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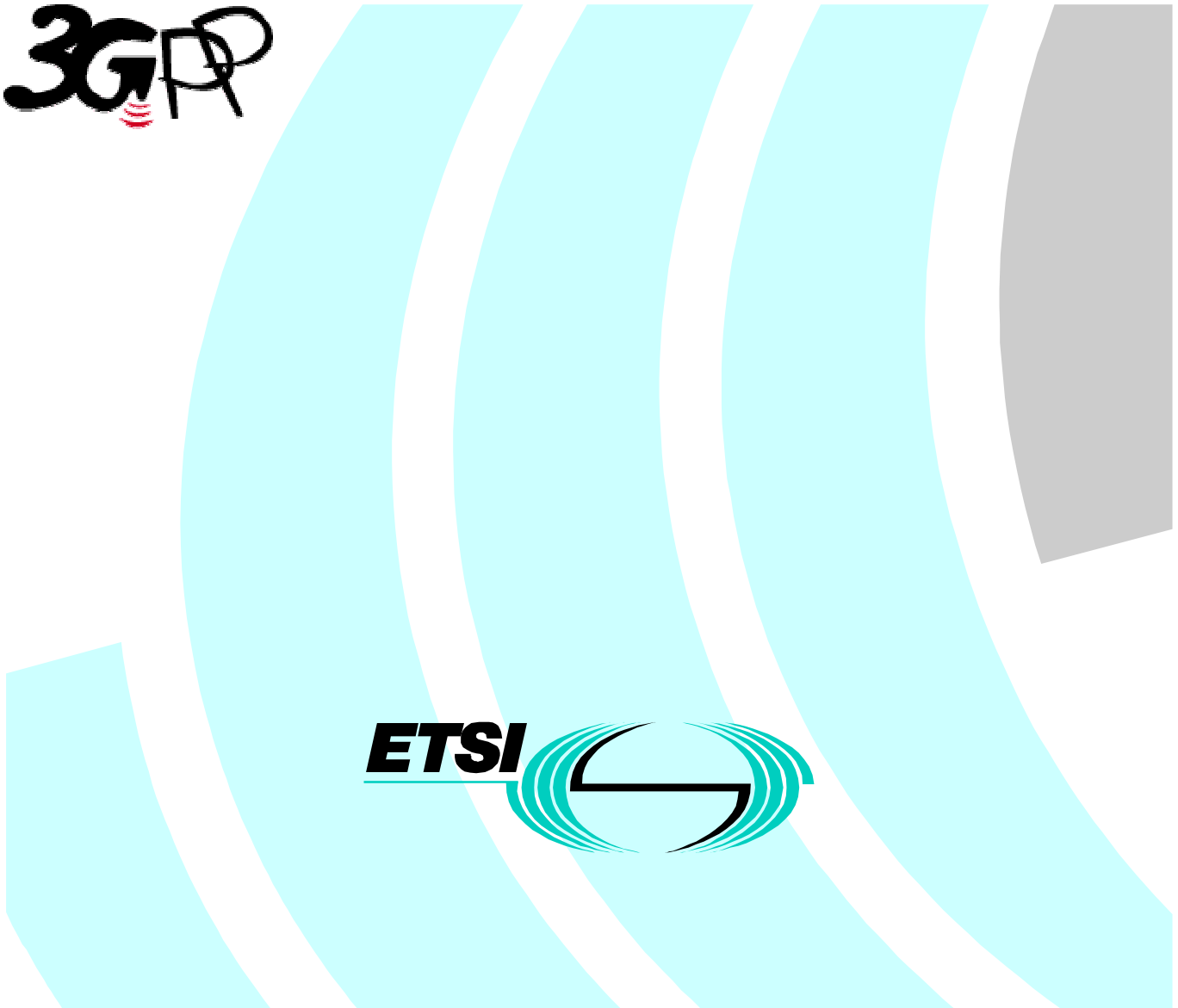
Technical Specification

**Universal Mobile Telecommunications System (UMTS);
Requirements for support of radio resource management (TDD)
(3GPP TS 25.123 version 3.4.0 Release 1999)**



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Foreword

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Contents

Foreword

This Technical Specification has been produced by the 3rd 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:

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1 Scope

This Technical Specification specifies requirements for support of Radio Resource Management for TDD. These requirements include requirements on measurements in UTRAN and the UE as well as requirements on node dynamic 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.
- A non-specific reference to an TS shall also be taken to refer to later versions published as an EN with the same number.

[1] (void)

[2] (void)

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRAN(BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRAN (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRAN (BS) TDD; Radio transmission and reception ".

[7] 3GPP TS 25.303: “Interlayer Procedures in Connected Mode”.

[8] (void)

[9] 3GPP TS 25.142: "Basestation conformance testing (TDD)".

[10] (void)

[11] (void)

[12] 3GPP TS 25.922: "RRM Strategies".

[13] (void)

[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 srotocol specification".

[17] 3GPP TS 25.224: "Physical layer procedures (TDD)".

[18] 3GPP TS 25.304: "UE procedures in idle mode".

[19] 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 measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 05.05: "Radio transmission and reception".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purpose of the present document the following definitions apply.

The main general definitions strictly related to the transmission and reception characteristics but important also for this specification 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

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…] Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken.

$\frac{DPCH\_E_c}{I_{or}}$	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.
E_c	Average energy per PN chip.
$\frac{\boldsymbol{E_c}}{\boldsymbol{I_{or}}}$	The ratio of the average transmit energy per PN chip for different fields or physical channels to the total transmit power spectral density at the Node B antenna connector.
I_o	The total received power density, including signal and interference, as measured at the UE antenna connector.
$\boldsymbol{I_{oc}}$	The power spectral density of a band limited white noise source (simulating interference from other cells) as measured at the UE antenna connector.
$\boldsymbol{I_{or}}$	The total transmit power spectral density of the down link at the Node B antenna connector.
$\hat{\boldsymbol{I}}_{\boldsymbol{or}}$	The received power spectral density of the down link as measured at the UE antenna connector.
$\frac{OCNS\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the OCNS to the total transmit power spectral density at the Node B antenna connector.
$\frac{PICH\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the PICH to the total transmit power spectral density at the Node B antenna connector.
$\frac{PCCPCH\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the PCCPCH to the total transmit power spectral density at the Node B antenna connector.
$\frac{SCH\_E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for the SCH to the total transmit power spectral density at the Node B antenna connector.

PENALTY_TIME	Defined in TS 25.304
Qhyst	Defined in TS 25.304
$Qoffset_{s,n}$	Defined in TS 25.304
Qqualmin	Defined in TS 25.304
Qrxlevmin	Defined in TS 25.304
Sintersearch	Defined in TS 25.304
Sintrasearch	Defined in TS 25.304
SsearchRAT	Defined in TS 25.304
T1	Time period 1
T2	Time period 2
TEMP_OFFSET	Defined in TS 25.304
Treselection	Defined in TS 25.304
UE_TXPWR_MAX_RACH	Defined in TS 25.304

3.3 Abbreviations

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

ACPR	Adjacent Channel Power Ratio
BER	Bit Error Ratio
BLER	Block Error Ratio
BS	Base Station
CW	Continuous wave (unmodulated signal)
CFN	Connection Frame Number
CPICH	Common Pilot Channel
DL	Downlink (forward link)
DPCH	Dedicated Physical Channel
DRX	Discontinuous Reception
EIRP	Equivalent Isotropic Radiated Power
FDD	Frequency Division Duplex
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a Forward link.
P-CCPCH	Primary Common Control Physical Channel
PICH	Paging Indicator Channel
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PPM	Parts Per Million
RRM	Radio Resource Management
RRC	Radio Resource Control
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
SCH	Synchronization Channel consisting of Primary and Secondary synchronization channels
SFN	System Frame Number
SIR	Signal to Interference ratio
TDD	Time Division Duplex
TPC	Transmit Power Control
UE	User Equipment
UL	Uplink (reverse link)
UTRA	UMTS Terrestrial Radio Access

4 Idle Mode

Cell selection and cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1 280 ms and the length of DRX cycle is not longer than 640 ms.

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*).

NOTE: At the moment, only requirements for *Stored information cell selection* has been defined.

4.1.2 Requirements

4.1.2.1 Stored information cell selection delay

The stored information cell selection delay is defined as the time the UE needs for sending the preamble for RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

4.1.2.1.1 The cells in the neighbour list belong to different frequencies

Unless otherwise stated, the cell selection delay shall be equal or less than [X] seconds when the cells in the neighbour list belong to less than [3] frequencies.

4.1.2.1.2 No cell is present in the neighbour list

The cell selection delay shall be equal or less than [5] seconds.

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 *Normally Camped* state and the occasions/triggers occur, as specified in 25.304, the UE shall perform the Cell Reselection Evaluation process.

4.2.2 Requirements

4.2.2.1 Number of cells to be monitored

The UE shall be capable of monitoring at least [x] neighbour cells per carrier frequency for at least [x] carriers.

4.2.2.2 Cell re-selection delay

The cell re-selection delay is defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process, as specified in 25.304, and the moment in time when the UE starts sending the preamble for RRC Connection request for Location Update message to the UTRAN.

4.2.2.2.1 Single carrier case

In a single carrier case, the cell re-selection delay shall be equal or less than [5] seconds.

4.2.2.2.2 Multi carrier case

In a multi carrier case, the cell re-selection delay shall be equal or less than [Nt] seconds.

4.3 UTRAN to GSM Cell Re-Selection

4.3.1 Introduction

The UTRAN to GSM Cell Re-Selection allows a UE, supporting both radio access technologies and camped on a UTRAN cell, to re-select a GSM cell and camp on it according to the cell re-selection criteria described in TS 25.304.

4.3.2 Requirements

4.3.2.1 Cell Re-Selection delay

The cell re-selection delay is defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process, as specified in 25.304, and the moment in time when the UE starts sending the RR Channel Request message for location update to GSM.

The UTRAN to GSM cell re-selection delay shall be equal or less than [x].

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 25.303. CELL_FACH, CELL_PCH and URA_PCH states are described in TS 25.331.

The handover process should be implemented in both the UE and UTRAN. The UE measurements and which radio links the UE shall use is controlled by UTRAN with RRC signalling.

Measurements are specified in TS25.225 and UE behaviour in response to UTRAN RRC messages is described in 3GPP TS 25.331. Further descriptions of the measurement procedures can be found in chapter 8.

5.1 TDD/TDD Handover

5.1.1 Introduction

The purpose of TDD/TDD handover is to change the cell of the connection between UE and UTRAN. The handover procedure is initiated from UTRAN with a RRC message that implies a handover (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION).

The handover procedure may cause the UE to change its frequency.

5.1.2 Requirements

5.1.2.1 TDD/TDD Handover delay

When the UE receives a RRC message that implies a handover, the UE shall start transmission of the new uplink DPCCH within [X ms] from the end of the last TTI containing the RRC command. However, if the command includes an indicated activation time, the UE shall start transmission of the new uplink DPCCH at the designated starting time, or within the time interval defined above, whichever is the later.

5.1.2.2 Interruption time

The interruption time i.e. the time between the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5-1. This requirement does not include a delay due to SFN decoding of the new cell when this is needed. There is different requirement on the handover delay depending on if the cell has been within the monitored setor not.

Table 5.2 TDD/TDD handover – interruption time

Number of new cells present in the handover command message	Maximum update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1	[20]	[4000]

5.2 TDD/FDD Handover

5.2.1 Introduction

The purpose of TDD/FDD handover is to change the mode between FDD and TDD.

The handover procedure is initiated from UTRAN with a handover command message (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION). The handover procedure causes the UE to change its frequency.

5.2.2 Requirements

These requirements shall apply only to TDD/FDD UE.

5.2.2.1 Handover delay

When the UE receives a RRC message that implies a handover, the UE shall start transmission of the new uplink DPCCH within [X ms] from the end of the last TTI containing the RRC command.

However, if the command includes an indicated activation time, the UE shall start transmission of the new uplink DPCCH at the designated starting time, or within the time interval defined above, whichever is the later.

5.2.3 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH , shall be less than the value in table 5-3. These requirement do not include a delay due to SFN decoding of the new cell when this is needed.

There is different requirement on the handover delay depending on if the cell has been within the monitored set or not.

Table 5.2 TDD/FDD interruption time

Number of new cells present in the handover command message	Maximum update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1	[ ]	[ ]

5.3 TDD/GSM Handover

In the early days of UMTS deployment it can be anticipated that the service area will not be as contiguous and extensive as existing second generation systems. It is also anticipated that UMTS network will be an overlay on the 2nd generation

network and utilize the latter, in the minimum case, as a fall back to ensure continuity of service and maintain a good QoS as perceived by the user.

5.3.1 Introduction

The purpose of inter-system handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (INTER-SYSTEM HANDOVER COMMAND).

NOTE: Support of Blind Handover should be stated.

5.3.2 Requirements

These requirements shall apply only to TDD/GSM UE.

This clause presents some of the important aspects of GSM handover required to be performed by the UE. For the full specifications reference should be made the GSM Technical Specifications.

The underlying requirement is to ensure continuity of service to the UMTS user. The handover requirements for 3G to GSM should be comparable to GSM to GSM handover requirements.

5.3.2.1 Inter-system handover delay

When the UE receives a RRC INTER-SYSTEM HANDOVER COMMAND it shall be ready to transmit (as specified in GSM 05.10) on the new channel within 120 ms from the last TTI containing the RRC command, unless the access is delayed to an indicated starting time, in which case it shall be ready to transmit on the new channel at the designated starting time, or within the time interval defined above, whichever is the later.

5.3.2.2 Interruption time

The interruption time, i.e. the time between 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 40 ms.

5.4 Cell Re-selection in Cell_FACH

5.4.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.303, based on radio measurements, and if a better cell is found that cell is selected.

5.4.2 Requirements

Cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1280 ms.

NOTE: For Inter-frequency cell re-selection in CELL_FACH state, the cell re-selection delay is dependent on the amount of Measurement Occasions that is provided by the network.

5.4.2.1 Cell re-selection delay

When the UE is camped in Cell_FACH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time between the occurence of an event which will trigger Cell Reselection process and to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.4.2.1.1 All cells in the neighbour list belong to the same frequency

The cell re-selection delay in CELL_FACH state shall be less than [x] seconds when all cells in the neighbour list belong to the same frequency

5.4.2.1.2 The cells in the neighbour list belong to different frequencies

NOTE: This requirement should be reconsidered based on RAN2 decisions.

The cell re-selection delay in CELL_FACH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [x] frequencies.

5.5 Cell Re-selection in Cell_PCH

5.5.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.303, based on radio measurements, and if a better cell is found that cell is selected.

5.5.2 Requirements

Cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1 280 ms and the length of DRX cycle is not longer than [640] ms.

5.5.2.1 Cell re-selection delay

When the UE is camped in Cell_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as the time between the occurence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.5.2.1.1 All cells in the neighbour list belong to the same frequency

The cell re-selection delay in CELL_PCH state shall be less than [x] seconds when all cells in the neighbour list belong to the same frequency

5.5.2.1.2 The cells in the neighbour list belong to different frequencies

The cell re-selection delay in CELL_PCH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [x] frequencies.

5.6 Cell Re-selection in URA_PCH

5.6.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.303, based on radio measurements, and if a better cell is found that cell is selected.

5.6.2 Requirements

Cell reselection delays are applicable when the repetition period of all relevant system information blocks is not more than 1280 ms and the length of DRX cycle is not longer than [640] ms.

5.6.2.1 Cell re-selection delay

When the UE is camped URA_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as the time between the occurence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.6.2.1.1 All cells in the neighbour list belong to the same frequency

The cell re-selection delay in URA_PCH state shall be less than [x] seconds when all cells in the neighbour list belong to the same frequency.

5.6.2.1.2 The cells in the neighbour list belong to different frequencies

The cell re-selection delay in URA_PCH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [x] frequencies.

6 Dynamic channel allocation

6.1 Introduction

The channel assignment algorithm will be implemented on network side in the RNC. It will be distributed, interference adapted approach where each base station makes the channel assignment based on local signal strength measurements performed in the UE and the Node B. A priori knowledge about the used channels of the other base stations in the vicinity can be implicitly used without additional signalling traffic.

6.2 Implementation requirements

The purpose of DCA is on one side the limitation of the interference (keeping required QoS) and on the other side to maximise the system capacity due to minimising reuse distance. The details on channel assignment policy are given in [12].

6.3 Number of timeslots to be measured

The number of down link timeslots to be measured in the UE is broadcasted on the BCH in each cell. In general, the number of downlink timeslots in question will be less than 14, but in worst case the UE shall be capable to measure 14 downlink timeslots. In case of "simple UE" [FFS] timeslots shall at least be measured.

6.4 Measurement reporting delay

In order to save battery life time, in idle mode no measurements are performed for DCA. ISCP measurements are started at call establishment. Taking into account that the measured interference of the timeslots is preferable averaged over [FFS] frames, the measurement reporting delay in connecting phase shall not exceed [FFS] milliseconds.

7 Timing characterisitics

7.1 Timing Advance (TA) requirements

To update timing advance of a moving UE the UTRAN measures "RX Timing deviation". The measurements are reported to higher layers, where timing advance values are calculated and signaled to the UE. The measurement for timing advance is defined in 3GPP TS25.225 "Physical Layer Measurements (TDD)", the requirements on the measurement is specified in clause 11.2.9 "RX Timing Deviation". The UE shall adjust the timing of its transmissions within ±0.5 chip of the signalled timing advance value.

7.2 Cell synchronization accuracy

7.2.1 Definition

Cell synchronization accuracy is defined as the maximum deviation in frame start times between any pair of cells that have overlapping coverage areas.

7.2.2 Minimum requirements

The cell synchronization accuracy shall be better than or equal to 3μs.

8 UE Measurements Procedures

8.1 Measurements 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 TDD intra frequency, TDD inter frequency, FDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. The measurements are defined in TS 25.225, 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. For the description of the idle intervals see TS 25.225, Annex A.

8.2.1 Requirements

8.1.2.1 TDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.

8.1.2.1.1 Identification of a new cell

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

$$T_{identify\ intra} = Max\left\{[480]ms, T_{basic\ identify\ TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\}$$

8.1.2.1.2 UE P-CCPCH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is [200] ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing P-CCPCH measurements for [6] detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of [200] ms. The measurement accuracy for all measured cells shall be as specified in the section 9.

whereby function Floor(x) takes the integer part of

$$x\,Y_{measurement\ intra} = Floor\left\{X_{basic\ measurement\ TDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}}\right\}.$$

$X_{basic\ measurement\ TDD}$ = [6]

$T_{Measurement\_Period,\ Intra}$ = [200] ms. The measurement period for Intra frequency P-CCPCH measurements.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing.

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

8.1.2.1.3 Periodic Reporting

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

8.1.2.1.4 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 8.1.2.1.5 Event Triggered Reporting.

8.1.2.1.5 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 from when a report is triggered at the physical layer according to the event, 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.

Editors Note: The test cases in section A.8 will need revisions to reflect the general requirements.

Unless otherwise stated, event triggered measurement reporting delay shall be less than 480 ms.

8.1.2.2 TDD inter frequency measurements

When signalled by the network during CELL_DCH state, the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.1.2.2.1 Identification of a new cell

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

$$T_{identify\ inter} = Max\left\{[5]s, T_{basic\ identify\ TDD,inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\}$$

8.1.2.2.2 Measurement period

When TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 with measurement period given by

$$T_{measurement\ inter} = Max\left\{[480]ms, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\}$$

In case of a dual receiver UE, the measurement period for inter frequency measurements is [480] ms.

$T_{Measurement\_Period\ Inter}$ = [480] ms. The period used for calculating the measurement period $T_{measurement\_inter}$ for inter frequency P-CCPCH measurements.

$T_{Inter:}$ This is the minimum time available for inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation whereby HW settling time and synchronisation time has to be taken into account (for the description of the idle intervals see Annex A of 25.225).

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

$T_{basic\_measurement\_TDD\ inter}$ = TBD ms. This is the time period used in the equation for defining the measurement period for inter frequency P-CCPCH measurements.

N_{Freq}: Number of TDD frequencies indicated in the measurement control information.

Note: It is still under consideration how to incorporate a time needed for adjusting asynchronous timing between intra and inter frequency measurement periods and UE HW settling time into the equations.

8.1.2.2.3 Periodic Reporting

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

8.1.2.2.4 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 from when a report is triggered at the physical layer according to the event, 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 measurement reporting delay shall be less than [5] seconds.

8.1.2.3 FDD measurements

The requirements in this section apply only to UE supporting both TDD and FDD mode.
Editors note: The requirements in this section need to be revised.

The UE shall be capable of measuring the requested measurement quantity of at least [FFS] cells on a maximum of [FFS] frequencies, different from the frequency currently used by the UE.

8.1.2.3.1 Periodic Reporting

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

8.1.2.3.2 Event Triggered Reporting

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

Editors note: The measurement accuracy in combination with event triggered reporting is an open issue and the above sentence shall be revised when this is settled.

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 from when a report is triggered at the physical layer according to the event, 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 uncertanty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The measurement reporting delay shall be less then [5] seconds.

8.1.2.4 GSM measurements

The requirements in this section applies only to UE supporting TDD and GSM.

When signalled by UTRAN during CELL_DCH state, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

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

If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified.

For the UE performing GSM measurements, the requirements in GSM 05.08 shall apply.

8.1.2.4.1 GSM carrier RSSI

An UE supporting GSM measurements shall be able to measure GSM carrier RSSI levels of GSM cells from the monitored set with acquisition speed defined in table 8.1. In the CELL_DCH 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 GSM 05.08, when the given measurement time allows the UE to the take the same amount of GSM carrier RSSI samples as stated in the GSM specification during the measurement period.

Table 8-1

Idle Interval Length	**Number of GSM carrier RSSI measurements.**
4	2
5	3
>5	≥4

In the calculation of the number of GSM carrier measurements based on the the idle interval length, the switching time [500 us] is already taken into account. For the description of the idle intervals see Annex A of 25.225.

8.1.2.4.2 BSIC verification

The procedure for UE measurements on a GSM cell with BSIC verified requested can be divided in the following two tasks:

1) 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 idle intervals as specified in TS 25.225, Annex A (Fig. A.1).

2) 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 idle intervals as specified in TS 25.225, Annex A (Fig. A.1).

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

The BSIC of a GSM cell is considered to be "verified" if the UE has demodulated 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 $T_{re\text{-}confirm\ GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{identify\ GSM}$, and the BSIC re-confirmation interval $T_{re\text{-}confirm\ GSM}$ can be found in the sections below.

If GSM measurements are requested with BSIC verified the UE shall be able to report at least the [6] strongest GSM cells with BSIC 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 GSM 05.05.

8.1.2.4.2.1 Initial BSIC identification

This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).

For GSM cells that is requested with BSIC verified the UE shall attempt to demodulate the SCH on the BCCH carrier of as many GSM cells indicated in the measurement control information as possible. The UE shall give priority for synchronisation attempts in signal strength order. The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.

When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ GSM}$, with

$T_{identify\ GSM}$ = TBD ms. This is the time necessary to identify one new GSM cell.

Note: The details of the initial BSIC identification procedure must be further clarified.

8.1.2.4.2.2 BSIC re-confirmation

This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

Note: The details of the BSIC re-confirmation procedure must be further clarified.

8.2 Parallel Measurements in CELL_DCH State

8.2.1 Introduction

The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel. The measurements are defined in TS 25.225, 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 measurements reporting delays are specified in section 8.1. For the description of the idle intervals see TS 25.225, Annex A.

8.2.2 Requirements

Editors note: The number of events that the UE shall be able to evaluate shall be considered either in this section or in a new section.

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

[The UE shall be able to handle at least [x] TDD cells per carrier on at least [x] TDD carriers and at least [x] FDD cells per carrier on at least [x] FDD carriers and 32 GSM cells in the monitored set.]

The UE shall be able to perform parallel measurements according to table 8-2.

In addition to the requirements in table 8-2 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8-2.

Table 8-2 Parallel measurement requirements

Measurement quantity	Number of parallel measurements possible to request from the UE
Transport channel BLER	[1] per TrCh
UE transmitted power	[1]
SFN-SFN observed time difference type 2	[]
UE GPS Timing of Cell Frames for LCS	[]

Editors Note: The presence of the measurements for location services needs to be revised.

8.3 Measurements in CELL_FACH State

8.3.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The measurements are defined in TS 25.225, 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. For the description of the idle intervals see TS 25.225, Annex A.

8.3.2 Requirements

TBD

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 complete list of measurements is specified in 3GPP TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for TDD are described and defined in 3GPP TS 25.225 "Physical layer – Measurements (TDD)". In this clause for TDD, per each measurement the relevant requirements on performance in terms of accuracy are reported.

Unless explicitly stated,

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12,2 kbps as defined in 3GPP TS 25.102 annex A, clause A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in 3GPP TS 25.101 annex B.
- All requirements are defined when UE is in a CELL_DCH or CELL_FACH stage. The difference between modes are the reporting delay. Some of the measurements are not requested to be reported in both stages.
- Cell 1 is the active cell, if not otherwise stated.
- Single task reporting.
- Power control is active.

9.1 Measurements performance for UE

9.1.1 Performance for UE measurements in downlink (RX)

9.1.1.1 P-CCPCH RSCP (TDD)

These measurements consider *P-CCPCH RSCP* measurements for TDD cells.

The measurement period for CELL_DCH state can be found in section 8.

9.1.1.1.1 Absolute accuracy requirements

Table 9.1 P-CCPCH_RSCP absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-94...-50

9.1.1.1.2 Relative accuracy requirements

Table 9.2 P-CCPCH_RSCP relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
P-CCPCH_RSCP	dBm	± 3	± 3	-94...-50

9.1.1.1.3 Range/mapping

The reporting range for *P-CCPCH RSCP* is from -115 ...-25 dBm.

In table 9.3 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.3

Reported value	Measured quantity value	Unit
P-CCPCH RSCP_LEV _00	P-CCPCH RSCP <–115	dBm
P-CCPCH RSCP_LEV _01	-115 ≤ P-CCPCH RSCP < –114	dBm
P-CCPCH RSCP_LEV _02	-114 ≤ P-CCPCH RSCP < –113	dBm
…	…	…
P-CCPCH RSCP_LEV _89	-27 ≤ P-CCPCH RSCP < -26	dBm
P-CCPCH RSCP_LEV _90	-26 ≤ P-CCPCH RSCP < -25	dBm
P-CCPCH RSCP_LEV _91	-25 ≤ P-CCPCH RSCP	dBm

9.1.1.2 CPICH measurements (FDD)

Note: This measurement is used for handover between UTRA TDD and UTRA FDD.

These measurements consider *CPICH RSCP* and *CPICH Ec/Io* measurementsThe requirements in this section are valid for terminals supporting this capability.

The measurement period for CELL_DCH state can be found in section 8.

9.1.1.2.1 CPICH RSCP

9.1.1.2.1.1 Inter frequency measurement relative accuracy requirement

The accuracy requirements in table 9-4 are valid under the following conditions:

CPICH_RSCP ≥ -114 dBm.

$$\left| P - CCPCH\_RSCP\big|_{in\ dB} - CPICH\_RSCP\big|_{in\ dB} \right| \le 20dB$$

| *Channel 1_Io -Channel 2_Io*| ≤ 20 dB.

$$\left| \frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

$$\left| \frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} \le XdB$$

Table 9-4 CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	± 6	± 6	-94...-50

9.1.1.2.1.2 Range/mapping

The reporting range for *CPICH RSCP* is from 115 ...-25 dBm.

In table 9.5 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.5

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _00	CPICH RSCP <–115	dBm
CPICH_RSCP_LEV _01	-115 ≤ CPICH RSCP < –114	dBm
CPICH_RSCP_LEV _02	-114 ≤ CPICH RSCP < –113	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

9.1.1.2.2 CPICH Ec/Io

9.1.1.2.2.1 Inter frequency measurement relative accuracy requirement

The accuracy requirements in table 9-4 are valid under the following conditions:

CPICH_RSCP ≥ -114 dBm.

$$\left| P-CCPCH\_RSCP\big|_{in\ dB} - CPICH\_RSCP\big|_{in\ dB} \right| \le 20dB$$

| *Channel 1_Io -Channel 2_Io*| ≤ 20 dB.

$$\left(\frac{I_o}{\hat{I}_{or}}\right)\Bigg|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

$$\left(\frac{I_o}{\hat{I}_{or}}\right)\Bigg|_{in\ dB} - \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} \le XdB$$

Table 9.6 CPICH Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dBm	± 6	± 6	-94...-50

9.1.1.2.2.2 Range/mapping

The reporting range for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.7 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.7

Reported value	Measured quantity value	Unit
CPICH_Ec/Io _00	CPICH Ec/Io < –24	dB
CPICH_Ec/Io _01	-24 ≤ CPICH Ec/Io < –23.5	dB
CPICH_Ec/Io _02	-23.5 ≤ CPICH Ec/Io < –23	dB
…	…	…
CPICH_Ec/Io _48	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/Io _49	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/Io _50	0 ≤ CPICH Ec/Io	dB

9.1.1.3 Timeslot ISCP

The measurement period for CELL_DCH state can be found in section 8.9.1.1.3.1 Absolute accuracy requirements

Table 9.8 Timeslot_ISCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
Timeslot_ISCP	dB	± 6	± 9	-94...-70
	dB	± 8	± 11	-94...-50

9.1.1.3.2 Range/mapping

The reporting range for *Timeslot ISCP* is from -115...-25 dBm.

In table 9.9 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.9

Reported value	Measured quantity value	Unit
UE_TS_ISCP_LEV_00	Timeslot_ISCP < –115	dBm
UE_TS_ISCP_LEV_01	-115 ≤ Timeslot_ISCP < –114	dBm
UE_TS_ISCP_LEV_02	-114 ≤ Timeslot_ISCP < –113	dBm
…	…	…
UE_TS_ISCP_LEV_89	-27 ≤ Timeslot_ISCP < -26	dBm
UE_TS_ISCP_LEV_90	-26 ≤ Timeslot_ISCP < -25	dBm
UE_TS_ISCP_LEV_91	-25 ≤ Timeslot_ISCP	dBm

9.1.1.4 UTRA carrier RSSI

Note: The purpose of measurement is for Inter-frequency handover evaluation.

The measurement period for CELL_DCH state can be found in section 8.

9.1.1.4.1 Absolute accuracy requirement

Absolute accuracy case only one carrier is applied.

Table 9.10 UTRA carrier RSSI Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dB	± 4	± 7	-94...-70
	dB	± 6	± 9	-94...-50

9.1.1.4.2 Relative accuracy requirement

Relative accuracy requirement is defined as active cell frequency UTRAN RSSI compared to measured other frequency UTRAN RSSI level

The accuracy requirements in table 9-11 are valid under the following conditions:

| Channel 1_Io -Channel 2_Io | < 20 dB.

Table 9.11 UTRA carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dB	± 5	± 8	-94...-70

9.1.1.4.3 Range/mapping

The reporting range for *UTRA carrier RSSI* is from -100 ...-25 dBm.

In table 9.12 mapping of the measured quantity is defined. Signalling range 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

9.1.1.5 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.

If the UE does not need compressed mode to perform GSM measurements, the measurement accuracy requirements for RXLEV in GSM 05.08 shall apply.

The reporting range and mapping specified for RXLEV in GSM 05.08 shall apply.

9.1.1.6 SIR

The measurement period for CELL_DCH state can be found in section 8.

9.1.1.6.1 Absolute accuracy requirements

Table 9.13 SIR Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	
SIR	dB	±3 dB for	[ ]	For 0<SIR<20dB and Io range -94...-50
SIR	dB	±(3 - SIR)	[ ]	For -7 ≤ SIR ≤ 0 dB and Io range -94...-50

9.1.1.6.2 Range/mapping

The reporting range for *SIR* is from -11 ...20 dBm.

In table 9.14 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.14

Reported value	Measured quantity value	Unit
UE_SIR_00	SIR< –11,0	dB
UE_SIR_01	-11,0 ≤ SIR< –10,5	dB
UE_SIR_02	-10,5 ≤ SIR< –10,0	dB
…	…	…
UE_SIR_61	-19 ≤ SIR< 19,5	dB
UE_SIR_62	19,5 ≤ SIR< 20	dB
UE_SIR_63	20 ≤ SIR	dB

9.1.1.7 Transport channel BLER

9.1.1.7.1 BLER measurement requirement

The Transport Channel BLER value shall be calculated from a window with the size equal to the reporting interval (see clause on periodical reporting criteria in TS 25.331).

9.1.1.7.2 Range/mapping

The *Transport channel BLER* reporting range is from 0 to 1.

In table 9.15 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.15

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	-

9.1.1.8 SFN-SFN observed time difference

The measurement period for CELL_DCH state can be found in section 8.

9.1.1.8.1 Accuracy requirements

Table 9.16 SFN-SFN observed time difference accuracy

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
SFN-SFN observed time difference	chip	+/-0,5 for both type 1 and 2	-94...-50

9.1.1.8.2 Range/mapping

The reporting range for *SFN-SFN observed time difference type 1* is from 0 ... 9830400 chip.

In table 9.17 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.17

Reported value	Measured quantity value	Unit
T1_SFN-SFN_TIME _0000000	0 ≤ SFN-SFN observed time difference type 1 < 1	chip
T1_SFN-SFN_TIME _0000001	1 ≤ SFN-SFN observed time difference type 1 < 2	chip
T1_SFN-SFN_TIME _0000002	2 ≤ SFN-SFN observed time difference type 1 < 3	chip
…	…	…
T1_SFN-SFN_TIME _9830397	9830397 ≤ SFN-SFN observed time difference type 1 < 9830398	chip
T1_SFN-SFN_TIME _9830398	9830398 ≤ SFN-SFN observed time difference type 1 < 980399	chip
T1_SFN-SFN_TIME _9830399	9830399 ≤ SFN-SFN observed time difference type 1 < 9830400	chip

The reporting range for *SFN-SFN observed time difference type 2* is from –1280 ... +1280 chip.

In table 9.18 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.18

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
…	…	…
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

9.1.1.9 Observed time difference to GSM cell

Note: This measurement is used to determine the system time difference between UTRAN and GSM cells.

The requirements in this section are valid for terminals supporting UTRA TDD and GSM.

The measurement period for CELL_DCH state is [10 s].

9.1.1.9.1 Accuracy requirements

Table 9.19 Observed time difference to GSM cell accuracy

Parameter	Unit	Accuracy [chip]	Conditions
Observed time difference to GSM cell	chip	± 20	

9.1.1.9.2 Range/mapping

The reporting range for *Observed time difference to GSM cell* is from 0 ... 3060/13 ms.

In table 9.20 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.20

Reported value	Measured quantity value	Unit
GSM_TIME _0000	0 ≤ Observed time difference to GSM cell < 1x3060/(4096x13)	ms
GSM_TIME _0001	1x3060/(4096x13) ≤ Observed time difference to GSM cell < 2x3060/(4096x13)	ms
GSM_TIME _0002	2x3060/(4096x13)≤ Observed time difference to GSM cell < 3x3060/(4096x13)	ms
GSM_TIME _0003	3x3060/(4096x13) ≤ Observed time difference to GSM cell < 4x3060/(4096x13)	ms
…	…	…
GSM_TIME _4093	4093x3060/(4096x13) ≤ Observed time difference to GSM cell < 4094x3060/(4096x13)	ms
GSM_TIME _4094	4094x3060/(4096x13) ≤ Observed time difference to GSM cell < 4095x3060/(4096x13)	ms
GSM_TIME _4095	4095x3060/(4096x13) ≤ Observed time difference to GSM cell < 3060/13	ms

9.1.1.10 UE GPS Timing of Cell Frames for LCS

9.1.1.10.1 Accuracy requirement

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.

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions
UE GPS Timing of Cell Frames for LCS	chip	[ ]	

9.1.1.10.2 UE GPS timing of Cell Frames for LCS measurement report mapping

The reporting range for *UE GPS timing of Cell Frames for LCS* is from 0 ... 2319360000000 chip.

In table 9.22 mapping of the measured quantity is defined.

Table 9.22

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for LCS < 0,0625	chip
GPS_TIME_00000000000001	0,0625 ≤ UE GPS timing of Cell Frames for LCS < 0,1250	chip
GPS_TIME_00000000000002	0,1250 ≤ UE GPS timing of Cell Frames for LCS < 0,1875	chip
...	...	...
GPS_TIME_37109759999997	2319359999999,8125 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999,8750	chip
GPS_TIME_37109759999998	2319359999999,8750 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999,9375	chip
GPS_TIME_37109759999999	2319359999999,9375 ≤ UE GPS timing of Cell Frames for LCS < 2319360000000,0000	chip

9.1.1.11 SFN-CFN observed time difference

Note: This measurement is for handover timing purposes to identify active cell and neighbour cell time difference.

The measurement period for CELL_DCH state can be found in section 8.

9.1.1.11.1 Accuracy requirements

Table 9.23 SFN-CFN observed time difference accuracy for a TDD neighbour cell

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
SFN-CFN observed time difference	chip	+/-0,5	-94...-50

Table 9.24 SFN-CFN observed time difference accuracy for a FDD neighbour cell

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm]
SFN-CFN observed time difference	chip	+/-1	-94...-50

9.1.1.11.2 Range/mapping

The reporting range for *SFN-CFN observed time difference* for a TDD neighbour cell is from 0...256 frames.

In table 9.25 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.25 SFN-CFN observed time difference range/mapping for a TDD neighbour cell

Reported value	Measured quantity value	Unit
SFN-CFN_TIME_000	0 ≤ SFN-CFN observed time difference < 1	frame
SFN-CFN_TIME_001	1 ≤ SFN-CFN observed time difference < 2	frame
SFN-CFN_TIME_002	2 ≤ SFN-CFN observed time difference < 3	frame
…	…	…
SFN-CFN_TIME_253	253 ≤ SFN-CFN observed time difference < 254	frame
SFN-CFN_TIME_254	254 ≤ SFN-CFN observed time difference < 255	frame
SFN-CFN_TIME_255	255 ≤ SFN-CFN observed time difference < 256	frame

The reporting range for *SFN-CFN observed time difference* for a FDD neighbour cell is from 0 ... 9830400 chip.

In table 9.26 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.26 SFN-CFN observed time difference range/mapping for a FDD neighbour cell

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 difference < 9830398	chip
SFN-CFN_TIME _9830398	9830398 ≤ SFN-CFN observed time difference < 980399	chip
SFN-CFN_TIME _9830399	9830399 ≤ SFN-CFN observed time difference < 9830400	chip

9.1.2 Performance for UE Measurements in Uplink (TX)

The output power is defined as the average power of the transmit timeslot, and is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate.

9.1.2.1 UE transmitted power

The measurement period for CELL_DCH state is [1 slot].

9.1.2.1.1 Absolute accuracy requirements

Table 9.27 UE transmitted power absolute accuracy

Parameter	Unit	PUEMAX	
		24dBm	21dBm
UE transmitted power=PUEMAX	dB	+1/-3	±2
UE transmitted power=PUEMAX-1	dB	+1,5/-3,5	±2,5
UE transmitted power=PUEMAX-2	dB	+2/-4	±3
UE transmitted power=PUEMAX-3	dB	+2,5/-4,5	±3,5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dB	+3/-5	±4

Note 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in 3GPP TS 25.102 "UTRA (UE) TDD; Radio Transmission and Reception".

Note 2: UE transmitted power is the reported value.

9.1.2.1.2 Range/mapping

The reporting range for *UE transmitted power* is from -50 ...+33 dBm.

In table 9.28 mapping of the 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	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

9.2 Measurements Performance for UTRAN

9.2.1 Performance for UTRAN Measurements in Uplink (RX)

9.2.1.1 RSCP

The measurement period shall be [100] ms.

9.2.1.1.1 Absolute accuracy requirements

Table 9.29 RSCP absolute accuracy

		Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm]
RSCP	dB	± 6	± 9	-105..-74

9.2.1.1.2 Relative accuracy requirements

Table 9.34 RSCP relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Io [dBm]
RSCP	dB	± 3 for intra-frequency	-105..-74

9.2.1.1.3 Range/mapping

The reporting range for *RSCP* is from -120 ...-80 dBm.

In table 9.31 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.31

Reported value	Measured quantity value	Unit
RSCP_LEV _00	RSCP <–120,0	dBm
RSCP_LEV _01	-120,0 ≤ RSCP < –119,5	dBm
RSCP_LEV _02	-119,5 ≤ RSCP < –119,0	dBm
…	…	…
RSCP_LEV _79	-81,0 ≤ RSCP < -80,5	dBm
RSCP_LEV _80	-80,5 ≤ RSCP < -80,0	dBm
RSCP_LEV _81	-80,0 ≤ RSCP	dBm

9.2.1.2 Timeslot ISCP

The measurement period shall be [100] ms.

9.2.1.2.1 Absolute accuracy requirements

Table 9.32 Timeslot ISCP Intra frequency absolute accuracy

		Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm]
Timeslot ISCP	dB	± 6	± 9	-105..-74

9.2.1.2.2 Range/mapping

The reporting range for *Timeslot ISCP* is from -120...-80 dBm.

In table 9.33 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.33

Reported value	Measured quantity value	Unit
UTRAN_TS_ISCP_LEV_00	Timeslot_ISCP < –120,0	dBm
UTRAN_TS_ISCP_LEV_01	-120,0 ≤ Timeslot_ISCP < –119,5	dBm
UTRAN_TS_ISCP_LEV_02	-119,5 ≤ Timeslot_ISCP < –119,0	dBm
…	…	…
UTRAN_TS_ISCP_LEV_79	-81,0 ≤ Timeslot_ISCP < -80,5	dBm
UTRAN_TS_ISCP_LEV_80	-80,5 ≤ Timeslot_ISCP < -80,0	dBm
UTRAN_TS_ISCP_LEV_81	-80,0 ≤ Timeslot_ISCP	dBm

9.2.1.3 RECEIVED TOTAL WIDE BAND POWER

The measurement period shall be [100] ms.

9.2.1.3.1 Absolute accuracy requirements

Table 9.34 RECEIVED TOTAL WIDE BAND POWER Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Io [dBm]
RECEIVED TOTAL WIDE BAND POWER	dB	± 4	-105..-74

9.2.1.3.2 Range/mapping

The reporting range for *RECEIVED TOTAL WIDE BAND POWER* is from -112 ... -50 dBm.

In table 9.35 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.35

Reported value	Measured quantity value	Unit
RECEIVED TOTAL WIDE BAND POWER_LEV _000	RECEIVED TOTAL WIDE BAND POWER < –112,0	dBm
RECEIVED TOTAL WIDE BAND POWER_LEV _001	-112,0 ≤ RECEIVED TOTAL WIDE BAND POWER < –111,9	dBm
RECEIVED TOTAL WIDE BAND POWER_LEV _002	-111,9 ≤ RECEIVED TOTAL WIDE BAND POWER < –111,8	dBm
…	…	…
RECEIVED TOTAL WIDE BAND POWER_LEV _619	-50,2 ≤ RECEIVED TOTAL WIDE BAND POWER < -50,1	dBm
RECEIVED TOTAL WIDE BAND POWER_LEV _620	-50,1 ≤ RECEIVED TOTAL WIDE BAND POWER < -50,0	dBm
RECEIVED TOTAL WIDE BAND POWER_LEV _621	-50,0 ≤ RECEIVED TOTAL WIDE BAND POWER	dBm

9.2.1.4 SIR

The measurement period shall be [80] ms.

9.2.1.4.1 Absolute accuracy requirements

Table 9.36 SIR Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
SIR	dB	± 3	For 0<SIR<20 dB when Io > -105 dBm
SIR	dB	+/-(3 - SIR)	For -7<SIR<0 dB when Io > -105 dBm

9.2.1.4.2 Range/mapping

The reporting range for *SIR* is from -11 ... 20 dB.

In table 9.37 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.37

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

9.2.1.5 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.

9.2.1.5.1 Accuracy requirement

The average of consecutive Transport channel BER measurements is required to fulfil the accuracy stated in table 9-48 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 9-38.

Table 9-38 Transport channel BER accuracy

Parameter	Unit	Accuracy [% of the absolute BER value]	Conditions
			Range
TrpBER	-	+/- 10	Convolutional coding 1/3rd 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 1/3rd with any amount of repetition or a maximum of 20% puncturing: for absolute BER value ≤ 15%.

9.2.1.5.2 Range/mapping

The *Transport channel BER* reporting range is from 0 to 1.

In table 9.39 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.39

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	-

9.2.1.6 RX Timing Deviation

The measurement period shall be [100] ms.

9.2.1.6.1 Accuracy requirements

Table 9.40 RX Timing Deviation accuracy

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
RX Timing Deviation	chip	+/- 0,5	-256, …, 256

9.2.1.6.2 Range/mapping

The reporting range for *RX Timing Deviation* is from -256 ... 256 chips.

In table 9.41 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.41

Reported value	Measured quantity value	Unit
RX_TIME_DEV_0001	RX Timing Deviation < –256,00	chip
RX_TIME_DEV_0002	-256,00≤ RX Timing Deviation < 255,75	chip
RX_TIME_DEV_0003	-255,75≤ RX Timing Deviation < –255,50	chip
…	…	…
RX_TIME_DEV_1024	000,00≤ RX Timing Deviation < 000,25	chip
…	…	…
RX_TIME_DEV_2046	255,5 ≤ RX Timing Deviation < 255,75	chip
RX_TIME_DEV_2047	255,75 ≤ RX Timing Deviation < 256,00	chip
RX_TIME_DEV_2048	256,00 ≤ RX Timing Deviation	chip

Note: This measurement may be used for timing advance calculation or location services.

9.2.1.9 UTRAN GPS Timing of Cell Frames for LCS

9.2.1.9.1 Accuracy requirement

Only necessary for UEs supporting LCS.

Table 9.42

Parameter	Unit	Accuracy [chip]	Conditions
UTRAN GPS timing of Cell Frames for LCS	chip	[ ]	

9.2.1.9.2 Range/mapping

The reporting range for *UTRAN GPS timing of Cell Frames for LCS* is from 0 ... 2319360000000 chip.

In table 9.43 the mapping of measured quantity is defined.

Table 9.43

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for LCS < 0,0625	chip
GPS_TIME_00000000000001	0,0625 ≤ UTRAN GPS timing of Cell Frames for LCS < 0,1250	chip
GPS_TIME_00000000000002	0,1250 ≤ UTRAN GPS timing of Cell Frames for LCS < 0,1875	chip
…	…	…
GPS_TIME_37109759999997	2319359999999,8125 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999,8750	chip
GPS_TIME_37109759999998	2319359999999,8750 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999,9375	chip
GPS_TIME_37109759999999	2319359999999,9375 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319360000000,0000	chip

9.2.2 Performance for UTRAN measurements in downlink (TX)

The output power is defined as the average power of the transmit timeslot, and is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0,22$ and a bandwidth equal to the chip rate.

9.2.2.1 Transmitted carrier power

The measurement period shall be [100] ms.

9.2.2.1.1 Accuracy requirements

Table 9.44 Transmitted carrier power accuracy

Parameter	Unit	Accuracy [% units]	Conditions
			Range
Transmitted carrier power	%	± 10	For 10% ≤ Transmitted carrier power ≤90%

9.2.2.1.2 Range/mapping

The reporting range for *Transmitted carrier power* is from 0 ... 100 %.

In table 9.45 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.45

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	%

9.2.2.2 Transmitted code power

The measurement period shall be [100] ms.

9.2.2.2.1 Absolute accuracy requirements

Table 9.46 Transmitted code power absolute accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code power	dB	[± 3]	Over the full range

9.2.2.2.2 Relative accuracy requirements

Table 9.47 Transmitted code power relative accuracy

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Transmitted code power	dB	± 2	Over the full range

9.2.2.2.3 Range/mappingThe reporting range for *Transmitted code power* is from -10 ... 46 dBm.

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
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

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 TS34.122. Statistical interpretation of the requirements is described in Annex A.2.

A.2 Requirement classification for statistical testing

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 25.123. The details of the tests, how many times to run it and how to establish confidence in the tests are described in TS 34.122. 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 25.123

Time and delay requirements on UE higher layer actions

One part of the RRM requirements are delay requirements:

In idle mode (A.4) there is cell selection delay and cell re-selection delay.

In UTRAN Connected Mode Mobility (A.5) there is measurement reporting delay and cell re-selection 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 34.122.

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 +/-3,29σ 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" in UTRAN Connected Mode Mobility (A.5)

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 25.102.

A.3 Reserved for Future Use

Editors Note: This section is included in order to make the following section numbering, match the sections in the beginning of this specification.

A.4 Idle Mode

A.4.1 Cell selection

Two scenarios are considered:

- Scenario 1: The cells in the neighbour list belong to different frequencies
- Scenario 2: No cell is present in the neighbour list

For each of them a test is proposed.

NOTE: More scenarios will be added later

A.4.1.1 Scenario 1: the cells in the neighbour list belong to different frequencies

A.4.1.1.1 Test Purpose and Environment

This test is to verify the requirement reported in section 4.1.2.1.1.

This scenario implies the presence of 2 carriers and 6 cells as reported in Table A.4-1 and A.4-2.

The stored information of the last registered PLMN is utilised in this test. The stored information includes one of the UTRA RF CHANNEL NUMBERs used in the test. All the cells in the test are given in the measurement control information of each cell, which are on the RF carrier stored to the UE.

Table A.4-1: General test parameters for Cell Selection in multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Stored RF channel		Channel2	
	Neighbour cells of Cell1		Cell2, Cell3,Cell4, Cell5, Cell6	
	Neighbour cells of Cell2		Cell1, Cell3,Cell4, Cell5, Cell6	
	Neighbour cells of Cell3		Cell1, Cell2,Cell4, Cell5, Cell6	
	Neighbour cells of Cell4		Cell1, Cell2,Cell3, Cell5, Cell6	
	Neighbour cells of Cell5		Cell1, Cell2,Cell3, Cell4, Cell6	
	Neighbour cells of Cell6		Cell1, Cell2,Cell3, Cell4, Cell5	
Final condition	Active cell		Cell1	

Table A.4-2: Cell selection multi carrier case

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 2		Channel 1		Channel 2	
Timeslot Number		0	8	0	8	0	8	0	8	0	8	0	8
PCCPCH_Ec/Ior	dB	-3		-3		-3		-3		-3		-3	
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	5	5	10	10	15	15	20	20	25	25
PICH_Ec/Ior	dB		-3		-3		-3		-3		-3		-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	10	10	-0,5	-0,5	3	3	-3	-3	-3	-3	-3	-3
I_{oc}	dBm/3,84 MHz	-70											
PCCPCH RSCP	dBm	-63		-73,5		-70		-76		-76		-76	
Propagation Condition		AWGN											
Qmin	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Note: The values are only valid during the active part of SCH. Chip Energy of the other channels remains constant across the burst.

A.4.1.2.2 Test Requirements

The requirements reported in section 4.1.2.1.1 shall be verified in more than [X%] of the cases.

A.4.1.2 Scenario 2 : no cell is present in the neighbour list

A.4.1.2.1 Test Purpose and Environment

This test is to verify the requirement reported in section 4.1.2.1.2.

This scenario implies the presence of 1 carrier and 1 cell as reported in Table A.4-3.

The stored information of the last registered PLMN is utilised in this test. The stored information includes the UTRA RF CHANNEL NUMBER. The active cell in the test does not contain any neighbour cells in its measurement control information.

Table A.4-3: Cell selection single carrier single cell case

Parameter	Unit	Cell 1	
UTRA RF Channel Number		Channel 1	
Timeslot Number		0	8
PCCPCH_Ec/Ior	dB	-3	
SCH_Ec/Ior	dB	-9	-9
SCH_t_{offset}		0	0
PICH_Ec/Ior	dB		-3
OCNS_Ec/Ior	dB	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	0	0
I_{oc}	dBm/3,84 MHz	-70	-70
PCCPCH RSCP	dBm	-73	
Propagation Condition		AWGN	AWGN
Qmin	dBm	[ ]	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]	[ ]

Note: The values are only valid during the active part of SCH. Chip Energy of the other channels remains constant across the burst.

A.4.1.2.2 Test Requirements

The requirements reported in section 4.1.2.1.2 shall be verified in more than [X %] of the cases.

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: More scenarios 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 4.2.2.2.1.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.4-4 and A.4-5.

Table A.4-4: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4-5: Cell re-selection single carrier multi-cell case

Parameter	**Unit**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP		-74	-74			-74	-74			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3,84 MHz	-70											
Propagation Condition		AWGN											

A.4.2.1.2 Test Requirements

The requirements reported in section 4.2.2.2.1 shall be verified in more than [X %] of the cases.

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 4.2.2.2.2.

This scenario implies the presence of 2 carriers and 6 cells as given in Table A.4-6 and A.4-7.

Table A.4-6: General test parameters for Cell Re-selection in Multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4-7: Cell re-selection multi carrier multi cell case

Parameter	**Unit**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	0	3	0	0	3	0	3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-70	-73			-73	-70			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP		-76	-76			-76	-76			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3,84 MHz	-70											
Propagation Condition		AWGN											

Note: P-CCPCH_RSCP is the quality measure for cell selection and re-selection.

A.4.2.2.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 4.2.2.2.2.

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 4.3.2.1.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. Test parameters are given in Table, A.4.8, A.4.9, A.4-10.

Table A.4-6: 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	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4-7: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
Timeslot Number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0
PICH_Ec/Ior	dB			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7
I_{oc}	dBm/3, 84 MHz	–70		–70	
PCCPCH RSCP	dBm	-64	-66		
Propagation Condition		AWGN		AWGN	
Cell_selection_and_reselection_quality_measure		P-CCPCH RSCP			
Qqualmin	dB	[ ]			
Qrxlevmin	dBm	[ ]			
UE_TXPWR_MAX_RACH	dBm	[ ]			
$Qoffset1_{s,n}$	dB	C1, C2: [ ]			
Qhyst1	dB	[ ]			
PENALTY_TIME	s	C2: [ ]			
TEMP_OFFSET1	dB	C2: [ ]			
Treselection	s	[ ]			
$Ssearch_{RAT}$	dB	[ ]			

Table A.4-8: 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	-70	-60
RXLEV_ACCESS_MIN	dBm	[ ]	
MS_TXPWR_MAX_CCH	dBm	[ ]	

A.4.3.1.2 Test Requirements

The requirements reported in section 4.3.2.1 shall be verified in more than [X %] of the cases.

A.5 UTRAN Connected Mode Mobility

A.5.1 TDD/TDD Handover

NOTE: This section is included for consistency with numbering with section 5; currently no test covering requirements in sections 5.1.2.1 and 5.1.2.2 exists.

A.5.2 TDD/FDD Handover

NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.2.2.1 and 5.2.2.2 exists.

A.5.3 TDD/GSM Handover

NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.

A.5.4 Cell Re-selection in CELL_FACH

A.5.4.1 One frequency present in neighbour list

A.5.4.1.1 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 5.4.2.1.1.

The test parameters are given in Table A.5.1 and A.5.2

Table A.5.1 General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.2 Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP		-74	-74			-74	-74			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70											
Propagation Condition		AWGN											

Note: PCCPCH_RSCP is the quality measure for cell selection and re-selection.

A.5.4.1.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 5.4.2.1.1

A.5.4.2 Two frequencies present in the neighbour list

A.5.4.2.1 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 5.4.2.1.2.The test parameters are given in Table A5-3 and A5-4.

Table A.5.3: General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.4: Cell specific test parameters for Cell re-selection in CELL_FACH state

Parameter	**Unit**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	0	3	0	0	3	0	3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-70	-73			-73	-70			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		20	20	20	20	15	15	15	15	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP		-76	-76			-76	-76			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70											
Propagation Condition		AWGN											

Note: PCCPCH_RSCP is the quality measure for cell selection and re-selection.

A.5.4.2.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 5.4.2.1.2

A.5.5 Cell Re-selection in CELL_PCH

A.5.5.1 One frequency present in the neighbour list

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_PCH state in section 5.5.2.1.1.

The test parameters are given in Table A5.5 and A5.6

Table A.5.5: General test parameters for Cell Re-selection in CELL_PCH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		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**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP		-74	-74			-74	-74			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70											
Propagation Condition		AWGN											

Note: PCCPCH_RSCP is the quality measure for cell selection and re-selection.

A.5.5.1.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 5.5.2.1.1

A.5.5.2 Two frequencies present in the neighbour list

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_PCH state in in section 5.5.2.1.2.

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		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**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	0	3	0	0	3	0	3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-70	-73			-73	-70			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		20	20	20	20	15	15	15	15	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP		-76	-76			-76	-76			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70											
Propagation Condition		AWGN											

Note: PCCPCH_RSCP is the quality measure for cell selection and re-selection.

A.5.5.2.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 5.5.2.1.2

A.5.6 Cell Re-selection in URA_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 URA_PCH state in in section 5.6.2.1.1.

The test parameters are given in Table A.5.9 and A.5.10.

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.10: Cell specific test parameters for Cell re-selection in URA_PCH state

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP		-74	-74			-74	-74			-74	-74		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70											
Propagation Condition		AWGN											

Note: PCCPCH_RSCP is the quality measure for cell selection and re-selection.

A.5.6.1.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 5.6.2.1.1

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 URA_PCH state in section 5.6.2.1.2.

The test parameters are given in Table A5.11 and A5.12.

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table A.5.12: Cell specific test parameters for Cell re-selection in URA_PCH state

Parameter	**Unit**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/Ior	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	0	3	0	0	3	0	3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-70	-73			-73	-70			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**8**		**0**		**8**		**0**		**8**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		20	20	20	20	15	15	15	15	25	25	25	25
PICH_Ec/Ior	dB			-3	-3			-3	-3			-3	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP		-76	-76			-76	-76			-76	-76		
Qoffset		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qhyst	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection		[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qintrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70											
Propagation Condition		AWGN											

Note: PCCPCH_RSCP is the quality measure for cell selection and re-selection.

A.5.6.2.2 Test Requirements

The UE shall select cell 2 within a cell re-selection delay specified in 5.6.2.1.2

A.6 Dynamic channel allocation

NOTE: This section is included for consistency with numbering with section 6; currently no test covering requirements in this section exists.

A.7 Timing characteristics

NOTE: This section is included for consistency with numbering with section 7; currently no test covering requirements in this section exists.

A.8 UE Measurements Procedures

A.8.1 TDD intra frequency measurements

A.8.1.1 Event triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8-1. The test parameters are shown in Table A.8-1. Hysteresis, absolute Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

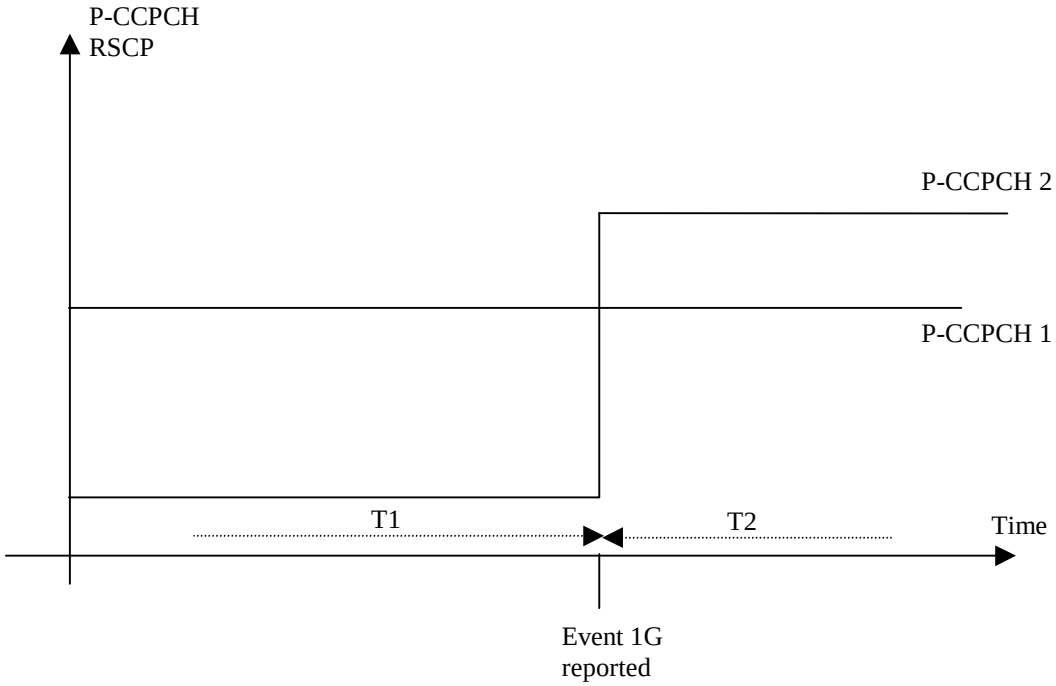

Figure A.8-1: Illustration of parameters for handover measurement reporting test case

Table A.8-1

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		0		8	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	5	-Infinity	5
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-68		
Absolute Threshold (SIR)	dB	[ ]							
Hysteresis	dB	[ ]							
Time to Trigger	msec	[ ]							
Propagation Condition		AWGN							

Note: The DPCH of all cells are located in an other timeslot than 0 or 8

A.8.1.1.2 Test Requirements

The UE shall send one Event 1G triggered measurement report, with a measurement reporting delay less than [480] ms from the beginning of time period T2.

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

A.8.2 TDD inter frequency measurements

A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

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 8.1.2.2.

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8-2. The test parameters are shown in Table A.8-2. Hysteresis, absolute Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

The test parameters are shown in Table A.8-2.

Table A.8-2 Cell Specific Parameters for Correct Reporting of Neighbours in AWGN Propagation Condition

Parameter	**Unit**	**Cell 1**				**Cell 2**			
Timeslot Number		0		8		0		8	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1		Channel 1		Channel 2		Channel 2	
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
*SCH_*t_{offset}		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-Infinity	6	-Infinity	6
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-67		
Absolute Threshold (SIR)	dB	[ ]							
Hysteresis	dB	[ ]							
Time to Trigger	msec	[ ]							
Propagation Condition		AWGN							

Note: The DPCH of all cells are located in an other timeslot than 0 or 8

A.8.2.1.2 Test Requirements

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] s from the beginning of time period T2.

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

A.8.3 FDD measurements

A.8.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH Ec/Io of cell 2 and the P-CCPCH RSCP of cell 1 is changed. Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. The number of neighbour cells in the measurement control information is FFS. The test parameters are shown in Table A.8-3.

Table A.8-3

Parameter	**Unit**	**Cell 1**				**Cell 2**			
Timeslot Number		0		8		n.a		n.a.	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2			
CPICH_Ec/Ior	dB	n.a.		n.a.		[ ]		[ ]	
PCCPCH_Ec/Ior	dB	-3	-3			[ ]		[ ]	
SCH_Ec/Ior	dB	-9	-9	-9	-9	[ ]		[ ]	
SCH_t_{offset}		0	0	0	0	n.a.		n.a.	
PICH_Ec/Ior				-3	-3	[ ]		[ ]	
DCH_Ec/Ior	dB	n.a.	n.a.	n.a.	n.a.	[ ]		[ ]	
OCNS	dB	-4,28	-4,28	-4,28	-4,28	[ ]		[ ]	
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]	[ ]	[ ]	[ ]		[ ]	
I_{oc}	dBm/3.84 MHz	-70				-70			
CPICH_Ec/Io		n.a.				[ ]			
PCCPCH_RSCP	dB	[ ]	[ ]	[ ]	[ ]	n.a.		n.a.	
Absolute Threshold (SIR)	dB	[ ]				[ ]			
Hysteresis	dB	[ ]				[ ]			
Time to Trigger	msec	[ ]				[ ]			
Propagation Condition		AWGN				AWGN			

Note: The DPCH of the TDD cell is located in an other timeslot than 0 or 8

A.8.3.1.2 Test Requirements

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] seconds from the start of time period T2.

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

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 25.102 annex A. This measurement channel is used both in active cell and cells to be measured.

– Cell 1 is the active cell.

– Single task reporting.

Power control is active.

A.9.1 Measurement Performance for UE

If not otherwise stated, the test parameters in table A.9.1 should be applied for UE RX measurements requirements in this clause.

A.9.1.1 TDD intra frequency measurements

In this case all cells are on the same frequency. The table A.9.1 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.1 Intra frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1		Cell 2	
UTRA RF Channel number		Channel 1		Channel 1	
Timeslot		0	8	0	8
P-CCPCH Ec/Ior	dB	-3	-	-3	-
SCH Ec/Ior	dB	-9	-9	-9	-9
PICH_Ec/Ior	dB	-	-3	-	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28
Îor/Ioc	dB	[ ]		[ ]	
Ioc	dBm/ 3,84 MHz	-70		-70	
Range 1:Io *Range 2: Io*	dBm	-94..-70 -94..-50		-94..-70 -94..-50	
Propagation condition	-	AWGN		AWGN	

Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.

Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* | ≤ 20 dB.

Note 3: | *Io – P-CCPCH_Ec/Ior*| ≤ [20] dB.

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8

A.9.1.2 TDD inter frequency measurements

In this case all cells are on the same frequency. The table A.9.2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.2 Inter frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1		Cell 2	
UTRA RF Channel number		Channel 1		Channel 2	
Timeslot		0	8	0	8
P-CCPCH Ec/Ior	dB	-3	-	-3	-
SCH Ec/Ior	dB	-9	-9	-9	-9
PICH_Ec/Ior	dB	-	-3	-	-3
OCNS	dB	-4,28	-4,28	-4,28	-4,28
Îor/Ioc	dB	[ ]		[ ]	
Ioc	dBm/ 3,84 MHz	-70		-70	
Range 1:Io *Range 2: Io*	dBm	-94..-70 -94..-50		-94..-70 -94..-50	
Propagation condition	-	AWGN		AWGN	

Note 1: *P-CCPCH_RSCP1,2* ≥ -[102] dBm.

Note 2: | *P-CCPCH_RSCP1 – PCCPCH_RSCP2* | ≤ 20 dB.

Note 3: | *Io – P-CCPCH_Ec/Ior*| ≤ [20] dB.

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

Note 5: The DPCH of all cells are located in an other timeslot than 0 or 8

A.9.1.3 FDD inter frequency measurements

In this case both cells are in different frequency. Table A.9.3 and notes 1-6 define the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.3 CPICH Inter frequency test parameters

Parameter	Unit	Cell 1		Cell 2
Timeslot Number		0	8	n.a
UTRA RF Channel Number		Channel 1		Channel 2
CPICH_Ec/Ior	dB	n.a.	n.a.	-10
P-CCPCH_Ec/Ior	dB	-3		-12
SCH_Ec/Ior	dB	-9	-9	-12
SCH_t_{offset}		0	0	n.a.
PICH_Ec/Ior			-3	-15
DPCH_Ec/Ior	dB	n.a.	n.a.	-15
OCNS	dB	-4.28	-4.28	-1,11
$\hat{I}_{or}/I_{oc}$	dB	[]	[]	10,5
I_{oc}	dBm/3,84 MHz	-70		Note 5
Range 1:Io *Range 2: Io*	dBm	-94..-70 -94..-50		-94..-70 -94..-50
Propagation condition	-	AWGN		AWGN

Note 1: *CPICH_RSCP1,2* ≥ -114 dBm.

Note 2: | *CPICH_RSCP1 – CPICH_RSCP2* | ≤ 20 dB

Note 3: | *Channel 1_Io –Channel 2_Io*| ≤ 20 dB

Note 4: | *Io – CPICH_Ec/Ior*| ≤ 20 dB

Note 5: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io –10,6 dB = Ioc*

Note 6: The DPCH of the TDD cell is located in an other timeslot than 0 or 8

A.9.1.4 UTRA carrier RSSI inter frequency measurements

The table A.9.4 and notes 1,2 define the limits of signal strengths, where the requirement is applicable.

Table A.9.4UTRA carrier RSSI Inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channei number	-	Channel 1	Channel 2
Îor/Ioc	dB	-1	-1
Ioc	dBm/ 3.84 MHz	Note 2	Note 2
Range 1: Io *Range 2: Io*	dBm/ 3,84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: For relative accuracy requirement | *Channel 1_Io –Channel 2_Io* | < *20 dB.*

Note 2: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

A.9.2 Measurement Performance for UTRAN

A.9.2.1 UTRAN RX measurements

If not otherwise stated, the test parameters in table A.9.5 should be applied for UTRAN RX measurements requirements in this clause.

Table A.9.5 Intra frequency test parameters for UTRAN RX Measurements

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
Timeslot		[ ]
DPCH Ec/Ior	dB	[ ]
Îor/Ioc	dB	[ ]
Ioc	dBm/ 3,84 MHz	-89
Range: Io	dBm	-105..-74
Propagation condition	-	AWGN

Annex B (informative): Change History

CRs approved by TSG-RAN#7.

RAN doc	Spec	CR	Rev	Phase	Subject	Cat	Old Version	New Version
RP-000020	25.123	001		R99	Update of test requirements for TDD/TDD Handover	F	3.0.0	3.1.0
RP-000020	25.123	002		R99	Update of the requirements for TDD/FDD Handover	F	3.0.0	3.1.0
RP-000020	25.123	003		R99	Update of Cell Selection and Re-selection sections	C	3.0.0	3.1.0
RP-000020	25.123	004		R99	Update of Power management and Radio Link Surveillance sections	F	3.0.0	3.1.0
RP-000020	25.123	005		R99	Update of measurements performance requirements	F	3.0.0	3.1.0
RP-000020	25.123	006		R99	Inclusion of transport channel BER	F	3.0.0	3.1.0
RP-000020	25.123	007		R99	Receiver Timing Advance	F	3.0.0	3.1.0
April 2000	25.123	-	-	R99	MCC Editorial update and clause 10 renumbering	A	3.1.0	3.1.1

CRs approved by TSG-RAN#8.

RAN Doc	Spec	CR	Rev	Phase	Subject	Cat	Version - Current	Version-New
RP-000209	25.123	008		R99	Correction of UTRAN "Transmitted carrier power" accuracy requirements	F	3.1.1	3.2.0
RP-000209	25.123	009		R99	Measurement reporting delay	F	3.1.1	3.2.0
RP-000209	25.123	010		R99	Update of UE SIR Measurements performance requirements	F	3.1.1	3.2.0
RP-000209	25.123	011		R99	UE Transport Channel BLER measurement	F	3.1.1	3.2.0
RP-000209	25.123	012		R99	Editorial corrections of 25.123	F	3.1.1	3.2.0
RP-000209	25.123	013		R99	Range and mapping in TS 25.123 (TDD)	F	3.1.1	3.2.0
RP-000209	25.123	014		R99	Requirement for UE Tx Power Measurement	F	3.1.1	3.2.0
RP-000209	25.123	015		R99	Addition of test parameters to RRM Measurements performance requirements	F	3.1.1	3.2.0

CRs approved by TSG-RAN#9.

RAN Doc	Spec	CR	Rev	Phase	Subject	Cat	Version - Current	Version-New
RP-000399	25.123	16		R99	Handling of measurement uncertainties in conformance testing (TDD) for RRM measurements	F	3.2.0	3.3.0
RP-000399	25.123	17		R99	Basestation Physical Channel BER Measurement	F	3.2.0	3.3.0
RP-000399	25.123	18		R99	Repetition Period of System Information	F	3.2.0	3.3.0
RP-000399	25.123	19		R99	RRC connection mobility in cell_FACH, cell_PCH and URA_PCH	F	3.2.0	3.3.0
RP-000399	25.123	20		R99	Basestation SIR Measurement	F	3.2.0	3.3.0

RP-000399	25.123	21		R99	UE SIR Measurement Accuracy	F	3.2.0	3.3.0
RP-000399	25.123	22		R99	UE TS ISCP range/mapping correction	F	3.2.0	3.3.0
RP-000399	25.123	23		R99	Alignment of TDD measurements for UE: SFN-CFN observed time difference	F	3.2.0	3.3.0
RP-000399	25.123	24		R99	UTRAN Transport Channel BLER	F	3.2.0	3.3.0
RP-000399	25.123	25		R99	Accuracy requirements for Node-B synchronization	F	3.2.0	3.3.0
RP-000399	25.123	26		R99	Alignment of TDD measurements with FDD: GPS related measurements	F	3.2.0	3.3.0

CRs approved by TSG RAN #10

RAN Doc	Spec	CR	Rev	Phase	Subject	Cat	Current	New
RP-000590	25.123	27		R99	Re-structuring TS 25.123 Section 3	F	3.3.0	3.4.0
RP-000590	25.123	28		R99	Re-structuring TS 25.123 Section 4+A4	F	3.3.0	3.4.0
RP-000590	25.123	29		R99	Re-structuring TS 25.123 Section 5	F	3.3.0	3.4.0
RP-000590	25.123	30		R99	Re-structuring TS 25.123 Section A5	F	3.3.0	3.4.0
RP-000590	25.123	31		R99	Re-structuring TS 25.123 Section 6+7	F	3.3.0	3.4.0
RP-000590	25.123	32		R99	Re-structuring TS 25.123 Section 8+A8	F	3.3.0	3.4.0
RP-000590	25.123	33		R99	Re-structuring TS 25.123 Section 9+A9	F	3.3.0	3.4.0
RP-000590	25.123	34		R99	Re-structuring TS 25.123 Annex A1-3	F	3.3.0	3.4.0

History

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