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## **Foreword**

This Technical Specification (TS) has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

#### where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

## 1 Scope

[19]

The present document specifies requirements for support of Radio Resource Management for FDD. These requirements include requirements on measurements in UTRAN and the UE as well as requirements on node dynamical behaviour and interaction, in terms of delay and response characteristics.

## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]	3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".
[2]	3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".
[3]	3GPP TS 25.101: "UE Radio transmission and reception (FDD)".
[4]	3GPP TS 25.104: "BTS Radio transmission and reception (FDD)".
[5]	3GPP TS 25.102: "UE Radio transmission and reception (TDD)".
[6]	3GPP TS 25.105: "BTS Radio transmission and reception (TDD)".
[7]	3GPP TS 25.212: "Multiplexing and channel coding (FDD)".
[8]	3GPP TS 25.141: "Base station conformance testing (FDD)".
[9]	3GPP TS 25.142: "Base station conformance testing (TDD)".
[10]	3GPP TS 25.113: "Base station EMC".
[11]	3GPP TR 25.942: "RF System scenarios".
[12]	3GPP TR 25.922: "RRM Strategies".
[13]	3GPP TS 25.215: "Physical Layer Measurements (FDD)".
[14]	3GPP TS 25.225: "Physical Layer Measurements (TDD)".
[15]	3GPP TS 25.302: "Services provided by Physical Layer".
[16]	3GPP TS 25.331: "RRC Protocol Specification".
[17]	ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".
[18]	3GPP TS 25.214: "Physical layer procedures (FDD)"

3GPP TS 25.321: "MAC protocol specification"

[20]	3GPP TS 25.303: "Interlayer Procedures in Connected Mode".
[21]	3GPP TS 45.008: "Radio subsystem link control".
[22]	3GPP TS 45.005: "Radio transmission and reception".
[23]	3GPP TS 26.103: "Speech Codec List for GSM and UMTS".
[24]	3GPP TS 36.133: "Requirements for support of radio resource management".
[25]	3GPP TS 36.304: "User Equipment (UE) procedures in idle mode".
[26]	3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2"
[27]	3GPP TS 36.331: "Radio Resource Control(RRC)".
[28]	3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".
[29]	3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation ".

## 3 Definitions, symbols and abbreviations

#### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

The main general definitions strictly related to the Transmission and Reception characteristics but important also for the present document can be found in [3] for UE FDD, in [4] for BS FDD, in [5] for UE TDD, in [6] for BS TDD.

**Node B:**A logical node responsible for radio transmission / reception in one or more cells to/from the User Equipment. Terminates the Iub interface towards the RNC

**Power Spectral Density:** The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH\_E<sub>c</sub>, E<sub>c</sub>, OCNS\_E<sub>c</sub> and S-CCPCH\_E<sub>c</sub>) and others defined in terms of PSD ( $I_o$ ,  $I_{oc}$ ,  $I_{or}$  and  $\hat{I}_{or}$ ). There also exist quantities that are a ratio of energy per chip to PSD (DPCH\_E<sub>c</sub>/ $I_{or}$ , E<sub>c</sub>/ $I_{or}$  etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3,84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3,84 MHz can be expressed as a signal power of Y dBm.

**MBSFN cluster:** Set of cells operating in MBSFN mode providing only MBMS service in PtM mode and seen as one cell by a UE.

**Adjacent Frequency:** A downlink frequency in the inter-frequency cell info list that is within 5 MHz from the intra frequency. It is explicitly indicated by UTRAN to UE via upper layer signaling.

**Primary uplink frequency**: If a single uplink frequency is configured for the UE, then it is the primary uplink frequency. In case more than one uplink frequency is configured for the UE, then the primary uplink frequency is the frequency on which the E-DCH corresponding to the serving E-DCH cell associated with the serving HS-DSCH cell is transmitted. The association between a pair of uplink and downlink frequencies is indicated by higher layers.

**Secondary uplink frequency**: A secondary uplink frequency is a frequency on which an E-DCH corresponding to a serving E-DCH cell associated with a secondary serving HS-DSCH cell is transmitted. The association between a pair of uplink and downlink frequencies is indicated by higher layers.

**Activated Uplink Frequency:** For a specific UE, an uplink frequency is said to be activated if the UE is allowed to transmit on that frequency. The primary uplink frequency is always activated when configured while a secondary uplink frequency has to be activated by means of an HS-SCCH order in order to become activated.

## 3.2 Symbols

For the purposes of the present document, the following symbol applies:

[...] Values included in square bracket must be considered for further studies, because it

means that a decision about that value was not taken.

CPICH\_Ec Average energy per PN chip for the CPICH

CPICH\_Ec/Ior The ratio of the transmit energy per PN chip of the CPICH to the total transmit power

spectral density at the Node B antenna connector.

CPICH\_Ec/Io The ratio of the received energy per PN chip for the CPICH to the total received power

spectral density at the UE antenna connector. For a UE that is able to simultaneously receive signals from more than 1 carrier, CPICH\_Ec/Io is defined for each carrier

individually.

DPCH\_Ec/Ior The ratio of the transmit energy per PN chip of the DPCH to the total transmit power

spectral density at the Node B antenna connector.

Ec Average energy per PN chip.

Ês Received energy per resource element (power normalized to the subcarrier spacing)

during the useful part of the symbol, i.e. excluding the cyclic prefix, at the UE antenna

connector and applicable to E-UTRA signals only.

Io The total received power density, including signal and interference, as measured at the

UE antenna connector. For a UE that is able to simultaneously receive signals from

more than 1 carrier, Io is defined for each carrier individually.

Iob The total received power density, including signal and interference, as measured at the

BS antenna connector.

Ioc The power spectral density (integrated in a noise bandwidth equal to the chip rate and

normalized to the chip rate) of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector. For a UE that is able to simultaneously receive signals from more than 1

carrier, Ioc is defined for each carrier individually.

Ior The total transmit power spectral density (integrated in a bandwidth of  $(1+\alpha)$  times the

chip rate and normalized to the chip rate) of the downlink signal at the Node B antenna

connector.

Îor The received power spectral density (integrated in a bandwidth of  $(1+\alpha)$  times the chip

rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector. For a UE that is able to simultaneously receive signals from more

than 1 carrier, Îor is defined for each carrier individually.

Iot The received power spectral density of the total noise and interference for a certain

resource element (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector and applicable to E-UTRA signals

only.

OCNS\_Ec/Ior The ratio of the transmit energy per PN chip of the OCNS to the total transmit power

spectral density at the Node B antenna connector.

PCCPCH\_Ec/Ior The ratio of the transmit energy per PN chip of the PCCPCH to the total transmit power

spectral density at the Node B antenna connector.

PENALTY\_TIME Defined in TS 25.304, subclause 5.2.6.1.5

PICH\_Ec/Ior The ratio of the transmit energy per PN chip of the PICH to the total transmit power

spectral density at the Node B antenna connector.

SCH\_Ec/Ior The ratio of the transmit energy per PN chip of the SCH to the total transmit power

spectral density at the Node B antenna connector.

SCH RP Received (linear) average power of the resource elements that carry E-UTRA

synchronisation signal, measured at the UE antenna connector and applicable to E-

UTRA signals only.

Sintersearch Defined in TS 25.304, subclause 5.2.6.1.5

Sintrasearch Defined in TS 25.304, subclause 5.2.6.1.5 SsearchRAT Defined in TS 25.304, subclause 5.2.6.1.5

T1 Time period 1 T2 Time period 2

 $\begin{array}{lll} TEMP\_OFFSET & Defined in TS 25.304, subclause 5.2.6.1.5 \\ Thresh_{serving\_high} & Defined in TS 25.304, subclause 5.2.6.1.5 \\ Thresh_{serving\_low} & Defined in TS 25.304, subclause 5.2.6.1.5 \\ Thresh_{x\_high} & Defined in TS 25.304, subclause 5.2.6.1.5 \\ Thresh_{x\_low} & Defined in TS 25.304, subclause 5.2.6.1.5 \\ \end{array}$ 

The RRC Re-establishment delay requirement, the time between the moment when

erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH.

Treselection Defined in TS 25.304, subclause 5.2.6.1.5
TS Basic time unit, defined in TS 36.211, clause 4
UE\_TXPWR\_MAX\_RACH Defined in TS 25.304, subclause 5.2.3.1.2.

#### 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply

AWGN Additive White Gaussian Noise

BCH Broadcast Channel
BER Bit Error Ratio
BLER Block Error Ratio
BS Base Station

CFN Connection Frame Number
CLTD Closed Loop Transmit Diversity

CPICH Common Pilot Channel
CSG Closed Subscriber Group
CGI Cell Global Identifier
DC-HSDPA Dual Cell HSDPA

DC-HSDPA-MIMO

DC-HSDPA with MIMO

DC-HSUPA Dual Cell HSUPA
DL Down link (forward link)

DPCH Dedicated Physical Control Channel
DPCH Dedicated Physical Channel

DPCH Dedicated Physical Channel
DPDCH Dedicated Physical Data Channel

DRX Discontinuous Reception eNB E-UTRAN NodeB

E-DCH Enhanced Dedicated Channel

E-DPCCH E-DCH Dedicated Physical Control Channel
E-DPDCH E-DCH Dedicated Physical Data Channel
E-UTRA Enhanced Universal Terrestrial Radio Access

E-UTRAN Enhanced Universal Terrestrial Radio Access Network

FDD Frequency Division Duplex

F-DPCH Fractional Dedicated Physical Channel
GERAN GSM EDGE Radio Access Network
GSM Global System for Mobile communication

HO Handover

HSDPA High Speed Downlink Packet Access HSUPA High Speed Uplink Packet Access

HS-DPCCH Dedicated Physical Control Channel (uplink) for HS-DSCH

HS-DPCCH<sub>2</sub> Secondary Dedicated Physical Control Channel (uplink) for HS-DSCH, when

 $Secondary\_Cell\_Enabled \ is \ greater \ than \ 3$ 

HS-DSCH High Speed Downlink Shared Channel

HS-PDSCH High Speed Physical Downlink Shared Channel HS-SCCH Shared Control Physical Channel for HS-DSCH MBSFN MBMS over a Single Frequency Network

MIB Master Information Block
MDT Minimization of Drive Tests
MIMO Multiple Input Multiple Output

OCNS Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on

the other orthogonal channels of a downlink.

OFDM Orthogonal Frequency Division Multiplexing
OFDMA Orthogonal Frequency Division Multiple Access

PBCH Physical Broadcast Channel

PCCPCH Primary Common Control Physical Channel

PICH Paging Indicator Channel
PIN Personal Identification Number
PLMN Public Land Mobile Network
QAM Quadrature Amplitude Modulation

RAT Radio Access Technology

RNC Radio Network ControllerRSCP Received Signal Code Power

RRC Radio Resource Control
RRM Radio Resource Management
RSRP Reference Signal Received Power
RSRQ Reference Signal Received Quality
RSSI Received Signal Strength Indicator

SCH Synchronisation Channel, power of SCH shall be divided equally between Primary and Secondary

Synchronous channels.

S-DPCCH Secondary Dedicated Physical Control Channel

S-E-DPCCH Secondary Dedicated Physical Control Channel for E-DCH S-E-DPDCH Secondary Dedicated Physical Data Channel for E-DCH

SFN System Frame Number
SIB System Information Block
SIR Signal to Interference ratio
TDD Time Division Duplex
TFC Transport Format Combination

TPC Transport Format Combinate
TPC Transmit Power Control
TTI Transmission Time Interval

UTRA Universal Terrestrial Radio Access

UTRAN Universal Terrestrial Radio Access Network

UE User Equipment UL Up link (reverse link)

USIM Universal Subscriber Identity Module UTRA Universal Terrestrial Radio Access

UTRAN Universal Terrestrial Radio Access Network

WB-RSRQ Wide Bandwith RSRQ

#### 3.4 Test tolerances

The requirements given in the present document make no allowance for measurement uncertainty. The test specification 34.121 and 25.141 define test tolerances. These test tolerances are individually calculated for each test. The test tolerances are then added to the limits in this specification to create test limits. The measurement results are compared against the test limits as defined by the shared risk principle.

Shared Risk is defined in ETR 273 Part 1 sub-part 2 section 6.5.

## 4 Idle Mode Tasks

#### 4.1 Cell Selection

#### 4.1.1 Introduction

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS25.304. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

#### 4.2 Cell Re-selection

#### 4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally* state or *Camped on Any Cell* state on a FDD cell, the UE shall attempt to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fulfilled.

#### 4.2.2 Requirements

In the following sections,  $T_{higher\_priority\_search}$  is defined as (60 \*  $N_{layers}$ ) seconds, where  $N_{layers}$  is the total number of configured higher priority E-UTRA, UTRA FDD and UTRA TDD carrier frequencies and is additionally increased by one if one or more groups of GSM frequencies is configured as a higher priority.

#### 4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

The UE shall measure the CPICH Ec/Io and CPICH RSCP level of the serving cell and evaluate the cell selection criterion S defined in [1] for the serving cell at least every DRX cycle. The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements of the serving cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by, at least  $T_{measureFDD}/2$  (see table 4.1).

If the UE has evaluated in  $N_{\text{serv}}$  consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1].

After this 12 s period a UE in Cell:PCH or URA\_PCH is considered to be "out of service area" and shall perform actions according to 25.331.

On transition from CELL\_DCH to CELL\_PCH/URA\_PCH, if a UE cannot find a suitable UTRA cell, then it is considered to be "out of service area" and shall perform actions according to [16].

If the S criterion of the serving cell is no longer fulfilled, the UE may suspend MBMS reception if necessary to improve the UE's ability to find a suitable cell.

If the S criterion of the serving cell is fulfilled, the measurement requirements when a MBMS reception is active are specified in sections 4.2.2.2 and 4.2.2.9.

#### 4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every  $T_{measureFDD}$  (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules.  $T_{measureFDD}$  is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least  $T_{measureFDD}/2$ .

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within  $T_{\text{evaluateFDD}}$  (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

If the UE is receiving the MTCH, the UE shall to be able to identify new intra-frequency cells and take them into use for MTCH combining purposes as defined in section 8.4.2.2.1

#### 4.2.2.3 Measurements of inter-frequency FDD cells

If priority information for UTRA FDD carrier frequencies is provided in the measurement control systems information and Srxlev\_ServingCell > Sprioritysearch1 and Squal\_ServingCell > Sprioritysearch2 then the UE shall search for any higher priority UTRA inter-frequency cells at least every  $T_{higher\_priority\_search}$  where  $T_{higher\_priority\_search}$  is described in section 4.2.2. If the UE is not in CELL\_PCH, URA\_PCH or IDLE state then the UE shall search for UTRA FDD layers of higher priority within  $T_{higher\_layer\_start}$  upon entering into any of these states. If 1 second has not elapsed since the UE camped on the current serving cell when the UE enters into any of these states,  $T_{higher\_layer\_start}$  is one DRX cycle plus 1 second; otherwise  $T_{higher\_layer\_start}$  is one DRX cycle. If higher priority UTRA cells are found by the higher priority search, they shall be measured at least every ( $N_{carrier}$ -1) \*  $T_{measureFDD}$ . If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If priority information for UTRA FDD carrier frequencies is provided in the measurement control systems information and Srxlev\_ServingCell < Sprioritysearch1 or Squal\_ServingCell < Sprioritysearch2, the rules defined below apply irrespective of the priority of the inter-frequency layer.

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every ( $N_{carrier}$ -1) \*  $T_{measureFDD}$  (see table 4.1) for interfrequency cells that are identified and measured according to the measurement rules. The parameter  $N_{carrier}$  is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least  $T_{measureFDD}/2$ .

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has met the reselection criteria in [1] within ( $N_{carrier}$ -1) \*  $T_{evaluateFDD}$  (see table 4.1) from the moment the inter-frequency cell met the reselection criteria by at least 3 dB provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has met the reselection criteria in [1] within 30 s from the moment the inter-frequency cell met the reselection criteria by at least 3 dB provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has met the reselection criteria in [1] within ( $N_{carrier}$ -1) \*  $T_{evaluateFDD}$  from the moment the inter-frequency cell met the reselection criteria by at least 5 dB dB for reselection based on ranking, or [6]dB for reselection based on absolute priorities provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell hasmet the reselection criteria in [1] within 30 s from the moment the inter-frequency cell met the reselection criteria by at least 5 dB dB for reselection based on ranking, or [6]dB for reselection based on absolute priorities provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell meets the reselection criteria in [1], the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell fulfils the reselection criteria within this duration, then the UE shall reselect that cell.

#### 4.2.2.4 Measurements of inter-frequency TDD cells

The requirements in this section shall apply to UE supporting FDD and TDD.

The UE shall measure P-CCPCH RSCP at least every  $N_{carrierTDD}$  \*  $T_{measureTDD}$  (see table 4.1) for inter-frequency TDD cells that are identified and measured according to the measurement rules. The parameter  $N_{carrierTDD}$  is the number of carriers used for inter-frequency TDD cells. The UE shall filter P-CCPCH RSCP measurements of each measured inter-frequency TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least  $T_{measureTDD}/2$ .

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already identified interfrequency TDD cell has become better ranked than the serving cell within  $N_{carrierTDD}^*$   $T_{evaluateTDD}$  from the moment the

inter-frequency TDD cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency TDD cells, the filtering shall be such that the UE shall be capable of evaluating that an inter-frequency TDD cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency TDD cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency TDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency TDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

#### 4.2.2.5 Measurements of inter-RAT GSM cells

#### 4.2.2.5.1 Cell reselection based on cell ranking

The requirements in this subclause shall apply if the UE uses the cell ranking algorithm for inter-RAT cell reselection [1].

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in [1], at least every  $T_{measureGSM}$  (see table 4.1). The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell reselection criteria defined in [1]. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier.

If Treselection timer has a non zero value and the inter-RAT GSM cell is better ranked than the serving cell, the UE shall evaluate this inter-RAT GSM cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

#### 4.2.2.5.2 Cell reselection based on priority information

The requirements in this subclause shall apply if the UE uses the absolute priorities based algorithm for inter-RAT cell reselection [1].

If  $Srxlev_{ServingCell} > S_{prioritysearch1}$  and  $Squal_{ServingCell} > S_{prioritysearch2}$  then the UE shall search for and measure GSM cells if the priority of GSM is higher than the serving cell. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life.

When the measurement rules defined in [1] indicate that inter-RAT cells are to be measured then the UE shall measure, the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell. GSM BCCH carriers of lower priority than the serving cell shall be measured at least every  $T_{measure,GSM}$  (see table 4.1).

If  $Srxlev_{ServingCell} > S_{prioritysearch1}$  and  $Squal_{ServingCell} > S_{prioritysearch2}$  then the UE shall search for GSM BCCH carrier at least every  $T_{higher\_priority\_search}$  where  $T_{higher\_priority\_search}$  is described in section 4.2.2. If the UE is not in CELL\_PCH, URA\_PCH or IDLE state then the UE shall search for GSM layers of higher priority within  $T_{higher\_layer\_start}$  upon entering into any of these states. If 1 second has not elapsed since the UE camped on the current serving cell when the UE enters into any of these states,  $T_{higher\_layer\_start}$  is one DRX cycle plus 1 second; otherwise  $T_{higher\_layer\_start}$  is one DRX cycle. When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every  $T_{measure,GSM}$ , and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection to continuously verify the BSIC of the GSM BCCH carrier every 30s. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If  $Srxlev_{ServingCell} <= S_{prioritysearch2}$ , the rules defined below apply irrespective of the priority of the GSM layer.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

#### 4.2.2.5a Measurements of inter-RAT E-UTRA cells

The UE shall be able to identify new E-UTRA cells and perform RSRP and RSRQ measurements of identified E-UTRA cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If  $Srxlev_{ServingCell} > S_{prioritysearch1}$  and  $Squal_{ServingCell} > S_{prioritysearch2}$  then the UE shall search for E-UTRA layers of higher priority at least every  $T_{higher\_priority\_search}$  where  $T_{higher\_priority\_search}$  is described in section 4.2.2. If the UE is not in CELL\_PCH, URA\_PCH or IDLE state then the UE shall search for E-UTRA layers of higher priority within  $T_{higher\_layer\_start}$  upon entering into any of these states. If 1 second has not elapsed since the UE camped on the current serving cell when the UE enters into any of these states,  $T_{higher\_layer\_start}$  is one DRX cycle plus 1 second; otherwise  $T_{higher\_layer\_start}$  is one DRX cycle. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life.

If  $Srxlev_{ServingCell} \le S_{prioritysearch1}$  or  $Squal_{ServingCell} \le S_{prioritysearch2}$  then the UE shall search for and measure E-UTRA frequency layers of higher or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for a lower priority layers.

The UE shall be able to evaluate whether a new detectable lower priority inter-RAT E-UTRA cell meets the reselection criteria defined in [1] within  $K_{carrier} * T_{detectE-UTRA}$ , where  $T_{detectE-UTRA}$  is given in Table 4.2, if E-UTRA carrier frequency information is provided in the inter-RAT measurement control system information when Treselection=0 provided that the reselection criteria is met by at least 6dB for RSRP reselections or 4dB for RSRQ reselections. The parameter  $K_{carrier}$  is the number of E-UTRA carrier frequencies indicated in the inter-RAT measurement control system information. An inter RAT E-UTRAN cell is considered to be detectable if:

- RSRP<sub>dBm</sub> according to Annex B.1.1 for a corresponding Band

The UE shall measure RSRP and RSRQ at least every  $K_{carrier} * T_{measure E-UTRA}$  as defined in table 4.2 for identified E-UTRA cells.

When higher priority cells are found by the higher priority search, they shall be measured at least every  $T_{measureE-UTRA}$ . If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP and RSRQ measurements of each measured E-UTRA cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least  $T_{measureE-UTRA}/2$ .

RSRP and RSRQ measurements of E-UTRA cells shall not be filtered over a longer period than that specified in Table 4.2.

The UE shall not consider an E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-RAT E-UTRA cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the E-UTRA cell has met reselection criterion defined TS 36.304 within  $K_{carrier} * T_{evaluateEUTRA}$  as specified in table 4.2 provided that the reselection criteria is met by at least 6dB for RSRP reselections or 4dB for RSRO reselections and the Treselection timer is set to zero.

#### 4.2.2.6 Evaluation of cell re-selection criteria

The UE shall evaluate the cell re-selection criteria defined in TS 25.304 for the cells, which have new measurement results available, at least every DRX cycle.

UE shall perform cell reselection immediately after the reselection criteria have been met (e.g. the UE has found a higher ranked suitable cell or the UE has found a suitable cell on a higher priority RAT), unless less than 1 second has elapsed from the moment the UE started camping on the serving cell. The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

#### 4.2.2.7 Maximum interruption in paging reception

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection the interruption time must not exceed -  $T_{SI}$  + 50 ms. For inter-RAT cell re-selection the interruption time must not exceed  $T_{BCCH}$  + 50 ms for GSM or  $T_{SI-EUTRA}$  + [50 ms] for E-UTRA.

 $T_{SI}$  is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

T<sub>BCCH</sub> is the maximum time allowed to read BCCH data from a GSM cell [21].

T<sub>SI-EUTRA</sub> is the maximum time allowed to read system information from a E-UTRA cell [24].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.

Table 4.1: T<sub>measureFDD</sub>, T<sub>evaluateFDD</sub>, T<sub>measureTDD</sub>, T<sub>evaluateTDD</sub>, and T<sub>measureGSM</sub>

DRX cycle length [s]	N <sub>serv</sub> [number of DRX cycles]	T <sub>measureFDD</sub> [s] (number of DRX cycles)	T <sub>evaluateFDD</sub> [s] (number of DRX cycles)	T <sub>measureTDD</sub> [s] (number of DRX cycles)	T <sub>evaluateTDD</sub> [s] (number of DRX cycles)	T <sub>measureGSM</sub> [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX	2.56 (32 DRX	0.64 (8 DRX	2.56 (32 DRX	2.56 (32 DRX
		cycles)	cycles)	cycles)	cycles)	cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

DRX cycle length [s]	T <sub>detectE-UTRA</sub> [S]	T <sub>measureE-UTRA</sub> [s] (number of DRX cycles)	T <sub>evaluateEUTRA</sub> [s] (number of DRX cycles)
0.08		2.56 (32)	7.68 (96)
0.16		2.56 (16)	7.68 (48)
0.32	30	5.12 (16)	15.36 (48)
0.64		5.12 (8)	15.36 (24)
1.28		6.4 (5)	19.2 (15)
2.56	60	7.68 (3)	23.04 (9)
5.12	60	10.24 (2)	30.72 (6)

Table 4.2: T<sub>detectE-UTRA</sub>, T<sub>measureE-UTRA</sub> and T<sub>evaluateEUTRA</sub>

For higher priority cells, a UE may optionally use a shorter value for TmeasureFDD and TmeasureE-UTRA , which shall not be less than Max(0.64 s, one DRX cycle).

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s, according to [16].

#### 4.2.2.8 Number of cells in cell lists

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - FDD cells on maximum 2 additional carriers. and
  - Depending on UE capability, TDD cells distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers, and
- Depending on UE capability, up to 4 E-UTRA FDD carriers, and
- Depending on UE capability up to 4 E-UTRA TDD carriers

as indicated in cell information lists sent in system information (BCCH).

In addition to the requirements defined above, a UE supporting E-UTRA measurements in RRC\_IDLE state shall be capable of monitoring a minimum total of at least 8 carrier frequency layers, including the intra-frequency serving layer and comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

## 4.2.2.9 Additional requirements for measurement of inter-frequency and inter-RAT cells when MBMS reception is active

If an MBMS service is being received then the following requirements additionally apply:

When the UE is receiving MTCH and the UE evaluates that the cell re-selection measurement rules in 25.304 indicate that inter-frequency or inter-RAT measurements are not required to be made, the UE shall not perform the corresponding inter-frequency or inter-RAT measurements.

When the UE is receiving MTCH and the UE evaluates that the cell re-selection measurement rules in 25.304 indicate that inter-frequency or inter-RAT measurements are required to be made, and the UE needs to interrupt MTCH reception to make inter-frequency or inter-RAT measurements, an individual interruption of MTCH reception shall not exceed 12.5% of an MTCH TTI from a single arbitrary cell from which the MTCH is received.

The total interruption time to the MTCH reception due to inter-frequency measurements shall not exceed a total of

- 20 ms every Tmeasure, FDD for measuring known FDD inter-frequency neighbours, and
- 300 ms every 30 seconds for searching for new FDD inter-frequency cells for each inter-frequency carrier frequency

There are no corresponding limitations on the total interruption time to the MTCH reception due to inter-RAT measurements

The UE shall ensure that inter-frequency measurement or inter-RAT measurement interruptions do not overlap constantly with the periodic MCCH transmissions.

#### 4.2.2.10 MTCH Interruption time

The MTCH interruption time is the time between the end of the last MTCH TTI on which UE receives MTCH from the serving cell and the beginning of the first MTCH TTI on which UE starts receiving MTCH from the target cell.

The MTCH interruption time due to intra-frequency cell reselection without soft combining during an MBMS session shall be less than  $T_{MTCH\ interrupt}$ 

$$T_{MTCH interrupt} = T_{IU} + 20 + T_{MCCH} + T_{MTCH} ms$$

Where

TMCCH: is the time required to read the relevant MCCH information of the target cell according to the

MBMS specific procedures defined in TS 25.331.

TMTCH: is the uncertainty when reading the MTCH of the serving and target cells while performing cell

reselection; TMTCCH can be up to 2 MTCH TTI.

The MTCH interruption time ( $T_{MTCH\_interrupt}$ ) shall be applicable when UE is receiving MBMS in idle mode, CELL\_PCH state and URA PCH state.

#### 4.2.2.11 Reselection to CSG cells

Note: Requirements in this section are minimum requirements defined to ensure the testability of autonomous CSG search.

Reselection from non CSG to CSG cells may be performed using UE autonomous search as defined in [1] when at least one CSG ID is included in the UE's CSG whitelist. The requirements in this section are valid for reselection to CSG cells previously visited by the UE when the radio configuration parameters, including the carrier frequency and physical cell identity of the CSG cell, non CSG cell and other neighbour cells are unchanged from the most recent previous visit.

NOTE: According to [1], the UE autonomous search function, per UE implementation, determines when and/or where to search for allowed CSG cells.

#### 4.2.2.11.1 Reselection from a non CSG to an inter-frequency CSG cell

The UE shall perform search and reselection to an allowed inter-frequency CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 4.2.2.11.1-1. There is no need for statistical testing of this requirement.

Table 4.2.2.11.1-1: Parameters for CSG inter-frequency reselection

Parameter	Unit	Cell 1	Cell 2
UARFCN Note1		Channel 1	Channel 2
CSG indicator		False	True
Primary scrambling code		Scrambling code	Scrambling
Note1		1	code 2
CSG identity		Not sent	Sent
			(Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non	multipath
CSG cell previously		Ye	S
visited by UE			
CPICH_RSCP <sup>Note2</sup>	dBm	-100	-100
CPICH_Ec/lor	dB	-10	-10
PCCPCH_Ec/lor	dB	-12	-12
SCCPCH_Ec/lor	dB	-12	-12
AICH_Ec/lor	dB	-15	-15
SCH_Ec/lor	dB	-15	-15
PICH_Ec/lor	dB	-15	-15
$I_{oc}$	dBm/3.84 MHz	Off	Off

Note 1: For this requirement to be applicable, the UARFCN and scrambling code for cell 1 and cell 2 shall be unchanged from when the CSG cell was visited previously.

Note 2: Chosen to ensure that CSG autonomous search has a high probability of success on every attempt made by UE.

#### 4.2.2.11.2 Reselection from a non CSG to an inter-RAT E-UTRA CSG cell

The UE shall perform search and reselection to an allowed inter-RAT E-UTRA CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 4.2.2.11.2-1. There is no need for statistical testing of this requirement.

Table 4.2.2.11.2-1: Parameters for CSG inter-RAT E-UTRA reselection

Parameter	Unit	Cell 1	Cell 2
UARFCN Note1	-	Channel 1	N/A
EARFCN Note1		N/A	Channel 2
CSG indicator		False	True
Primary scrambling code		Scrambling	N/A
Note1		code 1	
Physical cell identity <sup>Note1</sup>		N/A	2
CSG identity		Not sent	Sent
			(Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non	
CSG cell previously		Ye	S
visited by UE			T
CPICH_RSCP <sup>Note2</sup>	dBm	-100	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCCPCH_Ec/lor	dB	-12	N/A
AICH_Ec/lor	dB	-15	IN/A
SCH_Ec/lor	dB	-15	
PICH_Ec/lor	dB	-15	
$I_{oc}$	dBm/3.84 MHz	Off	
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		0
PDCCH_RA	dB	N1/A	
PDCCH_RB	dB	N/A	
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RANOTE 1	dB		
OCNG_RB <sup>Note 1</sup>	dB		
Qrxlevmin	dBm		-140
$N_{oc}$	dBm/15 kHz		Off
RSRP Note2	dBm/15 KHz		-110
Note 1: For this requirer	ment to be applicable	e, the UARFCN and	scrambling

Note 1: For this requirement to be applicable, the UARFCN and scrambling code for cell 1 and the EARFCN and physical cell identity for cell 2 shall be unchanged from when the CSG cell was visited previously

Note 2: Chosen to ensure that CSG autonomous search has a high probability of success on every attempt made by UE

## 4.3 MBSFN cluster selection

#### 4.3.1 Introduction

MBSFN allows the UE to select a suitable MBSFN cluster where to camp on in order to access available services.

#### 4.4 MBSFN cluster reselection

#### 4.4.1 Introduction

There are no requirements specified for MBSFN cluster reselection.

### 4.5 Minimization of Drive Tests (MDT)

UE supporting minimisation of drive tests shall be capable of, 3GPP TS 25.331 [16]:

- logging measurements in RRC\_IDLE, CELL\_PCH, and URA\_PCH states, reporting the logged measurements and meeting requirements in this section.
- logging of RRC connection establishment failure, reporting the logged failure and meeting requirements in this section.

#### 4.5.1 Introduction

The loggeed MDT requirements consist of measurement requirements as specified in section 4.5.2 and relative time stamp accuracy requirements as specified in section 4.5.3. Both sets of requirements are applicable for intra-frequency, inter-frequency and inter-RAT cases in idle, CELL\_PCH and URA\_PCH states. The MDT procedures are described in 3GPP TS 37.320 [26].

For RRC connection establishment failure logging and reporting, the MDT requirements consist of requirements for measurements performed and logged in IDLE, CELL\_PCH, and URA\_PCH states specified in Section 4.5.2 and relative time stamp accuracy requirement for RRC connection establishment failure log reporting as specified in Section 4.5.4.

#### 4.5.2 Measurements

The requirements specified in this section apply for the measurements (GSM carrier RSSI, UTRA CPICH RSCP, UTRA CPICH Ec/Io, P-CCPCH RSCP for UTRA 1.28 TDD , E-UTRA RSRP and E-UTRA RSRQ) performed and logged by the UE for MDT in IDLE, CELL\_PCH and URA\_PCH states. The requirements apply for the measurements included in logged MDT reports and RRC connection establishment failure reports.

#### 4.5.2.1 Requirements

The measurement values that are used to meet serving cell and reselection requirements as specified in sections 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.4, 4.2.2.5 and 4.2.2.5a shall also apply to the values logged for MDT measurements in idle state.

The measurement values that are used to meet serving cell and reselection requirements as specified in section 5.6 shall also apply to the values logged for MDT measurements in CELL\_PCH state.

The measurement values that are used to meet serving cell and reselectionrequirements as specified in section 5.7 shall also apply for the values logged for MDT measurements in URA\_PCH state.

## 4.5.3 Relative Time Stamp Accuracy

The relative time stamp for a logged measurement is defined as the time from the moment the MDT configuration was received at the UE until the measurement was logged, see [16].

#### 4.5.3.1 Requirements

The accuracy of the relative time stamping is such that the drift of the time stamping shall be not more than  $\pm 2$  seconds per hour.

## 4.5.4 Relative Time Stamp Accuracy for RRC Connection Establishment Failure Log Reporting

Relative time stamp for RRC connection establishment failure log reporting is defined as the time elapsed from the last RRC connection establishment failure to the time when the log is included in the report [16]. The UE shall report the RRC connection establishment failure log, while meeting the accuracy requirement specified in Section 4.5.4.1.

#### 4.5.4.1 Requirements

The accuracy of the relative time stamping for RRC connection establishment failure log reporting is such that the drift of the time stamping shall not be larger than  $\pm$  0.72 seconds per hour and  $\pm$  10 seconds over 48 hours. The relative time stamp accuracy requirements shall apply provided that:

- no switch off or detach occurs after the RRC connection establishment failure had been detected and until the log is time-stamped.

NOTE: This requirement does not need to be tested.

## 5 UTRAN Connected mode mobility

This section contains the requirements on the mobility procedures in UTRAN connected mode such as handover and cell re-selection.

Requirements related to the measurements in support of the execution of the UTRAN connected mode mobility procedures are specified, currently not necessarily for all UTRAN connected mode states, in section 8.

The radio links the UE shall use are controlled by UTRAN with RRC signalling.

UE behaviour in response to UTRAN RRC messages is described in TS25.331.

The purpose of Cell reselection in CELL\_FACH, CELL\_PCH and URA\_PCH states is that the UE shall select a better cell according to the cell reselection criteria in TS 25.304. CELL\_FACH, CELL\_PCH and URA\_PCH states are described in TS 25.331.

#### 5.1 FDD/FDD Soft Handover

#### 5.1.1 Introduction

Soft handover is a function in which the UE is connected to several UTRAN access points at the same time. Addition and/or release of radio links are controlled by the ACTIVE SET UPDATE procedure.

The soft handover function includes a measurement phase, a decision algorithm in UTRAN and the ACTIVE SET UPDATE procedure.

#### 5.1.2 Requirements

#### 5.1.2.1 Active set dimension

When the UE is configured with a single uplink carrier frequency, the UE shall be capable of supporting at least 6 radio links in the active set. For E-DCH the UE shall be capable of supporting a sub-set of the 6 radio links in the active set. The subset shall consist of the Serving E-DCH radio link and up to 3 additional E-DCH radio links. The 3 additional radio links can either be from the Serving E-DCH radio link set or can be Non-Serving radio links. The Serving E-DCH radio link, the Serving E-DCH radio link set and Non-Serving E-DCH radio links are defined in [15].

When the UE is configured with dual uplink carrier frequencies, the UE shall be capable of supporting at least 4 radio links per uplink carrier frequency. For E-DCH the UE shall be capable of supporting a sub-set of the 4 radio links in the active set per uplink carrier frequency. The subset shall consist of the Serving E-DCH radio link and up to 3 additional E-DCH radio links per uplink carrier frequency. The 3 additional radio links can either be from the Serving E-DCH radio link set or can be Non-Serving radio links on the same uplink carrier frequency.

#### 5.1.2.2 Active set update delay

The active set update delay is defined as the time from when the UE has received the ACTIVE SET UPDATE message from UTRAN, or at the time stated through the activation time when to perform the active set update, to the time when the UE successfully uses the set of radio links stated in that message for power control.

The active set update delay is depending on the number of known cells referred to in the ACTIVE SET UPDATE message. A cell is known if it has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

And the phase reference is the primary CPICH.

The active set update delay shall be less than 50+10\*KC+100\*OC ms, where

KC: is the number of known cells in the active set update message;

OC: is the number of cells that are not known in the active set update message.

If the UE have radio links in the active set that it can not use for data detection (due to low signal level), the UE shall at least every 150 ms search for the radio link

#### 5.1.2.3 Interruption Time

The UE shall not interrupt the data flow when adding, changing or removing radio links to the active set.

#### 5.2 FDD/FDD Hard Handover

#### 5.2.1 Introduction

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, see TS 25.331 section 8.3.5.

#### 5.2.2 Requirements

#### 5.2.2.1 Hard handover delay

Procedure delay for all procedures, that can command a hard handover, are specified in TS25.331 section 13.5.2.

When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within  $D_{handover}$  seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time + interruption time.

where:

- D<sub>handover</sub> equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.

#### 5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCCH, is depending on whether the target cell is known for the UE or not.

If intra-frequency hard handover is commanded or inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, and if higher layers do not indicate that the UE shall not perform any synchronisation procedure for timing maintained intra- or inter-frequency hard handover, the interruption time shall be less than  $T_{interrupt1}$ 

$$T_{interrupt1} = T_{IU} + T_{sync} + 20*KC + 150*OC + 10*F_{max} ms$$

where

$\mathrm{T_{IU}}$	is the interruption uncertainty when changing the timing from the old to the new cell. $T_{\rm IU}$ can be up to one frame (10 ms).
KC	is the number of known target cells in the message, and
OC	is the number of target cells that are not known in the message.
$F_{\text{max}}$	denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.
$T_{ m sync}$	is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2. In case higher layers indicate the usage of a post-verification period $T_{\text{sync}}$ =0 ms. Otherwise $T_{\text{sync}}$ =40 ms.

In the interruption requirement  $T_{interrupt1}$  a cell is known if it has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

If inter-frequency hard handover is commanded and the UE needs compressed mode to perform inter-frequency measurements and if higher layers do not indicate that the UE shall not perform any synchronisation procedure for timing maintained intra- or inter-frequency hard handover, the interruption time shall be less than Tinterrupt2

$$T_{interrupt2} = T_{IU} + T_{sync} + 50*KC + 150*OC + 10*F_{max} ms$$

In the interruption requirement T<sub>interrupt2</sub> a cell is known if the cell has been measured by the UE during the last 5 seconds.

If intra-frequency hard handover is commanded or if inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, and if higher layers do indicate that the UE shall not perform any synchronisation procedure for timing maintained intra- or inter-frequency hard handover, the interruption time shall be less than  $T_{interrupt3}$ 

$$T_{interrupt3}$$
=20\*KC+150\*OC +10\* $F_{max}$  ms

In the interruption requirement  $T_{interrupt3}$  a cell is known if the cell has been measured by the UE during the last 5 seconds or the timing of the cell is signalled from higher layers by the signal "Reference time difference to cell" in [16], with the signalled accuracy lower than or equal to 40 chips.

If inter-frequency hard handover is commanded and if higher layers do indicate that the UE shall not perform any synchronisation procedure for timing maintained intra- or inter-frequency hard handover, the interruption time shall be less than  $T_{interrupt4}$ 

In the interruption requirement  $T_{interrupt4}$  a cell is known if the cell has been measured by the UE during the last 5 seconds or the timing of the cell is signalled from higher layers by the signal "Reference time difference to cell" in [16], with the signalled accuracy lower than or equal to 40 chips.

The phase reference is the primary CPICH.

The requirements in this section assume that N312 has the smallest possible value i.e. only one insync is required.

#### 5.3 FDD/TDD Handover

#### 5.3.1 Introduction

The purpose of FDD/TDD handover is to change the radio access mode from FDD to TDD. The FDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover as described in [16].

### 5.3.2 Requirements

The requirements in this section shall apply to UE supporting FDD and TDD.

### 5.3.2.1 FDD/TDD handover delay

RRC procedure performance values for all RRC procedures, that can command a hard handover, are specified in [16].

When the UE receives a RRC message implying FDD/TDD handover with the activation time "now" or earlier than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within  $D_{handover}$  seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time + interruption time.

### where:

- D<sub>handover</sub> equals the RRC procedure performance value as defined in [16] plus the interruption time stated in section 5.3.2.2.

### 5.3.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCH, is dependent on whether the target cell is known for the UE or not.

If FDD/TDD handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC + 10*F_{max} ms$$

where.

$T_{offset}$	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
$T_{UL}$	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
$F_{SFN}$	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise
$F_{\text{max}}$	denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

An inter-frequency TDD target cell shall be considered known by the UE, if the target cell has been measured by the UE during the last 5 seconds.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

## 5.4 FDD/GSM Handover

### 5.4.1 Introduction

The purpose of inter-RAT handover from UTRAN FDD to GSM is to transfer a connection between the UE and UTRAN FDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS25.331 section 8.3.7.

Compressed mode according to the UE Capability may be used to be able to make measurements on GSM.

### 5.4.2 Requirements

The requirements in this section shall apply to UE supporting FDD and GSM.

The requirements given below in Tables 5.2 and 5.3 for the case where the UE has not synchronised to the GSM cell before receiving the HANDOVER FROM UTRAN COMMAND are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in [16].

### 5.4.2.1 Handover delay

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than RRC procedure delay (see below) from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in TS 45.010) on the channel of the new RAT within the value in table 5.2 from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than RRC procedure delay from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in TS 45.010) on the channel of the new RAT at the designated activation time + interruption time.

The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms, which is noted as RRC procedure delay. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.2: FDD/GSM handover -handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the	90
HANDOVER FROM UTRAN COMMAND is received	
The UE has not synchronised to the GSM cell before	190
the HANDOVER FROM UTRAN COMMAND is received	

### 5.4.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than The value in table 5.3.

Table 5.3: FDD/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the	40
HANDOVER FROM UTRAN COMMAND is received	
The UE has not synchronised to the GSM cell before	140
the HANDOVER FROM UTRAN COMMAND is received	

## 5.4a FDD to E-UTRAN FDD Handover

### 5.4a.1 Introduction

The purpose of inter-RAT handover from UTRAN FDD to E-UTRAN FDD is to transfer a connection between the UE and UTRAN FDD to E-UTRAN FDD. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS 25.331.

Compressed mode according to the UE Capability may be used to be able to make measurements on E-UTRAN.

## 5.4a.2 Requirements

The requirements in this section shall apply to UE supporting FDD and E-UTRAN FDD.

### 5.4a.2.1 Handover delay

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND message, the UE shall be ready to start the transmission of the new uplink PRACH channel within  $D_{handover}$  seconds from the end of the last TTI containing the RRC command, where:

- D<sub>handover</sub> equals the maximum RRC procedure delay defined plus the interruption time stated in section 5.4a.2.2.

The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms, which is noted as RRC procedure delay.

### 5.4a.2.2 Interruption time

The interruption time is the time between end of the last TTI containing the RRC command and the time the UE starts transmission of the PRACH in the new E-UTRA cell, excluding RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-RAT handover to E-UTRAN is commanded, the interruption time shall be less than Tinterrupt:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

 $T_{\text{search}} \\$ 

is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then  $T_{\rm search} = 0$  ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then  $T_{\rm search} = 80$  ms.

 $T_{IU}$  is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell.  $T_{IU}$  can be up to 30 ms.

NOTE: The actual value of T<sub>IU</sub> shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if

- it has been meeting the relevant cell identification requirements during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in [24].

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

## 5.4b FDD to E-UTRAN TDD Handover

### 5.4b.1 Introduction

The purpose of inter-RAT handover from UTRAN FDD to E-UTRAN TDD is to transfer a connection between the UE from UTRAN FDD to E-UTRAN TDD. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS 25.331 section 8.3.7.

Compressed mode according to the UE Capability may be used to be able to make measurements on E-UTRAN.

### 5.4b.2 Requirements

The requirements in this section shall apply to UE supporting FDD and E-UTRAN TDD.

### 5.4b.2.1 Handover delay

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND message, the UE shall be ready to start the transmission of the new uplink PRACH channel within  $D_{handover}$  seconds from the end of the last TTI containing the RRC command.

### Where:

D<sub>handover</sub> equals the maximum RRC procedure delay defined plus the interruption time stated in section 5.4b.2.2.

The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms, which is noted as RRC procedure delay.

### 5.4b.2.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on UTRA and the time the UE starts transmission of the new PRACH on E-UTRA cell, excluding the RRC procedure delay. This requirement applies when the UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-RAT handover to E-UTRAN is commanded, the interruption time shall be less than Tinterrupt

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

 $T_{search}$  is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then  $T_{search} = 0$  ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then  $T_{search} = 80$  ms.

 $T_{IU}$  is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell.  $T_{IU}$  can be up to 30 ms.

NOTE: The actual value of T<sub>III</sub> shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in [24].

## 5.5 Cell Re-selection in CELL\_FACH

### 5.5.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

### 5.5.2 Requirements

The Cell reselection delays specified below are applicable when the RRC parameter  $T_{reselection}$  is set to 0. Otherwise the Cell reselection delay is increased  $T_{reselection}$  s.

The measurements CPICH Ec/Io and CPICH RSCP shall be used for cell reselection in Cell-FACH state to another FDD cell, P-CCPCH RSCP shall be used for cell re-selection to a TDD cell, GSM carrier RSSI shall be used for cell reselection to a GSM cell and E-UTRA RSRP and RSRQ shall be used for cell re-selection to a E-UTRAN cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in section 9. The measurements used for S-criteria and cell re-selection evaluation in CELL\_FACH shall be performed according to section 8.4.

### 5.5.2.1 Cell re-selection delay

For UTRA FDD the cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the the preambles on the PRACH for sending RRC CELL UPDATE message to the UTRAN.

For UTRA TDD, the cell re-selection delay is defined as the time between the occurrence of an event which will trigger the cell re-selection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN on the RACH.

For GSM and E-UTRAN, the cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the random access in the target cell of the new RAT.

### 5.5.2.1.1 Intra frequency cell reselection

The cell re-selection delay in CELL\_FACH state to a cell in the same frequency shall be less than

$$T_{reselection,\,intra} = T_{identify,\,intra} + T_{IU} + 20 + T_{SI} + T_{RA} \, ms$$

where

T<sub>identify, intra</sub> is specified in 8.4.2.2.1.

 $T_{IU}$  is the interruption uncertainty when changing the timing from the old to the new cell.  $T_{IU}$  can be up to one frame (10 ms).

 $T_{SI}$  = The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell..

 $T_{RA}$  = The additional delay caused by the random access procedure.

If a cell has been detectable at least  $T_{identify,intra}$ , the cell reselection delay in CELL\_FACH state to a cell in the same frequency shall be less than

$$T_{reselection, intra} = T_{Measurement\_Period\ Intra} + T_{IU} + 20 + T_{SI} + T_{RA}\ ms$$

where

 $T_{\text{Measurement,Period Intra}} = \text{Specified in } 8.4.2.2.2.$ 

These requirements assume radio conditions to be sufficient, so reading of system information can be done without errors.

### 5.5.2.1.2 Inter frequency cell reselection

The cell re-selection delay in CELL\_FACH state to a FDD cell on a different frequency shall be less than

$$T_{\text{reselection, inter}} = T_{\text{identify, inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

.where

T<sub>identify, inter</sub> is specified in 8.4.2.3.1.

 $T_{IU}$  is the interruption uncertainty when changing the timing from the old to the new cell.  $T_{IU}$  can be

up to one frame (10 ms).

 $T_{SI}$  = The time required for receiving all the relevant system information data according to the reception

procedure and the RRC procedure delay of system information blocks defined in 25.331 for a

UTRAN cell..

 $T_{RA}$  = The additional delay caused by the random access procedure.

If a cell has been detectable at least  $T_{identify,inter}$ , the cell reselection delay in CELL\_FACH state to a FDD cell on a different frequency shall be less than

$$T_{\text{reselection inter}} = T_{\text{Measurement inter}} + T_{\text{III}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

where

T<sub>Measurement, inter</sub>= Specified in 8.4.2.3.2.

These requirements assume radio conditions to be sufficient, so that reading of system information can be done without errors.

### 5.5.2.1.3 FDD-TDD cell reselection

The requirements in this section shall apply to UE supporting FDD and TDD.

The cell re-selection delay in CELL\_FACH state in FDD to an inter frequency TDD cell shall be less than

$$T_{\text{reselection, TDD}} = T_{\text{identify TDD inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

where

T<sub>identify, TDD inter</sub> is specified in 8.4.2.4.1.

 $T_{IU}$  is the interruption uncertainty when changing the timing from the old to the new cell.  $T_{IU}$  can be

up to one frame (10 ms).

T<sub>SI</sub> is the time required for receiving all the relevant system information data according to the

reception procedure and the RRC procedure delay of system information blocks defined in [16] for

a UTRAN cell.

 $T_{RA}$  is the additional delay caused by the random access procedure.

If a cell has been detectable at least  $T_{identify\ TDD\ inter}$ , the cell re-selection delay in CELL\_FACH state to an interfrequency TDD cell shall be less than,

$$T_{\text{reselection, TDD}} = T_{\text{Measurement TDD inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

where

 $T_{\text{Measurement TDD inter}}$  is specified in 8.4.2.4.1.

These requirements assume radio conditions to be sufficient, so that reading of system information can be done without errors.

### 5.5.2.1.4 FDD-GSM Cell Reselection

The cell re-selection delay in CELL\_FACH state to a GSM cell shall be less than

$$T_{\text{reselection, GSM}} = T_{\text{identify,GSM}} + T_{\text{measurement,GSM}} + 40 + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

 $T_{BCCH}$  = the maximum time allowed to read BCCH data from GSM cell [21].

 $T_{RA}$  = the additional delay caused by the random access procedure.

where

a) For UE requiring measurement occasions.

T<sub>identify, GSM</sub> is specified in 8.4.2.5.2.1

$$T_{\text{measurement, GSM}} = Max \left\{ 8 \cdot \frac{N_{carriers}}{N_{GSM \ carrier RSSI}} \cdot T_{meas}, 4 * T_{meas}, 480 ms \right\}$$

where:

N<sub>carriers</sub> is the number of GSM carriers in the Inter-RAT cell info list

N<sub>GSM carrier RSSI</sub> is specified in 8.4.2.5.1.

b) For UE not requiring measurement occasions

$$T_{identify, GSM} = 150 \text{ ms}$$

$$T_{\text{measurement. GSM}} = 480 \text{ ms}$$

### 5.5.2.1.5 FDD-E-UTRAN Cell Reselection

The cell re-selection delay in CELL\_FACH state to a E-UTRAN cell shall be less than

$$T_{\text{reselection, E-UTRAN}} = T_{\text{identify, E-UTRAN}} + 40 + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

T<sub>BCCH</sub> = the maximum time allowed to read BCCH data from a E-UTRAN cell [24].

 $T_{RA}$  = the additional delay caused by the random access procedure.

If a cell has been detectable for at least  $T_{identify,E-UTRAN}$ , the cell reselection delay in CELL\_FACH state to a E-UTRAN cell on shall be less than

$$T_{\text{reselection, E-UTRAN}} = T_{\text{measurement, E-UTRAN}} + 40 + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

where

a) For UE requiring measurement occasions.

T<sub>identify, E-UTRAN</sub> and T<sub>measurement, E-UTRAN</sub> are specified in 8.4.2.6.2

b) For UE not requiring measurement occasions

$$T_{identify, E-UTRAN} = 480 \text{ ms}$$

$$T_{\text{measurement, E-UTRAN}} = 60 \text{ ms}$$

### 5.5.2.1.6 Void

### 5.5.2.1A Cell reselection delay to CSG cells

NOTE: The requirements in this section are minimum requirements defined to ensure the testability of autonomous CSG search, and are only applicable when the 2<sup>nd</sup> DRX cycle is configured, with a DRX cycle length of equal to or greater than 1280msec.

Reselection from non CSG to CSG cells may be performed using UE autonomous search as defined in [1] when at least one CSG ID is included in the UE's CSG whitelist. The requirements in this section are valid for reselection to CSG cells previously visited by the UE when the radio configuration parameters, including the carrier frequency and physical cell identity of the CSG cell, non CSG cell and other neighbour cells are unchanged from the most recent previous visit.

According to [1], the UE autonomous search function, per UE implementation, determines when and/or where to search for allowed CSG cells.

### 5.5.2.1A.1 Reselection from a non CSG FDD to an inter-frequency FDD CSG cell

The UE shall perform search and reselection to an allowed inter-frequency FDD CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 5.3A. There is no need for statistical testing of this requirement. When performing autonomous CSG search or reselection to the CSG cell, the UE shall also meet the exsiting cell reselection requirements defined in section 5.5.2.1.1-5.5.2.1.5. Where applicable, the interruption time requirement of section 5.5.2.2 shall apply. This requirement is not applicable if the SIB3 repetition period in the CSG cell is the same length as the 2<sup>nd</sup> DRX cycle in the serving cell and SIB3 transmissions partially or wholly overlap periods in which the UE is expected to receive HS-SCCH in the serving cell.

Table 5.3A: Parameters for CSG inter-frequency FDD reselection

Parameter	Unit	Cell 1	Cell 2
UARFCN Note1		Channel 1	Channel 2
CSG indicator		False	True
Primary scrambling code		Scrambling code 1	Scrambling code 2
CSG identity		Not sent	Sent (Already stored in UE whitelist from previous visit)
Propagation conditions		Static, non	multipath
CSG cell previously visited by UE		Ye	s
CPICH_RSCP <sup>Note2</sup>	dBm	-100	-100
CPICH_Ec/lor	dB	-10	-10
PCCPCH_Ec/lor	dB	-12	-12
SCCPCH_Ec/lor	dB	-12	-12
AICH_Ec/lor	dB	-15	-15
SCH_Ec/lor	dB	-15	-15
PICH_Ec/lor	dB	-15	-15
$I_{oc}$	dBm/3.84 MHz	Off	Off

For this requirement to be applicable, the UARFCN and scrambling Note 1:

code for cell 1 and cell 2 shall be unchanged from when the CSG cell was visited previously.

Chosen to ensure that CSG autonomous search has a high probability Note 2:

of success on every attempt made by UE.

#### 5.5.2.1A.2 Reselection from a non CSG FDD to an inter-RAT E-UTRA CSG cell

The UE shall perform search and reselection to an allowed inter-RAT E-UTRA CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 5.3B. There is no need for statistical testing of this requirement. When performing autonomous CSG search or reselection to the CSG cell, the UE shall also meet the exsiting cell reselection requirements defined in section 5.5.2.1.1-5.5.2.1.5. Where applicable, the interruption time requirement of section 5.5.2.2 shall apply.

Table 5.3B: Parameters for CSG inter-RAT E-UTRA reselection

Parameter	Unit	Cell 1	Cell 2			
UARFCN Note1	<b>5</b>	Channel 1	N/A			
EARFCN Note1		N/A	Channel 2			
CSG indicator		False	True			
Primary scrambling code		Scrambling	N/A			
Note1		code 1				
Physical cell identity <sup>Note1</sup>		N/A	2			
CSG identity		Not sent	Sent			
			(Already stored			
			in UE whitelist			
			from previous			
			visit)			
Propagation conditions		Static, non				
CSG cell previously		Ye	S			
visited by UE			T			
CPICH_RSCP <sup>Note2</sup>	dBm	-100				
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCCPCH_Ec/lor	dB	-12	N/A			
AICH_Ec/lor	dB	-15	IN/A			
SCH_Ec/lor	dB	-15				
PICH_Ec/lor	dB	-15				
$I_{oc}$	dBm/3.84 MHz	Off				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB		0			
PDCCH_RA	dB	21/2				
PDCCH_RB	dB	N/A				
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
Qrxlevmin	dBm		-140			
$N_{oc}$	dBm/15 kHz		Off			
RSRP Note2	dBm/15 KHz		-110			
Note 1: For this requirement to be applicable, the UARFCN and scrambling						
code for cell 1 and the EARFCN and physical cell identity for cell 2 shall						
be unchanged from when the CSG cell was visited previously						

Chosen to ensure that CSG autonomous search has a high probability Note 2: of success on every attempt made by UE

### 5.5.2.2 Interruption time

The requirements on interruption time below are valid when the signal quality of the serving cell is good enough to allow decoding of the FACH channel during the cell reselection.

#### 5.5.2.2.1 FDD-FDD cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel on the serving cell and the time the UE starts transmit the preambles on the PRACH for sending the RRC CELL UPDATE message in the target cell.

When intra-frequency cell reselection, or inter-frequency cell reselection when the UE does not need measurement occasion to perform inter-frequency measurements occurs, the interruption time shall be less than Tinterrupt1

$$T_{interrupt1} = T_{IU} + 20 + T_{RA} ms$$

where

is the interruption uncertainty when changing the timing from the old to the new cell.  $T_{IU}$  can be  $T_{IU}$ up to one frame (10 ms).

 $T_{\text{RA}}$ The additional delay caused by the random access procedure.

When inter-frequency cell reselection occurs and the UE needs measurement occasions to perform inter-frequency measurements, the interruption time shall be less than Tinterrupt2

$$T_{interrupt2} = T_{IU} + 20 + T_{SI} + T_{RA} ms$$

where

the time required for receiving all the relevant system information data according to the reception  $T_{SI}$ procedure and the RRC procedure delay of system information blocks defined in 25.331.

In CELL\_FACH state the MTCH interruption time due to intra-frequency cell reselection without soft combining during an MBMS session shall be less than T<sub>MTCH\_interrupt</sub> as specified in section 4.2.2.10.

#### 5.5.2.2.2 FDD-TDD cell reselection

The requirements in this section shall apply to UE supporting FDD and TDD.

The interruption time, is defined as the time period between the last TTI the UE monitors the FACH on the serving cell and the time instant the UE starts to transmit the RRC CELL UPDATE message in the target inter-frequency TDD cell on the RACH.

In case of inter-frequency cell reselection to a TDD cell and when the UE needs measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$$T_{interrupt1. TDD} = T_{IU} + 20 + T_{SI} + T_{RA} ms$$

In case of inter-frequency cell reselection to a TDD cell and when the UE does not need measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$$T_{interrupt2. TDD} = T_{IU} + 20 + T_{RA} ms$$

where

 $T_{IU}$ is the interruption uncertainty when changing the timing from the old to the new cell.  $T_{IU}$  can be up to one frame (10 ms).

is the time required for receiving all the relevant system information data according to the  $T_{SI}$ reception procedure and the RRC procedure delay of system information blocks defined in [16].

is the additional delay caused by the random access procedure.  $T_{RA}$ 

#### 5.5.2.2.3 FDD-GSM cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel and the time the UE starts transmit a RACH in the target GSM cell.

When FDD-GSM cell reselection occurs the interruption time shall be less than T<sub>interrupt</sub>, GSM

$$T_{interrupt.GSM} = 40 + T_{BCCH} + T_{RA} \text{ ms}$$

where

the maximum time allowed to read BCCH data from the GSM cell [21].  $T_{BCCH} =$ 

The additional delay caused by the random access procedure.  $T_{RA} =$ 

### 5.5.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods  $T_{Measurement\_Period\ Intra}$ .

The S-critera detection delay in CELL\_FACH state shall be less than:

$$T_{\text{S-criteria}} = 5 \times T_{\text{Measurement\_Period Intra}} \, ms$$

where

 $T_{Measurement\_Period\ Intra} = Specified\ in\ 8.4.2.2.2.$ 

The UE is "out of service area" if the UE has evaluated for 4 s that that the serving cell does not fulfil the cell selection criterion S and if the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information during these 4 s. When the UE is "out of service area" it shall initiate cell selection procedures for the selected PLMN as defined in [1].

On transition from CELL\_DCH to CELL\_FACH, if a UE cannot find a suitable UTRA cell, then it is considered to be "out of service area" and shall perform actions according to [16].

If the S criterion of the serving cell is no longer fulfilled, the UE may suspend MBMS reception if necessary to improve the UE's ability to find a suitable cell.

If the S criterion of the serving cell is fulfilled, the measurement requirements when a MBMS reception is active are specified in section 8.4.

### 5.5.2.2.4 FDD-E-UTRA Cell Reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel and the time the UE starts transmit a RACH in the target E-UTRAN cell.

When FDD-E-UTRAN cell reselection occurs the interruption time shall be less than T<sub>interrupt, E-UTRAN</sub>

$$T_{interrupt,\;E\text{-}UTRAN} = 40 \; \text{+} T_{BCCH} \text{+} T_{RA} \; ms$$

where

T<sub>BCCH</sub> = The maximum time allowed to read BCCH data from the E-UTRAN cell [24].

 $T_{RA}$  = The additional delay caused by the random access procedure.

# 5.6 Cell Re-selection in CELL\_PCH

### 5.6.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

## 5.6.2 Requirements

Requirements for cell re-selection in CELL\_PCH are the same as for cell re-selection in idle mode, see section 4.2. UE shall support all DRX cycle lengths in table 4.1 and table 4.2, according to [16].

## 5.7 Cell Re-selection in URA PCH

### 5.7.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

### 5.7.2 Requirements

Requirements for cell re-selection in URA\_PCH are the same as for cell re-selection in idle mode, see section 4.2. UE shall support all DRX cycle lengths in table 4.1 and table 4.2, according to [16].

## 5.8 RACH reporting

### 5.8.1 Introduction

The network may request the UE to report on RACH cell CPICH levels for the serving cell and up to 6 strongest monitored set cells and SFN-SFN observed time difference between the serving cell and up to 6 different monitored set cells.

## 5.8.2 Requirements

If all of the following conditions are true, the UE is allowed to have an additional delay of  $N_{RACH}*50$  ms in RACH transmission compared to the normal RACH transmission delay:

- SFN-SFN observed time difference measurement results are required to be reported on RACH;
- The set of cells on which the SFN-SFN observed time difference measurement is to be reported has changed since the previous RACH measurement report;
- The UE has not measured the SFN-SFN observed time differences for the cells to be reported on RACH in the CELL\_FACH state according to the requirements defined in Section 8.4.2.2.

If at least one of the previous conditions is false, the UE shall be able to report the requested measurement results on RACH within a normal RACH transmission delay.

 $N_{RACH}$  is the number of cells requiring SFN decoding prior to the reporting of SFN-SFN observed time difference measurement results on RACH.

# 5.9 Inter-RAT cell change order from UTRAN in CELL\_DCH and CELL\_FACH

### 5.9.1 Introduction

The purpose of inter-RAT cell change order from UTRAN FDD to GSM is to transfer a connection between the UE and UTRAN FDD to GSM. This procedure may be used in CELL\_DCH and CELL\_FACH state. The cell change order procedure is initiated from UTRAN with a RRC message (CELL CHANGE ORDER FROM UTRAN). The procedure is described in TS25.331 section 8.3.11.

NOTE: No procedure is defined for Inter-RAT cell change order from UTRAN to E-UTRAN.

### 5.9.2 Requirements

The requirements in this section shall apply to UE supporting FDD and GSM.

### 5.9.2.1 Delay

When the UE receives a RRC CELL CHANGE ORDER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in table 5.4 from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT within the value in table 5.4 from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than the value in table 5.4 from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC CELL CHANGE ORDER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.4: Inter-RAT cell change order from UTRAN - delay

UE synchronisation status	delay [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$90 + T_{BCCH} + T_{RA}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	190 + T <sub>BCCH</sub> +T <sub>RA</sub>

### where

 $T_{BCCH}$  = the maximum time allowed to read BCCH data from the GSM cell [21];

 $T_{RA}$  = the additional delay caused by the random access procedure.

## 5.9.2.2 Interruption time

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the old channel during the inter-RAT cell change order from UTRAN delay.

The interruption time, i.e. the time between the end of the last TTI containing a transport block that the UE is able to receive on the old channel and the time the UE starts transmit the random access in the target cell, shall be less than the value in table 5.5. The requirement in table 5.5 for the case, that UE is not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.5: Inter-RAT cell change order from UTRAN - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the CELL	$40 + T_{BCCH} + T_{RA}$
CHANGE ORDER FROM UTRAN COMMAND is received	
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	140 + T <sub>BCCH</sub> +T <sub>RA</sub>

### where

 $T_{BCCH}$  = the maximum time allowed to read BCCH data from the GSM cell [21].

 $T_{RA}$  = the additional delay caused by the random access procedure

## 5.10 Serving HS-DSCH cell change

### 5.10.3 Introduction

The serving HS-DSCH procedure is initiated from UTRAN with a RRC message that implies a change of the serving HS-DSCH cell, see TS 25.331 section 8.2.2

### 5.10.2 Requirements

### 5.10.2.1 Serving HS-DSCH cell change delay

Procedure delay for all procedures, that can command a HS-DSCH cell change are specified in TS25.331 section 13.5.2.

When the UE receives a RRC message implying HS-DSCH cell change with the activation time "now" or earlier than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to receive the HS-SCCH channel from the new cell within  $D_{cell\_change}$  seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink HS-DPCCH at the designated activation time + interruption time.

where:

 $D_{cell\_change}$  equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time of receiving HS-DSCH data stated in section 5.10.2.2.

### 5.10.2.2 Interruption time

The HS-DSCH interruption time is the time between the last received TTI that can contain a transport block on the old HS-PDSCH and the time when the UE is ready to transmit CQI reports based on the quality of the new cell and the UE have started to receive the HS-SCCH of the new cell. The interruption time is depending on whether the target cell is known for the UE or not.

If serving HS-DSCH cell change is commanded to a cell in the active set the HS-DSCH interruption time shall be less than  $T_{interrupt1}$ 

If an active set update, which includes a cell into the active set where the cell is known, and serving HS-DSCH cell change is simultaneously commanded to the same cell the HS-DSCH interruption time shall be less than T<sub>interrupt2</sub>

where  $T_{IU}$  is the interruption uncertainty when changing the timing from the old to the new cell.  $T_{IU}$  can be up to one subframe (2 ms).

The phase reference is the primary CPICH.

# 5.11 Enhanced Serving HS-DSCH cell change

### 5.11.1 Introduction

The enhanced serving HS-DSCH cell change procedure is initiated from UTRAN either with a RRC message that implies a change of the serving HS-DSCH cell or through an HS-SCCH order sent on the target cell (target cell is the cell which becomes the serving cell after the enhanced serving HS-DSCH cell change procedure).

## 5.11.2 Requirements

When the UE receives a RRC message implying enhanced HS-DSCH cell change, the serving cell change delay and interruption time requirements are as defined in Section 5.10.

When the UE receives an HS-SCCH order from the target cell that implies enhanced HS-DSCH serving cell change:

- if the activation time is not equal to "now", the UE shall be ready to receive the full configured HS-SCCH set from the target cell within MAX{40 ms, activation time the end of the TTI containing the HS-SCCH order} from the end of the TTI containing the HS-SCCH order.
- if the activation time is set to "now", the UE shall be ready to receive the full configured HS-SCCH set within 40 ms from the end of the TTI containing the HS-SCCH order.

## 5.12 Interruption on Primary Uplink Frequency in DC-HSUPA

### 5.12.1 Introduction

When the UE is configured with dual uplink carrier frequencies, the transmission interruption on the primary uplink frequency can occur due to the activation or deactivation of the secondary serving HS-DSCH cell or of the serving E-DCH cell on the secondary uplink frequency.

The activation or deactivation procedure for the secondary serving HS-DSCH cell or the serving E-DCH cell on the secondary uplink frequency, is initiated from UTRAN with an HS-SCCH order [18], which implies activation or deactivation of the secondary serving HS-DSCH cell or the serving E-DCH cell on the secondary uplink frequency.

## 5.12.2 Requirements

The interruption time on the primary uplink frequency,  $T_{interrupt}$ , starts from the end of the last DPCCH slot which overlaps with the HS-DPCCH subframe containing the ACK corresponding to the HS-SCCH order for the activation or deactivation of the secondary serving HS-DSCH cell or the serving E-DCH cell on the secondary uplink frequency. The UE shall be ready to resume transmission of each physical channel on the primary uplink frequency at the next slot, subframe or frame after  $T_{interrupt}$  =4 ms, depending on the channel timing relationship defined in [2] (next slot for DPCCH and next subframe for HS-DPCCH/2ms TTI E-DCH). This requirement applies when the UE is configured with dual uplink carrier frequencies.

## 5.13 System information acquisition for CSG cell

### 5.13.1 Introduction

The requirements in this section apply to a UE which supports system information acquisition of a CSG cell in preparation for handover. Both intra frequency and inter frequency system information reading can be configured, for the inter frequency case the UE may make autonomous gaps in both downlink reception and uplink transmission. For intrafrequency system information acquisition, interruption in downlink reception or uplink transmission shall not be performed to aquire system information.

## 5.13.2 CSG SI acquisition delay

The CSG SI acquisition delay is defined as the time between any occurrences that will trigger a SI decoding until the UE starts to transmit over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. The measurement reporting delay also excludes any RRC procedure delay which is defined in [16] when SI reading is initiated by a measurement control message.

For intra frequency CSG cells, CSG SI decoding is typically triggered when a cell with primary scrambling code in a preconfigured range meets the criteria for measurement reporting. For inter frequency CSG cells, CSG SI decoding is explicitly requested by RRC signalling.

The CSG SI reporting delay shall not be more than  $T_{CSG-SI-Report}$  where  $T_{CSG-SI-Report}$  in ms is given by

$$T_{CSG-SI-Report} = 630 + 40*SIB3\_REP$$

SIB3\_REP is the repetition period at which the CSG cell schedules SIB3 blocks in units of frames

This requirement is applicable for CSG target cell configurations where the information required to make the SI report can be determined from the MIB and SIB3 alone, and SIB3 is not segmented into multiple TTI. Additionally, for the requirement to be applicable, the reception conditions shall be such that the system frame number of the target CSG cell, the MIB and SIB3 can each be successfully decoded in no more than four attempts. According to the reception conditions:

A cell shall be considered detectable when:

- CPICH Ec/Io ≥ -20 dB if DL\_DRX\_Active = 0, or CPICH Ec/Io ≥-17dB if DL\_DRX\_Active=1,
- SCH\_Ec/Io ≥ -20 dB if DL\_DRX\_Active = 0, or SCH Ec/Io ≥-17dB if DL\_DRX\_Active=1, for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The system frame number, the MIB and SIB3 of the target CSG cell shall be considered decodable provided the BCH demodulation requirements are met according to [3].

## 5.13.3 Interfrequency CSG decoding interruption

When inter frequency CSG SI decoding of a neighbour cell is requested by UTRAN, the UE may interrupt ongoing downlink reception, and uplink transmission to perform the decoding on another frequency. The total of the gaps in reception and the total of the gaps in transmission during the period  $T_{CSG-SI-Report}$  shall not exceed  $T_{CSG-SI-Interruption}$  where  $T_{CSG-SI-Interruption} = 600$ ms. This requirement is applicable for CSG target cell configurations where the information required to make the SI report can be determined from the MIB and SIB3 alone, and SIB3 is not segmented into multiple TTI. Additionally, for the requirement to be applicable, the reception conditions shall be such that the system frame number of the target CSG cell, the MIB and SIB3 can each be successfully decoded in no more than four attempts. According to the reception conditions:

A cell shall be considered detectable when:

- CPICH Ec/Io > -20 dB,
- SCH\_Ec/Io > -17 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The system frame number, the MIB and SIB3 of the target CSG cell shall be considered decodable provided the BCH demodulation requirements are met according to [3].

# 5.13.4 CSG reporting delay

Reporting delay results from delay uncertainty when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

# 5.14 System information acquisition for inter-RAT E-UTRA cell

# 5.14.1 Identification of a new CGI of inter-RAT E-UTRA FDD cell with autonomous gaps

The UE shall identify and report the CGI when requested by the UTRAN for the purpose of SI reading. To perform SI reading, the UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message of E-UTRAN cell [27] when the IE " E-UTRA SI Acquisition" is received by the UE [16]. If the autonomous gaps are used for the measurement with the purpose of SI reading, the UE shall be able to identify a new CGI of inter-RAT E-UTRA cell within:

$$T_{identify\_CGI, E-UTRAN} = T_{basic\_identify\_CGI, E-UTRAN}$$
 ms

### Where

 $T_{basic\_identify\_CGI, E-UTRAN} = [300]$  ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined.

A E-UTRAN cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1of [24] are fulfilled for a corresponding Band,
- SCH\_RP|dBm and SCH Ês/Iot according to Annex B.4.1 for a corresponding Band.

The MIB of an inter-RAT E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [28].

# 5.14.2 Identification of a new CGI of inter-RAT E-UTRA TDD cell with autonomous gaps

The UE shall identify and report the CGI when requested by the UTRAN for the purpose of SI reading. To perform SI reading, the UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message [27] when the IE " E-UTRA SI Acquisition" is received by the UE [16]. If the autonomous gaps are used for the measurement with the purpose of SI reading, the UE shall be able to identify a new CGI of inter-RAT E-UTRA cell within:

$$T_{\text{identify\_CGI, E-UTRAN}} = T_{\text{basic\_identify\_CGI, E-UTRAN}}$$
 ms

### Where

 $T_{basic\_identify\_CGI, E-UTRAN} = [300]$  ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 of [24] are fulfilled for a corresponding Band,
- SCH RP and SCH Ês/Iot according to Annex B.4.1 for a corresponding Band.

The MIB of an inter-RAT E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [28].

# 5.14.3 ECGI reporting delay

Reporting delay results from delay uncertainty when inserting the measurement report to the TTI of the uplink DCCH and the RRC procedure delay. The delay uncertainty is twice the TTI of the uplink DCCH.

## 5.15 Packet Loss Rate on Serving HS-DSCH Cells in Multi-Carrier HSDPA

### 5.15.1 Introduction

A UE according to its measurement capability in the IE, "Inter-frequency measurements on configured carriers without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16] may reconfigure its receiver bandwidth when performing measurements on configured carrier frequencies corresponding to secondary serving HS-DSCH cells. This may cause loss of HS-DSCH reception from those primary and secondary serving HS-DSCH cells whose carrier frequencies belong to the same frequency band as that of the measured configured secondary carrier frequency.

### 5.15.2 Requirements

The probability of not sending ACK/NACK corresponding to HS-DSCH transmitted to a UE by its primary or secondary serving HS-DSCH cell shall not exceed 4% when the UE measures cells on any configured secondary carrier frequency which belongs to the same frequency band as that of the primary or secondary serving HS-DSCH cell.

## **6 RRC Connection Control**

### 6.1 RRC Re-establishment

### 6.1.1 Introduction

RRC connection re-establishment is needed, when a UE in state CELL\_DCH loses radio connection due to radio link failure. The procedure when a radio link failure occurs in CELL\_DCH is specified in TS 25.331.

## 6.1.2 Requirements

The requirements in this section are applicable when the UE performs a RRC Re-establishment to a cell belonging to any of the frequencies present in the previous (old) monitored set.

The UE *moves from CELL\_DCH to CELL\_FACH state and* shall be capable of sending a CELL UPDATE message using the cause "radio link failure" within T<sub>RE-ESTABLISH</sub> seconds from when the radio link failure occurred.

 $T_{RE-ESTABLISH}$  equals the RRC procedure delay ( $T_{RRC-RE-ESTABLISH}$ ) according to TS25.331 plus the UE Re-establishment delay ( $T_{UE-RE-ESTABLISH-REQ}$ ), specified in 6.1.2.1.

$$T_{RE-ESTABLISH} = T_{RRC-RE-ESTABLISH} + T_{UE-RE-ESTABLISH-REO}$$

### 6.1.2.1 UE Re-establishment delay requirement

The UE Re-establishment delay requirement ( $T_{\text{UE-RE-ESTABLISH-REQ}}$ ) is defined as the time between the moment when radio link failure is considered by the UE, to when the UE starts to send preambles on the PRACH.

 $T_{\text{UE-RE-ESTABLISH-REQ}}$  is depending on whether the target cell is known by the UE or not. A cell is known if either or both of the following conditions are true:

- the UE has had radio links connected to the cell in the previous (old) active set;
- the cell has been measured by the UE during the last 5 seconds.

And the phase reference is the primary CPICH.

The UE Re-establishment delay requirement T<sub>UE-RE-ESTABLISH-REQ</sub> shall be less than

$$T_{UE-RE-ESTABLISH-REQ-KNOWN} = 50ms + T_{search} + T_{SI} + T_{RA}$$

in case that the target cell is known, and

$$T_{UE\text{-}RE\text{-}ESTABLISH\text{-}REO\text{-}UNKNOWN} = 50ms + T_{search}*NF + T_{SI} + T_{RA}$$

in case that the target cell is not known by the UE.

where

T<sub>search</sub> is the time it takes for the UE to search the cell.

T<sub>search</sub> =100 ms if the target cell is known by the UE, and

 $T_{search}$  =800 ms if the target cell is not known by the UE.

T<sub>SI</sub> is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms).

 $T_{RA}$  = The additional delay caused by the random access procedure.

NF is the number of different frequencies in the monitored set.

This requirement assumes radio conditions to be sufficient, so that reading of system information can be done without errors.

## 6.2 (void)

## 6.3 Random Access

### 6.3.1 Introduction

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303. The UE procedure for selecting 2 or 10 msec TTI when operating Enhanced Uplink in CELL\_FACH is specified in 3GPP TS 25.321 [19].

### 6.3.2 Requirements

The UE shall have capability to calculate initial power according to the open loop algorithm and apply this power level at the first preamble and increase the power on additional preambles. The UE shall stop transmit preambles upon a ACK/NACK on the AICH has been received or if the maximum number of preambles within on cycle has been reached. Upon an ACK has been received the UE shall transmit a message otherwise the ramping procedure shall be repeated.

### 6.3.2.1 Correct behaviour when receiving an ACK

The UE shall stop transmitting preambles upon a ACK on the AICH has been received and then transmit a message..

The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3 of TS 25.101 [3]. The relative power applied to additional preambles shall have an accuracy as specified in section 6.5.2.1 of 25.101 [3].

### 6.3.2.2 Correct behaviour when receiving an NACK

The UE shall stop transmitting preambles upon a NACK on the AICH has been received and then repeat the ramping procedure when the back off timer  $T_{B01}$  expires.

### 6.3.2.3 Correct behaviour at Time-out

The UE shall stop transmit preambles when reaching the maximum number of preambles allowed in a cycle. The UE shall then repeat the ramping procedure until the maximum number of preamble ramping cycles are reached.

### 6.3.2.4 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum allowed UL TX power configured by the UTRAN.

The absolute power of any preamble shall not exceed the maximum allowed UL TX power with more than specified in section 6.5.

# 6.3.2.5 Correct behaviour when selecting 2 or 10msec TTI length for Enhanced Uplink in CELL\_FACH state and idle mode

A UE that is capable of 2/10msec TTI selection shall select a preamble signature assigned to 2msec TTI when the TX power headroom based on the TX power on the current preamble according to the method specified in [19] is greater than the threshold value configured by UTRAN plus an accuracy value of 6 dB. The UE shall select a preamble assigned to the 10msec TTI when the TX power headroom based on the TX power calculated on the current preamble according to the method specified in [19] is lower than the threshold value configured by UTRA minus the accuracy value 6 dB. Otherwise, the UE may select a preamble signature assigned to either 2msec or 10msec TTI.

## 6.4 Transport format combination selection in UE

### 6.4.1 Introduction

When the UE estimates that a certain TFC and E-TFC would require more power than the maximum transmit power, it shall limit the usage of transport format combinations for the assigned transport format set, according to the functionality specified in section 11.4 in TS25.321. This is in order to make it possible for the network operator to maximise the coverage. Transport format combination selection is described in section 11.4 of TS 25.321.

When the UE has more than one Activated Uplink Frequency, the UE estimates the power which may be allocated for all Activated Uplink Frequencies. The E-TFC selection when the UE has more than one Activated Uplink Frequency is described in section 11.8.1.4 of TS25.321

## 6.4.2 Requirements

The UE shall continuously evaluate based on the *Elimination, Recovery* and *Blocking* criteria defined below, how TFCs on an uplink DPDCH can be used for the purpose of TFC selection. The evaluation shall be performed for every TFC in the TFCS using the estimated UE transmit power.

The UE transmit power estimation for a given TFC, when HS-DPCCH and S-DPCCH are not transmitted during the measurement period, shall be calculated using the DPDCH and DPCCH gain factors of the corresponding TFC and reference transmit power. The reference transmit power is the transmit power of DPCCH and DPDCH of a given TFC during the measurement period for which UE transmit power estimation is made. If a single HS-DPCCH is transmitted either partially or totally within the given measurement period the UE transmit power estimation for a given TFC shall be calculated using DPDCH and DPCCH gain factors, the maximum value of the HS-DPCCH gain factor that is used during the measurement period, and the reference transmit power. If two HS-DPCCHs are transmitted either partially or totally within the given measurement period then a maximum combined transmit power over both of the HS-DPCCHs should be considered in the TFC calculation. Rules for calculating the HS-DPCCH gain factors from the most recent signalled  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI}$  according to the specific multicarrier and MIMO configuration and activation status of the secondary HS-DSCH serving cells are defined in subclause 5.1.2.5A in [18]. The timing of the measurement period, which is defined in 9.1.6.1 as one slot, is the same as the timing of the DPCH slot. If S-DPCCH is transmitted within the given measurement period, the UE transmit power for a given TFC shall be calculated using the DPDCH and DPCCH gain factors, the HS-DPCCH power as described above if one or two HS-DPCCH(s) are present, the S-DPCCH gain factor, and the reference transmit power.

E-TFC selection is allowed only in CELL\_DCH state, CELL\_FACH state, and Idle mode. E-TFC selection is based on the estimated power leftover from TFC selection if the DPDCH is present and from the HS-DPCCH.

When the UE has one Activated Uplink Frequency, the UE shall estimate the normalised remaining power margin available for E-TFC selection based on the following equations for E-TFC candidate j

$$NRPM_{j} = (PMax_{j} - P_{DPCCH,target} - P_{S-DPCCH} - P_{DPDCH} - P_{HS-DPCCH} - P_{E-DPCCH,j}) / P_{DPCCH,target} \ (1),$$
 
$$NRPM_{j} = 0.5 * (PMax_{j} - P_{DPCCH,target} - P_{S-DPCCH} - P_{HS-DPCCH} - P_{E-DPCCH,j} - P_{S-E-DPCCH,j}) / P_{DPCCH,target} \ (2),$$

where

Equation (2) is used when estimating the candidate E-TFCs for potential rank-2 transmissions for UL MIMO, and equation (1) in used in all other cases.

PMax<sub>i</sub> = Maximum UE transmitter power for E-TFC-j as defined in section 6.5

 $P_{DPCCH}(t)$  represents a slotwise estimate of the current UE DPCCH power at time t. If at time t, the UE is transmitting a compressed mode frame then  $P_{DPCCH,comp}(t) = P_{DPCCH}(t) \times (N_{pilot,C}/N_{pilot,N})$  else  $P_{DPCCH,comp}(t) = P_{DPCCH}(t)$ . If the UE is not transmitting uplink DPCCH during the slot at time t, either due to compressed mode gaps or when discontinuous uplink DPCCH transmission operation is enabled then the power shall not contribute to the filtered result. Samples of  $P_{DPCCH,comp}(t)$  shall be filtered using a filter period of 3 slotwise estimates of  $P_{DPCCH,comp}(t)$  when the E-DCH TTI is 2ms or 15 slotwise estimates of  $P_{DPCCH,comp}(t)$  when the E-DCH TTI is 10ms to give  $P_{DPCCH,filtered}$ . The accuracy of the  $P_{DPCCH}$  estimates shall be at least that specified in table 6.0A

If the target E-DCH TTI for which  $NRPM_j$  evaluated does not correspond to a compressed mode frame then  $P_{DPCCH,target} = P_{DPCCH,filtered}$ .

If the target E-DCH TTI for which  $NRPM_j$  is being evaluated corresponds to a compressed mode frame then  $P_{DPCCH,target} = P_{DPCCH,filtered} \times (N_{pilot,N}/N_{pilot,C})$ .  $N_{pilot,N}$  and  $N_{pilot,C}$  are numbers of pilot symbols as defined in [18].

 $P_{\text{DPDCH}}$  = estimated DPDCH transmit power, based on  $P_{\text{DPCCH,target}}$  and the gain factors from the TFC selection that has already been made. If the target E-DCH TTI for which NRPM $_{j}$  is being evaluated corresponds to a compressed mode frame then the modification to the gain factors which occur due to compressed mode shall be included in the estimate of  $P_{\text{DPDCH}}$ .

 $P_{\text{HS-DPCCH}}$  = estimated HS-DPCCH transmit power based on the maximum HS-DPCCH gain factor and  $P_{\text{DPCCH,target}}$  If two HS-DPCCHs are transmitted,  $P_{\text{HS-DPCCH}}$  is the maximum combined estimated transmit power over both HS-DPCCHs. Rules for calculating the HS-DPCCH gain factors from the most recent signalled  $\Delta_{\text{ACK}}$ ,  $\Delta_{\text{NACK}}$  and  $\Delta_{\text{CQI}}$  according to the specific multicarrier and MIMO configuration and activation status of the secondary HS-DSCH serving cells are defined in subclause 5.1.2.5A in [18]. If the target E-DCH TTI for which NRPM $_{\text{j}}$  is being evaluated corresponds to a compressed mode frame then the modification to the gain factors which occur due to compressed mode shall be included in the estimate of  $P_{\text{HS-DPCCH}}$ .

P<sub>E-DPCCH, i</sub> = estimated E-DPCCH transmit power for E-TFCI<sub>i</sub>, as follows:.

- For estimating the remaining power margin for a single transport block in an E-DCH TTI (UL MIMO not configured, or rank1 with UL MIMO configured); If E-TFCI<sub>j</sub> is smaller than or equal to E-TFCI<sub>ec,boost</sub> the estimate is based on P<sub>DPCCH,target</sub> and the E-DPCCH gain factor calculated using the most recent signalled value of Δ<sub>E-DPCCH</sub>. If E-TFCI<sub>j</sub> is greater than E-TFCI<sub>ec,boost</sub> the estimate is based on the E-DPCCH gain factor, β<sub>ec,j</sub>, which is calculated for E-TFCI<sub>j</sub> using the procedure in [18]. If the target E-DCH TTI for which NRPM<sub>j</sub> is being evaluated corresponds to a compressed mode frame then the modification to the gain factors which occur due to compressed mode shall be included in the estimate of P<sub>E-DPCCH</sub>
- For estimating the remaining power margin for transmission of two transport blocks in an E-DCH TTI (Rank2 UL MIMO); The estimate is based on the E-DPCCH gain factor,  $\beta_{ec,j}$ , which is calculated for E-TFCI<sub>j</sub> using the procedure in [18] assuming E-TFCI<sub>ec,boost</sub> = -1.

 $P_{S-E-DPCCH,j}$  = estimated S-E-DPCCH transmit power for E-TFCI<sub>j</sub>. The estimate is based on the S-E-DPCCH gain factor,  $\beta_{sec,i}$ , which is calculated for E-TFCI<sub>j</sub> as defined in [18].

 $P_{S\text{-DPCCH}}$  = estimated S-DPCCH transmit power, based on  $P_{DPCCH,target}$  and the S-DPCCH gain factor. In case neither the uplink CLTD operation nor uplink MIMO operation is configured or one of the two is configured with CLTD activation state 2 or 3,  $P_{S\text{-DPCCH}}$  is considered as zero.

NOTE: P<sub>DPCCH</sub>(t), PMax<sub>j</sub>, P<sub>DPCCH,target</sub>, P<sub>DPCCH,filtered</sub>, P<sub>DPCCH,comp</sub>(t), P<sub>DPDCH</sub>, P<sub>HS-DPCCH</sub>, P<sub>S-DPCCH</sub>, P<sub>E-DPCCH</sub> and P<sub>S-E-DPCCH</sub> are expressed in linear power units

In CELL\_FACH state and Idle mode, if less than 3 E-DCH TTIs of DPCCH transmission for 2ms TTI and less than 2 E-DCH TTIs of DPCCH transmission for 10ms TTI is configured prior to the start of the E-DCH transmissions, an estimate of  $P_{DPCCH, target} = P_{preamble} + P_{p-e}$  shall be used for initial E-TFC restriction.  $P_{preamble}$  is the code power of the last transmitted PRACH preamble, and  $P_{p-e}$  is the power offset between the power of the last transmitted preamble and the initial DPCCH transmission power.

The UE shall consider the *Elimination* criterion for a given TFC to be detected if the estimated UE transmit power needed for this TFC is greater than the Maximum UE transmitter power for at least X out of the last Y successive measurement periods immediately preceding evaluation. The MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bit rate for each logical channel to upper layers within  $T_{notify}$  from the moment the *Elimination* criterion was detected.

The UE shall consider the *Recovery* criterion for a given TFC to be detected if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for the last Z successive measurement periods immediately preceding evaluation. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bit rate for each logical channel to upper layers within  $T_{notify}$  from the moment the *Recovery* criterion was detected.

The evaluation of the *Elimination* criterion and the *Recovery* criterion shall be performed at least once per radio frame.

The definitions of the parameters X,Y and Z which shall be used when evaluating the *Elimination* and the *Recovery* criteria when no compressed mode patterns are activated are given in Table 6.0.

Table 6.0: X, Y, Z parameters for TFC selection

Х	Y	Z
15	30	30

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of:

$$(T_{notify} + T_{modify} + T_{L1 proc})$$

where:

T<sub>notify</sub> equals 15 ms, and

 $T_{modify}$  equals MAX( $T_{adapt\_max}$ ,  $T_{TTI}$ ), and

T<sub>L1 proc</sub> equals 15 ms, and

 $T_{adapt\_max}$  equals MAX(  $T_{adapt\_1},\,T_{adapt\_2},\,...,\,T_{adapt\_N}$  ), and

N equals the number of logical channels that need to change rate, and

 $T_{adapt\_n}$  equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. For services where no codec is used  $T_{adapt}$  shall be considered to be equal to 0 ms. For services where either UMTS\_AMR2 or UMTS\_AMR\_WB is used, Tadapt shall be considered to be equal to the time required to switch from the current codec mode to a new supported codec mode. In that case Tadapt equals 20 ms + 40 ms per codec mode switch. E.g. Tadapt equals 60ms if one codec mode switch is necessary and Tadapt equals 140ms if 3 codec mode switches are necessary.

T<sub>TTI</sub> equals the longest uplink TTI of the selected TFC (ms).

When the UE has one Activated Uplink Frequency, the UE shall be able to update the normalised remaining power estimate of each E-TFC at least every E-DCH TTI. The UE shall use the latest available estimate of  $NRPM_j$  at the time when all absolute and relative grants relating to the E-DCH TTI under consideration have been received. Using the estimates of  $NRPM_j$  the UE shall evaluate for each E-TFC which configured MAC-d flows are supported and which are unsupported as follows:

In the case that the target E-DCH TTI for which E-TFC restriction is being considered does not belong to a compressed mode frame then if NRPM<sub>i</sub> $\geq \sum (\beta_{ed,i}/\beta_c)^2$  then E-TFC<sub>i</sub> can be supported, otherwise it cannot be supported

In the case that the target E-DCH TTI for which E-TFC restriction is being considered belongs to a compressed mode frame then if  $NRPM_i \ge \sum (\beta_{ed,C,i}/\beta_{c,C})^2$  then E-TFC<sub>i</sub> can be supported, otherwise it cannot be supported

 $\beta_{ed,i}/\beta_c$  and  $\beta_{ed,C,i}/\beta_{c,C}$  is the quantized amplitude ratio.

If the UE is allowed to reduce its maximum transmit power for certain TFCs and E-TFCs, the UE shall use the reduced maximum transmit power in the evaluation of the TFC and E-TFC selection criteria for those TFCs.

When the UE has more than one Activated Uplink Frequency, the UE shall estimate the remaining power which is available to be allocated to scheduled E-DCH transmissions on all Activated Uplink Frequencies. The total available power for scheduled E-DCH transmissions is defined by:

$$P_{\text{remaining.s}} = \max(PMax - \Sigma_i P_{\text{DPCCH.target.i}} - P_{\text{HS-DPCCH}} - P_{\text{non-SG}}, 0)$$

where

PMax represents the Maximum UE Transmitter power, as defined in Section 6.5.

-  $P_{DPCCH,i}(t)$  represents a slotwise estimate of the current UE DPCCH power for carrier with index i (i=0,1) at time t. If at time t, the UE is transmitting a compressed mode frame then  $P_{DPCCH,comp,i}(t) = P_{DPCCH,i}(t) \times (N_{pilot,C}/N_{pilot,N})$  else  $P_{DPCCH,comp,i}(t) = P_{DPCCH,i}(t)$ . If the UE is not transmitting uplink DPCCH on the Activated Uplink Frequency i during the slot at time t, either due to compressed mode gaps or when discontinuous uplink DPCCH transmission operation is enabled then the power shall not contribute to the filtered result. Samples of  $P_{DPCCH,comp,i}(t)$  shall be filtered using a filter period of 3 slotwise estimates of  $P_{DPCCH,comp,i}(t)$ . The accuracy of the  $P_{DPCCH,i}$  estimate shall be at least that specified in table 6.0A

If the target E-DCH TTI for which RPM is being evaluated does not correspond to a compressed mode frame then  $P_{DPCCH,target,i} = P_{DPCCH,filtered,i}$ .

If the target E-DCH TTI for which RPM is being evaluated corresponds to a compressed mode frame then  $P_{DPCCH,target,i} = P_{DPCCH,filtered,i} \times (N_{pilot,N}/N_{pilot,C})$ .  $N_{pilot,N}$  and  $N_{pilot,C}$  are numbers of pilot symbols as defined in [18].

- $P_{HS-DPCCH}$  represents the estimated HS-DPCCH transmit power and shall be calculated based on the estimated Primary Activated Frequency DPCCH power, and the greatest HS-DPCCH gain factor. If two HS-DPCCHs are transmitted,  $P_{HS-DPCCH}$  is the maximum combined estimated transmit power from both HS-DPCCHs. Rules for calculating the HS-DPCCH gain factors from the most recent signalled  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI}$  according to the specific multicarrier and MIMO configuration and activation status of the secondary HS-DSCH serving cells are defined in subclause 5.1.2.5A in [18].
- P<sub>non-SG</sub> represents the power pre-allocated for non-scheduled transmissions for Primary Uplink Frequency, as defined by [19]. An estimate of the E-DPCCH power required for non-scheduled transmissions may be included in P<sub>non-SG</sub>.

When the UE has more than one Activated Uplink Frequency and no retransmission is required, or when the UE has more than one Activated Uplink Frequency and two retransmissions are required, the UE shall estimate the normalised remaining power margin available for E-TFC selection using the power allocated to the Primary Uplink Frequency  $P_{allocated,1}$  and the power allocated to the Secondary Uplink Frequency  $P_{allocated,2}$  defined by:

$$\begin{split} P_{allocated,1} &= P_1 + P_{non\text{-SG},} \\ P_{allocated,2} &= P_2 \end{split}$$

where

 $P_i$  represents the maximum remaining allowed power for scheduled transmissions for the Activated Uplink Frequency i = 1,2, where index 1 and index 2 correspond to the index of the Primary Uplink Frequency and the index of the Secondary Uplink Frequency as defined by [19]

When the UE has more than one Activated Uplink Frequency and one retransmission is required in one Activated Uplink Frequency, the UE shall estimate the normalised remaining power margin available for E-TFC selection using the power allocated to the Activated Uplink Frequency for which a retransmission is required  $P_{\text{allocated,x}}$  and on the power allocated to the Activated Uplink Frequency for which no retransmission is required  $P_{\text{allocated,x}}$  defined by:

$$\begin{split} &P_{allocated,y} = PMax - P_{HS\text{-}DPCCH} - \Sigma_i \ P_{DPCCH,target,i} \ - \ P_{E\text{-}DPCCH,x} - P_{E\text{-}DPDCH,x} \\ &P_{allocated,x} = P_{E\text{-}DPCCH,x} + P_{E\text{-}DPDCH,x} \end{split}$$

where

 $P_{\text{E-DPDCH,x}}$  represents the estimated E-DPDCH transmit power for the Uplink Frequency for which a retransmission is required. The estimate is based on  $P_{\text{DPCCH,target,x}}$  where x is denoting the index of the Activated Uplink Frequency on which a retransmission required and the E-DPDCH gain factor which will be used for the retransmission.

P<sub>E-DPCCH,x</sub> represents the estimated E-DPCCH transmit power for the Uplink Frequency for which a retransmission is required. The estimate is based on PDPCCH,target,x where x is denoting the index of the Activated Uplink Frequency on which a retransmission is required and the E-DPCCH gain factor which will be used for the retransmission.

When the UE has more than one Activated Uplink Frequency, the UE shall estimate the normalised remaining power margin available for E-TFC selection for the Activated Uplink Frequency i based on the following equation for E-TFC candidate i:

NRPM 
$$_{i,j} = (P_{allocated, i} - P_{E-DPCCHi,i}) / P_{DPCCH,target,i}$$

where

P<sub>E-DPCCH i,i</sub> represents the estimated E-DPCCH transmit power for E-TFCI<sub>i</sub> on the Activated Uplink Frequency i. If E-TFCI<sub>i</sub> is smaller than or equal to E-TFCI<sub>ec.boost</sub> the estimate is based on P<sub>DPCCH,target,i</sub> and the E-DPCCH gain factor calculated using the most recent signalled value of  $\Delta_{\text{E-DPCCH}}$ . If E-TFCI<sub>i</sub> is greater than E-TFCI<sub>ec,boost</sub> the estimate is based on the E-DPCCH gain factor,  $\beta_{ec,j}$ , which is calculated for E-TFCI<sub>j</sub> using the procedure in [18]. If the target E-DCH TTI for which NRPMilis being evaluated corresponds to a compressed mode frame then the modification to the gain factors which occur due to compressed mode shall be included in the estimation.

In the case that the target E-DCH TTI for which E-TFC restriction is being considered does not belong to a compressed mode frame then if NRPM<sub>i,i</sub>  $\geq \sum (\beta_{ed,i}/\beta_c)^2$  then E-TFC<sub>i</sub> can be supported on the Activated Uplink Frequency i, otherwise it cannot be supported on that Activated Uplink Frequency.

In the case that the target E-DCH TTI for which E-TFC restriction is being considered belongs to a compressed mode frame then if NRPM<sub>i,i</sub> $\geq \sum (\beta_{ed,C,j}/\beta_{e,C})^2$  then E-TFC<sub>i</sub> can be supported on the Activated Uplink Frequency i, otherwise it cannot be supported on that Activated Uplink Frequency.

 $\beta_{ed,j}/\beta_c$  and  $\beta_{ed,C,j}/\beta_{c,C}$  is the quantized amplitude ratio.

Table 6.0A: Accuracy requirements for the estimate of PDPCCH used in E-TFC restriction

Total UE output power value (dBm)	P <sub>DPCCH</sub> accuracy(dB) (note 1)			
25<= total output power <34	note 2			
24<= total output power <25	±2.0			
23<= total output power <24	±2.0			
22<= total output power <23	±2.0			
21<= total output power <22	±2.0			
20<= total output power <21	±2.5			
19<= total output power <20	±3.0			
18<= total output power <19	±3.5			
17<= total output power <18	±4.0			
16<= total output power <17	±4.0			
15<= total output power <16	±4.0			
14<= total output power <15	±4.0			
13<= total output power <14	±4.0 (power class 4)			
13<= total output power <14	±6.0 (power class 3)			
12<= total output power <13	±4.0 (power class 4)			
12<= total output power <15	±6.0 (power class 3)			
11<= total output power <12	±4.0 (power class 4)			
11<= total output power <12	±6.0 (power class 3)			
-50<= total output power <11 ±6.0				
NOTE 1: P <sub>DPCCH</sub> accuracy is the difference between the estimate of P <sub>DPCCH</sub> used				
by the UE for the purposes of E-TFC selection and the actual power of				
the DPCCH being transmitted				

NOTE 2: No tolerance is specified.

### 6.5 Maximum allowed UL TX Power

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN {Maximum allowed UL TX Power,  $P_{MAX}$ }

### Where

- Maximum allowed UL TX Power is set by UTRAN and defined in [16], and
- P<sub>MAX</sub> is the UE nominal maximum transmit power is defined by the UE power class, and specified in table 6.1 of

The UE shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN with the tolerances as defined for the UE transmitted power (section 9.1.6). For UE output powers that are outside the range covered by the UE transmitted power measurement the UE output power shall not exceed the Maximum allowed UL TX Power with more than the tolerances specified for the Open loop power control in TS 25.101 section 6.4.1.

For TFC selection the UE is allowed to reduce  $P_{MAX}$  when HS-DPCCH is transmitted by the TFC-MPR values specified in table 6.1

 $\begin{array}{|c|c|c|c|c|} \hline & & & & & & & \\ \hline \textbf{Case} & \textbf{Ratio of } & \beta_c & \textbf{to } & \beta_d & \textbf{for all values of } & \beta_{hs} \\ \hline 1 & & & & & & & \\ \hline 1 & & & & & & \\ \hline 2 & & & & & & \\ \hline 3 & & & & & \\ \hline 15/7 \leq \beta_c/\beta_d \leq 15/0 & & & \\ \hline 2 & & & & \\ \hline 3 & & & & \\ \hline 15/7 \leq \beta_c/\beta_d \leq 15/0 & & \\ \hline 2 & & & \\ \hline \end{array}$ 

Table 6.1: TFC-MPR used for TFC selection

When the UE has one Activated Uplink Frequency for E-TFC selection the UE is allowed to reduce  $P_{MAX}$  by the realistic E-TFC MPR values specified in Table 6.2

Table 6.2: E-TFC-MPR used for E-TFC selection for one Activated Uplink Frequency

Inputs for E-TFC selection							E-TFC-MPR	
Case	Ω	ρ	ρ	R R		E-DPDCH		dB)
Case	βς	$\beta_{hs}$	$\beta_d$	$\beta_{ec}$	$eta_{\sf ed}$	SFmin	Ncodes	(ub)
1	>0	0	0	>0	>0	≥4	1	0.25
2	>0	≥0	0	>0	>0	2	4	0.50
3	>0	0	>0	>0	>0	≥4	1	0.75
4	>0	>0	>0	>0	>0	≥4	1	1.50
5	>0	≥0	>0	>0	>0	4	2	0.75
6	>0	≥0	>0	>0	>0	2	2	0.50
NOTE: For inputs $\{\beta_{c, \beta_{hs}, \beta_{d, \beta_{ec, \beta_{ed, \beta_{e$								

For E-TFC selection, when the UE has more than one Activated Uplink Frequency, the UE is allowed to account for maximum power reduction at any point in the procedure described in Section 6.4.2. The total E-TFC MPR applied across the Activated Uplink Frequencies shall not exceed the maximum value specified in [3].

# 6.6 (void)

# 6.7 CSG Proximity Indication for E-UTRAN and UTRAN

### 6.7.1 Introduction

The requirements defined in this section are applicable to a UE supporting and configured with CSG proximity indication and are valid when a UE is entering the proximity of one or more CSG member cell(s) or leaving the proximity of all CSG member cell(s) on a UTRA or E-UTRA frequency as specified in [16].

The detection of CSG proximity is based on a UE autonomous search function.

## 6.7.2 Requirements

The UE shall initiate transmission of the *ProximityIndication* message with "entering" according to [16] within [6] minutes after entering the proximity of one or more CSG member cell(s) on a UTRA or E-UTRA frequency.

The UE shall initiate transmission of the *ProximityIndication* message with "leaving" according to [16] within [6] minutes after leaving the proximity of all CSG member cell(s) on a UTRA or E-UTRA frequency.

There is no need for statistical testing of this requirement.

NOTE: Entering the proximity of one or more CSG member cell(s) means that the UE is near a cell whose CSG ID is in the UE's CSG whitelist (as determined based on autonomous search procedures). Leaving the proximity of one or more CSG member cell(s) means that the UE is no longer near any cell whose CSG ID is in the UE's CSG whitelist.

# 7 Timing and Signalling characteristics

## 7.1 UE Transmit Timing

### 7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately  $T_0$  chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH or F-DPCH frame, from the reference cell.  $T_0$  is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

## 7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to  $\pm 1.5$  Chips. This requirement applies at the first transmission on the DPCCH/DPDCH. The reference point for the UE initial transmit timing control requirement shall be the time when the first detected path (in time) of the corresponding downlink DPCCH/DPDCH or F-DPCH frame is received from the reference cell plus  $T_0$  chips.  $T_0$  is defined in [2].

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. In case the UE is initially allocated in soft handover, the reference cell shall be the same cell as used for calculating the initial CFN as defined in [16].

The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

When the UE has performed a timing-maintained intra- or inter-frequency hard handover and higher layers has indicated that the UE shall not perform any synchronisation procedure for timing maintained intra- or inter-frequency hard handover, or when the UE attempts to re establish all dedicated physical channel(s) after an inter-RAT, intra- or inter-frequency hard-handover failure [18], it shall resume UL transmission with the same transmit timing as used immediately before the handover attempt. After resuming transmission, transmit timing adjustment requirements defined in the remainder of this clause apply.

The UE shall be capable of changing the transmission timing according to the received downlink DPCCH/DPDCH or F-DPCH frame. When the transmission timing error between the UE and the reference cell exceeds  $\pm 1.5$  chips the UE is required to adjust its timing to within  $\pm 1.5$  chips.

All adjustments made to the UE timing shall follow these rules:

1) The maximum amount of the timing change in one adjustment shall be ¼ Chip.

- 2) The minimum adjustment rate shall be 233ns per second.
- 3) The maximum adjustment rate shall be \(^1\)4 chip per 200ms.

In particular, within any given 800\*d ms period, the UE transmit timing shall not change in excess of  $\pm d$  chip from the timing at the beginning of this 800\*d ms period, where  $0 \le d \le 1/4$ .

## 7.2 UE Receive - Transmit Time Difference

### 7.2.1 Introduction

The UE shall have the capability to be in soft handover with more than one cell. The downlink DPCH frame timing or the downlink F-DPCH frame timing shall take place approximately  $T_0$  chips before the transmission of the uplink DPDCH/DPCCH. The adjustment requirements for the uplink DPDCH/DPCCH timing are specified in 7.1.1. The valid range of the Receive to Transmit time difference at the UE is defined in the following requirements.

## 7.2.2 Requirements

A UE shall support reception, demodulation and combining of signals of a downlink DPCH, or a downlink F-DPCH, when the receive timing is within a window of  $T_0 + /-148$  chip before the transmit timing where  $T_0$  is defined in [2].

For downlink DPCH a UE is only required to react to TPC commands with a transmit power adjustment in the immediate next slot if the downlink receive timing of all cells in the active set is within a window of  $T_0 + /-148$  chip before the uplink transmit timing.

For downlink F-DPCH, a UE is only required to react to TPC commands with a transmit power adjustment in the immediate next slot after the end of the TPC command combining period as defined in [18] if the downlink receive timing of all cells in the active set is within a window of  $T_0$ +/- 148 chip before the uplink transmit timing.

If the downlink receive timing of one or more cells in the active set is outside the window of  $T_0 + / -148$  chip, the UE may also react with a power adjustment one slot later. The receive timing is defined as the first detected path in time.

## 7.3 UE timer accuracy

### 7.3.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

## 7.3.2 Requirements

For UE timers T3xx,  $T_{barred}$ , Treselection, Penalty\_time,  $T_{CRmax}$ ,  $T_{CrmaxHyst}$  [16], UE shall comply with the timer accuracies according to Table 7.1.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Table 7.1

Timer value [s]	Accuracy
timer value <4	± 0.1 s
timer value ≥4	± 2.5 %

# 7.4 PRACH Burst timing accuracy

### 7.4.1 Introduction

The UE shall have capability to transmit the PRACH burst according to the timing of the received access slot [18]. The PRACH burst timing accuracy is defined in the following requirement.

## 7.4.2 Requirements

The UE PRACH burst timing error shall be less than or equal to  $\pm$  3.5 Chips. The reference point shall be the expected timing calculated from the UE's reference detected path of the P-CCPCH.

## 8 UE Measurements Procedures

## 8.1 General Measurement Requirements in CELL\_DCH State

### 8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL\_DCH state. The requirements are split in FDD intra frequency, FDD inter frequency, TDD, GSM and E-UTRAN measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

## 8.1.2 Requirements

### 8.1.2.1 UE Measurement Capability

In CELL\_DCH state, when a single uplink carrier frequency is configured, the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set); and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers; and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers; and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers; and
- Depending on UE capability, 4 E-UTRA FDD cells per E-UTRA FDD carrier for up to 4 E-UTRA FDD carriers;
   and
- Depending on UE capability, 4 E-UTRA TDD cells per E-UTRA TDD carrier for up to 4 E-UTRA TDD carriers; and
- Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

In addition to the requirements defined above, a UE supporting E-UTRA measurements shall be capable of monitoring a minimum total of at least 8 carrier frequency layers, including the intra-frequency serving layer and comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

In CELL\_DCH state, when dual uplink carrier frequencies are configured, the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set) per intra frequency carrier, and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers and
- Depending on UE capability, 4 E-UTRA FDD cells per E-UTRA FDD carrier for up to 4 E-UTRA FDD carriers and
- Depending on UE capability, 4 E-UTRA TDD cells per E-UTRA TDD carrier for distributed on up to 4 E-UTRA TDD carriers and
- Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

In addition to the requirements defined above, a UE supporting E-UTRA measurements shall be capable of monitoring a minimum total of at least 9 carrier frequency layers, including the two intra-frequency carriers and comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must:

- provide transmission gap pattern sequences with TGPL1 > 1, and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

The requirements in section 9 are applicable for a UE performing measurements according to this section.

The received CPICH E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{CPICH \_E_c}{I_o}\right)_{in\ dB} = \left(\frac{CPICH \_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})_{in\ dB}}$$

and the received SCH  $E_c/I_o$  is defined as

$$\left(\frac{SCH_{-}E_{c}}{I_{o}}\right)_{in,dR} = \left(\frac{SCH_{-}E_{c}}{I_{or}}\right)_{in,dR} - \frac{I_{o}}{(\hat{I}_{or})_{in,dR}}$$

### 8.1.2.2 FDD intra frequency measurements

During the CELL\_DCH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report detected set cells, the UE shall also search for intra frequency cells outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set, and are identified by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s. If DL\_DRX\_Active=1, and the UE is performing DRX, intra frequency measurements can be performed when the receiver is active, simultaneously to data reception from the active set cell/s.

The performance of intra frequency measurements when IPDL is active has not been studied.

### 8.1.2.2.1 Identification of a new cell

If DL\_DRX\_Active = 0, the UE shall be able to identify and decode the SFN of a new detectable cell belonging to the monitored set within

$$T_{\text{identify intra}} = Max \left\{ 800, T_{\text{basic identify FDD, intra}} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}} \right\} ms$$

If DL\_DRX\_Active = 1 and the UE DRX cycle < 10 subframes, the UE shall be able to identify and decode the SFN of a new detectable cell belonging to the monitored set within  $T_{identify\ intra} = 800 ms$ .

If DL\_DRX\_Active = 1 and the UE DRX cycle  $\geq$  10 subframes, the UE shall be able to identify and decode the SFN of a new detectable cell belonging to the monitored set within  $T_{identify\ intra} = 1.5s$ .

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB if DL\_DRX\_Active = 0, or CPICH Ec/Io ≥-17dB if DL\_DRX\_Active=1,
- SCH\_Ec/Io ≥ -20 dB if DL\_DRX\_Active = 0, or SCH Ec/Io ≥-17dB if DL\_DRX\_Active=1, for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

In case of conflict when a compressed gap sequence is activated the UE may choose to prioritise the SFN decoding

The UE shall be able to identify a new detectable cell not belonging to the monitored set within

$$T_{identify\ detected\ set} = 30s$$

when CPICH Ec/Io  $\geq$  -20 dB, SCH\_Ec/Io  $\geq$  -17 dB and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

### 8.1.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

where

T<sub>Measurement\_Period Intra</sub> = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

 $T_{IPDL}$  depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.0

Table 8.0: T<sub>IPDL</sub>

Search Window Size	T <sub>IPDL</sub>
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

### 8.1.2.2.2 UE CPICH measurement capability

In the CELL\_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated and DL\_DRX\_Active=0, the UE shall be capable of performing CPICH measurements for 8 identified-intra-frequency cells of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, and/or DL\_DRX\_Active=1, the UE shall be capable of performing CPICH measurements for at least  $Y_{measurement\ intra}$  cells , where  $Y_{measurement\ intra}$  is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than  $Y_{measurement\ intra}$  cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement Period, Intra}}} \right\} \text{ cells}$$

where

 $X_{basic measurement FDD} = 8 (cells)$ 

T<sub>Measurement Period Intra</sub> = 200 ms. The measurement period for Intra frequency CPICH measurements.

 $T_{Intra}$ : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. If DL\_DRX\_Active=1, and the UE is performing DRX, intra frequency measurements are assumed only to be performed when the receiver is guaranteed to be active, and simultaneously to data reception from the active set cell/s.

 $T_{basic\_identify\_FDD, intra} = 800$  ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

The UE shall furthermore be capable of performing CPICH measurements for at least 1 detected intra-frequency cell, in the detected set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 10 s. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2.

### 8.1.2.2.2.1 Capabilities for measurements during IPDL gaps

When idle periods with a length of 1 slot are scheduled, the UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{\text{measurement IPDL}} = Max \{ T_{\text{Measurement Period Intra}}, T_{\text{4 IPDLs}} \}$$
 ms

where

 $T_{Measurement\_Period\ Intra}$  = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

 $T_{4 \text{ IPDI } s}$  = Time period over which 4 consecutive idle periods occur.

### 8.1.2.2.3 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

### 8.1.2.2.4 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.3 Event Triggered Reporting.

### 8.1.2.2.5 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, on cells belonging to monitored set, measured without L3 filtering, shall be less than the above defined  $T_{identify\ intra}$  defined in Section 8.1.2.2.1

If a cell, belonging to monitored set, which the UE has identified and measured at least once over the measurement period, becomes undetectable for a period  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than  $T_{Measurement\_Period\ Intra}$  ms provided the timing to that cell has not changed more than +/-32 chips, the UE CPICH measurement capabilities of section 8.1.2.2.2 are valid and L3 filtering has not been used. When L3 filtering is used an additional delay can be expected.

If a cell belonging to monitored set has been detectable at least for the time period  $T_{identify\_intra}$  and then triggers the measurement report as per TS 25.331, section 14 [16], the event triggered measurement reporting delay shall be less than  $T_{Measurement\_Period\ Intra}$  when the L3 filter has not been used and the UE CPICH measurement capabilities of Section 8.1.2.2.2 are valid.

The event triggered measurement reporting delay on cells not belonging to monitored set, measured without L3 filtering, shall be less than the above defined T  $_{identify\ detected\ set}$  defined in Section 8.1.2.2.1.

### 8.1.2.3 FDD inter frequency measurements

In the CELL\_DCH state when a transmission gap pattern sequence with the "FDD measurements" purpose is provided by the network the UE shall continuously measure identified inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose FDD measurement using the following combinations for TGL1, TGL2, TGD and Max TGPL:

TGL1 [slots]	TGL2 [slots]	TGD [slots]	Max TGPL [frames]
7	-	undefined	18
14	-	undefined	36
10	-	undefined	24
7	7	15269	18 + ceil(TGD/15)
14	14	45269	36 + ceil(TGD/15)

Table 8.1

### 8.1.2.3.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, inter}} = T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inters}}} \cdot N_{\textit{Freq}} \quad \textit{ms}$$

and UE that supports inter frequency detected set CPICH measurements shall also be able to identify a new detectable cell belonging to the detected set within  $T_{identify\ inter\ detected\ set} = 30 \cdot N_{freq}\ s.$ 

If the UE does not need compressed mode to measure cells on a frequency adjacent to the intra-frequency (irrespective of the number of serving cells configured in the UE) according to its measurement capability in the IE "Adjacent Frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], and if the Adjacent Frequency Index [16] is configured, the UE shall be able to identify a new detectable cell on the indicated adjacent frequency belonging to the monitored set within  $T_{identify,inter,optional}$  and UE that supports inter frequency detected set CPICH measurements shall be able to identify a new detectable cell on the indicated adjacent frequency within  $T_{identify,inter\,detected\,set} = 30s$ .

If the UE does not need compressed mode to measure cells on a frequency in a band jointly supported with the band of intra-frequency according to its measurement capability in the IE "Inter-band Frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], the UE shall be able to identify a new detectable cell on that frequency belonging to the monitored set within  $T_{identify,inter,optional}$  and UE that supports inter frequency detected set CPICH measurements shall be able to identify a new detectable cell on that frequency within  $T_{identify,inter detected set} = 30s$ .

If the UE is able to search enhanced inter-frequency measurements without compressed mode according to its measurement capability in the IE "Enhanced inter-frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16],

- when a single uplink frequency is configured, the UE shall be able to identify a new detectable cell each of the 2 indicated frequencies belonging to the monitored set within  $T_{identify,inter,optional}$ ; or
- when dual uplink frequencies are configured, the UE shall be able to identify a new detectable cell on the indicated frequency belong to the monitored set within  $T_{identify,inter,optional}$ ,

where the indicated frequenc(ies) together with intra-frequenc(ies) shall be within UE RF capability as per Band Combination and Supported Carrier Combination List in [16] and UE that supports inter frequency detected set CPICH measurements shall be able to identify a new detectable cell on the indicated frequenc(ies) within  $T_{identify,inter\ detected\ set} = 30s$ .

If  $DL_DRX_Active = 0$ ,

$$T_{identify, \, inter, \, optional} = \textit{Max} \bigg\{ 800, T_{basic \, identify \, \, FDD, \, intra} \cdot \frac{T_{Measurement \, Period, \, Intra}}{T_{Intra}} \bigg\} \textit{ms} \; .$$

If DL\_DRX\_Active = 1 and the UE DRX cycle < 10 subframes,  $T_{identify, inter, optional} = 800 ms$ .

If DL\_DRX\_Active = 1 and the UE DRX cycle  $\geq$  10 subframes,  $T_{identify, inter, optional}$  = 1.5s.

If the UE does not need compressed mode to measure cells on configured carrier frequencies corresponding to secondary serving HS-DSCH cells according to its measurement capability in the IE, "Inter-frequency measurements on configured carriers without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], the UE shall be able to identify a new detectable cell on the configured carrier frequency belonging to the monitored set within  $T_{identify,inter,optional}$  where:

If DL\_DRX\_Active = 0,  $T_{identify, inter, optional} = 2.2*N_{freq}$  seconds.

If DL\_DRX\_Active = 1 and the UE DRX cycle < 10 subframes,  $T_{identify,\,inter,\,optional}$  = 2.2\* $N_{freq}$  seconds.

If DL\_DRX\_Active = 1 and the UE DRX cycle  $\geq$  10 subframes,  $T_{identify, inter, optional} = 4.4*N_{freq}$  seconds.

A cell shall be considered detectable when

- CPICH Ec/Io  $\geq$  -20 dB,
- SCH\_Ec/Io ≥ -17 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

### 8.1.2.3.2 UE CPICH measurement capability

When transmission gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement period given by

$$T_{\text{measurement inter}} = Max \left\{ T_{\text{Measurement\_Period Inter}} \cdot T_{\text{basic measurement FDD inter}} \cdot \frac{T_{\text{Measurement\_Period Inter}}}{T_{\text{Inter}}} \cdot N_{\textit{Freq}} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency measurements, the measurement period for inter-frequency measurements is 480 ms.

The UE shall be capable of performing CPICH measurements for  $X_{\text{basic measurement FDD inter}}$  inter-frequency cells per FDD frequency of the monitored set or the virtual active set, or the detected set for UE that supports inter frequency detected set measurements, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{\text{Measurement\_Inter}}$ . If the UE has identified more than Xbasic measurement FDD inter cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

 $X_{\text{basic measurement FDDinter}} = 6$ 

 $T_{Measurement\_Period\ Inter}$  = 480 ms. The period used for calculating the measurement period  $T_{measurement\_inter}$  for interfrequency CPICH measurements.

 $T_{Inter::}$  This is the minimum time that is available for inter frequency measurements, during the period  $T_{Measurement\_Period\ inter}$  with an arbitrarily chosen timing. The minimum time per transmission gap is calculated by using the actual idle length within the transmission gap as given in the table 11 of Annex B in TS 25.212 and by assuming 2\*0.5 ms for implementation margin and after that taking only full slots into account in the calculation.

 $T_{basic\_identify\_FDD,inter} = 300$  ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

 $T_{basic\_measurement\_FDD\ inter} = 50$  ms. This is the time period used in the equation for defining the measurement period for inter frequency CPICH measurements.

N<sub>Freq</sub>: Number of FDD frequencies indicated in the inter frequency measurement control information.

For UE that supports inter frequency detected set CPICH measurements, out of the  $X_{\text{basic measurement FDD inter}}$  interfrequency cells per FDD frequency for which the UE is capable of performing CPICH measurements, the UE shall be capable of measuring the CPICH of at least one detected set cell.

If the UE does not need compressed mode to measure cells on a frequency adjacent to the intra-frequency (irrespective of the number of serving cells configured in the UE) according to its measurement capability in the IE "Adjacent Frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], and if the Adjacent Frequency Index [16] is configured,

- when DL\_DRX\_Active=0, the UE shall be capable of performing CPICH measurements for 8 cells on the indicated adjacent frequency, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200ms. For UE that supports inter frequency detected set CPICH measurements, out of 8 cells on the indicated adjacent frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than 8 cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased; or
- when DL\_DRX\_Active=1, the UE shall be capable of performing CPICH measurements for at least Y<sub>measurement</sub> intra cells on the indicated adjacent frequency, where Y<sub>measurement</sub> intra is defined in sub-clause 8.1.2.2.2. If the UE has identified more than Y<sub>measurement</sub> intra cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased. For UE that supports inter frequency detected set CPICH measurements, out of Ymeasurement intra cells on the indicated adjacent frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than Ymeasurement intra cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

If the UE does not need compressed mode to measure cells on a frequency in a band jointly supported with the band of intra-frequency according to its measurement capability in the IE "Inter-band Frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16],

- when DL\_DRX\_Active=0, the UE shall be capable of performing CPICH measurements for 8 cells on that frequency, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200ms. For UE that supports inter frequency detected set CPICH measurements, out of 8 cells on that frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than 8 cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased; or
- when DL\_DRX\_Active=1, the UE shall be capable of performing CPICH measurements for at least Y<sub>measurement</sub> intra cells on that frequency. If the UE has identified more than Y<sub>measurement</sub> intra cells, where Y<sub>measurement</sub> intra is defined in sub-clause 8.1.2.2.2, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased. For UE that supports inter frequency detected set CPICH measurements, out of Ymeasurement intra cells on that frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than Ymeasurement intra cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

If the UE is able to search enhanced inter-frequency measurements without compressed mode according to its measurement capability in the IE "Enhanced inter-frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], and DL DRX Active = 0,

- when a single uplink frequency is configured, the UE shall be capable of performing CPICH measurements for 8 cells each on 2 indicated frequencies, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200ms. For UE that supports inter frequency detected set CPICH measurements, out of 8 cells each on 2 indicated frequencies, the UE shall be capable of measuring the CPICH of at least one detected set cell each on 2 indicated frequencies. If the UE has identified more than 8 cells on

each frequency, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased; or

- when dual uplink frequencies are configured, the UE shall be capable of performing CPICH measurements for 8 cells on the indicated frequency, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200ms. For UE that supports inter frequency detected set CPICH measurements, out of 8 cells on the indicated frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than 8 cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

If the UE is able to search enhanced inter-frequency measurements without compressed mode according to its measurement capability in the IE "Enhanced inter-frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], and DL\_DRX\_Active = 1,

- when a single uplink frequency is configured, the UE shall be capable of performing CPICH measurements for at least Y<sub>measurement intra</sub> cells each on 2 indicated frequencies, where Y<sub>measurement intra</sub> is defined in sub-clause 8.1.2.2.2. If the UE has identified more than Y<sub>measurement intra</sub> cells on the indicated frequency, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased for that frequency. For UE that supports inter frequency detected set CPICH measurements, out of Ymeasurement intra cells each on 2 indicated frequencies, the UE shall be capable of measuring the CPICH of at least one detected set cell each on 2 indicated frequencies. If the UE has identified more than Ymeasurement intra cells on each frequency, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased; or
- when dual uplink frequencies are configured, the UE shall be capable of performing CPICH measurements for at least Y<sub>measurement intra</sub> cells on the indicated frequency, where Y<sub>measurement intra</sub> is defined in sub-clause 8.1.2.2.2. If the UE has identified more than Y<sub>measurement intra</sub> cells on the indicated frequency, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased for that frequency. For UE that supports inter frequency detected set CPICH measurements, out of Ymeasurement intra cells on the indicated frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than Ymeasurement intra cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

If the UE does not need compressed mode to measure cells on configured carrier frequencies corresponding to secondary serving HS-DSCH cells according to its measurement capability in the IE, "Inter-frequency measurements on configured carriers without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16]:

- when DL\_DRX\_Active=0, or DL\_DRX\_Active=1 and the UE DRX cycle < 10 subframes, the UE shall be capable of performing CPICH measurements for 6 cells per configured carrier frequency belonging to the monitored set or the virtual active set, or the detected set for UE that supports inter frequency detected set measurements on the configured carrier frequency, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 1000\* N<sub>Freq</sub> ms. For UE that supports inter frequency detected set CPICH measurements, out of 6 cells per configured carrier frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than 6 cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased; or
- when DL\_DRX\_Active=1 and the UE DRX cycle ≥ 10 subframes, the UE shall be capable of performing CPICH measurements for at least 6cells per configured carrier frequency belonging to the monitored set or the virtual active set, or the detected set for UE that supports inter frequency detected set measurements on the configured carrier frequency, and the UE physical layer shall be capable of reporting measurements to high layers with the measurement period of  $2000*N_{Freq}$  ms. For UE that supports inter frequency detected set CPICH measurements, out of 6 cells per configured carrier frequency, the UE shall be capable of measuring the CPICH of at least one detected set cell. If the UE has identified more than 6cells then the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

The measurement accuracy for all measured cells shall be as inter frequency measurement accuracy specified in the sub-clause 9.1.1 and 9.1.2.

#### 8.1.2.3.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

## 8.1.2.3.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay of a cell belonging to the monitored set, measured without L3 filtering shall be less than T <sub>identify inter</sub> defined in Section 8.1.2.3.1 When L3 filtering is used an additional delay can be expected.

The event triggered measurement reporting delay of a cell belonging to the detected set, measured without L3 filtering shall be less than  $T_{identify\ inter\ detected\ set}$  defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected.

If a cell belonging to a monitored set has been detectable at least for the time period  $T_{identify\_inter}$  or a cell belonging to a detected set has been detectable at least for the time period  $T_{identify\_inter}$  and then triggers the measurement report as per TS 25.331, section 14 [16], the event triggered measurement reporting delay shall be less than  $T_{Measurement\_Period\ Inter}$  provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.

If one of the following conditions is met,

- 1) if the UE does not need compressed mode to measure cells on a frequency adjacent to the intra-frequency (irrespective of the number of serving cells configured in the UE) according to its measurement capability in the IE "Adjacent Frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16], and if the Adjacent Frequency Index [16] is configured; or
- 2) if the UE does not need compressed mode to measure cells on a frequency in a band jointly supported with the band of intra-frequency according to its measurement capability in the IE "Inter-band Frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16]; or
- 3) if the UE is able to search enhanced inter-frequency measurements without compressed mode according to its measurement capability in the IE "Enhanced inter-frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16]; or
- 4) if the UE does not need compressed mode to measure cells on configured carrier frequencies corresponding to secondary serving HS-DSCH cells according to its measurement capability in the IE, "Inter-frequency measurements on configured carriers without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16],

the event triggered measurement reporting delay of a cell belonging to the monitored set, measured without L3 filtering shall be less than T  $_{identify,inter,optional}$  defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected. If a cell has been detectable at least for the time period  $T_{identify,inter,optional}$  and then triggers the measurement report as per TS 25.331, section 14 [16], the event triggered measurement reporting delay shall be less than  $T_{Measurement\_Period\ Intra}$  defined in Section 8.1.2.2.2 provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.

#### 8.1.2.4 TDD measurements

The requirements in this section shall apply to UE supporting FDD and TDD.

In the CELL\_DCH state when a transmission gap pattern sequence with the "TDD measurements" purpose is provided by the network, the UE shall continuously measure identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall either be synchronised or non-overlapping in time such that the UE can measure an inter-frequency TDD cell at least once in every transmission gap pattern as given in [7] for the slot allocation case in use in this cell and by assuming 2\*0.5 ms implementation margin per transmission gap.

UTRAN shall provide a transmission gap pattern sequence with measurement purpose TDD measurement using the combinations for TGL1, TGL2 and TGD in Table 8.2:

Table 8.2

TGL1 [slots]	TGL2 [slots]	TGD [slots]
10	-	undefined
10	10	41269
14	7	37269

#### 8.1.2.4.1 Identification of a new cell

#### 8.1.2.4.1.1 3,84 Mcps TDD Option

When transmission gaps are scheduled for inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{\text{identify TDD inter}} = Max \left\{ 5000, N_{\text{basic identify TDD inter}} \cdot \frac{T_{\text{Measurement Period TDD inter}}}{N_{\text{TDD inter}}} \cdot N_{\text{Freq}} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

An inter-frequency TDD cell shall be considered detectable when P-CCPCH Ec/Io ≥ -8 dB and SCH\_Ec/Io ≥ -13 dB.

The received P-CCPCH\_E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{P - CCPCH _ E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _ E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{(\hat{I}_{or})}_{in \ dB}$$

and the received SCH\_E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{SCH \_E_c}{I_o}\right)_{in JB} = \left(\frac{SCH \_E_c}{I_{or}}\right)_{in JB} - \frac{I_o}{(\hat{I}_{or})_{in JB}}$$

#### 8.1.2.4.1.2 1.28 Mcps TDD Option

When transmission gaps are scheduled for inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{\text{identify TDD inter}} = Max \left\{ 5000, N_{\text{basic identify TDD inter}} \cdot \frac{T_{\text{Measurement Period TDD inter}}}{N_{\text{TDD inter}}} \cdot N_{\text{Freq}} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

A cell shall be considered detectable when P-CCPCH Ec/Io  $\geq$  -8 dB and DwPCH\_Ec/Io  $\geq$  -5 dB. When L3 filtering is used an additional delay can be expected.

The received P-CCPCH E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{P - CCPCH _E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{(\hat{I}_{or})_{in \ dB}}$$

The received DwPTS E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{DwPCH\_E_c}{I_o}\right)_{in\_dR} = \left(\frac{DwPCH\_E_c}{I_{or}}\right)_{in\_dR} - \frac{I_o}{(\hat{I}_{or})_{in\_dR}}$$

# 8.1.2.4.2 P-CCPCH RSCP measurement period

When transmission gaps are scheduled for inter frequency TDD measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and with a measurement period as given by

$$T_{\text{measurement TDD inter}} = Max \left\{ T_{\text{Measurement Period TDD inter}}, N_{\text{basic measurement TDD inter}} \cdot \frac{T_{\text{Measurement Period TDD inter}}}{N_{\text{TDD inter}}} \cdot N_{\text{Freq}} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the measurement period for inter-frequency TDD measurements shall be 480 ms.

The UE shall be capable of performing P-CCPCH RSCP measurements for  $X_{\text{basic measurement TDD inter}}$  inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{\text{measurement TDD inter}}$ .

 $X_{basic\ measurement\ TDD\ inter} = 6$  (cells)

 $T_{Measurement\_Period\ TDD\ inter} = 480\ ms.\ The\ time\ period\ used\ for\ calculating\ the\ measurement\ period\ T_{measurement\_TDD\ inter}$  for inter frequency P-CCPCH RSCP measurements.

 $N_{TDD\ inter}$ . This is the smallest resulting integer number of transmission gap patterns in a transmission gap pattern sequence assigned to UE by UTRAN for inter frequency TDD measurements during the time period  $T_{Measurement\_Period\ TDD\ inter}$  with an arbitrarily chosen timing.

 $N_{basic\_identify\_TDD,inter}$  =80. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new inter frequency TDD cell is defined.

 $N_{basic\_measurement\_TDD\ inter} = 5$ . This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time period  $T_{Measurement\_Period\ TDD\ inter}$  with an arbitrarily chosen timing that is used in the inter-frequency TDD equation where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

 $N_{\text{Freq}}$ : This is the number of TDD frequencies indicated in the inter frequency measurement control information.

#### 8.1.2.4.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

# 8.1.2.4.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH.. This measurement reporting delay excludes a delay

uncertainty resulting when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than  $T_{identify\ TDD\ inter}$  defined in Section 8.1.2.4.1 When L3 filtering is used an additional delay can be expected.

## 8.1.2.5 GSM measurements

The requirements in this section apply only to UE supporting FDD and GSM.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

- 1) In CELL\_DCH state when a transmission gap pattern sequence is provided by the UTRAN the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.
- 2) If the UE does not need compressed mode to perform GSM measurements:
  - the UE shall measure all GSM cells present in the monitored set
  - the relevant requirements for GSM dedicated mode when a TCH channel is assigned in TS 45.008 shall apply. This is further detailed in the following sub-sections.

#### 8.1.2.5.1 GSM carrier RSSI

1) For a UE requiring compressed mode

A UE supporting GSM measurements using compressed mode shall meet the minimum number of GSM RSSI carrier measurements specified in table 8.4. This measurement shall be based on a transmission gap pattern sequence with purpose "GSM carrier RSSI measurements"

In order for the requirements in this subsection to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose GSM carrier RSSI measurements using the following combinations for TGL1, TGL2 and TGD:

Table 8.3

TGL1 [slots]	TGL2 [slots]	TGD [slots]
3	-	undefined
4	-	undefined
5	-	undefined
7	-	undefined
10	-	undefined
14	-	undefined
3	3	15269
4	4	15269
5	5	15269
7	7	15269
10	10	41269
14	14	45269

In the CELL\_DCH state the measurement period,  $T_{Measurement Period, GSM}$ , for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS45.008, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.4

TGL	Number of GSM carrier RSSI samples in each gap.
3	1
4	2
5	3
7	6
10	10
14	15

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

#### 2) For a UE not requiring compressed mode

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per RSSI value. The measurement period is 480 ms.

#### 8.1.2.5.2 BSIC verification

## 1) For a UE requiring compressed mode

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose GSM Initial BSIC identification or with measurement purpose GSM BSIC reconfirmation, using the following combinations for TGL1, TGL2 and TGD:

Table 8.5

TGL1 [slots]	TGL2 [slots]	TGD [slots]	
5	-	undefined	
7	-	undefined	
10	-	undefined	
14	-	undefined	
5	5	15269	
7	7	15269	
10	10	41269	
14	14	45269	

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

#### **Initial BSIC identification**

Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within the available transmission gap pattern sequence with purpose "GSM Initial BSIC identification". The requirements for Initial BSIC identification can be found in 8.1.2.5.2.1.

#### **BSIC** re-confirmation

Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available transmission gap pattern sequence with purpose "GSM BSIC reconfirmation". The requirements for BSIC re-confirmation can be found in 8.1.2.5.2.2.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

If the network requests measurements on a GSM cell with BSIC verified, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to Section 8.1.2.5.1 when ever a transmission gap pattern sequence with the purposes "GSM carrier RSSI measurements" is provided and the UE shall perform measurement reporting as defined in Section 8.6.7.6 of [16].
- The UE shall perform BSIC identification according to Section 8.1.2.5.2.1 when a "GSM Initial BSIC identification" transmission gap pattern sequence is activated. The UE shall use the last available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation according to Section 8.1.2.5.2.2 when a "GSM BSIC re-confirmation" transmission gap pattern sequence is activated.
- If a "GSM BSIC re-confirmation" transmission gap pattern sequence is not activated in parallel to a "GSM Initial BSIC identification" transmission gap pattern sequence or within one frame from the deactivation of a "GSM Initial BSIC identification" transmission gap pattern sequence, the BSIC shall be considered to be non-verified after 10s has elapsed after the UE identified the BSIC of the cell..

The UE shall perform event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the last available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting. Periodic reports shall be triggered according to Sections 8.6.7.5 and 8.6.7.6 of [16].

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every  $T_{\text{re-confirm\_abort}}$  seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a transmission gap pattern sequence with a purpose "GSM BSIC re-confirmation" is not activated by the network after BSIC identified or the "GSM BSIC re-confirmation" transmission gap pattern sequence is deactivated, the UE shall behave as described previously in this section.

The parameters  $N_{identify\_abort}$  and  $T_{re-confirm\_abort}$  are defined by higher layers and are signalled to the UE together with the transmission gap pattern sequence.  $N_{identify\_abort}$  indicates the maximum number of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure.  $T_{re-confirm\_abort}$  indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a transmission gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective transmission gap is within the limits specified in table 8.6.

The effective transmission gap is calculated by assuming both UL and DL compressed mode and applying the worst-case values for UL/DL timing offset and pilot field length of last DL gap slot.

 Gap length [slots]
 Maximum time difference [μs]

 5
 ± 500

 7
 ± 1200

Table 8.6: The gap length and maximum time difference for BSIC verification

± 2200

 $\pm 3500$ 

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005.

10

14

2) For a UE not requiring compressed mode

If a BSIC is decoded and matches the expected value, it is considered as "verified", else it is considered as "non verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005.

#### 8.1.2.5.2.1 Initial BSIC identification

This measurement shall be based on a transmission gap pattern sequence with the purpose "GSM Initial BSIC identification"

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strength levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available transmission gaps, within the transmission gap pattern sequence with the purpose "GSM Initial BSIC identification", to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within  $N_{identify\_abort}$  successive patterns, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

 $N_{identify\_abort}$  values are given for a set of reference patterns in table 8.7.  $T_{identify\_abort}$  is the elapsed time during  $N_{identify\_abort}$  transmission gap patterns (informative). The figures given in table 8.7 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

TGL1 TGL2 TGD TGPL1 Tidentify abort N<sub>identify\_abort</sub> [slots] [slots] [slots] [frames] [s] [patterns] Pattern 1 undefined 1.56 52 7 3 Pattern 2 undefined 8 5.28 66 Pattern 3 7 47 8 2.88 36 Pattern 4 7 7 38 12 2.88 24 23 Pattern 5 14 undefined 8 1.84 22 Pattern 6 14 24 5.28 undefined Pattern 7 12 14 14 45 1.44 12 Pattern 8 10 undefined 8 2.88 36 Pattern 9 10 10 75 12 2.88 24

Table 8.7: The worst-case time for identification of one previously not identified GSM cell

#### 8.1.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each transmission gap of a transmission gap pattern sequence with the measurement purpose "GSM BSIC reconfirmation", the UE shall attempt to decode the BSIC falling within the effective gap duration. If more than one BSIC can be decoded within the same gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within  $T_{re-confirm\_abort}$  seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

 $N_{\text{re-confirm\_abort}}$  is the number of transmission gap patterns executed during  $T_{\text{re-confirm\_abort}}$  (informative).

TGL1 TGL2 TGD TGPL1 Tre-confirm\_abort Nre-confirm\_abort [slots] [slots] [frames] [patterns] [slots] [s] Pattern 1 undefined 3 1.32 7 44 Pattern 2 7 undefined 8 5.04 63 -Pattern 3 15 8.1 7 undefined 54 Pattern 4 7 7 69 23 10.12 44 7 7 69 8 Pattern 5 2.64 33 Pattern 6 14 undefined 8 1.6 20 Pattern 7 14 14 8 0.80 10 60 Pattern 8 10 undefined 8 2.64 33 10 23 35 Pattern 9 undefined 8.05 47 Pattern 10 7 7 8 2.64 33 2.64 Pattern 11 7 7 38 12 22 14 Pattern 12 undefined 24 5.04 21 14 14 12 Pattern 13 45 1.20 10 Pattern 14 10 undefined 13 4.94 38 10 Pattern 15 10 12 2.64 75 22

Table 8.8: The worst-case time for BSIC re-confirmation of one GSM cell

#### 8.1.2.5.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

# 8.1.2.5.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period  $T_{Measurement\ Period,\ GSM}$  (see section 8.1.2.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than  $2*T_{Measurement\ Period,\ GSM}$ , where  $T_{Measurement\ Period,\ GSM}$  is defined in Section 8.1.2.5.1. When L3 filtering is used an additional delay can be expected. For a GSM cell with non-verified BSIC an additional delay according to section 8.1.2.5.2.1 Initial BSIC identification can be expected.

#### 8.1.2.6 E-UTRAN measurements

The requirements in this section apply only to UEs supporting UTRAN FDD and E-UTRAN FDD and TDD.

1) In CELL\_DCH state when a transmission gap pattern sequence is provided by the UTRAN the UE shall continuously measure previously detected E-UTRAN cells and search for new E-UTRAN cells.

In order for the requirements in the following subsections to apply the UTRAN must provide a transmission gap pattern sequence with measurement purpose "E-UTRAN measurement" using the following combinations for TGL1, TGL2, TGD and Max TGPL:

Table 8.8a

TGL1 [slots]	TGL2 [slots]	TGD [slots]	Max TGPL [frames]
≥10	-	undefined	12

2) If the UE does not need compressed mode to perform E-UTRAN measurements:

- the UE shall measure either all E-UTRAN cells present in the monitored set or, if only frequencies are
  provided in the neighbour cell list, the strongest cells present in the detected set, up to the monitoring
  capabilities of the UE.
- the relevant requirements for E-UTRAN RRC\_CONNECTED mode specified in 3GPP TS 36.133 [24] shall apply. This is further detailed in the following subclauses.

#### 8.1.2.6.1 Identification of a new cell

When compressed mode gaps are used for E-UTRAN measurements, the UE shall be able to identify a new detectable E-UTRAN cell within

$$\mathbf{T}_{\text{Identify,E-UTRAN}} = N_{\text{freq,E-UTRA}} \cdot \mathbf{T}_{\text{Basic\_Identify\_E-UTRAN}} \cdot \frac{480}{\mathbf{T}_{\text{E-UTRAN}}} \quad \textit{ms} \; ;$$

If the UE does not need compressed mode to perform E-UTRAN measurements, the UE shall be able to identify a new detectable E-UTRAN cell within  $T_{Basic\ Identifv\ E-UTRAN}$  ms.

#### Where:

 $T_{\text{E-UTRAN}}$ : This is the minimum time that is available for E-UTRAN measurements during a 480ms period with an arbitrarily chosen timing. The minimum time per compressed mode gap is calculated by subtracting 2\*0.5 ms from the length of the gap.

 $N_{\text{freq},E-UTRAN}$ : This is the number of E-UTRAN carriers being monitored

 $T_{Basic\_Identify\_E\text{-}UTRAN} = 480ms$ 

When L3 filtering is used an additional delay can be expected.

An E-UTRANcell shall be considered detectable when

- RSRP<sub>dBm</sub> RSRP Ês/Iot according to Annex B.2.1 for a corresponding Band
- other RSRP related side condition given in Section 9.1 of [24] are fulfilled,
- SCH\_RP|<sub>dBm</sub> and SCH\_RP/Iot according to Annex B.2.1 for a corresponding Band

#### 8.1.2.6.2 E-UTRAN RSRP and RSRQ measurement period

When compressed mode gaps are scheduled for E-UTRAN measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.4a and 9.1.4b with measurement period of  $T_{Measurement\_Period\_E-UTRAN} = 480 \text{ x N}_{Freq}$  ms where  $N_{Freq}$  is the number of E-UTRAN frequencies indicated in the inter-RAT measurement control information.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 E-UTRAN cells per E-UTRAN frequency, according to its supported UE capabilities. Additionally, for a UE supporting E-UTRA measurements in Cell-DCH state, the UE shall be capable of monitoring a minimum total of at least 8 carrier frequency layers, including the intrafrequency serving layer and comprising of any allowed combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

#### 8.1.2.6.3 Periodic reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

#### 8.1.2.6.4 Void

#### 8.1.2.6.5 Event Triggered reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T  $_{identify,E-UTRAN}$  defined in Section 8.1.2.6.1When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period than T  $_{identify,E-UTRAN}$  and then triggers the measurement report as per TS 25.331, section 14 [16], the event triggered measurement reporting delay shall be less than T  $_{Measurement\_Period\_E-UTRAN}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts while transmission gap has not been available and the L3 filter has not been used.

# 8.2 Measurements in CELL\_DCH State with special requirements

# 8.2.1 Introduction

This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. As long as the measurement configuration does not exceed the requirements stated in section 8.2.2, the UE shall meet the performance requirements defined in section 9.

Control of measurement reporting is specified in TS 25.331. Compressed mode is specified in TS 25.215.

# 8.2.2 Requirements

The UE shall be able to perform in parallel all physical layer measurements according to table 8.9. In this section one physical layer measurement corresponds to a measurement at the reference point B (i.e. measurement reported by layer 1 after layer 1 filtering) in the measurement model in TS 25.302 [15].

In addition to the requirements in table 8.9 the UE shall in parallel, in state CELL\_DCH, also be able to measure and report the quantities according to section 8.1.

Measurement quantity

Number of parallel physical layer measurements possible to request from the UE

Transport channel BLER

UE transmitted power

UE Rx-Tx time difference

SFN-SFN observed time difference type 2

UE GPS Timing of Cell Frames for LCS

Number of parallel physical layer measurements possible to request 1 per Transport Channel

1 per Transport Channel

1 including timing to all radio links in active set

Table 8.9: Parallel physical layer measurement requirements

Editors Note: The presence of the measurements for location services needs to be revised.

# 8.3 Capabilities for Support of Event Triggering and Reporting Criteria in CELL DCH state

# 8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria. As long as the measurement configuration does not exceed the requirements stated in section 8.3.2, the UE shall meet the performance requirements defined in section 9.

The UE can be requested to make measurements under different Measurement Identities [16]. Each Measurement Identity corresponds to either event based reporting, periodic reporting or no reporting. In case of event based reporting, each Measurement Identity is associated with one or more events, each identified with an Event Identity. In case of periodic reporting, a Measurement Identity is associated with one periodic reporting criterion. In case of no reporting, a Measurement Identity is associated with one no reporting criterion.

The purpose of this section is to set some limits on the number of different event, periodic and no reporting criteria the UE may be requested to track in parallel.

# 8.3.2 Requirements

per intra-frequency

In this section a reporting criterion corresponds to either one event (in the case of event based reporting), or one periodic reporting criterion (in case of periodic reporting), or one no reporting criterion (in case of no reporting). For event based reporting, each instance of event, with the same or different Event Identities, is counted as separate reporting criterion in Table 8.10.

The UE shall be able to support in parallel per category up to  $E_{cat}$  reporting criteria according to Table 8.10. If the UE is configured with a single uplink carrier frequency, for the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 22 reporting criteria in total. If the UE is configured with dual uplink carrier frequencies, for the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 28 reporting criteria in total. For the measurement categories: Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Table 8.10: Requirements for reporting criteria per measurement category

Measurement category	E <sub>cat</sub>	Note	
Intra-frequency	9		
Inter-frequency	7		
Inter-frequency, virtual active set	4		
Inter-RAT GERAN	4	Only applicable for UE with this capability	
Inter-RAT E-UTRAN	4	Only applicable for UE with this capability	
UE internal measurements	8		
Traffic volume measurements	2 + (2 per Transport Channel)		
Quality measurements	2 per Transport Channel		
UP measurements	2	Only applicable for UE with this capability.	
UE Rx-Tx time difference measurement	1		
Note: When the UE is configured with dual uplink carrier frequencies, E <sub>cat</sub> for Intra-frequency is applied			

# 8.4 Measurements in CELL\_FACH State when HS-DSCH discontinuous reception is not ongoing

# 8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL\_FACH state when HS-DSCH discontinuous reception is not ongoing. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD, GSM and E-UTRAN measurements. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL\_FACH state are described in TS 25.331.

# 8.4.2 Requirements

# 8.4.2.1 UE Measurement Capability when HS-DSCH discontinuous reception is not ongoing

In CELL\_FACH state, the UE shall be able to monitor up to

- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers, and
- Depending on UE capability, up to 4 E-UTRA FDD carriers, and
- Depending on UE capability up to 4 E-UTRA TDD carriers, and
- Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD, GSM and E-UTRAN cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this four parameters are defined:

- $N_{FDD}$  is 0 or 1. If there are inter-frequency FDD cells in the neighbour list and FDD measurements are required by higher layers,  $N_{FDD}$ =1, otherwise  $N_{FDD}$ =0.
- $N_{TDD}$  is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list and TDD measurements are required by higher layers,  $N_{TDD}=1$  otherwise  $N_{TDD}=0$ .
- $N_{GSM}$  is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list and GSM measurements are required by higher layers,  $N_{GSM}=1$ , otherwise  $N_{GSM}=0$ .
- $N_{E-UTRAN}$  is 0 or 1. If the UE is capable of E-UTRAN and there are E-UTRAN cells in the neighbour list and E-UTRAN measurements are required by higher layers,  $N_{E-UTRAN}$ =1, otherwise  $N_{E-UTRAN}$ =0.

The measurement time  $T_{\text{meas}}$  is then defined as

$$T_{meas} = \left[ \left( N_{FDD} + N_{TDD} + N_{GSM} + N_{E-I/TRAN} \right) \cdot N_{TTI} \cdot M_{REP} \cdot 10 \right] \text{ms}$$

where

- M\_REP is the Measurement Occasion cycle length where K is given in Table 8.10A. K is the FACH measurement occasion length coefficient as specified in TS25.331
- The FACH Measurement Occasion of N<sub>TTI</sub> frames will be repeated every N<sub>TTI</sub> \* M\_REP frame.
- N<sub>TTI</sub> is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE. FACHs that only carry MBMS logical channels (MTCH, MSCH, or MCCH) are excluded from measurement occasion calculations.
- A UE receiving MTCH shall use only that part of the Measurement Occasion of NTTI frames which corresponds to 25% of the MTCH TTI length at the maximum.

For UEs receiving MTCH, the reduced measurement time, if applicable, needs to be considered when performance requirements are derived according to section 8. The repetition rate of NTTI \* M\_REP frames remains unaffected

Table 8.10A: K values for each N<sub>TTI</sub> value

N <sub>TTI</sub>	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

The UE is assumed to measure periodically once every time period  $T_{meas}$  on each of the modes and systems, FDD inter frequency cells, TDD inter frequency cells, GSM and E-UTRA carriers for which the corresponding parameter  $N_{FDD}$ ,  $N_{TDD}$ ,  $N_{GSM}$  and  $N_{E-UTRAN}$  is set to 1.

# 8.4.2.2 FDD intra frequency measurements when HS-DSCH discontinuous reception is not ongoing

During the CELL\_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

The performance of intra frequency measurements when IPDL is active has not been studied.

## 8.4.2.2.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, intra}} = Max \left\{ 800, \text{Ceil} \left\{ \frac{T_{\text{basic identify FDD, intra}}}{N_{\text{TTI}} \cdot (M_{\text{REP}} - 1) \cdot 10} \right\} \cdot N_{\text{TTI}} \cdot M_{\text{REP}} \cdot 10 \right\} \text{ ms}$$

where

T<sub>basic\_identify\_FDD, intra</sub> is specified in section 8.1.2.2.2,

N<sub>TTI</sub> and M\_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when

- CPICH Ec/Io > -20 dB,
- SCH\_Ec/Io ≥ -20 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In the case that MTCH is being received, the UE shall be able to take identified cells into use for MTCH combining purposes within one MTCH TTI after the completion of identification.

If more candidate cells are identified than the UE has combining capability, then the UE shall estimate MTCH reception quality of all candidate cells and determine a subset of the identified cells which best allow the UE to meet the required MTCH reception performance.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding

#### 8.4.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$$T_{identify,IPDL}$$
= $Max\{T_{Measerement\_Period\ Intra},T_{IPDL}\}$  ms

where

 $T_{Measurement\_Period\ Intra}$  = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

 $T_{IPDL}$  depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.10B

Table 8.10B: T<sub>IPDL</sub>

Search Window Size	T <sub>IPDL</sub>
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

#### 8.4.2.2.2 UE CPICH measurement capability

In the CELL\_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for 8 identified intrafrequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When a measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for the  $Y_{measurement\ intra}$  strongest cells , where  $Y_{measurement\ intra}$  is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than  $Y_{measurement\ intra}$  cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathbf{T}_{\text{Measurement\_Period Intra}} - Ceit \left\{ \frac{\mathbf{T}_{\text{Measurement\_Period Intra}}}{N_{TTI} \cdot M - REP \cdot 10 \text{ ms}} \right\} \cdot N_{TTI} \cdot 10 \text{ ms}} \right\} \cdot Cells$$

where

X<sub>basic measurement FDD</sub> is specified in section 8.1.2.2.2,

 $T_{Measurement\_Period\ Intra}$  is specified in section 8.1.2.2.2,

 $M_{REP}$  and  $N_{TTI}$  is specified in section 8.4.2.1.

#### 8.4.2.2.2.1 Capabilities for measurements during IPDL gaps.

When idle periods with a length of 1 slot are scheduled UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{\text{measurement IPDL}} = Max \{ T_{\text{Measurement\_Period Intra}}, T_{\text{4 IPDLs}} \} ms$$

where

T<sub>Measurement\_Period Intra</sub> = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

 $T_{4 \text{ IPDLs}}$  = Time period over which 4 consecutive idle periods occur.

#### 8.4.2.2.3 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9.

# 8.4.2.3 FDD inter frequency measurements when HS-DSCH discontinuous reception is not ongoing

In the CELL\_FACH state when a measurement occasion cycle is provided by the network, and absolute priority based reselection is not used, the UE shall continuously measure identified inter frequency cells and search for new inter frequency cells indicated in the measurement control information. When absolute priority based reselection is used, measurement rules defined in [1] apply (based on  $S_{prioritysearch1}$  and  $S_{prioritysearch2}$  thresholds).

If E-DCH resources are allocated to the UE or timer T321[16] is running, the UE is not required to perform interfrequency FDD cell identification or measurement.

#### 8.4.2.3.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, inter}} = Ceil \left\{ \frac{T_{\text{basic identify FDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{Freq, FDD} \quad ms$$

where

 $T_{basic\_identify\_FDD,inter}$  is specified in 8.1.2.3.2.

N<sub>Frea,FDD</sub>: Number of FDD frequencies in the Inter-frequency cell info list

T<sub>Meas</sub> and M\_REP are specified in 8.4.2.1.

$$T_{Inter FACH} = (N_{TTI}*10 - 2*0.5) \text{ ms}$$

A cell shall be considered detectable when

- CPICH Ec/Io  $\geq$  -20 dB,
- SCH\_Ec/Io ≥ -17 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

# 8.4.2.3.2 UE CPICH measurement capability

When a measurement occasion cycle is scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.2 with measurement period is given by

$$T_{\text{measurement inter}} = Max \left\{ T_{\text{Measurement\_Period Inter}}, 2 \cdot T_{\text{meas}}, Ceil \left\{ \frac{T_{\text{basic measurement FDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\textit{Freq,FDD}} \right\} \text{ ms}$$

where

 $T_{basic\_measurement\_FDD,inter}$  is specified in section 8.1.2.3.2.

T<sub>Measurement Period Inter</sub> is specified in section 8.1.2.3.2.

 $T_{\text{Meas}}$  is specified in section 8.4.2.1.

N<sub>Freq,FDD</sub> and T<sub>Inter FACH</sub> are specified in section 8.4.2.3.1

If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter frequency measurements is 480 ms.

The UE shall be capable of performing CPICH measurements for  $X_{basic\ measurement\ FDD\ inter}$  inter-frequency cells per FDD frequency of the monitored set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{Measurement\_Inter}$ .

X<sub>basic measurement FDDinter</sub> is defined in section 8.1.2.3.2

# 8.4.2.4 TDD measurements when HS-DSCH discontinuous reception is not ongoing

The requirements in this section shall apply to UE supporting FDD and TDD.

In the CELL\_FACH state when a measurement occasion cycle is provided by the network the UE shall continuously measure identified inter frequency TDD cells and search for new inter-frequency TDD cells indicated in the measurement control information. If E-DCH resources are allocated to the UE or timer T321[16] is running, the UE is not required to perform interfrequency TDD cell identification or measurement.

#### 8.4.2.4.1 Identification of a new cell

# 8.4.2.4.1.13,84 Mcps TDD Option

The UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{\text{identify, TDD}} = Max \left\{ 5000, Ceil \left\{ \frac{T_{\text{basic identify TDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{Freq, TDD} \right\} \text{ ms}$$

where

T<sub>basic identify TDD.inter</sub> = 800ms

 $N_{\text{Freq}, \text{TDD}}$ : Number of TDD frequencies indicated in the Inter-frequency cell info list

T<sub>Meas</sub> is specified in section 8.4.2.1.

T<sub>Inter FACH</sub> is specified in section 8.4.2.3.1

If the UE does not need measurement occasions to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

An inter-frequency TDD cell shall be considered detectable when P-CCPCH\_Ec/Io ≥ -8 dB and SCH\_Ec/Io ≥ -13 dB.

The received P-CCPCH\_E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{P - CCPCH _E_c}{I_o}\right)_{in \ dR} = \left(\frac{P - CCPCH _E_c}{I_{or}}\right)_{in \ dR} - \frac{I_o}{(\hat{I}_{or})}_{in \ dR}$$

and the received SCH\_E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{SCH_{-}E_{c}}{I_{o}}\right)_{in,dR} = \left(\frac{SCH_{-}E_{c}}{I_{or}}\right)_{in,dR} - \frac{I_{o}}{(\hat{I}_{or})}_{in,dR}$$

#### 8.4.2.4.1.2 1.28 Mcps TDD Option

The UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$\mathbf{T}_{\text{identify, TDD}} = Max \left\{ 5000, Ceil \left\{ \frac{\mathbf{T}_{\text{basic identify TDD inter}}}{\mathbf{T}_{\text{Inter FACH}}} \right\} \cdot \mathbf{T}_{\text{meas}} \cdot N_{\textit{Freq,TDD}} \right\} \text{ ms}$$

where

 $T_{\text{basic identify TDD.inter}} = 800 \text{ms}$ 

N<sub>Freq,TDD</sub>: Number of TDD frequencies indicated in the inter-frequency cell info list

 $T_{Meas}$  is specified in section 8.4.2.1.

T<sub>Inter FACH</sub> is specified in section 8.4.2.3.1

If the UE does not need measurement occasions to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When L3 filtering is used an additional delay can be expected.

A cell shall be considered detectable when P-CCPCH Ec/Io  $\geq$  -8 dB and DwPCH\_Ec/Io  $\geq$  -5 dB.

The received P-CCPCH  $E_c \! / I_o$  is defined as

$$\left(\frac{P - CCPCH _E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{\left(\hat{I}_{or}\right)_{in \ dB}}$$

The received DwPTS E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left. \left( \frac{DwPCH _E_c}{I_o} \right) \right|_{in \ dB} = \left( \frac{DwPCH _E_c}{I_{or}} \right) \right|_{in \ dB} - \frac{I_o}{\left( \hat{I}_{or} \right)} \right|_{in \ dB}$$

# 8.4.2.4.2 P-CCPCH RSCP measurement period

When a measurement occasion cycle as previously described is scheduled for inter frequency TDD measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and with a measurement period as given by

$$T_{\text{measurement TDD}} = Max \left\{ T_{\text{Measurement\_Period TDD inter}}, 2 \cdot T_{\text{meas}}, Ceil \left\{ \frac{T_{\text{basic measurement TDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\textit{Freq,TDD}} \right\}$$

where

 $T_{basic\_measurement\_TDD inter} = 50 \text{ ms.}$ 

 $T_{Measurement\ Period\ TDD\ inter}$  is specified in section 8.1.2.4.2.

 $T_{Meas}$  is specified in section 8.4.2.1.

T<sub>Inter FACH</sub> is specified in section 8.4.2.3.1

N<sub>Freq.TDD</sub>: This is the number of TDD frequencies indicated in the inter-frequency cell info list

If the UE does not need measurement occasions to perform inter-frequency TDD measurements, the measurement period for inter frequency TDD measurements is 480 ms.

The UE shall be capable of performing P-CCPCH RSCP measurements for  $X_{\text{basic measurement TDD}}$  inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{\text{Measurement TDD}}$ .

 $X_{\text{basic measurement TDD inter}}$  is defined in section 8.1.2.4.2

## 8.4.2.5 GSM measurements when HS-DSCH discontinuous reception is not ongoing

The requirements in this section apply only to UE supporting FDD and GSM. If E-DCH resources are allocated to the UE or timer T321[16] is running, the UE is not required to perform GSM BSIC identification or RSSI measurement.

To support cell reselection the UE shall always perform BSIC verification in Cell FACH state.

1) In CELL\_FACH state when measurement occasions are provided by the UTRAN the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

In section 8.4.2.1 the split of measurements between different modes and systems is defined. Every second measurement occasion scheduled for GSM measurements, as given by 8.4.2.1 shall be allocated for GSM initial BSIC identification.

The remaining measurements occasions scheduled for GSM measurements shall be used as follows. 3 occasions out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement occasions between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

- 2) If the UE does not need measurement occasions to perform GSM measurements:
  - the UE shall measure all GSM cells present in the monitored set
  - the relevant requirements for GSM dedicated mode when a TCH channel is assigned in TS 45.008 shall apply. This is further detailed in the following sub-sections.

#### 8.4.2.5.1 GSM carrier RSSI

1) For a UE requiring measurement occasions.

A UE supporting GSM measurements using measurement occasions shall meet the minimum number of GSM carrier RSSI measurements specified in Table 8.11. This measurement shall be based on measurement occasions allocated for GSM carrier RSSI measurements as described in 8.4.2.5. In the CELL\_FACH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

**Table 8.11** 

Length of measurement occasion (frames)	Number of GSM carrier RSSI samples in each measurement occasion, N <sub>GSM carrier RSSI</sub> .
1	16
2	32
4	64
8	128

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

#### 2) For a UE not requiring measurement occasions

The samples allocated to each carrier shall as far as possible be uniformly distributed over each measurement period. At least 3 received signal level measurement samples are required per RSSI value. The measurement period is 480 ms.

In case UTRA RACH procedure prevents the UE from acquiring the required number of samples per GSM carrier during one measurement period, the GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

#### 8.4.2.5.2 BSIC verification

#### 1) For a UE requiring measurement occasions.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

#### Initial BSIC identification

Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement occasions used for GSM measurements as specified in 8.4.2.1. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1.

#### BSIC re-confirmation

Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement occasions used for GSM as specified in 8.4.2.1. The requirements for BSIC re-confirmation can be found in 8.4.2.5.2.2.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times  $T_{\text{re-confirm}}$  gsm seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

 $T_{\text{re-confirm\_GSM}}$  indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure according to section 8.4.2.5.2.2.

The UE shall be able to decode a BSIC within a measurement occasion when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the measurement occasion is within the limits specified in table 8.12.

Table 8.12: The measurement occasion length and maximum time difference for BSIC verification

Measurement occasion length (frames]	Maximum time difference [μs]
1	± 4100
2	± 9100
4	± 19100
8	± 39100

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005.

#### 2) For a UE not requiring measurement occasions

The UE shall attempt to check the BSIC for at least the 6 strongest GSM carriers at least every 10 seconds, to confirm that it is monitoring the same cell, as far as UTRA RACH procedure does not prevent UE from decoding BSIC.

If a BSIC is decoded and matches the expected value, it is considered as "verified", else it is considered as "non verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005.

#### 8.4.2.5.2.1 Initial BSIC identification

This measurement shall be based on the measurement occasions allocated for Initial BSIC identification as described in 8.4.2.5.

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 6 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurements occasions allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within  $T_{identify,\,GSM}$  ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 6 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

 $T_{identify\_GSM}$  is given for the combinations of  $T_{meas}$  and  $N_{TTI}$  that are given in table 8.13. The values given in table 8.13 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.13: The worst-case time for identification of one previously not identified GSM cell

T_meas	N_TTI=1 frame	N_TTI=2 frames	N_TTI=4 frames	N_TTI=8 frames
(ms)	T <sub>identify,GSM</sub> (ms)	T <sub>identify,GSM</sub> (ms)	T <sub>identify,GSM</sub> (ms)	T <sub>identify,GSM</sub> (ms)
80	2880	1280		-
160	7680	2880	1280	640
240	29760	5280		•
320	14080	6400	2560	1280
480	34560	12480	2880	1920
640	34560	12800	5120	2560
960	*	24960	5760	3840
1280	*	20480	10240	5120
1920	*	34560	15360	7680
NOTE *:	NOTE *: There are no performance requirements for these combinations of			
	parameters because they result in long identification time.			

#### 8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of 6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement occasion allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the measurement occasion duration according to table 8.12. When the UE has to select one out of several possible GSM cells to reconfirm within the possible allocation of measurement occasions, according to 8.4.2.5, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC reconfirmation attempts for the 6 strongest GSM cells in the monitored list.

 $T_{\text{re-confirm GSM}}$  is given for the combinations of  $T_{\text{meas}}$  and  $N_{\text{TTI}}$  that are given in table 8.14. The values given in table 8.14 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. Different values for T<sub>re-confirm GSM</sub> might apply when more than one GSM cell is in the BSIC reconfirmation procedure at the same time.

Table 8.14: The worst-case time for reconfirmation of one previously identified GSM cell

T_meas	N_TTI=1 frame	N_TTI=2 frames	N_TTI=4 frames	N_TTI=8 frames
(ms)	T <sub>re-confirm,GSM</sub> (ms)	T <sub>re-confirm,GSM</sub> (ms)	T <sub>re-confirm,GSM</sub> (ms)	T <sub>re-confirm,GSM</sub> (ms)
80	2880	1600	-	-
160	6400	3200	2240	1600
240	17280	4800	-	-
320	14080	6400	4480	3200
480	22080	9600	6720	4800
640	26880	12800	10240	6400
960	*	17280	13440	9600
1280	*	33280	17920	12800
1920	*	*	26880	19200
* Note: There are no performance requirements for these combinations of parameters				

because they result in long reconfirmation time.

#### 8.4.2.6 E-UTRAN measurements when HS-DSCH discontinuous reception is not ongoing

The requirements in this section apply only to UE supporting FDD and E-UTRA.

When absolute priority based reselection is used, measurement rules defined in [1] apply (based on  $S_{prioritysearch1}$  and  $S_{prioritysearch2}$  thresholds)

If E-DCH resources are allocated to the UE or timer T321[16] is running, the UE is not required to perform E-UTRA measurements.

The requirements below apply to both cell reselection to E-UTRA and network controlled mobility to E-UTRA (i.e. E-UTRA measurement for CELL\_FACH and E-UTRA RACH reporting).

#### 8.4.2.6.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$\mathbf{T}_{\text{identify, E-UTRAN}} = Ceil \left\{ \frac{\mathbf{T}_{\text{basic identify E-UTRAN}}}{\mathbf{T}_{\text{E-UTRAN FACH}}} \right\} \cdot \mathbf{T}_{\text{meas}} \cdot \mathbf{N}_{\text{E-UTRA}} \quad \textit{ms}$$

where

T<sub>basic identify E-UTRAN</sub> is specified in 8.1.2.6.

N<sub>E-UTRA</sub>: Number of E-UTRA frequencies in the E-UTRA cell info list

T<sub>Meas</sub> and M\_REP are specified in 8.4.2.1.

 $T_{E-UTRAN FACH} = (N_{TTI}*10 - 2*0.5) \text{ ms}$ 

A cell shall be considered detectable based on requirements defined in [24].

# 8.4.2.6.2 UE RSRP and RSRQ measurement capability

When a measurement occasion cycle is scheduled for E-UTRA measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.4a/b with measurement period given by

$$\mathbf{T}_{\text{measurement E-UTRAN}} = \mathbf{\textit{Max}} \bigg\{ \mathbf{T}_{\text{Measurement\_Period E-UTRAN}}, 2 \cdot \mathbf{T}_{\text{meas}}, \mathbf{\textit{Ceil}} \bigg\{ \frac{\mathbf{T}_{\text{basic measurement E-UTRAN}}}{\mathbf{T}_{\text{E-UTRAN FACH}}} \bigg\} \cdot \mathbf{T}_{\text{meas}} \cdot \mathbf{\textit{N}}_{\textit{E-UTRAN}} \bigg\} \mathbf{m}$$

where

T<sub>basic measurement E-UTRAN</sub> = 60 ms.

T<sub>Measurement Period E-UTRAN</sub> is specified in section 8.1.2.6.

 $T_{\text{Meas}}$  is specified in section 8.4.2.1.

N<sub>E-UTRA</sub> and T<sub>E-UTRAN FACH</sub> are specified in section 8.4.2.6.1

If the UE does not need measurement occasions to perform E-UTRA measurements, the measurement period for E-UTRA measurements is 480 ms.

# 8.4.2.6.3 E-UTRA measurements reporting

If E-UTRA measurement for CELL\_FACH is configured by upper layers, UE can report measurements in measurement reports, whose report criteria can be set to Event triggered or Periodical reporting. In both cases, the UE shall send only one measurement report. The UE shall be able to support at least 1 E-UTRA measurement per carrier on up to 4 E-UTRA carriers for CELL\_FACH configuration.

Reported measurements shall meet the requirements in section 9.

#### 8.4.2.6.3.1 Event Triggered reporting

The measurement reporting delay is defined as the time between the triggering of a measurement report (the measured quality of any cell on a configured E-UTRA frequency exceeds the configured threshold) until the moment in time when the UE starts sending the preambles on the PRACH for sending the measurement report

The event triggered measurement reporting delay shall be less than  $T_{identify,E-UTRAN} + T_{RA}$ , where  $T_{identify,E-UTRAN}$  is defined in Section 8.4.2.6.1 and  $T_{RA}$  is the additional delay caused by the random access procedure.

If a cell has been detectable at least for the time period than T  $_{identify,E-UTRAN}$  and then triggers the measurement report, the event triggered measurement reporting delay shall be less than T  $_{Measurement\_Period\_E-UTRAN} + T_{RA}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts while transmission gap has not been available.

# 8.4a Measurements in CELL\_FACH State when HS-DSCH discontinuous reception is ongoing

#### 8.4a.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL\_FACH state when HS-DSCH discontinuous reception is ongoing. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD, GSM and E-UTRA measurements. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. DRX in CELL FACH state is described in TS 25.331.

# 8.4a.2 Requirements

# 8.4a.2.1 UE Measurement Capability

In CELL\_FACH state, the number of cells the UE shall be able to monitor is defined in section 8.4.2.1

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD, GSM and E-UTRAN cell re-selection, DRX gaps as specified in TS 25.331 are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the DRX gaps that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

# 8.4a.2.2 FDD intra frequency measurements when HS-DSCH discontinuous reception is ongoing

During the CELL\_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set during the on part of the DRX cycle.

#### 8.4a.2.2.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify,intra}} = Min \left\{ 30000, Max \left\{ 300, \text{ceil} \left\{ \frac{T_{\text{basic identify FDD,intra\_HS-DSCH-DRX}}}{T_{\text{on}}} \right\} T_{\text{DRX\_Cycle}} \right\} \right\} \text{ where }$$

T<sub>basic identify FDD, intra\_HS-DSCH-DRX</sub> is 300ms

HS- $DSCH Rx burst_{FACH}$  is the duration of the on part of the DRX cycle (frames)

 $HS ext{-}DSCH\ DRX\ cycle_{FACH}$  is the duration of the total DRX cycle (frames)

A cell shall be considered detectable when

- CPICH Ec/Io  $\geq$  -17 dB,
- SCH\_Ec/Io ≥ -17 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

#### 8.4a.2.2.2 UE CPICH measurement capability

In the CELL\_FACH state the measurement period for intra frequency measurements is

$$T_{\text{Measurement\_Period Intra}} = Min \left\{ 10240, Max \left\{ 200, \text{ceil} \left\{ \frac{200}{T_{\text{on}}} \right\} T_{\text{DRX\_Cycle}} \right\} \right\} \text{ms}$$

The UE shall be capable of performing CPICH measurements for 8 identified intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{Measurent\_Period\_Intra}$ .

where

HS-DSCH Rx burst<sub>FACH</sub> is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX  $cycle_{FACH}$  is the duration of the total DRX cycle (frames)

# 8.4a.2.2.3 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9.

# 8.4a.2.3 FDD inter frequency measurements

In the CELL\_FACH state when DRX is being performed by the UE, the UE shall measure identified inter frequency cells and search for new inter frequency cells indicated in the measurement control information, according to the measurement rules defined in [1].

When absolute priority based reselection is used:

- If  $Srxlev_{ServingCell} > S_{prioritysearch1}$  and  $Squal_{ServingCell} > S_{prioritysearch2}$  then the UE shall search for inter frequency layers of higher priority at least every  $T_{higher\_priority\_search}$ , where  $T_{higher\_priority\_search}$  is described in section 4.2.2.
- If  $Srxlev_{ServingCell} \le S_{prioritysearch1}$  or  $Squal_{ServingCell} \le S_{prioritysearch2}$  then the UE shall search for all inter frequency layers based on the requirements below.

If E-DCH resources are allocated to the UE or timer T321 [16] is running, the UE is not required to perform interfrequency cell identification or measurements as continuous HS-DSCH reception is required.

#### 8.4a.2.3.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, inter}} = Min \left\{ 30000, Ceil \left\{ \frac{T_{\text{basic identify FDD inter}}}{T_{\text{Inter FACH, DRX}}} \right\} \cdot T_{scale} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{Freq, FDD} \quad ms$$

where

 $T_{basic\_identify\_FDD,inter}$  is specified in 8.1.2.3.2.

N<sub>Freq,FDD</sub>: Number of FDD frequencies in the Inter-frequency cell info list

 $T_{Inter\ FACH,DRX} = Min(\textit{HS-DSCH}\ DRX\ cycle_{FACH} - \textit{HS-DSCH}\ Rx\ burst_{FACH}, \textit{HS-DSCH}\ Rx\ burst_{FACH}) - 2*0.5ms\ [ms]$ 

HS-DSCH Rx burst<sub>FACH</sub> is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX  $cycle_{FACH}$  is the duration of the total DRX cycle (frames)

$$T_{scale} = N_{FDD} + N_{TDD} + N_{GSM} + N_{E-UTRAN}$$

If absolute priority based reselection is used, and  $Srxlev_{ServingCell} > S_{prioritysearch1}$  and  $Squal_{ServingCell} > S_{prioritysearch2}$ ,  $T_{identify, inter}$  shall be increased by  $T_{higher\_priority\_search}$ .

A cell shall be considered detectable when

- CPICH Ec/Io  $\geq$  -17 dB,
- SCH\_Ec/Io ≥ -17 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

#### 8.4a.2.3.2 UE CPICH measurement capability

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.2 with measurement period is given by within

$$T_{\text{measurement inter}} = \textit{Max} \left\{ T_{\text{Measurement\_Period, Inter}}, \textit{Min} \left\{ 10240, \textit{Ceil} \left\{ \frac{T_{\text{basic\_measurement\_FDD, inter}}}{T_{\text{Inter FACH, DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{\textit{Freq,FDD}} \right\}$$

ms

where

N<sub>Frea,FDD</sub>: Number of FDD frequencies in the Inter-frequency cell info list

 $T_{Measurement\_Period\ Inter}$  is specified in section 8.1.2.3.2.

 $T_{Inter\ FACH,DRX} = Min(\textit{HS-DSCH\ DRX\ cycle}_{FACH} - \textit{HS-DSCH\ Rx\ burst}_{FACH}, \textit{HS-DSCH\ Rx\ burst}_{FACH}) - 2*0.5ms [ms]$ 

HS-DSCH Rx burst<sub>FACH</sub> is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX cycle<sub>FACH</sub> is the duration of the total DRX cycle (frames)

The UE shall be capable of performing CPICH measurements for  $X_{\text{basic measurement FDD inter}}$  inter-frequency cells per FDD frequency of the monitored set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{\text{Measurement}}$  Inter.

 $X_{\text{basic measurement FDDinter}}$  is defined in section 8.1.2.3.2

$$T_{scale} = N_{FDD} + N_{TDD} + N_{GSM} + N_{E-UTRAN}$$

#### 8.4a.2.4 TDD measurements when HS-DSCH discontinuous reception is ongoing

The requirements in this section shall apply to UE supporting FDD and TDD.

The UE shall continuously measure identified inter frequency TDD cells and search for new inter-frequency TDD cells indicated in the measurement control information. If E-DCH resources are allocated to the UE or timer T321[16] is running, the UE is not required to perform interfrequency TDD cell identification or measurements as continuous HS-DSCH reception is required.

#### 8.4a.2.4.1 Identification of a new cell

8.4.2.4.1.13,84 Mcps TDD Option

The UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{\text{identify, TDD}} = Max \left\{ 5000, Min \left\{ 30000, Ceil \left\{ \frac{T_{\text{basic identify TDD inter}}}{T_{\text{Inter FACH,DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{\textit{Freq,TDD}} \right\} \text{ ms}$$

Where

 $T_{basic\_identify\_TDD,inter} = 800ms$ 

 $N_{\text{Freq,TDD}}$ : Number of TDD frequencies indicated in the Inter-frequency cell info list

 $T_{Inter\ FACH,DRX} = Min(HS-DSCH\ DRX\ cycle_{FACH} - HS-DSCH\ Rx\ burst_{FACH}, HS-DSCH\ Rx\ burst_{FACH}, n)-2*0.5ms\ [ms]$ 

HS-DSCH Rx burst<sub>FACH</sub> is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX cycle<sub>FACH</sub> is the duration of the total DRX cycle (frames)

$$T_{scale} = N_{FDD} + N_{TDD} + N_{GSM}$$

When L3 filtering is used an additional delay can be expected.

An inter-frequency TDD cell shall be considered detectable when P-CCPCH\_Ec/Io ≥ -8 dB and SCH\_Ec/Io ≥ -13 dB.

The received P-CCPCH\_E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{P - CCPCH _E_c}{I_o}\right)_{in,dR} = \left(\frac{P - CCPCH _E_c}{I_{or}}\right)_{in,dR} - \frac{I_o}{(\hat{I}_{or})}_{in,dR}$$

and the received SCH\_E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \frac{I_o}{(\hat{I}_{or})}_{in\ dB}$$

#### 8.4a.2.4.1.2 1.28 Mcps TDD Option

The UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$\mathbf{T}_{\text{identify, TDD}} = Max \left\{ 5000, Min \left\{ 30000, Ceil \left\{ \frac{\mathbf{T}_{\text{basic identify TDD inter}}}{\mathbf{T}_{\text{Inter FACH, DRX}}} \right\} \cdot \mathbf{T}_{\text{scale}} \cdot \mathbf{T}_{\text{DRX\_Cycle}} \right\} \cdot N_{\textit{Freq,TDD}} \right\} \text{ms}$$

where

 $T_{\text{basic identify TDD.inter}} = 800 \text{ms}$ 

N<sub>Frea,TDD</sub>: Number of TDD frequencies indicated in the Inter-frequency cell info list

T<sub>Measurement Period TDD inter</sub> is specified in section 8.1.2.4.2

 $T_{Inter\ FACH,DRX} = Min(\textit{HS-DSCH\ DRX\ cycle}_{FACH} - \textit{HS-DSCH\ Rx\ burst}_{FACH}, \textit{HS-DSCH\ Rx\ burst}_{FACH}) - 2*0.5ms [ms]$ 

HS- $DSCH Rx burst_{FACH}$  is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX cycle<sub>FACH</sub> is the duration of the total DRX cycle (frames)

 $T_{scale} = N_{FDD} + N_{TDD} + N_{GSM}$ 

When L3 filtering is used an additional delay can be expected.

A cell shall be considered detectable when P-CCPCH Ec/Io  $\geq$  -8 dB and DwPCH\_Ec/Io  $\geq$  -5 dB.

The received P-CCPCH  $E_c/I_o$  is defined as

$$\left(\frac{P - CCPCH _E_c}{I_o}\right)_{in \ dB} = \left(\frac{P - CCPCH _E_c}{I_{or}}\right)_{in \ dB} - \frac{I_o}{(\hat{I}_{or})_{in \ dB}}$$

The received DwPTS E<sub>c</sub>/I<sub>o</sub> is defined as

$$\left. \left( \frac{DwPCH _E_c}{I_o} \right) \right|_{in \ dB} = \left( \frac{DwPCH _E_c}{I_{or}} \right) \right|_{in \ dB} - \frac{I_o}{\left( \hat{I}_{or} \right)} \right|_{in \ dB}$$

#### 8.4a.2.4.2 P-CCPCH RSCP measurement period

When a DRX cycle as previously described is scheduled for inter frequency TDD measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and with a measurement period as given by

$$T_{\text{measurement,TDD}} = \textit{Max} \left\{ T_{\text{Measurement\_Period,Inter}}, \textit{Min} \left\{ 10240, \textit{Ceil} \left\{ \frac{T_{\text{basic\_measurement\_TDD,inter}}}{T_{\text{Inter FACH,DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{\textit{Freq,FDD}} \right\}$$

where

 $N_{\text{Freq,TDD}}$ : Number of TDD frequencies in the Inter-frequency cell info list

T<sub>Measurement Period Inter</sub> is specified in section 8.1.2.3.2.

 $T_{Inter\ FACH,DRX} = Min(\textit{HS-DSCH\ DRX\ cycle}_{FACH} - \textit{HS-DSCH\ Rx\ burst}_{FACH}, \textit{HS-DSCH\ Rx\ burst}_{FACH}) - 2*0.5ms [ms]$ 

HS-DSCH Rx  $burst_{FACH}$  is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX  $cycle_{FACH}$  is the duration of the total DRX cycle (frames)

$$T_{scale} = N_{FDD} + N_{TDD} + N_{GSM}$$

The UE shall be capable of performing P-CCPCH RSCP measurements for  $X_{\text{basic measurement TDD inter}}$  inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{\text{Measurement TDD}}$ .

X<sub>basic measurement TDD inter</sub> is defined in section 8.1.2.4.2

#### 8.4a.2.5 GSM measurements when HS-DSCH discontinuous reception is ongoing

Note: Further study is required for GSM measurements when DRX is active, especially regarding BSIC identification and reconfirmation

8.4a.2.5.1 GSM carrier RSSI

8.4a.2.5.2 BSIC verification

8.4a.2.5.2.1 Initial BSIC identification

8.4a.2.5.2.2 BSIC re-confirmation

#### 8.4a.2.6 E-UTRA measurements when HS-DSCH discontinuous reception is ongoing

In the CELL\_FACH state when DRX is being performed by the UE, the UE shall measure identified E-UTRAN cells and search for new E-UTRAN cells indicated in the measurement control information, according to the measurement rules defined in [1].

When absolute priority based reselection is used:

- If  $Srxlev_{ServingCell} > S_{prioritysearch1}$  and  $Squal_{ServingCell} > S_{prioritysearch2}$  then the UE shall search for E-UTRA layers of higher priority at least every  $T_{higher\_priority\_search}$  where  $T_{higher\_priority\_search}$  is described in section 4.2.2.
- If  $Srxlev_{ServingCell} \le S_{prioritysearch1}$  or  $Squal_{ServingCell} \le S_{prioritysearch2}$  then the UE shall search for all E-UTRA layers based on the requirements below.

If E-DCH resources are allocated to the UE or timer T321 [16] is running, the UE is not required to perform E-UTRAN cell identification or measurements as continuous HS-DSCH reception is required.

The requirements below apply to both cell reselection to E-UTRA and network controlled mobility to E-UTRA (i.e. E-UTRA measurement for CELL\_FACH and E-UTRA RACH reporting).

#### 8.4a,2.6.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, E-UTRAN}} = \min \left\{ 60000, Ceil \left\{ \frac{T_{\text{basic identify E-UTRAN}}}{T_{\text{E-UTRAN FACH, DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{\text{E-UTRAN}} \quad ms = \sum_{i=1}^{n} \left\{ \frac{T_{\text{basic identify E-UTRAN}}}{T_{\text{E-UTRAN FACH, DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{\text{E-UTRAN}} \quad ms = \sum_{i=1}^{n} \left\{ \frac{T_{\text{basic identify E-UTRAN}}}{T_{\text{E-UTRAN FACH, DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}}$$

where

T<sub>basic\_identify\_E-UTRAN</sub> is specified in 8.1.2.6.

N<sub>E-UTRA</sub>: Number of E-UTRA frequencies in the E-UTRA neighbor list

 $T_{E-UTRAN\ FACH,DRX} = Min(HS-DSCH\ DRX\ cycle_{FACH} - HS-DSCH\ Rx\ burst_{FACH},\ HS-DSCH\ Rx\ burst_{FACH}) - 2*0.5ms$  [ms]

HS-DSCH Rx burst<sub>FACH</sub> is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX cycle<sub>FACH</sub> is the duration of the total DRX cycle (frames)

$$T_{scale} = N_{FDD} + N_{TDD} + N_{GSM} + N_{E\text{-}UTRAN}$$

 $If \ absolute \ priority \ based \ reselection \ is \ used, \ and \ Srxlev_{ServingCell} > S_{prioritysearch1} \ and \ Squal_{ServingCell} > S_{prioritysearch2}, \ T_{identify, \ E-UTRAN} \ shall \ be \ increased \ by \ T_{higher\_priority\_search}.$ 

A cell shall be considered detectable according to [36.133]

#### 8.4a.2.6.2 UE RSRP and RSRQ measurement capability

The UE physical layer shall be capable of reporting E-UTRA measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.4a/b with measurement period given by

$$T_{\text{measurement E-UTRAN}} = Max \left\{ T_{\text{Measurement\_Period, E-UTRAN}}, \min \left\{ 30720, Ceil \left\{ \frac{T_{\text{basic\_measurement\_E-UTRAN}}}{T_{\text{E-UTRAN FACH, DRX}}} \right\} \cdot T_{\text{scale}} \cdot T_{\text{DRX\_Cycle}} \right\} \cdot N_{E-Cycle} \right\}$$

ms

where

N<sub>E-UTRA</sub>: Number of E-UTRA frequencies in the E-UTRA cell info list

T<sub>Measurement Period E-UTRAN</sub> is specified in section 8.1.2.6.

 $T_{basic\_measurement\_E-UTRAN} = 60 \text{ ms.}$ 

 $T_{\text{E-UTRAN FACH,DRX}} = \min(\textit{HS-DSCH DRX cycle}_{\textit{FACH}} - \textit{HS-DSCH Rx burst}_{\textit{FACH}}, \textit{HS-DSCH Rx burst}_{\textit{FACH}}) - 2*0.5 \text{ms} \\ \lceil \text{ms} \rceil$ 

HS-DSCH Rx burst<sub>FACH</sub> is the duration of the on part of the DRX cycle (frames)

HS-DSCH DRX cycle<sub>FACH</sub> is the duration of the total DRX cycle (frames)

$$T_{scale} = N_{FDD} + N_{TDD} + N_{GSM} + N_{E-UTRA}$$

#### 8.4a.2.6.3 E-UTRA measurements reporting

If E-UTRA measurement for CELL\_FACH is configured by upper layers, UE can report measurements in measurement reports, whose report criteria can be set to Event triggered or Periodical reporting. In both cases, the UE shall send only one measurement report. The UE shall be able to support at least 1 E-UTRA measurement per carrier on up to 4 E-UTRA carriers for CELL\_FACH configuration.

Reported measurements shall meet the requirements in section 9.

#### 8.4a.2.6.3.1 Event Triggered reporting

The measurement reporting delay is defined as the time between the triggering of a measurement report (the measured quality of any cell on a configured E-UTRA frequency exceeds the configured threshold) until the moment in time when the UE starts sending the preambles on the PRACH for sending the measurement report

The event triggered measurement reporting delay shall be less than  $T_{identify,E-UTRAN} + T_{RA}$ , where  $T_{identify,E-UTRAN}$  is defined in Section 8.4.2.6.1 and  $T_{RA}$  is the additional delay caused by the random access procedure.

If a cell has been detectable at least for the time period than T  $_{identify,E-UTRAN}$  and then triggers the measurement report, the event triggered measurement reporting delay shall be less than  $T_{Measurement\_Period\_E-UTRAN} + T_{RA}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts while transmission gap has not been available.

# 8.5 Capabilities for Support of Event Triggering and Reporting Criteria in CELL\_FACH state

# 8.5.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

# 8.5.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.15: Requirements for reporting criteria per measurement category

Measurement category	E <sub>cat</sub>	Note
Traffic volume measurements	2 per transport channel type	The transport channel types are "E-DCH"
		and "RACH"

# 9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band. Definitions of each frequency bands can be found in TS 25.101.

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions.

# 9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

- in state CELL DCH and/or state CELL FACH.
- performing measurements according to section 8.
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS25.302.

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

NOTE: It needs to be clarified how the accuracy requirements shall be handled when the UE is measuring on cells using IPDL.

NOTE: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

# 9.1.1 CPICH RSCP

NOTE: This measurement is for handover evaluation, DL open loop power control, UL open loop power control and for the calculation of pathloss.

# 9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL FACH state can be found in sub clause 8.4.2.2.

#### 9.1.1.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.1 are valid under the following conditions:

CPICH\_RSCP1|<sub>dBm</sub>-according to Annex B.3.1 for a corresponding Band

$$\frac{\left. I_{o} \right|_{in \ dB}}{\left. \left( \hat{I}_{or} \right) \right|_{in \ dB}} \quad - \quad \left( \frac{CPICH \_E_{c}}{I_{or}} \right) \right|_{in \ dB} \le 20dB$$

Table 9.1: CPICH RSCP Intra frequency absolute accuracy

		Accuracy [dB]			Conditions						
Parameter			Band I, IV, VI, X, XI, XIX and XXI			Band III, VIII, XII, XIII, XIV, XX and XXII	Band I)				
		Condition	Condition	lo	lo	lo	lo	lo			
				[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 I			
CPICH_RSCP	dBm	± 6	± 9	-9470	-9270	-90.570 (Note 1)	-9170	-937(			
	dBm	± 8	± 11	-7050	-7050	-7050	-7050	-7050			

NOTE 1: The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MH the UE which supports both Band V and Band XXVI operating frequencies.

## 9.1.1.1.2 Relative accuracy requirement

The relative accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on the same frequency

The accuracy requirements in table 9.2 are valid under the following conditions:

CPICH\_RSCP1,2|dBm according to Annex B.3.2 for a corresponding Band.

$$\left| CPICH \ RSCP1 \right|_{in\ dBm} - CPICH \ RSCP2 \Big|_{in\ dBm} \right| \le 20dB$$

$$\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left| \frac{CPICH\_E_c}{I_{or}} \right|_{in\ dB} \le 20dB$$

Table 9.2: CPICH\_RSCP Intra frequency relative accuracy

Parameter	Unit	Accura	cy [dB]	] Conditions							
		Normal	Extreme	Band I, IV, VI, X,	Band II, V and	Band XXV and	Band III, VIII,	Band IX			
		condition	condition	XI, XIX and XXI	VII	XXVI	XII, XIII, XIV, XX				
							and XXII				
				lo	lo	lo	lo	lo			
				[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84			
								MHz]			
CPICH_RSCP	dBm	± 3	± 3	-9450	-9250	-90.550	-9150	-9350			
						(Note 1)					

NOTE 1: The condition is -90.5...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL FACH state can be found in sub clause 8.4.2.3.

# 9.1.1.2.1 Relative accuracy requirement

The relative accuracy of CPICH RSCP in inter frequency case is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on a different frequency.

The accuracy requirements in table 9.3 are valid under the following conditions:

CPICH\_RSCP1|dBm according to Annex B.3.3 for a corresponding Band

$$\left| CPICH \ RSCP1 \right|_{in \ dBm} - CPICH \ RSCP2 \right|_{in \ dBm} \le 20 dB$$

| Channel 1\_ $Io|_{dBm/3,84~MHz}$  -Channel 2\_ $Io|_{dBm/3,84~MHz}$  |  $\leq 20~dB$ .

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 9.3: CPICH\_RSCP Inter frequency relative accuracy

Parame	ter	Unit	Accura			Conditions						
			Normal	Extreme	CPICH_RSCP is	CPICH_RSCP is	CPICH_RSCP is	CPICH_RSCP is	CPICH_RSCP is			
			condition	condition	on Band I, IV,	on Band II, V	on Band XXV	on Band III, VIII,	on Band IX			
					VI, X, XI, XIX	and VII	and XXVI	XII, XIII, XIV, XX				
					and XXI			and XXII				
					lo	lo	lo	lo	lo			
					[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]			
CPICH_R	SCP	dBm	± 6	± 6	-9450	-9250	-90.550	-9150	-9350			
							(Note 1)					

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.1.3 CPICH RSCP measurement report mapping

The reporting range is for CPICH RSCP is from -120 dBm ...-25 dBm.

In table 9.4 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV03	-119 ≤ CPICH RSCP < -118	dBm
	•••	
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

# 9.1.2 CPICH Ec/lo

NOTE: This measurement is for Cell selection/re-selection and for handover evaluation.

# 9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL\_FACH state can be found in sub clause 8.4.2.2.

#### 9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

CPICH\_RSCP1|<sub>dBm</sub> according to Annex B.3.4 for a corresponding Band

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 9.5: CPICH\_Ec/lo Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dE	3]			Conditions		
		Normal condition	Extreme	Band I, IV, VI,	Band II, V	Band XXV	Band III, VIII,	Band IX
			condition	X, XI, XIX and	and VII	and XXVI	XII, XIII, XIV,	
				XXI			XX and XXII	
				lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84
				MHz]	MHz]	MHz]	MHz]	MHz]
CPICH_Ec/lo	dB	± 1.5 for -14	± 3	-9450	-9250	-90.550	-9150	-9350
		≤				(Note 1)		
		CPICH Ec/lo ± 2 for -16						
		≤						
		CPICH Ec/lo						
		<						
		-14 ± 3 for -20						
		≤						
		CPICH Ec/lo < -16						

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.2.1.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as the maximum allowable error in the measured difference between the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on the same frequency.

The relative accuracy is defined using the lower CPICH\_Ec/Io of cell 1 and cell 2.

The accuracy requirements in table 9.6 are valid under the following conditions:

CPICH\_RSCP1,2|dBm according to Annex B.3.5 for a corresponding Band

$$\left| CPICH RSCP1 \right|_{in dBm} - CPICH RSCP2 \Big|_{in dBm} \le 20dB$$

$$\left| CPICH E_{s} \right|$$

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)_{lin\ dB}} \right|_{lin\ dB} - \left. \left( \frac{CPICH\_E_c}{I_{or}} \right) \right|_{lin\ dB} \le 20dB$$

Table 9.6: CPICH\_Ec/lo Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]	]			Conditions		
		Normal condition	Extreme condition	Band I, IV, VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV, XX and XXII	Band IX
				lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]
The lower of the CPICH_Ec/lo from cell1 and cell2	dB	± 1.5 for -14 <pre></pre>	±3	-9450	-9250	-90.550 (Note 1)	-9150	-9350

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL\_FACH state can be found in sub clause 8.4.2.3.

# 9.1.2.2.1 Absolute accuracy requirement

The accuracy requirements in table 9.7 are valid under the following conditions:

 $\textsc{CPICH\_RSCP1}|_{dBm}$  according to Annex B.3.6 for a corresponding Band

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 9.7: CPICH\_Ec/lo Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dE	3]			Conditions		
		Normal condition	Extreme condition	Band I, IV VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV, XX and XXII	
				lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]
CPICH_Ec/lo		$\pm$ 1.5 for -14 $\leq$ CPICH Ec/lo $\pm$ 2 for -16 $\leq$ CPICH Ec/lo $<$ -14 $\pm$ 3 for -20 $\leq$ CPICH Ec/lo $<$ -16	±3	-9450	-9250	-90.550 (Note 1)	-9150	-9350

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.2.2.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as the maximum allowable error in the measured difference between the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency

The relative accuracy is defined using the lower CPICH\_Ec/Io of cell 1 and cell 2.

The accuracy requirements in table 9.8 are valid under the following conditions:

CPICH\_RSCP1|dBm according to Annex B.3.7 for a corresponding Band

$$\left| CPICH \ RSCP1 \right|_{in \ dBm} - CPICH \ RSCP2 \Big|_{in \ dBm} \right| \le 20 dB$$

| Channel 1\_ $Io|_{dBm/3,84~MHz}$  -Channel 2\_ $Io|_{dBm/3,84~MHz}$  |  $\leq 20~dB$ .

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}}$$
 -  $\left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$ 

Table 9.8: CPICH\_Ec/lo Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB	]			Conditions		
		Normal condition	Extreme	CPICH_Ec/I	CPICH_Ec/I	CPICH_Ec/lo	CPICH_Ec/I	CPICH_Ec/I
			condition	o is on	o is on	is on Band	o is on	o is on
				Band I, IV,	Band II, V	XXV and XXVI	Band III, VIII,	Band IX
				VI, X, XI, XIX	and VII		XII, XIII, XIV,	
				and XXI			XX and XXII	
				lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84
				MHz]	MHz]	MHz]	MHz]	MHz]
The lower of	dB	± 1.5 for -14	± 3	-9450	-9250	-90.550	-9150	-9350
the		≤				(Note 1)		
CPICH_Ec/lo		CPICH Ec/lo $\pm$ 2 for -16						
from cell1		≤						
and cell2		CPICH Ec/lo						
		<						
		$-14 \pm 3$ for $-20$						
		<b>≤</b>						
		CPICH Ec/lo						
		<						
		-16						

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.2.3 CPICH Ec/lo measurement report mapping

The reporting range is for CPICH Ec/Io is from -24 ...0 dB.

In table 9.9 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/lo < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/lo < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/lo < -23	dB
•••		
CPICH_Ec/No _47	-1 ≤ CPICH Ec/lo < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/lo	dB

# 9.1.3 UTRA Carrier RSSI

NOTE: This measurement is for Inter-frequency handover evaluation.

The measurement period is equal to the measurement period for UE CPICH measurements, For CELL\_DCH state the measurement period can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.3 for inter frequency measurements.

# 9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions				
		Normal	Extreme	Band I, IV, VI,	Band II, V		Band III, VIII,	Band IX
		condition	condition	X, XI, XIX and	and VII	and XXVI	XII, XIII, XIV,	
				XXI			XX and XXII	
				Io [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84
				MHz]	MHz]	MHz]	MHz]	MHz]
UTRA Carrier RSSI	dBm	± 4	± 7	-9470	-9270	-90.570	-9170	-9370
						(Note 1)		
	dBm	± 6	± 9	-7050	-7050	-7050	-7050	-7050

NOTE 1: The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.3.2 Relative accuracy requirement

The relative accuracy requirement is defined as the UTRA carrier RSSI measured from one frequency compared to the UTRA carrier RSSI measured from another frequency.

The accuracy requirements in table 9.11 are valid under the following condition:

| Channel 1\_Io $|_{dBm}$  -Channel 2\_Io $|_{dBm}$  | < 20 dB.

Table 9.11: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accura	cy [dB]	Conditions					
		Normal	Extreme	UTRA Carrier	UTRA	UTRA	UTRA	UTRA	
		condition	condition	RSSI is on	Carrier RSSI	Carrier RSSI	Carrier RSSI	Carrier RSSI	
				Band I, IV, VI,	is on Band	is on Band	is on Band	is on Band	
				X, XI, XIX and	II, V and VII	XXV and	III, VIII, XII,	IX	
				XXI		XXVI	XIII, XIV, XX		
							and XXII		
				lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	
				MHz]	MHz]	MHz]	MHz]	MHz]	
UTRA Carrier RSSI	dBm	± 7	± 11	-9450	-9250	-90.550	-9150	-9350	
						(Note 1)			

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

# 9.1.3.3 UTRA Carrier RSSI measurement report mapping

The reporting range for UTRA carrier RSSI is from -100 ...-25 dBm.

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.12** 

Reported value	Measured quantity value	Unit
UTRA_carrier_RSSI_LEV _00	UTRA carrier RSSI < -100	dBm
UTRA_carrier_RSSI_LEV _01	-100 ≤ UTRA carrier RSSI < -99	dBm
UTRA_carrier_RSSI_LEV _02	-99 ≤ UTRA carrier RSSI < -98	dBm
***		
UTRA_carrier_RSSI_LEV _74	-27 ≤ UTRA carrier RSSI < -26	dBm
UTRA_carrier_RSSI_LEV _75	-26 ≤ UTRA carrier RSSI < -25	dBm
UTRA_carrier_RSSI_LEV_76	-25 ≤ UTRA carrier RSSI	dBm

#### 9.1.4 GSM carrier RSSI

NOTE: This measurement is for handover between UTRAN and GSM.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for CELL\_DCH state can be found in section 8.1.2.5. The measurement period for CELL FACH state can be found in section 8.4.2.5.

If the UE, in CELL\_DCH state, does not need compressed mode to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 45.008 shall apply.

If the UE, in CELL\_DCH state, needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.5 shall apply.

If the UE, in CELL\_FACH state, does not need measurement occasions to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 45.008 shall apply.

If the UE, in CELL\_FACH state, needs measurement occasions to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement stated in section 8.4.2.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 45.008 shall apply.

#### 9.1.4a E-UTRAN RSRP

NOTE: This measurement is for handover between UTRAN and E-UTRAN.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for E-UTRA RSRP in CELL\_DCH state can be found in section 8.1.2.6.

If the UE, in CELL\_DCH state, needs compressed mode to perform E-UTRAN measurements, the E-UTRAN measurement procedure and compressed mode gap pattern stated in section 8.1.2.6 shall apply.

In Cell DCH state, whether or not UE requires compressed mode to perform E-UTRAN measurements, the requirements for accuracy of E-UTRA RSRP measurements in CELL\_DCH state shall be the same as the interfrequency RSRP Accuracy Requirements in 3GPP TS 36.133 [24].

The reporting range and mapping specified for RSRP in 3GPP TS 36.133 [24] shall apply.

#### 9.1.4b E-UTRAN RSRQ

NOTE: This measurement is for handover between UTRAN and E-UTRAN.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for E-UTRA RSRQ in CELL\_DCH state can be found in section 8.1.2.6.

If the UE, in CELL\_DCH state, needs compressed mode to perform E-UTRAN measurements, the E-UTRAN measurement procedure is stated in section 8.1.2.6 shall apply.

In CELL DCH state, whether or not UE requires compressed mode to perform E-UTRAN measurements, the requirements for accuracy of E-UTRA RSRQ measurements in CELL\_DCH state shall be the same as the interfrequency RSRQ Accuracy Requirements in 3GPP TS 36.133 [24].

The reporting range and mapping specified for RSRQ in 3GPP TS 36.133 [24] shall apply.

#### 9.1.4c E-UTRAN WB-RSRQ

NOTE: This measurement is for handover between UTRAN and E-UTRAN.

The requirements in this section are valid for terminals supporting this capability.

The requirements in this section shall apply when the measurement configuration message received by the UE contains the IE "Wideband RSRO measurements" defined in TS 25.331 [2].

The measurement period for E-UTRA WB-RSRQ in CELL\_DCH state is the same as defined for E-UTRA RSRQ in section 8.1.2.6.

If the UE, in CELL\_DCH state, needs compressed mode to perform E-UTRAN measurements, the E-UTRAN measurement procedure is stated in section 8.1.2.6 shall apply.

In CELL DCH state, whether or not UE requires compressed mode to perform E-UTRAN measurements, the requirements for accuracy of E-UTRA WB-RSRQ measurements in CELL\_DCH state shall be the same as the interfrequency absolute WB-RSRQ Accuracy Requirements in 3GPP TS 36.133 [24].

The reporting range and mapping for E-UTRA WB-RSRQ shall be the same as defined for RSRQ in 3GPP TS 36.133 [24].

#### 9.1.5 Transport channel BLER

#### 9.1.5.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a window with the size equal to the IE Reporting interval as specified in section 10.3.7.53 Periodical reporting criteria in TS 25.331.

#### 9.1.5.2 Transport channel BLER measurement report mapping

The Transport channel BLER reporting range is from 0 to 1.

In table 9.13 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	-∞ < Log10(Transport channel BLER) < -4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < -3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < -3.9	-
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

**Table 9.13** 

# 9.1.6 UE transmitted power

#### 9.1.6.1 Accuracy requirement

This requirement is applicable in CELL\_DCH state. The measured quantity is the transmitted power averaged over the longest period (excluding a 25µs period either side of any expected composite power change) during which the nominal composite symbol power reaches the maximum during 1 DPCH slot interval. The UE measured quantity absolute accuracy is defined in Table 9.15.

#### **Table 9.14: (void)**

#### 9.1.6.2 UE transmitted power measurement report mapping

The reporting range for *UE transmitted power* is from -50 ...+33 dBm.

In table 9.15 the mapping of the measured quantity specified in Section 9.1.6.1 and the accuracy range are defined. The range in the signalling may be larger than the guaranteed accuracy range. For each empty slot created by compressed mode or discontinuous uplink DPCCH transmission, no value shall be reported by the UE L1 for these slots.

**Table 9.15** 

Reported value	Measured quantity value (dBm)	Accuracy (	dB) note 1	
UE_TX_POWER _104	33<= to <34	note 2		
UE_TX_POWER _103	32<= to <33	not	e 2	
UE_TX_POWER _102	31<= to <32	not	e 2	
UE_TX_POWER _096	25<= to <26	not	e 2	
UE_TX_POWER _095	24<= to <25	2.0	-2.0	
UE_TX_POWER _094	23<= to <24	2.0	-2.0	
UE_TX_POWER _093	22<= to <23	2.0	-2.0	
UE_TX_POWER _092	21<= to <22	2.0 -2.0		
UE_TX_POWER _091	20<= to < 21	2.5	-2.5	
UE_TX_POWER _090	19<= to <20	3.0 -3.0		
UE_TX_POWER _089	18<= to <19	3.5	-3.5	
UE_TX_POWER _088	17<= to <18	4.0	-4.0	
UE_TX_POWER _087	16<= to <17	4.0	-4.0	
UE_TX_POWER _086	15<= to <16	4.0	-4.0	
UE_TX_POWER _085	14<= to <15	4.0	-4.0	
UE_TX_POWER _084	13<= to <14	4.0*	-4.0 (note 3)	
UE_TX_POWER _083	12<= to <13	4.0*	-4.0 (note 3)	
UE_TX_POWER _082	11<= to <12	4.0*	-4.0 (note 3)	
UE_TX_POWER _081	10<= to <11	note 2		
UE_TX_POWER _023	-48<= to <-47	note 2		
UE_TX_POWER _022	-49<= to <-48	note 2		
UE_TX_POWER _021	-50<= to <-49	not	e 2	

NOTE 1: The tolerance is specified for the maximum and minimum measured quantity value (dBm), i.e.

MIN(Measured quantity value) + MIN(Accuracy)

<= UE transmitted Power <

Max (Measured quantity value) + MAX(Accuracy)

NOTE 2: No tolerance is specified. NOTE 3: Applicable to power class 4

#### 9.1.7 SFN-CFN observed time difference

NOTE: This measurement is for handover timing purposes to identify active cell and neighbour cell time difference.

#### 9.1.7.1 Intra frequency measurement requirement

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.2.

The accuracy requirement in table 9.16 is valid under the following conditions:

CPICH\_RSCP1,2|dBm according to Annex B.3.8 for a corresponding Band

$$\left| CPICH \_RSCP1 \right|_{in dBm} - CPICH \_RSCP2 \Big|_{in dBm} \right| \le 20 dB$$

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}}$$
 -  $\left(\frac{CPICH_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$ 

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} \quad - \quad \left(\frac{P - CCPCH \ \_E_c}{I_{or}}\right)_{in\ dB} \ \text{is low enough to ensure successful SFN decoding}.$$

**Table 9.16** 

Parameter	Unit	Accuracy	Conditions						
		[chip]	Band I, IV, VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV,	Band IX		
						XX and XXII			
			lo [dBm/3,84 MHz]	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84		
				MHz]	MHz]	MHz]	MHz]		
SFN-CFN observed	chip	± 1	-9450	-9250	-90.550	-9150	-9350		
time difference					(Note 1)				

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.7.2 Inter frequency measurement requirement

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.3.

The accuracy requirement in table 9.17 is valid under the following conditions:

CPICH\_RSCP1|dBm according to Annex B.3.9 for a corresponding Band.

$$\left| CPICH \_RSCP1 \right|_{in \ dBm} - CPICH \_RSCP2 \Big|_{in \ dBm} \right| \le 20 dB$$
,

| Channel 1\_Io $|_{dBm/3,84 \text{ MHz}}$  -Channel 2\_Io $|_{dBm/3,84 \text{ MHz}}$  |  $\leq 20 \text{ dB}$ ,

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB.$$

**Table 9.17** 

Parameter	Unit	Accuracy		Conditions						
		[chip]	SFN-CFN	SFN-CFN	SFN-CFN	SFN-CFN	SFN-CFN			
			observed time	observed time	observed time	observed time	observed			
			difference is on	difference is on	difference is on	difference is	time			
			Band I, IV, VI, X,	Band II, V and	Band XXV and	on Band III,	difference is			
			XI, XIX and XXI	VÍI	XXVI	VIII, XII, XIII,	on Band IX			
			,			XIV, XX and				
						XXII				
			lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84			
			MHz]	MHz]	MHz]	MHz]	MHz]			
SFN-CFN	chip	± 1	-9450	-9250	-90.550	-9150	-9350			
observed time difference					(Note 1)					

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.7.3 SFN-CFN observed time difference measurement report mapping

The reporting range is for CFN-SFN observed time difference is from 0 ... 9830400 chip.

In table 9.18 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.18** 

Reported value	Measured quantity value	Unit
SFN-CFN_TIME _0000000	0 ≤ SFN-CFN observed time difference < 1	chip
SFN-CFN_TIME _0000001	1 ≤ SFN-CFN observed time difference < 2	chip
SFN-CFN_TIME _0000002	2 ≤ SFN-CFN observed time difference < 3	chip
SFN-CFN_TIME _9830397	9830397 ≤ SFN-CFN observed time	chip
	difference < 9830398	
SFN-CFN_TIME _9830398	9830398 ≤ SFN-CFN observed time	chip
	difference < 980399	
SFN-CFN_TIME _9830399	9830399 ≤ SFN-CFN observed time	chip
	difference < 9830400	

#### 9.1.8 SFN-SFN observed time difference

#### 9.1.8.1 SFN-SFN observed time difference type 1

NOTE: This measurement is for identifying time difference between two cells.

#### 9.1.8.1.1 Measurement requirement

The measurement period for CELL\_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.19 is valid under the following conditions:

CPICH\_RSCP1|dBm according to Annex B.3.10 for a corresponding Band

$$\begin{aligned} & \left| CPICH \_RSCP1 \right|_{in \, dBm} - CPICH \_RSCP2 \right|_{in \, dBm} \right| \leq 20 dB \,, \\ & \left| \underbrace{I_o}_{(\hat{I}_{or})} \right|_{in \, dB} \quad - \quad \left( \frac{CPICH \_E_c}{I_{or}} \right) \right|_{in \, dB} \leq 20 dB \,, \\ & \left| \underbrace{I_o}_{(\hat{I}_{or})} \right|_{in \, dB} \quad - \quad \left( \frac{P - CCPCH \_E_c}{I_{or}} \right) \right|_{in \, dB} \end{aligned}$$

is low enough to ensure successful SFN decoding.

**Table 9.19** 

Parameter	Unit	Accuracy			Conditions		
		[chip]	SFN-SFN observed time difference type1 is on Band I, IV, VI, X, XI, XIX and XXI		SFN-SFN observed time difference type1 is on Band XXV and XXVI	SFN-SFN observed time difference type1 is on Band III, VIII, XII, XIII, XIV, XX and XXII	SFN-SFN observed time difference type1 is on Band IX
			lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]	lo [dBm/3,84 MHz]
0511 0511			•		-		
SFN-SFN	chip	± 1	-9450	-9250	-90.550	-9150	-9350
observed time					(Note 1)		
difference type1							

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.8.1.2 SFN-SFN observed time difference type 1 measurement report mapping

The reporting range is for SFN-SFN observed time difference type 1 is from 0 ... 9830400 chip.

In table 9.20 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Reported value	Measured quantity value	Unit
T1_SFN-SFN_TIME _0000000	0 ≤ SFN-SFN observed time difference type	chip
	1 < 1	
T1_SFN-SFN_TIME _0000001	1 ≤ SFN-SFN observed time difference type	chip
	1 < 2	
T1_SFN-SFN_TIME _0000002	2 ≤ SFN-SFN observed time difference type	chip
	1 < 3	
T1_SFN-SFN_TIME _9830397	9830397 ≤ SFN-SFN observed time	chip
	difference type 1 < 9830398	
T1_SFN-SFN_TIME _9830398	9830398 ≤ SFN-SFN observed time	chip
	difference type 1 < 980399	
T1_SFN-SFN_TIME _9830399	9830399 ≤ SFN-SFN observed time	chip
	difference type 1 < 9830400	

**Table 9.20** 

#### 9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This measurement is for location service purposes to identify time difference between two cells.

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

NOTE: Requirement on the UE shall be reconsidered when the state of the art technology progress.

#### 9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL\_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH\_RSCP1,2|dBm according to Annex B.3.11 for a corresponding Band

$$\frac{I_{o}}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH\_E_{c}}{I_{or}}\right)_{in\ dB} \leq 20dB$$

**Table 9.21** 

Parameter	Unit	Accuracy	Conditions					
		[chip]	Band I, IV,	Band II, V		Band III, VIII,	Band IX	
			VI, X, XI, XIX and XXI	and VII	and XXVI	XII, XIII, XIV, XX and XXII		
			lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	
			MHz]	MHz]	MHz]	MHz]	MHz]	
SFN-SFN observed	chip	± 0.5	-9450	-9250	-90.550	-9150	-9350	
time difference type2					(Note 1)			

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

This requirement is valid only for UEs supporting IPDL measurements.

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL\_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH\_RSCP1,2|dBm according to Annex B.3.11 for a corresponding Band

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Additionally the accuracy requirement in table 9.22 is also valid for neighbour cells for which the following conditions apply to during idle periods provided idle periods have a length of 1 slot:

CPICH\_RSCPx,y $|_{dBm} \ge -114 dBm$ .

$$\frac{I_{o\_idle\_period}}{\left(\hat{I}_{or}\right)}\bigg|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)\bigg|_{in\ dB} \le 20dB,$$

where x and y represent cells measured using idle periods and  $I_{o\_idle-period}$  is the total received power during the idle period.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

**Table 9.22** 

Parameter	Unit	Accuracy			Conditions		
		[chip]	Band I, IV,	Band II, V	Band XXV	Band III, VIII,	Band IX
			VI, X, XI, XIX	and VII	and XXVI	XII, XIII, XIV,	
			and XXI			XX and XXII	
			lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,
			MHz]	MHz]	MHz]	MHz]	MHz]
SFN-SFN observed time difference	chip	± 0.5	-9450	-9250	-90.550	-9150	-9350
type 2	-				(Note 1)		

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MF for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH\_RSCP1|dBm according to Annex B.3.12 for a corresponding Band

| Channel 1\_ $Io|_{dBm}$  -Channel 2\_ $Io|_{dBm}$  |  $\leq 20 dB$ ,

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in,dB}} - \left(\frac{CPICH_E_c}{I_{or}}\right)_{in,dB} \le 20dB$$
.

**Table 9.23** 

Parameter	Unit	Accuracy	Conditions						
		[chip]	SFN-SFN	SFN-SFN	SFN-SFN	SFN-SFN	SFN-SFN		
			observed time	observed	observed time	observed	observed		
			difference type	time	difference type	time	time		
			2 is on Band I,	difference	2 is on Band	difference	difference		
			IV, VI, X, XI,	type 2 is on	XXV and XXVI	type 2 is on	type 2 is on		
			XIX and XXI	Band II, V and		Band III, VIII,	Band IX		
				VII		XII, XIII, XIV,			
						XX and XXII			
			lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84		
			MHz]	MHz]	MHz]	MHz]	MHz]		
SFN-SFN	chip	± 1	-9450	-9250	-90.550	-9150	-9350		
observed time					(Note 1)				
difference type 2									

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.8.2.4 SFN-SFN observed time difference type 2 measurement report mapping

The reporting range is for SFN-SFN observed time difference type 2 is from -1280 ... +1280 chip.

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.24** 

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
	2	
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

#### 9.1.9 UE Rx-Tx time difference

#### 9.1.9.1 UE Rx-Tx time difference type 1

NOTE: This measurement is used for call set up purposes to compensate propagation delay of DL and UL.

The measurement period in CELL\_DCH state is 100 ms.

#### 9.1.9.1.1 Measurement requirement

**Table 9.25** 

Parameter	Unit	Accuracy			Conditions		
		[chip]	Band I, IV, VI,	Band II, V	Band XXV	Band III, VIII,	Band IX
			X, XI, XIX and	and VII	and XXVI	XII, XIII, XIV,	
			XXI			XX and XXII	
			lo [dBm/3,84	Io [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,
			MHz]	MHz]	MHz]	MHz]	MHz]
UE RX-TX time difference	chip	± 1.5	-9450	-9250	-90.550	-9150	-9350
	-				(Note 1)		

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-89 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.9.1.2 UE Rx-Tx time difference type 1 measurement report mapping

The reporting range is for UE Rx-Tx time difference type 1 is from 768 ... 1280 chip.

In table 9.26 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.26** 

Reported value	Measured quantity value	Unit
RX-TX_TIME _768	UE Rx-Tx Time difference type 1< 768	chip
RX-TX_TIME _769	768 ≤ UE Rx-Tx Time difference type 1< 769	chip
RX-TX_TIME _770	769 ≤ UE Rx-Tx Time difference type 1< 770	chip
RX-TX_TIME _771	770 ≤ UE Rx-Tx Time difference type 1< 771	chip
•••		
RX-TX_TIME _1277	1276 ≤ UE Rx-Tx Time difference type 1< 1277	chip
RX-TX_TIME _1278	1277 ≤ UE Rx-Tx Time difference type 1< 1278	chip
RX-TX_TIME _1279	1278 ≤ UE Rx-Tx Time difference type 1< 1279	chip
RX-TX_TIME _1280	1279 ≤ UE Rx-Tx Time difference type 1	chip

## 9.1.9.2 UE Rx-Tx time difference type 2

NOTE: This measurement is used for UE positioning purposes.

It is optional for a terminal to support a subset of UE positioning methods. This measurement represents an instantaneous value that is time stamped as defined in the IE description in TS 25.331 [16].

#### 9.1.9.2.1 Measurement requirement

**Table 9.27** 

Parameter	Unit	Accuracy	Conditions				
		[chip]	Band I, IV, VI,	Band II, V	Band XXV	Band III, VIII,	Band IX
			X, XI, XIX and	and VII	and XXVI	XII, XIII, XIV,	
			XXI			XX and XXII	
			lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,84	lo [dBm/3,
			MHz]	MHz]	MHz]	MHz]	MHz]
UE RX-TX time difference	chip	± 1.0	-9450	-9250	-90.550	-9150	-9350
	-				(Note 1)		

NOTE 1: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### 9.1.9.2.2 UE Rx-Tx time difference type 2 measurement report mapping

The reporting range is for *UE Rx-Tx time difference type2* is from 768 ... 1280 chip.

In table 9.28 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.28** 

Reported value	Measured quantity value		
RX-TX_TIME _0000	UE Rx-Tx Time difference type 2 < 768.000	chip	
RX-TX_TIME _0001	768.000 ≤ UE Rx-Tx Time difference type 2 < 768.0625	chip	
RX-TX_TIME _0002	768.0625 ≤ UE Rx-Tx Time difference type 2 < 768.1250	chip	
RX-TX_TIME _0003	768.1250 ≤ UE Rx-Tx Time difference type 2 < 768.1875	chip	
RX-TX_TIME _8189	1279.7500 ≤ UE Rx-Tx Time difference type 2 < 1279.8125	chip	
RX-TX_TIME _8190	1279.8125 ≤ UE Rx-Tx Time difference type 2 < 1279.8750	chip	
RX-TX_TIME _8191	1279.8750 ≤ UE Rx-Tx Time difference type 2	chip	

#### 9.1.10 (void)

Table 9.29 (void)

Table 9.30 (void)

#### 9.1.11 P-CCPCH RSCP

NOTE: This measurement is used for handover between UTRA FDD and UTRA TDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for CELL\_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL\_FACH state can be found in sub clause 8.4.2.4.

#### 9.1.11.1 Absolute accuracy requirements

#### 9.1.11.1.1 3,84 Mcps TDD Option

The accuracy requirement in table 9.31is valid under the following conditions:

P-CCPCH\_RSCP  $\ge$  -102 dBm.

$$\frac{I_o}{\left(\hat{I}_{or}\right)_{in\ dB}} - \left(\frac{P - CCPCH - E_c}{I_{or}}\right)_{in\ dB} \le 8dB$$

Table 9.31: P-CCPCH\_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accura	Conditions	
		Normal conditions	Extreme conditions	lo [dBm/3,84 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	-7050

#### 9.1.11.1.2 1.28 Mcps TDD Option

The accuracy requirement in table 9.31A is valid under the following conditions:

P-CCPCH RSCP ≥ -102 dBm

P-CCPCH Ec/Io  $\geq$  -8 dB

Table 9.31A: P-CCPCH\_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accura	Conditions	
		Normal conditions	Extreme conditions	lo [dBm/1.28 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-9470
	dBm	± 8	± 11	-7050

#### 9.1.11.2 P-CCPCH RSCP measurement report mapping

The reporting range is for P-CCPCH RSCP is from -115 ... -25 dBm.

In table 9.32 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.32** 

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV _00	PCCPCH RSCP< -115	dBm
PCCPCH_RSCP_LEV _01	-115 ≤ PCCPCH RSCP< -114	dBm
PCCPCH_RSCP_LEV _02	-114 ≤ PCCPCH RSCP< -113	dBm
PCCPCH_RSCP_LEV _03	-113 ≤ PCCPCH RSCP< -112	dBm
PCCPCH_RSCP_LEV _89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV _90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV _91	-25 ≤ PCCPCH RSCP	dBm

# 9.1.12 UE GPS Timing of Cell Frames for UE positioning

The requirements in this section are valid for terminals supporting this capability:

**Table 9.33** 

Parameter	Unit	Accuracy [chip]	Conditions
UE GPS Timing of Cell Frames	chip	[]	
for UE positioning			

#### 9.1.12.1 UE GPS timing of Cell Frames for UE positioning measurement report mapping

The reporting range is for UE GPS timing of Cell Frames for UE positioning is from  $0\dots2322432000000$  chip.

In table 9.34 the mapping of measured quantity is defined.

**Table 9.34** 

Reported value	Measured quantity value	Unit
GPS_TIME_000000000000000	UE GPS timing of Cell Frames for UE positioning < 0.0625	chip
GPS_TIME_000000000000001	0.0625 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1250	chip
GPS_TIME_000000000000000000000000000000000000	0.1250 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1875	chip
GPS_TIME_3715891199997	2322431999999.8125 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.8750	chip
GPS_TIME_37158911999998	2322431999999.8750 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.9375	chip
GPS_TIME_37158911999999	2322431999999.9375 ≤ UE GPS timing of Cell Frames for UE positioning < 2322432000000.0000	chip

# 9.1.13 UE transmission power headroom

#### 9.1.13.1 Delay requirement

The UE transmission power headroom measurement reporting delay is defined as the time between the end of the UE transmission power headroom measurement period and the time when the UE starts transmitting the measurement report over the Uu interface. The reporting delay of the UE transmission power headroom measurement result shall be not more than 10 ms, which is applicable for all configured triggering mechanisms for UE transmission power headroom measurement.

#### 9.1.13.2 Measurement period requirement

The reported UE transmission power headroom measurement result shall be an estimate of the average value of the UE transmission power headroom over a 100 ms period. The UE transmission power headroom measurement shall exclude the empty slots created by the compressed mode or discontinuous uplink DPCCH transmission.

If the UE is in CELL\_FACH state, the UE can be configured to send DPCCH for a configurable number of radio frames prior to the start of the E-DCH transmissions. The UE in CELL\_FACH state reports the headroom available based on the average of the DPCCH power including the period DPCCH is transmitted prior to the start of the E-DCH transmissions. The averaging period for the UE transmission power headroom measurement in CELL\_FACH state, after the commencement of the data transmission, is 10ms.

For the first measurement, if less than 20 ms of DPCCH is configured prior to the start of the E-DCH transmissions, the UE in CELL\_FACH state reports the headroom available based on the last successfully transmitted PRACH preamble power. In this case, the UPH can be computed from  $P_{preamble}$  using the  $P_{p-e}$ :

$$UPH = P_{max,tx} - P_{preamble} - P_{p-e}$$

where  $P_{max,tx}$  is the UE maximum transmission power,  $P_{preamble}$  is the transmitted code power on PRACH preamble, and  $P_{p-e}$  is the power offset between the power of the last transmitted preamble and the initial DPCCH transmission power, all in dB.

#### 9.1.13.3 UE transmission power headroom measurement report mapping

The UE transmission power headroom reporting range is from 0 ...+31 dB. Table 9.34A defines the mapping

Table 9.34A

Reported value	Measured quantity value (dB)
UE_POWER_HEADROOM_0	0 ≤ UPH < 1
UE_POWER_HEADROOM_1	1 ≤ UPH < 2
UE_POWER_HEADROOM_2	2 ≤ UPH < 3
UE_POWER_HEADROOM_3	3 ≤ UPH < 4
UE_POWER_HEADROOM_4	4 ≤ UPH < 5
UE_POWER_HEADROOM_5	5 ≤ UPH < 6
UE_POWER_HEADROOM_6	6 ≤ UPH < 7
UE_POWER_HEADROOM_7	7 ≤ UPH < 8
UE_POWER_HEADROOM_8	8 ≤ UPH < 9
UE_POWER_HEADROOM_9	9 ≤ UPH < 10
UE_POWER_HEADROOM_10	10 ≤ UPH < 11
UE_POWER_HEADROOM_11	11 ≤ UPH < 12
UE_POWER_HEADROOM_12	12 ≤ UPH < 13
UE_POWER_HEADROOM_13	13 ≤ UPH < 14
UE_POWER_HEADROOM_14	14 ≤ UPH < 15
UE_POWER_HEADROOM_15	15 ≤ UPH < 16
UE_POWER_HEADROOM_16	16 ≤ UPH < 17
UE_POWER_HEADROOM_17	17 ≤ UPH < 18
UE_POWER_HEADROOM_18	18 ≤ UPH < 19
UE_POWER_HEADROOM_19	19 ≤ UPH < 20
UE_POWER_HEADROOM_20	20 ≤ UPH < 21
UE_POWER_HEADROOM_21	21 ≤ UPH < 22
UE_POWER_HEADROOM_22	22 ≤ UPH < 23
UE_POWER_HEADROOM_23	23 ≤ UPH < 24
UE_POWER_HEADROOM_24	24 ≤ UPH < 25
UE_POWER_HEADROOM_25	25 ≤ UPH < 26
UE_POWER_HEADROOM_26	26 ≤ UPH < 27
UE_POWER_HEADROOM_27	27 ≤ UPH < 28
UE_POWER_HEADROOM_28	28 ≤ UPH < 29
UE_POWER_HEADROOM_29	29 ≤ UPH < 30
UE_POWER_HEADROOM_30	30 ≤ UPH < 31
UE_POWER_HEADROOM_31	UPH ≥ 31

# 9.1.13.4 UE transmission power headroom measurement report accuracy

The accuracy requirements for UE transmission power headroom depends on the total power transmitted by the UE. Table 9.34B defines the accuracy of the measured quantity.

Table 9.34B

Total UE output power value (dBm)	UPH reporting accuracy(dB) (note 1)			
25<= total output power <34	note 2			
24<= total output power <25	±2.0			
23<= total output power <24	±2.0			
22<= total output power <23	±2.0			
21<= total output power <22	±2.0			
20<= total output power < 21	±2.5			
19<= total output power <20	±3.0			
18<= total output power <19	±3.5			
17<= total output power <18	±4.0			
16<= total output power <17	±4.0			
15<= total output power <16	±4.0			
14<= total output power <15	±4.0			
13<= total output power <14	±4.0 (power class 4) ±6.0 (power class 3)			
12<= total output power <13	±4.0 (power class 4) ±6.0 (power class 3)			
11<= total output power <12	±4.0 (power class 4) ±6.0 (power class 3)			
-50<= total output power <11	±6.0			
Note 1. LIDLI reporting acquirecy is the difference between the LIDLI				

Note 1: UPH reporting accuracy is the difference between the UPH reported by the UE and the actual uplink power headroom

Note 2: No tolerance is specified.

# 9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302.

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

Test like descriptions of these measurements are located in the TS 25.141 as an informative Annex H. The Annex H specifies test specific parameters for some of the UTRAN requirements in this chapter. The tests provide additional information to how the requirements should be tested. Some requirements may lack a test.

# 9.2.1 Received total wideband power

The measurement period shall be 100 ms.

#### 9.2.1.1 Absolute accuracy requirement

**Table 9.35** 

Parameter	Unit	Accuracy	Conditions	BS class
		[dB]	lob [dBm/3,84 MHz]	
lob	dBm/3,84 MHz	± 4	-10374	Wide area BS
lob	dBm/3,84 MHz	± 4	-9364	Medium Range BS
lob	dBm/3,84 MHz	± 4	-8960	Local area BS

#### 9.2.1.2 Relative accuracy requirement

The relative accuracy is defined as the Received total wideband power measured at one frequency compared to the Received total wideband power measured from the same frequency at a different time.

**Table 9.36** 

Parameter	Unit	Accuracy	Conditions	BS class
		[dB]	lob [dBm/3,84 MHz]	
lob	dBm/3,84 MHz	± 0.5	-10374	Wide area BS
			AND for changes ≤ ±9.0 dB	
lob	dBm/3,84 MHz	± 0.5	-9364	Medium Range BS
			AND for changes ≤ ±9.0 dB	
lob	dBm/3,84 MHz	± 0.5	-8960	Local area BS
			AND for changes <= ±12.0 dB	

#### 9.2.1.3 Received total wideband power measurement report mapping

The reporting range for Received total wideband power (RTWP) is from -112 ... -50 dBm.

In table 9.37 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.37** 

Reported value	Measured quantity value	Unit
RTWP_LEV _000	RTWP < -112.0	dBm
RTWP_LEV _001	-112.0 ≤ RTWP < -111.9	dBm
RTWP_LEV _002	-111.9 ≤ RTWP < -111.8	dBm
RTWP_LEV _619	-50.2 ≤ RTWP < -50.1	dBm
RTWP_LEV _620	-50.1 ≤ RTWP < -50.0	dBm
RTWP_LEV _621	-50.0 ≤ RTWP	dBm

#### 9.2.2 SIR

The measurement period shall be 80 ms.

#### 9.2.2.1 Accuracy requirement

**Table 9.38** 

Parameter	Unit	Accuracy [dB]	Conditions	
			Range	
SIR	dB	± 3	For -7 <sir<20 db="" lob="" when=""> -105 dBm/3,84 MHz</sir<20>	

#### 9.2.2.2 SIR measurement report mapping

The reporting range for SIR is from -11 ... 20 dB.

In table 9.39 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.39** 

Reported value	Measured quantity value	Unit
UTRAN_SIR_00	SIR < -11.0	dB
UTRAN_SIR_01	-11.0 ≤ SIR < -10.5	dB
UTRAN_SIR_02	-10.5 ≤ SIR < -10.0	dB
UTRAN_SIR_61	19.0 ≤ SIR < 19.5	dB
UTRAN_SIR_62	19.5 ≤ SIR < 20.0	dB
UTRAN_SIR_63	20.0 ≤ SIR	dB

# 9.2.3 SIR<sub>error</sub>

The measurement period shall be 80 ms.

NOTE: The measurement period is the same as for the SIR measurement in section 9.2.2.  $SIR_{error}$  is calculated from SIR and  $SIR_{target}$ , see TS 25.215.

#### 9.2.3.1 Accuracy requirement

**Table 9.40** 

Parameter	Accuracy	Range
SIR <sub>error</sub>	± 3 dB	The accuracy requirement for SIR <sub>error</sub> is valid
		for SIR within the guaranteed accuarcy range
		specified in section 9.2.2.

NOTE: The accuracy requirement for  $SIR_{error}$  is the same as for the SIR measurement specified in section 9.2.2.  $SIR_{error}$  is calculated from SIR and  $SIR_{target}$ , see TS 25.215.

#### 9.2.3.2 SIR<sub>error</sub> measurement report mapping

The reporting range for SIR<sub>error</sub> is from -31 ... 31 dB.

In table 9.41 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.41** 

Reported value	Measured quantity value	Unit
UTRAN_SIR_ERROR_000	SIR <sub>error</sub> < -31.0	dB
UTRAN_SIR_ERROR_001	-31.0 ≤ SIR <sub>error</sub> < -30.5	dB
UTRAN_SIR_ERROR_002	$-30.5 \le SIR_{error} < -30.0$	dB
UTRAN_SIR_ERROR_062	-0.5 ≤ SIR <sub>error</sub> < 0.0	dB
UTRAN_SIR_ERROR_063	0.0 ≤ SIR <sub>error</sub> < 0.5	dB
***		
UTRAN_SIR_ERROR_123	30.0 ≤ SIR <sub>error</sub> < 30.5	dB
UTRAN_SIR_ERROR_124	30.5 ≤ SIR <sub>error</sub> < 31.0	dB
UTRAN_SIR_ERROR_125	31.0 ≤ SIR <sub>error</sub>	dB

# 9.2.4 Transmitted carrier power

The measurement period shall be 100 ms.

#### 9.2.4.1 Accuracy requirement

**Table 9.42** 

Parameter	Unit	Accuracy [% units]	Conditions	
			Range	
Ptot	%	± 5	For 5% ≤ Transmitted carrier power ≤95%	

#### 9.2.4.2 Transmitted carrier power measurement report mapping

The reporting range for *Transmitted carrier power* is from 0 ... 100 %.

In table 9.43 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.43** 

Reported value	Measured quantity value	Unit
UTRAN_TX_POWER _000	Transmitted carrier power = 0	%
UTRAN_TX_POWER _001	0 < Transmitted carrier power ≤ 1	%
UTRAN_TX_POWER _002	1 < Transmitted carrier power ≤ 2	%
UTRAN_TX_POWER _003	2 < Transmitted carrier power ≤ 3	%
UTRAN_TX_POWER _098	97 < Transmitted carrier power ≤ 98	%
UTRAN_TX_POWER _099	98 < Transmitted carrier power ≤ 99	%
UTRAN_TX_POWER _100	99 < Transmitted carrier power ≤ 100	%

## 9.2.5 Transmitted code power

The measurement period shall be 100 ms.

#### 9.2.5.1 Absolute accuracy requirement

**Table 9.44** 

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Pcode	dBm	± 3	Over the full range

#### 9.2.5.2 Relative accuracy requirement

The relative accuracy of Transmitted code power is defined as the Transmitted code power measured at one dedicated radio link compared to the Transmitted code power measured from a different dedicated radio link in the same cell.

**Table 9.45** 

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Pcode	dBm	± 2	Over the full range

#### 9.2.5.3 Transmitted code power measurement report mapping

The reporting range for Transmitted code power is from -10 ... 46 dBm.

In table 9.46 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.46** 

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER _010	-10.0 ≤ Transmitted code power < -9.5	dBm
UTRAN_CODE_POWER _011	-9.5 ≤ Transmitted code power < -9.0	dBm
UTRAN_CODE_POWER _012	-9.0 ≤ Transmitted code power < -8.5	dBm
	•••	
UTRAN_CODE_POWER _120	45.0 ≤ Transmitted code power < 45.5	dBm
UTRAN_CODE_POWER _121	45.5 ≤ Transmitted code power < 46.0	dBm
UTRAN_CODE_POWER _122	46.0 ≤ Transmitted code power < 46.5	dBm

#### 9.2.6 (void)

# 9.2.7 Physical channel BER

The measurement period shall be equal to the TTI of the transport channel, to which the Physical channel BER is associated via the IE QE-Selector, see TS 25.433. Each reported Physical channel BER measurement shall be an estimate of the BER averaged over one measurement period only.

#### 9.2.7.1 Accuracy requirement

The average of consecutive Physical channel BER measurements is required to fulfil the accuracy stated in table 9.47 if the total number of erroneous bits during these measurements is at least 500 and the absolute BER value for each of the measurements is within the range given in table 9.47.

**Table 9.47** 

Parameter	Unit	Accuracy [% of	Conditions
		absolute BER value]	Range
PhyBER	-	+/- 10	for absolute BER value ≤ 30%

#### 9.2.7.2 Physical channel BER measurement report mapping

The *Physical channel BER* reporting range is from 0 to 1.

In table 9.48 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.48** 

Reported value	Measured quantity value	Unit
PhCh_BER_LOG_000	Physical channel BER = 0	-
PhCh_BER_LOG_001	-∞ < Log10(Physical channel BER) < -2.06375	-
PhCh_BER_LOG_002	-2.06375≤ Log10(Physical channel BER) < -2.055625	-
PhCh_BER_LOG_003	-2.055625 ≤ Log10(Physical channel BER) < -2.0475	-
PhCh_BER_LOG_253	-0.024375 ≤ Log10(Physical channel BER) < -0.01625	-
PhCh_BER_LOG_254	-0.01625 ≤ Log10(Physical channel BER) < -0.008125	-
PhCh_BER_LOG_255	-0.008125 ≤ Log10(Physical channel BER) ≤ 0	-

# 9.2.8 Round trip time

The measurement period shall be 100 ms. The support of extended round trip time is optional.

#### 9.2.8.1 Absolute accuracy requirement

#### 9.2.8.1.1 Minimum requirement

**Table 9.49** 

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
RTT	chip	+/- 0.5	876,, 2923.50

#### 9.2.8.1.2 Requirement for extended round trip time

Table 9.49X

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
RTT	chip	+/- 0.5	2923.75,, 5783.2500

#### 9.2.8.2 Round trip time measurement report mapping

#### 9.2.8.2.1 Minimum requirement

The Round trip time reporting range is from 876.0000 ... 2923.8750 chip.

In table 9.50 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.50** 

Reported value	Measured quantity value	Unit
RT_TIME_0000	Round trip time < 876.0000	chip
RT_TIME_0001	876.0000 ≤ Round trip time < 876.0625	chip
RT_TIME_0002	876.0625 ≤ Round trip time < 876.1250	chip
RT_TIME_0003	876.1250 ≤ Round trip time < 876.1875	chip
RT_TIME_32764	2922.6875 ≤ Round trip time < 2923.7500	chip
RT_TIME_32765	2923.7500 ≤ Round trip time < 2923.8125	chip
RT_TIME_32766	2923.8125 ≤ Round trip time < 2923.8750	chip
RT_TIME_32767	2923.8750 ≤ Round trip time	chip

#### 9.2.8.2.2 Requirement for extended round trip time

The extended Round trip time reporting range is from 2923.8750 ... 7316 chip.

In table 9.50X the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.50X

Reported value	Measured quantity value	Unit
RT_TIME_32767	2923.8750 ≤ Round trip time < 2923.9375	chip
RT_TIME_32768	2923.9375 ≤ Round trip time < 2924.0000	chip
RT_TIME_32769	2924.0000 ≤ Round trip time < 2924.0625	chip
RT_TIME_32770	2924.0625 ≤ Round trip time < 2924.1250	chip
RT_TIME_32771	2924.1250 ≤ Round trip time < 2924.1875	chip
	***	•••
RT_TIME_103038	7315.8125 ≤ Round trip time < 7315.8750	chip
RT_TIME_103039	7315.8750 ≤ Round trip time < 7315.9375	chip
RT_TIME_103040	7315.9375 ≤ Round trip time < 7316.0000	chip
RT_TIME_103041	7316.0000 ≤ Round trip time	chip

# 9.2.9 Transport Channel BER

The measurement period shall be equal to the TTI of the transport channel. Each reported Transport channel BER measurement shall be an estimate of the BER averaged over one measurement period only.

#### 9.2.9.1 Accuracy requirement

The average of consecutive Transport channel BER measurements is required to fulfil the accuracy stated in table 9.51 if the total number of erroneous bits during these measurements is at least 500 and the absolute BER value for each of the measurements is within the range given in table 9.51.

**Table 9.51** 

Parameter	Unit	Accuracy	Conditions
		[% of the absolute BER value]	Range
TrpBER	-	+/- 10	Convolutional coding 1/3 <sup>rd</sup> with any amount of repetition or a maximum of 25% puncturing: for absolute BER value ≤ 15% Convolutional coding 1/2 with any amount of repetition or no puncturing: for absolute BER value ≤ 15% Turbo coding 1/3 <sup>rd</sup> with any amount of repetition or a maximum of 20% puncturing: for absolute BER value ≤ 15%.

#### 9.2.9.2 Transport channel BER measurement report mapping

The *Transport channel BER* reporting range is from 0 to 1.

In table 9.52 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.52** 

Reported value	Measured quantity value	Unit
TrCh_BER_LOG_000	Transport channel BER = 0	-
TrCh_BER_LOG_001	-∞ < Log10(Transport channel BER) < -2.06375	-
TrCh_BER_LOG_002	-2.06375≤ Log10(Transport channel BER) < -2.055625	-
TrCh_BER_LOG_003	-2.055625 ≤ Log10(Transport channel BER) < -2.0475	-
	***	
TrCh_BER_LOG_253	-0.024375 ≤ Log10(Transport channel BER) < -0.01625	-
TrCh_BER_LOG_254	-0.01625 ≤ Log10(Transport channel BER) < -0.008125	-
TrCh_BER_LOG_255	-0.008125 ≤ Log10(Transport channel BER) ≤ 0	-

#### 9.2.10 UTRAN GPS Timing of Cell Frames for UE positioning

NOTE: This measurement is used for UE positioning purposes.

The measurement period shall be [1] second.

#### 9.2.10.1 Accuracy requirement

Three accuracy classes are defined for the UTRAN GPS Timing of Cell Frames for UE positioning measurement, i.e. accuracy class A, B and C. The implemented accuracy class depends on the UE positioning methods that are supported.

**Table 9.53** 

Parameter	Unit	Accuracy [chip]	Conditions
UTRAN GPS Timing of Cell	chip	Accuracy Class A: +/- [20000] chip	Over the full
Frames for UE positioning		Accuracy Class B: +/- [20] chip	range
		Accuracy Class C: +/- [X] chip	

# 9.2.10.2 UTRAN GPS timing of Cell Frames for UE positioning measurement report mapping

The reporting range is for UTRAN GPS timing of Cell Frames for UE positioning is from 0 ... 2322432000000 chip. In table 9.54 the mapping of measured quantity is defined.

**Table 9.54** 

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for UE	chip
	positioning < 0.0625	
GPS_TIME_00000000000001	0.0625 ≤ UTRAN GPS timing of Cell Frames for UE	chip
	positioning < 0.1250	
GPS_TIME_000000000000002	0.1250 ≤ UTRAN GPS timing of Cell Frames for UE	chip
	positioning < 0.1875	
•••		
GPS_TIME_37158911999997	2322431999999.8125 ≤ UTRAN GPS timing of Cell	chip
	Frames for UE positioning < 2322431999999.8750	
GPS_TIME_37158911999998	2322431999999.8750 ≤ UTRAN GPS timing of Cell	chip
	Frames for UE positioning < 2322431999999.9375	
GPS_TIME_37158911999999	2322431999999.9375 ≤ UTRAN GPS timing of Cell	chip
	Frames for UE positioning < 2322432000000.0000	

# 9.2.11 PRACH Propagation delay

#### 9.2.11.1 Accuracy requirement

#### 9.2.11.1.1 PRACH Propagation delay

The accuracy requirements in table 9.55 and table 9.55X are valid under the following conditions:

- The radio conditions are according to 25.104 section 8.7.2.1 Minimum requirements for Static Propagation Condition for BLER=10<sup>-1</sup>.
- Only RACH messages with correct CRC shall be considered

The support of extended PRACH propagation delay is optional.

**Table 9.55 Minimum requirement** 

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
PRACH PropDelay	chip	+/-2	0, , 765

Table 9.55X Requirement for extended PRACH propagation delay

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
PRACH PropDelay	chip	+/-2	766,, 2307

9.2.11.1.2 (void)

#### Table 9.55A (void)

#### 9.2.11.2 PRACH Propagation delay measurement report mapping

#### 9.2.11.2.1 Minimum requirement

The PRACH Propagation delay reporting range is from 0 ... 765 chip.

In table 9.56 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.56** 

Reported value	Measured quantity value	Unit
PROP_DELAY_000	0 ≤ PRACH Propagation delay < 3	chip
PROP_DELAY_001	3 ≤ PRACH Propagation delay < 6	chip
PROP_DELAY_002	6 ≤ PRACH Propagation delay < 9	chip
PROP_DELAY_252	756 ≤ PRACH Propagation delay < 759	chip
PROP_DELAY_253	759 ≤ PRACH Propagation delay < 762	chip
PROP_DELAY_254	762 ≤ PRACH Propagation delay < 765	chip
PROP_DELAY_255	765 ≤ PRACH Propagation delay	chip

#### 9.2.11.2.2 Requirement for extended PRACH propagation delay

The extended PRACH Propagation delay reporting range is from 765 ... 3069 chip.

In table 9.56X the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.56X

Reported value	Measured quantity value	Unit
PROP_DELAY_255	765 ≤ PRACH Propagation delay < 768	chip
PROP_DELAY_256	768 ≤ PRACH Propagation delay < 771	chip
PROP_DELAY_257	771 ≤ PRACH Propagation delay < 774	chip
PROP_DELAY_258	774 ≤ PRACH Propagation delay < 777	chip
PROP_DELAY_1020	3060 ≤ PRACH Propagation delay < 3063	chip
PROP_DELAY_1021	3063 ≤ PRACH Propagation delay < 3066	chip
PROP_DELAY_1022	3066 ≤ PRACH Propagation delay < 3069	chip
PROP_DELAY_1023	3069 ≤ PRACH Propagation delay	chip

# 9.2.12 Acknowledged PRACH preambles

The measurement period shall be 20 ms.

#### 9.2.12.1 Acknowledged PRACH preambles measurement report mapping

The Acknowledged PRACH preambles reporting range is from 0 ... 240 acknowledgements.

In table 9.57 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.57** 

Reported value	Measured quantity value	Unit
ACK_PRACH_PREAMPLE_000	Acknowledged PRACH preambles = 0	-
ACK_PRACH_PREAMPLE_001	Acknowledged PRACH preambles = 1	-
ACK_PRACH_PREAMPLE_002	Acknowledged PRACH preambles = 2	-
•••	***	
ACK_PRACH_PREAMPLE_237	Acknowledged PRACH preambles = 237	-
ACK_PRACH_PREAMPLE_238	Acknowledged PRACH preambles = 238	-
ACK_PRACH_PREAMPLE_239	Acknowledged PRACH preambles = 239	-
ACK_PRACH_PREAMPLE_240	Acknowledged PRACH preambles = 240	-

9.2.13 (void)

Table 9.58 (void)

9.2.14 (void)

Table 9.59 (void)

#### 9.2.15 SFN-SFN observed time difference

This measurement is needed for RTD estimation in UTRAN.

#### 9.2.15.1 Accuracy requirement

#### 9.2.15.1.1 Accuracy requirement without IPDL

The measurement period shall be [100] ms.

**Table 9.60** 

Parameter	Unit	Accuracy	Conditions
		[chip]	Range [chips]
SFN-SFN observed time	chip	+/- 0.5	-19200.0000 19200.0000
difference			

#### 9.2.15.1.2 Accuracy requirement with IPDL

The measurement period shall be [TBD] ms.

IPDL pattern parameters [TBD].

**Table 9.61** 

Parameter	Unit	Accuracy	Conditions
		[chip]	Range [chips]
SFN-SFN observed time	chip	+/- 0.5	-19200.0000 19200.0000
difference			

#### 9.2.15.2 SFN-SFN observed time difference measurement report mapping

The SFN-SFN observed time difference reporting range is from -19200.0000 ... 19200.0000 chip.

In table 9.62 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.62** 

Reported value	Measured quantity value	Unit
SFN-SFN_TIME _00000	-19200.0000 ≤ SFN-SFN observed time difference < -19199.9375	chip
SFN-SFN_TIME _00001	-19199.9375 ≤ SFN-SFN observed time difference < -19199.8750	chip
SFN-SFN_TIME _614398	19199.8750 ≤ SFN-SFN observed time difference < 19199.9375	chip
SFN-SFN_TIME _614399	19199.9375 ≤ SFN-SFN observed time difference ≤ 19200.0000	chip

# 9.2.16 Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission

The measurement period shall be 100 ms.

#### 9.2.16.1 Accuracy requirement

**Table 9.63** 

Parameter	Unit	Accuracy	Conditions
		[% units]	Range
Ptot	%	± 5	For 5% ≤ Transmitted carrier power of all codes not used
			for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH
			transmission ≤95%

# 9.2.16.2 Measurement report mapping for transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission

The reporting range for *Transmitted carrier power of all codes not used for HS-PDSCH*, *HS-SCCH*, *E-AGCH*, *E-RGCH or E-HICH transmission* is from 0 ... 100 %.

In table 9.64 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.64** 

Reported value	Measured quantity value	Unit
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_000	Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E- AGCH, E-RGCH or E-HICH transmission = 0	%
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_001	0 < Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission ≤ 1	%
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_002	1 < Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission ≤ 2	%
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_003	2 < Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission ≤ 3	%
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_098	97 < Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission ≤ 98	%
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_099	98 < Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission ≤ 99	%
Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission_100	99 < Transmitted carrier power of all codes not used for HS-PDSCH, HS-SCCH, E-AGCH, E-RGCH or E-HICH transmission ≤ 100	%

#### 9.2.17 DL Transmission Branch Load

This measurement is applicable in case of TX diversity.

The measurement period shall be 100 ms.

#### 9.2.17.1 Accuracy requirement

**Table 9.65** 

Parameter	Unit	Accuracy [% units]	Conditions
			Range
Pbranchtot	%	± 5	For 5% ≤ DL Transmission
			Branch Load ≤95%

# 9.2.17.2 DL Transmission Branch Load measurement report mapping

The reporting range for *DL Transmission Branch Load measurement* is from 0 ... 100 %.

In table 9.66 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.66** 

Reported value	Measured quantity value	Unit
branch_load _000	DL Transmission Branch Load = 0	%
branch_load _001	0 < DL Transmission Branch Load ≤ 1	%
branch_load _002	1 < DL Transmission Branch Load ≤ 2	%
branch_load _003	2 < DL Transmission Branch Load ≤ 3	%
***		•••
branch_load _098	97 < DL Transmission Branch Load ≤ 98	%
branch_load _099	98 < DL Transmission Branch Load ≤ 99	%
branch_load _100	99 < DL Transmission Branch Load ≤ 100	%
branch_load _101	DL Transmission Branch Load > 100	%

# 9.2.18 Received scheduled E-DCH power share (RSEPS)

The measurement period shall be 100 ms.

#### 9.2.18.1 Accuracy requirement

**Table 9.67** 

Parameter	Unit	Accuracy [dB]	Conditions
			Range
RSEPS	dB	± 3	For -15 dB $\leq$ RSEPS $\leq$ 0 dB

#### 9.2.18.2 Received scheduled E-DCH power share measurement report mapping

The reporting range for *Received scheduled E-DCH power share* is from -15  $\dots$  0 dB.

In table 9.yy the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9.68** 

Reported value	Measured quantity value	Unit
RSEPS _LEV _000	RSEPS < -15.0	dB
RSEPS _LEV _001	-15.0 ≤ RSEPS < -14.9	dB
RSEPS _LEV _002	-14.9 ≤ RSEPS < -14.8	dB
RSEPS _LEV _149	-0.2 ≤ RSEPS < -0.1	dB
RSEPS _LEV _150	-0.1 ≤ RSEPS < 0	dB
RSEPS _LEV _151	0 ≤ RSEPS	dB

# Annex A (normative): Test Cases

# A.1 Purpose of Annex

This Annex specifies test specific parameters for some of the functional requirements in chapters 4 to 9. The tests provide additional information to how the requirements should be interpreted for the purpose of conformance testing. The tests in this Annex are described such that one functional requirement may be tested in one or several test and one test may verify several requirements. Some requirements may lack a test.

The conformance tests are specified in TS34.121. Statistical interpretation of the requirements is described in Annex A.2.

# A.2 Requirement classification for statistical testing

Editors note: Each requirement in the annex have to be gone through and updated with which type it belongs to and in applicable cases, which success rate that defines the requirement. Tdoc R4 00 619 shall be used as a base for that work.

Requirements in this specification are either expressed as absolute requirements with a single value stating the requirement, or expressed as a success rate. There are no provisions for the statistical variations that will occur when the parameter is tested.

Annex A outlines the test in more detail and lists the test parameters needed. The test will result in an outcome of a test variable value for the DUT inside or outside the test limit. Overall, the probability of a "good" DUT being inside the test limit(s) and the probability of a "bad" DUT being outside the test limit(s) should be as high as possible. For this reason, when selecting the test variable and the test limit(s), the statistical nature of the test is accounted for.

The statistical nature depends on the type of requirement. Some have large statistical variations, while others are not statistical in nature at all. When testing a parameter with a statistical nature, a confidence level is set. This establishes the probability that a DUT passing the test actually meets the requirement and determines how many times a test has to be repeated and what the pass and fail criteria are. Those aspects are not covered by TS 25.133. The details of the tests, how many times to run it and how to establish confidence in the tests are described in TS 34.121. This Annex establishes what the test variable is and whether it can be viewed as statistical in nature or not.

# A.2.1 Types of requirements in TS 25.133

#### Time and delay requirements on UE higher layer actions

A very large part of the RRM requirements are delay requirements:

- In idle mode (A.4) there is cell re-selection delay.
- In UTRAN Connected Mode Mobility (A.5) there is measurement reporting delay, handover delay and cell reselection delay.
- In RRC Connection Control (A.6) there is RRC re-establishment delay and TFC blocking delay.

All have in common that the UE is required to perform an action observable in higher layers (e.g. camp on the correct cell) within a certain time after a specific event (e.g. a new strong pilot arises). The delay time is statistical in nature for several reasons, among others that measurements required by the UE are performed in a fading radio environment.

The variations make a strict limit unsuitable for a test. Instead there is a condition set for a correct action by the UE, e.g. that the UE shall camp on the correct cell within X seconds. Then the rate of correct events is observed during repeated tests and a limit is set on the rate of correct events, usually 90% correct events are required. How the limit is applied in the test depends on the confidence required, further detailed are in TS 34.121.

#### Measurements of power levels, relative powers and time

A very large number of requirements are on measurements that the UE performs:

- In UTRAN Connected Mode Mobility (A.5) there are measurement reports.
- Measurement performance requirements (A.8) has requirements on all type of measurements.

The accuracy requirements on measurements are expressed in this specification as a fixed limit (e.g. +/-X dB), but the measurement error will have a distribution that is not easily confined in fixed limits. Assuming a Gaussian distribution of the error, the limits will have to be set at +/-3.29 $\sigma$  if the probability of failing a "good DUT" in a single test is to be kept at 0.1%. It is more reasonable to set the limit tighter and test the DUT by counting the rate of measurements that are within he limits, in a way similar to the requirements on delay.

#### **Implementation requirements**

A few requirements are strict actions the UE should take or capabilities the UE should have, without any allowance for deviations. These requirements are absolute and should be tested as such. Examples are

- "Event triggered report rate" and "Active set dimension" in UTRAN Connected Mode Mobility (A.5)
- "Correct behaviour at time-out" in RRC connection control (A.6)

#### Physical layer timing requirements

All requirements on "Timing Characteristics" (A.7) are absolute limits on timing accuracy.

#### **BER** and **BLER** requirements

Some measurement report procedures in "UE Measurement procedures" (A.8) have requirements on DCH BLER. These are tested in the same way as BLER requirements in TS 25.101.

# A.3 RRM test configurations

# A.3.1 UE with single antenna connector

For testing a UE with a single UTRA antenna connector, the test configuration is fully described in sections A.4 to A.9

# A.3.2 UE with multiple antenna connectors

For testing a UE with multiple UTRA receive diversity antenna connectors, test signals from each cell in section A.4 to A.9 shall be generated with independent fading (fading applicable to test cases A.8.1.4, A.8.1.5, A.8.1.6, A.8.2.2 and A.8.2.3 only) and applied to each antenna port. For each carrier frequency specified in the testcase, independent noise shall be generated and applied to each antenna port.

The received power spectral density at each antenna connector n, denoted as  $\hat{l}or_{,n}$  shall be the same as to the received power spectal density  $\hat{l}or$  specified for testing a UE with a single antenna connector. The noise spectral density at each antenna connector n, denoted as  $loc_{,n}$  shall be the same as the noise spectral density  $loc_{,n}$  specified for testing a UE with a single antenna connector.

# A.4 Idle Mode

# A.4.1 (void)

#### A.4.2 Cell Re-Selection

Two scenarios are considered:

- Scenario 1: Single carrier case

- Scenario 2: Multi carrier case

For each of them a test is proposed.

NOTE: Existing scenarios cover only requirements in section 4.2.2.2 and 4.2.2.3. More scenarios, covering requirements in section 4.2.2.1, will be added later.

#### A.4.2.1 Scenario 1: Single carrier case

#### A.4.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the cell re-selection delay in the single carrier case reported in section 4.2.2.

This scenario implies the presence of 1 carrier and 6 cells as given in tables A.4.1 and A.4.2. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.1: General test parameters for Cell Re-selection single carrier multi-cell case

	Parameter	Unit	Value	Comment
Initial Active cell			Cell2	
condition Neighbour cells			Cell1, Cell3,Cell4, Cell5, Cell6	
Final Active cell condition			Cell1	
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		s 15		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.2: Cell re-selection single carrier multi-cell case

Parameter	Unit	Ce	II 1	Ce	II 2	Ce	II 3	Ce	II 4	Ce	II 5	Ce	II 6	
		T1	T2											

UTRA RF Channel Number		Chanr	nel 1	Chann	el 1	Channel 1	Channel 1	Channel 1	Channel 1
CPICH_Ec/lor	dB	-10		-10		-10	-10	-10	-10
PCCPCH_Ec/lor	dB	-12		-12		-12	-12	-12	-12
SCH_Ec/lor	dB	-12		-12		-12	-12	-12	-12
PICH_Ec/lor	dB	-15		-15		-15	-15	-15	-15
OCNS_Ec/lor	dB	-0.941		-0.941		-0.941	-0.941	-0.941	-0.941
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27	0.27	0.27	0.27
$I_{oc}$	dBm / 3,84 MHz	-70							
CPICH_Ec/lo	dB	-16	-13	-13	-16	-23	-23	-23	-23
Propagation Condition		AWG	1						
Cell_selection_and_		CPICH	$H E_c/N_0$	CPICH	$H E_c/N_0$	CPICH E <sub>c</sub> /N <sub>0</sub>	CPICH E <sub>0</sub> /N <sub>0</sub>	CPICH E <sub>0</sub> /N <sub>0</sub>	CPICH E <sub>c</sub> /N <sub>0</sub>
reselection_quality_measure									
Qqualmin	dB	-20		-20		-20	-20	-20	-20
Qrxlevmin	dBm	-115		-115		-115	-115	-115	-115
UE_TXPWR_MAX_ RACH	dB	21		21		21	21	21	21
Qoffset2 <sub>s, n</sub>	dB	C1, C	2: 0	C2, C1	1: 0	C3, C1: 0	C4, C1: 0	C5, C1: 0	C6, C1: 0
,		C1, C	3: 0	C2, C3	3: 0		C4, C2: 0	C5, C2: 0	C6, C2: 0
		C1, C		C2, C4			C4, C3: 0	C5, C3: 0	C6, C3: 0
		C1, C		C2, C5	5: 0	C3, C5: 0	C4, C5: 0	C5, C4: 0	C6, C4: 0
		C1, C	6: 0	C2, C6	6: 0	C3, C6: 0	C4, C6: 0	C5, C6: 0	C6, C5: 0
Qhyst2	dB	0		0		0	0	0	0
Treselection	S	0		0		0	0	0	0
Sintrasearch	dB	not se	nt	not se	nt	not sent	not sent	not sent	not sent

#### A.4.2.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 1.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateFDD} + T_{SI}$ ,

where:

 $T_{evaluateFDD}$  See Table 4.1 in section 4.2.2.

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to

camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

#### A.4.2.2 Scenario 2: Multi carrier case

#### A.4.2.2.1 Test Purpose and Environment

This test is to verify the requirement for the cell re-selection delay in the multi carrier case reported in section 4.2.2.

This scenario implies the presence of 2 carriers and 6 cells as given in tables A.4.3 and A.4.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.3: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment		
Initial	Active cell		Cell2			
condition	Neighbour cells		Cell1, Cell3,Cell4,			
			Cell5, Cell6			
Final	Active cell		Cell1			
condition						
	rvice Class (ASC#0)	-	1	Selected so that no additional delay is caused by		
- Persisten	ce value			the random access procedure. The value shall be		
				used for all cells in the test.		
HCS				Not used		
DRX cycle	DRX cycle length		1.28	The value shall be used for all cells in the test.		
T1	T1		S		30	T1 need to be defined so that cell re-selection
				reaction time is taken into account.		
T2	T2 s		S		15	T2 need to be defined so that cell re-selection
				reaction time is taken into account.		

Table A.4.4: Cell re-selection multi carrier multi cell case

Parameter	Unit	Ce	ell 1	Ce	ell 2	Се	II 3	Ce	ll 4	Ce	II 5	Ce	ell 6
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Chann	nel 1	Chann	nel 2	Chann	el 1	Chann	nel 1	Chann	nel 2	Chann	el 2
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/lor	dB	-0.941	1	-0.941		-0.941		-0.941		-0.941		-0.941	
$ \hat{I}_{or}/I_{oc} $	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
$I_{oc}$	dBm / 3,84 MHz	-70											
CPICH_Ec/lo	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_		CPICH	$H E_c/N_0$	CPICH	$H E_c/N_0$	CPICH	$E_c/N_0$	CPICH	$H E_c/N_0$	CPICH	$H E_c/N_0$	CPICH	$H E_c/N_0$
reselection_quality_measure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_ RACH	dB	21		21		21		21		21		21	
Qoffset2 <sub>s, n</sub>	dB	C1, C2	2: 0	C2, C	1: 0	C3, C1	1: 0	C4, C	1: 0	C5, C'	1: 0	C6, C1	1: 0
		C1, C		C2, C		C3, C2		C4, C2		C5, C2		C6, C2	
		C1, C4		C2, C4		C3, C4		C4, C		C5, C3		C6, C3	
		C1, C		C2, C		C3, C5		C4, C		C5, C4		C6, C4	
		C1, C6	3: 0	C2, C	6: 0	C3, C6	S: 0	C4, C	3: 0	C5, C6	3: 0	C6, C5	5: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0		0		0		0	
Sintrasearch	dB	not se		not se		not sei		not se		not se		not se	
Sintersearch	dB	not se	nt	not se	nt	not sei	nt	not se	nt	not se	nt	not se	nt

#### A.4.2.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 1.

The cell re-selection delay shall be less than  $8\ s.$ 

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateFDD} + T_{SI}$ ,

where:

 $T_{evaluateFDD}$  See Table 4.1 in section 4.2.2.

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to

camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

## A.4.3 UTRAN to GSM Cell Re-Selection

#### A.4.3.1 Scenario 1

#### A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		S	1.28	
HCS				Not used
T1		S	45	
T2		S	35	

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (l	JTRA)
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
OCNS_Ec/lor	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/lo	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E√I	$N_0$
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Qoffset1 <sub>s, n</sub>	dB	C1, C2: 0	
Qhyst1	dB	0	
Treselection	S	0	
Ssearch <sub>RAT</sub>	dB	not sent	•

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)		
Parameter	Onit	T1	T2	
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-90	-75	
RXLEV_ACCESS_MIN	dBm	-104		
MS_TXPWR_MAX_CCH	dBm	33	·	

#### A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than  $26 \text{ s} + T_{BCCH}$ , where  $T_{BCCH}$  is the maximum time allowed to read BCCH data from GSM cell [21].

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $4*T_{measureGSM} + T_{BCCH}$ , where:

 $T_{measureGSM}$  See Table 4.1 in section 4.2.2.

T<sub>BCCH</sub> Maximum time allowed to read BCCH data from GSM cell [21].

According to [21], the maximum time allowed to read the BCCH data, when being synchronized

to a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s +  $T_{BCCH}$ , allow 26 s +  $T_{BCCH}$  in the test case.

#### A.4.3.2 Scenario 2

#### A.4.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.7A, A.4.7B, A.4.7C. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.7A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter			Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		S	1.28	
HCS				Not used
T1		S	45	
T2		s	12	

Table A.4.7B: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)		
		T1	T2	
UTRA RF Channel Number		Channel 1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
OCNS_Ec/lor	dB	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	20	-9	
$I_{oc}$	dBm/3,84 MHz	-81		
CPICH_Ec/lo	dB	-10.0	-19.5	
CPICH_RSCP	dBm	-70	-100	
Propagation Condition		AWGN		
Cell_selection_and_		CPICH E	/Na	
reselection_quality_measure		CHICHE	91 <b>4</b> 0	
Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
UE_TXPWR_MAX_RACH	dBm	21		
Qoffset1 <sub>s, n</sub>	dB	C1, C2: 0		
Qhyst1	dB	0		
Treselection	S	0		
Ssearch <sub>RAT</sub>	dB	not sent		

Table A.4.7C: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2	(GSM)
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

#### A.4.3.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 7.7 s +  $T_{BCCH}$ , where  $T_{BCCH}$  is the maximum time allowed to read BCCH data from GSM cell [21].

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $Max(3*T_{measureFDD}, T_{measureGSM} + DRX cycle length) + T_{BCCH}$ , where:

T<sub>measureFDD</sub> See Table 4.1 in section 4.2.2.

T<sub>measureGSM</sub> See Table 4.1 in section 4.2.2.

DRX cycle length 1.28s see Table A.4.7.A

T<sub>BCCH</sub> Maximum time allowed to read BCCH data from GSM cell [21].

According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 7.68 s +  $T_{BCCH}$ , allow 7.7 s +  $T_{BCCH}$  in the test case.

#### A.4.3.3 Scenario 3

#### A.4.3.3.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2 when measurement rules according to HCS is used.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.7D, A.4.7E, A.4.7F. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.7D: General test parameters for UTRAN to GSM Cell Re-selection

	Unit	Value	Comment	
Initial condition		Cell1		
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		S	1.28	
HCS				Used
T1		S	45	
T2		S	45	

Table A.4.7E: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1	(UTRA)	
		T1	T2	
UTRA RF Channel Number		Channel 1	ĺ	
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
OCNS_Ec/lor	dB	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	40	10	
$I_{oc}$	dBm/3,84 MHz	-100		
CPICH_Ec/lo	dB	-10.0	-10.4	
CPICH_RSCP	dBm	-70	-100	
Propagation Condition		AWGN		
Cell_selection_and_		CPICH E₀/N₀		
reselection_quality_measure		OI IOII L	9110	
Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
UE_TXPWR_MAX_RACH	dBm	21		
Qoffset1 <sub>s, n</sub>	dB	C1, C2: 0		
Qhyst1	dB	0		
Treselection	S	0		
Ssearch <sub>RAT</sub>	dB	0		
SHCS,RATm	dB	25		
S <sub>limit,SearchRAT</sub>	dB	0		
Penalty_time	S	0 (default value)		
HCS_PRIO		0 (default value)		
Qhcs		0 (default value)		
T <sub>Crmax</sub>	s	not used (default va	alue)	

Table A.4.7F: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2	(GSM)
		T1	T2
Absolute RF Channel Number		ARFCN '	1
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

#### A.4.3.3.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than  $37.7 \text{ s} + T_{BCCH}$ , where  $T_{BCCH}$  is the maximum time allowed to read BCCH data from GSM cell [21].

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to unidentified GSM cells can be expressed as:  $30 \text{ s} + T_{\text{measureGSM}} + DRX$  cycle length  $+ T_{\text{BCCH}}$ , where:

 $T_{measureFDD}$  See Table 4.1 in section 4.2.2.

T<sub>measureGSM</sub> See Table 4.1 in section 4.2.2.

DRX cycle length 1.28s see Table A.4.7D

T<sub>BCCH</sub> Maximum time allowed to read BCCH data from GSM cell [21].

According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 37.68 s +  $T_{BCCH}$ , allow 37.7 s +  $T_{BCCH}$  in the test case.

#### A.4.4 FDD/TDD Cell Re-selection

#### A.4.4.1 Test Purpose and Environment

#### A.4.4.1.1 3,84 Mcps TDD Option

This test is to verify the requirement for the FDD/TDD cell re-selection delay reported in section 4.2.2.

This scenario implies the presence of UTRA FDD and 1 UTRA TDD cell as given in Table A.4.8, A.4.9 and A.4.10. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.8: General test parameters for FDD/TDD Cell Re-selection

	Parameter		Value	Comment
Initial condition	Active cell		Cell1	FDD cell
	Neighbour cells		Cell2	TDD cell
Final condition	Active cell		Cell2	TDD cell
UE_TXPWR_MA	AX_RACH	dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
DRX cycle length	า	S	1.28	The value shall be used for all cells in the test.
T1		S	15	
T2		S	15	

Table A.4.9: Cell 1 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	Unit		Cell 1
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
P-CCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
OCNS_Ec/lor	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	9	3
$I_{oc}$	dBm / 3,84 MHz	-70	
CPICH_RSCP	dBm	-71	-77
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH_Ec/No	
Qrxlevmin	dBm	-115	
Qoffset1 <sub>s,n</sub>	dB	0	
Qhyst1	dB	0	
PENALTY_TIME	S	0	
TEMPORARY_OFFSET	dB	0	
Treselection	S	0	
Sintrasearch	dB	not sent	
Sintersearch	dB	not sent	

Table A.4.10: Cell 2 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	Unit	Cell 2				
DL timeslot number			0		8	
		T1	T2	T1	T2	
UTRA RF Channel Number		Channel 2	2			
P-CCPCH_Ec/lor	dB	-3		n.a.		
PICH_Ec/lor	dB	n.a.		-3		
SCH_Ec/lor	dB	-9				
SCH_t <sub>offset</sub>	dB	10				
OCNS_Ec/lor	dB	-3.12				
$\hat{I}_{or}/I_{oc}$	dB	-4	2	-4	2	
P-CCPCH RSCP	dBm	-77	-71	n.a.	n.a.	
$I_{oc}$	dBm/3,84 MHz	-70				
Propagation Condition		AWGN				
Qrxlevmin	dBm	-103				
Qoffset2 <sub>s,n</sub>	dB	0				
Qhyst2	dB	0				
PENALTY_TIME	S	0				
TEMPORARY_OFFSET	dB	0				
Treselection	S	0				
Sintrasearch	dB	not sent				
Sintersearch	dB	not sent		•		
	Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

#### A.4.4.1.2 1.28 Mcps TDD Option

This test is to verify the requirement for the FDD/TDD cell re-selection delay reported in section 4.2.2.

This scenario implies the presence of UTRA FDD and 1 UTRA TDD cell as given in Table A.4.11, A.4.12 and A4.13. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.11: General test parameters for FDD/TDD cell re-selection

Para	Parameter		Value	Comment
Initial condition	Active cell		Cell1	FDD cell
	Neighbour cells		Cell2	TDD cell
Final condition	Active cell		Cell2	TDD cell
UE_TXPWR_MAX	_RACH	dBm	21	The value shall be used for all cells in the test.
Access Service Cla	ass (ASC#0)		1	Selected so that no additional delay is caused by the
- Persistence value	- Persistence value			random access procedure. The value shall be used for all cells in the test.
HCS				Not used
DRX cycle length		S	1.28	The value shall be used for all cells in the test.
T1		S	15	The value shall be used for all cells in the test.
T2		S	15	

Table A.4.12: FDD/TDD cell re-selection

Parameter	Unit		Cell 1
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
P-CCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
OCNS_Ec/lor	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	9	3
$I_{oc}$	dBm / 3,84 MHz	-70	
CPICH_RSCP	dBm	-71	-77
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH_Ec/No	
Qrxlevmin	dBm	-115	
Qoffset1 <sub>s,n</sub>	dB	0	
Qhyst1	dB	0	
Treselection	S	0	
Sintrasearch	dB	not sent	
Sintersearch	dB	not sent	

Table A.4.13: Cell 2 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	Unit	Cell 2			
DL timeslot number		0		Dw	PTs
		T1	T2	T1	T2
UTRA RF Channel Number		Channel	2		
P-CCPCH_Ec/lor	dB	-3			
DwPCH _Ec/lor	dB			0	
OCNS_Ec/lor	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-4	2	-4	2
P-CCPCH RSCP	dBm	-77	-71		
$I_{oc}$	dBm/1.28 MHz	-70		•	
Propagation Condition		AWGN			
Qrxlevmin	dBm	-103			
Qoffset1 <sub>s,n</sub>	dB	0			
Qhyst1	dB	0			
Treselection	S	0			
Sintrasearch	dB	not sent			
Sintersearch	dB	not sent			

### A.4.4.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

 $T_{evaluateTDD} + T_{SI} \\$ 

where:

 $T_{evaluateTDD}$  See Table 4.1 in section 4.2.2.

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

#### A.4.5 UTRAN to E-UTRA Cell Reselection

## A.4.5.1 E-UTRA FDD is of higher priority

#### A.4.5.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA FDD to E-UTRA FDD inter-RAT cell reselection delay reported in section 4.2.

The test scenario comprises two different cells, with cell 1 being the UTRA serving cell and cell 2 being the E-UTRA cell to be re-selected to. Test parameters are given in Tables A.4.14, A.4.15, A.4.16. The test consists of three successive time periods, with time duration of T1, T2, and T3, respectively. UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

Cell 1 and cell 2 shall belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.14: General test parameters for UTRAN to E-UTRA Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
T2 end condition	Active cell		Cell2	UE shall
				perform
				reselection to
				cell 2 during T2
	Neighbour cell		Cell1	
T3 end condition	Active cell		Cell1	UE shall
				perform
				reselection to
				cell 1 during T3
	Neighbour cell		Cell2	
DRX cycle length		S	1.28	
HCS				Not used
E-UTRA PRACH o	onfiguration		4	As specified in
				table 5.7.1-2 in
				TS 36.211
E-UTRA access ba	arring information		Not sent	No additional
				delays in
				random access
				procedure
T1		S	>20	During T1, cell
				2 shall be
				powered off,
				and during the
				off time its
				physical cell
				identity shall be
				changed. The
				intention is to
				ensure that cell
				2 has not been
				detected by the
				UE prior to the
				start of period
To			0.5	T2.
T2		S	85	T2 needs to be
				defined so that
				cell re-selection reaction time is
				taken into
				account.
T3		s	25	T3 needs to be
13		5	20	defined so that
				cell re-selection
				reaction time is
				taken into
				account.
			1	account.

Table A.4.15: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 1)

Parameter	Unit	С	ell 1 (UTR	A)
		T1	T2	T3
UTRA RF Channel Number		Channel	1	
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
OCNS_Ec/lor	dB	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	13	13	13
$I_{oc}$	dBm/3,84 MHz	-70		
CPICH_Ec/lo	dB	-10.21	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67	-67
Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
UE_TXPWR_MAX_RACH	dBm	21		
Treselection	S	0		
Sprioritysearch1	dB	42		
Sprioritysearch2	dB	0		
S <sub>searchE-UTRA</sub>	dB	Not sent		
Thresh <sub>x, high</sub> (Note 1)	dB	48		
Propagation Condition		AWGN		
Note 1: This refers to the value				UTRA
system information, and is a threshold for the E-UTRA target cell.				

Table A.4.16: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 2)

Parameter	Unit	Cell 2				
		T1	T2	T3		
E-UTRA RF Channel		2				
number						
BW <sub>channel</sub>	MHz	10				
OCNG Patterns defined in						
TS 36.133 A.3.2.1.2 (OP.2			OP.2 FDI	)		
FDD) [24]						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
Qrxlevmin	dBm		-140			
$N_{oc}$	dBm/15 kHz		-98			
RSRP	dBm/15 KHz	-infinity	-86	-102		
$\hat{E}_s/N_{oc}$	dB	-infinity	12	-4		
$\hat{E}_{s}/I_{ot}$	dB	-infinity	12	-4		
Treselection <sub>EUTRAN</sub>	S	0				
Snonintrasearch	dB	Not sent				
Thresh <sub>serving, low</sub>	dB		44			

Thresh <sub>x, low</sub> (Note 2)	dB	42
Propagation Condition		AWGN

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, low</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

#### A.4.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 81 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{higher\_priority\_search} + T_{evaluateEUTRA} + T_{SI}$ , where:

 $T_{higher\_priority\_search}$  See section 4.2.2

T<sub>evaluateEUTRA</sub> See Table 4.2 in section 4.2.2.5a

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to

camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s, allow 81 s in the test case.

## A.4.5.2 E-UTRA FDD is of lower priority

#### A.4.5.2.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to E-UTRAN cell reselection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 E-UTRAN cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UTRAN carrier and 1 E-UTRAN carrier. Test parameters are given in Table, A.4.17, A.4.18, A.4.19. The test consists of two successive time periods, with time duration of T1 and T2, respectively. Both UTRA cell 1 and E-UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.17: General test parameters for UTRAN to E-UTRAN Cell Re-selection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	UTRAN cell
	Neighbour cell		Cell 2	E-UTRAN cell
Final condition	Active cell		Cell 2	UE shall
				perform
				reselection to
				cell 2 during T3
DRX cycle length		S	1.28	
HCS				Not used
E-UTRA PRACH o	onfiguration		4	As specified in
				table 5.7.1-2 in
				TS 36.211
E-UTRA access ba	arring information		Not sent	No additional
				delays in
				random access
T4			0.5	procedure
T1		S	85	T1 need to be
				defined so that cell re-selection
				reaction time is
				taken into
				account.
T2		S	25	T2 need to be
'-		3	25	defined so that
				cell re-selection
				reaction time is
				taken into
				account.

Table A.4.18: Cell re-selection UTRAN to E-UTRAN cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
		T1	T2		
UTRA RF Channel Number		Channel 1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
OCNS_Ec/lor	dB	-0.941			
$\hat{I}_{or}/I_{oc}$	dB	11	-5		
$I_{oc}$	dBm/3,84 MHz	-70			
CPICH_Ec/lo	dB	-10.33	-16.19		
CPICH_RSCP	dBm	-69	-85		
Propagation Condition		AWGN			
Cell_selection_and_ reselection_quality_measure		CPICH E <sub>∂</sub> I	$N_0$		
Qqualmin	dB	-20			
Qrxlevmin	dBm	-115			
UE_TXPWR_MAX_RACH	dBm	21			
Qhyst1	dB	0			
Treselection	S	0			
Sprioritysearch1	dB	62	-		
Sprioritysearch2	dB	0			
Thresh <sub>serving, low</sub>	dB	36			
Thresh <sub>x, low</sub> (Note 1)	dB	50			
Note 1: This refers to the value of Thresh,, which is included in					

Note 1 : This refers to the value of  $\mbox{ Thresh}_{x,\mbox{ low}}$  which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Table A.4.19: Cell re-selection UTRAN to E-UTRAN cell case (cell 2)

Parameter	Unit	Cell 2 (E	-UTRA)	
		T1	T2	
E-UTRA RF Channel		•	1	
number				
BW <sub>channel</sub>	MHz	1	0	
OCNG Patterns defined in				
A.3.2.1.1 (OP.2 FDD)		OP.2	FDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	(	)	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA <sup>Note 1</sup>	dB			
OCNG_RB <sup>Note 1</sup>	dB			
Qrxlevmin	dBm	-1-	40	
$N_{oc}$	dBm/15 kHz	-6	98	
RSRP	dBm/15 KHz	-84	-84	
$\hat{E}_s/N_{oc}$	dB	14	14	
$\hat{E}_{s}/I_{ot}$	dB	14 14		
Treselection <sub>EUTRAN</sub>	S	Ö		
Snonintrasearch	dB	50		
Thresh <sub>x, high</sub>	dB	40		
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, high</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target

#### A.4.5.2.2 Test Requirements

The cell reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 21 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateEUTRA} + T_{SI\text{-}EUTRA}$ , where:

T<sub>evaluateEUTRA</sub> See Table 4.2 in section 4.2.2.

T<sub>SI-EUTRA</sub> Maximum time allowed to read system information from a E-UTRA cell [24].

According to [24], the maximum time allowed to read relevant system info blocks, that need to be

received by the UE to camp on a cell, is 1280 ms.

This gives a total of 20.48 s, allow 21 s in the test case.

## A.4.5.3 RSRQ based reselection when E-UTRA FDD is of higher priority

#### A.4.5.3.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA FDD to E-UTRA FDD inter-RAT cell reselection delay reported based on RSRQ measurement in section 4.2.

The test scenario comprises two different cells, with cell 1 being the UTRA serving cell, cell 2 being the E-UTRA cell to be re-selected to. Test parameters are given in Tables A.4.20, A.4.21, A.4.22. The test consists of four successive time periods, with time duration of T1, T2, T3 and T4, respectively. UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

Cell 1 and cell 2 shall belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.20: General test parameters for UTRAN to E-UTRA Cell Reselection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
T2 end condition	Active cell		Cell1	UE shall not perform reselection to cell 2 during T2
	Neighbour cell		Cell2	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	
T4 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T4
	Neighbour cell		Cell2	
DRX cycle length		S	1.28	
HCS				Not used
E-UTRA PRACH co	nfiguration		4	As specified in table 5.7.1-2 in TS 36.211
E-UTRA access bar	ring information		Not sent	No additional delays in random access procedure
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time its physical cell identity shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		S	85	T2 needs to be defined, in order to ensure UE do not conduct cell reselect to Cell2
Т3		S	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.
T4		S	25	T4 needs to be defined, in order to ensure UE conducting cell reselection to Cell 1 by end of the T4.

Table A.4.21: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 1)

T4
13
-10.21
-67

Note 1: This refers to the value of Thresh<sub>x, highQ</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

Table A.4.22: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 2)

Parameter	Unit	Cell 2				
		T1	T2	T3	T4	
E-UTRA RF Channel Number			2			
BW <sub>channel</sub>	MHz		10			
OCNG Patterns defined in A.3.2.1.2			OP.2 FI	OD		
(OP.2 FDD)						
PBCH_RA	dB		0			
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
Qrxlevmin	dBm		-140			
Qqualmin	dB		-20			
$N_{oc}$	dBm/15 kHz		-98			
RSRP	dBm/15 kHz	-inf	-105.5	-84.91	-105.5	
RSRQ	dB	-inf	-19	-11	-19	
$\hat{E}_{s}/I_{ot}$	dB	-inf	-7.50	13.09	-7.50	
$\hat{E}_s/N_{oc}$	dB	-inf	-7.50	13.09	-7.50	
Treselection	S	0				
Snonintrasearch	dB	Not sent				
Thresh <sub>serving, lowQ</sub>		5				
Thresh <sub>x, lowQ</sub> (Note 2)		5				
Propagation Condition			AWGI	V		

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, lowQ</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

#### A.4.5.3.2 Test Requirements

The UE shall not send preambles on the PRACH before the end of T2.

The cell re-selection delay is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2. The cell re-selection delay shall be less than 21 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{higher\_priority\_search} + T_{evaluateEUTRA} + T_{SI}$ , where:

 $T_{higher\_priority\_search}$  See section 4.2.2, where, this value should be 0s, since the cell2 shall be already indentified at the beginning of T3

T<sub>evaluateEUTRA</sub> See Table 4.2 in section 4.2.2.5a

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s in the test case.

## A.5 UTRAN Connected Mode Mobility

## A.5.1 FDD/FDD Soft Handover

#### A.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the soft handover delay in CELL\_DCH state specified in section 5.1.2.

The test parameters are given in Table A.5A and A.5B below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A shall be used, and that CPICH Ec/Io and SFN-CFN observed time difference shall be reported together with Event 1A. The test consists of six successive time periods, with a time duration of T1, T2, T3, T4, T5 and T6 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

Table A.5A: General test parameters for Soft handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement	As specified in TS 25.101 section
			Channel 12.2 kbps	A.3.1
Power Control			On	
Target quality value	ue on DTCH	BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
Reporting range		dB	3	Applicable for event 1A and 1B
Hysteresis		dB	0	
W			1	Applicable for event 1A and 1B
Reporting deactive	ation threshold		0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		S	5	
T2		s	3	
T3		s	0.5	
T4		ms	60	This is the requirement on active set update delay, see section 5.1.2.2, where KC=1 and OC=0.
T5		ms	20	
T6		s	2	

Table A.5B: Cell specific test parameters for Soft handover

Parameter	Unit		Cell 1			Cell 2							
		T1	T2	T3	T4	T5	T6	T1	T2	T3	T4	T5	T6
CPICH_Ec/lor	dB	-10						-10					
PCCPCH_Ec/lor	dB	-12						-12					
SCH_Ec/lor	dB	-12						-12					
PICH_Ec/lor	dB	-15						-15					
DPCH_Ec/lor	dB	Note1	Note1	Note1		N/A	N/A	N/A	N/A	Note3	Note1	Note1	
OCNS		Note2	Note2	Note2		-0.94	-0.94	-0.94	-0.94	Note2	Note2	Note2	
$\hat{I}_{or}/I_{oc}$	dB	0	2.91	2.91		2.91	2.91	-Inf	2.91	2.91	2.91	2.91	
$I_{oc}$	dBm/ 3,84 MHz	-70								·			
CPICH_Ec/lo	dB	-13	-14	-14		-14	-14	-Inf	-14	-14	-14	-14	
Propagation Condition		AWGN	AWGN										
Relative delay of	chips	{-148 .	{-148 148}										
paths received from		Note 4											
cell 2 with respect to cell 1													

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{
m or}$ 

NOTE 3: The DPCH level is controlled by the power control loop. The initial power shall be set equal to the DPCH\_Ec/lor of Cell 1 at the end of T2.

NOTE 4: The relative delay of the path from cell 2 with respect to cell 1 shall always be within ±148 chip.

#### A.5.1.1.1 Test procedure

- 1) The test is started at the beginning of T1.
- 2) During time period T2 an Event 1A triggered measurement report shall be sent by the UE containing the CFN-SFN observed time difference between cell 1 and cell 2.
- 3) At the beginning of T3 the downlink DPCH of cell 2 shall be activated.
- 4) UTRAN shall send a Active Set Update command with activation time now adding cell 2 to the active set. The Active Set Update message shall be sent to the UE so that the whole message is available at the UE at the beginning of T4.
- 5) At the beginning of T5 the DPCH from cell 1 shall be switched off.

### A.5.1.2 Test Requirements

The measured quality on the DTCH of the UE downlink during T6 shall be BLER=0.01±30%.

#### A.5.2 FDD/FDD Hard Handover

#### A.5.2.1 Handover to intra-frequency cell

#### A.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the hard handover delay in CELL\_DCH state in the single carrier case reported in section 5.2.2.1.

The test parameters are given in Table A.5.0 and A.5.0A below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods,

with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time "now" with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE during period T2, after the UE has reported event 1A. T3 is defined as the end of the last TTI containing the physical channel reconfiguration message.

Table A.5.0: General test parameters for Handover to intra-frequency cell

Par	ameter	Unit Value		Comment
DCH parameters			DL and UL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality va	alue on DTCH	BLER	0.001	
Initial	Active cell		Cell 1	
conditions	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
Reporting range	)	dB	3	Applicable for event 1A and 1B
Hysteresis		dB	0	
W			1	Applicable for event 1A and 1B
Reporting deact	ivation threshold		0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		S	5	
T2	·	S	≤5	
T3		S	1	

Table A.5.0A: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	T3	T1	T2	T3	
CPICH_Ec/lor	dB	-10			-10			
PCCPCH_Ec/lor	dB	-12			-12			
SCH_Ec/lor	dB	-12			-12			
PICH_Ec/lor	dB	-15			-15			
DPCH_Ec/lor	dB	Note1	Note1	Note3	N/A	N/A	Note1	
OCNS		Note2	Note2	Note2	-0.941	-0.941	Note2	
$\hat{I}_{or}/I_{oc}$	dB	0	6.97		-Infinity	5.97		
$I_{oc}$	dBm/	-70						
OC .	3,84 MHz							
CPICH_Ec/lo	dB	-13			-Infinity	-14		
Propagation		AWGN	•			•		
Condition								

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ .

Note 3: The DPCH may not be power controlled by the power control loop.

#### A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

## A.5.2.2 Handover to inter-frequency cell

#### A.5.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter frequency hard handover delay in CELL\_DCH state as specified in section 5.2.2.1.

The test consists of three successive time periods, with a time duration T1, T2 and T3. The test parameters are given in tables A.5.0B and A.5.0C below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time "now" with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE during period T2, after the UE has reported event 2C T3 is defined as the end of the last TTI containing the physical channel reconfiguration message.

Table A.5.0B: General test parameters for Handover to inter-frequency cell

Para	Parameter l		Value	Comment
DCH parameters	DCH parameters		DL and UL Reference	As specified in TS 25.101 section
·			Measurement Channel 12.2 kbps	A.3.1 and A.2.1
Power Control			On	
Target quality val	ue on DTCH	BLER	0.001	
Compressed mode			A.22 set 1	As specified in TS 25.101 section A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non us	sed frequency	dB	-18	Absolute Ec/I0 threshold for event 2C
Hysteresis		dB	0	
W non-used frequ	uency		1	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.0C: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
UTRA RF Channel Number		Channel	1		Channel	2		
CPICH_Ec/lor	dB	-10			-10			
PCCPCH_Ec/lor	dB	-12			-12			
SCH_Ec/lor	dB	-12	-12			-12		
PICH_Ec/lor	dB	-15			-15			
DPCH_Ec/lor	dB	Note 1	Note 1	Note3	N/A	N/A	Note 1	
OCNS		Note 2			-0.941	-0.941	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	0			-Infinity	-1.8	-1.8	
$I_{oc}$	dBm/3,84 MHz	-70						
CPICH_Ec/lo	dB	-13			-Infinity	-14	-14	
Propagation Condition		AWGN						

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ 

NOTE 3: The DPCH may not be power controlled by the power control loop.

#### A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 220 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

### A.5.3 (void)

Table A.5.0CA: (void)

Table A.5.0CB: (void)

Table A.5.0CC: (void)

Table A.5.0CD: (void)

Table A.5.0CE: (void)

Table A.5.0CF: (void)

## A.5.4 Inter-system Handover from UTRAN FDD to GSM

#### A.5.4.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell handover delay reported in section 5.4.2.1.

The test parameters are given in Table A.5.0D, A.5.0E and A.5.0F below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used.. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

The UTRAN shall send a Handover from UTRAN command with activation time "now" with a new active cell, cell 2. In the GSM Handover command contained in that message, the IE starting time shall not be included. The RRC HANDOVER FROM UTRAN COMMAND message shall be sent to the UE. The start of T3 is defined as the end of last TTI containing the HO command.

The requirements are also applicable for a UE not requiring compressed mode, in which case no compressed mode pattern should be sent for the parameters specified in table A5.0D

Table A.5.0D: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.001	
Compressed mode patterns - GSM carrier RSSI			Only applicable for UE requiring compressed mode patterns
measurement		DL Compressed mode reference pattern 2 in Set 2	As specified in table A.22 TS 25.101 section A.5
- GSM Initial BSIC identification		Pattern 2	As specified in section 8.1.2.5.2.1 table 8.7.
- GSM BSIC re- confirmation		Pattern 2	As specified in section 8.1.2.5.2.2 table 8.8.
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
N Identify abort		66	Taken from table 8.7.
T Reconfirm abort		5.5	Based on table 8.8 and requirement specified in section 10.3.6.33 of TS 25.331.
T1	S	20	
T2	S	5	
T3	S	1	

Table A.5.0E: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)
		T1, T2, T3
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DCH_Ec/lor	dB	Note 1
OCNS_Ec/lor	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
$I_{oc}$	dBm/3,84 MHz	-70
CPICH_Ec/lo	dB	-13
Propagation Condition		AWGN

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall

make the total power from the cell to be equal to I<sub>or</sub>.

Table A.5.0F: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)		
Farameter	Onit	T1	T2, T3	
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-85	-75	

#### A.5.4.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 100 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay} = 90 \text{ ms} (Table 5.2) + T_{offset} + T_{UL}$ 

T<sub>offset</sub>: Equal to 4.65 ms, GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T<sub>UL</sub>: Equal to 4.65 ms, the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 99.3 ms, allow 100 ms in the test case.

## A.5.4a Inter-system Handover from UTRAN FDD to E-UTRAN FDD

#### A.5.4a.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN FDD to E-UTRAN FDD handover requirements specified in section 5.4a.

The test parameters are given in Table A.5.0G, A.5.0H and A.5.0I below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3A shall be used. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

The UTRAN shall send a Handover from UTRAN command with activation time "now" with a new active cell, cell 2. In the E-UTRAN Handover command contained in that message, the IE starting time shall not be included. The RRC HANDOVER FROM UTRAN COMMAND message shall be sent to the UE. The start of T3 is defined as the end of last TTI containing the HO command.

The requirements are also applicable for a UE not requiring compressed mode, in which case no compressed mode pattern should be sent for the parameters specified in table A.5.0G.

Table A.5.0G: General test parameters for UTRAN FDD to E-UTRAN FDD handover test case

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.001	
Compressed mode		DL Compressed mode reference pattern 2 in Set 5	Only applicable for UE requiring compressed mode patterns
			As specified in table A.22 TS 25.101 section A.5
Active cell		Cell 1	
UTRAN FDD measurement quantity		CPICH Ec/N0	
Inter-RAT (E- UTRAN) measurement		RSRP	
quantity			
Threshold own system	dB	-10	Absolute UTRAN CPICH Ec/N0 threshold for event 3A
Threshold other system	dBm	-99	Absolute E-UTRAN RSRP threshold for event 3A
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored UTRA FDD cell list size		24 UTRA FDD neighbours on Channel 1	Measurement control information is sent before the compressed mode patterns starts.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in TS 36.133 section A.3.1.1.1
PCFICH/PDCCH/PHI		DL Reference Measurement Channel	As specified in TS 36.133 section
CH parameters		R.6 FDD	A.3.1.2.1
PRACH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring Information	-	Not sent	No additional delays in random access procedure
T1	S	5	
T2	S	≤7	
T3	S	1	

Table A.5.0H: Cell specific test parameters for UTRAN FDD to E-UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (UTRA)		
		T1, T2, T3		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DCH_Ec/lor	dB	Note 1		
OCNS_Ec/lor	dB	Note 2		
$\hat{I}_{or}/I_{oc}$	dB	0		
$I_{oc}$	dBm/3,84 MHz	-70		
CPICH_Ec/lo	dB	-13		
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop				

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall

make the total power from the cell to be equal to I<sub>or</sub>.

Table A.5.0I: Cell specific test parameters for UTRAN FDD to E-UTRAN FDD handover test case (cell 2)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel			1	
number				
BW <sub>channel</sub>	MHz		10	
OCNG Patterns		OP.2	OP.2	OP.1 FDD
defined in A.3.2.1.1		FDD	FDD	
(OP.1 FDD) and in				
A.3.2.1.2 (OP.2 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB		0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA <sup>Note 1</sup>	dB			
OCNG_RB <sup>Note 1</sup>	dB			

$\hat{E}_{s}/I_{ot}$		dB	-infinity	7	7
$N_{oc}$ Note 2	2	dBm/15 kHz		-98	
$\hat{E}_s/N_{oc}$	Note 3	dB	-infinity	7	7
RSRP <sup>No</sup>	te 3	dBm/15 KHz	-infinity	-91	-91
lo Note 3		dBm/9 MHz	-70.22 -62.43 -62.4		-62.43
Propagat	ion Condition		AWGN		
Note 1:	OCNG shall b	e used such that b	ooth cells are	fully allocate	ed and a
Note 2:	constant total transmitted power spectral density is achieved for all OFDM symbols.  Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall				
Note 3:	be modelled as AWGN of appropriate power for $^{N_{\it oc}}$ to be fulfilled.				

#### A.5.4a.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 85 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

## A.5.4b Inter-system Handover from UTRAN FDD to E-UTRAN

#### A.5.4b.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN FDD to E-UTRAN TDD handover requirements specified in section 5.4b.

The test parameters are given in Table A.5.0J, A.5.0K and A.5.0L below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3A shall be used. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

The UTRAN shall send a Handover from UTRAN command with activation time "now" with a new active cell, cell 2. In the E-UTRAN Handover command contained in that message, the IE starting time shall not be included. The RRC HANDOVER FROM UTRAN COMMAND message shall be sent to the UE. The start of T3 is defined as the end of last TTI containing the HO command.

The requirements are also applicable for a UE not requiring compressed mode, in which case no compressed mode pattern should be sent for the parameters specified in table A.5.0J.

Table A.5.0J: General test parameters for UTRAN FDD to E-UTRAN TDD handover test case

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.001	
Compressed mode		DL Compressed mode reference pattern 2 in Set 5	Only applicable for UE requiring compressed mode patterns
			As specified in table A.22 TS 25.101 section A.5
Active cell		Cell 1	
UTRAN FDD		CPICH Ec/N0	
measurement quantity			
Inter-RAT (E-		RSRP	
UTRAN)			
measurement			
quantity			
Threshold own	dB	-10	Absolute UTRAN CPICH Ec/N0
system			threshold for event 3A
Threshold other	dBm	-99	Absolute E-UTRAN RSRP threshold for
system			event 3A
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored UTRA		24 UTRA FDD neighbours on Channel	Measurement control information is
FDD cell list size		1	sent before the compressed mode patterns starts.
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHI CH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
PRACH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring Information	-	Not sent	No additional delays in random access procedure
Special subframe		6	As specified in table 4.2-1 in 3GPP TS
configuration			36.211
Uplink-downlink		1	As specified in table 4.2-2 in 3GPP TS
configuration			36.211
PRACH configuration		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
T1	s	5	
T2	s	≤7	
T3	S	1	
	-		L

Table A.5.0K: Cell specific test parameters for UTRAN FDD to E-UTRAN TDD handover test case (cell 1)

Parameter	Unit	Cell 1 (UTRA)		
		T1, T2, T3		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DCH_Ec/lor	dB	Note 1		
OCNS_Ec/lor	dB	Note 2		
$\hat{I}_{or}/I_{oc}$	dB	0		
$I_{oc}$	dBm/3,84 MHz	-70		
CPICH_Ec/Io	dB	-13		
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop				

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall
make the total power from the cell to be equal to I<sub>or</sub>.

Table A.5.0L: Cell specific test parameters for UTRAN FDD to E-UTRAN TDD handover test case (cell 2)

Parameter	Unit	Cell 1 (E-UTRA)			
		T1 T2 T3		T3	
E-UTRA RF Channel			1		
number					
BW <sub>channel</sub>	MHz		10		
OCNG Patterns		OP.2	OP.2	OP.1 TDD	
defined in A.3.2.2.1		TDD	TDD		
(OP.1 TDD) and in					
A.3.2.2.2 (OP.2 TDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{E}_s/I_{ot}$	dB	-infinity	7	7	
$N_{oc}^{ m Note~2}$	dBm/15 kHz		-98		
$\hat{E}_s/N_{oc}$ Note 3	dB	-infinity	7	7	
RSRP Note 3	dBm/15 KHz	-infinity	-91	-91	
lo Note 3	dBm/9 MHz	-70.22	-62.43	-62.43	
Propagation Condition			AWGN	· ·	
Note 1: OCNG shall b	e used such that b	oth cells a	re fully allocated	ated and a	
constant total	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all				
OFDM symbo	OFDM symbols.				
Note 2: Interference fi	from other cells and noise sources not specified in the				
test is assume	imed to be constant over subcarriers and time and shall				
N					
be modelled a	be modelled as AWGN of appropriate power for $^{N}{}_{\!oc}$ to be fulfilled.				
Note 3: RSRP and lo	nd lo levels have been derived from other parameters for on purposes. They are not settable parameters themselves.				
information pu	irposes. They are	not settable	e parameters	s themselves.	

#### A.5.4b.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 80 ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

# A.5.4c Inter-system Handover from UTRAN FDD to E-UTRAN FDD; Unknown Target Cell

## A.5.4c.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN FDD to E-UTRAN FDD handover requirements for the case when the target E-UTRAN FDD cell is unknown as specified in section 5.4a.

The test parameters are given in Table A.5.0M, A.5.0N and A.5.0O below. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. No compressed mode patterns are configured in the test case.

The UTRAN shall send a Handover from UTRAN command with activation time "now" with a new active cell, cell 2. In the E-UTRAN Handover command contained in that message, the IE starting time shall not be included. The RRC HANDOVER FROM UTRAN COMMAND message shall be sent to the UE towards the end of the time period T1. The start of T2 is defined as the end of last TTI containing the handover command.

Table A.5.0M: General test parameters for UTRAN FDD to E-UTRAN FDD handover test case; unknown target E-UTRAN FDD cell

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.001	
Initial condition	Active cell	Cell 1	UTRAN FDD
	Neighbouring cell	Cell 2	E-UTRAN FDD
Final condition	Active cell	Cell 2	E-UTRAN FDD
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in TS 36.133 section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in TS 36.133 section A.3.1.2.1
PRACH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring Information	-	Not sent	No additional delays in random access procedure
T1	S	≤5	
T2	S	1	

Table A.5.0N: Cell specific test parameters for cell # 1 in UTRAN FDD to E-UTRAN FDD handover test

Parameter	Unit	Cell 1 (UTRA FDD)		
		T1, T2		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DCH_Ec/lor	dB	Note 1		
OCNS_Ec/lor	dB	Note 2		
$\hat{I}_{or}/I_{oc}$	dB	0		
$I_{oc}$	dBm/3,84 MHz	-70		
CPICH_Ec/Io	dB	-13		
Propagation Condition		AWGN		

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or.</sub>

Table A.5.00: Cell specific test parameters for cell # 2 in UTRAN FDD to E-UTRAN FDD handover test case

Parameter	Unit	Cell 1 (E-	UTRA FDD)	
		T1	T2	
E-UTRA RF Channel number		1		
BW <sub>channel</sub>	MHz		10	
OCNG Patterns defined in A.3.2.1.1 (OP.1		OP.2 FDD	OP.1 FDD	
FDD) and in A.3.2.1.2 (OP.2 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB	0		
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB	1		
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	-infinity	0	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	-infinity	0	
RSRP Note 3	dBm/15 KHz	-infinity	-98	
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 $N_{\it oc}$  to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

### A.5.4c.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 165 ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

NOTE: The handover delay is expressed as: RRC procedure delay +  $T_{interrupt}$ , where:

T<sub>interrupt</sub> also includes time to detect E-UTRAN FDD cell; see section 5.4a.2.2.

# A.5.4d Inter-system Handover from UTRAN FDD to E-UTRAN TDD; Unknown Target Cell

#### A.5.4d.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN FDD to E-UTRAN TDD handover requirements for the case when the target E-UTRAN FDD cell is unknown as specified in section 5.4b.

The test parameters are given in Table A.5.0P, A.5.0Q and A.5.0R below. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. No compressed mode patterns are configured in the test case.

The UTRAN shall send a Handover from UTRAN command with activation time "now" with a new active cell, cell 2. In the E-UTRAN Handover command contained in that message, the IE starting time shall not be included. The RRC HANDOVER FROM UTRAN COMMAND message shall be sent to the UE towards the end of the time period T1. The start of T2 is defined as the end of last TTI containing the handover command.

Table A.5.0P: General test parameters for UTRAN FDD to E-UTRAN TDD handover test case

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel	As specified in TS 25.101 section A.3.1
		12.2 kbps	
Power Control		On	
Target quality value on DTCH	BLER	0.001	
Initial condition	Active cell	Cell 1	UTRAN FDD
	Neighbouri ng cell	Cell 2	E-UTRAN TDD
Final condition	Active cell	Cell 2	E-UTRAN TDD
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHI		DL Reference Measurement Channel	As specified in section A.3.1.2.2
CH parameters		R.6 TDD	
PRACH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring	-	Not sent	No additional delays in random access
Information			procedure
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink		1	As specified in table 4.2-2 in 3GPP TS
configuration			36.211
PRACH configuration		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
T1	S	≤5	
T2	S	1	

Table A.5.0Q: Cell specific test parameters for cell # 1 in UTRAN FDD to E-UTRAN TDD handover test

Unit	Cell 1 (UTRA FDD)
	T1, T2
dB	-10
dB	-12
dB	-12
dB	-15
dB	Note 1
dB	Note 2
dB	0
dBm/3,84 MHz	-70
dB	-13
	AWGN
	dB dB dB dB dB dB dB dB

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or.</sub>

Table A.5.0R: Cell specific test parameters for cell # 2 in UTRAN FDD to E-UTRAN TDD handover test

Parameter	Unit	Cell 1 (E-l	UTRA TDD)		
		T1	T2		
E-UTRA RF Channel number			1		
BW <sub>channel</sub>	MHz		10		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.1 TDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{E}_s/I_{ot}$	dB	-infinity	0		
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-	98		
$\hat{E}_s/N_{oc}$	dB	-infinity 0			
RSRP Note 3	dBm/15 KHz	-infinity	-98		
Propagation Condition		AV	VGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 $N_{oc}$  to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

### A.5.4d.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 160 ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

NOTE: The handover delay is expressed as: RRC procedure delay +  $T_{interrupt}$ , where:

T<sub>interrupt</sub> also includes time to detect E-UTRAN TDD cell; see section 5.4b.2.2.

## A.5.5 Cell Re-selection in CELL\_FACH

## A.5.5.1 One frequency present in neighbour list and FACH measurement occasions configured

#### A.5.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in the single carrier case reported in section 5.5.2.1.1.

The test parameters are given in Table A.5.1 and A.5.2. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

Table A.5.1 General test parameters for Cell Re-selection in CELL\_FACH

Pai	rameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
Neighbour cells			Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service C - Persistence valu		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
T1		S	15(initial), 5 (repetition)	
T2	·	S	5	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.1A and Table A.5.1B.

Table A.5.1A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	120
Channel symbol rate	ksps	60
Slot Format #I	-	8
TFCI	-	ON
Power offsets of TFCI and Pilot fields relative to data field	dB	0

NOTE: Transport channel parameters for S-CCPCH are taken from TS34.108 clause 6.1.0b (Content of System Information Block type 5 (FDD))

Parameter Unit Cell 1 Cell 2 Cell 3 Cell 4 Cell 5 Cell 6 T2 T2 T2 T2 T1 **T2** T2 T1 T1 T1 T1 T1 **UTRA RF Channel** Channel 1 Channel 1 Channel 1 Channel 1 Channel 1 Channel 1 Number CPICH\_Ec/lor dΒ -10 -10 -10 -10 -10 -10 PCCPCH\_Ec/lor dB -12 -12 -12 -12 -12 -12 SCH Ec/lor -12 dB -12 -12 -12 -12 -12 PICH\_Ec/lor dB -15 -15 -15 -15 -15 -15 S-CCPCH\_Ec/lor dB -12 -12 -12 -12 -12 -12 -1.295 -1.295 dΒ -1.295 -1.295 -1.295 -1.295 OCNS\_Ec/lor dΒ 7.3 10.27 10.27 7.3 0.27 0.27 0.27 0.27  $\hat{I}_{or}/I_{oc}$ dBm/ -70  $I_{oc}$ 3,84 MHz CPICH\_Ec/lo -16 -13 -13 -16 -23 -23 -23 -23 dΒ Propagation **AWGN** Condition CPICH E<sub>c</sub>/N<sub>0</sub> CPICH Ed/No CPICH Ed/No CPICH Ed/No CPICH Ed/No CPICH Ed/No Cell\_selection\_and\_ reselection\_quality\_m easure Qqualmin dB -20 -20 -20 -20 -20 -20 Qrxlevmin -115 -115 -115 dBm -115 -115 -115 21 UE\_TXPWR 21 21 dBm 21 21 21 MAX\_RACH C2, C1: 0 Qoffset 2<sub>s, n</sub> dΒ C1, C2: 0 C3, C1: 0 C4, C1: 0 C5, C1: 0 C6, C1: 0 C1, C3: 0 C2, C3: 0 C3, C2: 0 C4, C2: 0 C5, C2: 0 C6, C2: 0 C4, C3: 0 C1, C4: 0 C2, C4: 0 C3, C4: 0 C5, C3: 0 C6, C3: 0 C1, C5: 0 C2, C5: 0 C3, C5: 0 C4, C5: 0 C5, C4: 0 C6, C4: 0 C1, C6: 0 C2, C6: 0 C3, C6: 0 C4, C6: 0 C5, C6: 0 C6, C5: 0 Qhyst dΒ 0 0 0 0 0 0 Treselection 0 0 0 0 0 0 s Sintrasearch dB not sent not sent not sent not sent not sent not sent IE "FACH not sent not sent not sent not sent not sent not sent

Table A.5.2 Cell specific test parameters for Cell Re-selection in CELL\_FACH

#### A.5.5.1.2 Test Requirements

Measurement occasion info"

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than  $1.6\ \mathrm{s}.$ 

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay in this case is expressed as:

$$T_{\text{reselection,intra}} = T_{\text{Measurement\_Period Intra}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms},$$

where:

 $T_{Measurement\_Period\ Intra} \quad \text{is specified in 8.4.2.2.2 as 200 ms in this case.}$ 

 $T_{SI}$ : The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

NOTE: Since 1280 ms is one of the typical values for repeating system information blocks, T<sub>SI</sub> of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

This gives a total of 1.55 s, allow 1.6 s in the test case.

## A.5.5.1A One frequency present in neighbour list and HS-DSCH DRX configured

#### A.5.5.1A.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in the single carrier case reported in section 5.5.2.1.1.

The test parameters are given in Table A.5.2A and A.5.2B. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. HS-DSCH first DRX cycle shall be configured.

Table A.5.2A General test parameters for Cell Re-selection in CELL\_FACH when HS-DSCH DRX is configured

Pa	rameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
HS-DSCH DRX c	ycle <sub>FACH</sub>	frames	8	DRX cycle length
HS-DSCH Rx bur	St <sub>FACH</sub>	frames	1	On time during DRX cycle
T321		msec	100	Time before the DRX cycle is activated
T1		S	15 (Initial) 5 (Repetition)	
T2		s	5	

Table A.5.2B Cell specific test parameters for Cell Re-selection in CELL\_FACH

Parameter	Unit	Се	II 1	Се	II 2	Се	Cell 3		I 4	Ce	II 5	Cel	l 6
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Chann	el 1	Chann	iel 1	Chann	el 1	Channe	el 1	Chann	el 1	Channe	əl 1
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
HS-PDSCH_Ec/lor (Note 1)	dB	-10		-10		-10		-10		-10		-10	
HS-SCCH1_Ec/lor (Note 1)	dB	-13		-13		-13		-13		-13		-13	
OCNS_Ec/lor	dB	-1. 837	7	-1. 837	7	-1.837	,	-1. 837		-1.837		-1. 837	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
$I_{oc}$	dBm/ 3,84 MHz	-70											
CPICH_Ec/lo	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN	1										
Cell_selection_and_ reselection_quality_m easure		CPICH	I E₀/N₀	CPICH	I E₀/N₀	CPICH	E <sub>0</sub> /N <sub>0</sub>	CPICH	E <sub>0</sub> /N <sub>0</sub>	CPICH	E <sub>0</sub> /N <sub>0</sub>	CPICH	E <sub>o</sub> /N <sub>0</sub>
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_ MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset 2 <sub>s, n</sub>	dB	C1, C2 C1, C3 C1, C4 C1, C5 C1, C6	3: 0 1: 0 5: 0	C2, C1 C2, C3 C2, C4 C2, C5 C2, C6	3: 0 4: 0 5: 0	C3, C1 C3, C2 C3, C4 C3, C5 C3, C6	:: 0 :: 0 :: 0	C4, C1: C4, C2: C4, C3: C4, C5: C4, C6:	0 0	C5, C1 C5, C2 C5, C3 C5, C4 C5, C6	:: 0 :: 0 :: 0	C6, C1 C6, C2 C6, C3 C6, C4 C6, C5	: 0 : 0 : 0
Qhyst	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not se	nt	not ser	nt	not sen	t	not ser	nt	not sen	t
IE "FACH		not se	nt	not se	nt	not ser	nt	not sen	t	not ser	nt	not sen	t
Measurement occasion info"													
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Note 1: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

#### A.5.5.1A.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 3 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay in this case is expressed as:

$$T_{\text{reselection,intra}} = T_{\text{Measurement\_Period Intra}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms},$$

where:

 $T_{Measurement\_Period\;Intra}$  is specified in 8.4A.2.2.2 as 1600 ms in this case.

 $T_{SI}$ : The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

NOTE: Since 1280 ms is one of the typical values for repeating system information blocks,  $T_{SI}$  of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

This gives a total of 2.95 s, allow 3 s in the test case.

# A.5.5.1B One frequency present in neighbour list and HS-DSCH 2<sup>nd</sup> DRX configured

#### A.5.5.1B.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in the single carrier case reported in section 5.5.2.1.1.

The test parameters are given in Table A.5.2C and A.5.2D. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

Table A.5.2C General test parameters for Cell Re-selection in CELL\_FACH with HS-DSCH 2<sup>nd</sup> DRX configured

Pai	rameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
	Access Service Class (ASC#0) Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
HS-DSCH second	DRX cycle <sub>FACH</sub>	frames	512	DRX cycle length
HS-DSCH second	Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
DRX Level			1 level DRX	2 <sup>nd</sup> DRX cycle only
T329		msec	500	Time before the DRX cycle is activated
T1		S	60(initial), 15 (repetition)	
T2		s	15	

Table A.5.2D Cell specific test parameters for Cell Re-selection in CELL\_FACH

Parameter	Unit	Се	II 1	Ce	ll 2	Се	Cell 3		I 4	Ce	II 5	Cel	l 6
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Chann	el 1	Chann	iel 1	Chann	el 1	Channe	el 1	Chann	el 1	Channe	el 1
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
HS-PDSCH_Ec/lor (Note 1)	dB	-10		-10		-10		-10		-10		-10	
HS-SCCH1_Ec/lor (Note 1)	dB	-13		-13		-13		-13		-13		-13	
OCNS_Ec/lor	dB	-1.837		-1.837		-1.837		-1.837		-1.837		-1.837	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
$I_{oc}$	dBm/ 3,84 MHz	-70											
CPICH_Ec/lo	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN	1										
Cell_selection_and_ reselection_quality_m easure		CPICH	I E₀/N₀	CPICH	I E₀/N₀	CPICH	E <sub>0</sub> /N <sub>0</sub>	CPICH	E <sub>0</sub> /N <sub>0</sub>	CPICH	E <sub>0</sub> /N <sub>0</sub>	CPICH	E <sub>c</sub> /N <sub>0</sub>
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_ MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset 2 <sub>s, n</sub>	dB	C1, C2 C1, C3 C1, C4 C1, C5 C1, C6	3: 0 1: 0 5: 0	C2, C1 C2, C3 C2, C4 C2, C5 C2, C6	3: 0 4: 0 5: 0	C3, C1 C3, C2 C3, C4 C3, C5 C3, C6	:: 0 :: 0 :: 0	C4, C1: C4, C2: C4, C3: C4, C5: C4, C6:	0 0	C5, C1 C5, C2 C5, C3 C5, C4 C5, C6	: 0 : 0 : 0	C6, C1 C6, C2 C6, C3 C6, C4 C6, C5	: 0 : 0 : 0
Qhyst	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not se	nt	not ser	nt	not sen	t	not ser	nt	not sen	t
IE "FACH		not se	nt	not se	nt	not ser	nt	not sen	t	not ser	nt	not sen	t
Measurement occasion info"													
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Note 1: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

#### A.5.5.1B.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 12 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay in this case is expressed as:

$$T_{\text{reselection,intra}} = T_{\text{Measurement Period Intra}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms},$$

where:

 $T_{Measurement\ Period\ Intra}$  is specified in 8.4A.2.2.2 as 10240 ms in this case.

 $T_{SI}$ : The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

NOTE: Since 1280 ms is one of the typical values for repeating system information blocks,  $T_{SI}$  of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

This gives a total of 11.59 s, allow 12 s in the test case.

## A.5.5.2 Two frequencies present in the neighbour list and FACH measurement occasions configured

#### A.5.5.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in section 5.5.2.1.2.

The test parameters are given in tables A5.3 and A5.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Table A.5.3: General test parameters for Cell Re-selection in CELL\_FACH

	Parameter	Unit	Value	Comment
initial	Active cell		Cell2	
condition	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Se - Persisten	rvice Class (ASC#0) ce value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
T1		S	15 (initial), 5 (repetition)	
T2		S	5	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.3A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.3B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.4: Cell specific test parameters for Cell re-selection in CELL\_FACH state

Parameter	Unit		II 1		Cell 2		II 3	Cell 4		Cell 5		Ce	II 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	
UTRA RF Channel Number		Chann	el 1	Chann	el 2	Chann	el 1	Chanr	nel 1	Chann	nel 2	Chann	el 2	
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10		
PCCPCH_Ec/lor	dB	-12			-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12		
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15		
S-CCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12		
OCNS_Ec/lor	dB	-1.295		-1.295		-1.295		-1.295	5	-1.295	;	-1.295		
$\hat{I}_{or}/I_{oc}$	dB	-1.8	2.2	2.2	-1.8	-6.8	-4.8	-6.8	-4.8	-4.8	-6.8	-4.8	-6.8	
$I_{oc}$	dBm/ 3,84 MHz	-70												
CPICH_Ec/lo	dB	-15	-13	-13	-15	-20		-20		-20		-20		
Propagation Condition		AWG												
Cell_selection_		CPICH	$H E_c/N_0$	CPICH	$I E_c/N_0$	CPICH	$I E_0/N_0$	CPIC	$H E_0/N_0$	CPICH	$H E_0/N_0$	CPICH	$I E_c/N_0$	
and_reselection_														
quality_measure														
Qqualmin	dB	-20		-20		-20		-20		-20		-20		
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115		
UE_TXPWR_	dBm	21		21		21		21		21		21		
MAX_RACH														
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C1		C3, C1		C4, C		C5, C		C6, C1		
		C1, C3		C2, C3		C3, C2		C4, C2: 0		C5, C2: 0		C6, C2: 0		
		C1, C4		C2, C4		C3, C4		C4, C		C5, C3		C6, C3		
		C1, C5		C2, C5		C3, C5		C4, C		C5, C4: 0		C6, C4: 0		
		C1, C6	5: 0	C2, C6	S: 0	C3, C6	5: 0	C4, C	6: 0	C5, C6	5: 0	C6, C5	5: 0	
Qhyst2	dB	0		0		0		0		0		0		
Treselection	S	0		0		0		0		0		0		
Sintrasearch	dB	not se		not ser		not ser		not se		not se		not sei		
Sintersearch	dB	not se	nt	not ser	nt	not ser	nt	not se	nt	not se	nt	not sei	nt	
IE "FACH Measurement		sent		sent		sent		sent		sent		sent		
occasion info"		_				_								
FACH Measurement		3		3		3		3		3		3		
occasion cycle length														
coefficient		TDUE		TD:		TD: :-		TDUE		TD:		TD:		
Inter-frequency FDD		TRUE		TRUE		TRUE		TRUE		TRUE		TRUE		
measurement indicator		EA: 0-	_	E 4 : 6 =		E4: 0-		E 4 1 6 1	_	E4: 6-	_	E 4 : 0 =	_	
Inter-frequency TDD		FALSE	=	FALSE	=	FALSE	•	FALSI	Ė	FALSE	=	FALSE		
measurement indicator														

#### A.5.5.2.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 1.9 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay in this case is expressed as:

$$T_{\text{reselection, inter}} = T_{\text{Measurement inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \ \text{ms,}$$

where:

 $T_{measurement\ inter}$  is specified in 8.4.2.3.2 as 480 ms in this case.

 $T_{SI}$ : The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

NOTE: Since 1280 ms is one of the typical values for repeating system information blocks, T<sub>SI</sub> of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

This gives a total of 1.83 s, allow 1.9 s in the test case.

# A.5.5.2A Two frequencies present in the neighbour list and HS-DSCH DRX configured (Absolute priority levels not configured)

# A.5.5.2A.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in section 5.5.2.1.2.

This scenario implies the presence of 2 carriers and 6 cells as given in tables A.5.4AA and A.5.4AB. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.5.4AA: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell2	
condition	Neighbour cells	eighbour cells Cell1, Cell5,		
Final condition	Active cell		Cell1	
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
HS-DSCH	DRX cycle <sub>FACH</sub>	frames	8	DRX cycle length
HS-DSCH	Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
T321		msec	100	Time before the DRX cycle is activated
T1	T1		5	T1 need to be defined so that cell 1 and cell 2 are identified
T2		S	5	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.4AB: Cell re-selection multi carrier multi cell case

Parameter	Unit	Се	ell 1	Ce	ell 2	Се	ell 3	Ce	ell 4	Се	II 5	Ce	ell 6
		T1	T2										
UTRA RF Channel Number		Chann	nel 1	Chann	el 2	Chann	el 1	Chanr	nel 1	Chann	el 2	Chanr	nel 2
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
HS-PDSCH_Ec/lor (Note 1)	dB	-10		-10		-10		-10		-10		-10	
HS-SCCH1_Ec/lor (Note 1)	dB	-13		-13		-13		-13		-13		-13	
OCNS_Ec/lor	dB	-1.837	•	-1.837		-1.837	,	-1.837	•	-1.837		-1.837	,
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
$I_{oc}$	dBm/	-70		•		•		•		•			
	3,84												
	MHz												
CPICH_Ec/lo	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_		CPICE	$H E_c/N_0$	CPICE	$H E_c/N_0$	CPICE	$H E_c/N_0$	CPIC	$H E_c/N_0$	CPICE	$1 E_c/N_0$	CPIC	$H E_c/N_0$
reselection_quality_measure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_	dB	21		21		21		21		21		21	
RACH													
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C		C3, C1		C4, C		C5, C		C6, C	
		C1, C		C2, C3		C3, C2		C4, C		C5, C2		C6, C	2: 0
		C1, C4		C2, C4		C3, C4		C4, C		C5, C3		C6, C	
		C1, C		C2, C5		C3, C5		C4, C		C5, C4		C6, C	
		C1, C6	3: 0	C2, C6	3: 0	C3, C6	3: 0	C4, C	5: 0	C5, C6	5: 0	C6, C	5: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0		0		0		0	
Sintrasearch	dB	not se											
Sintersearch	dB	not se											

Note 1: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

# A.5.5.2A.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 1.

The cell re-selection delay shall be less than 2 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, inter}} = T_{\text{Measurement, inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}}$$
,

where:

 $T_{measurement,inter}$  See section 8.4a.2.3.2 as 480 ms in this case

 $T_{IIJ}$  10msec

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

This gives a total of 1.83 s, allow 2s in the test case.

# A.5.5.2B Two frequencies present in the neighbour list and HS-DSCH DRX configured (Absolute priority levels configured)

# A.5.5.2B.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in section 5.5.2.1.2.

This scenario implies the presence of 2 carriers and 6 cells as given in tables A.5.4AC and A.5.4AD. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. Cell 1 and cell 2 shall belong to different Location Areas. The target UTRA carrier (cell 1) shall have higher absolute priority than the starting carrier (cell 2).

Table A.5.4AC: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment			
Initial	Active cell		Cell2				
condition	Neighbour cells	ghbour cells Cell1, Cell3,Cell4, Cell5, Cell6					
Final condition	Active cell		Cell1				
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.			
HCS				Not used			
HS-DSCH DRX cycle <sub>FACH</sub>		frames	8	DRX cycle length			
HS-DSCH	HS-DSCH Rx burst <sub>FACH</sub>		1	On time during DRX cycle			
T321		msec	100	Time before the DRX cycle is activated			
T1	S		>5	T1 need to be defined so that cell re-selection reaction time is taken into account.			
T2	T2		70	T2 need to be defined so that cell re-selection reaction time is taken into account.			
Sprioritysearch	1	dB	30				
Sprioritysearch		dB	0				
Thresh <sub>x, hig</sub>		dB	5				
	Thresh <sub>x, low2</sub>		0				
Pmax		dBm	21				

Table A.5.4AD: Cell re-selection multi carrier multi cell case

Parameter	Unit	Ce	ell 1	Ce	ell 2	Се	ell 3	Ce	ell 4	Се	II 5	Ce	ell 6
		T1	T2										
UTRA RF Channel Number		Chann	el 1	Chann	el 2	Chann	el 1	Chann	el 1	Chann	el 2	Chanr	nel 2
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
HS-PDSCH (Note 1)	dB	-10		-10		-10		-10		-10		-10	
HS-SCCH1 (Note 1)	dB	-13		-13		-13		-13		-13		-13	
OCNS_Ec/lor	dB	-1.837		-1.837		-1.837	,	-1.837	•	-1.837		-1.837	,
$\hat{I}_{or}/I_{oc}$	dB	2.2	2.2	-8.5	0	-4.8	-4.8	-4.8	-4.8	-8.5	-6.0	-8.5	-6.0
$I_{oc}$	dBm/	-70		•									
	3,84												
	MHz												
CPICH_Ec/lo	dB	-13	-13	-20	-14	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_		CPICE	$H E_c/N_0$	CPICE	$1 E_c/N_0$	CPIC	$H E_c/N_0$						
reselection_quality_measure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_	dB	21		21		21		21		21		21	
RACH													
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C		C3, C1		C4, C		C5, C		C6, C	
		C1, C		C2, C3		C3, C2		C4, C2		C5, C2		C6, C	2: 0
		C1, C4		C2, C4		C3, C4		C4, C3		C5, C3		C6, C	
		C1, C		C2, C5		C3, C5		C4, C		C5, C4		C6, C	
01 10	in.	C1, C6	5: 0	C2, C6	5: 0	C3, C6	5: 0	C4, C6	5: 0	C5, C6	5: 0	C6, C	o: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0	4	0	4	0	-1	0	4
Sintrasearch	dB	not se											
Sintersearch	dB	not se											

Note 1: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

## A.5.5.2B.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 1.

The cell re-selection delay shall be less than 65 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, inter}} = T_{\text{HigherPrioritySeearch}} + T_{\text{identify, inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \,,$$

where:

T<sub>identify,inter</sub> See section 8.4a.2.3.2 as 2720 ms in this case

 $T_{IU}$  10msec

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

 $T_{higher\_priority\_search}$  is described in section 4.2.2

This gives a total of 64.05 s, allow 65s in the test case.

# A.5.5.2C Two frequencies present in the neighbour list and HS-DSCH 2<sup>nd</sup> DRX configured (Absolute priority levels not configured)

## A.5.5.2C.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in section 5.5.2.1.2.

This scenario implies the presence of 2 carriers and 6 cells as given in tables A.5.4AE and A.5.4AF. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. Cell 1 and cell 2 shall belong to different Location Areas. Both UTRA carriers shall have equal priority.

Table A.5.4AE: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell2	
condition	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell1	
	Access Service Class (ASC#0) - Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS	HCS			Not used
HS-DSCH cycle <sub>FACH</sub>	second DRX	frames	512	DRX cycle length
	second Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
DRX Level	-		1 level DRX	2 <sup>nd</sup> DRX cycle only
T329		msec	500	Time before the DRX cycle is activated
T1	T1		15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2	T2		15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.4AF: Cell re-selection multi carrier multi cell case

Parameter	Unit	Ce	ell 1	Ce	ell 2	Ce	ell 3	Ce	ell 4	Ce	II 5	Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Chann	el 1	Chann	nel 2	Chann	nel 1	Chanr	nel 1	Chann	nel 2	Chann	iel 2
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
HS-PDSCH_Ec/lor (Note 1)	dB	-10		-10		-10		-10		-10		-10	
HS-SCCH1_Ec/lor (Note 1)	dB	-13		-13		-13		-13		-13		-13	
OCNS_Ec/lor	dB	-1.837		-1.837	,	-1.837	•	-1.837	7	-1.837	,	-1.837	•
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
$I_{oc}$	dBm / 3,84 MHz	-70											
CPICH_Ec/lo	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN	1										
Cell_selection_and_ reselection_quality_measure		CPICH	I E <sub>c</sub> /N <sub>0</sub>	CPICH	HE <sub>0</sub> /N <sub>0</sub>	CPICH	HE <sub>c</sub> /N <sub>0</sub>	CPICI	H E <sub>c</sub> /N <sub>0</sub>	CPICH	H E₀/N₀	CPICH	I E₀/N₀
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_ RACH	dB	21		21		21		21		21		21	
Qoffset2 <sub>s. n</sub>	dB	C1, C2	2: 0	C2, C	1: 0	C3, C'	1: 0	C4, C	1: 0	C5, C'	1: 0	C6, C	1: 0
,		C1, C3	3: 0	C2, C3	3: 0	C3, C2	2: 0	C4, C	2: 0	C5, C2	2: 0	C6, C2	2: 0
		C1, C4	<b>1</b> : 0	C2, C4	4: 0	C3, C4	4: 0	C4, C	3: 0	C5, C3	3: 0	C6, C3	3: 0
		C1, C5	5: 0	C2, C		C3, C5	5: 0	C4, C	5: 0	C5, C4	4: 0	C6, C4	
		C1, C6	3: 0	C2, C6	3: 0	C3, C6	3: 0	C4, C	6: 0	C5, C6	3: 0	C6, C	5: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not se	nt	not se	nt	not se	ent	not se	nt	not se	nt
Sintersearch	dB	not se		not se		not se		not se	ent	not se		not se	

Note 1: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

## A.5.5.2C.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 1.

The cell re-selection delay shall be less than 12 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselectio n, inter}} = T_{\text{Measurement, inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} ,$$

where:

T<sub>measurement,inter</sub> See section 8.4a.2.3.2; as 10240 ms in this case

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to

camp on a cell. 1280 ms is assumed in this test case.

 $T_{IU}$  10msec

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

This gives a total of 11.6 s, allow 12s in the test case.

# A.5.5.2D Two frequencies present in the neighbour list and HS-DSCH 2<sup>nd</sup> DRX configured (Absolute priority levels configured)

# A.5.5.2D.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in section 5.5.2.1.2.

This scenario implies the presence of 2 carriers and 6 cells as given in tables A.5.4AG and A.5.4AH. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms. Cell 1 and cell 2 shall belong to different Location Areas. The target UTRA carrier (cell 1) shall have higher absolute priority than the starting carrier (cell 2).

Table A.5.4AG: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell2	
condition	Neighbour cells		Cell1, Cell3,Cell4,	
			Cell5, Cell6	
Final	Active cell		Cell1	
condition				
	rvice Class (ASC#0)	-	1	Selected so that no additional delay is caused by
- Persisten	ice value			the random access procedure. The value shall be
				used for all cells in the test.
HCS	HCS			Not used
HS-DSCH second DRX		frames	512	DRX cycle length
cycle <sub>FACH</sub>				
HS-DSCH	second Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
DRX Level			1 level DRX	2 <sup>nd</sup> DRX cycle only
T329		msec	500	Time before the DRX cycle is activated
T1		S	35	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2		S	100	T2 need to be defined so that cell re-selection
				reaction time is taken into account.
Spriorityse	arch1	dB	30	
Spriorityse	Sprioritysearch2		0	
Threshx, h	Threshx, high2		5	
Threshx, lo	ow2	dB	0	
Pmax		dBm	21	

Table A.5.4AH: Cell re-selection multi carrier multi cell case

Parameter	Unit	Ce	ell 1	Ce	ell 2	Ce	ell 3	Ce	ell 4	Ce	II 5	Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Chann	el 1	Chann	nel 2	Chann	nel 1	Chanr	nel 1	Chann	el 2	Chann	iel 2
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
HS-PDSCH (Note 1)	dB	-10		-10		-10		-10		-10		-10	
HS-SCCH 1(Note 1)	dB	-13		-13		-13		-13		-13		-13	
OCNS_Ec/lor	dB	-1.837		-1.837	,	-1.837	•	-1.837	,	-1.837		-1.837	,
$\hat{I}_{or}/I_{oc}$	dB	2.2	2.2	-8.5	0	-4.8	-4.8	-4.8	-4.8	-8.5	-6.0	-8.5	-6.0
$I_{oc}$	dBm /	-70										•	
	3,84 MHz												
CPICH_Ec/lo	dB	-13	-13	-20	-14	-20		-20		-20		-20	
Propagation Condition	-	AWGN											
Cell selection and		CPICH	H E₀/N₀	CPICH	H E <sub>c</sub> /N <sub>0</sub>	CPICH	H E <sub>c</sub> /N <sub>0</sub>	CPIC	HE <sub>c</sub> /N <sub>0</sub>	CPICH	H E <sub>c</sub> /N <sub>0</sub>	CPICH	I E <sub>c</sub> /N <sub>0</sub>
reselection_quality_measure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_	dB	21		21		21		21		21		21	
RACH													
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C		C3, C		C4, C		C5, C'		C6, C	
		C1, C3		C2, C3		C3, C2		C4, C		C5, C2		C6, C	
		C1, C4	1: 0	C2, C4	4: 0	C3, C4	4: 0	C4, C	3: 0	C5, C3		C6, C	
		C1, C5	5: 0	C2, C	5: 0	C3, C	5: 0	C4, C	5: 0	C5, C4	<b>1</b> : 0	C6, C4	<del>1</del> : 0
		C1, C6	3: 0	C2, C6	3: 0	C3, C6	6: 0	C4, C	6: 0	C5, C6	3: 0	C6, C	5: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not se	nt	not se	nt	not se	nt	not se	nt	not se	nt
Sintersearch	dB	not se		not se		not se		not se	nt in DD	not se		not se	nt

Note 1: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

## A.5.5.2D.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 1.

The cell re-selection delay shall be less than 92 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, inter}} = T_{\text{HigherPrioritySeearch}} + T_{\text{identify, inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \,,$$

where:

T<sub>identify,inter</sub> See section 8.4a.2.3.2; 30000 ms in this case

T<sub>SI</sub> Maximum repetition period of relevant system info blocks that needs to be received by the UE to

camp on a cell. 1280 ms is assumed in this test case.

 $T_{III}$  10msec

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

 $T_{higher\_priority\_search}$  is described in section 4.2.2

This gives a total of 91.34 s, allow 92s in the test case.

# A.5.5.3 Cell Reselection to GSM

## A.5.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_FACH state in section 5.5.2.1.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 6 GSM cells. Test parameters are given in Table, A.5.4A, A.5.4B, A.5.4C, A.5.4D, A.5.4E.

Table A.5.4A: General test parameters for UTRAN to GSM Cell Re-selection

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cell		Cell2	
Final	Active cell		Cell2	
condition				
HCS				Not used
Neighbour	cell list size		24 FDD neighbours on Channel 1	
			6 GSM neighbours including	
			ARFCN 1	
T1		S	5	
T2		S	10	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.4B: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.4C: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.4D: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)				
Parameter	Onit	T1	T2			

Number	UTRA RF Channel		1	
CPICH_Ec/lor         dB         -10           PCCPCH_Ec/lor         dB         -12           SCH_Ec/lor         dB         -15           PICH_Ec/lor         dB         -15           S-CCPCH_Ec/lor         dB         -12           OCNS_Ec/lor         dB         -12           OCNS_Ec/lor         dB         -1.295           I oc         dB         0         -5           I oc         dBm/3, 84 MHz         -70           CPICH_Ec/lo         dB         -13         -16.2           CPICH_Ec/lo         dBm         -80         -85           Propagation         AWGN         AWGN           Cell_selection_and_reselection_and_reselection_quality_measure         CPICH Ec/lo         CPICH Ec/lo           Qrasulamin         dB         -20         CPICH Ec/lo         CPICH Ec/lo           Qrasulamin         dBm         -115         CPICH Ec/lo         CPICH Ec/lo         CPICH Ec/lo           Qrasulamin         dB         -20         CPICH Ec/lo			Channe	el 1
PCCPCH_Ec/lor         dB         -12           SCH_Ec/lor         dB         -12           PICH_Ec/lor         dB         -15           S-CCPCH_Ec/lor         dB         -12           OCNS_Ec/lor         dB         -1.295           Image: Compand of the compand of	CPICH Ec/lor	dB	-10	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	PCCPCH Ec/lor	dB	-12	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			-12	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	S-CCPCH Ec/lor			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	OCNS Ec/lor			
CPICH_Ec/lo CPICH_Ec/lo CPICH_RSCP  Rropagation Condition  Cell_selection_and_ reselection_quality_m easure  Qqualmin Qrxlevmin  UE_TXPWR_MAX_ RACH Qoffset1_s, n Qhyst1  Treselection Search_RAT  IE "FACH Measurement occasion info"  FACH Measurement occasion cycle length coefficient Inter-frequency FDD measuremand  AWGN  CPICH Ec/lo  CPICH Ec/lo  AWGN  CPICH Ec/lo  CPICH Ec/lo  AWGN  CPICH Ec/lo  CPICH Ec/lo  CPICH Ec/lo  CPICH Ec/lo  CPICH Ec/lo  CPICH Ec/lo  AWGN  CPICH Ec/lo  AWGN  CPICH Ec/lo  CPICH E	_ ,			-5
CPICH_RSCP       dBm       -80       -85         Propagation Condition       AWGN         Cell_selection_and_ reselection_quality_m easure       CPICH Ec/lo         Qqualmin       dB       -20         Qrxlevmin       dBm       -115         UE_TXPWR_MAX_ RACH       dBm       21         Qoffset1_s, n       dB       C1, C2: 0         Qhyst1       dB       0         Treselection       s       0         Ssearch_RAT       dB       Not sent         IE "FACH       Sent         Measurement       occasion info"         FACH Measurement       3         coefficient       Inter-frequency FDD         measurement       FALSE			-70	
Propagation Condition  Cell_selection_and_ reselection_quality_m easure  Qqualmin Qrxlevmin  UE_TXPWR_MAX_ RACH Qoffset1_s, n Qhyst1  Treselection Search_RAT  IE "FACH Measurement occasion info"  FACH Measurement occasion cycle length coefficient Inter-frequency FDD measurement  MWGN  CPICH Ec/lo  CPICH		dB	-13	-16.2
Condition  Cell_selection_and_ reselection_quality_m easure  Qqualmin  Qrxlevmin  UE_TXPWR_MAX_ RACH  Qoffset1_s, n  Qhyst1  Treselection  Ssearch_RAT  IE "FACH  Measurement occasion info"  FACH Measurement occasion cycle length coefficient  Inter-frequency FDD measurement  MCPICH Ec/lo  CPICH Ec/lo  ABM  -115  4B  C1, C2: 0  Qhyst1  GB  Not sent  Sent occasion info"  FACH Measurement occasion cycle length coefficient  Inter-frequency FDD measurement  FALSE	CPICH_RSCP	dBm	-80	-85
reselection_quality_m easure  Qqualmin			AWGN	
Qrxlevmin     dBm     -115       UE_TXPWR_MAX_ RACH     dBm     21       Qoffset1 <sub>s,n</sub> dB     C1, C2: 0       Qhyst1     dB     0       Treselection     s     0       Ssearch <sub>RAT</sub> dB     Not sent       IE "FACH     Sent       Measurement occasion info"     Sent       FACH Measurement occasion cycle length coefficient     3       Inter-frequency FDD measurement     FALSE	reselection_quality_m		CPICH	Ec/lo
UE_TXPWR_MAX_ RACH  Qoffset1 <sub>s,n</sub> Qhyst1  Treselection  Ssearch <sub>RAT</sub> IE "FACH  Measurement occasion info"  FACH Measurement occasion cycle length coefficient  Inter-frequency FDD measurement  RACH  Measurement  RACH  RAC	Qqualmin	dB		
RACH  Qoffset1 <sub>s,n</sub> Qhyst1  Treselection  Ssearch <sub>RAT</sub> IE "FACH  Measurement occasion info"  FACH Measurement occasion cycle length coefficient  Inter-frequency FDD measurement  FALSE		dBm	-115	
Qoffset1 <sub>s,n</sub> dB     C1, C2: 0       Qhyst1     dB     0       Treselection     s     0       Ssearch <sub>RAT</sub> dB     Not sent       IE "FACH     Sent       Measurement occasion info"     Sent       FACH Measurement occasion cycle length coefficient     3       Inter-frequency FDD measurement     FALSE	RACH	dBm	21	
Qhyst1     dB     0       Treselection     s     0       Ssearch <sub>RAT</sub> dB     Not sent       IE "FACH     Sent       Measurement occasion info"     Sent       FACH Measurement occasion cycle length coefficient     3       Inter-frequency FDD measurement     FALSE	Qoffset1 <sub>s, n</sub>	dB	C1, C2: 0	
Treselection s 0  Ssearch <sub>RAT</sub> dB Not sent  IE "FACH  Measurement occasion info"  FACH Measurement occasion cycle length coefficient  Inter-frequency FDD measurement  FALSE	Qhyst1	dB		
IE "FACH  Measurement occasion info"  FACH Measurement occasion cycle length coefficient  Inter-frequency FDD measurement FALSE		s	0	
IE "FACH Measurement occasion info"  FACH Measurement occasion cycle length coefficient Inter-frequency FDD measurement FALSE	Ssearch <sub>RAT</sub>	dB	Not ser	nt
occasion cycle length 3 coefficient  Inter-frequency FDD measurement FALSE	IE "FACH Measurement		Sent	
measurement FALSE	occasion cycle length coefficient		3	
indicator	measurement indicator		FALSE	
Inter-frequency TDD measurement FALSE indicator	measurement		FALSE	
Inter-RAT Included Included Indicators	measurement		Include	d
>RAT type GSM	>RAT type		GSM	

Table A.5.4E: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2	(GSM)
		T1	T2
Absolute RF Channel Number		<b>ARFCN</b>	1
RXLEV	dBm	-90	-75
RXLEV_ACCESS_	dBm	-104	
MIN			
MS_TXPWR_MAX_	dBm	33	
CCH			

# A.5.5.3.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to transmit the random access in Cell 2 (the GSM cell).

The cell re-selection delay shall be less than  $5.5 + T_{RA} \ s.$ 

The rate of correct reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed

$$T_{\text{reselection, GSM}} = T_{\text{identify,GSM}} + T_{\text{measurement, GSM}} + 40 + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

where:

T<sub>identify,GSM</sub> Specified in 8.4.2.5.2.1, here it is 2880 ms

 $T_{measurement, \, GSM}$  Specified in 5.5.2.1.4, here it is 640 ms

T<sub>BCCH</sub> According to [21], the maximum time allowed to read the BCCH data, when being synchronized

to a BCCH carrier, is 1.9 s.

T<sub>RA</sub> The additional delay caused by the random access procedure in the GSM cell. Shall be defined by

T1/RF when the test case is further detailed in TS 34.121.

This gives a total of  $5.46 + T_{RA}$  s, allow  $5.5 + T_{RA}$  s.

# A.5.5.4 Cell Reselection during an MBMS session, two frequencies present in neighbour list

## A.5.5.4.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell identification for UEs in an MBMS PTM session and the required functionality on measurement occasions by use of a cell re-selection test case.

The test parameters are given in tables A.5.4F, A.5.4G, A.5.4H, A.5.4I, A.5.4J and A.5.4K. The UE is requested to receive the MBMS service and monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Table A.5.4F: General test parameters for Cell Re-selection in CELL\_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
final condition	Active cell		Cell1	
Access Service Cla	ss (ASC#0)	-	1	Selected so that no additional delay is caused by
- Persistence value				the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
MBMS preferred fr	equency layer			Not used
T1	-	S	15 (initial), 5 (repetition)	
T2		S	3	
T3		S	3	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.4G and Table A.5.4H.

Table A.5.4G: Physical channel parameters for S-CCPCH\_1 carrying the FACH.

Parameter	Unit	Level
Channel bit rate	Kbps	120
Channel symbol rate	Ksps	60
Slot Format #I	-	8
TFCI	-	ON
Power offsets of TFCI and Pilot fields relative to data field	dB	0

### Table A.5.4H: Void

The transport channel parameters for S-CCPCH\_1 carrying FACH are taken from TS34.108 clause 6.1.0b (Content of System Information Block type 5 (FDD)) with M2 condition and with the exception that TTI for FACH carrying BCCH set to 20ms.

The transport and physical parameters of the S-CCPCH carrying the MTCH are defined in Table A.5.4I and Table A.5.4J.

Table A.5.4I: Physical channel parameters for S-CCPCH\_2 carrying the MTCH.

Parameter	Unit	Level
Channel bit rate	kbps	960
Channel symbol rate	ksps	480
Slot Format #I	-	14
TFCI	-	ON
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.4J: Transport channel parameters for S-CCPCH\_2

Parameter	FACH
Transport Channel Number	1
Transport Block Size	2536
Transport Block Set Size	10144
Transmission Time Interval	40ms
Type of Error Protection	Turbo Coding
Coding Rate	1/3
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Flexible

Table A.5.4K: Cell specific test parameters for Cell re-selection in CELL\_FACH state

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel		Channel 1	•		Channel 2		•
Number		Chamer			Chamilei 2		
CPICH_Ec/lor	dB	-10			-10		
PCCPCH_Ec/lor	dB	-12			-12		
SCH_Ec/lor	dB	-12			-12		
PICH_Ec/lor	dB	-15			-15		
S-CCPCH_1_Ec/lor	dB	-12			-12		
S-CCPCH_2_Ec/lor	dB	n.a.			-6		
OCNS_Ec/lor	dB	Note 1			Note 1		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-3.37	0	0	0	-5
$I_{oc}$	dBm/3,8 4 MHz	-70		l			П
CPICH_Ec/lo	dB	- infinity	-15	-13	-13	-13	-16.2
Propagation Condition		AWGN					
Cell_selection_ and_reselection_ quality_measure		CPICH E₀/N	I <sub>o</sub>		CPICH E <sub>0</sub> /N	<b>1</b> 0	
Qqualmin	dB	-20			-20		
Qrxlevmin	dBm	-115			-115		
UE_TXPWR_ MAX_RACH	dBm	21			21		
Qoffset2 <sub>s, n</sub>	dB	C1, C2: 0			C2, C1: 0		
Qhyst2	dB	0			0		
Treselection	s	0			0		
Sintrasearch	dB	not sent			not sent		
Sintersearch	dB	not sent			not sent		
IE "FACH Measurement occasion info"		Sent			Sent		
FACH Measurement occasion cycle length coefficient		2			2		
Inter-frequency FDD measurement indicator		TRUE			TRUE		
Inter-frequency TDD measurement indicator  NOTE 1: The power of	f the OCNIC	FALSE	io odda -	ahall ===	FALSE	ower from 4	ha aall ta

NOTE 1: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

# A.5.5.4.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 1.9s.

During T1 and T2 the MTCH SDU ER shall not exceed 4.0%.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay in this case is expressed as:

$$T_{\text{reselection, inter}} = T_{\text{Measuremnt, inter}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms,}$$

where:

T<sub>Measuremnt, inter</sub> Specified in 8.4.2.3.2 as 480ms

T<sub>identify, interi</sub> Specified in 8.4.2.3.1 as 2.72 s in this case, thus 3sec for T2 is sufficient for identification of cell 1.

Note: The calculation based on the S-CCPCH carrying the FACH provides a measurement occasion of 20ms repeated every 80ms. As the MTCH TTI length is only 40ms this has to be shortened to a gap of 10ms

every 80ms, the re-selection delay is based upon.

T<sub>SI</sub>: The time required for receiving all the relevant system information data according to the reception

procedure and the RRC procedure delay of system information blocks defined in 25.331 for a

UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T<sub>SI</sub> of 1280 ms could

be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

 $T_{RA}$ :  $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section

6.1. A persistence value is assumed to be 1 in this test case and therefore T<sub>RA</sub> in this test case is 40

ms.

Note: The maximum allowed time to be used to perform the measurements for a UE in an MBMS session may

be smaller than the duration of the measurement occasion to fulfill the MBMS demodulation

performance.

This gives a total of 1.83 s, allow 1,9s in the test case.

# A.5.5.5 UTRAN to E-UTRA Cell Reselection

# A.5.5.5.1 Reselection to E-UTRA FDD when HS-DSCH DRX is configured (E-UTRA has higher priority)

### A.5.5.5.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA FDD to E-UTRA FDD inter-RAT cell reselection delay reported in section 5.5.2.1.5

The test scenario comprises two different cells, with cell 1 being the UTRA serving cell and cell 2 being the E-UTRA cell to be re-selected to. Test parameters are given in Tables A.5.4L, A.5.4M, A.5.4N. The test consists of two successive time periods, with time duration of T1, T2. UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

Cell 1 and cell 2 shall belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

CELL\_FACH with discontinuous HS-DSCH reception should be configured. The UE should not be scheduled with HS-DSCH data during T1 and T2 such that the DRX cycle becomes active.

Table A.5.4L: General test parameters for UTRAN to E-UTRA Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
T2 end condition	Active cell		Cell2	UE shall
				perform
				reselection to
				cell 2 during T2
	Neighbour cell		Cell1	
HS-DSCH DRX cy		frame s	8	Length of the DRX cycle
HS-DSCH Rx burs	t <sub>FACH</sub>	frame s	1	On time during DRX cycle
T321		msec	100	Number of
				seconds until
				the DRX cycle
				is initiated
HCS				Not used
E-UTRA PRACH o	onfiguration		4	As specified in
				table 5.7.1-2 in
				TS 36.211
E-UTRA access ba	arring information		Not sent	No additional
				delays in
				random access
T4			70	procedure
T1		S	>70	During T1, cell 2 shall be
				powered off,
				and during the
				off time its
				physical cell
				identity shall be
				changed. The
				intention is to
				ensure that cell
				2 has not been
				detected by the
				UE prior to the
				start of period
				T2.
T2		S	70	T2 needs to be
				defined so that
				cell re-selection
				reaction time is
				taken into
				account.

Table A.5.4M: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
HS-PSDCH_Ec/lor (Note 2)	dB	-10	
HS-SCCH_Ec/lor (Note 2)	dB	-13	
OCNS_Ec/lor	dB	-1.837	
$\hat{I}_{or}/I_{oc}$	dB	13	13
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
SsearchE-UTRA	dB	Not sent	
Thresh <sub>x, high</sub> (Note 1)	dB	48	
Propagation Condition	<u> </u>	AWGN	

Note 1: This refers to the value of Thresh<sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

Note 2: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed.

The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

Table A.5.4N: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 2)

Parameter	Unit	Cell 2	
		T1	T2
E-UTRA RF Channel		2	
number			
BW <sub>channel</sub>	MHz	10	0
OCNG Patterns defined in			
TS 36.133 A.3.2.1.2 (OP.2		OP.2	FDD
FDD) [24]			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	C	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		

Qrxlevmin	dBm	-14	40
$N_{oc}$	dBm/15 kHz	-9	8
RSRP	dBm/15 KHz	-infinity	-86
$\hat{E}_s/N_{oc}$	dB	-infinity	12
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	-infinity	12
Treselection <sub>EUTRAN</sub>	S	0	
Snonintrasearch	dB	Not sent	
Thresh <sub>serving, low</sub>	dB	44	
Thresh <sub>x, low</sub> (Note 2)	dB	42	
Propagation Condition		AW	GN

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, low</sub> which is included in E-UTRA system

information, and is a threshold for the UTRA target cell.

## A.5.5.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 66 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{reselection, E-UTRAN} = T_{HigherPrioritySearch} + 40 + T_{SI} + T_{RA}$ , where:

T<sub>SI</sub>= the maximum time allowed aquire system information from a E-UTRAN cell, 1280msec [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

 $T_{Identify,E-UTRAN} = Time \text{ to identify an } E-UTRA \text{ cell, as defined in section } 8.4a.2.6.1$ 

 $T_{\text{higher\_priority\_search}}$  is described in section 4.2.2

This gives a total of 65.7, allow 66 s in the test case.

# A.5.5.5.2 Reselection to E-UTRA FDD when HS-DSCH DRX is configured (E-UTRA has lower priority)

### A.5.5.5 2.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to E-UTRAN cell reselection delay reported in section 5.5.2.1.5.

This scenario implies the presence of 1 UTRAN serving cell, and 1 E-UTRAN cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UTRAN carrier and 1 E-UTRAN carrier. Test parameters are given in Table, A.5.4O, A.5.4P, A.5.4Q. The test consists of two successive time periods, with time duration of T1 and T2, respectively. Both UTRA cell 1 and E-UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

CELL\_FACH with discontinuous HS-DSCH reception and with only the first DRX cycle active should be configured. The UE should not be scheduled with HS-DSCH data during T1 and T2 such that the DRX cycle becomes active.

Table A.5.40: General test parameters for UTRAN to E-UTRAN Cell Re-selection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	UTRAN cell
	Neighbour cell		Cell 2	E-UTRAN cell
Final condition	Active cell		Cell 2	UE shall
				perform
				reselection to
				cell 2 during T2
HS-DSCH DRX c	ycle <sub>FACH</sub>	frame	8	DRX cycle
		S		length
HS-DSCH Rx bur	StFACH	frame	1	On time during
		S		DRX cycle
T321		msec	100	Time before
				the DRX cycle
				is activated
E-UTRA PRACH	configuration		4	As specified in
				table 5.7.1-2 in
				TS 36.211
E-UTRA access b	parring information		Not sent	No additional
				delays in
				random access
				procedure
T1		S	>20	T1 need to be
				defined so that
				cell re-selection
				reaction time is
				taken into
			<u> </u>	account.
T2		S	7	T2 need to be
				defined so that
				cell re-selection
				reaction time is
				taken into
				account.

Table A.5.4P: Cell re-selection UTRAN to E-UTRAN cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
HS-PDSCH_Ec/lor (Note 2)	dB	-10	
HS-SCCH1_Ec/lor (Note 2)	dB	-13	
OCNS_Ec/lor	dB	-1.837	
$\hat{I}_{or}/I_{oc}$	dB	11	-5
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/lo	dB	-10.33	-16.19
CPICH_RSCP	dBm	-69	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E₀/I	$N_0$
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Qhyst1	dB	0	
Treselection	S	0	
Sprioritysearch1	dB	62	
Sprioritysearch2	dB	0	
Thresh <sub>serving, low</sub>	dB	36	
Thresh <sub>x, low</sub> (Note 1)	dB	50	ll.

Note 1 : This refers to the value of  $\mathsf{Thresh}_{\mathsf{x},\,\mathsf{low}}$  which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Note 2: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

Table A.5.4Q: Cell re-selection UTRAN to E-UTRAN cell case (cell 2)

Parameter	Unit	Cell 2 (E-UTRA)	
		T1	T2
E-UTRA RF Channel		,	
number			
BW <sub>channel</sub>	MHz	1	0
OCNG Patterns defined in			
A.3.2.1.1 (OP.2 FDD)		OP.2	FDD
PBCH_RA	dB		
PBCH_RB	dB	]	
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	(	)
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB	]	
OCNG_RB <sup>Note 1</sup>	dB	]	

Qrxlevmin	dBm	-140	
$N_{oc}$	dBm/15 kHz	-9	8
RSRP	dBm/15 KHz	-84	-84
$\hat{E}_s/N_{oc}$	dB	14	14
$\hat{E}_{s}/I_{ot}$	dB	14	14
Treselection <sub>EUTRAN</sub>	S	Ö	
Snonintrasearch	dB	50	
Thresh <sub>x, high</sub>	dB	40	
Propagation Condition		AW	GN

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, high</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target

# A.5.5.5.2.2 Test Requirements

The cell reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 5.7 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

$$T_{\rm reselectio\,n,\,E-UTRAN} = T_{\rm identify,\,E-UTRAN} + 40 + T_{\rm SI} + T_{\rm RA}$$
 , where:

T<sub>SI</sub>= the maximum time allowed aquire system information from a E-UTRAN cell, 1280msec [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

 $T_{Identify,E-UTRAN}$  = Time to identify an E-UTRA cell, as defined in section 8.4a.2.6.1

This gives a total of 5.61 s, allow 5.7 s in the test case.

# A.5.5.5.3 Reselection to E-UTRA FDD when HS-DSCH 2<sup>nd</sup> DRX is configured (E-UTRA has higher priority)

### A.5.5.5.3.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA FDD to E-UTRA FDD inter-RAT cell reselection delay reported in section 5.5.2.1.5

The test scenario comprises two different cells, with cell 1 being the UTRA serving cell and cell 2 being the E-UTRA cell to be re-selected to. Test parameters are given in Tables A.5.4R, A.5.4S, A.5.4T. The test consists of two successive time periods, with time duration of T1, T2. UTRA cell 1 is already identified by the UE prior to the start of the test. Cell2 shall have higher priority than Cell 1.

Cell 1 and cell 2 shall belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

CELL\_FACH with discontinuous HS-DSCH reception and  $2^{nd}$  DRX cycle should be configured. The UE should not be scheduled with HS-DSCH data during T1 and T2 such that the DRX cycle becomes active.

Table A.5.4R: General test parameters for UTRAN to E-UTRA Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
HS-DSCH second		frame s	512	Length of the DRX cycle
HS-DSCH second	Rx burst <sub>FACH</sub>	frame s	1	On time during DRX cycle
T329		msec	500	Number of seconds until the DRX cycle is initiated
DRX level			Single level DRX	Second DRX only active
HCS				Not used
E-UTRA PRACH o	_		4	As specified in table 5.7.1-2 in TS 36.211
E-UTRA access ba	arring information		Not sent	No additional delays in random access procedure
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time its physical cell identity shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		S	70	T2 needs to be defined so that cell re-selection reaction time is taken into account.

Table A.5.4S: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
HS-PDSCH_Ec/lor (Note 2)	dB	-10	
HS-SCCH1_Ec/lor (Note 2)	dB	-13	
OCNS_Ec/lor	dB	-1.837	
$\hat{I}_{or}/I_{oc}$	dB	13	13
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
SsearchE-UTRA	dB	Not sent	
Thresh <sub>x, high</sub> (Note 1)	dB	48	
Propagation Condition	<u> </u>	AWGN	

Note 1: This refers to the value of Thresh<sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

Note 2: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed.

The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

Table A.5.4T: Cell specific test parameters for UTRAN to E-UTRA cell reselection (cell 2)

Parameter	Unit	Cell 2	
		T1	T2
E-UTRA RF Channel		2	
number			
BW <sub>channel</sub>	MHz	10	0
OCNG Patterns defined in			
TS 36.133 A.3.2.1.2 (OP.2		OP.2	FDD
FDD) [24]			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	C	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		

dBm	-140		
dBm/15 kHz	-9	8	
dBm/15 KHz	-infinity	-86	
dB	-infinity	12	
dB	-infinity	12	
S	0		
dB	Not sent		
dB	44		
dB	42		
	AWGN		
	dBm/15 kHz dBm/15 KHz dB dB dB	dBm/15 kHz -9  dBm/15 kHz -infinity dB -infinity  dB -infinity  s 0  dB Not s  dB dB  dB 43	

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, low</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

## A.5.5.5.3.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 66 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, E-UTRAN}} = T_{\text{HigherPrioritySeearch}} + T_{\text{identify, E-UTRAN}} + 40 + T_{\text{SI}} + T_{\text{RA}}$$
, where:

T<sub>SI</sub>= the maximum time allowed aquire system information from a E-UTRAN cell, 1280msec [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

 $T_{Identify,E-UTRAN} = Time \text{ to identify an } E-UTRA \text{ cell, as defined in section } 8.4a.2.6.1$ 

 $T_{higher\_priority\_search}$  is described in section 4.2.2

This gives a total of 65.67, allow 66 s in the test case.

# A.5.5.5.4 Reselection to E-UTRA TDD when HS-DSCH DRX is configured (E-UTRA has higher priority)

#### A.5.5.5.4.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA FDD to E-UTRA TDD inter-RAT cell reselection delay reported in section 5.5.2.1.5

The test scenario comprises two different cells, with cell 1 being the UTRA serving cell and cell 2 being the E-UTRA cell to be re-selected to. Test parameters are given in Tables A.5.4U, A.5.4V, A.5.4W. The test consists of two successive time periods, with time duration of T1, T2. UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

Cell 1 and cell 2 shall belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

CELL\_FACH with discontinuous HS-DSCH reception should be configured. The UE should not be scheduled with HS-DSCH data during T1 and T2 such that the DRX cycle becomes active.

Table A.5.4U: General test parameters for UTRAN to E-UTRA Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
T2 end condition	Active cell		Cell2	UE shall
				perform
				reselection to
				cell 2 during T2
	Neighbour cell		Cell1	
HS-DSCH DRX cy		frame s	8	Length of the DRX cycle
HS-DSCH Rx burs	t <sub>FACH</sub>	frame s	1	On time during DRX cycle
T321		msec	100	Number of
				seconds until
				the DRX cycle
				is initiated
HCS				Not used
E-UTRA PRACH o	onfiguration		4	As specified in
				table 5.7.1-2 in
				TS 36.211
E-UTRA access ba	arring information		Not sent	No additional
				delays in
				random access
T4			70	procedure
T1		S	>70	During T1, cell 2 shall be
				powered off,
				and during the
				off time its
				physical cell
				identity shall be
				changed. The
				intention is to
				ensure that cell
				2 has not been
				detected by the
				UE prior to the
				start of period
				T2.
T2		S	70	T2 needs to be
				defined so that
				cell re-selection
				reaction time is
				taken into
				account.

Table A.5.4V: Cell specific test parameters for UTRAN to E-UTRA TDD cell reselection (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
HS-PDSCH_Ec/lor	dB	-10	
HS-SCCH1_Ec/lor	dB	-13	
OCNS_Ec/lor	dB	-1.837	
$\hat{I}_{or}/I_{oc}$	dB	13	13
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
S <sub>searchE-UTRA</sub>	dB	Not sent	
Thresh <sub>x, high</sub> (Note 1)	dB	48	
Propagation Condition		AWGN	-

Note 1: This refers to the value of Thresh<sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

Note 2: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed.

The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

Table A.5.4W: Cell specific test parameters for UTRAN to E-UTRA TDD cell reselection (cell 2)

Parameter	Unit	Cell 2	
		T1	T2
E-UTRA RF Channel		2	
number			
BW <sub>channel</sub>	MHz	10	0
OCNG Patterns defined in			
TS 36.133 A.3.2.2.2 (OP.2		OP.2	TDD
TDD) [24]			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	C	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		

Qrxlevmin	dBm	-140	
$N_{oc}$	dBm/15 kHz	-9	8
RSRP	dBm/15 KHz	-infinity	-86
$\hat{E}_s/N_{oc}$	dB	-infinity	12
$\hat{E}_{s}/I_{ot}$	dB	-infinity	12
Treselection <sub>EUTRAN</sub>	S	0	
Snonintrasearch	dB	Not sent	
Thresh <sub>serving, low</sub>	dB	44	
Thresh <sub>x, low</sub> (Note 2)	dB	42	
Propagation Condition		AW	GN

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, low</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

# A.5.5.5.4.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 66 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, E-UTRAN}} = T_{\text{HigherPrioritySeearch}} + T_{\text{identify, E-UTRAN}} + 40 + T_{\text{SI}} + T_{\text{RA}}$$
, where:

T<sub>SI</sub>= the maximum time allowed aquire system information from a E-UTRAN cell, 1280msec [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

 $T_{Identify,E-UTRAN} = Time \text{ to identify an } E-UTRA \text{ cell, as defined in section } 8.4a.2.6.1$ 

 $T_{higher\_priority\_search}$  is described in section 4.2.2

This gives a total of 65.70, allow 66 s in the test case.

# A.5.5.5.5 Reselection to E-UTRA TDD when HS-DSCH DRX is configured (E-UTRA has lower priority)

### A.5.5.5.5.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to E-UTRAN cell reselection delay reported in section 5.5.2.1.5.

This scenario implies the presence of 1 UTRAN serving cell, and 1 E-UTRAN cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UTRAN carrier and 1 E-UTRAN carrier. Test parameters are given in Table, A.5.4X, A.5.4Y, A.5.4Z. The test consists of two successive time periods, with time duration of T1 and T2, respectively. Both UTRA cell 1 and E-UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

CELL\_FACH with discontinuous HS-DSCH reception and with only the first DRX cycle active should be configured. The UE should not be scheduled with HS-DSCH data during T1 and T2 such that the DRX cycle becomes active.

Table A.5.4X: General test parameters for UTRAN to E-UTRAN Cell Re-selection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	UTRAN cell
	Neighbour cell		Cell 2	E-UTRAN cell
Final condition	Active cell		Cell 2	UE shall
				perform
				reselection to
				cell 2 during T2
HS-DSCH DRX c	ycle <sub>FACH</sub>	frame	8	DRX cycle
		S		length
HS-DSCH Rx bur	St <sub>FACH</sub>	frame	1	On time during
		S		DRX cycle
T321		msec	100	Time before
				the DRX cycle
E LITEA DE AOLL			1	is activated
E-UTRA PRACH	configuration		4	As specified in
				table 5.7.1-2 in TS 36.211
E-UTRA access b	arring information		Not sent	No additional
E-OTRA access to	armig imormation		NOI Selli	delays in
				random access
				procedure
T1		s	>20	T1 need to be
			- = 0	defined so that
				cell re-selection
				reaction time is
				taken into
				account.
T2		s	7	T2 need to be
				defined so that
				cell re-selection
				reaction time is
				taken into
			1	account.

Table A.5.4Y: Cell re-selection UTRAN to E-UTRAN TDD cell case (cell 1)

Parameter	Unit	Cell 1 (l	JTRA)
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
HS-PDSCH_Ec/lor (Note 2)	dB	-10	
HS-SCCH1_Ec/lor (Note 2)	dB	-13	
OCNS_Ec/lor	dB	-1.837	
$\hat{I}_{or}/I_{oc}$	dB	11	-5
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/lo	dB	-10.33	-16.19
CPICH_RSCP	dBm	-69	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E₀/I	$N_0$
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Qhyst1	dB	0	
Treselection	S	0	
Sprioritysearch1	dB	62	
Sprioritysearch2	dB	0	
Thresh <sub>serving, low</sub>	dB	36	
Thresh <sub>x, low</sub> (Note 1)	dB	50	to alord a d

Note 1 : This refers to the value of  $Thresh_{x, low}$  which is included in UTRA system information, and is a threshold for the E-UTRA target cell

Note 2: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed. The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

Table A.5.4Z: Cell re-selection UTRAN to E-UTRAN TDD cell case (cell 2)

Parameter	Unit	Cell 2 (E-UTRA)	
		T1	T2
E-UTRA RF Channel		1	
number			
BW <sub>channel</sub>	MHz	1	0
OCNG Patterns defined in			
A.3.2.1.1 (OP.2 TDD)		OP.2	TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	(	)
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB	]	
OCNG_RA <sup>Note 1</sup>	dB	]	
OCNG_RB <sup>Note 1</sup>	dB		

Qrxlevmin	dBm	-1-	40
$N_{oc}$	dBm/15 kHz	-9	98
RSRP	dBm/15 KHz	-84	-84
$\hat{E}_s/N_{oc}$	dB	14	14
$\hat{E}_{s}/I_{ot}$	dB	14	14
Treselection <sub>EUTRAN</sub>	S	(	)
Snonintrasearch	dB	5	0
Thresh <sub>x, high</sub>	dB	4	0
Propagation Condition		AW	'GN

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, high</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target

## A.5.5.5.5.2 Test Requirements

The cell reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 5.7 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

$$T_{reselection, E-UTRAN} = T_{identify, E-UTRAN} + 40 + T_{SI} + T_{RA}$$
, where:

T<sub>SI</sub>= the maximum time allowed aquire system information from a E-UTRAN cell, 1280msec [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

T<sub>Identify,,E-UTRAN</sub> = Time to identify an E-UTRA cell, as defined in section 8.4a.2.6.1

This gives a total of 5.61 s, allow 5.7 s in the test case.

# A.5.5.5.6 Reselection to E-UTRA TDD when HS-DSCH 2<sup>nd</sup> DRX is configured (E-UTRA has higher priority)

### A.5.5.5.6.1 Test Purpose and Environment

This test is to verify the requirement for the UTRA FDD to E-UTRA TDD inter-RAT cell reselection delay reported in section 5.5.2.1.5

The test scenario comprises two different cells, with cell 1 being the UTRA serving cell and cell 2 being the E-UTRA cell to be re-selected to. Test parameters are given in Tables A.5.4ZA, A.5.4ZB, A.5.4ZC. The test consists of two successive time periods, with time duration of T1, T2. UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 shall have higher priority than Cell 1.

Cell 1 and cell 2 shall belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

CELL\_FACH with discontinuous HS-DSCH reception and  $2^{nd}$  DRX cycle should be configured. The UE should not be scheduled with HS-DSCH data during T1 and T2 such that the DRX cycle becomes active.

Table A.5.4ZA: General test parameters for UTRAN to E-UTRA TDD Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
HS-DSCH second		frame s	512	Length of the DRX cycle
HS-DSCH second	Rx burst <sub>FACH</sub>	frame s	1	On time during DRX cycle
T329		msec	500	Number of seconds until the DRX cycle is initiated
DRX level			Single level DRX	Second DRX only active
HCS				Not used
E-UTRA PRACH o	_		4	As specified in table 5.7.1-2 in TS 36.211
E-UTRA access ba	arring information		Not sent	No additional delays in random access procedure
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time its physical cell identity shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		S	70	T2 needs to be defined so that cell re-selection reaction time is taken into account.

Table A.5.4ZB: Cell specific test parameters for UTRAN to E-UTRA TDD cell reselection (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
HS-PDSCH_Ec/lor	dB	-10	
HS-SCCH1_Ec/lor	dB	-13	
OCNS_Ec/lor	dB	-1.837	
$\hat{I}_{or}/I_{oc}$	dB	13	13
$I_{oc}$	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
S <sub>searchE-UTRA</sub>	dB	Not sent	
Thresh <sub>x, high</sub> (Note 1)	dB	48	
Propagation Condition	<u> </u>	AWGN	

Note 1: This refers to the value of Thresh<sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell.

Note 2: The UE under test shall not be continuously scheduled to ensure that it operates in DRX when the reselection is being performed.

The test equipment shall schedule with a different common H-RNTI when the UE under test is not being scheduled

Table A.5.4ZC: Cell specific test parameters for UTRAN to E-UTRA TDD cell reselection (cell 2)

Parameter	Unit	Cell 2	
		T1	T2
E-UTRA RF Channel		2	
number			
BW <sub>channel</sub>	MHz	10	0
OCNG Patterns defined in			
TS 36.133 A.3.2.2.2 (OP.2		OP.2	TDD
TDD) [24]			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	C	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		

Qrxlevmin	dBm	-14	10
$N_{oc}$	dBm/15 kHz	-9	8
RSRP	dBm/15 KHz	-infinity	-86
$\hat{E}_s/N_{oc}$	dB	-infinity	12
$\hat{E}_{s}/I_{ot}$	dB	-infinity	12
Treselection <sub>EUTRAN</sub>	S	0	
Snonintrasearch	dB	Not sent	
Thresh <sub>serving, low</sub>	dB	44	
Thresh <sub>x, low</sub> (Note 2)	dB	42	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell 2 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Thresh<sub>x, low</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

## A.5.5.5.6.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 66 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, E-UTRAN}} = T_{\text{HigherPrio ritySeearch}} + T_{\text{identify, E-UTRAN}} + 40 + T_{\text{SI}} + T_{\text{RA}} \text{ , where:}$$

T<sub>SI</sub>= the maximum time allowed aquire system information from a E-UTRAN cell, 1280msec [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

T<sub>Identify,E-UTRAN</sub> = Time to identify an E-UTRA cell, as defined in section 8.4a.2.6.1

 $T_{higher\_priority\_search}$  is described in section 4.2.2

This gives a total of 65.70, allow 66 s in the test case.

## A.5.5.5.7 Reselection to E-UTRA FDD with FACH measurement occasions configured

## A.5.5.5.7.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to E-UTRA cell re-selection delay reported in section 5.5.2.1.5 with measurement occasions configured.

This scenario implies the presence of 1 UTRAN serving cell, and 1 E-UTRA FDD cell to be re-selected. The UE is requested to monitor neighbouring cells on 2 UMTS carriers, 12 GSM cells and 1 E-UTRA FDD carrier. Test parameters are given in Table, A.5.4ZF, A.5.4ZG and A.5.4ZH. During time phase T1, the E-UTRA cell can be identified but is not sufficiently strong to trigger reselection. Cell 2 is of higher priority than cell 1. The GERAN neighbour cells are not assigned any absolute priority.

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.4ZD and Table A.5.4ZE.

Table A.5.4ZD: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	Kbps	60
Channel symbol rate	Ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.4ZE: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.4ZF General test parameters for UTRAN to E-UTRA Cell Re-selection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
HCS				Not used
T1		S	9	
T2		S	3	
FACH Measureme coefficient	nt occasion cycle length		3	N_TTI=1
GSM neighbour ce	ell list			Includes 12 GSM Cells
UTRA intrafrequer	cy neighbour cell list			Includes cell 1 and 23 other cells on channel 1
UTRA interfrequen	cy neighbour cell list			Includes 24 interfrequency neighbour cells on UARFCN channel 3
E-UTRA cell list				Includes channel 2
CELL_FACH Absort	lute Priority Measurement		All layers	

Table A.5.4ZG: Cell re-selection UTRAN to E-UTRA cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)
		T1 T2
UTRA RF Channel Number		Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
S-CCPCH_Ec/lor	dB	-12
OCNS_Ec/lor	dB	-1.294
$\hat{I}_{or}/I_{oc}$	dB	0
$I_{oc}$	dBm/3,84 MHz	-69
CPICH_Ec/lo	dB	-13
CPICH_RSCP	dBm	-79
Propagation Condition		AWGN
Cell_selection_and_		CPICH RSCP
reselection_quality_measure		CFICH ROCF
Qqualmin	dB	-20
Qrxlevmin	dBm	-115
UE_TXPWR_MAX_RACH	dBm	21
Qoffset1 <sub>s, n</sub>	dB	C1, C2: 0
Qhyst1	dB	0
Treselection	S	0
Ssearch <sub>RAT</sub>	dB	Not sent
Sprioritysearch1	dB	0
Sprioritysearch2	dB	0 (default)
S <sub>searchE-UTRA</sub>	dB	Not sent
Thresh <sub>x, high</sub> (Note 1)	dB	48
Propagation Condition		AWGN
Note 1: This refers to the		
value of Thresh <sub>x, high</sub> which is		
included in UTRA system		
information, and is a threshold		
for the E-UTRA target cell.		

Table A.5.4ZH: Cell re-selection UTRAN to E-UTRA cell case (cell 2)

Parameter	Unit	Cell 2	
		T1	T2
E-UTRA RF Channel		2	
number			
BW <sub>channel</sub>	MHz	10	)
OCNG Patterns defined in			
TS 36.133 A.3.2.1.2 (OP.2		OP.2	FDD
FDD) [24]			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		

Qrxlevmin	dBm	-140		
$N_{oc}$	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-98	-86	
$\hat{E}_s/N_{oc}$	dB	0	12	
$\hat{E}_{s}/I_{ot}$	dB	0	12	
Treselection <sub>EUTRAN</sub>	S	0		
Snonintrasearch	dB	Not sent		
Thresh <sub>serving, low</sub>	dB	30		

### A.5.5.5.7.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 2.5 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE1: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, E-UTRAN}} = T_{\text{measurement, E-UTRAN}} + 40 + T_{\text{BCCH}} + T_{\text{RA}}$$
 ms

where

T<sub>measurement, E-UTRAN</sub> = Time to measure E-UTRA RSRP or RSRQ, as defined in section 8.4.2.6.2, 1120ms.

 $T_{BCCH}$  = The maximum time allowed to read BCCH data from the E-UTRAN cell, 1280ms [24]. $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

This gives a total of 2460ms, allow 2.5 seconds in the test case.

NOTE2: The reselection delay is based on  $N_{\text{freq}}$ =2 since measurements of GERAN are not required by the higher layers in this scenario.

## A.5.5.5.8 Reselection to E-UTRA TDD with FACH measurement occasions configured

### A.5.5.5.8.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to E-UTRA cell re-selection delay reported in section 5.5.2.1.5 with measurement occasions configured.

This scenario implies the presence of 1 UTRAN serving cell, and 1 E-UTRA TDD cell to be re-selected. The UE is requested to monitor neighbouring cells on 2 UMTS carriers, 12 GSM cells and 1 E-UTRA TDD carrier. Test parameters are given in Table, A.5.4ZK, A.5.4ZL and A.5.5.4ZM. During time phase T1, the E-UTRA cell can be identified but is not sufficiently strong to trigger reselection. Cell 2 is of higher priority than cell 1. The GERAN neighbour cells are not assigned any absolute priority.

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.4ZI and Table A.5.4ZI.

Table A.5.4ZI: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	Kbps	60
Channel symbol rate	Ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot	dB	0
fields relative to data field		

Table A.5.4ZJ: Transport channel parameters for S-CCPCH

Parameter	FACH		
Transport Channel Number	1		
Transport Block Size	240		
Transport Block Set Size	240		
Transmission Time Interval	10 ms		
Type of Error Protection	Convolution Coding		
Coding Rate	1/2		
Rate Matching attribute	256		
Size of CRC	16		
Position of TrCH in radio frame	Fixed		

Table A.5.4ZK General test parameters for UTRAN to E-UTRA Cell Re-selection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
HCS				Not used
T1		S	9	
T2		S	3	
FACH Measurement occasion cycle length coefficient			3	N_TTI=1
GSM neighbour cell list				Includes 12 GSM Cells
UTRA intrafrequency neighbour cell list				Includes cell 1 and 23 other cells on channel 1
UTRA interfrequency neighbour cell list				Includes 24 interfrequency neighbour cells on UARFCN channel 3
E-UTRA cell list				Includes channel 2
CELL_FACH Absolute Priority Measurement Indicator			All layers	

Table A.5.4ZL: Cell re-selection UTRAN to E-UTRA cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
		T1 T2			
UTRA RF Channel Number		Channel 1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
S-CCPCH_Ec/lor	dB	-12			
OCNS_Ec/lor	dB	-1.294			
$\hat{I}_{or}/I_{oc}$	dB	0			
$I_{oc}$	dBm/3,84 MHz	-69			
CPICH_Ec/lo	dB	-13			
CPICH_RSCP	dBm	-79			
Propagation Condition		AWGN			
Cell_selection_and_		CPICH RSCP			
reselection_quality_measure		CPICH RSCP			
Qqualmin	dB	-20			
Qrxlevmin	dBm	-115			
UE_TXPWR_MAX_RACH	dBm	21			
Qoffset1 <sub>s, n</sub>	dB	C1, C2: 0			
Qhyst1	dB	0			
Treselection	S	0			
Ssearch <sub>RAT</sub>	dB	not sent			
Sprioritysearch1	dB	0			
Sprioritysearch2	dB	0 (default)			
S <sub>searchE-UTRA</sub>	dB	Not sent			
Thresh <sub>x, high</sub> (Note 1)	dB	48			
Propagation Condition		AWGN			
Note 1: This refers to the					
value of Thresh <sub>x, high</sub> which is					
included in UTRA system					
information, and is a threshold					
for the E-UTRA target cell.					

Table A.5.4ZM: Cell re-selection UTRAN to E-UTRA cell case (cell 2)

Parameter	Unit	Cell 2			
		T1	T2		
E-UTRA RF Channel		2			
number					
BW <sub>channel</sub>	MHz	10	)		
OCNG Patterns defined in					
A.3.2.1.1 (OP.2 TDD)		OP.2	TDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	_			
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				

Qrxlevmin	dBm	-140				
$N_{oc}$	dBm/15 kHz	-9	8			
RSRP	dBm/15 KHz	-98	-86			
$\hat{E}_s/N_{oc}$	dB	0	12			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	12			
Treselection <sub>EUTRAN</sub>	S	(	)			
Snonintrasearch	dB	Not sent				
Thresh <sub>serving, low</sub>	dB		30			

### A.5.5.5.8.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay shall be less than 2.5 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE1: The cell re-selection delay can be expressed as:

$$T_{\text{reselection, E-UTRAN}} = T_{\text{measurement, E-UTRAN}} + 40 + T_{\text{BCCH}} + T_{\text{RA}}$$
 ms

where

T<sub>measurement, E-UTRAN</sub> = Time to measure E-UTRA RSRP or RSRQ, as defined in section 8.4.2.6.2, 1120ms.

T<sub>BCCH</sub> = The maximum time allowed to read BCCH data from the E-UTRAN cell, 1280ms [24].

 $T_{RA}$  = the additional delay caused by the random access procedure, 30msec [24]

This gives a total of 2460ms, allow 2.5 seconds in the test case.

NOTE2: The reselection delay is based on  $N_{freq}$ =2 since measurements of GERAN are not required by the higher layers in this scenario.

# A.5.6 Cell Re-selection in CELL\_PCH

# A.5.6.1 One frequency present in the neighbour list

### A.5.6.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_PCH state in section 5.6.2.

The test parameters are given in Table A5.5 and A5.6. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Table A.5.5: General test parameters for Cell Re-selection in CELL\_PCH

	Parameter	Unit	Value	Comment
Initial Active cell			Cell2	
condition	Neighbour cells		Cell1, Cell3,Cell4,	
			Cell5, Cell6	
Final	Active cell		Cell1	
condition				
Access Ser	vice Class (ASC#0)	-	1	Selected so that no additional delay is caused by the
- Persistend	ce value			random access procedure. The value shall be used for
				all cells in the test.
HCS				Not used
DRX cycle	length	s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction
				time is taken into account.
T2		s	15	T2 need to be defined so that cell re-selection reaction
				time is taken into account.

Table A.5.6: Cell specific test parameters for Cell re-selection in CELL\_PCH state

Parameter	Unit	Се	II 1	Cell 2		Cel	I 3	Се	II 4	Cel	I 5	Ce	l 6
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel		Chann	el 1	Chann	el 1	Channe	el 1	Chann	el 1	Chann	el 1	Chann	el 1
Number													
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/lor	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
$I_{oc}$	dBm/ 3,84MHz	-70											
CPICH_Ec/lo	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation		AWGN	1			•							
Condition													
Cell_selection_and_		CPICH	$H E_0/N_0$	CPICH	$I E_0/N_0$	CPICH	$E_c/N_0$	CPICH	$I E_0/N_0$	CPICH	ł	CPICH	$E_c/N_0$
reselection_quality_m										$E_c/N_0$			
easure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_	dBm	21		21		21		21		21		21	
MAX_RACH													
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C1		C3, C1:		C4, C1		C5, C1		C6, C1	-
		C1, C3		C2, C3		C3, C2:		C4, C2		C5, C2		C6, C2	
		C1, C4	1: 0	C2, C4	1: 0	C3, C4:		C4, C3	3: 0	C5, C3	3: 0	C6, C3	
		C1, C5		C2, C5		C3, C5:	: 0	C4, C5	5: 0	C5, C4	l: 0	C6, C4	: 0
		C1, C6	S: 0	C2, C6	S: 0	C3, C6:	: 0	C4, C6	6: 0	C5, C6	S: 0	C6, C5	: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not se	nt	not sen	t	not ser	nt	not ser	nt	not ser	nt

## A.5.6.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateFDD} + T_{SI}$ ,

where:

T<sub>evaluateFDD:</sub> See section 5.6.2.

 $T_{SI}$ : Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

## A.5.6.2 Two frequencies present in the neighbour list

## A.5.6.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL\_PCH state in section 5.6.2. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

The test parameters are given in Table A.5.7 and A.5.8

Table A.5.7: General test parameters for Cell Re-selection in CELL\_PCH

Pa	arameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service ( - Persistence val		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
DRX cycle length	1	S	1.28	The value shall be used for all cells in the test.
T1		S	30	T1 need to be defined so that cell reselection reaction time is taken into account.
T2		S	15	T2 need to be defined so that cell re- selection reaction time is taken into account.

Table A.5.8: Cell specific test parameters for Cell re-selection in CELL\_PCH state

Parameter	Unit	Се	II 1	Cell 2		Ce	II 3	Ce	ell 4	Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel		Channel 1 Channel 2		Channe	Channel 1 Channel 1		Channel 2		Channel 2				
Number													
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/lor	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
$I_{oc}$	dBm/	-70											
	3,84												
	MHz							1					
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN		T				1		Т		1	
Cell_selection_		CPICH	$I E_c/N_0$	CPIC	$H E_c/N_0$	CPICH	$E_c/N_0$	CPICH	$E_c/N_0$	CPICH	$E_c/N_0$	CPICH	$H E_c/N_0$
and_reselection_													
quality_measure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_	dBm	21		21		21		21		21		21	
MAX_RACH													
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C		C3, C1		C4, C1		C5, C1		C6, C	
		C1, C3		C2, C		C3, C2		C4, C2		C5, C2		C6, C	2: 0
		C1, C4		C2, C		C3, C4		C4, C3		C5, C3		C6, C	
		C1, C5		C2, C		C3, C5		C4, C5		C5, C4		C6, C	
		C1, C6	S: 0	C2, C	6: 0	C3, C6	: 0	C4, C6	: 0	C5, C6	: 0	C6, C	5: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not ser	nt	not se	nt	not ser	nt	not ser	nt	not ser	nt	not se	nt
Sintersearch	dB	not ser	nt	not se	nt	not ser	nt	not ser	nt	not ser	nt	not se	nt

### A.5.6.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateFDD} + T_{SI}$ ,

where:

 $T_{evaluateFDD}$ : See section 5.6.2.

T<sub>SI</sub>: Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

# A.5.6.3 Cell re-selection during an MBMS session, one UTRAN interfrequency and 2 GSM cells present in the neighbour list

### A.5.6.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the GSM BSIC identification for UEs in an MBMS PTM session according to section 4.2.2.3 and 4.2.2.5. Furthermore, the required functionality on the limitation of measurements in dependence of the MBMS TTI as specified in section 4.2.2.9 are tested.

This scenario implies the presence of 1 UTRAN serving cell, 1 UTRAN inter-frequency cell and 2 GSM cells of which one is to be re-selected. The UE is requested to monitor neighbor cells on 2 UMTS carriers (Channel 1, Channel 2) and 12 GSM cells. Test parameters are given in Tables A.5.8A, A5.8B, A.5.8C, A.5.8D and A.5.8E.

Table A.5.8A: General test parameters for Cell Re-selection

Pa	arameter	Unit	Value	Comment
Initial	Active cell		Cell2	UMTS cell providing the MBMS session
condition	Neighbour cells		Cell1	UMTS inter-frequency neighbour cell
	-		Cell3, Cell4	GSM cells
Final condition	Active cell		Cell3	
DRX cycle	length	ms	160	
HCS				Not used
MBMS pref layer	ferred frequency			Not used
T1		S	15 (initial), 5 repeated	
T2		S	45	
T3		S	7	

The transport and physical channel parameters of the S-CCPCH carrying the MTCH are defined in Table A.5.8B and Table A.5.8C

Table A.5.8B: Physical channel parameters for S-CCPCH carrying the MTCH.

Parameter	Unit	Level
Channel bit rate	kbps	960
Channel symbol rate	ksps	480
Slot Format #I	-	14
TFCI	-	ON
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.8C: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	2536
Transport Block Set Size	10144
Transmission Time Interval	40ms
Type of Error Protection	Turbo Coding
Coding Rate	1/3
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Flexible

Table A.5.8D: Cell specific test parameters for serving Cell2 and inter-frequency neighbour Cell1

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	Т3	T1	T2	Т3
UTRA RF Channel		Channel 1			Channel 2		
Number							
CPICH_Ec/lor	dB	-10			-10		
PCCPCH_Ec/lor	dB	-12			-12		
SCH_Ec/lor	dB	-12			-12		
PICH_Ec/lor	dB	-15			-15		
S-CCPCH_1_Ec/lor	dB	-12			-12		
S-CCPCH_2_Ec/lor	dB	n.a.			-6,8		
OCNS_Ec/lor	dB	Note 1			Note 1		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-4.75	-infinity	0	0	-15
$I_{oc}$	dBm/3,84 MHz	-70					
CPICH_Ec/lo	dB	- infinity	-16	- infinity	-13	-13	-25.14
CPICH_RSCP		- infinity	-84,75	- infinity	-80	-80	-95
Propagation Condition		AWGN					
Cell_selection_		CPICH E <sub>c</sub> /N <sub>0</sub>			CPICH E <sub>c</sub> /N	0	
and_reselection_							
quality_measure							
Qqualmin	dB	-20			-20		
Qrxlevmin	dBm	-115			-115		
UE_TXPWR_	dBm	21			21		
MAX_RACH							
Qoffset2 <sub>s, n</sub>	dB	C1, C2: 0			C2, C1: 0		
Qhyst2	dB	0			0		
Qoffset1 <sub>s, n</sub>	dB				C2, C3: 0; C	2, C4: 0	
Qhyst1	dB	0			0		
Treselection	S	0			0		
Sintrasearch	dB	not sent			not sent		
Sintersearch	dB	not sent			not sent		
SsearchRAT	dB	not sent			not sent		
NOTE 1: The power of	the OCNS	channel that i	s added	shall mak	e the total po	wer from th	ne cell to be

equal to lor.

Table A.5.8E: Cell re-selection parameters for GSM cells case (cell 3 and cell4,cell5,cell6)

Parameter	Unit	Ce	II 3 (GS	SM)	Ce	II 4 (GS	SM)
		T1	T2	Т3	T1	T2	Т3
Absolute RF Channel Number		ARFCN 2	2		ARFCN 1		
RXLEV	dBm	-infinity	-85	-85	-infinity	-85	-infinity
RXLEV_ACCESS_MIN	dBm	-104			-104		
MS_TXPWR_MAX_CCH	dBm	33			33		

### A.5.6.3.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 3, and starts to send the RR Channel Request message for location update to Cell 3.

The cell re-selection delay shall be less than  $2,75 \text{ s} + T_{BCCH}$ , where  $T_{BCCH}$  is the maximum time allowed to read BCCH data from GSM cell [21].

During T1 and T2 the MTCH SDU ER shall not exceed 4.0%.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $Max(3*T_{measureFDD}, T_{measureGSM} + DRX \text{ cycle length}) + T_{BCCH}$ , where:

 $T_{measure FDD}$  See Table 4.1 in section 4.2.2.  $T_{measure GSM}$  See Table 4.1 in section 4.2.2.

DRX cycle length 160mss see Table A.4.7.A

 $T_{BCCH}$  Maximum time allowed to read BCCH data from GSM cell [21].

According to [21], the maximum time allowed to read the BCCH data, when being synchronized

to a BCCH carrier, is 1.9 s.

This gives a total of 2.72 s +  $T_{BCCH}$ , allow 2.75 s +  $T_{BCCH}$  in the test case.

# A.5.7 Cell Re-selection in URA\_PCH

## A.5.7.1 One frequency present in the neighbour list

## A.5.7.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in URA\_PCH state in section 5.7.2.

The test parameters are given in Table A.5.9 and A.5.10. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Cells possible for re-selection shall belong to different UTRAN Registration Areas (URA).

Table A.5.9: General test parameters for Cell Re-selection in URA\_PCH

Pa	arameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
DRX cycle length	1	S	1.28	The value shall be used for all cells in the test.
T1		S	15	T1 need to be defined so that cell reselection reaction time is taken into account.
T2		S	15	T2 need to be defined so that cell reselection reaction time is taken into account.

Table A.5.10: Cell specific test parameters for Cell re-selection in URA\_PCH state

Parameter	Unit	Се	II 1	Ce	II 2	Ce	II 3	Cel	I 4	Ce	II 5	Ce	II 6
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Chann	el 1	Chann	el 1	Chann	el 1	Chann	el 1	Chann	el 1	Chann	el 1
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/lor	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
$I_{oc}$	dBm/ 3,84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_		CPICH	I E <sub>c</sub> /N <sub>0</sub>	CPICH	I E <sub>c</sub> /N <sub>0</sub>	CPICH	$E_c/N_0$	<b>CPICH</b>	E <sub>c</sub> /N <sub>0</sub>	CPICH	I E <sub>0</sub> /N <sub>0</sub>	<b>CPICH</b>	$E_c/N_0$
reselection_quality_measure													
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_	dBm	21		21		21		21		21		21	
MAX_RACH													
Qoffset2 <sub>s, n</sub>	dB	C1, C2		C2, C1		C3, C1		C4, C1		C5, C1		C6, C1	
		C1, C3		C2, C3		C3, C2		C4, C2		C5, C2		C6, C2	
		C1, C4		C2, C4		C3, C4		C4, C3		C5, C3		C6, C3	
		C1, C5		C2, C5		C3, C5		C4, C5		C5, C4		C6, C4	
		C1, C6	S: 0	C2, C6	6: 0	C3, C6	5: 0	C4, C6	: 0	C5, C6	6: 0	C6, C5	5: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not sei	nt	not ser	nt	not ser	nt	not ser	nt	not ser	nt

## A.5.7.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the URA UPDATE message with cause value "URA reselection" in Cell 1.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateFDD} + T_{SI}$ ,

where:

T<sub>evaluateFDD</sub>: See section 5.7.2.

 $T_{SI}$ : Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

# A.5.7.2 Two frequencies present in the neighbour list

### A.5.7.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in URA\_PCH state in section 5.7.2.

The test parameters are given in Table A5.11 and A5.12. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Cells possible for re-selection shall belong to different UTRAN Registration Areas (URA).

Table A.5.11: General test parameters for Cell Re-selection in URA\_PCH

Pa	rameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5,	
			Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
HCS				Not used
DRX cycle length	1	S	1.28	The value shall be used for all cells in the test.
T1		S	30	T1 need to be defined so that cell reselection reaction time is taken into account.
T2		S	15	T2 need to be defined so that cell reselection reaction time is taken into account.

Table A.5.12: Cell specific test parameters for Cell re-selection in URA\_PCH state

Parameter	Unit	C	ell 1	Ce	ell 2	Се	II 3	Ce	ell 4	Cel	l 5	Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1 Channel 2		iel 2	Channel 1 Channel 1		Channel 2		Channel 2				
CPICH_Ec/lor	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/lor	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/lor	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
$I_{oc}$	dBm/3,8 4 MHz	-70								•		•	
CPICH_Ec/lo	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGI	AWGN										
Cell_selection_ and_reselection_ quality_measure		CPICI	HE <sub>0</sub> /N <sub>0</sub>	CPICH	HE₀/N₀	СРІСН	E <sub>c</sub> /N <sub>0</sub>	СРІСН	E <sub>c</sub> /N <sub>0</sub>	CPICH E	<sub>c</sub> /N <sub>0</sub>	СРІСН	E <sub>c</sub> /N <sub>0</sub>
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_ MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset2 <sub>s, n</sub>	dB	C1, C C1, C C1, C C1, C C1, C	3: 0 4: 0 5: 0	C2, C3 C2, C3 C2, C4 C2, C5 C2, C6	3: 0 4: 0 5: 0	C3, C1 C3, C2 C3, C4 C3, C5 C3, C6	: 0 : 0 : 0	C4, C1 C4, C2 C4, C3 C4, C5 C4, C6	2: 0 3: 0 3: 0	C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0	) )	C6, C1 C6, C2 C6, C3 C6, C4 C6, C5	:: 0 :: 0 :: 0
Qhyst2	dB	0		0		0		0		0		0	
Treselection	S	0		0		0		0		0		0	
Sintrasearch	dB	not se	nt	not se	nt	not sen	it	not ser	nt	not sent		not ser	nt
Sintersearch	dB	not se	nt	not se	nt	not ser	ıt	not ser	nt	not sent		not ser	nt

## A.5.7.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending URA UPDATE message with cause value "URA reselection" in Cell 1.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay can be expressed as:  $T_{evaluateFDD} + T_{SI}$ ,

where:

T<sub>evaluateFDD</sub>: See section 5.7.2.

 $T_{SI}$ : Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

# A.5.8 Serving HS-DSCH cell change

## A.5.8.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the delay when performing the serving HS-DSCH cell change in CELL\_DCH state specified in section 5.10.

The test parameters are given in Table A.5.13 and A.5.14 below. The test consists of 4 successive time periods, with a time duration of T1, T2, T3 and T4 respectively. At the start of time duration T1 the UE have cell 1 and cell 2 in active set and cell 1 as the serving HS-DSCH cell.

Data shall be transmitted continuously to the UE on the HS-DSCH channel.

Table A.5.13: General test parameters for serving HS-DSCH cell change

Para	ameter	Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control			On	
Target quality value	ue on DTCH	BLER	0.001	
HSDPA paramete	ers		Fixed Reference Channel Definition H-Set 1, with QPSK modulation only	As specified in TS 25.101 section A.7.1.1
Initial conditions	Active cells		Cell 1 and Cell 2	
	Serving HS-DSCH cell		Cell 1	
Final condition	Active cell		Cell 1 and Cell 2	
	Serving HS-DSCH cell		Cell 2	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
CQI Feedback cy	cle, k	ms	2	
CQI repetition fac	tor		1	
T1		S	5	
T2		S	3	
T3		S	0.5	
T4		ms	100	

Cell 1 **Parameter** Unit Cell 2 T4 T1 T2 T1 T2 **T3 T3** UTRA RF Channel Channel 1 Channel 1 Number CPICH\_Ec/lor dB -10 -10 -12 PCCPCH\_Ec/lor dB -12 SCH\_Ec/lor dB -12 -12 PICH\_Ec/lor dB -15 -15 Note 1 N/A N/A DPCH\_Ec/lor dB Note 1 Note 1 N/A Note 3 Note 1 -10 HS-PDSCH\_Ec/lor dB -inf -inf -10 HS-SCCH-1 Ec/lor dB -13 -inf -inf -13 **OCNS** Note 2 dB 3.64 1.14 1.14 3.64 dBm/ -70 3,84  $\mathsf{MHz}$ 

-15.5

-13

Table A.5.14: Cell specific test parameters for serving HS-DSCH cell change

Note 1: The DPCH level is controlled by the power control loop

-13

AWGN

Note 4

{-148 ... 148}

dB

Chips

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

Note 3: The DPCH level is controlled by the power control loop. The initial power shall be set equal to the DPCH\_Ec/lor of Cell 1 at the end of T2.

Note 4: The relative delay of the path from cell 2 with respect to cell 1 shall always be within ±148 chip.

-15.5

### A.5.8.1.1 Test procedure

CPICH\_Ec/lo

respect to cell 1

**Propagation Condition** 

Relative delay of paths received from cell 2 with

- 1) The test is started at the beginning of T1.
- 2) During time period T2 an Event 1D triggered measurement report shall be sent by the UE.
- 3) During time period T3 UTRAN shall send a Physical Channel Configuration command with activation time now changing serving HS-DSCH from cell 1 to cell 2. The Physical Channel Configuration message shall be sent to the UE so that the whole message is available at the UE at the beginning of T4.

# A.5.8.2 Test Requirements

The UE shall start to transmit the CQI to cell 2 less than 74 ms from the beginning of time period T4.

The UE shall also start to receive the first HS-SCCH message from cell 2 less than 74 ms from the beginning of time period T4 and transmit the ACK or NAK which corresponds to the HS-SCCH message.

NOTE: The delay  $D_{cell\_change}$  equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time of receiving HS-DSCH data stated in section 5.10.2.2. The RRC procedure delay is 50 ms and the interruption time is given by  $T_{interrupt1} = T_{IU} + 22$  ms=24 ms.

The total delay  $D_{cell\_change}$ =50 + 24 ms = 74 ms.

# A.5.9 Enhanced Serving HS-DSCH cell change

## A.5.9.1 Test Purpose and Environment

This test case is only applicable to UEs which support enhanced HS-DSCH serving cell change.

The purpose of this test is to verify the requirement for the delay when performing the enhanced serving HS-DSCH cell change in CELL\_DCH state specified in section 5.11.

The test parameters are given in Table A.5.15 and A.5.16 below. The test consists of 4 successive time periods, with a time duration of T1, T2, T3 and T4 respectively. At the start of time duration T1 the UE has cell 1 and cell 2 in the active set and cell 1 as the serving HS-DSCH cell. Target cell preconfiguration is provided for cell 2 in the active set update. The target cell preconfiguration shall not contain the optional IE "Activation time offset". After sending event 1D during time period T2, the UE should start to monitor HS-SCCH-1 from cell 2. A single HS-SCCH order implying serving cell change starts to be transmitted from cell 2 during T3. By the start of T4, the single HS-SCCH order implying serving cell change completes transmission, and within the time specified in section 5.11 the UE shall also be monitoring the HS-SCCH-2 on target cell 2.

Data shall be transmitted continuously to the UE on the HS-DSCH channel of cell 1 during T1 and T2, and on the HS-DSCH channel of cell2 during T4.

Table A.5.15: General test parameters for enhanced serving HS-DSCH cell change

Para	ameter	Unit	Value	Comment
F-DPCH slot form	F-DPCH slot format		0	
Power Control			On	
Target quality val	ue on F-DPCH	TPC BER	0.05	5%
HSDPA paramete	HSDPA parameters		Fixed Reference Channel Definition H-Set 1, with QPSK modulation only	As specified in TS 25.101 section A.7.1.1
Initial conditions	Active cells		Cell 1 and Cell 2	
	Serving HS-DSCH cell		Cell 1	
Final condition	Active cell		Cell 1 and Cell 2	
	Serving HS-DSCH cell		Cell 2	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		S	5	
T2	T2		1	
T3		ms	100	
T4	<u>-</u>	ms	100	

Table A.5.16: Cell specific test parameters for enhanced serving HS-DSCH cell change

Parameter	Unit		Cell 1				С	Cell 2				
		T1	T2	T3	T4	T1	T2	T3	T4			
UTRA RF Channel		Channel	1			Channel 1						
Number		Onamor	'			Onamo						
CPICH_Ec/lor	dB	-10				-10						
PCCPCH_Ec/lor	dB	-12				-12						
SCH_Ec/lor	dB	-12				-12						
PICH_Ec/lor	dB	-15				-15						
F-DPCH_Ec/lor	dB	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1			
HS-PDSCH_Ec/lor	dB	-10		-inf		-inf	•	•	-10			
HS-SCCH-1_ Ec/lor	dB	-13		-inf		-inf		-13	-inf			
HS-SCCH-2 Ec/lor	dB	-inf				-inf		•	-13			
OCNS		Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2			
$\hat{I}_{or}/I_{oc}$	dB	3.64	1.14			1.14	3.64					
$I_{oc}$	dBm/	-70	-			•	•					
-00	3,84											
	MHz											
CPICH_Ec/Io	dB	-13	-15.5			-15.5	-13					
Propagation Condition		AWGN										
Relative delay of paths	Chips	{-148	148}									
received from cell 2 with	-	Note 3										
respect to cell 1												

Note 1: The F-DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>.

Note 3: The relative delay of the path from cell 2 with respect to cell 1 shall always be within ±148 chip.

### A.5.9.1.1 Test procedure

- 1) The test is started at the beginning of T1.
- 2) During time period T2 an Event 1D triggered measurement report shall be sent by the UE.
- 3) During time period T3 UTRAN shall send an HS-SCCH order on HS-SCCH-1from cell 2 implying enhanced serving HS-DSCH from cell 1 to cell 2. The HS-SCCH order message shall be sent to the UE so that the end of the TTI containing the HS-SCCH order corresponds to the beginning of T4.
- 4) At the start of T4, UTRAN shall transmit data to the UE using HS-SCCH-2 and HS-PDSCH on cell 2. Any ACK/NACK received from the UE indicates that the UE is monitoring HS-SCCH-2

## A.5.9.2 Test Requirements

The UE shall start to receive the first HS-SCCH message on HS-SCCH-2 from cell 2 within no more than 40 ms from the beginning of time period T4 and transmit the ACK or NACK which corresponds to the HS-SCCH message.

Note: Since HS-SCCH-2 on cell 2 is the only HS-SCCH which is being transmitted from the start of T4, either ACK or NACK transmission from the UE after the start of T4 implies that the enhanced serving cell change has been completed.

The rate of correct serving cell changes observed during repeated tests shall be at least 90%.

# A.5.10 Intrafrequency System information acquisition for CSG cell

# A.5.10.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for intrafrequency CSG SI acquisition in section 5.13.2. The test parameters are given in Table A.5.17 and A.5.18 below. In the measurement control information cell 2 shall be included in the "Intra-frequency SI Acquisition" IE. The test consists of two successive time periods, with time duration of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

Table A.5.17: General test parameters for intrafrequency CSG SI acquisition

Par	ameter	Unit	Value	Comment
DCH p	arameters		DL and UL Reference	As specified in TS 25.101 section
			Measurement Channel 12.2 kbps	A.3.1 and A.2.1
Powe	er Control		On	
Target quality	y value on DTCH	BLER	0.01	
Initial	Active cell		Cell 1	
conditions	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 1	Handover to cell 2 is not requested
Report	ting range	dB	3	Applicable for event 1A
Hys	steresis	dB	0	
	W		1	Applicable for event 1A
Reporting dead	ctivation threshold		0	Applicable for event 1A
Time t	to Trigger	Ms	0	
SIB	3_REP	Frames	32	Applicable for cell 2 SIB3 scheduling
SIB3 SE	EG_COUNT		1	Applicable for cell 2 SIB3 scheduling
UE v	whitelist		Empty	_
Monitored	d cell list size		24 on channel 1	Measurement control information is sent before the start of the test
CSG ic	d (of cell 2)		Set to any non-empty value	
Filter	coefficient		0	
	T1		5	
	T2	S	5	

Table A.5.18: Cell specific test parameters for intrafrequency CSG SI acquisition

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T1	T2		
CPICH_Ec/lor	dB	-10		-10	•		
PCCPCH_Ec/lor	dB	-12		-12			
SCH_Ec/lor	dB	-12		-12	-12		
PICH_Ec/lor	dB	-15		-15	-15		
DPCH_Ec/lor	dB	Note 1		N/A	N/A		
OCNS		Note 2		-0.941	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	-Infinity	5.97		
$I_{oc}$	dBm/ 3,84 MHz	-63.01	-70	Note 3	Note 3		
CPICH_Ec/lo	dB	-13		-Infinity	-14		
Propagation Condition		AWGN					

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

Note 3: The loc level is common for cell 1 and cell 2

# A.5.10.2 Test Requirements

The UE shall transmit an Event 1A-triggered measurement report containing the cell identity and CSG identity of cell 2 and membership indication sent to false within [2.71] seconds from the start of T2

Test requirement =  $T_{identify intra} + T_{CSG-SI-Report}$ 

= 800 + [630] + 40\*32 from the start of T2

= [2.71] seconds.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled..

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

The measured quality on the DTCH of the UE downlink during T2 shall not exceed BLER=0.01±30% = 0.013

# A.5.11 Interfrequency System information acquisition for CSG cell

## A.5.11.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for interfrequency CSG SI acquisition in section 5.13.2. The test parameters are given in Table A.5.19 and A.5.20 below.

The test consists of three successive time periods, with a time duration T1, T2 and T3. The test parameters are given in tables A.5.19 and A.5.20 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The CPICH Ec/Io of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

During T2, the UE shall transmit a measurement report with event 2C, and UTRAN shall respond with a measurement control message which reconfigures interfrequency measurements with the Inter-frequency SI Acquisition IE containing the PSC of cell 2. The start of T3 is defined as the end of the last TTI containing this measurement control message.

Table A.5.19: General test parameters for Handover to inter-frequency cell

Para	meter	Unit	Value	Comment
DCH parameters			DL and UL Reference	As specified in TS 25.101 section
			Measurement Channel 12.2 kbps	A.3.1 and A.2.1
Power Control	Power Control		On	
Target quality val	ue on DTCH	BLER	0.001	
Compressed mod	le		A.22 set 1	As specified in TS 25.101 section A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 1	Handover to cell 2 is not requested
Threshold non us	Threshold non used frequency		-18	Absolute Ec/I0 threshold for event 2C
Hysteresis		dB	0	
W non-used frequ	iency		1	Applicable for event 2C
Time to Trigger		Ms	0	
Filter coefficient			0	
SIB3_REP		Frames	32	Applicable for cell 2 SIB3 scheduling
SIB3 SEG_COUN	NT		1	Applicable for cell 2 SIB3 scheduling
CSG id (of cell 2)			Set to any non-empty value	
CSG Indicator (of	cell 2)		Set to TRUE	
UE whitelist			Empty	
Monitored cell list size			24 on channel 1 16 on channel 2	Measurement control information is sent before the compressed mode pattern starts.
T1		S	5	
T2		S	≤5	
T3		S	5	

Table A.5.20: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	Т3
UTRA RF Channel Number		Channel	1		Channel	2	
CPICH_Ec/lor	dB	-10			-10		
PCCPCH_Ec/lor	dB	-12			-12		
SCH_Ec/lor	dB	-12			-12		
PICH_Ec/lor	dB	-15			-15		
DPCH_Ec/lor	dB	Note 1			N/A		
OCNS		Note 2			-0.941		
$\hat{I}_{or}/I_{oc}$	dB	0			-Infinity	-1.8	-1.8
$I_{oc}$	dBm/3,84 MHz	-70					
CPICH_Ec/lo	dB	-13			-Infinity	-14	-14
Propagation Condition		AWGN					

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ .

## A.5.11.2 Test Requirements

The UE shall transmit a measurement report containing the cell identity, CSG identity of cell 2 and membership indication set to FALSE within [1.96] seconds from the start of T3.

Test requirement = RRC Procedure delay +  $T_{CSG-SI-Report}$ 

= 50+ [630]+40\*32 from the start of T3

= [1.96] seconds.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled..

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

The measured quality on the DTCH of the UE downlink measured from the start of T3 until 1.96 seconds after the start of T3 using loopback shall not exceed BLER= 0.612

- a) NOTE: The test BLER is defined from the requirements as follows:
- b) 600ms of downlink interruption and 600ms of uplink interruption may occur = 30 DTCH TTI
- c) Due to loopback delay (up to 10 TTI), this means that 30 + 30 = 60 TTI loopback throughput may be lost due to gaps in uplink and downlink
- d) There are 98 TTI in the test interval (1.96 seconds)
- e) The remaining 98-60 = 38 TTI should have a BLER not exceeding 0.001+30% = 0.0013

Overall maximum allowed BLER is (38/98)\*0.0013 + (60/98)\*1 = 0.612

# A.6 RRC Connection Control

# A.6.1 RRC Re-establishment delay

# A.6.1.1 Test Purpose and Environment

The purpose is to verify that the RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

## A.6.1.1.1 TEST 1

The test parameters are given in table A.6.1 and table A.6.2 below. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consist of 2 successive time periods, with a time duration of T1 and T2 respectively. At the start of time period T2, the dedicated channel is removed.

Table A.6.1 General test parameters for RRC re-establishment delay, Test 1

Parameter	Unit	Value	Comment
DCH Parameters		DL Reference measurement channel 12.2 kbps	As specified in TS 25.101, section A.3.1
Power Control		On	
Active cell, initial condition		Cell 1	
Active cell, final condition		Cell 2	
N313		20	
N315		1	
T313	Seconds	0	
Tsı	ms	1280	Time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms). Note: Since 1280 ms is one of the typical values for repeating system information blocks, T <sub>SI</sub> of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.
Monitored cell list size		24	Monitored set shall only include intra frequency neighbours.
Cell 2			Included in the monitored set.
Reporting frequency	Seconds	4	
T1	S	10	
T2	S	6	

Table A.6.2 Cell specific parameters for RRC re-establishment delay test, Test 1

Parameter	Unit	Cell 1		Ce	ell 2
		T1	T2	T1	T2
Cell Frequency	ChNr	1		1	
CPICH_Ec/lor	dB	-10		-10	
PCCPCH_Ec/lor	dB	-12		-12	
SCH_Ec/lor	dB	-12		-12	
PICH_Ec/lor	dB	-15		-15	
DCH_Ec/lor	dB	Note 1	-Infinity	Not applicable	
OCNS_Ec/lor	dB	Note 2	-0.941	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	2,39	-Infinity	4,39	0,02
$I_{oc}$	dBm/ 3,84 MHz	-70			
CPICH_Ec/lo dB		-15	-Infinity	-13	
Propagation Condition		AWGN			
Note 1: The DPCH level is controlled by the power control loop  Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to					

#### A.6.1.1.2 TEST 2

The test parameters are given in table A.6.3 and table A.6.4 below. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively. At the start of time period T2, the dedicated channel is removed.

Table A.6.3 General test parameters for RRC re-establishment delay, Test 2

Parameter	Unit	Value	Comment
DCH Parameters		DL Reference measurement channel 12.2 kbps	As specified in TS 25.101, section A.3.1
Power Control		On	
Active cell, initial condition		Cell 1	
Active cell, final condition		Cell 2	
N313		20	
N315		1	
T313	Seconds	0	
T <sub>SI</sub>	ms	1280	Time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms).  Note: Since 1280 ms is one of the typical values for repeating system information blocks, T <sub>SI</sub> of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.
Monitored cell list size		24	Monitored set shall include 2 additional frequencies.
Cell 2			Cell 2 is not included in the monitored set. Cell 2 is located on one of the 2 additional frequencies of the monitored set.
Reporting frequency	Seconds	4	
T1	S	10	
T2	S	6	

Table A.6.4 Cell specific parameters for RRC re-establishment delay test, Test 2

Parameter	Unit	Cell 1			Cell 2	
		T1	T2	T1	T2	
Cell Frequency	ChNr	1		2		
CPICH_Ec/lor	dB	-10		-10		
PCCPCH_Ec/lor	dB	-12		-12	-12	
SCH_Ec/lor	dB	-12		-12	-12	
PICH_Ec/lor	dB	-15		-15		
DCH_Ec/lor	dB	Note 1	-Infinity	Not applicable	)	
OCNS_Ec/lor	dB	Note 2	-0.941	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	-3,35	-Infinity	-Infinity	0,02	
$I_{oc}$	dBm/ 3,84 MHz	-70				
CPICH_Ec/lo	dB	-15	-Infinity	-Infinity	-13	
Propagation Condition		AWGN	•			

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to

## A.6.1.2 Test Requirements

### A.6.1.2.1 Test 1

The Re-establishment delay T<sub>RE-ESTABLISH</sub> to a known cell shall be less than 1.9s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The Re-establishment delay in this case can be expressed as

 $T_{\text{RE-ESTABLISH}} = T_{\text{RRC-RE-ESTABLISH}} + T_{\text{UE-RE-ESTABLISH-REQ-KNOWN}}$ 

where

 $T_{RRC-RE-ESTABLISH} = 160ms + (N_{313}-1)*10ms + T_{313}$ 

 $T_{UE-RE-ESTABLISH\_REQ-KNOWN} = 50ms + T_{search} + T_{SI} + T_{RA}$ 

 $N_{313}=20$ 

 $T_{313} = 0s$ 

T<sub>search</sub>=100ms

 $T_{RA}$  = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

 $T_{SI}$  is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms). 1280 ms is assumed in this test case.

This gives a total of 1820ms, allow 1.9s in the test case.

### A.6.1.2.2 Test 2

The Re-establishment delay to an unknown cell shall be less than 4.2s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The Re-establishment delay in this case can be expressed as

 $T_{\text{RE-ESTABLISH}} = T_{\text{RRC-RE-ESTABLISH}} + T_{\text{UE-RE-ESTABLISH-REQ-UNKNOWN}}.$ 

where

 $T_{RRC\text{-}RE\text{-}ESTABLISH}\!\!=\!\!160ms\!\!+\!\!(N_{313}\!\!-\!\!1)\!*\!10ms\!+\!T_{313}$ 

 $T_{\text{UE-RE-ESTABLISH-REQ-UNKNOWN}}\!\!=\!\!50ms\!+\!T_{\text{search}}*NF+T_{SI}+T_{RA},$ 

 $N_{313}=20$ 

 $T_{313} = 0s$ 

 $T_{search}$ =800ms

NF is the number of different frequencies in the monitored set. 3 frequencies are assumed in this test case.

 $T_{RA}$  = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

 $T_{SI}$  is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms).1280 ms is assumed in this test case.

This gives a total of 4120ms, allow 4.2s in the test case.

## A.6.2 Random Access

## A.6.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the behaviour of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This tests will verify the requirements in section 6.3.2 and section 7.4.2.

Parameter	Unit	Cell 1
UTRA RF Channel Number		Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
Number of other transmitted Acquisition Indicators	-	0
AICH_Ec/lor	dB	-10
PICH_Ec/lor	dB	-15
OCNS_Ec/lor when an AI is not transmitted	dB	-0.941
OCNS_Ec/lor when an AI is transmitted	dB	-1.516
$\hat{I}_{or}/I_{oc}$	dB	0
$I_{oc}$	dBm/3,84 MHz	-70
CPICH_Ec/lo	dB	-13
Propagation Condition		AWGN

Table A.6.5: RF Parameters for Random Access test

The test parameters "System Information Block (SIB) type 5 (ASC #0)" defined in section 6.1 of TS34.108, shall be used in all random access tests. Crucial parameters for the test requirements are repeated in Table A.6.6 and A.6.7 and these overrule the parameters defined in SIB type 5.

Table A.6.6: UE parameters for Random Access test

Parameter	Unit	Value
Access Service Class (ASC#0)		
	01	1
- Persistence value		
Maximum number of preamble		2
ramping cycles (M <sub>max</sub> ).		
Maximum number of		12
preambles in one preamble		
ramping cycle		
(Preamble Retrans Max)		
The backoff time T <sub>B01</sub>	ms	N/A
$N_{B01min}=N_{B01max}$	#TTI	10
Power step when no	dB	3
acquisition indicator is received		
(Power offset P0)		
Power offset between the last	dB	0
transmitted preamble and the	ub	O
control part of the message		
(Power offset P p-m)		
Maximum allowed ÚL TX	dBm	21
power		

Table A.6.7: UTRAN parameters for Random Access test

Parameter	Unit	Value
Primary CPICH DL TX power	dBm	-8
UL interference	dBm	-92
SIR in open loop power	dB	-10
control (Constant value)		
AICH Power Offset	dB	0

## A.6.2.2 Test Requirements

### A.6.2.2.1 Correct behaviour when receiving an ACK

The UE shall stop transmitting preambles upon a ACK on the AICH has been received and then transmit a message. An ACK shall be transmitted after 10 preambles have been received by the UTRAN.

The absolute power applied to the first preamble shall be -30 dBm with an accuracy as specified in section 6.4.1.1 of TS 25.101 [3]. The relative power applied to additional preambles shall have an accuracy as specified in section 6.5.2.1 of TS 25.101 [3].

The UE shall transmit 10 preambles and 1 message.

The transmit timing of all PRACH transmissions shall be within the accuracy specified in subclause 7.4.2.

## A.6.2.2.2 Correct behaviour when receiving an NACK

The UE shall stop transmitting preambles upon a NACK on the AICH has been received and then repeat the ramping procedure when the back off timer  $T_{B01}$  expires. The NACK shall be transmitted after the 10 preambles have been received by the UTRAN.

The UE shall transmit 10 preambles in the first ramping cycle and no transmission shall be done by the UE within 100 ms after the NACK has been transmitted by the UTRAN. Then the UE shall start the second preamble ramping cycle.

### A.6.2.2.3 Correct behaviour at Time-out

The UE shall stop transmit preambles when reaching the maximum number of preambles allowed in a cycle. The UE shall then repeat the ramping procedure until the maximum number of preamble ramping cycles are reached. No ACK/NACK shall be sent by UTRAN during this test.

The UE shall transmit 2 preambles cycles, consisting of 12 preambles in each preamble cycle.

## A.6.2.2.4 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum allowed UL TX power configured by the UTRAN. No ACK/NACK shall be sent by UTRAN during this test.

The absolute power of any preambles belonging to the first or second preamble cycle shall not exceed 0 dBm with more than the tolerance given in section 6.5.

Table A.6.7A: Specific UE parameter for correct behaviour when reaching maximum transmit power

Parameter	Unit	Value
Maximum allowed UL TX power	dBm	0
Power step when no acquisition indicator is received (Power offset P0)	dB	6

# A.6.2.2.5 Correct behaviour when selecting 2 or 10msec TTI length for Enhanced Uplink in CELL\_FACH state and idle mode

No ACK/NACK shall be sent by UTRAN during this test.

The UE shall select a preamble corresponding to 2msec TTI when the transmit power of the preamble is less than -16 dBm. The UE shall select a preamble corresponding to the 10msec TTI when the transmit power of the preamble is greater than -4 dBm.

Table A.6.7B: Specific UE parameters for correct behaviour when selecting 2 or 10msec TTI length for Enhanced Uplink in CELL\_FACH state and idle mode

Parameter	Unit	Value
Maximum allowed UL TX power	dBm	0
Power step when no acquisition	dB	6
indicator is received		
(Power offset P0)		
Power offset between the last transmitted preamble and the initial power of the DPCCH transmission in the Enhanced Uplink in CELL_FACH state and Idle mode (Power offset P p-e)	dB	0
Power headroom threshold for switching between 2msec TTI and 10msec TTI	dB	10

# A.6.3 (void)

# A.6.4 Transport format combination selection in UE

# A.6.4.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

## A.6.4.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6.8, A.6.9 and Table A.6.10 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6.8 and A.6.9 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6.8: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6.9: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6.10: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	21	
T1	S	30	
T2	S	2	
Propagation condition		AWGN	

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL\_TFC8 or UL TFC9) during the entire test and it shall be ensured that the UE is using UL TFC8 or UL TFC9 at the end of T1.

The test shall be performed in the following way:

### **Before time period T1:**

The allowed TFCS according to table A.6.10 shall be signalled to the UE.

### **During time period T1:**

The system simulator shall ensure that the UE output power is commanded to be between 14 to 15 dB below the UE Maximum allowed UL TX power.

### **During time period T2:**

The system simulator shall continously send TPC\_cmd=1 to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL\_TFC8 to UL\_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL\_TFC8 and UL\_TFC9 shall be measured.

# A.6.4.1.2 Interactive or Background, PS, UL: 64 kbps + Conversational / speech, CS, UL: 12.2kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for circuit switched and packet data services, i.e. Interactive or Background, PS, UL: 64kbps + Conversational / speech / CS UL:12.2kbps as defined in TS 34.108 [3].

The test parameters are given in Table A.6.8a , A.6.9a and Table A.6.10a below. The test consists of  $\,2$  successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6.8a and A.6.9a can be found in TS 34.108 [3] section "Conversational / speech / UL:12.2 DL:12.2 kbps / CS RAB + Interactive or background / UL:64 DL:64 kbps / PS RAB+ UL:3.4 DL: 3.4 kbps SRBs for DCCH".

Table A.6.8a: UL reference RAB, Interactive or Background + Conversational/ Speech

	TFI	12.2kbps RAB subflow#1 (20ms TTI)	12.2kbps RAB subflow#2 (20ms TTI)	12.2kbps RAB subflow#3 (20ms TTI)	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x81	0x103	0x60	0x340	0x148
	TF1, bits	1x39	1x103	1x60	1x340	1x148
	TF2, bits	1x81	N/A	N/A	2x340	N/A
	TF3, bits	N/A	N/A	N/A	3x340	N/A
	TF4. bits	N/A	N/A	N/A	4x340	N/A

Table A.6.9a: UL TFCI

TFCI	(12.2kbps RAB subflow#1, 12.2kbps RAB subflow#2, 12.2kbps RAB subflow#3, ,64 kbps RAB, DCCH)
UL_TFC0	(TF0,TF0,TF0,TF0)
UL_TFC1	(TF1,TF0,TF0,TF0)
UL_TFC2	(TF2,TF1,TF1,TF0,TF0)
UL_TFC3	(TF0,TF0,TF0,TF1,TF0)
UL_TFC4	(TF1,TF0,TF0,TF1,TF0)
UL_TFC5	(TF2,TF1,TF1,TF0)
UL_TFC6	(TF0,TF0,TF0,TF2,TF0)
UL_TFC7	(TF1,TF0,TF0,TF2,TF0)
UL_TFC8	(TF2,TF1,TF1,TF2,TF0)
UL_TFC9	(TF0,TF0,TF3,TF0)
U L_TFC10	(TF1,TF0,TF0,TF3,TF0)
U L_TFC11	(TF2,TF1,TF1,TF3,TF0)
UL_TFC12	(TF0,TF0,TF0,TF4,TF0)
UL_TFC13	(TF1,TF0,TF0,TF4,TF0)
UL_TFC14	(TF2,TF1,TF1,TF4,TF0)
UL_TFC15	(TF0,TF0,TF0,TF1)
UL_TFC16	(TF1,TF0,TF0,TF1)
UL_TFC17	(TF2,TF1,TF1,TF0,TF1)
UL_TFC18	(TF0,TF0,TF1,TF1)
UL_TFC19	(TF1,TF0,TF0,TF1,TF1)
UL_TFC20	(TF2,TF1,TF1,TF1)
UL_TFC21	(TF0,TF0,TF0,TF2,TF1)
UL_TFC22	(TF1,TF0,TF0,TF2,TF1)
UL_TFC23	(TF2,TF1,TF1,TF2,TF1)
UL_TFC24	(TF0,TF0,TF3,TF1)
UL_TFC25	(TF1,TF0,TF0,TF3,TF1)
UL_TFC26	(TF2,TF1,TF1,TF3,TF1)
UL_TFC27	(TF0,TF0,TF4,TF1)
UL_TFC28	(TF1,TF0,TF0,TF4,TF1)
UL_TFC29	(TF2,TF1,TF1,TF4,TF1)

Table A.6.10a: General test parameters

Parameter	Unit	Value	Comment
TFCS size		30	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9, UL_TFC10, UL_TFC11, UL_TFC12, UL_TFC13, UL_TFC14, UL_TFC15, UL_TFC16, UL_TFC16, UL_TFC17, UL_TFC18, UL_TFC29, UL_TFC21, UL_TFC24, UL_TFC25, UL_TFC25, UL_TFC26, UL_TFC27, UL_TFC28, UL_TFC29	
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX	dBm	21	
power			
T1	S	30	
T2	S	2	
Propagation condition		AWGN	

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL\_TFC28 or UL\_TFC29) during the entire test and it shall be ensured that the UE is using UL\_TFC28 or UL\_TFC29 at the end of T1.

The test shall be performed in the following way:

### **Before time period T1:**

The allowed TFCS according to table A.6.10a shall be signalled to the UE.

### **During time period T1:**

The system simulator shall ensure that the UE output power is commanded to be between 14 to 15 dB below the UE Maximum allowed UL TX power.

### **During time period T2:**

The system simulator shall continuously send TPC\_cmd=1 to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL\_TFC28 to UL\_TFC29 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL\_TFC28 and UL\_TFC29 shall be measured.

## A.6.4.2 Test Requirements

### A.6.4.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL\_TFC8 and UL\_TFC9 within 140 ms from beginning of time period T2.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE: The delay from the beginning of T2 can be expressed as:

$$T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$$

where:

T<sub>ramp</sub> Margin added for the increase of UE output power to the UE maximum power. A margin of 1

frame (10ms) is used, i.e. 15 TPC commands.

 $T_{detect\_block}$  The time needed to detect that UL\_TFC8 and UL\_TFC9 can no longer be supported, i.e. defines

the maximum time to detect that the *Elimination* criterion is fulfilled for UL\_TFC8 and UL\_TFC9. According to X and Y values of 15 and 30 as defined in Section 6.4.2 and by assuming the maximum misalignment between the frame boundary, where the evaluation of the *Elimination* criterion is performed and the last slot needed for triggering the *Elimination* criterion on L1,

T<sub>detect block</sub> becomes 15 slots +14 slots =19.33 ms.

T<sub>notify</sub> Equal to 15 ms, the time allowed for MAC to indicate to higher layers that UL\_TFC8 and

UL\_TFC9 can no longer be supported.

 $T_{modify}$  Equal to MAX( $T_{adapt max}$ ,  $T_{TTI}$ ) = MAX(0, 40)=40ms

T<sub>adapt max</sub> Equals to 0ms for the case without codec.

T<sub>L1 proc</sub> Equals 15ms.

T<sub>align\_TTI</sub> Align with the longest uplink TTI where the new TFC can be selected. The worst case equals

40ms in this test case.

T<sub>TTI</sub> See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of (10 + 19.33 + 15 + 40 + 15 + 40) ms= 139.33 ms from the beginning of T2, allow 140 ms in the test case.

# A.6.4.2.2 Interactive or Background, PS, UL: 64 kbps + Conversational / speech, CS, UL: 12.2kbps

The UE shall have stopped using UL\_TFC28 and UL\_TFC29 within 140 ms from beginning of time period T2.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE: The delay from the begining of T2 can be expressed as:

$$T_{ramp} + T_{detect\ block} + T_{notify} + T_{modify} + T_{L1\ proc} + T_{align\ TTI}$$

where:

T<sub>ramp</sub> Margin added for the increase of UE output power to the UE maximum power. A margin of 1

frame (10ms) is used, i.e. 15 TPC commands.

 $T_{detect\_block} \qquad \qquad \text{The time needed to detect that } UL\_TFC28 \text{ and } UL\_TFC29 \text{ can no longer be supported, i.e. defines}$ 

the maximum time to detect that the Elimination criterion is fulfilled for UL TFC28 and

UL\_TFC9. According to X and Y values of 15 and 30 as defined in Section 6.4.2 and by assuming the maximum misalignment between the frame boundary, where the evaluation of the *Elimination* criterion is performed and the last slot needed for triggering the *Elimination* criterion on L1,

 $T_{detect\ block}$  becomes 15 slots +14 slots =19.33 ms.

T<sub>notify</sub> Equal to 15 ms, the time allowed for MAC to indicate to higher layers that UL\_TFC28 and

UL\_TFC29 can no longer be supported.

 $T_{modify}$  Equal to  $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40) = 40ms$ 

 $T_{adapt\_max}$  Equals to 0ms for the case without codec.

 $T_{L1\_proc}$  Equals 15ms.

T<sub>align\_TTI</sub> Align with the longest uplink TTI where the new TFC can be selected. The worst case equals

40ms in this test case.

T<sub>TTI</sub> See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of (10 + 19.33 + 15 + 40 + 15 + 40) ms= 139.33 ms from the beginning of T2, allow 140 ms in the test case.

# A.6.5 (void)

**Table A.6.11: (void)** 

**Table A.6.12: (void)** 

**Table A.6.13: (void)** 

## A.6.6 E-TFC restriction in UE

## A.6.6.1 Test Purpose and Environment

The purpose is to verify the UE stops using a currently used E-TFC when its remaining power margin is not sufficient to support that E-TFC, and resumes using that E-TFC when its remaining power margin is sufficient to support it. This test will verify the general requirement on E-TFC selection in section 6.4.

### A.6.6.1.1 10ms TTI E-DCH E-TFC restriction testcase

The test will verify the general requirement on E-TFC restriction and recovery in section 6.4 for a 10ms TTI E-DCH Transport Block Size Table 0 [19].

The test parameters are given in Table A.6.14 below. The test consists of 2 time periods, with a time duration of T1 and T2 respectively.

The UE shall be configured to transmit UL DTCH data continuously on the DPCH. An HSDPA radio bearer shall be configured so that the UE transmits ACK and UL HS-DPCCH. An E-DCH radio bearer shall be configured, so that UE is transmitting E-DPCCH and E-DPDCH.

**Table A.6.14: General test parameters** 

Parameter	Unit	Value	Comment
UL DPCH configuration		12.2kbps reference	
		measurement channel	
E-DCH Transport Block		10ms TTI E-DCH Transport	
Size Table		Block Size Table 0 according to	
		25.321 annex B.3	
UL Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	24	For a class 4 UE maximum allowed TX power can still be signalled as 24dBm however the UE only has capability to transmit 21dBm
Propagation condition		AWGN	
β <sub>θ</sub> /β <sub>c</sub>		9/15	Care needs to be taken to ensure that TFCS with $\beta_d/\beta_C$ =9/15 is always used even during power limited part of the test in T2
A <sub>hs</sub>		2	$\Delta_{ACK}=\Delta_{NACK}=\Delta_{CQI}$
A <sub>ec</sub>		2	
$\beta_{\rm ed,ref}/\beta_{\rm C}$		5/15	
L <sub>ref</sub>		1	
K <sub>ref</sub>		18	
$\Delta_{harg}$	dB	0	
PL <sub>non-max</sub>		0.52	
E-DCH minimum set E-TFI		0	Makes E-DCH transport block size with index 0 unblockable even in power limited phase
Periodicity for Scheduling Info		Every TTI	Ensures that some data is sent on every TTI even in the power limited phase
E-DCH MAC-d flow maximum number of retransmissions		0	
T1	S	2	
T2	S	2	

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow E-DCH uplink transmission at the highest possible bit rate with E-DCH TB index 127. It shall also be ensured that sufficient data is made available on the DTCH so that the UE is continuously transmitting on the DPCH.

The test shall be performed in the following way:

### **Initial conditions:**

Call is established with DCH, HSDPA and E-DCH radio bearers. An absolute grant with the value 31 is sent on the E-AGCH to give the UE sufficient grants to make use of the maximum possible data rate.

### **Before time period T1:**

The UE shall be transmitting at its maximum DPCCH power and the UE uplink E-DPCCH shall indicate use of E-TFCI with index 0.

### **During time period T1:**

From the start of T1 the system simulator shall send sufficient consecutive TPC\_cmd= -1 to the UE until the DPCCH power is between 0dBm and 1dBm for a power class 3 UE, or between -4dBm and -3dBm for a power class 4 UE. Within 45ms from the start of T1, the UE uplink E-DPCCH shall indicate use of E-TFCI 127, or the E-TFCI which represents the maximum of the UE's capabilities.

### **Before time period T2:**

The UE P<sub>DPCCH</sub> power shall be between 0dBm and 1dBm for a power class 3 UE, or between -4dBm and -3dBm for a power class 4 UE, and the UE uplink E-DPCCH shall indicate either be not transmitted or use of E-TFCI 127, or the E-TFCI which represents the maximum of the UE's capabilities.

### **During time period T2:**

The system simulator shall continuously send TPC\_cmd=1 to the UE from the beginning of T2 until the end of T2. Within 45ms from the start of T2, the UE uplink E-DPCCH shall indicate use of E-TFCI with index 0.

NOTE: During this phase the UE may perform DTX of the E-DPDCH in accordance with [18] clause 5.1.2.6.

Time periods T1 and T2 shall be repeated until the necessary statistical confidence is achieved.

### A.6.6.1.1.1 Test Requirements

During time period T1, uplink power control shall be adjusted so that the UE is able to make use of E-TFC index 127, or the maximum of its capabilities if this is lower.

NOTE: The required headroom to support E-TFC 127 can be calculated using the parameters  $L_{ref}$ =18 and  $K_{127}$ =20000. This requires {(5006)\*3+12}\*4=60120 before rate matching/ARQ. This can be transmitted on 2xSF/2 codes, so needs equivalent of 4xSF/4 codes, giving  $L_{127}$ =4.

Substituting into the equation for  $\beta_{\text{ed,j,harq}}$  from 25.214:

$$oldsymbol{eta_{ed,j,harq}} = oldsymbol{eta_{ed,ref}} \sqrt{rac{L_{e,ref}}{L_{e,j}}} \sqrt{rac{K_{e,j}}{K_{e,ref}}} \cdot 10^{\left(rac{\Delta_{harq}}{20}
ight)}$$

gives

$$\beta_{ed,j,harq}$$
= 5 \* sqrt (1/4) \* sqrt (20000 / 18) = 83.333

For the SF/2 case, the unquantised gain factor  $\beta_{ed,k,j,uq}$  for each of these two codes is according to

$$\beta_{ed,k,j,uq} = \beta_{ed,k,j,uq} = \sqrt{2} \times \beta_{ed,i,harg}$$

$$\beta_{ed,k,j,uq}$$
 = sqrt(2) \* 83.333 = 117.85

 $\beta_{ed,k}$  is set such that  $\beta_{ed,k}/\beta_c$  is the largest quantized value of Table 1B.2 in [3] subclause 4.2.1.3, for which the condition  $\beta_{ed,k} \le \beta_{ed,k,j,uq}$  holds.

According to 25.213 Table 1B.2 in subclause 4.2.1.3, the corresponding quantised amplitude ratio has index 25,  $A_{ed} = \beta_{ed}/\beta_{c} = 106/15$  for each of the two SF/2 E-DPDCH codes.

The E-TFC selection MPR for this case from 25.133 table 6.2 corresponds to case 6, or an E-TFC MPR of 0.5dB.

$$NRPM_{j} = \left(PMax_{j} - P_{DPCCH} - P_{DPDCH} - P_{HS-DPCCH} - P_{E-DPCCH}\right) / P_{DPCCH}$$

$$= \frac{PMax_{j}}{P_{DPCCH}} - \frac{\beta_{c}^{2} + \beta_{d}^{2} + \beta_{ec}^{2} + \beta_{hs}^{2}}{\beta_{c}^{2}}$$

$$= \frac{PMax_{j}}{P_{DPCCH}} - \left(1 + \frac{\beta_{d}^{2}}{\beta_{c}^{2}} + A_{ec}^{2} + A_{hs}^{2}\right)$$

For a power class 3 UE  $PMax_i = 23.5dBm = 223.87mW$ , or for a power class 4 UE,  $PMax_i = 20.5dBm = 112.20mW$ 

The inequality for support of E-TFC with index 127 is

$$223.87/P_{DPCCH} - (1 + (9^2/15^2) + 2^2 + 2^2) \ge 106^2/15^2 + 106^2/15^2 \text{ (class 3)}$$

$$112.20/P_{DPCCH} - (1 + (9^2/15^2) + 2^2 + 2^2) \ge 106^2/15^2 + 106^2/15^2 \text{ (class 4)}$$

This is satisfied if  $P_{DPCCH} \le (223.87/109.23) = 2.04 \text{mW} = 3.11 \text{dBm}$  for a class 3 UE or  $P_{DPCCH} \le (112.20/109.23) = 1.03 \text{mW} = 0.12 \text{dBm}$  for a class 4 UE.

From table 6.0A the accuracy of the  $P_{DPCCH}$  estimate used for E-TFC selection in this scenario is  $\pm 2dB$  for power class 3 or  $\pm 2.5dB$  for power class 4. Therefore, for  $P_{DPCCH} \leq 1.11dBm$  (class 3) or -2.38dBm (class 4), the UE shall be able to support E-TFC index 127. Since power control granularity is 1dB, the UE output power should be maintained so that  $0dBm \leq P_{DPCCH} \leq 1dBm$  throughout this phase for a class 3 UE, or so that  $-4dBm \leq P_{DPCCH} \leq -3dBm$  throughout this phase for a class 4 UE.

NOTE: Test tolerance may need to be added to further reduce the UE DPCCH power further by RAN5, depending on how accurately tester can set and maintain UE DPCCH power.

NOTE: The required time to start using E-TFC index 127 or the maximum of the UEs cababilities at the beginning of T1, and to start using E-TFC with index 0 at the beginning of T2 can be calculated as follows.

Since TPC commands are received error free by the UE,  $P_{DPCCH}$  shall reach the new power level power within 25 slots = 16.666ms.

The UE shall have evaluated and started to use the new restriction criteria with  $T_s$  = (Power level change time +  $P_{DPCCH}$  filtering period + E-TFC estimation rate + Maximum time from RGCH reception to E-TFC transmission) from the start of the time period

$$= 16.66 \text{ms} + 10 \text{ms} + 10 \text{ms} + 7.53 \text{ms}$$
  
= 44.19 ms, allow 45 ms

The rate of correct tests observed during repeated tests shall be at least 90%.

### A.6.6.1.2 2ms TTI E-DCH E-TFC restriction testcase

The test will verify the general requirement on E-TFC restriction and recovery in section 6.4 for a 2ms TTI E-DCH Transport Block Size Table 0 [19].

The test parameters are given in Table A.6.15 below. The test consists of 2 time periods, with a time duration of T1 and T2 respectively.

The UE shall be configured to transmit UL DTCH data continuously on the DPCH. An HSDPA radio bearer shall be configured so that the UE transmits ACK and UL HS-DPCCH. An E-DCH radio bearer shall be configured, so that UE is transmitting E-DPCCH and E-DPDCH.

**Table A.6.15: General test parameters** 

Parameter	Unit	Value	Comment
UL DPCH configuration		12.2kbps reference	
		measurement channel	
E-DCH Transport Block		2ms TTI E-DCH Transport Block	
Size Table		Size Table 0 according to	
		25.321 annex B.1	
UL Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	24	For a class 4 UE maximum allowed TX power can still be signalled as 24dBm however the UE only has capability to transmit 21dBm
Propagation condition		AWGN	
β <sub>θ</sub> /β <sub>c</sub>		9/15	Care needs to be taken to ensure that TFCS with $\beta_d/\beta_C$ =9/15 is always used even during power limited part of the test in T2
A <sub>hs</sub>		2	$\Delta_{ACK}=\Delta_{NACK}=\Delta_{CQI}$
A <sub>ec</sub>		2	
$\beta_{\rm ed,ref}/\beta_{\rm C}$		5/15	
L <sub>ref</sub>		1	
K <sub>ref</sub>		18	
$\Delta_{harg}$	dB	0	
PL <sub>non-max</sub>		0.52	
E-DCH minimum set E-TFI		0	Makes E-DCH transport block size with index 0 unblockable even in power limited phase
Periodicity for Scheduling Info		Every TTI	Ensures that some data is sent on every TTI even in the power limited phase
E-DCH MAC-d flow maximum number of retransmissions		0	
T1	S	2	
T2	S	2	

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow E-DCH uplink transmission at the highest possible bit rate with E-DCH TB index 127. It shall also be ensured that sufficient data is made available on the DTCH so that the UE is continuously transmitting on the DPCH.

The test shall be performed in the following way:

### **Initial conditions:**

Call is established with DCH, HSDPA and E-DCH radio bearers. An absolute grant with the value 31 is sent on the E-AGCH to give the UE sufficient grants to make use of the maximum possible data rate.

### **Before time period T1:**

The UE shall be transmitting at its maximum DPCCH power and the UE uplink E-DPCCH shall indicate use of E-TFCI with index 0.

### **During time period T1:**

From the start of T1 the system simulator shall send sufficient consecutive TPC\_cmd= -1 to the UE until the DPCCH power is between 2dBm and 3dBm for a power class 3 UE, or between -1dBm and 0dBm for a power class 4 UE. Within 23ms from the start of T1, the UE uplink E-DPCCH shall indicate use of E-TFCI 127, or the E-TFCI which represents the maximum of the UE's capabilities.

### Before time period T2:

The UE P<sub>DPCCH</sub> power shall be between 2dBm and 3dBm for a power class 3 UE, or between -1dBm and 0dBm for a power class 4 UE, and the UE uplink E-DPCCH shall either be not transmitted or indicate use of E-TFCI 127, or the E-TFCI which represents the maximum of the UE's capabilities.

#### **During time period T2:**

The system simulator shall continuously send TPC\_cmd=1 to the UE from the beginning of T2 until the end of T2. Within 23ms from the start of T2, the UE uplink E-DPCCH shall indicate use of E-TFCI with index 0.

NOTE: During this phase the UE may perform DTX of the E-DPDCH in accordance with [18] clause 5.1.2.6.

Time periods T1 and T2 shall be repeated until the necessary statistical confidence is achieved.

## A.6.6.1.2.1 Test Requirements

During time period T1, uplink power control shall be adjusted so that the UE is able to make use of E-TFC index 127, or the maximum of its capabilities if this is lower.

NOTE: The required headroom to support E-TFC 127 can be calculated using the parameters  $L_{ref}$ =1,  $K_{ref}$ =18 and  $K_{127}$ =11484. This requires {(3836)\*3+12}\*3 =34560 bits before rate matching/ARQ. This can be transmitted on 2xSF/2 codes and 2xSF/4 codes, so needs equivalent of 6xSF/4 codes, giving  $L_{127}$ =6.

Substituting into the equation for  $\beta_{ed,j,harq}$  from 25.214:

$$oldsymbol{eta_{ed,j,harq}} = oldsymbol{eta_{ed,ref}} \sqrt{rac{L_{e,ref}}{L_{e,j}}} \sqrt{rac{K_{e,j}}{K_{e,ref}}} \cdot 10^{\left(rac{\Delta_{harq}}{20}
ight)}$$

gives

$$\beta$$
ed,j,harq= 5 \* sqrt (1/6) \* sqrt (11484 / 18) = 51.56

For the SF/2 codes, the unquantised gain factor  $\beta_{ed,k,j,uq}$  for each of these two codes is according to  $\beta_{ed,k,j,uq} = \beta_{ed,k,j,uq} = \sqrt{2} \times \beta_{ed,i,hara}$ 

$$\Box$$
 ed,k,j,uq= sqrt(2) \* 51.56 = 72.91

And for the SF/4 codes, the unquantised gain factor is  $\beta_{ed,k,j,uq}$  =51.56

 $\beta_{ed,k}$  is set such that  $\beta_{ed,k}/\beta_c$  is the largest quantized value of Table 1B.2 in [3] subclause 4.2.1.3, for which the condition  $\beta_{ed,k} \leq \beta_{ed,k,j,uq}$  holds.

According to 25.213 Table 1B.2 in subclause 4.2.1.3, the corresponding quantised amplitude ratio are  $A_{ed} = \beta_{ed}/\beta_c = 67/15$  for each of the two SF/2 E-DPDCH codes and  $A_{ed} = \beta_{ed}/\beta_c = 47/15$  for each of the two SF/4 codes

The E-TFC selection MPR for this case from 25.133 table 6.2 is 0.0dB.

$$NRPM_{j} = \frac{(PMax_{j} - P_{DPCCH} - P_{DPDCH} - P_{HS-DPCCH} - P_{E-DPCCH})}{P_{DPCCH}}$$

$$= \frac{PMax_{j}}{P_{DPCCH}} - \frac{\beta_{c}^{2} + \beta_{d}^{2} + \beta_{ec}^{2} + \beta_{hs}^{2}}{\beta_{c}^{2}}$$

$$= \frac{PMax_{j}}{P_{DPCCH}} - \left(1 + \frac{\beta_{d}^{2}}{\beta_{c}^{2}} + A_{ec}^{2} + A_{hs}^{2}\right)$$

For a power class 3 UE PMax<sub>i</sub> = 24dBm = 251.2mW, or for a power class 4 UE, PMax<sub>i</sub> = 21dBm = 125.9mW

The inequality for support of E-TFC with index 127 is

$$251.2/P_{DPCCH} - \left(1 + (9^2/15^2) + 2^2 + 2^2\right) \geq 47^2/15^2 + 47^2/15^2 + 67^2/15^2 + 67^2/15^2 \text{ (class 3)}$$

$$125.9/P_{DPCCH} - (1+(9^2/15^2) + 2^2 + 2^2) \ge 47^2/15^2 + 47^2/15^2 + 67^2/15^2 + 67^2/15^2 (class 4)$$

This is satisfied if  $P_{DPCCH} \le (251.2/68.9) = 3.64 \text{mW} = 5.61 \text{dBm}$  for a class 3 UE or  $P_{DPCCH} \le (125.9/68.9) = 1.82 \text{mW} = 2.61 \text{dBm}$  for a class 4 UE.

From table 6.0A the accuracy of the Pdpcch estimate used for E-TFC selection in this scenario is  $\pm 2dB$  for power class 3 or  $\pm 2.5dB$  for power class 4. Therefore, for  $P_{DPCCH} \leq 3.61dBm$  (class 3) or 0.11dBm (class 4), the UE shall be able to support E-TFC index 127. Since power control granularity is 1dB, the UE output power should be maintained so that  $2dBm \leq P_{DPCCH} \leq 3dBm$  throughout this phase for a class 3 UE, or so that  $-1dBm \leq P_{DPCCH} \leq 0dBm$  throughout this phase for a class 4 UE.

NOTE: Test tolerance may need to be added to further reduce the UE DPCCH power further by RAN5, depending on how accurately tester can set and maintain UE DPCCH power.

NOTE: The required time to start using E-TFC index 127 or the maximum of the UEs cababilites at the beginning of T1, and to start using E-TFC with index 0 at the beginning of T2 can be calculated as follows.

Since TPC commands are received error free by the UE,  $P_{DPCCH}$  shall reach the new power level power within 20 slots = 13.33ms.

The UE shall have evaluated and started to use the new restriction criteria with  $T_s$  = (Power level change time + Pdpcch filtering period + E-TFC estimation rate + Maximum time from RGCH reception to E-TFC transmission) from the start of the time period

- = 13.33ms + 2ms + 2ms + 5.53ms
- = 22.86ms, allow 23ms

The rate of correct tests observed during repeated tests shall be at least 90%.

# A.7 Timing and Signalling Characteristics

# A.7.1 UE Transmit Timing

# A.7.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in section 7.1.2.

For this test two cells on the same frequency are used. Table A.7.1 defines the transmitted signal strengths, the relative timing and the propagation condition used for the two cells.

**Parameter** Unit Level DPCH\_Ec/ Ior, Cell 1 and Cell 2 dB -13.5 CPICH Ec/ lor. Cell 1 and Cell 2 dB -10 PCCPH\_Ec/ Ior, Cell 1 and Cell 2 dB -12 SCH\_Ec/ Ior, Cell 1 and Cell 2 dΒ -12 PICH\_Ec/ Ior, Cell 1 and Cell 2 dB -15 OCNS\_Ec/ Ior, Cell 1 and Cell 2 -1.2 dΒ Î<sub>or,</sub> Cell 1 dBm/3,84 MHz -96 dBm/3,84 MHz -99 Î<sub>or,</sub> Cell 2 Information data rate 12.2 kbps Relative delay of path received from cell +/-2 2 with respect to cell 1 Propagation condition **AWGN** 

Table A.7.1: Test parameters for UE Transmit Timing requirement

## A.7.1.2 Test Requirements

For parameters specified in Table A.7.1, the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

The relevant soft handover parameters shall be set such that the UE enters soft handover with cell 1 and cell 2 when both cells are sending a signal. The following sequence of events shall be used to verify that the requirements are met.

- a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within  $T_0 + 1.5$  chips with respect to the first detected received path (in time) of the downlink DPCCH/DPDCH of cell 1.  $T_0$  is defined in TS 25.211[2].
- b) Test system introduces cell 2 into the test system at delay +2 µs from cell 1.
- c) Test system verifies that cell 2 is added to the active set.
- d) Test system shall verify that the UE transmit timing offset is still within  $T_0 + 1.5$  chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 1.
- e) Test system switches Tx timing of cell 2 to a delay of -2 µs with respect to cell 1.
- f) Test system verifies cell 2 remains in the active set.
- g) Test system shall verify that the UE transmit timing offset is still within  $T_0 + 1.5$  chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 1.
- h) Test system stops sending cell 1 signals.
- i) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. The adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within  $T_0 +/-1.5$  chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 2.
- j) Test system shall verify that the UE transmit timing offset stays within  $T_0$  +/- 1.5 chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 2.
- k) Test system starts sending cell 1 signal again with its original timing.
- 1) Test system verifies that cell 1 is added to the active set.
- m) Test system verifies that the UE transmit timing is still within  $T_0$  +/- 1.5chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 2.
- n) Test system stops sending cell 2 signals.

- o) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. The adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within  $T_0$  +/- 1.5 chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 1.
- p) Test system shall verify that the UE transmit timing offset stays within  $T_0$  +/- 1.5 chips with respect to the first detected path (in time) of the downlink DPCCH/DPDCH of cell 1.

# A.8 UE Measurements Procedures

# A.8.1 FDD intra frequency measurements

## A.8.1.1 Event triggered reporting in AWGN propagation conditions

## A.8.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8.1 and A.8.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1: General test parameters for Event triggered reporting in AWGN propagation conditions

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section A.3.1
		Channel 12.2 kbps	
Power Control		On	
Active cell		Cell 1	
Reporting range	dB	3	Applicable for event 1A and 1B
Hysteresis	dB	0	
W		1	Applicable for event 1A and 1B
Reporting deactivation		0	Applicable for event 1A
threshold			
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24	
T1	S	5	
T2	S	5	
T3	S	5	

Table A.8.2: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions

Parameter	Unit		Cell 1			Cell 2				
		T1	T2	Т3	T1	T2	T3			
CPICH_Ec/lor	dB	-10			-10	•				
PCCPCH_Ec/lor	dB	-12			-12					
SCH_Ec/lor	dB	-12			-12					
PICH_Ec/lor	dB	-15			-15					
DPCH_Ec/lor	dB	Note 1			N/A					
OCNS		Note 2			-0.941	-0.941				
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	0	-Infinity	5.97	-Infinity			
$I_{oc}$	dBm/3,84 MHz	-70								
CPICH_Ec/lo	dB	-13	-13	-13	-Infinity	-14	-Infinity			
Propagation Condition		AWGN								

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ .

### A.8.1.1.2 Test Requirements

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall send one Event 1B triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

## A.8.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition

#### A.8.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8.3 and A.8.4. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A, 1C and 1B shall be used and the periodical reporting of the events is not applied. The test consists of four successive time periods, with a time duration of T1, T2, T3 and T4 respectively. In the initial condition before the time T1 only Cell1 is active.

Table A.8.3: General test parameters for Event triggered reporting of multiple neighbours in AWGN propagation conditions

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Active cell		Cell 1	
Reporting range	dB	3	Applicable for event 1A and 1B
Hysteresis	dB	0	
W		1	Applicable for event 1A and 1B
Replacement activation threshold		0	Applicable for event 1C
Reporting deactivation threshold		0	Applicable for event 1A
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		32	
T1	S	10	
T2	S	10	
T3	S	5	
T4	S	10	

Table A.8.4: Cell specific test parameters for Event triggered reporting of multiple neighbours in AWGN propagation condition

Parameter	Unit		Ce	ell 1			Cell 2				Cell3			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	
CPICH_Ec/lor	dB	-10				-10				-10				
PCCPCH_Ec/ lor	dB	-12				-12				-12				
SCH_Ec/lor	dB	-12	-12							-12				
PICH_Ec/lor	dB	-15				-15				-15				
DPCH_Ec/lor	dB	Note 1				N/A	1/A A\I			N/A	N/A			
OCNS_Ec/lor	dB	Note 2				-0.941	-0.941			-0.941				
$\hat{I}_{or}/I_{oc}$	dB	6.97	6.93	5.97	6.12	-Inf	9.43	6.97	7.62	5.97	6.93	-Inf	5.62	
$I_{oc}$	dBm/ 3,84 MHz	,84 -85												
CPICH_Ec/lo	dB	-13	-16	-14	-15.5	-Inf	-13.5	-13	-14	-14	-16	-Inf	-16	
Propagation Condition AWGN														
	NOTE 1: The DPCH level is controlled by the power control loop  NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I <sub>or</sub> .													

### A.8.1.2.2 Test Requirements

- a) The UE shall send one Event 1A triggered measurement report for Cell3, with a measurement reporting delay less than 800 ms from the beginning of time period T1.
- b) The UE may send one Event 1C triggered measurement report for Cell3 after the beginning of the time period T1
- c) The UE shall send one Event 1C triggered measurement report for Cell2, with a measurement reporting delay less than 800 ms from the beginning of time period T2.
- d) The UE shall send one Event 1A triggered measurement report for Cell2, with a measurement reporting delay less than 800 ms from the beginning of time period T2.
- e) The UE shall send one Event 1B triggered measurement report for Cell3, with a measurement reporting delay less than 200 ms from the beginning of time period T3.

- f) The UE shall send one Event 1A triggered measurement report for Cell3, with a measurement reporting delay less than 200 ms from the beginning of time period T4.
- g) The UE may send one Event 1C triggered measurement report for Cell2 after the beginning of the time period T4.
- h) The UE may send one Event 1C triggered measurement report for Cell3 after the beginning of the time period T4.
- i) The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition

### A.8.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8.5 and A.8.6. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used and the periodical reporting of the events is not applied. The test consists of four successive time periods, with a time duration of T1, T2, T3 and T4 respectively. In the initial condition before the time T1 only Cell1 is active.

Table A.8.5: General test parameters for Event triggered reporting of two detectable neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section A.3.1
		Channel 12.2 kbps	
Power Control		On	
Active cell		Cell 1	
Reporting range	dB	3	Applicable for event 1A and 1B
Hysteresis	dB	0	
W		1	Applicable for event 1A and 1B
Reporting deactivation		0	Applicable for event 1A
threshold			
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		32	
T1	S	10	
T2	S	10	
T3	S	10	
T4	S	10	

Table A.8.6: Cell specific test parameters for Event triggered reporting of two detectable neighbours in AWGN propagation condition

Parameter	Unit		Ce	II 1			Cell 2				Cell3		
		T1	T2	T3	T4	T1	T2	Т3	T4	T1	T2	T3	T4
CPICH_Ec/lor	dB	-10				-1	0			-1	10		
PCCPCH_Ec/ lor	dB		-12				-12			-12			
SCH_Ec/lor	dB		-12				-1	2		-12			
PICH_Ec/lor	dB	-15					-1	5		-15			
DPCH_Ec/lor	dВ	Note 1				N/A			N/A				
OCNS_Ec/lor	dВ		No	te 2		-0.941			-0.941				
$\hat{I}_{or}/I_{oc}$	dB	14.55	28.51	14.45	28.51	-Inf	27.51	13.95	21.51	8.05	21.51	13.95	27.51
$I_{oc}$	dBm/ 3,84 MHz		-85										
CPICH_Ec/lo	dB	-11	-13	-14.5	-13	-Inf	-14.0	-15	-20	-17.5	-20	-15	-14
Propagation Condition		AWGN											
NOTE 1: The D	PCH lev	el is cor	trolled b	y the po	wer con	trol loop		_	_		_		

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ 

### A.8.1.3.2 Test Requirements

- a) The UE shall send one Event 1A triggered measurement report for Cell2, with a measurement reporting delay less than 800 ms from the beginning of time period T2.
- b) The UE shall send one Event 1A triggered measurement report for Cell3, with a measurement reporting delay less than 200 ms from the beginning of time period T3.
- c) The UE shall send one Event 1B triggered measurement report for Cell2, with a measurement reporting delay less than 200 ms from the beginning of time period T4.
- d) The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.1.4 Correct reporting of neighbours in fading propagation condition

### A.8.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs sufficient layer 1 filtering of the measurements, see section 9.1, which are the base for the event evaluation. The test is performed in fading propagation conditions. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.7 and A.8.8.In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and Event 1B shall be used. The test consists of two successive time periods, each with a time duration of T1 and T2 respectively.

The TTI of the uplink DCCH shall be 20ms.

Table A.8.7: General test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel	As specified in TS 25.101 section A.3.1
·		12.2 kbps	
Power Control		On	
Active cell		Cell 1	
Reporting range	dB	0	Applicable for event 1A and 1B
Hysteresis	dB	0	
W		1	Applicable for event 1A and 1B
Reporting deactivation		0	Applicable for event 1A
threshold			
Time to Trigger	ms	120	
Filter coefficient		0	
Monitored cell list size		24	Signalled before time T1.
T1	S	200	
T2	S	201	

Table A.8.8: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Ce	II 1	Ce	II 2			
		T1	T2	T1	T2			
CPICH_Ec/lor	dB	-1	0	-1	10			
PCCPCH_Ec/lor	dB	-1	2	-1	12			
SCH_Ec/lor	dB	-1	2	-1	-12			
PICH_Ec/lor	dB	-1	5	-15				
DPCH_Ec/lor	dB	No	te 1	N	N/A			
OCNS		Not	te 2	-0.9	941			
$\hat{I}_{or}/I_{oc}$	dB	7.29	3.29	3.29	7.29			
$I_{oc}$	dBm/3,84 MHz	-70						
CPICH_Ec/lo	dB	-12	-16	-16	-12			
Propagation Condition		Case 5 as specified in Annex B of TS25.101						

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ 

### A.8.1.4.2 Test Requirements

- a) The number of received event 1A reports for Cell 2 during time period T1 shall be less than 60.
- b) During the first 1 s of time period T2 no event reports shall be counted.
- c) The number of received event 1B reports counted from 1s after the beginning of time period T2 until the end of time period T2 shall be less than 60.

### A.8.1.5 Event triggered reporting of multiple neighbour cells in Case 1 fading condition

### A.8.1.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in Case1 fading propagation condition. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.8A and A.8.8B below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A shall be used and "CFN-SFN-Observed Time Difference" shall

be reported. The test consists of two successive time periods, with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information of invisible cells.

Table A.8.8A: General test parameters for event triggered reporting in multi-cell pedestrian environment

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101
		Channel 12.2 kbps	section A.3.1
Power Control		On	
Active cells		Cell2, Cell3, Cell4	
Hysteresis	dB	0	Applicable for event 1A
Time to Trigger	ms	0	Applicable for event 1A
Filter coefficient		0	Applicable for event 1A
Reporting range R <sub>1a</sub>	dB	9	Applicable for event 1A
W		0	Applicable for event 1A
TriggeringCondition		activeSetAndMonitoredSetCells	Applicable for event 1A
Monitored cell list size		32	
T1	S	5	
T2	S	5	

Table 8.8B: Cell specific test parameters for event triggered reporting in multi-cell pedestrian environment

Parameter	Unit	Cel	II 1	Се	II 2	Ce	II 3	Cell 4	
	Ţ	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/lor	dB	-1	0		10		10	-1	10
PCCPCH_Ec/lor	dB	-1	2		12		12		12
SCH_Ec/lor	dB	-1	2		12		12		12
PICH_Ec/lor	dB	-15		-15		-15		-15	
DPCH_Ec/lor	dB	n.a.		Note 1		Note 1		Note 1	
OCNS_Ec/lor	dB	-0.9	941	Note 2		Note 2		Note 2	
$\hat{I}_{or}/I_{oc}$	dB		1.3	4.3	1.3	4.3	1.3	1.3	4.3
$I_{oc}$	dBm/3,84 MHz				=	70			
<b>Propagation Condition</b>					Case 1	(3km/h)			
CPICH_Ec/lo	dB	-∞	-17.6	-14.6	-17.6	-14.6	-17.6	-17.6	-14.6
$rac{SCH\_\hat{E}_{c, ext{maxpath}}}{I_o}$	dB	-∞	-20.0	-17.0	-20.0	-17.0	-20.0	-20.0	-17.0

NOTE 1: The DPCH level is controlled by the power control loop.

NOTE 2: The power of the OCNS channel that is added shall make the total power equal to Ior.

NOTE 3: CPICH\_Ec/lo and SCH\_Ec\_maxpath/lo levels have been calculated from other parameters for information purposes. They are not settable themselves.

#### A.8.1.5.2 Test Requirements

The UE shall send one Event 1A triggered measurement report for Cell 1 with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.1.6 Event triggered reporting of multiple neighbour cells in Case 3 fading condition

### A.8.1.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in Case3 fading propagation condition. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.8C and A.8.8D below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1F shall be used and "CFN-SFN-Observed Time Difference" shall be reported. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of invisible cells.

Table A.8.8C: General test parameters for event triggered reporting in multi-cell vehicular environment

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section
		Channel 12.2 kbps	A.3.1
Power Control		On	
Active cells		Cell2, Cell3, Cell4	
Hysteresis	dB	0	Applicable for event 1A
Time to Trigger	ms	0	Applicable for event 1A
Filter coefficient		0	Applicable for event 1A and event
			1F
Reporting range R <sub>1a</sub>	dB	8	Applicable for event 1A
W		0	Applicable for event 1A
TriggeringCondition		activeSetAndMonitoredSetCells	Applicable for event 1A
Absolute threshold T <sub>1f</sub>	dB	<b>-</b> 20	Applicable for event 1F
Time to Trigger	ms	0	Applicable for event 1F
TriggeringCondition		activeSet	Applicable for event 1F
Monitored cell list size		32	
T1	S	5	
T2	S	5	

Table 8.8D: Cell specific test parameters for event triggered reporting in multi-cell vehicular environment

Parameter	Unit	Ce	ell 1	Cell 2		Се	II 3	Cell 4	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/lor	dB	ı	10	-1	0	-	10	-'	10
PCCPCH_Ec/lor	dB	-	12	-1	2		12		12
SCH_Ec/lor	dB	-6	9.3	-9.	.3	-9	.3	-9	.3
PICH_Ec/lor	dB	-	15	-1	5		15	-15	
DPCH_Ec/lor	dB	n.a.		Note 1		Note 1		Note 1	
OCNS_Ec/lor	dB	No	te 2	Note 2		Note 2		Note 2	
$\hat{I}_{or}/I_{oc}$	dB		1.1	3.6	4.6	3.6	4.6	6.6	-∞
$I_{oc}$	dBm/3,84 MHz				-70				
Propagation Condition				Ca	ase 3 (12	0km/h)			
CPICH_Ec/lo	dB	-∞	-18.0	-16.5	-14.5	-16.5	-14.5	-13.5	-∞
$\frac{SCH\_\hat{E}_{c,\text{maxpath}}}{I_o}$	dB	-∞	-20.0	-18.5	-16.5	18.5	-16.5	-15.5	-∞

NOTE 1: The DPCH level is controlled by the power control loop.

NOTE 2: The power of the OCNS channel that is added shall make the total power equal to I<sub>or</sub>.

NOTE 3: CPICH\_Ec/lo, SCH\_Ec\_maxpath/lo, and  $I_o$  levels have been calculated from other

parameters for information purposes. They are not settable themselves

### A.8.1.6.2 Test Requirements

The UE shall send an Event 1A triggered measurement report for Cell 1, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The UE shall send an Event 1F triggered measurement report for Cell 4, with a measurement reporting delay less than 200 ms from the beginning of time period T2.

The rate of correct events 1A for Cell1 observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

#### A.8.2 FDD inter frequency measurements

#### Correct reporting of neighbours in AWGN propagation condition A.8.2.1

#### A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.3.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.8.9 and A.8.10 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting.

Table A.8.9: General test parameters for Correct reporting of neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode		A.22 set 1	As specified in TS 25.101 section A.5.
Active cell		Cell 1	
Threshold non used frequency	dB	-18	Absolute Ec/I0 threshold for event 2C
Reporting range	dB	4	Applicable for event 1A
Hysteresis	dB	0	
W		1	Applicable for event 1A
W non-used frequency		1	Applicable for event 2C
Reporting deactivation threshold		0	Applicable for event 1A
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1	Measurement control information is
		16 on channel 2	sent before the compressed mode pattern starts.
T1	S	5	
T2	S	5	

TableA.8.10: Cell Specific parameters for Correct reporting of neighbours in AWGN propagation condition

Parameter	Unit	Ce	II 1	Cell 2		Ce	II 3
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 2	
CPICH_Ec/lor	dB	-1	0	-10		-10	
PCCPCH_Ec/lor	dB	-12		-12		-12	
SCH_Ec/lor	dB	-12		-12		-12	
PICH_Ec/lor	dB	-1	5	-15		-15	
DPCH_Ec/lor	dB	Not	e 1	N/A		N/A	
OCNS		Not	e 2	-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	5.42	-Infinity 3.92		-1.8	-1.8
$I_{oc}$	dBm/3,84 MHz	-70				-7	0
CPICH_Ec/lo	dB	-13 -13		-Infinity -14.5		-14	-14
Propagation Condition	AWGN						

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

### A.8.2.1.2 Test Requirements

- a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 3.4 seconds from the beginning of time period T1.
- b) The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 956.2 ms from the beginning of time period T2. The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.2.2 Correct reporting of neighbours in Fading propagation condition

#### A.8.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.3. The test parameters are given in Table A.8.11 and A.8.12. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used. The test consists of two successive time periods, each with a time duration of T1 and T2 respectively.

Table A.8.11: General test parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		_ '	
		On	
Compressed mode		A.22 set 2 (TGPL1=12)	As specified in TS 25.101 section A.5.
Active cell		Cell 1	
Absolute Threshold	dB	-18	
(Ec/N0) for Event 2c			
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24	Measurement control information is
		8 on frequency Channel 2	sent before the compressed mode
			pattern starts.
Propagation Condition		Case 5	As specified in Annex B of TS 25.101.
Frequency offset	ppm	+/- 0.1	Frequency offset between Cell 1 and
			Cell 2.
T1	S	2	
T2	S	15	

Table A.8.12: Test parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Cell 1		Cel	12
		T1	T2	T1	T2
UTRA RF Channel Number		Chan	nel 1	Chan	nel 2
CPICH_Ec/lor	dB	-1	0	-1	0
PCCPCH_Ec/lor	dB	-1	2	-12	
SCH_Ec/lor	dB	-12		-12 -12	
PICH_Ec/lor	dB	-15		-15	
DPCH_Ec/lor	dB	Note 1		N/A	
OCNS		Not	e 2	-0.9	941
$\hat{I}_{or}/I_{oc}$	dB	0		-Infinity -1.8	
$I_{oc}$	dBm/3,84 MHz	-70		-7	0
CPICH_Ec/lo	dB	-13		-Infinity	-14
Propagation Condition	Case 5 as specified in Annex B of TS25.101				

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

### A.8.2.2.2 Test Requirements

- a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 13.5 seconds from the beginning of time period T2.
- b) The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

## A.8.2.3 Correct reporting of neighbours in fading propagation condition using TGL1=14

### A.8.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.3. The test parameters are given in Table A.8.12A and A.8.12B. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used. The test consists of two successive time periods, each with time duration of T1 and T2 respectively.

Table A.8.12A: General test parameters for correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel	As specified in TS 25.101 section A.3.1
·		12.2 kbps	
Power Control		On	
Compressed mode		A.22 set 4	As specified in TS 25.101 section A.5.
Active cell		Cell 1	
Absolute Threshold	dB	-18	
(Ec/N0) for Event 2c			
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24	Measurement control information is
		8 on frequency Channel 2	sent before the compressed mode
			pattern starts.
Propagation Condition		Case 5	As specified in Annex B of TS 25.101.
Frequency offset	ppm	+/- 0.1	Frequency offset between Cell 1 and
<u> </u>			Cell 2.
T1	S	2	
T2	S	2	

Table A.8.12B: Test parameters for correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Cell 1		Cel	II 2
		T1	T2	T1	T2
UTRA RF Channel Number		Chan	nel 1	Chan	nel 2
CPICH_Ec/lor	dB	-1	0	-1	0
PCCPCH_Ec/lor	dB	-1	2	-12	
SCH_Ec/lor	dB	-12		-12	
PICH_Ec/lor	dB	-15		-15	
DPCH_Ec/lor	dB	Not	Note 1		Ά
OCNS		Not	e 2	-0.9	941
$\hat{I}_{or}/I_{oc}$	dB	0		-Infinity -1.8	
$I_{oc}$	dBm/3,84 MHz	-7	-70		0
CPICH_Ec/lo	dB	-13		-Infinity	-14
Propagation Condition	Case 5 as specified in Annex B of TS25.101				

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

### A.8.2.3.2 Test Requirements

- a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 1.7 seconds from the beginning of time period T2.
- b) The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

### A.8.2A FDD adjacent frequency measurements

The test cases under A.8.2A are only applicable to UEs that do not require compressed mode to measure cells on a frequency adjacent to the intra-frequency.

### A.8.2A.1 Event triggered reporting in AWGN propagation conditions

### A.8.2A.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8.12C and A.8.12D below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C and 2E shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.12C: General test parameters for Event triggered reporting in AWGN propagation conditions

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement	As specified in TS 25.101 section A.3.1
		Channel 12.2 kbps	
Power Control		On	
Active cell		Cell 1	
Threshold non used	dB	-17	Absolute Ec/lo threshold for event 2C
frequency			and 2E
Hysteresis	dB	0	Applicable for event 2C and 2E
W non-used frequency		0	Applicable for event 2C and 2E
Time to Trigger	Ms	0	Applicable for event 2C and 2E
Filter coefficient		0	Applicable for event 2C and 2E
Monitored cell list size		24 on channel 1 and 2 each	
T1	S	5	
T2	S	5	
T3	S	5	

Table A.8.12D: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number			Channel 1			Channel 2	
CPICH_Ec/lor	dB	-10			-10		
PCCPCH_Ec/lor	dB	-12			-12		
SCH_Ec/lor	dB	-12			-12		
PICH_Ec/lor	dB	-15			-15		
DPCH_Ec/lor	dB	Note 1			N/A		
OCNS		Note 2			-0.941		
$\hat{I}_{or}/I_{oc}$	dB	0.02	0.02	0.02	-Infinity	-1.80	-Infinity
$I_{oc}$	dBm/3,84 MHz	-70		·	·		
CPICH_Ec/lo	dB	-13	-13	-13	-Infinity	-14	-Infinity
Propagation Condition		AWGN			•		

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ .

### A.8.2A.1.2 Test Requirements

- a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.
- b) The UE shall send one Event 2E triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T3.
- c) The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.2A.2 Event triggered reporting of two detectable neighbours in AWGN propagation condition

### A.8.2A.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8.12E and A.8.12F. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C and 2E shall be used and the periodical reporting of the events is not applied. The test consists of four successive time periods, with a time duration of T1, T2, T3 and T4 respectively. In the initial condition before the time T1 only Cell1 is active.

Table A.8.12E: General test parameters for Event triggered reporting of two detectable neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-16	Absolute Ec/lo threshold for event 2C and 2E
Hysteresis	dB	0	Applicable for event 2C and 2E
W non-used frequency		0	Applicable for event 2C and 2E
Time to Trigger	Ms	0	Applicable for event 2C and 2E
Filter coefficient		0	Applicable for event 2C and 2E
Monitored cell list size		32	
T1	S	10	
T2	S	10	
T3	S	10	
T4	S	10	

Table A.8.12F: Cell specific test parameters for Event triggered reporting of two detectable neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Ce	II 2			Ce	II 3		
		T1	T2	Т3	T4	T1	T2	Т3	T4	T1	T2	Т3	T4
UTRA RF Channel Number		Channel 1			Channel 2				Channel 2				
CPICH_Ec/lor	dB	-10					-1	10			-1	10	
PCCPCH_Ec/lo r	dB	-12			-12				-12				
SCH_Ec/lor	dB		-1	2		-12			-12				
PICH_Ec/lor	dB		-1	15		-15			-15				
DPCH_Ec/lor	dB		Not	te 1		N/A			N/A				
OCNS_Ec/lor	dB		Not	te 2		-0.941					-0.9	941	
$\hat{I}_{or}/I_{oc}$	dB	5.87	0.02	5.87	0.02	-Inf	-0.06	20.33	-8.73	-6.65	-6.56	21.93	-12.23
$I_{oc}$	dBm/ 3,84 MHz	-85											
CPICH_Ec/lo	dB	-11	-13	-11	-13	-Inf	-13.5	-13.9	-19.5	-17.5	-20	-12.3	-23
Propagation Condition		AWGN					•						

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{
m or}$ 

#### A.8.2A.2.2 Test Requirements

- a) The UE may send one Event 2C triggered measurement report for Cell3, with a measurement reporting delay less than 800 ms from the beginning of time period T1, and send one Event 2E triggered measurement report for Cell3, with a measurement reporting delay less than 200ms from the beginning of time period T2.
- b) The UE shall send one Event 2C triggered measurement report for Cell2, with a measurement reporting delay less than 800 ms from the beginning of time period T2.
- c) The UE shall send one Event 2C triggered measurement report for Cell3, with a measurement reporting delay less than 200 ms from the beginning of time period T3.
- d) The UE shall send one Event 2E triggered measurement report for Cell2, with a measurement reporting delay less than 200 ms from the beginning of time period T4.
- d) The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.2A.3 Correct reporting of neighbours in fading propagation condition

#### A.8.2A.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs sufficient layer 1 filtering of the measurements, see section 9.1, which are the base for the event evaluation. The test is performed in fading propagation conditions. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8.12G and A.8.12H.In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C and Event 2E shall be used. The test consists of two successive time periods, each with a time duration of T1 and T2 respectively.

The TTI of the uplink DCCH shall be 20ms.

Table A.8.12G: General test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel	As specified in TS 25.101 section A.3.1
		12.2 kbps	
Power Control		On	
Active cell		Cell 1	
Threshold non used	dB	-12	Absolute Ec/Io threshold for event 2C
frequency for event 2C	UD	- 12	Absolute Ed/10 tilleshold for event 20
Threshold non used	dB	-16	Absolute Ec/Io threshold for event 2E
frequency for event 2E	uD.	10	Absolute Egio tilieshold for event 2E
Hysteresis	dB	0	Applicable for event 2C and 2E
W non-used frequency		0	Applicable for event 2C and 2E
Time to Trigger	ms	120	Applicable for event 2C and 2E
Filter coefficient		0	Applicable for event 2C and 2E
Monitored cell list size		24	Signalled before time T1.
T1	S	200	
T2	S	201	

Table A.8.12H: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Cell 1		Ce	II 2	
		T1	T2	T1	T2	
UTRA RF Channel Number		Channel 1		Char	nnel 2	
CPICH_Ec/lor	dB	-1	10	-1	10	
PCCPCH_Ec/lor	dB	-1	12	-12		
SCH_Ec/lor	dB	-1	12	-1	12	
PICH_Ec/lor	dB	-15		-15		
DPCH_Ec/lor	dB	No	te 1	N/A		
OCNS		No	te 2	-0.9	941	
$\hat{I}_{or}/I_{oc}$	dB	2.32	-4.74	-4.74	2.32	
$I_{oc}$	dBm/3,84 MHz	-70				
CPICH_Ec/lo	dB	-12	-16	-16	-12	
Propagation Condition		Case 5 as specified in Annex B of TS25.101				

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ 

### A.8.2A.3.2 Test Requirements

- a) The number of received event 2C reports for Cell 2 during time period T1 shall be less than 60.
- b) During the first 1 s of time period T2 no event reports shall be counted.
- c) The number of received event 2E reports for Cell 2 counted from 1s after the beginning of time period T2 until the end of time period T2 shall be less than 60.

## A.8.2B FDD inter frequency measurements without compressed mode

## A.8.2B.1 Event triggered reporting using enhanced inter-frequency measurements without compressed mode

The test case under A.8.2B.1 is only applicable to a UE that is able to search enhanced inter-frequency measurements without compressed mode according to its measurement capability in the IE "Enhanced inter-frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16].

### A.8.2B.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of Event 2B when using enhanced interfrequency measurements without compressed mode. The test will partly verify the requirements for "Enhanced interfrequency measurements without compressed mode" in section 8.1.2.3.

The test consists of four successive time periods, T1, T2, T3 and T4, respectively. The test parameters are given in tables A.8.2B.1.1-1 and A.8.2B.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2B shall be used. The CPICH Ec/I0 of the cell on the unused frequency shall be reported together with Event 2B reporting. As part of the preconditions, the UE shall use Channel 1 as the serving HS-DSCH cell and Channel 2 and Channel 3 as the secondary serving HS-DSCH cells.

Table A.8.2B.1.1-1: General test parameters for correct reporting of enhanced inter-frequency measurements without compressed mode

Pai	rameter	Unit	Value	Comment
DCH p	DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Powe	er Control		On	
Primary Servi	ng HS-DSCH Cell		Channel 1	
Secondary Ser	ving HS-DSCH Cell		Channel 2, Channel 3	
	shold (Ec/ Io) used quency	dB	-13	Absolute Ec/ lo threshold for event 2B
	Absolute threshold (Ec/ Io) non used frequency		-13	Absolute Ec/ lo threshold for event 2B
Hy:	Hysteresis		0	
Time	to Trigger	ms	0	
Filter	coefficient		0	
Dropogation	Cell 1		AWGN	
Propagation Condition	Cell 2		Case 5	See Annex B of TS 25.101
Condition	Cell 3		Case 5	See Annex B of TS 25.101
DL_D	RX_Active		0	Downlink DRX is not used
	T1		5	
	T2		2	
	T3	S	4	
	T4	S	1	

Table A.8.2B.1.1-2: Cell Specific parameters for correct reporting of enhanced inter-frequency measurements without compressed mode

Parameter	Unit		Cell 1			Cell 2			Cell 3				
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
UTRA RF Channel Number			Channel 1			Channel 2				Channel 3			
CPICH_Ec/lor	dB		-1	0			-	10		-10			
PCCPCH_Ec/lor	dB		-1	2			-	12			-	12	
SCH_Ec/lor	dB		-1	2		-12				-12			
PICH_Ec/lor	dB		-1	5		-15				-15			
DPCH_Ec/lor	dB		Not	te 1		N/A				N/A			
OCNS			Not	te 2		-0.941			-0.941				
$\hat{I}_{or}/I_{oc}$	dB	5.87	-4.74	5.87	-4.74	-Inf	5.87	-4.74	5.87	-Inf	5.87	-4.74	5.87
$I_{oc}$	dBm/3.84 MHz							70					
SCH _Ec/lo	dB	-13	-18	-13	-18	-Inf	-13	-18	-13	-Inf	-13	-18	-13
CPICH_Ec/lo	dB	-11	-16	-11	-16	-Inf	-11	-16	-11	-Inf	-11	-16	-11
Propagation Condition	_		AW	'GN			Ca	ise 5			Ca	ise 5	

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ 

### A.8.2B.1.2 Test Requirements

- a) The UE shall send one Event 2B triggered measurement report each for both Cell 2 and Cell 3 with a measurement reporting delay less than 800 ms from the beginning of time period T2.
- b) The UE shall send one Event 2B triggered measurement report each for both Cell 2 and Cell 3 with a measurement reporting delay less than 200 ms from the beginning of time period T4.
- c) The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events and cells in T2 and T4

### A.8.2B.2 Event triggered reporting of inter frequency measurements without compressed mode for MC-HSDPA

The test case under A.8.2B.2 is only applicable to a UE that is able perfom inter-frequency measurements without compressed mode for MC-HSDPA connections according to its measurement capability in the IE "Inter-frequency measurements on configured carriers without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16].

### A.8.2B.2.1 Test Purpose and Environment

The purpose of this test is to partly verify the requirements for UEs that does not need compressed mode to measure cells on configured carrier frequencies corresponding to secondary serving HS-DSCH. The requirements consist of packet loss requirements specified in section 5.15 and new cell identification time and CPICH measurement period requirements specified in 8.1.2.3 and applicable sub-clauses.

The test scenario comprises two cells, with cell 1 on carrier frequency f1 being the serving HS-DSCH cell and cell 2 on carrier frequency f2 being the secondary serving HS-DSCH cell. The activation status of cell 2 is deactivated. Both f1 and f2 are within the same frequency band for the UE supporting DC-HSDPA, 4C-HSDPA or 8C-HSDPA. For the UE capable of DB-DC-HSDPA the frequencies f1 and f2 are in different frequency bands. DL DRX is not configured. No compressed mode pattern shall be configured in the test.

The test consists of 2 successive time periods, T1 and T2 respectively. The test parameters are given in tables A.8.2B.2.1-1 and A.8.2B.2.1-2 below.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used and that the monitored set consists of 6 cells including the secondary serving HS-DSCH cell. The measurement quantity is CPICH Ec/No.

For the verification of packet loss rate requirements the UE shall be continuously scheduled with HS-DSCH data on the serving HS-DSCH cell during the test.

Table A.8.2B.2.1-1: General test parameters for Event triggered reporting of inter frequency measurements without compressed mode for MC-HSDPA

Par	ameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1	
Power Control			On	
HSDPA parameters			Fixed Reference Channel Definition H-Set 1, with QPSK modulation only	As specified in TS 25.101 section A.7.1.1
Primary serving	HS-DSCH Cell		Channel 1	
Secondary serv	Secondary serving HS-DSCH Cell		Channel 2	
Absolute thresh used frequency	Absolute threshold (Ec/ Io) non dB		-13	Absolute Ec/ lo threshold for event 2C
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficien	t		0	
Monitored cell I	ist size		6	List of cells on f2 including secondary serving HS-DSCH cell
Propagation	Cell 1		AWGN	
Condition	Cell 2		Case 5	See Annex B of TS 25.101
DL_DRX_Active	DL_DRX_Active		0	Downlink DRX is not used
T1		S	5	
T2		S	10	

Table A.8.2B.2.1-2: Cell Specific parameters for Event triggered reporting of inter frequency measurements without compressed mode for MC-HSDPA

Parameter	Unit	Се	II 1	С	ell 2
		T1	T2	T1	T2
UTRA RF Channel		Channel 1		Channel 2	
Number		Chamilei		Charmer 2	
CPICH_Ec/lor	dB	-10		-10	
PCCPCH_Ec/lor	dB	-12		-12	
SCH_Ec/lor	dB	-12		-12	
PICH_Ec/lor	dB	-15		-15	
DPCH_Ec/lor	dB	Note 1		N/A	
HS-PDSCH_Ec/lor	dB	-7		N/A	
HS-SCCH-1_ Ec/lor	dB	-15		N/A	
OCNS		Note 2	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	10	10	-Inf	5.87
$I_{oc}$	dBm/3.84 MHz	-70			
SCH _Ec/lo	dB	-12.4	-12.4	-Inf	-13
CPICH_Ec/lo	dB	-10.4 -10.4		-Inf	-11
Propagation Condition		AWGN		Case 5	•

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

### A.8.2B.2.2 Test Requirements

a) The UE shall send one Event 2C triggered measurement report for Cell 2 within a measurement reporting delay less than 2200 ms from the beginning of time period T2.

- b) From the beginning of T2 until the measurement report is received by the system simulator during T2, at least 95% of all ACK/NACKs corresponding to HS-DSCH transmitted by the primary serving HS-DSCH cell to the UE shall be detected by the system simulator.
- NOTE 1: The probability of passing both test requirements (a) and (b) simultaneously shall be at least 90%.
- NOTE 2: The test requirements on probability of not sending ACK/NACK is not applicable for DB-DC-HSDPA.
- NOTE 3: The test requirements on receiving at least 95% of all ACK/NACKs during T2 take into account 4% packet loss requirements specified in section 5.15 and 1% mis-detection of HS-SCCH when there is no interruption on the reception of Cell 1.

### A.8.2C FDD detected set measurements

### A.8.2C.1 Event triggered reporting of interfrequency detected set measurements with compressed mode

The test case under A.8.2C.1 is only applicable to a UE that is able to support inter frequency detected set CPICH measurements.

### A.8.2C.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency detected set cell measurements. The test will partly verify the requirements in section 8.1.2.3.

The test consists of four successive time periods, T1, T2, T3 and T4 respectively. The test parameters are given in tables A.8.2C.1.1-1 and A.8.2C.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2B shall be used. The CPICH Ec/Io of the cell on the unused frequency shall be reported together with Event 2B reporting. Cell 2 shall not be included in the monitored cell list.

Table A.8.2C.1.1-1: General test parameters for correct reporting of inter-frequency detected cell with compressed mode

Parameter		Unit	Value	Comment
DCH paramet	ameters		DL Reference Measurement	As specified in TS 25.101 section A.3.1
			Channel 12.2 kbps	
Power Contr	ol		On	
Compressed m	node		Table A.22, set 4	As specified in TS 25.101 section A.5.
Active cell			Cell 1	On used frequency (RF Channel 1)
Neighbor ce			Cell 2	Non-used frequency (RF Channel 2)
Absolute threshold			-13	Absolute Ec/ Io threshold for event 2B
used frequen				
Absolute threshold		dB	-13	Absolute Ec/ Io threshold for event 2B
non used freque	ency			
Hysteresis		dB	0	
Time to Trigg	jer	ms	0	
Filter coefficie	ent		0	
Propagation	Cell 1		AWGN	
Condition	Cell 2		Case 5	See Annex B of TS 25.101
DL DRX Activ	DL DRX Active		0	Downlink DRX is not used
T1		S	5	
T2 s		S	40	
T3		S	4	
T4		S	1	

Table A.8.2C.1.1-2: Cell Specific parameters for correct reporting of inter-frequency detected cell with compressed mode

Parameter	Unit		Cell 1				Cel	12	
		T1	T2	T3	T4	T1	T2	T3	T4
UTRA RF Channel Number		Channel 1				Channel 2			
CPICH_Ec/lor	dB		-1	0			-10	)	
PCCPCH_Ec/lor	dB		-1	2			-12	2	
SCH_Ec/lor	dB		-1	2			-12		
PICH_Ec/lor	dB	-15 -15							
DPCH_Ec/lor	dB		Not	e 1			N/A	4	
OCNS			Not	e 2			-0.9	41	
$\hat{I}_{or}/I_{oc}$	dB	5.87	-4.74	5.87	-4.74	-Inf	5.87	-4.74	5.87
$I_{oc}$	dBm/3,84 MHz				-7	70			
SCH _Ec/lo	dB	-13	-18	-13	-18	-Inf	-13	-18	-13
CPICH_Ec/lo	dB	-11	-16	-11	-16	-Inf	-11	-16	-11
Propagation Condition		AWGN Case 5							

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to l...

### A.8.2C.1.2 Test Requirements

- a) The UE shall send one Event 2B triggered measurement report with the IE "Detected Set Trigger" set, with a measurement reporting delay less than 30 seconds from the beginning of time period T2.
- b) The UE shall send one Event 2B triggered measurement report, with a measurement reporting delay less than 480 ms from the beginning of time period T4.
- c) The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events in T2 and T4.

### A.8.2C.2 Event triggered reporting of inter frequency detected set measurements without compressed mode

The test case under A.8.2C.1 is only applicable to a UE that is able to support inter frequency detected set CPICH measurements and to search inter-frequency measurements without compressed mode according to its measurement capability in the IE "Adjacent Frequency measurements without compressed mode", the IE "Inter-band Frequency measurements without compressed mode", or the IE "Enhanced inter-frequency measurements without compressed mode" defined in section 10.3.3.21 of TS 25.331 [16].

#### A.8.2C.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency detected set cell measurements. The test will partly verify the requirements in section 8.1.2.3.

The test consists of four successive time periods T1, T2, T3 and T4. The test parameters are given in tables A.8.2C.2.1-1 and A.8.2C.2.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2B shall be used. The CPICH Ec/Io of the cell on the unused frequency shall be reported together with Event 2B reporting. Cell 2 shall not be included in the monitored cell list.

Table A.8.2C.2.1-1: General test parameters for correct reporting of inter-frequency detected cell without compressed mode

Parar	neter	Unit	Value	Comment		
DCH par	DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1		
Power (	Control		On			
Active	e cell		Cell 1			
Neighb	or cell		Cell 2			
Absolute thre used fre		dB	-13	Absolute Ec/Io threshold for event 2B		
	Absolute threshold (Ec/Io)		Absolute threshold (Ec/Io) dB non used frequency		-13	Absolute Ec/Io threshold for event 2B
Hyste	resis	dB	0			
Time to	Trigger	ms	0			
Filter co	efficient		0			
Propagation	Cell 1		AWGN			
Condition	Cell 2		Case 5	See Annex B of TS 25.101		
DL_DRX	DL_DRX_Active		0	Downlink DRX is not used		
Т	T1		5			
T	T2		40			
T:	3	S	4			
T-	4	S	1			

Table A.8.2C.2.1-2: Cell Specific parameters for correct reporting of inter-frequency detected cell without compressed mode

Parameter	Unit		Cell 1				Ce	II 2	
		T1	T2	Т3	T4	T1	T2	Т3	T4
UTRA RF Channel Number			Char	nel 1			Char	nnel 2	
CPICH_Ec/lor	dB			10		-10			
PCCPCH_Ec/lor	dB		-12 -12					12	
SCH_Ec/lor	dB	-12 -12							
PICH_Ec/lor	dB	-15 -15							
DPCH_Ec/lor	dB		No	te 1			N	/A	
OCNS			No	te 2			-0.	941	
$\hat{I}_{or}/I_{oc}$	dB	5.87	-4.74	5.87	-4.74	-Inf	5.87	-4.74	5.87
$I_{oc}$	dBm/3.84 MHz				-7	0			
SCH _Ec/lo	dB	-13	-18	-13	-18	-Inf	-13	-18	-13
CPICH_Ec/lo	dB	-11	-16	-11	-16	-Inf	-11	-16	-11
Propagation Condition		AWGN Case 5							

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ 

### A.8.2C.2.2 Test Requirements

- a) The UE shall send one Event 2B triggered measurement report with the IE "Detected Set Trigger" set, with a measurement reporting delay less than 30 seconds from the beginning of time period T2.
- b) The UE shall send one Event 2B triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T4.
- c) The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for each of the events in T2 and T4.

### A.8.3 (void)

**Table A.8.13: (void)** 

**Table A.8.14: (void)** 

Table A.5.14A: (void)

Table A.8.14B: (void)

Table A.8.14C: (void)

Table A.8.14D: (void)

### A.8.4 GSM measurements

### A.8.4.1 Correct reporting of GSM neighbours in AWGN propagation condition

### A.8.4.1.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event when doing inter-RAT GSM measurements. The test will partly verify the requirements in section 8.1.2.5. The requirements are also applicable for a UE not requiring compressed mode, in which case no compressed mode pattern should be sent for the parameters specified in table A8.15.

The test consists of three successive time periods, with a time duration T1, T2 and T3. The test parameters are given in tables A.8.15, A.8.16 and A.8.17 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3B and 3C shall be used.

### A.8.4.1.1.1 Test 1. With BSIC verification required

Table A.8.15: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition, Test 1

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns			Only applicable for UE requiring compressed mode patterns
- GSM carrier RSSI measurement		DL Compressed mode reference pattern 2 in Set 2	As specified in table A.22 TS 25.101 section A.5
- GSM Initial BSIC identification		Pattern 2	As specified in section 8.1.2.5.2.1 table 8.7.
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
N Identify abort		66	Taken from table 8.7.
T1	S	5	
T2	S	7	
T3	S	5	

Table A.8.16: Cell specific test parameters for Correct reporting of GSM neighbours in AWGN propagation condition (cell 1)

Parameter	Unit	Cell 1
		T1, T2, T3
UTRA RF Channel		Channel 1
Number		
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DPCH_Ec/lor	dB	Note 1
OCNS		Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
$I_{oc}$	dBm/	-85
00	3,84	
	MHz	
CPICH_Ec/lo	dB	-13
Propagation Condition		AWGN
	l el is contr	olled by the power control loop

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total

power from the cell to be equal to I<sub>or</sub>.

Table A.8.17: Cell specific test parameters for Correct reporting of GSM neighbours in AWGN propagation condition (cell 2)

Parameter	Unit	Cell 2				
Parameter	Ollit	T1	T2	T3		
Absolute RF Channel Number		A	RFCN 1			
RXLEV	dBm	-Infinity	-75	-85		

### A.8.4.1.1.2 Test 2: Without BSIC verification required

Table A.8.18: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition, Test 2

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel	As specified in TS 25.101 section A.3.1
		12.2 kbps	
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI			Only applicable for UE requiring compressed mode patterns
measurement		DL Compressed mode reference pattern 2 in Set 2	As specified in table A.22 TS 25.101 section A.5
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		not required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
T1	S	5	
T2	S	2	
T3	s	5	

Table A.8.19: Cell specific test parameters for Correct reporting of GSM neighbours in AWGN propagation condition (cell 1)

Parameter	Unit	Cell 1
		T1, T2, T3
UTRA RF Channel		Channel 1
Number		
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DPCH_Ec/lor	dB	Note 1
OCNS		Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
$I_{oc}$	dBm/ 3,84	-85
OC.	MHz	
CPICH_Ec/lo	dB	-13
Propagation		AWGN
Condition		

NOTE 1: The DPCH level is controlled by the power control loop.

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ .

Table A.8.20: Cell specific test parameters for Correct reporting of GSM neighbours in AWGN propagation condition (cell 2)

Parameter	Unit		Cell 2	
		T1	T2	Т3
Absolute RF Channel Number			ARFCN 1	
RXLEV	dBm	-Infinity	-75	-85

#### A.8.4.1.2 Test Requirements

### A.8.4.1.2.1 TEST 1 With BSIC verification required

The UE shall send one Event 3C triggered measurement report for Cell2, with a measurement reporting delay less than 6.24 s from the beginning of time period T2.

The UE shall send one Event 3B triggered measurement report for Cell2, with a measurement reporting delay less than 960 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

#### A.8.4.1.2.2 TEST 2 Without BSIC verification required

The UE shall send one Event 3C triggered measurement report for Cell2, with a measurement reporting delay less than 960 ms from the beginning of time period T2.

The UE shall send one Event 3B triggered measurement report for Cell2, with a measurement reporting delay less than 960 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

### A.8.5 Combined Interfrequency and GSM measurements

### A.8.5.1 Correct reporting of neighbours in AWGN propagation condition

### A.8.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency and GSM measurements. The test will partly verify the requirements in section 8.1.2.3 and 8.1.2.5. The requirements are also applicable for a UE not requiring compressed mode for inter-frequency or inter-RAT GSM measurements. In case a UE is not requiring compressed mode for inter-frequency measurements no compressed mode pattern with measurement purpose "FDD measurement" should be sent and in case a UE is not requiring compressed mode for inter-RAT GSM measurements no compressed mode pattern with measurement purpose "GSM carrier RSSI measurements", "GSM Initial BSIC identification" and "GSM BSIC re-confirmation" should be sent for the parameters specified in table A8.21.

The test consists of five successive time periods, with a time duration T1, T2, T3, T4 and T5. The test parameters are given in tables A.8.21, A.8.22 and A.8.23 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2B and 3A shall be used as well as periodic reporting with period 4s.

Table A.8.21: General test parameters for Correct reporting of neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode  Interfrequency measurements		DL compressed mode reference pattern 3, set 1	Only applicable for UE requiring compressed mode patterns. As specified in table A.22A TS 25.101 section A.5
- GSM carrier RSSI measurement		DL compressed mode reference pattern 3, set 2	As specified in table A.22A TS 25.101 section A.5
- GSM Initial BSIC identification		DL compressed mode reference pattern 3, set 3	As specified in table A.22A TS 25.101 section A.5
- GSM BSIC reconfirmation		DL compressed mode reference pattern 3, set 4	As specified in table A.22A TS 25.101 section A.5
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		required	
Absolute Threshold (Ec/N0) used frequency	dB	-15	Ec/lo threshold for Event 2B and 3A
Absolute Threshold (Ec/N0) used for a not used frequency	dB	-15	Ec/lo threshold for Event 2B
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3A.
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24 FDD neighbours 8 on frequency Channel 2 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode pattern starts.
Propagation Condition		AWGN	
T1	S	1	
T2	S	4	
T3	S	1	
T4	S	8	
T5	S	15	

TableA.8.22: Cell Specific parameters for Correct reporting of neighbours in AWGN propagation condition

Parameter	Unit		Cell 1					Cell 2			
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
UTRA RF			(	Channel 1					Channel 2	<u> </u>	
Channel Number											
CPICH_Ec/lor	dB			-10					-10		
PCCPCH_Ec/lor	dB			-12					-12		
SCH_Ec/lor	dB		-12						-12		
PICH_Ec/lor	dB			-15					-15		
DPCH_Ec/lor			Note 1		N	/A	N/A	4	N	ote 1	
OCNS	dB		Note 2		-0,	941	-0,9	41	N	ote 2	
$\hat{I}_{or}/I_{oc}$	dB	0		-8			-Infinity	-13	-13	-8	-8
$I_{oc}$	dB/		-60								
OC.	3,84										
	MHz										
CPICH_Ec/lo	dB	-13		-18	,6		-Infinity	-13	-13	-18.6	-18.6

NOTE 1: The DPCH level is controlled by the power control loop

NOTE 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>

Table A.8.23: Cell specific test parameters for Correct reporting of GSM neighbours in AWGN propagation condition (cell 3)

Parameter	Unit			Cell 3			
Parameter	Unit	T1	T2	T3	T4	T5	
Absolute RF Channel Number		ARFCN 1					
RXLEV	dBm	-Infinity -75					
GSM BSIC			N/A		Valid	Not valid	

### A.8.5.1.2 Test Requirements

The UE shall send one Event 2B triggered measurement report for Cell2, with a measurement reporting delay less than 3.5 s from the beginning of time period T2.

A handover to cell 2 is signalled to the UE well before end of time period T3.

The UE shall send one Event 3A triggered measurement report for Cell3, with a measurement reporting delay less than 6.24 s from the beginning of time period T4.

The UE shall indicate that the BSIC of the GSM carrier is not verified in a periodic report sent before 9.04 seconds have passed since the start of time period T5.

NOTE: The delay for interfrequency cell detection is equal to:

$$T_{\text{identify, inter}} = T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{\textit{Freq}} \text{ ms} = 3.3 \text{ s}$$

where:

 $T_{\text{basic identify FDD,inter}}$  is specified in 8.1.2.3.2 as 300 ms

 $T_{\text{Measurement Period, Inter}}$  is specified in 8.1.2.3.2 as 480 ms

and

 $T_{Inter}$  is specified in 8.1.2.3.2 as 6 gaps of length 11 slots each, 44 ms

NOTE: The delay for interRAT cell detection is equal to 6.24 s.

The event triggered measurement reporting delay: 2\*T<sub>Measurement Period, GSM</sub> = 2\* 480ms = 960ms.

BSIC verification: T<sub>identify abort</sub> 5.28 s.

# A.8.5A CSG Proximity Indication Testing Case for UTRAN FDD – FDD Inter frequency

Note: The test case in this section forms the basis for a signalling test for CSG proximity detection.

### A.8.5A.1 Test Purpose and Environment

The purpose of this test is to verify the UE has implemented properly the feature for indicating that the UE is entering or leaving the proximity of one or more CSG member cells based on proximity detection with an autonomous search function as defined by the requirements in Section 6.7.

The test case consists of three successive segments: Test Preparation, Negative Test, and Positive Test. The test scenario comprises of three UTRAN FDD cells on different carriers. Cell 1 represents the serving cell in the proximity of the CSG cell, Cell 2 the CSG cell and Cell 3 the serving cell not in the proximity of the CSG cell. The description of the test procedure is shown in Table A.8.5A-1. The general test parameters and cell specific test parameters are presented in Table A.8.5A-2 and Table A.8.5A-3 respectively.

Table A.8.5A-1: Description of the test procedures

Parameter	Cell Status	Comment
		Test Preparation
Initial Condition	Cell 1 is active	Clean up the UE memory to be free from previously stored cell information for proximity detection.
		Turn on the UE and allow sufficient time for the UE to reselect to Cell 1.
Time duration T1	Cell 1 and Cell 2	Turn on Cell 2 at the start of T1.
	are active	Perform manual CSG selection towards Cell 2. The UE is expected to store necessary information for later proximity detection.
End condition		Turn off the UE. Turn off Cell 1 and Cell 2.
		Negative Test
Initial Condition	Cell 3 is active	Turn on Cell 3.
		Turn on the UE and set up the UE in connected mode with Cell 3
Time duration T2	Cell 3 is active	Configure the UE with proximity indication control by sending the Measurement Control message to enable CSG Proximity detection
		at the start of T2. The UE is not expected to report "entering" proximity in the negative test.
End condition		Turn off the UE. Turn off Cell 3.
		Positive Test
Initial Condition	Cell 1 is active	Turn on Cell 1.
		Turn on the UE and set up the UE in connected mode with Cell 1
Time duration T3	Cell 1 and Cell 2	Turn on Cell 2 at the start of T3.
	are active	Configure the UE with proximity indication control by sending the
		Measurement Control message to enable CSG Proximity at the
		start of T3. The UE is expected to report "entering" proximity before end of T3.
Time duration T4	Cell 1 is active	Turn off Cell 2 and turn on Cell 3 at the start of T4.
	and Cell 3 are	Hand the UE over Note 1 from Cell 1 to Cell 3.
	active	(Note: The UE may report "leaving" proximity in T4. In this case,
		there is no need to proceed to the next step.).
Time duration T5	Cell 3 are active	Turn off Cell 1 at the start of T5. The procedures in T4 and T5
		together simulate the situation that UE leaves the proximity of the CSG cell. The UE is expected to report "leaving" proximity before
F 1 100		end of T5
End condition		Turn off the UE. Turn off Cell 1 and Cell 3.
		Cell 3 must preserve the proximity configuration (i.e. must involve or SRNS relocation, as described in [16])

Table A.8.5A-2: General test parameters for UTRAN FDD-FDD inter frequency cell proximity indication test case

Para	meter	Unit	Value	Comment
DCH parameters			DL and UL Reference	As specified in TS 25.101 section
	-		Measurement Channel 12.2 kbps	A.3.1 and A.2.1
Power Control			On	
Target quality val	ue on DTCH	BLER	0.001	
Compressed mod			A.22 set 1	As specified in TS 25.101 section
				A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 1	Handover to cell 2 is not
				requested
Threshold non us	ed frequency	dB	-18	Absolute Ec/I0 threshold for
				event 2C
Hysteresis		dB	0	
W non-used frequ	uency		1	Applicable for event 2C
Time to Trigger		Ms	0	
Filter coefficient			0	
SIB3_REP		Frames	32	Applicable for cell 2 SIB3
				scheduling
SIB3 SEG_COUN	NT		1	Applicable for cell 2 SIB3
				scheduling
CSG id (of cell 2)	CSG id (of cell 2)		Set to any non-empty value	
CSG Indicator (of	cell 2)		Set to TRUE	
UE whitelist			Include Cell 2	

Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before the compressed mode pattern starts.
Time duration T1	S	[10]	Defined to give enough time for the UE to complete the registration to Cell 2.
Time duration T2	S	[360]	Defined to be longer enough to see whether the UE will report enter "proximity" indication.
Time duration T3 Note 1	s	[<=360]	The time duration for a UE to report enters "proximity" when the UE is near a CSG cell.
Time duration T4 Note 1	S	[<=360]	The time duration for a UE to be handed over to Cell 3.
Time duration T5 Note 1	S	[<=360]	The time duration for a UE to report leaving "proximity" when the UE is no longer near a CSG cell.

Note 1: The maximum allowed time duration for the UE to decide either entering or leaving "proximity" is 360s. To reduce test time, T3 may end once UE reports entering "proximity", T4 may end once the UE is handed over to Cell 3 and T5 may end once UE reports leaving "proximity".

Note 2: The test case assumes an environment where CSG proximity detection results not being impact by non-3GPP signals, such as GPS and WiFi. When the test case is being executed, the UE may ignore any radio signals which are not provided by the test setup which it would otherwise use in proximity estimation.

Table A.8.5A-3: Cell specific test parameters for UTRAN FDD-FDD inter frequency cell proximity indication test case (Cell 1 and Cell 2)

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	Т3	T4	T5	T1	T2	Т3	T4	T5
UARFCN Note1			C	hannel 1					Channel 2	2	
CSG indicator				False			True	N/A	True	N/A	N/A
Primary scrambling code Note1		1						N/A	2	N/A	N/A
CSG identity				Not sent			Sent	N/A	Sent	N/A	N/A
BW <sub>channel</sub>	MHz			10					10		
CPICH_Ec/lor	dB			-10					[-6]		
PCCPCH_Ec/lor	dB		-12					[-8]			
CPICH_Ec/Io	dB			-13			[-9]				
SCH_Ec/lor	dB			-15					[-11]		
PICH_Ec/lor	dB			-15					[-11]		
DPCH_Ec/lor	dB	Note 2	N/A	Note 2	Note 2	N/A	Note 2	N/A	Note 2	N/A	N/A
$\hat{I}_{or}/I_{oc}$	dB	0	-inf	0	0	-inf	-1.8	-inf	-1.8	-inf	-inf
$I_{oc}$	dBm/3 .84 MHz	-70							-70		
OCNS		Note 3	N/A	Note	Note	N/A	-0.941	N/A	-0.941	N/A	N/A
				3	3						
Propagation Condition				AWGN					AWGN		

Note 1: For this requirement to be applicable, and scrambling code for cell 1 and cell 2 shall be unchanged from when the CSG cell was visited previously

Note 2: The DPCH level is controlled by the power control loop

Note 3: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

Table A.8.5A-4: Cell specific test parameters for UTRAN FDD-FDD inter frequency cell proximity indication test case (Cell 3)

Parameter	Unit	Cell 3						
		T1	T2	Т3	T4	T5		
UARFCN Note1				Channe	el 1			
CSG indicator				False	9			
Primary scrambling code Note1		3	3	3	3	3		
CSG identity				Not Se	ent			
BW <sub>channel</sub>	MHz			10				
CPICH_Ec/lor	dB			-10				
PCCPCH_Ec/lor	dB			-12				
CPICH_Ec/lo	dB			-13				
SCH_Ec/lor	dB			-15				
PICH_Ec/lor	dB			-15				
DPCH_Ec/lor	dB	N/A	N/A	N/A	Note 2	Note 2		
$\hat{I}_{or}/I_{oc}$	dB	-inf	-inf	-inf	2	2		
$I_{oc}$	dBm/3.8 4 MHz			-70				
OCNS		N/A	N/A	N/A	Note 3	Note 3		
Propagation Condition				AWG	N			
Note 1: For this requirement to be applicable, and scrambling code for cell 1 and cell 2 shall be unchanged from when the CSG cell was visited previously								
Note 2: The DPCH le	vel is contro	ontrolled by the power control loop						

### A.8.5A.2 Test Requirements

The UE shall not send an "entering" proximity indication in T2 during Negative Test.

The UE shall send an "entering" proximity indication in T3 and send a "leaving" proximity indication in T4 or T5 during Positive Test.

### A.8.6 E-UTRAN Measurements

## A.8.6.1 Correct reporting of E-UTRAN FDD neighbours in fading propagation condition in CELL\_DCH

### A.8.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing measurements on E-UTRAN FDD cells. The test will partly verify the requirements in section 8.1.2.6.

The test consists of three successive time periods, with time duration T1, T2 and T3. The test parameters are given in tables A.8.24, A.8.25 and A.8.26. In the measurement control information it is indicated to the UE that event-triggered reporting with Events 3B and 3C shall be used.

Table A.8.24: General test parameters for correct reporting of E-UTRAN FDD neighbours in fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference	As specified in TS 25.101 section A.3.1. This is
		Measurement Channel	for UTRAN FDD
		12.2 kbps	
Power Control		On	This is relevant for UTRAN FDD
Compressed mode pattern		Pattern 2; Set 4	As specified in table A.22 in section A.5 in TS 25.101.
Inter-RAT (E-UTRAN FDD)		RSRP	
measurement quantity			
Active cell		Cell 1	Cell 1 is on UTRA RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on E-UTRA RF channel number 1
Threshold other system	dBm	-95	Absolute threshold for triggering events 3b and
(E-UTRAN FDD)			3c
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used
E-UTRA Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )			
Monitored UTRA FDD cell list		24	UTRA cells on UTRA RF channel 1 provided in
size			the cell list. Measurement control information is
			sent before the compressed mode pattern starts.
T1	S	5	
T2	S	4	
T3	S	4	

Table A.8.25: Cell Specific parameters for correct reporting of E-UTRAN FDD neighbours in fading propagation condition (cell # 1)

Parameter	Unit		Cell 1			
		T1	T2	T3		
UTRA RF Channel Number			Channel 1			
CPICH_Ec/lor	dB		-10			
PCCPCH_Ec/lor	dB		-12			
SCH_Ec/lor	dB		-12			
PICH_Ec/lor	dB		-15			
DPCH_Ec/lor	dB		Note 1			
OCNS			Note 2			
$\hat{I}_{or}/I_{oc}$	dB	0	0	0		
$I_{oc}$	dBm/3.84 MHz	-70				
CPICH_Ec/lo	dB	-13 -13 -13				
Propagation Condition		Case 5 (Note 3)				

Note 1:

The DPCH level is controlled by the power control loop.

The power of the OCNS channel that is added shall make the total power from the cell to be equal Note 2:

Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101. Note 3:

TableA.8.26: Cell Specific parameters for correct reporting of E-UTRAN FDD neighbours in fading propagation condition (cell # 2)

Parameter	Unit		Cell 2				
		T1 T2 T3					
E-UTRA RF Channel Number		1					
BW <sub>channel</sub>	MHz		10				
OCNG Pattern defined in A.3.2.1.2							
in 3GPP TS 36.133 (OP.2 FDD)			OP.2 FDD				
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		_				
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
B <sup>Note 1</sup>	dB						
Noc Note 2	dBm/15 kHz		-100				
$\hat{E}_s/N_{oc}$	dB	-Infinity	16	-4			
$\hat{E}_{s}/I_{ot}$	dB	-Infinity	16	-4			
RSRP Note 3	dBm/15 kHz	-Infinity	-84	-104			
SCH_RP Note 3	dBm/15 kHz	-Infinity	-84	-104			
lo Note 3	dBm/9 MHz	-72.22	-56.11	-70.76			
Propagation Condition			ETU70 (Note 4)				

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. OCNG patterns are specified in annex A 3.2 of 3GPP TS 36.133.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled
- Note 3: RSRP, SCH\_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: ETU70 propagation conditions are specified in Annex B.2 of 3GPP TS 36.101.

### A.8.6.1.2 Test Requirements

If the UE needs compressed mode to perform E-UTRAN measurements:

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 2.65 seconds from the beginning of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 480 ms from the beginning of time period T3.

If the UE does not need compressed mode to perform E-UTRAN measurements:

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 480 ms from the beginning of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 480 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

### A.8.6.2 Correct reporting of E-UTRAN TDD neighbours in fading propagation condition in CELL\_DCH

### A.8.6.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing measurements on E-UTRAN TDD cells. The test will partly verify the requirements in section 8.1.2.6.

The test consists of three successive time periods, with time duration T1, T2 and T3. The test parameters are given in tables A.8.27, A.8.28 and A.29. In the measurement control information it is indicated to the UE that event-triggered reporting with Events 3B and 3C shall be used.

Table A.8.27: General test parameters for correct reporting of E-UTRAN TDD neighbours in fading propagation condition

Parameter	Unit	Value	Comment	
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1. This is for UTRAN FDD	
Power Control		On	This is relevant for UTRAN FDD	
Compressed mode pattern		Pattern 2; Set 4	As specified in table A.22 in section A.5 in TS 25.101.	
Inter-RAT (E-UTRAN TDD) measurement quantity		RSRP		
Active cell		Cell 1	Cell 1 is on UTRA RF channel number 1	
Neighbour cell		Cell 2	Cell 2 is on E-UTRA RF channel number 1	
Threshold other system (E-UTRAN TDD)	dBm	-95	Absolute threshold for triggering events 3b and 3c	
Hysteresis	dB	0		
Time to Trigger	ms	0		
Filter coefficient		0		
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used	
E-UTRA Channel Bandwidth (BW <sub>channel</sub> )	MHz	10		
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. This is for E-UTRAN TDD	
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. This is for E-UTRAN TDD	
Monitored UTRA FDD cell list size		24	UTRA cells on UTRA RF channel 1 provided in the cell list. Measurement control information is sent before the compressed mode pattern starts.	
T1	s	5	sent before the compressed mode pattern starts.	
T2	S	4		
T3	S	4		

TableA.8.28: Cell Specific parameters for correct reporting of E-UTRAN TDD neighbours in fading propagation condition (cell # 1)

Parameter	Unit	Cell 1				
		T1	T2	T3		
UTRA RF Channel Number		Channel 1				
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
DPCH_Ec/lor	dB	Note 1				
OCNS		Note 2				
$\hat{I}_{or}/I_{oc}$	dB	0	0	0		
$I_{oc}$	dBm/3.84 MHz	-70				
CPICH_Ec/lo	dB	-13	-13	-13		
Propagation Condition		Case 5 (Note 3)				

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to law.

Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

TableA.8.29: Cell Specific parameters for correct reporting of E-UTRAN TDD neighbours in fading propagation condition (cell # 2)

Parameter	Unit	Cell 2				
		T1	T2	Т3		
E-UTRA RF Channel Number		1				
BW <sub>channel</sub>	MHz	10				
OCNG Pattern defined in A.3.2.2.2						
in 3GPP TS 36.133 (OP.2 TDD)		OP.2 TDD				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB	_				
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
B <sup>Note 1</sup>	dB					
$N_{oc}^{ m Note  2}$	dBm/15 kHz	-100				
$\hat{E}_s/N_{oc}$	dB	-Infinity	16	-4		
$\hat{E}_{s}/I_{ot}$	dB	-Infinity	16	-4		
RSRP Note 3	dBm/15 kHz	-Infinity	-84	-104		
SCH_RP Note 3	dBm/15 kHz	-Infinity	-84	-104		
lo Note 3	dBm/9 MHz	-72.22	-56.11	-70.76		
Propagation Condition		ETU70 (Note 4)				
Note 1: OCNG shall be used such spectral density is achieve 3GPP TS 36.133.						
Note 2: Interference from other cel	Interference from other cells and noise sources not specified in the test is assumed to be constant					
over subcarriers and time and shall be modelled as AWGN of appropriate power for $N$ to be						

- over subcarriers and time and shall be modelled as AWGN of appropriate power for  $\,N_{oc}\,$  to be
- Note 3: RSRP, SCH\_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- ETU70 propagation conditions are specified in Annex B.2 of 3GPP TS 36.101.

#### A.8.6.2.2 **Test Requirements**

If the UE needs compressed mode to perform E-UTRAN measurements:

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 2.65 seconds from the beginning of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 480 ms from the beginning of time period T3.

If the UE does not need compressed mode to perform E-UTRAN measurements:

The UE shall send one Event 3C triggered measurement report for cell 2, with a measurement reporting delay less than 480 ms from the beginning of time period T2.

The UE shall send one Event 3B triggered measurement report for cell 2, with a measurement reporting delay less than 480 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2 x TTI<sub>UL DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in the UL DCCH.

# A.8.6.3 Correct reporting of E-UTRAN FDD neighbours in fading propagation condition in CELL\_FACH

#### A.8.6.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing network configured measurements on E-UTRAN FDD cells in CELL\_FACH. The test will partly verify the requirements in section 8.4a.2.6.3.

The test consists of two successive time periods, with time duration T1, T2. The test parameters are given in tables A.8.29A, A.8.29B and A.8.29C. In the measurement control information it is indicated to the UE that event-triggered reporting shall be used. CELL\_FACH with discontinuous HS-DSCH reception should be configured.

Table A.8.29A: General test parameters for correct reporting of E-UTRAN FDD neighbours in fading propagation condition

Parameter	Unit	Value	Comment
Report criteria			Event triggered
Inter-RAT (E-UTRAN FDD)		RSRP	
measurement quantity			
Active cell		Cell 1	Cell 1 is on UTRA RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on E-UTRA RF channel number 1
Reporting Threshold	dBm	-95	
HS-DSCH DRX cycle <sub>FACH</sub>	frames	8	Length of the DRX cycle
HS-DSCH Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
T321	S	0.1	Number of seconds until the DRX cycle is initiated
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used
E-UTRA Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	
T1	S	20	During T1, cell 2 shall be powered off, and during the off time its physical cell identity shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	S	6	

TableA.8.29B: Cell Specific parameters for correct reporting of E-UTRAN FDD neighbours in fading propagation condition (cell # 1)

Parameter	Unit	Cell 1			
		T1	T2		
UTRA RF Channel Number		Chan	nel 1		
CPICH_Ec/lor	dB	-1	0		
PCCPCH_Ec/lor	dB	-1	2		
SCH_Ec/lor	dB	-1	2		
PICH_Ec/lor	dB	-1	5		
HS-PDSCH_Ec/lor (Note 3)	dB	-1	0		
HS-SCCH1_Ec/lor (Note 3)	dB	-13			
OCNS		Note 1			
$\hat{I}_{or}/I_{oc}$	dB	0	0		
$I_{oc}$	dBm/3.84 MHz	-7	0		
CPICH_Ec/Io	dB	-13	-13		
Inter-frequency FDD measurement indicator		FAL	SE		
Inter-frequency TDD measurement indicator		FAL	SE		
Inter-RAT measurement indicators		Included			
Propagation Condition		Case 5	(Note 2)		
Note 1: The power of the OC	NS channel that is	added shall make the total pov	wer from the cell to be equal to		

Note 1: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ .

Note 2: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

TableA.8.29C: Cell Specific parameters for correct reporting of E-UTRAN FDD neighbours in fading propagation condition (cell # 2)

Parameter	Unit	Cell	2
		T1	T2
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	MHz	10	
OCNG Pattern defined in A.3.2.1.2			
in 3GPP TS 36.133 (OP.2 FDD)		OP.2 F	DD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
B <sup>Note 1</sup>	dB		
$N_{oc}^{ m Note  2}$	dBm/15 kHz	-100	
$\hat{E}_s/N_{oc}$	dB	-Infinity	16
$\hat{E}_{s}/I_{ot}$	dB	-Infinity	16
RSRP Note 3	dBm/15 kHz	-Infinity	-84
SCH_RP Note 3	dBm/15 kHz	-Infinity	-84
lo Note 3	dBm/9 MHz	-72.22	-56.11
Propagation Condition		ETU70 (N	
	that both cells are	fully allocated and a constant	
spectral density is achieved 3GPP TS 36.133.	d for all OFDM sym	abols. OCNG patterns are spe es not specified in the test is a	cified in annex A 3.2 of
		ed as AWGN of appropriate p	
	and snan be modell	ed as Avvoiv of appropriate p	ower for TV oc to be
		ved from other parameters fo	r information purposes.
They are not settable para	meters themselves		

### A.8.6.3.2 Test Requirements

The measurement delay is defined as the time from the beginning of period T2 and the moment at which the UE starts to send preambles on the PRACH to send the MEASUREMENT REPORT message.

ETU70 propagation conditions are specified in Annex B.2 of 3GPP TS 36.101.

The measurement delay shall be less than 5 seconds

NOTE: The measurement delay can be expressed as:  $T_{\text{identify},\text{E-UTRAN}} + T_{\text{RA}}$  , where:

 $T_{RA}$  is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

 $T_{Identify,E-UTRAN}$  = Time to identify an E-UTRA cell, as defined in section 8.4a.2.6.1

# A.8.6.4 Correct reporting of E-UTRAN TDD neighbours in fading propagation condition

#### A.8.6.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing network configured measurements on E-UTRAN TDD cells in CELL\_FACH. The test will partly verify the requirements in section 8.4a.2.6.3.

The test consists of two successive time periods, with time duration T1, T2. The test parameters are given in tables A.8.27, A.8.28 and A.29. In the measurement control information it is indicated to the UE that event-triggered reporting shall be used. CELL\_FACH with discontinuous HS-DSCH reception.

Table A.8.29D: General test parameters for correct reporting of E-UTRAN TDD neighbours in fading propagation condition

Parameter	Unit	Value	Comment
Report criteria			Event triggered
Inter-RAT (E-UTRAN TDD)		RSRP	
measurement quantity			
Active cell		Cell 1	Cell 1 is on UTRA RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on E-UTRA RF channel number 1
HS-DSCH DRX cycle <sub>FACH</sub>	frame	8	Length of the DRX cycle
,	S		,
HS-DSCH Rx burstFACH	frame	1	On time during DRX cycle
	S		
T321	S	0.1	Number of seconds until the DRX cycle is
			initiated
Reporting Threshold	dBm	-95	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used
			·
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used
E-UTRA Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )		_	
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211.
			This is for E-UTRAN TDD
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211.
			This is for E-UTRAN TDD
T1	S	20	During T1, cell 2 shall be powered off, and during
			the off time its physical cell identity shall be
			changed. The intention is to ensure that cell 2
			has not been detected by the UE prior to the start
			of period T2.
T2	S	6	

TableA.8.29F: Cell Specific parameters for correct reporting of E-UTRAN TDD neighbours in fading propagation condition (cell # 1)

Parameter	Unit		Cell 1		
		T1	T2		
UTRA RF Channel Number		C	Channel 1		
CPICH_Ec/lor	dB		-10		
PCCPCH_Ec/lor	dB		-12		
SCH_Ec/lor	dB		-12		
PICH_Ec/lor	dB		-15		
HS-PDSCH_Ec/lor (Note 3)	dB		-10		
HS-SCCH1_Ec/lor (Note 3)	dB	-13			
OCNS			Note 1		
$\hat{I}_{or}/I_{oc}$	dB	0	0		
$I_{oc}$	dBm/3.84 MHz		-70		
Inter-frequency FDD measurement indicator			FALSE		
Inter-frequency TDD measurement indicator			FALSE		
Inter-RAT measurement indicators		Included			
>RAT type		E-UTRA			
CPICH_Ec/lo	dB	-13	-13		
Propagation Condition		Cas	e 5 (Note 2)		

Note 1: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I<sub>or</sub>. Note 2: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

Table A.8.29G: Cell Specific parameters for correct reporting of E-UTRAN TDD neighbours in fading propagation condition (cell # 2)

Parameter	Unit	Cell	2
		T1	T2
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	MHz	10	
OCNG Pattern defined in A.3.2.2.2			
in 3GPP TS 36.133 (OP.2 TDD)		OP.2	TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	_	
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
B <sup>Note 1</sup>	dB		
$N_{oc}^{ m Note  2}$	dBm/15 kHz	-10	0
$\hat{E}_s/N_{oc}$	dB	-Infinity	16
$\hat{E}_{s}/I_{ot}$	dB	-Infinity	16
RSRP Note 3	dBm/15 kHz	-Infinity	-84
SCH_RP Note 3	dBm/15 kHz	-Infinity	-84
lo Note 3	dBm/9 MHz	-72.22	-56.11
Propagation Condition		ETU70 (I	Note 4)
Note 1: OCNG shall be used such		fully allocated and a constan nbols. OCNG patterns are sp	t total transmitted power
	s and noise sourc	es not specified in the test is	assumed to be constant
over subcarriers and time a	and shall be mode	led as AWGN of appropriate	power for $N_{oc}$ to be
fulfilled.			

RSRP, SCH\_RP and lo levels have been derived from other parameters for information purposes. Note 3: They are not settable parameters themselves.

ETU70 propagation conditions are specified in Annex B.2 of 3GPP TS 36.101. Note 4:

#### A.8.6.4.2 **Test Requirements**

The measurement delay is defined as the time from the beginning of period T2 and the moment at which the UE starts to send preambles on the PRACH to send the MEASUREMENT REPORT message.

The measurement delay shall be less than 5 seconds

The measurement delay can be expressed as:  $T_{identify,E-UTRAN} + T_{RA}$ , where:

T<sub>RA</sub> is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore  $T_{RA}$  in this test case is 40 ms.

 $T_{Identify.E-UTRAN}$  = Time to identify an E-UTRA cell, as defined in section 8.4a.2.6.1

# A.8.7 Combined Interfrequency and E-UTRAN measurements

# A.8.7.1 Correct reporting of E-UTRA FDD neighbours in fading propagation condition

## A.8.7.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency and E-UTRAN FDD measurements. The test will partly verify the requirements in section 8.1.2.3 and 8.1.2.6. The requirements are also applicable for a UE not requiring compressed mode for inter-frequency or inter-RAT E-UTRAN FDD measurements. In case a UE is not requiring compressed mode for inter-frequency measurements no compressed mode pattern with measurement purpose "FDD measurement" should be sent and in case a UE is not requiring compressed mode for inter-RAT E-UTRAN measurements no compressed mode pattern with measurement purpose "E-UTRAN measurements" should be sent for the parameters specified in table A8.30.

The test consists of two successive time periods, with time durations T1 and T2. The test parameters are given in tables A.8.30, A.8.31 and A.8.32 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2B and 3A shall be used.

Table A.8.30: General test parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode  Interfrequency measurements		DL compressed mode reference pattern 2, set 5	Only applicable for UE requiring compressed mode patterns. As specified in table A.22 TS 25.101 section A.5
E-UTRAN measurement		DL compressed mode reference pattern 2, set 5	As specified in table A.22 TS 25.101 section A.5
Active cell		Cell 1	
Inter-RAT measurement		E-UTRAN RSRP	
quantity			
Absolute Threshold (Ec/N0) used frequency	dB	-9	Ec/N0 threshold for Event 2b and 3a
Absolute Threshold (Ec/N0) used for a not used frequency	dB	-18	Ec/IN0 threshold for Event 2b
Threshold other system	dBm	-96	Absolute E-UTRA RSRP threshold for event 3a.
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24 FDD neighbours 8 on frequency Channel 2	Measurement control information is sent before the compressed mode pattern starts.
T1	S	≥1	
T2	S	10	

Table A.8.31: Cell Specific parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit	it Cell 1		Cell 2	
		T1	T2	T1	T2
UTRA RF Channel Number		Chann	el 1	Chanr	nel 2
CPICH_Ec/lor	dB	-10	)	-10	)
PCCPCH_Ec/lor	dB	-12	2	-12	2
SCH_Ec/lor	dB	-12	2	-12	2
PICH_Ec/lor	dB	-15		-15	
DPCH_Ec/lor	dB	Note 1		N/A	
OCNS		Note	2	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0		-Infinity	-1.8
$I_{oc}$	dBm/3,84 MHz	-70		-70	)
CPICH_Ec/lo	dB	-13		-Infinity	-14
Propagation Condition		AWG	SN	Case 5 as specified in Annex E of TS25.101	

The DPCH level is controlled by the power control loop

The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor Note 2:

Table A.8.32: Cell specific test parameters for Correct reporting of E-UTRAN FDD neighbours in fading propagation condition (cell 3)

Parameter	Unit	Cel	13
		T1	T2
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	MHz	10	)
OCNG Pattern defined in A.3.2.1.2 in 3GPP TS 36.133 (OP.2 FDD)		OP.2	FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		
N <sub>oc</sub> Note 2	dBm/15 kHz	-98	8
$\hat{E}_s/N_{oc}$	dB	-Infinity	13
$\hat{E}_{s}/I_{ot}$	dB	-Infinity	13
RSRP Note 3	dBm/15 kHz	-Infinity	-85

SCH_RP	Note 3	dBm/15 kHz	-Infinity	-85
lo Note 3		dBm/9 MH	-70.22	-57.01
Propagat	ropagation Condition ETU70 (Note 4)			Note 4)
Note 1:			fully allocated and a constar abols. OCNG patterns are sp	
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.			
Note 3:	RSRP, SCH_RP and lo leven They are not settable parar	neters themselves		, ,
Note 4	FTU70 propagation condition	ons are specified in	Annex B 2 of 3GPP TS 36	101

#### A.8.7.1.2 Test Requirements

The UE shall send one Event 2B triggered measurement report for Cell2, with a measurement reporting delay less than 5.14 s from the beginning of time period T2.

The UE shall send one Event 3A triggered measurement report for Cell3, with a measurement reporting delay less than 8.23 s from the beginning of time period T2.

NOTE: The delay for interfrequency cell detection is equal to:

$$T_{\text{identify, inter}} = T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{\textit{Freq}} \text{ ms} = 5143 \text{ ms}$$

where:

 $T_{\text{basic identify FDD,inter}}$  is specified in 8.1.2.3.2 as 300 ms

 $T_{Measurement\ Period,\ Inter}$  is specified in 8.1.2.3.2 as 480 ms

and

 $T_{Inter}$  is specified in 8.1.2.3.2 as 6 gaps of length 7 slots each, 28 ms

NOTE: The delay for interRAT cell detection is equal to:

$$\mathbf{T}_{\text{Identify,E-UTRAN}} = N_{\text{freq,E-UTRA}} \cdot \mathbf{T}_{\text{Basic\_Identify\_E-UTRAN}} \cdot \frac{480}{\mathbf{T}_{\text{E-UTRAN}}} \quad \textit{ms} = 8229 \text{ ms}$$

where:

T<sub>Basic Identify E-UTRAN</sub> is specified in 8.1.2.6 as 480 ms

and

 $T_{\text{E-UTRAN}}$  is specified in 8.1.2.6 as 6 gaps of length 7 slots each, 28 ms

# A.8.7.2 Correct reporting of E-UTRA TDD neighbours in fading propagation condition

#### A.8.7.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency and E-UTRAN TDD measurements. The test will partly verify the requirements in section 8.1.2.3 and 8.1.2.6. The requirements are also applicable for a UE not requiring compressed mode for inter-frequency or inter-RAT E-UTRAN TDD measurements. In case a UE is not requiring compressed mode for inter-frequency measurements no compressed

mode pattern with measurement purpose "FDD measurement" should be sent and in case a UE is not requiring compressed mode for inter-RAT E-UTRAN measurements no compressed mode pattern with measurement purpose "E-UTRAN measurements" should be sent for the parameters specified in table A8.33.

The test consists of two successive time periods, with time durations T1 and T2. The test parameters are given in tables A.8.33, A.8.34 and A.8.35 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2B and 3A shall be used.

Table A.8.33: General test parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Compressed mode  Interfrequency measurements		DL compressed mode reference pattern 2, set 5	Only applicable for UE requiring compressed mode patterns. As specified in table A.22 TS 25.101 section A.5
E-UTRAN measurement		DL compressed mode reference pattern 2, set 5	As specified in table A.22 TS 25.101 section A.5
Active cell		Cell 1	
Inter-RAT measurement quantity		E-UTRAN RSRP	
Absolute Threshold (Ec/N0) used frequency	dB	-9	Ec/N0 threshold for Event 2b and 3a
Absolute Threshold (Ec/N0) used for a not used frequency	dB	-18	Ec/IN0 threshold for Event 2b
Threshold other system	dBm	-96	Absolute E-UTRA RSRP threshold for event 3a.
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		Total 24 FDD neighbours 8 on frequency Channel 2	Measurement control information is sent before the compressed mode pattern starts.
T1	S	≥1	
T2	S	10	

TableA.8.31: Cell Specific parameters for Correct reporting of neighbours in Fading propagation condition

Parameter	Unit Cell 1		Cell 2		
		T1	T2	T1	T2
UTRA RF Channel Number		Chanr	nel 1	Chanr	nel 2
CPICH_Ec/lor	dB	-1(	)	-1(	)
PCCPCH_Ec/lor	dB	-12	2	-12	2
SCH_Ec/lor	dB	-12	2	-12	2
PICH_Ec/lor	dB	-15	5	-15	
DPCH_Ec/lor	dB	Note 1		N/A	
OCNS		Note	2	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0		-Infinity	-1.8
$I_{oc}$	dBm/3,84 MHz	-70		-70	
CPICH_Ec/lo	dB	-13		-Infinity	-14
Propagation Condition		AWO	<b>GN</b>	Case 5 as specified in Annex E of TS25.101	

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor

Table A.8.32: Cell specific test parameters for Correct reporting of E-UTRAN TDD neighbours in fading propagation condition (cell 3)

Parameter	Unit	Cel	13				
		T1	T2				
E-UTRA RF Channel Number		1					
BW <sub>channel</sub>	MHz	10	)				
OCNG Pattern defined in A.3.2.2.2 in 3GPP TS 36.133 (OP.2 TDD)		OP.2	TDD				
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB	0					
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$N_{oc}$ Note 2	dBm/15 kHz	-98	3				
$\hat{E}_s/N_{oc}$	dB	-Infinity	13				
$\hat{E}_{s}/I_{ot}$	dB	-Infinity	13				
RSRP Note 3	dBm/15 kHz	-Infinity	-85				

SCH_RP	Note 3	dBm/15 kHz	-Infinity	-85		
lo Note 3		dBm/9 MHz	-70.22	-57.01		
Propagation Condition ETU70 (Note 4)						
Note 1:	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. OCNG patterns are specified in annex A 3.2 of 3GPP TS 36.133.					
Note 2:						
Note 3:	fulfilled.					
Note 4:	ETU70 propagation conditions are specified in Annex B.2 of 3GPP TS 36.101.					

#### A.8.7.2.2 Test Requirements

The UE shall send one Event 2B triggered measurement report for Cell2, with a measurement reporting delay less than 5.14 s from the beginning of time period T2.

The UE shall send one Event 3A triggered measurement report for Cell3, with a measurement reporting delay less than 8.23 s from the beginning of time period T2.

NOTE: The delay for interfrequency cell detection is equal to:

$$T_{\text{identify, inter}} = T_{\text{basic identify FDD,inter}} \cdot \frac{T_{\text{Measurement Period, Inter}}}{T_{\text{Inter}}} \cdot N_{\textit{Freq}} \text{ ms} = 5143 \text{ ms}$$

where:

 $T_{\text{basic identify FDD,inter}}$  is specified in 8.1.2.3.2 as 300 ms

 $T_{Measurement\ Period,\ Inter}$  is specified in 8.1.2.3.2 as 480 ms

and

 $T_{Inter}$  is specified in 8.1.2.3.2 as 6 gaps of length 7 slots each, 28 ms

NOTE: The delay for interRAT cell detection is equal to:

$$T_{\text{Identify,E-UTRAN}} = N_{\text{freq,E-UTRA}} \cdot T_{\text{Basic\_Identify\_E-UTRAN}} \cdot \frac{480}{T_{\text{E-UTRAN}}} \quad ms = 8229 \text{ ms}$$

where:

T<sub>Basic Identify E-UTRAN</sub> is specified in 8.1.2.6 as 480 ms

and

 $T_{\text{E-UTRAN}}$  is specified in 8.1.2.6 as 6 gaps of length 7 slots each, 28 ms

# A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, sub-clause A.3.1. This measurement channel is used both in active cell and cells to be measured.

- Physical channels used as defined in TS 25.101 annex C.
- Cell 1 is the active cell when in CELL\_DCH state.
- Single task reporting.
- Power control is active.

## A.9.1 Measurement Performance for UE

### A.9.1.1 CPICH RSCP

#### A.9.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.1.

#### A.9.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Por	ameter	Unit	Tes	st 1	Tes	st 2	Tes	st 3	
Fai	ameter	Offic	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
	Channel number		Char	nnel 1	Char	nel 1	Channel 1		
	H_Ec/lor	dB		10	1	10	-10		
PCCP	CH_Ec/lor	dB	-1	12	-12		-1	12	
SCH_Ec/lor		dB	-1	12	-1	12		12	
PICI	H_Ec/lor	dB	-15		-1	15	-1	15	
DPC	H_Ec/lor	dB	-15	-	-15	-	-15	-	
OCN	S_Ec/lor	dB	-1.11	-0.94	-1.11	-0.94	-1.11	-0.94	
	Band I, IV, VI, X, XI, XIX, XXI Band II, V, VII						-95	5.47	
loc	Band XXV, XXVI Band III, VIII, XII, XIII, XIV, XX, XXII Band IX (Note 2)	dBm/3,84 MHz	-77	7.54	-59	.98	-94	47	
Îor/loc		dB	4	0	9	0	0	-6.53	
CPICH RSCP, Note 1	Band I, IV, VI, X, XI, XIX, XXI Band II, V, VII Band XXV, XXVI Band III, VIII, XII, XIII, XIV, XX, XXII	dBm	-83.5	-87.5	-60.98	-69.88	-107.47 -105.47 -103.97 (Note 3) -104.47	-114.0 -112 -110.5 (Note 3)	
Band IX (Note 2)   Band I, IV, VI, X,		dBm/3,84 MHz -71		-50		-106.47 -113 -94 -92 -90.5 (Note 3)			
XIII, XIV, XX, XXII  Band IX (Note 2)  Propagation condition			AWGN		AMON.		-(	-91 -93	
	NA DOOD AND A	-	AVV	GIN	AWGN		AWGN		

NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

#### A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. . CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: CPICH RSCP Inter frequency tests parameters

Cell 2 nannel 2	
nannel 2	
-12	
-12	
-	
-0.94	
-94.46	
92.46	
90.96	
Note 3)	
91.46	
00.40	
93.46	
-9.54	
-114.0	
440.0	
112.0	
·110.5	
Note 3)	
-111.0	
113.0	
-94.0	
-3 <del>-1</del> .0	
-92.0	
-90.5	
Note 3)	
-91.0	
-93.0	
1	

NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

#### A.9.1.1.2 Test Requirements

The CPICH RSCP measurement accuracy shall meet the requirements in section 9.1.1.

#### A.9.1.2 CPICH Ec/lo

#### A.9.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/Io measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.2.

#### A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Table A.9.3: CPICH Ec/lo Intra frequency test parameters

Dor	om otor	l lmi4	Tes	st 1	Tes	st 2	Test 3		
Par	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2	
UTRA RF C	Channel number		Char	nel 1	Char	nel 1	Channel 1		
CPICH_Ec/lor		dB	-1	10	-10		-1	0	
PCCP	PCCPCH_Ec/lor		-12		-12		-1	2	
SCH	H_Ec/lor	dB	1	12	-1	2	-1	2	
PICI	H_Ec/lor	dB	-15 -15		-1	5			
DPC	H_Ec/lor	dB	-15	-	-15	1	-6	1	
OCN	IS_Ec/lor	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94	
	Band I, IV, VI, X, XI,XIX, XXI						-94	.98	
	Band II, V, VII							-92.98	
loc Band XXV, XXVI		dBm/ 3,84	-56	5.98	-89.07		-91.48 (	Note 3)	
100	Band III, VIII, XII, XIII, XIV, XX, XXII	MHz 50.30				-91.98			
	Band IX (Note 2)						-93.98		
Îc	or/loc	dB	3.0	3.0	-2.9	-2.9	-9.0	-9.0	
CPICH E	Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0	
	Band I, IV, VI, X, XI, XIX, XXI						-9	)4	
	Band II, V, VII							)2	
Io, Note 1	Band XXV, XXVI	dBm/3,84 MHz	_F	50	_9	36	-90.5 (	Note 3)	
10, 14016 1	Band III, VIII, XII,	dbiii/5,04 ivii iz		,,		,0			
	XIII, XIV, XX,						-91		
	XXII								
	Band IX (Note 2)						-93		
Propagat	tion condition	-	AW	'GN	AW	'GN	AWGN		

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

#### A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.4.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

Table A.9.4: CPICH Ec/lo Inter frequency tests parameters

	Denometer	I I to ! 4	Tes	st 1	Tes	st 2	Test 3	
	Parameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
U	TRA RF Channel		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
	number							
	CPICH_Ec/lor	dB		10		0		10
F	CCPCH_Ec/lor	dB		2		2		12
	SCH_Ec/lor	dB		12		2		12
	PICH_Ec/lor	dB		5		5		15
	DPCH_Ec/lor	dB	-15	-	-6	-	-6	-
	OCNS_Ec/lor	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
	Band I, IV, VI, X, XI, XIX, XXI						-94.46	-94.46
	Band II, V, VII	alDua /	dBm/ 3,84 -52.22	-52.22	-87.27	-87.27	-92.46	-92.46
loc	Band XXV, XXVI	-					-90.96	-90.96
100	Dallu AAV, AAVI	MHz	-32.22				(Note 3)	(Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII	IVII IZ					-91.46	-91.46
	Band IX (Note 2)						-93.46	-93.46
	Îor/loc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CP	ICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
	Band I, IV, VI, X, XI, XIX, XXI						-94	-94
١.	Band II, V, VII						-92.0	-92.0
lo, Note	Band XXV, XXVI	dBm/3,	-50	-50	-86	-86	-90.5	-90.5
1	,	84 MHz	-30	-50 -50	-80	-80	(Note 3)	(Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII						-91.0	-91.0
	Band IX (Note 2)						-93	-93
Pro	pagation condition	-	AW	GN	AW	GN	AW	GN

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

## A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. In case of the absolute intra-frequency CPICH\_Ec/Io measurement and relative inter-frequency CPICH\_Ec/Io measurement accuracy test cases the effect of assumed thermal noise and noise generated in the receiver (-99 dBm for frequency bands I, IV, VI, X, XI, XIX and XXI; -98 dBm for frequency band IX, -97dBm for frequency bands II, V and VII; -95.5dBm for frequency band XXV and XXVI; and -96dBm for frequency band III) shall be added into the required accuracy. The test requirements for the absolute intra -frequency CPICH\_Ec/Io measurement are defined in Section 9.1.2 as shown in Table A.9.4A. The test requirements for the relative inter-frequency CPICH\_Ec/Io measurement are defined in Section 9.1.2 as shown in Table A.9.4B.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Table A.9.4A: CPICH\_Ec/lo Intra-frequency absolute accuracy

		Accuracy [dB]	Accuracy [dB]			
Parameter	Unit	Init Normal condition		lo [dBm/3,84 MHz]		
CDICH Falls	dB	-2.71.5 for -14 ≤ CPICH Ec/lo -3.22 for -16 ≤ CPICH Ec/lo < -14 -4.23 for -20 ≤ CPICH Ec/lo < -16	-4.23	-9487(Band I, IV, VI, X, XI, XIX, XXI) -9285 (Band II, V, VII) -90.583.5 (Band XXV, XXVI (Note 2)) -9184 (Band III, VIII, XII, XIII, XIV, XX, XXII) 9386 (Band IX (Note 1))		
CPICH_Ec/lo	ив	$\pm$ 1.5 for -14 $\leq$ CPICH Ec/lo $\pm$ 2 for -16 $\leq$ CPICH Ec/lo $<$ -14 $\pm$ 3 for -20 $\leq$ CPICH Ec/lo $<$ -16	± 3	-8750(Band I, IV, VI, X, XI, XIX, XXI) -8550 (Band II, V, VII) -83.550 (Band XXV, XXVI (Note 2)) -8450 (Band III, VIII, XII, XIII, XIV, XX, XXII) -8650 (Band IX (Note 1))		

NOTE1: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE

NOTE 2: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies..

Table A.9.4B: CPICH\_Ec/lo Inter frequency relative accuracy

		Accuracy [dB]	Accuracy [dB]			
Parameter	Unit	Normal condition	Extreme condition	lo [dBm]		
CDICH Fo/lo	dB	$\pm 2.7$ for -14 $\leq$ CPICH Ec/lo $\pm 3.2$ for -16 $\leq$ CPICH Ec/lo $<$ -14 $\pm 4.2$ for -20 $\leq$ CPICH Ec/lo $<$ -16	± 4.2	-9487(Band I, IV, VI, X, XI, XIX, XXI) -9285 (Band II, V, VII) -90.584.5 (Band XXV, XXVI (Note 2)) -9184 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9386 (Band IX (Note 1))		
CPICH_Ec/lo	UB	$\pm$ 1.5 for -14 $\leq$ CPICH Ec/lo $\pm$ 2 for -16 $\leq$ CPICH Ec/lo $<$ -14 $\pm$ 3 for -20 $\leq$ CPICH Ec/lo $<$ -16	± 3	-8750 (Band I, IV, VI, X, XI, XIX, XXI) -8550 (Band II, V, VII) -83.550 (Band XXV, XXVI (Note 2)) -8450 (Band III, VIII, XII, XIII, XIV, XX, XXII) -8650 (Band IX (Note 1))		

NOTE 1: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 2: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.3 UTRA Carrier RSSI

#### A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. In this case all cells are in different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5 for absolute accuracy and Table A.9.5.1 for relative accuracy. In the relative accuracy test, UTRA carrier RSSI measurements of neighbour cell 2 and neighbour cell 3 are reported to serving cell 1.

Table A.9.5: UTRA Carrier RSSI Inter frequency absolute accuracy test parameters

	Darameter	Unit	Tes	st 1	Tes	st 2	Tes	st 3
	Parameter		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA I	RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
(	CPICH_Ec/lor	dB	-1	0	-10		-10	
P	CCPCH_Ec/lor	dB	-12		-1	12	-1	2
	SCH_Ec/lor	dB	-12		-1	12	-1	2
	PICH_Ec/lor	dB	-1	5	-15		-1	5
	DPCH_Ec/lor	dB	-15	-	-6	-	-6	-
(	OCNS_Ec/lor	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
	Band I, IV,VI, X, XI, XIX, XXI						-94.46	-94.46
	Band II, V, VII Band XXV, XXVI	dBm/					-92.46	-92.46
loc		3,84	-52.22	-52.22	-70.27	-70.27	-90.96 (Note 3)	-90.96 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII	MHz					-91.46	-91.46
	Band IX (Note 2)						-93.46	-93.46
	Îor/loc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPI	CH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
	Band I, IV,VI, X, XI, XIX, XXI						-94	-94
lo	Band II, V, VII	dBm/					-92	-92
lo, Note	Band XXV, XXVI	3,84	-50	-50	-69	-69	-90.5 (Note 3)	-90.5 (Note 3)
1	Band III, VIII, XII, XIII, XIII, XIV, XX, XXII					-91	-91	
	Band IX (Note 2)						-93	-93
Prop	agation condition	-	AW	'GN	AW	/GN	AWGN	

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

Table A.9.5.1: UTRA Carrier RSSI Inter frequency relative accuracy test parameters

Para	ameter	Unit		Test 1			Test 2			Test 3	
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell3	Cell 1	Cell 2	Cell 3
UTRA R	F Channel		Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel
	mber		1	2	3	1	2	3	1	2	3
CPIC	H_Ec/lor	dB		-10			-10			-10	
PCCPC	CH_Ec/lor	dB		-12			-12			-12	
	_Ec/lor	dB		-12			-12			-12	
	l_Ec/lor	dB		-15			-15			-15	
	H_Ec/lor	dB	-15	-	-	-6	-	-	-6	-	-
OCNS	S_Ec/lor	dB	-1.11	-0.94	-0.94	-2.56	-0.94	-0.94	-2.56	-0.94	-0.94
loc	Band I, IV,VI, X, XI, XIX, XXI	dBm/ 3,84 MHz	-52.23	-52.23	-71.23	-91.27	-91.27	-81.27	-94.45	-94.45	-75.45
	Band II, V, VII								-92.45	-92.45	-73.45
	Band XXV,								-90.95	-90.95	-71.95
	XXVI								(Note 3)	(Note 3)	(Note 3)
	Band III,								-91.45	-91.45	-72.45
	VIII, XII,										
	XIII, XIV,										
	XX, XXII										
	Band IX (Note 3)								-93.45	-93.45	-74.45
îo	r/loc	dB	-1.75	-1.75	-1.75	-4.7	-4.7	-4.7	-9.54	-9.54	-9.54
	c/lo, Note 1	dBm	-14.0	-14.0	-14.0	-16.0	-16.0	-16.0	-20.0	-20.0	-20.0
lo,	Band I,	dBm/	-50	-50	-69	-90 (Note	-90	-80	-94	-94	-75
Note 1	IV,VI, X, XI, XIX, XXI	3,84 MHz	(Note 2)	00		2)			(Note 2)		
	Band II, V, VII	141112							-92 (Note 2)	-92	-73
	Band								-90.5	-90.5	-71.5
	XXV, XXVI								(Note 2, 3)	(Note 3)	(Note 3)
	Band III,								-91	-91	-72
	VIII, XII,								(Note 2)		
	XIII, XIV,								,		
	XX, XXII										
	Band IX								-93	-93	-74
	(Note 3)								(Note 2)		
Propa	agation cond	lition					AWGN				

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

- NOTE 2: Io levels are not reported by the UE on cell 1.
- NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
- NOTE 4: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose Cell 2 or Cell 3 in between the tests.

#### A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (-99 dBm for frequency bands I, IV,VI, X, XI, XIX, XXI; -98 dBm for frequency band IX; -97dBm for frequency bands II,V, VII; -95.5dBm for frequency band XXV, XXVI; and -96dBm for frequency band III, VIII, XII, XIII, XIV, XX, XXII) shall be added into the required accuracy defined in Section 9.1.3 as shown in Table A.9.5A and in Table A.9.5A1.

Table A.9.5A: UTRA Carrier RSSI absolute accuracy

		Accurac	y [dB]	Conditions
Parameter	Unit	Normal condition	Extreme condition	lo [dBm/3,84 MHz]
UTRA Carrier RSSI	dBm	±4 (Note 1)	±7 (Note 1)	-9470 (Band I, IV, VI, X, XI, XIX, XXI) -9270 (Band II, V, VII) -90.570 (Band XXV, XXVI (Note 3)) -9170 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9370 (Band IX (Note 2))
	dBm	± 6	± 9	-7050

- NOTE 1: Impact from RF noise floor is test case dependent and has not been considered. Noise floor shall be considered in RAN WG5 test case.
- NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
- NOTE 3: The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

Table A.9.5A1: UTRA Carrier RSSI relative accuracy

		Accurac	cy [dB]	Conditions		
Parameter	Unit	Normal condition	Extreme condition	lo [dBm/3,84 MHz]		
UTRA Carrier RSSI	dBm	± 7 (Note 1)	± 11(Note 1)	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI (Note 3)) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9350 (Band IX (Note 2))		

- NOTE 1: Impact from RF noise floor is test case dependent and has not been considered. Noise floor shall be considered in RAN WG5 test case.
- NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement
- performance requirements for Band III shall apply to the multi-band UE.

  NOTE 3: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.3A GSM Carrier RSSI

#### A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell\_DCH state compressed mode with purpose "GSM Carrier RSSI Measurement" is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5AA defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Table A.9.5AA: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Not required	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/loc	dB	-1
loc	dBm/ 3,84 MHz	-70
Propagation condition	-	AWGN

#### A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

The rate of correct measurements observed during repeated tests shall be at least 90%.

# A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

# A.9.1.3CUE transmitted power

#### A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

The test parameters are given in Table A.9.5C and A.9.5D below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.

Table A.9.5C: General test parameters for UE transmitted power

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		Off	

**Parameter** Unit Cell 1 CPICH\_Ec/lor dB -10 PCCPCH\_Ec/lor dB -12 dB SCH\_Ec/lor -12 PICH\_Ec/lor dB -15 DPCH\_Ec/lor dΒ **OCNS** dΒ -5.2 $\hat{I}_{or}/I_{oc}$ dB 0 dBm/3,84 MHz -70  $I_{oc}$ CPICH\_Ec/lo dB -13 **Propagation Condition** AWGN

Table A.9.5D: Cell Specific parameters for UE transmitted power

#### A.9.1.3C.1.1 Test procedure

- 1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
- 2) Send continuously during the entire test Up power control commands to the UE.
- 3) Check the UE reported value
- 4) Map the UE reported value to accuracy requirement and define the test limits
- 5) Measure the output power of the UE. The output power shall be averaged over one timeslot.
- 6) Check that measured power is within the defined limits.
- 7) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.
- 8) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

#### A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

The rate of correct measurements observed during repeated tests shall be at least 90%.

#### A.9.1.4 SFN-CFN observed time difference

#### A.9.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-CFN observed time difference measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.7.

#### A.9.1.4.1.1 Intra frequency test parameters

During the test the timing difference between Cell 1 and 2 can be set to value from 0...9830399 chips.

In this case all cells are in the same frequency. Table A.9.6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.6: SFN-CFN observed time difference Intra frequency test parameters

Parame	eter	Unit	Cell 1	Cell 2
UTRA RF Char	nnel number		Channel 1	Channel 1
CPICH_E	Ec/lor	dB	-10	-10
PCCPCH	_Ec/lor	dB	-12	-12
SCH_E	c/lor	dB	-12	-12
PICH_E	c/lor	dB	-15	-15
DPCH_E	Ec/lor	dB	-15	-15
OCN	S	dB	-1.11	-1.11
Îor/Io	С	dB	10.5	10.5
loc		dBm/ 3,84 MHz	<i>Io -13.7 dB = loc,</i> Note 1	lo -13.7 dB = loc, Note 1
Range 1	lo	dBm/3,84 MHz	-9470 (Band I, IV, VI, X, XI,	-9470(Band I, IV, VI, X, XI,
			XIX, XXI)	XIX, XXI)
			-9270 (Band II, V, VII)	-9270 (Band II, V, VII)
			-90.570 (Band XXV, XXVI	-90.570 (Band XXV, XXVI
			(Note 3))	(Note 3))
			-9170 (Band III, VIII, XII, XIII,	-9170 (Band III, VIII, XII, XIII,
			XIV, XX, XXII)	XIV, XX, XXII)
			-9370 (Band IX (Note 2))	-9370 (Band IX (Note 2))
Range 2			-9450 (Band I, IV, VI, X, XI,	-9450 (Band I, IV, VI, X, XI,
			XIX, XXI)	XIX, XXI)
			-9250 (Band II, V, VII)	-9250 (Band II, V, VII)
			-90.550 (Band XXV, XXVI	-90.550 (Band XXV, XXVI
			(Note 4))	(Note 4))
			-9150 (Band III, VIII, XII, XIII,	-9150 (Band III, VIII, XII, XIII,
			XIV, XX, XXII)	XIV, XX, XXII)
			-9350 (Band IX (Note 2))	-9350 (Band IX (Note 2))
Propagation	condition	-	AW	/GN

- NOTE 1: loc level shall be adjusted according the total signal power spectral density lo at receiver input and the geometry factor *lor/loc*.
- NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

  The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is
- NOTE 3: within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
- NOTE 4: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.4.1.2 Inter frequency test parameters

During the test the timing difference between Cell 1 and 2 can be set to value from 0...9830399 chips.

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. Table A.9.7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.7: SFN-CFN observed time difference Inter frequency tests parameters

Parame	ter	Unit	Cell 1	Cell 2
UTRA RF Chan	UTRA RF Channel number		Channel 1	Channel 2
CPICH_E	PICH_Ec/lor dB -10		-10	-10
PCCPCH_	Ec/lor	dB	-12	-12
SCH_E	/lor	dB	-12	-12
PICH_E	c/lor	dB	-15	-15
DPCH_E	c/lor	dB	-15	-15
OCNS	S	dB	-1.11	-1.11
Îor/Io	С	dB	10.1	10.1
loc		dBm/ 3,84 MHz	<i>Io -10.6 dB = loc,</i> Note 1	<i>Io -10.6 dB = loc,</i> Note 1
Range 1	lo	dBm/ 3,84 MHz	-9470 (Band I, IV, VI, X, XI,	-9470 (Band I, IV, VI, X, XI,
			XIX, XXI)	XIX, XXI)
			-9270 (Band II, V, VII)	-9270 (Band II, V, VII)
			-90.570 (Band XXV, XXVI	-90.570 (Band XXV, XXVI
			(Note 3))	(Note 3))
			-9170 (Band III, VIII, XII, XIII,	-9170 (Band III, VIII, XII, XIII,
			XIV, XX, XXII)	XIV, XX, XXII)
			-9370 (Band IX (Note 2))	-9370 (Band IX (Note 2))
Range 2			-9450 (Band I, IV, VI, X, XI,	-9450 (Band I, IV, VI, X, XI,
			XIX, XXI)	XIX, XXI)
			-9250 (Band II, V, VII)	-9250 (Band II, V, VII)
			-90.550 (Band XXV, XXVI	-90.550 (Band XXV, XXVI
			(Note 4))	(Note 4))
			-9150 (Band III, VIII, XII, XIII,	-9150 (Band III, VIII, XII, XIII,
			XIV, XX, XXII)	XIV, XX, XXII)
			-9350 (Band IX (Note 2))	-9350 (Band IX (Note 2))
Propagation (	condition	-	AW	GN

- NOTE 1: loc level shall be adjusted in each carrier frequency according the total signal power spectral density lo at receiver input and the geometry factor *lor/loc*.
- NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement
- performance requirements for Band III shall apply to the multi-band UE.

  The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is NOTE 3: within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
- NOTE 4: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.4.2 **Test Requirements**

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in section 9.1.7.

### A.9.1.5 SFN-SFN observed time difference

#### A.9.1.5.1 SFN-SFN observed time difference type 1

#### A.9.1.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 1 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.1.

During the test the timing difference between Cell 1 and 2 can be set to value from 0...9830399 chips.

In this case all cells are in the same frequency. Table A.9.8 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.8: SFN-SFN observed time difference type 1 Intra frequency test parameters

Paramete	er	Unit	Cell 1	Cell 2
UTRA RF Channe	el number		Channel 1	Channel 1
CPICH_Ec	/lor	dB	-10	-10
PCCPCH_E	c/lor	dB	-12	-12
SCH_Ec/l	lor	dB	-12	-12
PICH_Ec/	lor	dB	-15	-15
S-CCPCH_E	c/lor	dB	-12	-12
OCNS		dB	-1.29	-1.29
Îor/loc		dB	10.5	10.5
loc		dBm/ 3,84 MHz	<i>Io -13.7 dB = loc,</i> Note 1	<i>Io -13.7 dB = loc,</i> Note 1
Range 1			-9470 (Band I, IV, VI, X, XI, XIX, XXI) -9270 (Band II, V, VII) -90.570 (Band XXV, XXVI	-9470 (Band I, IV, VI, X, XI, XIX, XXI) -9270 (Band II, V, VII) -90.570 (Band XXV, XXVI
_	lo	dBm/2 94 MUz	(Note 3)) -9170 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9370 (Band IX (Note 2))	(Note 3)) -9170 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9370 (Band IX (Note 2))
Range 2	10	dBm/3,84 MHz	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI (Note 4)) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9350 (Band IX (Note 2))	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI (Note 4)) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9350 (Band IX (Note 2))
Propagation co	ndition	-	AWO	, , , , , , , , , , , , , , , , , , , ,
1 Topagation condition			-	

- NOTE 1: *loc* level shall be adjusted according the total signal power spectral density *lo* at receiver input and the geometry factor *lor/loc*.
- NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
- NOTE 3: The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
- NOTE 4: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.5.1.2 Test Requirements

The SFN-SFN observed time difference type 1 measurement accuracy shall meet the requirements in section 9.1.8.1

#### A.9.1.5.2 SFN-SFN observed time difference type 2 without IPDL period active

#### A.9.1.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy without IPDL period active is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 can be set to value from -1279.75 to 1280 chips.

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Paramete	er	Unit	Cell 1	Cell 2
	UTRA RF Channel		Channel 1	Channel 1
number				
CPICH_Ec/	/lor	dB	-10	-10
PCCPCH_E	c/lor	dB	-12	-12
SCH_Ec/I	or	dB	-12	-12
PICH_Ec/I	or	dB	-15	-15
DPCH_Ec/	lor	dB	-15	-15
OCNS		dB	-1.11	-1.11
Îor/loc		dB	10.5	10.5
loc		dBm/ 3,84	lo -13.7 dB = loc, Note 1	lo -13.7 dB = loc, Note 1
		MHz		
CPICH_Ec/lo,	Note 2	dB	-13.2	-13.2
Range 1	lo	dBm/3,84 MHz	-9470 (Band I, IV, VI, X, XI,	-9470 (Band I, IV, VI, X, XI,
			XIX, XXI)	XIX, XXI)
			-9270 (Band II, V, VII)	-9270 (Band II, V, VII)
			-90.570 (Band XXV, XXVI	-90.570 (Band XXV, XXVI
			(Note 4))	(Note 4))
			-9170 (Band III, VIII, XII,	-9170 (Band III, VIII, XII, XIII,
			XIII, XIV, XX, XXII)	XIV, XX, XXII)
			-9370 (Band IX (Note 3))	-9370 (Band IX (Note 3))
Range 2			-9450 (Band I, IV, VI, X, XI,	-9450 (Band I, IV, VI, X, XI,
			XIX, XXI)	XIX, XXI)
			-9250 (Band II, V, VII)	-9250 (Band II, V, VII)
			-90.550 (Band XXV, XXVI	-90.550 (Band XXV, XXVI
			(Note 5))	(Note 5))
			-9150 (Band III, VIII, XII,	-9150 (Band III, VIII, XII, XIII,
			XIII, XIV, XX, XXII)	XIV, XX, XXII)
NOTE 4			-9350 (Band IX (Note 3))	-9350 (Band IX (Note 3))

- NOTE 1: *loc* level shall be adjusted according the total signal power spectral density *lo* at receiver input and the geometry factor *lor/loc*.
- NOTE 2: To and CPICH Ec/lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
- NOTE 3: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

  NOTE 4: The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is
- NOTE 4: The condition is -92...-70 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
- NOTE 5: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.5.2.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

#### A.9.1.5.3 SFN-SFN observed time difference type 2 with IPDL period active

#### A.9.1.5.3.1 Test Purpose and Environment

This requirement is valid only for UEs supporting IPDL measurements.

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 shall be set according to the assistance data defined in table A.9.10A.

In this case all cells are in the same frequency. Table A.9.10 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.10: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Ce	II 1	Ce	II 2
Time		No idle period	Idle period in Cell 1	No idle period	Idle period in Cell 1
UTRA RF Channel number		Channel 1	Channel 1	Channel 1	Channel 1
CPICH_Ec/lor	dB	-10	-10	-10	-10
PCCPCH_Ec/lor	dB	-12	-12	-12	-12
SCH_Ec/lor	dB	-12	-12	-12	-12
PICH_Ec/lor	dB	-15	-15	-15	-15
DPCH_Ec/lor	dB	-15	-15	-	-
OCNS	dB	-1.11	-1.11	-0.94	-0.94
Îor/loc	dB	10.5	-24.5	-6	-6
loc	dBm/ 3,84 MHz		-8	30	
Io, Note 1	dBm/3,84 MHz	-69.04	-79.01	-69.04	-79.01
CPICH_Ec/Io, Note 1	dB	-10.46	-35.49	-26.96	-16.99
Propagation condition	-		AW	GN	

NOTE 1: Io and CPICH Ec/lo levels have been calculated from other parameters for information purposes. They are is not settable parameters themselves.

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10A shall be used.

Table A.9.10A: SFN-SFN observed time difference type 2 assistance data test parameters

Parameter	Unit	Cell 1
Search Window Size	Chips	80
IP_Status	-	Continuous
IP_Spacing	Frames	10
IP_Lenght	Symbols	10
IP_Offset	frame	NA
Seed	integer	13
Burst_Start		NA
Burst_Length		NA
Burst_Freq		NA

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

#### A.9.1.5.3.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

#### A.9.1.6 UE Rx-Tx time difference

#### A.9.1.6.1 UE Rx-Tx time difference type 1

### A.9.1.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE Rx-Tx time difference type 1 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.9.1

The connection is started using cell 1, then cell 2 is added to the active set so that cell 1 is the timing reference. During the test the downlink DPCH time difference between Cell 1 and 2 can be set to any value from -148 to 148 chips.

Table A.9.11 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.11: UE Rx-Tx time difference type 1 intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2	
UTRA RF Channel number		Channel 1	Channel 1	
Downlink DPCH timing	Chips	Timing reference	From reference timing -148	
_		_	to reference timing+148	
CPICH_Ec/lor	dB	-10	-10	
PCCPCH_Ec/lor	dB	-12	-12	
SCH_Ec/lor	dB	-12	-12	
PICH_Ec/lor	dB	-15	-15	
DPCH_Ec/lor	dB	-15	-15	
OCNS	dB	-1.11	-1.11	
Îor/loc	dB	10.5	10.5	
loc	dBm/3,84 MHz	lo -13.7 dB = loc, Note 1	Io-13.7 dB = Ioc, Note 1	
lo	dBm/3,84 MHz	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI (Note 3)) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII)	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI (Note 3))	
Propagation condition		-9350 (Band IX (Note 2))	-9350 (Band IX (Note 2))	
r ropagation condition	-	AWGN		

NOTE 1: *loc* level shall be adjusted according the total signal power spectral density *lo* at receiver input and the geometry factor *lor/loc*.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.6.1.2 Test Requirements

The UE Rx-Tx time difference type 1 measurement accuracy measured for cell 2 shall meet the requirements in section 9.1.9.1.

#### A.9.1.6.2 UE Rx-Tx time difference type 2

#### A.9.1.6.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE Rx-Tx time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.9.2.

The connection is started using cell 1, then cell 2 is added to the active set so that cell 1 is the timing reference. During the test the downlink DPCH time difference between Cell 1 and 2 can be set to any value from -148 to 148 chips.

Table A.9.12 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.12: UE Rx-Tx time difference type 2 intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
Downlink DPCH timing	Chips	Timing reference	From reference timing -148 to
			reference timing+148
CPICH_Ec/lor	dB	-10	-10
PCCPCH_Ec/lor	dB	-12	-12
SCH_Ec/lor	dB	-12	-12
PICH_Ec/lor	dB	-15	-15
DPCH_Ec/lor	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/loc	dB	10.5	10.5
loc	dBm/ 3,84 MHz	lo -10.9 dB = loc, Note 1	Io-13.7 dB = Ioc, Note 1
lo	dBm/ 3,84 MHz	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9350 (Band IX (Note 2))	-9450 (Band I, IV, VI, X, XI, XIX, XXI) -9250 (Band II, V, VII) -90.550 (Band XXV, XXVI) -9150 (Band III, VIII, XII, XIII, XIV, XX, XXII) -9350 (Band IX (Note 2))
Propagation condition	-	AW	

NOTE1: loc level shall be adjusted according the total signal power spectral density lo at receiver input and the geometry factor lor/loc.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

NOTE 3: The condition is -92...-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

#### A.9.1.6.2.2 Test Requirements

The UE Rx-Tx time difference type 2 measurement accuracy measured for cell 2 shall meet the requirements in section 9.1.9.2.

A.9.1.7 (void)

A.9.1.8 (void)

**Table A.9.13: (void)** 

**Table A.9.14: (void)** 

#### A.9.1.9 UE Transmission Power Headroom

#### A.9.1.9.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmission power headroom measurement report accuracy is within the specified limits. This test will verify the requirements in section 9.1.13.4.

The test parameters are given in Table A.9.15A and Table A.9.15B. In the Scheduling Information configuration for the E-DCH, it shall be indicated to the UE that it shall periodically report Scheduling Information, which contains UPH measurement every E-DCH TTI. During the test the system simulator shall not send any scheduling grant to the UE. An HSDPA radio bearer shall be configured.

Table A.9.15A: General test parameters for UE transmission power headroom

Parameter	Unit	Value	Comment
DL DCH configuration		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
E-DCH TTI	ms	10	
E-DCH configuration		10 ms TTI E-DCH Transport Block	Table 0 in TS 25.321 section B.3
		Size	
DL Power Control		Off	
Active cell		Cell1	
$eta_{ m ec}\!/eta_{ m c}$		5/15	
$eta_{ t ed\_ref}/eta_c$		5/15	·
A <sub>hs</sub>		5/15	$\Delta_{ACK} = \Delta_{NACK} = \Delta_{CQI}$
Reference E-TFCI index	_	0	Table 0 in TS 25.321 section B.3

Table A.9.15B: Cell Specific parameters for UE transmission power headroom

Parameter	Unit	Cell 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DPCH_Ec/lor	dB	-10
HS-SCCH_Ec/lor	dB	-8
HS-PDSCH_Ec/lor	dB	-3
E-AGCH_Ec/Io	dB	DTX
E-HICH_Ec/lo	dB	DTX
E-RGCH_Ec/lo	dB	DTX
OCNS	dB	Note 1
Î <sub>or</sub>	dBm/3,84 MHz	-70

Note 1: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{\rm or}$ 

#### A.9.1.9.1.1 Test Procedure

- 1) Set the maximum allowed uplink transmit power ( $P_{\text{max}}$ ) to the maximum power for that UE power class.
- 2) Use uplink power control commands to set the UE DPCCH power to a level (*P*) where the UE power headroom is at least 31dB.
- 3) Measure the power transmitted by the UE on DPCCH every time slot. The DPCCH output power shall be averaged over 100 ms.
- 4) The total measured output power of the UE shall be averaged over 100 ms.
- 5) Estimate the reference UE transmission power headroom as the difference between the maximum allowed uplink transmit power ( $P_{\text{max}}$ ) and the average DPCCH power measured in step 3.
- 6) Check the UE reported value of UE transmission power headroom.
- 7) Check the accuracy limits according to table 9.34B for the total output power measured in step 4).
- 8) The difference between the reported UPH in step 6) and estimated reference UPH in step 5) shall be within the accuracy limits obtained in step 7).
- 9) Increase the variable *P* by 1 dB.
- 10) Repeat from step 2) until the UPH is tested over the entire dynamic range.

#### A.9.1.9.2 Test Requirements

The UE transmission power headroom measurement report accuracy shall meet the requirements in section 9.1.13.4.

The rate of correct measurements observed during repeated tests shall be at least 90%.

## A.9.1.10 E-UTRAN FDD RSRP absolute accuracy (CELL\_DCH)

#### A.9.1.10.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD RSRP measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4a.

The test is carried out in Cell\_DCH state using a compressed mode pattern with purpose "E-UTRAN Measurement". The compressed mode pattern repeats every 80 ms and uses a gap length of 10 slots. Further details are found in TS 25.101 annex A.5.

Tables A.9.1.10.1-1 and A.9.1.10.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN FDD RSRP is indicated to the UE. The E-UTRAN FDD test parameters are given in Table A.9.1.10.1-3.

Table A.9.1.10.1-1: General UTRAN test parameters for E-UTRAN FDD RSRP measurements

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - E-UTRAN measurement		Compressed mode reference pattern 2 Set 5	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		E-UTRAN FDD RSRP	
Monitored cell list size		1 E-UTRAN FDD neighbour cell	Measurement control information is sent before the compressed mode pattern starts.

Table A.9.1.10.1-2: Cell specific UTRAN test parameters for E-UTRAN FDD RSRP measurements

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DCH_Ec/lor	dB	Note 1
OCNS_Ec/lor	dB	Note 2
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
CPICH_Ec/lo	dB	-13.54
Propagation condition	-	AWGN

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

Table A.9.1.10.1-3: E-UTRAN FDD RSRP test parameters

Parameter		Unit	Test 1 Cell 2	Test 2 Cell 2
BW <sub>channel</sub>		MHz	10	10
Measurement bandwidth		$n_{PRB}$	22—27	22—27
PDCCH/PCFICH/PHICH Reference measurement channel as defined in TS 36.133 A.3.1.2.1		TND	R.6 FDD	R.6 FDD
OCNG Pattern A.3.2.1.2	as defined in TS 36.133		OP.2 FDD	OP.2 FDD
PBCH_RA				
PBCH_RB PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB		dB	0	0
PDCCH_RA				
PDCCH_RB PDSCH_RA				
PDSCH_RB				
OCNG_RA <sup>Note1</sup>				
OCNG_RB <sup>Note1</sup>				
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.	dBm/15 kHz	-88.65	-117
$N_{oc}^{$	Bands 2, 5, 7, 26 and 27 (Note 5)			-115
TV oc	Band 25			-113.5
	Band 28			-115.5
	Bands 3, 8, 12, 13, 14, 17, 20 and 22			-114
	Band 9			-116
$\hat{E}_s/I_{ot}$		dB	10	-4
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.	dBm/15 kHz	-78.65	-121
RSRP <sup>Note3</sup>	Bands 2, 5, 7, 26 and 27 (Note 5)			-119
RSRP	Band 25			-117.5
	Band 28			-119.5
	Bands 3, 8, 12, 13, 14, 17, 20 and 22			-118
	Band 9			-120
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.			-87.76
. Note3	Bands 2, 5, 7, 26 and 27 (Note 5)			-85.76
lo <sup>Note3</sup>	Band 25	dBm/9 MHz	-49.5	-84.26
	Band 28			-86.26
	Bands 3, 8, 12, 13, 14, 17, 20 and 22			-84.76
Band 9				-86.76
$\hat{E}_s/N_{oc}$		dB	10	-4
	Propagation condition		AWGN	AWGN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894

#### A.9.1.10.2 Test Requirements

The E-UTRAN FDD RSRP absolute measurement accuracy shall meet the requirements in section 9.1.4a.

## A.9.1.11 E-UTRAN TDD RSRP Absolute Accuracy (CELL\_DCH)

#### A.9.1.11.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD RSRP measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4a.

The test is carried out in Cell\_DCH state using a compressed mode pattern with purpose "E-UTRAN Measurement". The compressed mode pattern repeats every 80 ms and uses a gap length of 10 slots. Further details are found in table A.22 in annex A.5 of 3GPP TS 25.101.

Tables A.9.1.11.1-1 and A.9.1.11.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN TDD RSRP is indicated to the UE. The E-UTRAN TDD test parameters are given in Table A.9.1.11.1-3.

Table A.9.1.11.1-1: General test parameters for E-UTRAN TDD RSRP absolute accuracy tests

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in 3GPP TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - E-UTRAN measurement		Compressed mode reference pattern 2 Set 5	As specified in table A.22 3GPP TS 25.101 section A.5
Inter-RAT measurement quantity		E-UTRAN TDD RSRP	
Monitored cell list size		1 E-UTRAN TDD neighbour cell	Measurement control information is sent before the compressed mode pattern starts.

Table A.9.1.11.1-2: UTRAN FDD cell specific test parameters for E-UTRAN TDD RSRP absolute accuracy tests

Parameter	Unit	Cell 1	
UTRA RF Channel number	-	Channel 1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
DCH_Ec/lor	dB	Note 1	
OCNS_Ec/lor	dB	Note 2	
Îor/loc	dB	-1	
loc	dBm/ 3.84 MHz	-70	
CPICH_Ec/lo	dB	-13.54	
Propagation condition	-	AWGN	
Note 1: The DPCH level is controlled by the power control loop.			
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.			

Table A.9.1.11.1-3: E-UTRAN TDD cell specific test parameters for E-UTRAN TDD RSRP absolute accuracy tests

Parameter		Unit	Test 1	Test 2
		Offic	Cell 2	Cell 2
E-UTRA RF Channel Number			1	1
BW <sub>channel</sub>	Noto1	MHz	10	10
Special subfrar	me configuration <sup>Note1</sup>	<u> </u>	6	6
Uplink-downlin	nk configuration Note1	<u> </u>	1	1
Measurement I		$n_{PRB}$	22—27	22—27
	CH/PHICH Reference	1	0.000	D 0 TDD
	channel as defined in	1	R.6 TDD	R.6 TDD
TS 36.133 A.3.		<del> </del>	<b></b>	<del> </del>
A.3.2.2.2	as defined in TS 36.133	1	OP.2 TDD	OP.2 TDD
PBCH RA		1	<del>                                     </del>	1
PBCH_RB		1	1	
PSS RA		1	1	ĺ
SSS_RA		1		0
PCFICH RB		1	1	
PHICH RA		1		
PHICH RB		dB	0	
PDCCH_RA				1
PDCCH_RB		1		1
PDSCH_RA		1		1
PDSCH_RB		1		1
OCNG_RA <sup>Note2</sup>		1		1
OCNG_RB <sup>Note2</sup>		1		1
	Bands 33, 34, 35,	<del> </del>	†	
3.7 Note3	36, 37, 38, 39 and	1		-117
$N_{oc}^{ m Note3}$	40	dBm/15 kHz	-88.65	
	Bands 42 and 43	1		-116
	Bands 41 and 44	1		-115
r. /ı		-ID	10	
$\hat{E}_s/I_{ot}$	ļ	dB	10	-4
	Bands 33, 34, 35,	'		
	36, 37, 38, 39 and	1		-121
RSRP <sup>Note4</sup>	40	dBm/15 kHz	-78.65	<u></u>
	Bands 42 and 43	1		-120
	Bands 41 and 44	ĺ'	<u></u> !	-119
	Bands 33, 34, 35,			
	36, 37, 38, 39 and	1		-87.76
Io <sup>Note4</sup>	40	dBm/9 MHz	-49.5	
	Bands 42 and 43	1		-86.76
	Bands 41 and 44			-85.76
$\hat{E}_s/N_{oc}$		dB	10	-4
Propagation co		-	AWGN	AWGN
Note 1: For special subframe and unlink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

#### A.9.1.11.2 Test Requirements

The E-UTRAN TDD RSRP absolute measurement accuracy shall meet the requirements in section 9.1.4a.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled

## A.9.1.12 E-UTRA FDD RSRQ absolute accuracy (CELL\_DCH)

#### A.9.1.12.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD RSRQ measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4b.

The test is carried out in Cell\_DCH state using a compressed mode pattern with purpose "E-UTRAN Measurement". The compressed mode pattern repeats every 80 ms and uses a gap length of 10 slots. Further details are found in TS 25.101 annex A.5.

Tables A.9.1.12.1-1 and A.9.1.12.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN RSRQ is indicated to the UE. The E-UTRAN FDD test parameters are given in Table A.9.1.12.1-3.

Table A.9.1.12.1-1: General UTRAN test parameters for E-UTRAN FDD RSRQ measurements

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - E-UTRAN measurement		Compressed mode reference pattern 2 Set 5	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		E-UTRAN FDD RSRQ	
Monitored cell list size		1 E-UTRAN FDD neighbour cell	Measurement control information is sent before the compressed mode pattern starts.

Table A.9.1.12.1-2: Cell specific UTRAN test parameters for E-UTRAN FDD RSRQ measurements

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DCH_Ec/lor	dB	Note 1
OCNS_Ec/lor	dB	Note 2
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
CPICH_Ec/lo	dB	-13.54
Propagation condition	-	AWGN
Propagation condition	-	

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the

total power from the cell to be equal to lor.

total power from the cell to be equal to lor.

### Table A.9.1.12.1-3: E-UTRAN FDD RSRQ test parameters

Borometer	Unit	Test 1	Test 2	Test 3
Faranietei	Unit	Cell 2	Cell 2	Cell 2

BW <sub>channel</sub>		MHz	10	10	10
Measurement bandwidth		$n_{PRB}$	22—27	22—27	22—27
PDCCH/PCFICH/PHICH Reference measurement channel as defined in TS 36.133 A.3.1.2.1		TRD	R.6 FDD	R.6 FDD	R.6 FDD
OCNG Pattern	as defined in TS 36.133		OP.2 FDD	OP.2 FDD	OP.2 FDD
A.3.2.1.2 PBCH_RA			-	-	-
PBCH RB		†			
PSS_RA					
SSS_RA					
PCFICH_RB		1			
PHICH_RA PHICH_RB		410	0	0	0
PDCCH_RA		dB	0	0	0
PDCCH_RB		1			
PDSCH_RA					
PDSCH_RB		4			
OCNG_RA <sup>Note1</sup>		1			
OCNG_RB <sup>Note1</sup>					
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.				-119.50
$N_{oc}^{ m Note2}$	Bands 2, 5, 7, 26 and 27 (Note 5)		-80	-104.70	-117.50
TV oc	Band 25	dBm/15 kHz			-116
	Band 28				-118
	Bands 3, 8, 12, 13, 14, 17, 20 and 22				-116.50
	Band 9				-118.50
$\hat{E}_s/I_{ot}$		dB	-1.75	-4.0	-4.0
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.				-123.50
	Bands 2, 5, 7, 26 and 27 (Note 5)		-81.75	-108.70	-121.50
RSRP <sup>Note3</sup>	Band 25	dBm/15 kHz			-120
	Band 28	1			-122
	Bands 3, 8, 12, 13, 14, 17, 20 and 22				-120.50
	Band 9				-122.50
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.	 <del> </del>			
RSRQ <sup>Note3</sup>	Bands 2, 5, 7, 25, 26, 27 and 28	dB	-14.76	-16.25	-16.25
	Bands 3, 8, 12, 13, 14, 17, 20 and 22				
	Band 9				
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24.				-90.26
	Bands 2, 5, 7, 26 and 27 (Note 5)				-88.26
Io <sup>Note3</sup>	Band 25	dBm/9 MHz	-50	-75.46	-86.76
	Band 28	1			-88.76
	Bands 3, 8, 12, 13, 14, 17, 20 and 22				-87.26
	Band 9				-89.26
$\hat{E}_s/N_{oc}$		dB	-1.75	-4.0	-4.0
Propagation co	ondition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894

### A.9.1.12.2 Test Requirements

The E-UTRAN FDD RSRQ absolute measurement accuracy shall meet the requirements in section 9.1.4b.

### A.9.1.13 E-UTRAN TDD RSRQ Absolute Accuracy (CELL\_DCH)

### A.9.1.13.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD RSRQ measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4b.

The test is carried out in Cell\_DCH state using a compressed mode pattern with purpose "E-UTRAN Measurement". The compressed mode pattern repeats every 80 ms and uses a gap length of 10 slots. Further details are found in table A.22 in annex A.5 of 3GPP TS 25.101.

Tables A.9.1.13.1-1 and A.9.1.13.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN TDD RSRQ is indicated to the UE. The E-UTRAN TDD test parameters are given in Table A.9.1.13.1-3.

Table A.9.1.13.1-1: General test parameters for E-UTRAN TDD RSRQ absolute accuracy tests

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in 3GPP TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - E-UTRAN measurement		Compressed mode reference pattern 2 Set 5	As specified in table A.22 3GPP TS 25.101 section A.5
Inter-RAT measurement quantity		E-UTRAN TDD RSRQ	
Monitored cell list size		1 E-UTRAN TDD neighbour cell	Measurement control information is sent before the compressed mode pattern starts.

Table A.9.1.13.1-2: UTRAN FDD cell specific test parameters for E-UTRAN TDD RSRQ absolute accuracy tests

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DCH_Ec/lor	dB	Note 1
OCNS_Ec/lor	dB	Note 2
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
CPICH_Ec/lo	dB	-13.54
Propagation condition	-	AWGN

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

Table A.9.1.13.1-3: E-UTRAN TDD cell specific test parameters for E-UTRAN TDD RSRQ absolute accuracy tests

Pa	arameter	Unit	Test 1	Test 2	Test 3
	E-UTRA RF Channel Number		Cell 2 1	Cell 2	Cell 2 1
	annei Number	MHz	10	10	10
BW <sub>channel</sub> Special subframe configuration Note1		IVII IZ	6	6	6
Uplink-downlink	configuration Note1		1	1	1
Measurement ba		$n_{PRB}$	22—27	22—27	22—27
	H/PHICH Reference	PRB			
	nannel as defined in		R.6 TDD	R.6 TDD	R.6 TDD
3GPP TS 36.13					
36.133 A.3.2.2.2	as defined in 3GPP TS		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	·				
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB		dB	0	0	0
PDCCH_RA					
PDCCH_RB PDSCH_RA					
PDSCH_RB					
OCNG RA <sup>Note2</sup>					
OCNG_RB <sup>Note2</sup>		-			
OCNG_RB	Daniela 22, 24, 25				
3.7 Novo	Bands 33, 34, 35, 36, 37, 38, 39 and				-119.50
$N_{oc}^{ m Note3}$	40	dBm/15 kHz	-80	-104.70	
	Bands 42 and 43				-118.50
	Bands 41 and 44				-117.50
$\hat{E}_s/I_{ot}$		dB	-1.75	-4.0	-4.0
	Bands 33, 34, 35,				
Note/	36, 37, 38, 39 and				-123.50
RSRP <sup>Note4</sup>	40	dBm/15 kHz	-81.75	-108.70	400.50
	Bands 42 and 43				-122.50
	Bands 41 and 44				-121.50
	D 1 00 04 65				
RSRQ <sup>Note4</sup>	Bands 33, 34, 35,	40	4.4.70	40.05	40.05
KSKQ	36, 37, 38, 39, 40, 42, 43 and 44	dB	-14.76	-16.25	-16. 25
	42, 45 and 44				
	Bands 33, 34, 35,				
	36, 37, 38, 39 and				-90.26
Io <sup>Note4</sup>	40	dBm/9 MHz	-50	-75.46	
Bands 42 and 43			- <del>-</del>		-89.26
	Bands 41 and 44				-88.26
$\hat{E}_s/N_{oc}$	$\hat{F}_{N}$		-1.75	-4.0	-4.0
	dition	dB	AWGN	AWGN	AWGN
Propagation con	cial subframe and uplink-	downlink configuration			

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

### A.9.1.13.2 Test Requirements

The E-UTRAN TDD RSRQ absolute measurement accuracy shall meet the requirements in section 9.1.4b.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $\,N_{oc}\,$  to be fulfilled.

Note 4: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

### A.9.1.14 E-UTRAN FDD RSRP absolute accuracy (CELL\_FACH)

### A.9.1.14.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD RSRP measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4a.

The test is carried out in Cell\_FACH state using HS-DSCH DRX.

Tables A.9.1.14.1-1 and A.9.1.14.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN FDD RSRP is indicated to the UE. The E-UTRAN FDD test parameters are given in Table A.9.1.14.1-3.

Table A.9.1.14.1-1: General UTRAN test parameters for E-UTRAN FDD RSRP measurements

Parameter	Unit	Value	Comment
HS-DSCH DRX	frames	8	Length of the DRX cycle
cycle <sub>FACH</sub>			
HS-DSCH Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
T321	S	0.1	Number of seconds until the DRX cycle
			is initiated
Report criteria		Periodic	
Inter-RAT measurement		E-UTRAN FDD RSRP	
quantity			
Monitored cell list size		1 E-UTRAN FDD neighbour cell	

Table A.9.1.14.1-2: Cell specific UTRAN test parameters for E-UTRAN FDD RSRP measurements

Parameter	Unit	Cell 1		
UTRA RF Channel number	-	Channel 1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
HS-PDSCH_Ec/lor	dB	-10		
HS-SCCH_Ec/lor	dB	-13		
OCNS_Ec/lor	dB	Note 1		
Îor/loc	dB	-1		
loc	dBm/ 3.84 MHz	-70		
CPICH_Ec/lo	dB	-13.54		
Propagation condition	-	AWGN		
Note 1: The power of the OCNS channel that is added shall make the				

Table A.9.1.14.1-3: E-UTRAN FDD RSRP test parameters

	1			
Parameter	Unit	Cell 2		
BW <sub>channel</sub>	MHz	10		
Measurement bandwidth	$n_{PRB}$	22—27		
PDCCH/PCFICH/PHICH Reference measurement channel as defined in TS 36.133 A.3.1.2.1		R.6 FDD		
OCNG Pattern as defined in TS 36.133 A.3.2.1.2		OP.2 FDD		
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB OCNG_RB	dB	0		
$N_{oc}^{ m Note2}$	dBm/15 kHz	-88.65		
$\hat{E}_s/I_{ot}$	dB	10		
RSRP <sup>Note3</sup>	dBm/15 kHz	-78.65		
Io <sup>Note3</sup>	dBm/9 MHz	-49.5		
$\hat{E}_s/N_{oc}$	dB	10		
Propagation condition - AWGN				
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.  Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is				

- achieved for all OFDM symbols.
- nterference from other cells and noise sources not specified in Note 3: the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{\it oc}$  to be fulfilled.
- RSRQ, RSRP and lo levels have been derived from other Note 4: parameters for information purposes. They are not settable parameters themselves.
- RSRP and RSRQ minimum requirements are specified Note 5: assuming independent interference and noise at each receiver antenna port.

### A.9.1.14.2 Test Requirements

The E-UTRAN FDD RSRP absolute measurement accuracy shall meet the requirements in section 9.1.4a.

### A.9.1.15 E-UTRAN TDD RSRP Absolute Accuracy (CELL\_FACH)

### A.9.1.15.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD RSRP measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4a.

The test is carried out in Cell\_FACH state using HS-DSCH DRX.

Tables A.9.1.15.1-1 and A.9.1.15.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN TDD RSRP is indicated to the UE. The E-UTRAN TDD test parameters are given in Table A.9.1.15.1-3.

Table A.9.1.15.1-1: General test parameters for E-UTRAN TDD RSRP absolute accuracy tests

Parameter	Unit	Value	Comment
HS-DSCH DRX	frames	8	Length of the DRX cycle
cycle <sub>FACH</sub>			
HS-DSCH Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
T321	S	0.1	Number of seconds until the DRX cycle
			is initiated
Report criteria		Periodic	
Inter-RAT measurement		E-UTRAN TDD RSRP	
quantity			
Monitored cell list size		1 E-UTRAN TDD neighbour cell	

Table A.9.1.15.1-2: UTRAN FDD cell specific test parameters for E-UTRAN TDD RSRP absolute accuracy tests

Parameter	Unit	Cell 1		
UTRA RF Channel number	-	Channel 1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
HS-PDSCH_Ec/lor	dB	-10		
HS-SCCH_Ec/lor	dB	-13		
OCNS_Ec/lor	dB	Note 1		
Îor/loc	dB	-1		
loc	dBm/ 3.84 MHz	-70		
CPICH_Ec/lo	dB	-13.54		
Propagation condition	-	AWGN		
Note 1: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.				

Table A.9.1.15.1-3: E-UTRAN TDD cell specific test parameters for E-UTRAN TDD RSRP absolute accuracy tests

Parameter	Unit	Cell 2		
E-UTRA RF Channel Number		1		
BW <sub>channel</sub>	MHz	10		
Special subframe configuration <sup>Note1</sup>		6		
Uplink-downlink configuration <sup>Note1</sup>		1		
Measurement bandwidth	$n_{PRB}$	22—27		
PDCCH/PCFICH/PHICH Reference measurement channel as defined in TS 36.133 A.3.1.2.2		R.6 TDD		
OCNG Pattern as defined in TS 36.133 A.3.2.2.2		OP.2 TDD		
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB	0		
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA <sup>Note2</sup>				
OCNG_RB <sup>Note2</sup>				
$N_{oc}^{ m Note3}$	dBm/15 kHz	-88.65		
$\hat{E}_s/I_{ot}$	dB	10		
RSRP <sup>Note4</sup>	dBm/15 kHz	-78.65		
lo <sup>Note4</sup>	dBm/9 MHz	-49.5		
$\hat{E}_s/N_{oc}$	dB	10		
Propagation condition	-	AWGN		
Note 1: For appoint subframe and unlink downlink configurations and				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{\it oc}$  to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

### A.9.1.15.2 Test Requirements

The E-UTRAN TDD RSRP absolute measurement accuracy shall meet the requirements in section 9.1.4a.

### A.9.1.16 E-UTRA FDD RSRQ absolute accuracy (CELL\_FACH)

### A.9.1.16.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD RSRQ measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4b.

The test is carried out in Cell\_FACH state with HS-DSCH DRX activated.

Tables A.9.1.16.1-1 and A.9.1.16.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN RSRQ is indicated to the UE. The E-UTRAN FDD test parameters are given in Table A.9.1.16.1-3.

Table A.9.1.16.1-1: General UTRAN test parameters for E-UTRAN FDD RSRQ measurements

Parameter	Unit	Value	Comment
HS-DSCH DRX	frames	8	Length of the DRX cycle
cycle <sub>FACH</sub>			
HS-DSCH Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
T321	S	0.1	Number of seconds until the DRX cycle
			is initiated
Report criteria		Periodic	
Inter-RAT measurement		E-UTRAN FDD RSRQ	
quantity			
Monitored cell list size		1 E-UTRAN FDD neighbour cell	

Table A.9.1.16.1-2: Cell specific UTRAN test parameters for E-UTRAN FDD RSRQ measurements

Parameter	Unit	Cell 1		
UTRA RF Channel number	-	Channel 1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
HS-PDSCH_Ec/lor	dB	-10		
HS-SCCH_Ec/lor	dB	-13		
OCNS_Ec/lor	dB	Note 1		
Îor/loc	dB	-1		
loc	dBm/ 3.84 MHz	-70		
CPICH_Ec/Io	dB	-13.54		
Propagation condition	-	AWGN		
Note 1: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.				

Table A.9.1.16.1-3: E-UTRAN FDD RSRQ test parameters

	Parameter	Unit	Test 1			
BW <sub>channel</sub>		MHz	Cell 2 10			
	ent bandwidth	$n_{PRR}$	22—27			
	CFICH/PHICH Reference	PRB				
measurem 36.133 A.3	ent channel as defined in TS 3.1.2.1		R.6 FDD			
OCNG Pa A.3.2.1.2	ttern as defined in TS 36.133		OP.2 FDD			
PBCH_RA	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \					
PBCH_RB	3					
PSS_RA SSS RA						
PCFICH F	RB					
PHICH_R/						
PHICH_RI		dB	0			
PDCCH_F						
PDSCH R						
PDSCH_R	RB					
OCNG_RA						
OCNG_RE	S <sup>Note1</sup>					
$N_{_{OC}}$ Note2		dBm/15 kHz	-80			
$\hat{E}_s/I_{ot}$		dB	-1.75			
RSRP <sup>Note3</sup>		dBm/15 kHz	-81.75			
RSRQ <sup>Note3</sup>		dB	-14.76			
Io <sup>Note3</sup>		dBm/9 MHz	-50			
$\hat{E}_s/N_{oc}$		dB	-1.75			
	on condition	-	AWGN			
Note 1:	OCNG shall be used such th and a constant total transmit achieved for all OFDM symb Interference from other cells the test is assumed to be con	ted power spec ols. and noise sou nstant over sub	ctral density is  rces not specified in  ocarriers and time			
	and shall be modelled as AW	/GN of approp	riate power for $N_{oc}^{}$			
Note 3:	to be fulfilled. RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable					
Note 4:	assuming independent interference and noise at each receiver					
Note 5:	antenna port.  Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894.					

### A.9.1.16.2 Test Requirements

The E-UTRAN FDD RSRQ absolute measurement accuracy shall meet the requirements in section 9.1.4b.

### A.9.1.17 E-UTRAN TDD RSRQ Absolute Accuracy (CELL\_FACH)

### A.9.1.17.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD RSRQ measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4b.

The test is carried out in Cell\_FACH state with HS-DSCH DRX activated.

Tables A.9.1.17.1-1 and A.9.1.17.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN TDD RSRQ is indicated to the UE. The E-UTRAN TDD test parameters are given in Table A.9.1.17.1-3.

Table A.9.1.17.1-1: General test parameters for E-UTRAN TDD RSRQ absolute accuracy tests

Parameter	Unit	Value	Comment
HS-DSCH DRX	frames	8	Length of the DRX cycle
cycle <sub>FACH</sub>			
HS-DSCH Rx burst <sub>FACH</sub>	frames	1	On time during DRX cycle
T321	S	0.1	Number of seconds until the DRX cycle
			is initiated
Report criteria		Periodic	
Inter-RAT measurement		E-UTRAN TDD RSRQ	
quantity			
Monitored cell list size		1 E-UTRAN TDD neighbour cell	

Table A.9.1.17.1-2: UTRAN FDD cell specific test parameters for E-UTRAN TDD RSRQ absolute accuracy tests

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
HS-PDSCH_Ec/lor	dB	-10
HS-SCCH_Ec/lor	dB	-13
OCNS_Ec/lor	dB	Note 1
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
CPICH_Ec/lo	dB	-13.54
Propagation condition	-	AWGN
Note 1: The power of the OCI	NS channel that is adde	d shall make the

Table A.9.1.17.1-3: E-UTRAN TDD cell specific test parameters for E-UTRAN TDD RSRQ absolute accuracy tests

Parameter	Unit	Test 1					
	- '	Cell 2					
E-UTRA RF Channel Number BW <sub>channel</sub>	MHz	1 10					
Special subframe configuration Note1	IVITZ	6					
Uplink-downlink configuration Note1		1					
Measurement bandwidth	$n_{PRB}$	22—27					
PDCCH/PCFICH/PHICH Reference measurement channel as defined in 3GPP TS 36.133 A.3.1.2.2.	PRB	R.6 TDD					
OCNG Pattern as defined in 3GPP TS 36.133 A.3.2.2.2.		OP.2 TDD					
PBCH RA							
PBCH RB							
PSS_RA	1						
SSS_RA	1						
PCFICH_RB	1						
PHICH_RA							
PHICH_RB	dB	0					
PDCCH_RA		•					
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA <sup>Note2</sup>							
OCNG_RB <sup>Note2</sup>							
$N_{oc}^{ m Note3}$	dBm/15 kHz	-80					
$\hat{E}_s/I_{ot}$	dB	-1.75					
RSRP <sup>Note4</sup>	dBm/15 kHz	-81.75					
RSRQ <sup>Note4</sup>	dB	-14.76					
lo <sup>Note4</sup>	dBm/9 MHz	-50					
$\hat{E}_s/N_{oc}$	dB	-1.75					
Propagation condition	-	AWGN					
	Lunlink-downlink	Note 1: For special subframe and unlink-downlink configurations see					

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

### A.9.1.17.2 Test Requirements

The E-UTRAN TDD RSRQ absolute measurement accuracy shall meet the requirements in section 9.1.4b.

### A.9.1.18 Void

### A.9.1.19 Void

### A.9.1.20 E-UTRA FDD WB-RSRQ Absolute Accuracy (CELL\_DCH)

### A.9.1.20.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD WB-RSRQ measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4c.

The test is carried out in Cell\_DCH state using a compressed mode pattern with purpose "E-UTRAN Measurement". The compressed mode pattern repeats every 80 ms and uses a gap length of 10 slots. Further details are found in annex A.5 of TS 25.101 [3].

Tables A.9.1.20.1-1 and A.9.1.20.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN WB-RSRQ is indicated to the UE. The measurement control message received by the UE shall also contain the IE "Wideband RSRQ measurements" and "Measurement Bandwidth" defined in TS 25.331 [16].

The E-UTRAN FDD test parameters are given in Table A.9.1.20.1-3.

Table A.9.1.20.1-1: General UTRAN test parameters for E-UTRAN FDD WB-RSRQ measurements

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel	As specified in section A.3.1 of TS
		12.2 kbps	25.101 [3]
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns for E-UTRAN measurement		Compressed mode reference pattern 2 Set 5	As specified in table A.22, section A.5 of TS 25.101 [3]
Inter-RAT measurement quantity		E-UTRAN FDD WB-RSRQ	
Monitored cell list size		1 E-UTRAN FDD neighbour cell	Measurement control information is sent before the compressed mode pattern starts.

Table A.9.1.20.1-2: Cell specific UTRAN test parameters for E-UTRAN FDD WB-RSRQ measurements

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DCH_Ec/lor	dB	Note 1
OCNS_Ec/lor	dB	Note 2
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
CPICH_Ec/lo	dB	-13.54
Propagation condition	-	AWGN

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

Table A.9.1.20.1-3: E-UTRAN FDD WB-RSRQ test parameters

Parameter		Unit	Test 1 Cell 2		
E LITDA DE Chara	al Niversia au		C		
E-UTRA RF Chann	ei Number	N/I I-		1	
Antonna Configurat	ion	MHz		10	
Antenna Configurat	ion			1x2 0	
PBCH_RA PBCH_RB		_		0	
PSS_RA		_		0	
	SSS RA			0	
PCFICH_RB				<u>U</u> -∞	
PHICH RA				-∞	
PHICH_RB		dB		-∞	
PDCCH_RA		_ ub		-∞	
PDCCH_RB				-∞	
PDSCH_RA				-∞	
PDSCH_RB				-∞	
OCNG_RA <sup>Note1</sup>				-∞	
OCNG_RB <sup>Note1</sup>				-∞	
	lwidth in TS 25.331 [16]	RB		50	
	measurement channel	T\D			
defined in A.3.1.1.1			N/A		
PDSCH allocation		$n_{PRB}$	N/A		
	PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 of FS 36 133 [24]		N/A		
OCNG Patterns def 36.133 [24].	ined in A.3.2.1 of TS		N/A		
$I_{ot}^{\text{Note2}}$	bandwidth	$n_{PRB}$	0-21, 28-49	22-27	
a ot		dBm/15 kHz	-87	-110	
$\hat{E}_{s}/I_{ot}$	bandwidth	$n_{PRB}$	0-21, 28-49	22-27	
$\mathbf{L}_{s}/\mathbf{I}_{ot}$		dB	-3	20	
RSRP <sup>Note3</sup>		dBm/15 kHz	-90		
WB-RSRQ <sub>0</sub> <sup>Note3</sup> in s	subframe 0	dB	-13.68		
WB-RSRQ <sub>1</sub> <sup>Note3</sup> in s		dB	-13.63		
Io <sup>Note3</sup> in symbol 0,	4, 11 of subframe 0	dBm/ 9 MHz	-82.38		
lo <sup>Note3</sup> in symbol 7 c	of subframe 0	dBm/ 9 MHz	-82.20		
lo <sup>Note3</sup> in symbol 0, 4, 7, 11 of subframes ≠ 0		dBm/ 9 MHz	-82.38		
Propagation conditi		-		VGN	
power sp Note 2: Interfered and mod	hall be used such that Cell of pectral density is achieved for note from other cells not speelled as noise.	or all OFDM symbo cified in the test, a	ols. ssumed to be co	nstant over time	
Note 3: RSRP, V	VB-RSRQ and lo levels have	e been derived fro	m other paramet	ers for	

information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the *Measurement Bandwidth*, and the WB-RSRQ values assume averaging over symbols 0, 4, 7 and 11 of the subframe.

Note 4: RSRP and WB-RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: This test case is applicable to all FDD frequency bands except band 31.

### A.9.1.20.2 Test Requirements

The E-UTRAN FDD WB-RSRQ measurement accuracy for cell 2 shall fulfil the requirements in Section 9.1.4c, compared with WB-RSRQ<sub>0</sub> or WB-RSRQ<sub>1</sub>.

### A.9.1.21 E-UTRA TDD WB-RSRQ Absolute Accuracy (CELL\_DCH)

#### A.9.1.21.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD WB-RSRQ measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.1.4c.

The test is carried out in Cell\_DCH state using a compressed mode pattern with purpose "E-UTRAN Measurement". The compressed mode pattern repeats every 80 ms and uses a gap length of 10 slots. Further details are found in annex A.5 of TS 25.101 [3].

Tables A.9.1.21.1-1 and A.9.1.21.1-2 define the limits of signal strengths and code powers on the UTRA FDD cell where the requirement is applicable. In the measurement control information periodic reporting of E-UTRAN WB-RSRQ is indicated to the UE. The measurement control message received by the UE shall also contain the IE "Wideband RSRQ measurements" and "Measurement Bandwidth" defined in TS 25.331 [16].

The E-UTRAN TDD test parameters are given in Table A.9.1.21.1-3.

Table A.9.1.21.1-1: General UTRAN test parameters for E-UTRAN TDD WB-RSRQ measurements

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in section A.3.1 of TS 25.101 [3]
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns for E-UTRAN measurement		Compressed mode reference pattern 2 Set 5	As specified in table A.22, section A.5 of TS 25.101 [3]
Inter-RAT measurement quantity		E-UTRAN TDD WB-RSRQ	
Monitored cell list size		1 E-UTRAN TDD neighbour cell	Measurement control information is sent before the compressed mode pattern starts.

Table A.9.1.21.1-2: Cell specific UTRAN test parameters for E-UTRAN TDD WB-RSRQ measurements

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
CPICH_Ec/lor	dB	-10
PCCPCH_Ec/lor	dB	-12
SCH_Ec/lor	dB	-12
PICH_Ec/lor	dB	-15
DCH_Ec/lor	dB	Note 1
OCNS_Ec/lor	dB	Note 2
Îor/loc	dB	-1
loc	dBm/ 3.84 MHz	-70
CPICH_Ec/lo	dB	-13.54
Propagation condition	-	AWGN

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.

Table A.9.1.21.1-3: E-UTRAN TDD WB-RSRQ test parameters

Parameter		Unit	Test 1		
		<b>5</b>	Cell 2		
E-UTRA RF Cha	annel Number		1		
BW <sub>channel</sub>	. Note1	MHz	10		
Special subfram	e configuration Note1		6		
Uplink-downlink configuration Note1			1		
Antenna Configu	uration		1x		
PBCH_RA			C		
PBCH_RB			C		
PSS_RA			0		
SSS_RA			C		
PCFICH_RB					
PHICH_RA		-ID			
PHICH_RB PDCCH_RA		dB			
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA <sup>Note2</sup>					
OCNG_RB <sup>Note2</sup>					
	andwidth in TS 25.331 [16]	RB	-∞ 50		
	nce measurement channel	KD			
	.1.2 of TS 36.133 [24].		N/A		
PDSCH allocation		$n_{PRB}$	N/A		
	H/PHICH Reference	TAD	N/A		
measurement ch TS 36.133 [24].	nannel defined in A.3.1.2.2 of		N/	Ά	
OCNG Patterns 36.133 [24].	defined in A.3.2.2 of TS		N/A		
$I_{ot}^{ m Note3}$	bandwidth	$n_{PRB}$	0-21, 28-49	22-27	
ot		dBm/15 kHz	-87	-110	
$\hat{E}_s/I_{ot}$	bandwidth	$n_{PRB}$	0-21, 28-49	22-27	
•		dB	-3	20	
RSRP <sup>Note4</sup>		dBm/15 kHz	-90		
WB-RSRQ <sub>0</sub> <sup>Note4</sup>		dB	-13.68		
WB-RSRQ <sub>1</sub> <sup>Note4</sup> in subframe ≠ 0		dB	-13	.63	
lo <sup>Note4</sup> in symbol 0, 4, 11 of subframe 0		dBm/ 9 MHz	-82	.38	
lo <sup>Note4</sup> in symbol	7 of subframe 0	dBm/ 9 MHz	-82	.20	
lo <sup>Note4</sup> in symbol	0, 4, 7, 11 of subframes ≠ 0	dBm/ 9 MHz	-82		
Propagation cor	ndition	-	AW		
	ecial subframe and uplink-downl	ink configurations	are defined in Tal	oles 4.2-1 and	

Note 1: Special subframe and uplink-downlink configurations are defined in Tables 4.2-1 and 4.2-2 of TS 36.211 [29].

Note 2: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.

Note 4: RSRP, WB-RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the *Measurement Bandwidth*, and the WB-RSRQ values assume averaging over symbols 0, 4, 7 and 11 of the subframe.

Note 5: RSRP and WB-RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

### A.9.1.21.2 Test Requirements

The E-UTRAN TDD WB-RSRQ measurement accuracy for cell 2 shall fulfil the requirements in Section 9.1.4c, compared with WB-RSRQ $_0$  or WB-RSRQ $_1$ .

## Annex B (normative): Conditions for RRM requirements applicability for operating bands

### B.1. Conditions for Idle mode tasks

### B.1.1. Conditions for measurements of inter-RAT E-UTRA cells

This section defines the inter-RAT E-UTRA RSRP, RSRP Ês/Iot, SCH\_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of inter-RAT E-UTRA cells are defined in Table B.1.1-1

Table B.1.1-1. Conditions for measurements of inter-RAT E-UTRA cells

Parameter	Conditions							
	Bands	Bands	Bands	Bands	Bands	Bands	Bands	
	1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 33, 34, 35, 36, 37, 38, 39, 40	9, 42, 43	2, 5, 7, 27, 41, 44	3, 8, 12, 13, 14, 17, 20, 22	25	26	28	
RSRP  <sub>dBm</sub> ≥	-124 dBm	-123 dBm	-122 dBm	-121 dBm	-120.5dBm	-121.5 dBm(Note 1)	-122.5 dBm	
SCH_RP  <sub>dBm</sub> ≥	-124 dBm	-123 dBm	-122 dBm	-121 dBm	-120.5dBm	-121.5 dBm(Note 1)	-122.5 dBm	
RSRP Ês/lot≥		-4 dB						
SCH Ês/lot ≥	-4 dB							

Note 1: The condition is -122 dBm when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz

### B.2. Conditions for UE Measurements Procedures

### B.2.1. Conditions for E-UTRAN measurements

This section defines the E-UTRAN RSRP, RSRP  $\hat{E}s/Iot$ , SCH\_RP and SCH RP/Iot applicable for a corresponding operating band.

The conditions for E-UTRAN measurements are defined in Table B.2.1-1.

Table B.2.1-1. Conditions for E-UTRAN measurements

Parameter		Conditions						
	Bands	Bands Bands Bands Bands Bands						
	1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 33, 34, 35, 36, 37, 38, 39, 40	9, 42, 43	2, 5, 7, 27, 41, 44	3, 8, 12, 13, 14, 17, 20, 22	25	26	28	
RSRP  <sub>dBm</sub> ≥	-125 dBm	-124 dBm	-123 dBm	-122 dBm	-121.5dBm	-122.5 dBm (Note 1)	-123.5dBm	
SCH_RP dBm≥         -125 dBm         -124 dBm         -123 dBm         -122 dBm         -121.5dBm         -122.5 dBm (Note 1)								
RSRP Ês/lot≥		-4 dB						
SCH RP/lot ≥		-4 dB						
Note 1: The c								

Note 1: The condition is -123 dBm when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz

### B.3. Conditions for Measurement Performance for UE

## B.3.1. Conditions for intra frequency CPICH RSCP measurements accuracy

This section defines the intra frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for measurements accuracy of intra-frequency CPICH RSCP are defined in Table B.3.1-1

Table B.3.1-1. Conditions for measurements of intra-frequency CPICH RSCP

Parameter			Conditions		
	Bands	Bands	Bands	Bands	Bands
	I, IV, VI, X, XI, XIX, XXI	IX	II, V, VII	III, VIII, XII, XIII, XIV, XX, XXII	XXV, XXVI
CPICH RSCP1  <sub>dBm</sub> ≥	-114 dBm	-113 dBm	-112 dBm	-111 dBm	-110.5dBm (Note 1)

Note 1: The condition is -112 dBm when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

## B.3.2. Conditions for intra frequency CPICH RSCP relative measurements accuracy

This section defines the intra frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for relative measurements accuracy of intra-frequency CPICH RSCP are defined in Table B.3.2-1

Table B.3.2-1. Conditions for relative measurements of intra-frequency CPICH RSCP

Parameter			Conditions		
	Bands	Bands	Bands	Bands	Bands
	I, IV, VI, X, XI, XIX, XXI	IX	II, V, VII	III, VIII, XII, XIII, XIV, XX, XXII	XXV, XXVI
CPICH RSCP1,2  <sub>dBm</sub> ≥	-114 dBm	-113 dBm	-112 dBm	-111 dBm	-110.5dBm (Note 1)

Note 1: The condition is -112 dBm when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.

## B.3.3. Conditions for inter frequency CPICH RSCP relative measurements accuracy

This section defines the inter frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for relative measurements accuracy of inter-frequency CPICH RSCP are defined in Table B.3.2-1

## B.3.4. Conditions for intra frequency CPICH Ec/lo measurements accuracy

This section defines the intra frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for measurements accuracy of intra-frequency CPICH Ec/Io are defined in Table B.3.1-1

## B.3.5. Conditions for intra frequency CPICH Ec/lo relative measurements accuracy

This section defines the intra frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for measurements accuracy of intra-frequency CPICH Ec/Io are defined in Table B.3.2-1

## B.3.6. Conditions for inter frequency CPICH Ec/lo measurements accuracy

This section defines the inter frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for measurements accuracy of inter-frequency CPICH Ec/Io are defined in Table B.3.1-1

## B.3.7. Conditions for inter frequency CPICH Ec/lo relative measurements accuracy

This section defines the inter frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for measurements accuracy of inter-frequency CPICH Ec/Io are defined in Table B.3.2-1

## B.3.8. Conditions for intra frequency SFN-SFN observed time difference

This section defines the intra frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for intra-frequency SFN-SFN observed time difference are defined in Table B.3.2-1

### B.3.9. Conditions for inter frequency SFN-SFN observed time difference

This section defines the inter frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for inter-frequency SFN-SFN observed time difference are defined in Table B.3.2-1

### B.3.10. Conditions for SFN-SFN observed time difference type 1

This section defines the CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for SFN-SFN observed time difference type 1 are defined in Table B.3.2-1

## B.3.11. Conditions for intra frequency SFN-SFN observed time difference type 2 without or with IPDL period active

This section defines the intra frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for intra-frequency SFN-SFN observed time difference type 2 without or with IPDL period active are defined in Table B.3.2-1

## B.3.12. Conditions for inter frequency SFN-SFN observed time difference type 2

This section defines the inter frequency CPICH RSCP applicable for a corresponding operating band.

The CPICH RSCP conditions for inter-frequency SFN-SFN observed time difference type 2 without or with IPDL period active are defined in Table B.3.2-1

### B.4. Conditions for UTRAN Connected mode mobility

### B.4.1. Conditions for identification of a new CGI of inter-RAT E-UTRA cell with autonomous gaps

This section defines the E-UTRAN SCH\_RP|dBm and SCH  $\hat{E}s/Iot$  applicable for a corresponding operating band.

The conditions for E-UTRAN measurements are defined in Table B.4.1-1

Table B.4.1-1. Conditions for identification of a new CGI of inter-RAT E-UTRA cell with autonomous gaps

Parameters		Conditions								
	Bands	Bands Bands Bands Bands Bands Bands								
	1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 33, 34, 35, 36, 37, 38, 39, 40	9, 42, 43	2, 5, 7, 27, 41, 44	3, 8, 12, 13, 14, 17, 20, 22	25	26	28			
SCH_RP  <sub>dBm</sub> ≥	-125 dBm	-125 dBm   -124 dBm   -123 dBm   -122 dBm   -121.5   -122.5   -123.5								
SCH Ês/lot≥		-4 dB  dition is -123 dBm when the carrier frequency of the assigned F-LITRA channel handwidth is								
SCH Ês/lot≥	36, 37, 38, 39, 40 -125 dBm			-4 dB	dBm	(Note 1)	)an			

Note 1: The condition is -123 dBm when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz

# Annex C (informative): Change History

TSG	Doc	CR	R	Title	Cat	Curr	New	Work Item
RP-37				Rel-8 version created based on v7.9.0			8.0.0	
RP-37	RP-070658	0916		Introduction of UMTS1500 requirements (Rel-8)	В	7.9.0	8.0.0	RInImp8-UMTS1500
RP-38	RP-070933	0922		Title change for test case in Annex A.5.4.4	Α	8.0.0	8.1.0	TEI6
RP-38	RP-070933	0925	1	Removal of square brackets in cell identification test case	Α	8.0.0	8.1.0	TEI6
RP-38	RP-070934	0919	1	Addition of E-DPCCH boosting to ETFC restriction requirements	Α	8.0.0	8.1.0	RANimp- 16QamUplink
RP-39	RP-080119	0929		Correction to Annex A.5.5.4	Α	8.1.0	8.2.0	TEI6
RP-39	RP-080124	0926		Introduction of UMTS700 requirements	В	8.1.0	8.2.0	RInImp8-UMTS700
RP-40	RP-080321	0936		Correction to A.5.5.4 and A.5.6.3	Α	8.2.0	8.3.0	TEI6
RP-40	RP-080325	0937		Updates of TS25.133 to include requirements for UTRA to E-UTRA mobility	В	8.2.0	8.3.0	LTE-RF
RP-41	RP-080637	941	1	Updates of TS25.133 requirements for UTRA to E-UTRA mobility	F	8.3.0	8.4.0	LTE-RF
RP-41	RP-080637	946		Updates of TS25.133 to include requirements for UTRA to E-UTRA mobility	F	8.3.0	8.4.0	LTE-RF
RP-41	RP-080626	943		Modification of new cell identification time (intra-frequency) when UE DRX is enabled	Α	8.3.0	8.4.0	RANimp-CPC
RP-41	RP-080630	953		Correction of UTRAN to GSM relection Scenario 3	Α	8.3.0	8.4.0	TEI6
RP-41	RP-080627	947	1	Performance requirements for mobility for Enhanced Uplink for CELL_FACH state and Enhanced UE DRX	В	8.3.0	8.4.0	RANimp- UplinkEnhState
RP-41	RP-080627	945		RRC re-establishment requirements	F	8.3.0	8.4.0	TEI8
RP-42	RP-080938	962	1	E-UTRA Changes for 25.133	F	8.4.0	8.5.0	LTE-RF
RP-42	RP-080947	959		UE Transmission Power Headroom definition for E-DCH in CELL_FACH	F	8.4.0	8.5.0	RANimp- UplinkEnhState
RP-42	RP-080949	960	1	UE interruption time requirement for Enhanced Serving Cell Change Procedure	В	8.4.0	8.5.0	RANimp-HSDSCH
RP-42	RP-081102	958	2	Introduction of UE Measurement Capability for frequency adjacent to intra-frequency	В	8.4.0	8.5.0	TEI8
RP-43	RP-090167	968		Correction to RRM PRACH test case "Correct behaviour when reaching maximum transmit power"	A	8.5.0	8.6.0	TEI6
RP-43	RP-090167	977		Correction to RRM E-TFC restriction test cases A.6.6.1.1 and A.6.6.1.2	A	8.5.0	8.6.0	TEI6
RP-43	RP-090189	969	1	Test case of UTRA FDD-E-UTRA FDD cell reselection when E- UTRA FDD is of higher priority	F	8.5.0	8.6.0	LTE-RF
RP-43	RP-090190	965	1	E-UTRA Changes for 25.133	F	8.5.0	8.6.0	LTE-RF
RP-43	RP-090190	971	2	25.133 CR measurement rule for absolute priority based interfrequency cells.	F	8.5.0	8.6.0	TEI8
RP-43	RP-090196	964		Testcase for Enhanced Serving HS-DSCH cell change	F	8.5.0	8.6.0	RANimp-HSDSCH
RP-43	RP-090196	973		Correction to mobility requirements for enhanced UE DRX	F	8.5.0	8.6.0	RANimp-DRX
RP-43	RP-090196	974		Initial E-TFC restriction for enhanced uplink in cell FACH	F	8.5.0	8.6.0	RANimp- UplinkEnhState

FDD cell reselection test case   when E-UTRA FDD is of lower   priority									
Propose   Prop	RP-43	RP-090370	979	3		F	8.5.0	8.6.0	LTE-RF
RP-44									
RP-44   RP-090551   981	RP-44	RP-090546	984		UTRA FDD-E-UTRA FDD/ TDD	F	8.6.0	8.7.0	LTE-RF
RP-44   RP-090551   981   Alignment of E-UTRA RRM respection testasses with ore requirements. (Technically Endorsed CR in R4-50bis - R4-091091)   Feb. 8.6.0   8.7.0   LTE-RF	RP-44	RP-090546	988		UTRAN FDD - E-UTRAN Cell Search	F	8.6.0	8.7.0	LTE-RF
RP-44   RP-090555   987	RP-44	RP-090551	981		Alignment of E-UTRA RRM reselection testcases with core requirements. (Technically Endorsed	F	8.6.0	8.7.0	LTE-RF
RP-44   RP-090555   987	DD 44	DD 000551	005			_	0.6.0	0.7.0	LTC DC
RP-44   RP-090555   983									
RP-44   RP-090557   982   Correction of initial E-TFC restriction in ini	RP-44	RP-090555	967		requirements on a frequency adjacent	Г	8.6.0	6.7.0	IEIO
For E-DCH in CELL_FACH state and Idle mode (Technically Endorsed CR in R4-50bis: R4-091052)   Page   Page	RP-44	RP-090555	983	1	capability on a frequency adjacent to intra-frequency	F	8.6.0	8.7.0	TEI8
RP-44   RP-090551   986   E-UTRA Changes for 25.133   A   8.7.0   9.0.0   LTE-RF	RP-44	RP-090557	982		for E-DCH in CELL_FACH state and Idle mode (Technically Endorsed CR	F	8.6.0	8.7.0	RANimp- UplinkEnhState
RP-44   RP-090559   980   Introduction of Extended UMTS800   requirements. (Technically Endorsed CR in R4-50bis - R4-091056)   RP-45   RP-090827   993   1   25.133 Rel-3 CR Clarification of NRPM computation when MIMO or DC-HSDPA is configured Corrections of Combined Interfrequency and GSM measurements   RP-45   RP-090817   995   Corrections of Combined Interfrequency and GSM measurements   RP-45   RP-090817   1005   1   E-UTRA Changes for 25.133   A   9.0.0   9.1.0   LTE-RF	RP-44	RP-090551	986			Α	8.7.0	9.0.0	LTE-RF
RP-45   RP-090827   993	RP-44	RP-090559	980		requirements. (Technically Endorsed	В	8.7.0	9.0.0	
RP-45   RP-090817   995   Corrections of Combined Interfrequency and GSM measurements   RP-45   RP-090831   1005   1   E-UTRA Changes for 25.133   A   9.0.0   9.1.0   LTE-RF	RP-45	RP-090827	993	1	25.133 Rel-8 CR Clarification of NRPM computation when MIMO or	А	9.0.0	9.1.0	TEI8
RP-45   RP-090817   1005	RP-45	RP-090817	995		Corrections of Combined Interfrequency and GSM	A	9.0.0	9.1.0	LTE-RF
Handover to Unknown Target Cell   Test Cases	RP-45	RP-090817	1005	1		Α	9.0.0		LTE-RF
RP-45	RP-45	RP-090831	1003		Handover to Unknown Target Cell	А	9.0.0	9.1.0	LTE-RF
Some parts of the specification	RP-45	RP-090831	1009		UTRAN FDD- E-UTRAN FDD Handover to Unknown Target Cell	A	9.0.0	9.1.0	LTE-RF
RP-46   RP-091286   1010   In R4-093627)   B   9.1.0   9.2.0   UMTSLTE1500	RP-45	RP-090826	996		some parts of the specification	F	9.0.0	9.1.0	
Clarification of NRPM computation when DC-HSDPA and MIMO is configured (Technically endorsed at RAN 4 52bis in R4-094060)   B   9.1.0   9.2.0   RANimp-DC_MI	DD 46	PD 001286	1010		requirements for TS25.133 (Technically endorsed at RAN 4 52bis	D	0.1.0	020	LIMTSI TE1500
RP-46         RP-091290         1013         RAN 4 52bis in R4-094060)         B         9.1.0         9.2.0         RANimp-DC_MI           RP-46         RP-091288         1014         RRM requirements for DC-HSUPA (Technically endorsed at RAN 4 52bis in R4-094073)         B         9.1.0         9.2.0         RANimp-DC_HS RANimp-DC_HS RANimp-DC_HS RANimp-DC_HS RANimp-LS RANimp-	1(1 -40	1091200	1010		Clarification of NRPM computation	D	9.1.0	9.2.0	OWNSETETOO
RP-46         RP-091288         1014         in R4-094073)         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091283         1017         1         DSCH cell change test case         A         9.1.0         9.2.0         RANimp-HSDS           RP-46         RP-091273         1018         1         Measurement Accuracy Tests         F         9.1.0         9.2.0         LTE-RF           RP-46         RP-091289         1020         secondary carrier for DB-DC-HSDPA         B         9.1.0         9.2.0         A           RP-46         RP-091288         1021         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091288         1022         1         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091271         1025         E-UTRA Changes for 25.133         F         9.1.0         9.2.0         LTE-RF	RP-46	RP-091290	1013		RAN 4 52bis in R4-094060)  RRM requirements for DC-HSUPA	В	9.1.0	9.2.0	RANimp-DC_MIMO
RP-46         RP-091283         1017         1         DSCH cell change test case         A         9.1.0         9.2.0         RANimp-HSDSG           RP-46         RP-091273         1018         1         Measurement Accuracy Tests         F         9.1.0         9.2.0         LTE-RF           RP-46         RP-091289         1020         Measurement requirements of secondary carrier for DB-DC-HSDPA         B         9.1.0         9.2.0         A           RP-46         RP-091288         1021         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091288         1022         1         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091271         1025         E-UTRA Changes for 25.133         F         9.1.0         9.2.0         LTE-RF	RP-46	RP-091288	1014		in R4-094073)	В	9.1.0	9.2.0	RANimp-DC_HSUPA
RP-46         RP-091273         1018         1         Measurement Accuracy Tests         F         9.1.0         9.2.0         LTE-RF           RP-46         RP-091289         1020         Measurement requirements of secondary carrier for DB-DC-HSDPA         B         9.1.0         9.2.0         A           RP-46         RP-091288         1021         UE capabilities for support of event triggering and reporting criteria for DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HSUPA           RP-46         RP-091288         1022         1         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HSUPA           RP-46         RP-091271         1025         E-UTRA Changes for 25.133         F         9.1.0         9.2.0         LTE-RF	RP-46	RP-091283	1017	1	DSCH cell change test case	Α	9.1.0	9.2.0	RANimp-HSDSCH
RP-46         RP-091289         1020         secondary carrier for DB-DC-HSDPA         B         9.1.0         9.2.0         A           LE capabilities for support of event triggering and reporting criteria for DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           LE capabilities for support of event triggering and reporting criteria for DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091288         1022         1         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091271         1025         E-UTRA Changes for 25.133         F         9.1.0         9.2.0         LTE-RF	RP-46	RP-091273	1018	1		F	9.1.0	9.2.0	
RP-46   RP-091288   1021   triggering and reporting criteria for   DC-HSUPA   B   9.1.0   9.2.0   RANimp-DC_HSUPA   B   9.1.0   9.2.0   RANimp-DC_HSUPA   B   9.1.0   9.2.0   RANimp-DC_HSUPA   RP-46   RP-091271   1025   E-UTRA Changes for 25.133   F   9.1.0   9.2.0   LTE-RF	RP-46	RP-091289	1020		secondary carrier for DB-DC-HSDPA	В	9.1.0	9.2.0	MultiBand_DC_HSDP
RP-46         RP-091288         1022         1         DC-HSUPA         B         9.1.0         9.2.0         RANimp-DC_HS           RP-46         RP-091271         1025         E-UTRA Changes for 25.133         F         9.1.0         9.2.0         LTE-RF	RP-46	RP-091288	1021		triggering and reporting criteria for DC-HSUPA	В	9.1.0	9.2.0	RANimp-DC_HSUPA
RP-46 RP-091271 1025 E-UTRA Changes for 25.133 F 9.1.0 9.2.0 LTE-RF	RD-46	RP-001299	1022	1		R	910	020	RANimp-DC HOLIDA
UTRAN F-I ITRAN FDD RSRP				1					
3.70 W E O 110 W 11 D 110 W		55.271			UTRAN E-UTRAN FDD RSRP	-	20	3.2.0	
RP-46         RP-091273         1026         Measurement Accuracy Tests         F         9.1.0         9.2.0         LTE-RF           UTRAN FDD E-UTRAN TDD RSRP					Measurement Accuracy Tests UTRAN FDD E-UTRAN TDD RSRP				
RP-46         RP-091273         1027         Measurement Accuracy Tests         F         9.1.0         9.2.0         LTE-RF	RP-46	RP-091273	1027			F	9.1.0	9.2.0	LTE-RF
UTRAN E-UTRAN FDD RSRQ	DD_46	PP-001272	1029			F	010	020	I TE-DE
RP-46 RP-091281 1030 1 Editorial corrections for TS25.133 A 9.1.0 9.2.0 TEI8				1					
RP-47 RP-100254 1033 2 UE measurement capability A 9.2.0 9.3.0 LTE-RF					UE measurement capability				
requirements in Idle and Connected					requirements in Idle and Connected				

RP-47	RP-100254	1048		Cell search requirement for UTRA to E-UTRA HO to unknown target cell	Α	9.2.0	9.3.0	LTE-RF
RP-47	RP-100254	1039		Correction to Cell Reselection Requirements	Α	9.2.0	9.3.0	LTE-RF
RP-47	RP-100260	1036		Corrections on RRM parameters for Bands XII, XIII, XIV	Α	9.2.0	9.3.0	TEI8
RP-47	RP-100263	1037		Introduction of UMTS in 800 MHz for Europe requirements in TS 25.133	В	9.2.0	9.3.0	RInImp9- UMTSLTE800EU
RP-47	RP-100267	1046		Correction to UL interruptime requirement for DC-HSUPA	F	9.2.0	9.3.0	RANimp-DC_HSUPA
RP-47	RP-100267	1034r1		ETFC Restriction for DC-HSUPA	В	9.2.0	9.3.0	RANimp-DC_HSUPA
RP-47	RP-100266	1049		Introduction of requirements for HNB	В	9.2.0	9.3.0	EHNB-RAN2
				inbound mobility				
RP-48	RP-100623	1059		RRC procedure delay for UTRA to E- UTRA HO	Α	9.3.0	9.4.0	LTE-RF
RP-48	RP-100623	1061	1	Unknown target cell search requirements for UTRA to E-UTRA HO test cases	Α	9.3.0	9.4.0	LTE-RF
RP-48	RP-100623	1057	1	Correction of UTRAN-E-UTRAN Cell Re-selection Requirements	Α	9.3.0	9.4.0	LTE-RF
RP-48	RP-100627	1054	1	Introduction of HNB test cases	F	9.3.0	9.4.0	EHNB-RAN2
RP-49	RP-100921	1065	1	Clarification of primary uplink	F	9.4.0	9.5.0	4C_HSDPA-Core
KF-49	KF-100921	1003	'	frequency and secondary uplink frequency		9.4.0	9.3.0	4C_HSDFA-Cole
RP-49	RP-100924	1066		Introduction of intrafrequency HNB	F	9.4.0	9.5.0	EHNB-RAN2
RP-50	RP-101353	1070	1	test case 25.133 CR introduction of UE RRM	В	9.5.0	9.6.0	4C_HSDPA-Core
RP-50	RP-101355	1071	2	requirements for 4C-HSDPA Interfrequency detected set for UMTS	В	9.5.0	9.6.0	Interf_dset_meas_UM
RP-51	RP-110339	1084	1	introduction in 25.133 Cell identity change time and	Α	10.0.0	10.1.0	TS LTE-RF
KF-51	KF-110339	1004	ı	rearrangement of Time periods for UTRA-EUTRA reselection Test case A.4.5.1	A	10.0.0	10.1.0	LIL-NI
RP-51	RP-110408	1085	1	Requirements for Minimization of Drive Tests (MDT) in UMTS	В	10.0.0		MDT_UMTSLTE-Core
RP-51	RP-110342	1088	-	Correction of inter-frequency measurement accuracy test cases	Α	10.0.0	10.1.0	TEI9
RP-52	RP-110778	1112	1	Cell Reselection Requirements for Higher Priority Layer	F	10.1.0	10.2.0	TEI10
RP-52	RP-110804	1099		Expanded 1900 MHz addition to 25.133	В	10.1.0	10.2.0	E1900-Core
RP-52	RP-110796	1101		Simplification of frequency dependent requirements in 25.133	F	10.1.0	10.2.0	TEI10
RP-52	RP-110794	1104		Measurement Reporting Criteria Requirements in CELL_DCH	Α	10.1.0	10.2.0	TEI9
RP-52	RP-110803	1110		CR Timestamp accuracy requirements for MDT	В	10.1.0	10.2.0	MDT_UMTSLTE-Core
RP-52	RP-110790	1109		Inter-RAT E-UTRAN cell SI acquisition requirement	Α	10.1.0	10.2.0	EHNB
RP-53	RP-111246	1115	1	Thresholds and margins for reporting of neighbour cells in RRM tests A.8.6.1, A.8.6.2	A	10.2.0	10.3.0	LTE-RF
RP-53	RP-111246	1118		Thresholds and margins for reporting of neighbour cells in RRM tests A.8.7.1, A.8.7.2	Α	10.2.0	10.3.0	LTE-RF
RP-53	RP-111246	1127		Thresholds and margins for reporting of neighbour cells in RRM tests A.5.4a, A.5.4b	A	10.2.0	10.3.0	LTE-RF
RP-53	RP-111249	1124		Editorial corrections for 25.133 (Rel-	Α	10.2.0	10.3.0	LTE-RF
RP-53	RP-111249	1130		Specify Es/Noc in RRM tests A 4.5.1 and A 4.5.2	Α	10.2.0	10.3.0	LTE-RF
RP-53	RP-111250	1144		Correction to inter-RAT signal levels for band 17	Α	10.2.0	10.3.0	TEI8
RP-53	RP-111255	1140		Add Band XXII for LTE/UMTS 3500 (FDD) to TS 25.133	В	10.2.0	10.3.0	RInImp8- UMTSLTE3500
RP-53	RP-111255	1141		Add Band 42/43 for LTE/UMTS 3500 (FDD) to TS 25.133	В	10.2.0	10.3.0	RInImp8- UMTSLTE3500
RP-53	RP-111263	1120	3	Correction to cell reselection requirements for higher priority layer	F	10.2.0	10.3.0	TEI10
RP-53	RP-111263	1139		Correction to measurement reporting requirements	F	10.2.0	10.3.0	TEI10
RP-54	RP-111735	1145		Correction to event triggered reporting	F	10.3.0	10.4.0	TEI10
RP-54	RP-111690	1148	1	Test case for Inter-frequency detected set without compressed mode	F	10.3.0	10.4.0	TEI10
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RP-54	RP-111690	1149	1	Test case for Inter-frequency detected set with compressed mode	F	10.3.0	10.4.0	TEI10
RP-54	1030	1143	'	Test case for enhanced Inter-	•	10.5.0	10.4.0	TETTO
	RP-111690	1150	1	frequency measurements	F	10.3.0	10.4.0	TEI10
RP-54				UE CPICH measurement				
				requirements for inter frequency detected set without compressed				
	RP-111690	1153		mode	F	10.3.0	10.4.0	TEI10
RP-54	RP-111734	1155		Simplification of operating bands	F	10.3.0	10.4.0	TEI10
RP-54	RP-111734	1157		Missing bands for test cases	F	10.3.0	10.4.0	TEI10
RP-54	RP-111690	1158	1	Optional faster higher priority reselection	F	10.3.0	10.4.0	TEI10
RP-55	RP-120304	1160	'	Inter-RAT E-UTRA RSRP, RSRQ Test	F	10.3.0	10.4.0	TEI10
				cases band dependency				
RP-55	RP-120307	1168	1	Introduction of Band 26/XXVI to TS	В	10.4.0	11.0.0	e850_UB-Perf
RP-56	RP-120781	1170		25.133 Inter-RAT E-UTRA RSRP, RSRQ	Α	11.0.0	11.1.0	TEI10
111 -30	101-120701	1170		band 41 side conditions change	^	11.0.0	11.1.0	TETTO
RP-56	RP-120786	1173		Requirements for transport format	В	11.0.0	11.1.0	8C-HSDPA-core
				combination selection for 8C-HSDPA				
RP-56	RP-120767	1181		Correction on idle state RSRP filter requirement on inter-RAT	Α	11.0.0	11.1.0	TEI8
				measurement from UTRAN to E-				
				UTRAN				
RP-56	RP-120771	1186		Radio conditions for SI acquisition in	Α	11.0.0	11.1.0	TEI9
DD 56	DD 120704	1107		UTRA FDD	D	11.00	11 1 0	LTE ADACTOO Dorf
RP-56 RP-56	RP-120794 RP-120795	1187 1188	1	Introduction of Band 28 Clarification of cell FACH	B	11.0.0	11.1.0 11.1.0	LTE_APAC700-Perf
10 30	10 120755	1100		measurement requirements		11.0.0	11.1.0	15111
RP-56	RP-120794	1189		Introduction of Band 44	В	11.0.0	11.1.0	LTE_APAC700-Perf
RP-56	RP-120792	1190		Introduction of E850_LB (Band 27) to	В	11.0.0	11.1.0	LTE_e850_LB-Perf
RP-57	RP-121294	1198		TS 25.133  Duration of Time period T1 in Test	Α	11.1.0	11.2.0	LTE-RF
KF-37	KF-121294	1190		Cases A.8.7.1 and A.8.7.2.	A	11.1.0	11.2.0	LIE-KF
RP-57	RP-121297	1200		Radio conditions for PBCH reading in	Α	11.1.0	11.2.0	EHNB-RAN2
				Inter-RAT E-UTRA FDD				
RP-57	RP-121319	1203		Introduction of absolute priority cell reselection and 2nd DRX cycle in	В	11.1.0	11.2.0	Cell_FACH_enh-Core
				CELL_FACH				
RP-57	RP-121313	1209		Handover Requirements for UTRA	Α	11.1.0	11.2.0	LTE-RF
				FDD to E-UTRA for 25.133 Rel-11				
RP-57	RP-121313	1211	4	Reference correction	A B	11.1.0	11.2.0	TEI10 HSPA_UL_TxDiv-CL-
RP-58	RP-121876	1215	1	Introduction of uplink closed loop transmit diversity in 25.133	В	11.2.0	11.3.0	Core
RP-58	RP-121867	1218		Editorial corrections	Α	11.2.0	11.3.0	TEI10
RP-58	RP-121908	1223	1	Introduction of UL MIMO to TS 25.133	В	11.2.0	11.3.0	MIMO_64QAM_HSUP
DD 50	DD 404000	4007	4	Description of the National Controlled	<b>D</b>	44.0.0	44.0.0	A-Core
RP-58	RP-121869	1227	1	Requirements for Network Controlled  Mobility in Enhanced CELL FACH	В	11.2.0	11.3.0	Cell_FACH_enh-Core
RP-58	RP-121869	1228	1	Performance requirement for	В	11.2.0	11.3.0	Cell_FACH_enh-Core
				2/10msec TTI selection when				
				operating Enhanced Uplink in				
RP-58	RP-121873	1232	1	CELL_FACH or idle mode  MDT requirements in Rel-11	В	11.2.0	11.3.0	eMDT_UMTSLTE-
111 00	141 121070	1202	'	Wild requirements in real ri		11.2.0	11.0.0	Core
RP-58	RP-121867	1233		Addition of Annexes A.6.4.1.2 and	Α	11.2.0	11.3.0	TEI10
				A.6.4.2.2 considering CS+PS RAB				
				combination parameters for "Transport format combination				
				selection in UE" requirement				
RP-58	RP-121849	1235		Correction to RRM Measurement	Α	11.2.0	11.3.0	LTE-RF
DD 50	DD 100050	4000		Requirements		44.0.0	44.40	TEIO
RP-59	RP-130258	1239		Conditions in CSG reselection requirements	Α	11.3.0	11.4.0	TEI8
RP-59	RP-130287	1240		RSRQ based reselection in UTRA idle	F	11.3.0	11.4.0	LTE-RF
				mode				
RP-59	RP-130268	1243		Correction to CSG proxmity	Α	11.3.0	11.4.0	TEI10
RP-59	RP-130268	1245		requirement UTRAN FDD Proximity Indication	Α	11.3.0	11.4.0	TEI10
111 -08	130200	1240		RRM Requirements (Rel-11)	Α	11.3.0	11.4.0	, LIIV
RP-59	RP-130287	1257	1	TVM measurements in CELL_FACH	F	11.3.0	11.4.0	TEI11
RP-59	RP-130269	1258		Finalization of 2ms/10ms TTI selection	F	11.3.0	11.4.0	Cell_FACH_enh-Core
RP-59	RP-130261	1260		for FE-FACH UTRAN FDD Proximity Indication Test	Α	11.3.0	11.4.0	TEI9
111 -09	130201	1200		Case (Rel-11)	^	11.3.0	11.4.0	1 1 1 3
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RP-60	RP-130770	1262		Correction for RSRQ based	F	11.4.0	11.5.0	LTE-RF
				reselection in UTRA idle mode				
RP-60	RP-130768	1268		Addition of value for maximum cell timing change for CELL_FACH E-UTRA measurements	F	11.4.0	11.5.0	TEI11, Cell_FACH_enh-Core
RP-60	RP-130799	1269	1	Test procedure for 2/10msec TTI selection when operating Enhanced Uplink in CELL_FACH	В	11.4.0	11.5.0	Cell_FACH_enh-Perf
RP-60	RP-130769	1272	1	Condition clarification in MDT requirements	F	11.4.0	11.5.0	eMDT_UMTSLTE- Core
RP-60	RP-130768	1274	1	Inter-frequency Measurement Requirements without CM for MC- HSDPA	F	11.4.0	11.5.0	TEI11
RP-60	RP-130768	1275	1	Packet Loss Rate on Serving Carriers in MC-HSDPA	F	11.4.0	11.5.0	TEI11
RP-60	RP-130762	1278		Corrections of UTRAN FDD CSG Proximity Indication Test Case (Rel- 11)	A	11.4.0	11.5.0	TEI9
RP-60	RP-130768	1283		CR on RSRQ based cell reselction testing	F	11.4.0	11.5.0	TEI11
RP-60	RP-131286	1288		Testcase for reselection to E-UTRA with Measurement Occasions	F	11.5.0	11.6.0	Cell_FACH_enh-Perf
RP-61	RP-131293	1289	1	Inter-frequency measurement requirements without CM for MC-HSPA with DRX	F	11.5.0	11.6.0	TEI11
RP-61	RP-131293	1293		Requirements for Inter-RAT WB- RSRQ	F	11.5.0	11.6.0	TEI11
RP-61	RP-131293	1295		Square brackets removal of RSRQ based cell reselction testing	F	11.5.0	11.6.0	TEI11
RP-61	RP-131286	1300		Introduction of test cases for E-UTRA reselection in CELL_FACH	В	11.5.0	11.6.0	Cell_FACH_enh-Perf
RP-61	RP-131293	1302		Correction to misplaced section and section headings for E-UTRA and GSM reselection	F	11.5.0	11.6.0	TEI11
RP-61	RP-131286	1304		Introduction of test cases for network controlled E-UTRA measurement reporting in CELL_FACH	В	11.5.0	11.6.0	Cell_FACH_enh-Perf
RP-61	RP-131286	1306		Introduction of test cases for UTRA reselection with DRX and 2nd DRX in CELL_FACH	В	11.5.0	11.6.0	Cell_FACH_enh-Perf
RP-62	RP-131939	1318	1	Autonomous CSG reselection in CELL_FACH	F	11.6.0	11.7.0	TEI11
RP-62	RP-131925	1322		Proximity Indication - correction of proximity test case [UMTS]	Α	11.6.0	11.7.0	EHNB-RAN2
RP-62	RP-131939	1328		Inter-RAT WB-RSRQ test cases	F	11.6.0	11.7.0	TEI11
RP-62	RP-131932	1330	1	Corrections to CELL_FACH RRM test cases	D	11.6.0	11.7.0	Cell_FACH_enh-Perf
RP-63	RP-140369	1332	-	Correction to E-UTRA cell FACH reselection requirement	F	11.7.0	11.8.0	Cell_FACH_enh-Core
RP-63	RP-140375	1334	1	Test case on inter-frequency measurements and packet loss rate requirements	F	11.7.0	11.8.0	TEI11
RP-63	RP-140375	1336	-	Correction in Annex B.3.X of TS 25.133	F	11.7.0	11.8.0	TEI11
RP-63	RP-140369	1339	2	Corrections to CELL FACH test cases release 11	F	11.7.0	11.8.0	Cell_FACH_enh-Perf
RP-64	RP-140912	1348	1	Corrections to CELL FACH test cases release 11	F	11.8.0	11.9.0	Cell_FACH_enh-Perf

### History

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