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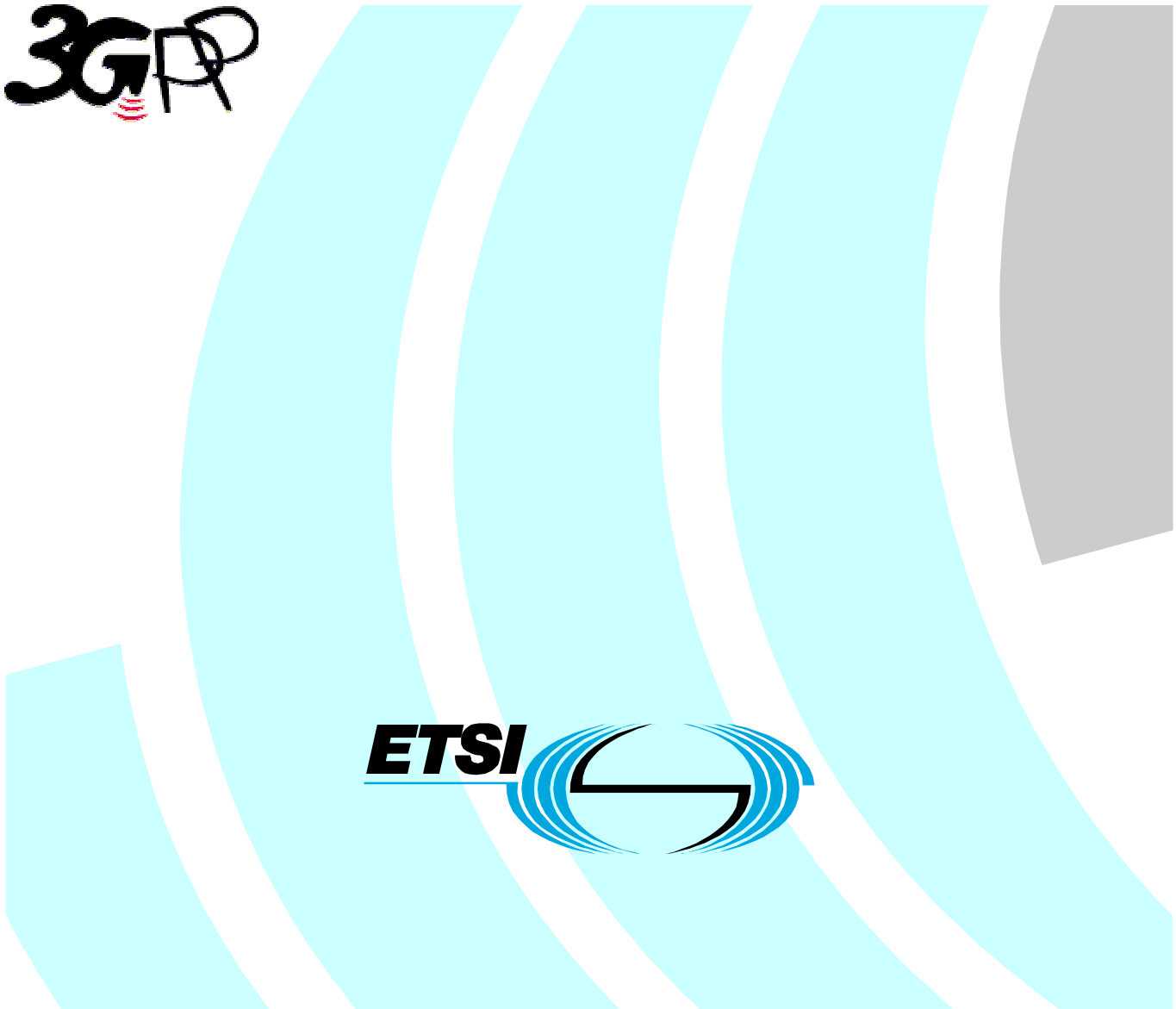

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Foreword

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:

Version x.y.z

where:

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

1 Scope

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*.

[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: "Base station 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 protocol 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 measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[20] 3GPP TS 45.005: "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

3.4 Test tolerances

The requirements given in the present document make no allowance for measurement uncertainty. The test specification 34.122 and 25.142 define test tolerances. These test tolerances are individually calculated for each test. The test tolerances are then added to the limits in this specification to create test limits. The measurement results are compared against the test limits as defined by the shared risk principle.

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

4 Idle Mode

4.1 Cell Selection

4.1.1 Introduction

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

4.2 Cell Re-selection

4.2.1 Introduction

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

When the UE is in *Normally Camped* state on a TDD cell, the UE shall attempt to detect, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. If 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 Measurement and evaluation of cell selection criteria S_{rxlev} of serving cell

4.2.2.1.1 3.84 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S_{rxlev} defined in TS25.304 for the serving cell at least once per DRX cycle. The UE shall filter the PCCPCH RSCP measurement of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} successive measurements that the serving cell does not fulfil the cell selection criterion S_{rxlex}, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

4.2.2.1.2 1.28 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S defined in TS25.304 for the serving cell once per DRX cycle. The UE shall filter the PCCPCH RSCP level of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$ (see table 4.1A).

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

If the UE has not found any new suitable cell based the on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

4.2.2.2 Measurement of intra-frequency cells

4.2.2.2.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureTDD}$ (see table 4.1) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureTDD}$ is defined in Table 4.1. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateTDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero.

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

4.2.2.2.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureNTDD}$ (see table 4.1A) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureNTDD}$ is defined in Table 4.1A. The UE shall filter PCCPCH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateNTDD}$ (see table 4.1A), from the moment the intra-frequency cell became at least [2] dB better ranked than the current serving cell, provided that Treselection timer is set to zero and PCCPCH RSCP is used as measurement quantity for cell reselection.

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

4.2.2.3 Measurement of inter-frequency TDD cells

4.2.2.3.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureTDD}$ (see table 4.1) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for TDD cells. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero.

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

4.2.2.3.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureNTDD}$ (see table 4.1A) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 1.28 Mcps TDD OPTION cells. The maximum number of carriers is [3] including the carrier the UE is camped on. The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateNTDD}$ from the moment the inter-frequency cell became at least [3] dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least [3] dB better than the current serving cell provided that Treselection timer is set to zero.

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

4.2.2.3A 1.28 Mcps TDD to 3.84 Mcps TDD cell re-selection

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The ranking of the low and high chip rate TDD cells shall be made according to the cell reselection criteria specified in TS25.304. The use of mapping functions is indicated in the broadcast.

The UE shall measure PCCPCH RSCP at least every $N_{TDDcarrier}$ * $T_{measureTDD}$ (see table 4.1A) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 3.84 Mcps TDD cells. The maximum number of carriers is 3.The UE shall filter PCCPCH RSCP measurements of each measured high chip rate TDD cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that a high chip rate TDD cell has become better ranked than the serving cell within $N_{TDDcarrier}$ * $T_{evaluateTDD}$ from the moment the inter-frequency cell became at least [3] better ranked than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least [3] dB better than the current serving cell provided that Treselection timer is set to zero.

4.2.2.4 Measurement of inter-frequency FDD cells

4.2.2.4.1 3.84 Mcps option

The UE shall measure the signal level CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

CPICH RSCP is used as basic measurement quantity for cell ranking, the filtering shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $N_{carrierFDD}$ * $T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. The parameter $N_{carrierFDD}$ is the number of carriers used for FDD cells.

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

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.

4.2.2.4.2 1.28 Mcps option

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The UE shall measure the signal level CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1A). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

CPICH RSCP is used as basic measurement quantity for cell ranking, the filtering shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $NFDD_{carrier}$ * $T_{evaluateFDD}$ from the moment the inter-frequency cell became at least [5] dB better than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least [5] dB better than the current serving cell provided that Treselection timer is set to zero.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE

shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.

4.2.2.5 Measurement of inter-RAT GSM cells

4.2.2.5.1 3.84 Mcps option

The UE shall measure the signal level of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureGSM}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

The UE shall attempt to verify the BSIC for each of the 4 best ranked GSM BCCH carriers (the best ranked according to the cell reselection criteria defined in TS25.304) at least every 30 seconds if GSM cells are measured according to the measurement rules. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

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

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.

4.2.2.5.2 1.28 Mcps option

The UE shall measure the signal level of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureGSM}$ (see table 4.1A). The UE shall maintain a running average of 4 measurements for each cell. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

The UE shall attempt to verify the BSIC for each of the 4 best ranked GSM BCCH carriers (the best ranked according to the cell reselection criteria defined in TS25.304) at least every 30 seconds if GSM cells are measured according to the measurement rules. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell.

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

4.2.2.6 Evaluation of cell reselection criteria

4.2.2.6.1 3.84 Mcps option

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

Cell reselection shall take place immediately after the UE has found a better suitable cell unless the UE has made cell reselection within the last 1 second.

4.2.2.6.2 1.28 Mcps option

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

Cell reselection shall take place immediately after the UE has found a better suitable cell unless the UE has made cell reselection within the last 1 second.

4.2.2.7 Maximum interruption time in paging reception

4.2.2.7.1 3.84 Mcps option

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

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

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. The interruption time must not exceed T_REP + 50 ms. T_REP is the longest repetition period for the system information required to be read by the UE to camp on the cell.

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors.

Table 4.1: $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} [number of successive measurements]	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

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

4.2.2.7.2 1.28 Mcps option

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

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

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. The interruption time must not exceed T_REP + [50] ms. T_REP is the longest repetition period for the system information required to be read by the UE to camp on the cell.

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors.

Table 4.1A: $T_{measureNTDD}$, $T_{evaluateNTDD}$, $T_{measureTDD}$, $T_{evaluateTDD}$, $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} [number of successive measurements]	$T_{measureNTDD}$ [s] (number of DRX cycles)	$T_{evaluateNTDD}$ [s] (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s.

4.2.2.8 Number of cells in cell lists

4.2.2.8.1 3.84 Mcps option

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

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

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

4.2.2.8.2 1.28 Mcps option

The UE shall be capable of monitoring [32] intra-frequency 1.28 Mcps TDD OPTION cells (including serving cell), -[32] inter-frequency cells including low and high chip rate TDD Mode cells and FDD Mode cells if FDD and/or high chip rate TDD is supported by the UE.

The 1.28 Mcps TDD OPTION inter-frequency cells can be located on [x] additional frequencies besides the serving cell.

The inter-frequency cells can be located on up to [x] carriers.

In addition the UE shall be able to monitor 32 GSM carriers if GSM is supported by the UE. UE measurement activity is controlled by measurement rules defined in in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fulfilled.

5 UTRAN Connected Mode Mobility

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

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

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

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

The purpose of Cell reselection in CELL_FACH, CELL_PCH and URA_PCH states is that the UE shall select a better cell according to the cell reselection criteria in TS 25.304. CELL_FACH, CELL_PCH and URA_PCH states are described in TS 25.331.

5.1 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, refer to TS25.331.The handover procedure may cause the UE to change its frequency.

For 1.28 Mcps TDD, at the beginning of the measurement process the UE shall find synchronisation to the cell to measure using the synchronisation channel (DwPCH). This is described under 'cell search' in 3GPP RAN TS25.201, TS25.221 TS25.222, TS25.223, TS25.224, TS25.225' if the monitored cell is a 1.28 Mcps TDD cell. For a TDD cell to monitor after this procedure the exact timing of the midamble of the P-CCPCH is known and the measurements can be performed. Depending on the UE implementation and if timing information about the cell to monitor is available, the UE may perform the measurements on the P-CCPCH directly without prior DwPCH synchronisation.

5.1.2 Requirements

5.1.2.1 TDD/TDD Handover delay

5.1.2.1.1 3.84 Mcps TDD option

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

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

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.1.

5.1.2.1.2 1.28 Mcps TDD option

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

When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command,,the UE shall start transmission $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.2.

5.1.2.2 Interruption time

5.1.2.2.1 3.84 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH, shall be less than the value in table 5.1 for intra-frequency handover and TDD/TDD inter-frequency handover. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not.

A cell shall be regarded as known by the UE if either or both of the following conditions are true:

- it has been measured during the last 5 seconds or
- a dedicated connection existed between the UE and the cell during the last 5 seconds.

The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:

- a handover with timing maintain is commanded by the UTRAN or
- the SFN of the target cell is known by the UE or

Table 5.1 TDD/TDD handover – interruption time

TDD/TDD handover case	Maximum delay [ms]			
	Known Cell		Unknown Cell	
	SFN not to be decoded	SFN needs to be decoded	SFN not to be decoded	SFN needs to be decoded
Intra-frequency	40	70	350	400
Inter-frequency	40	70	350	400

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted , which can be up to one frame (10ms).

The requirement in Table 5.1 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

NOTE: One synchronisation attempt can consist of coherent averaging using several frames.

5.1.2.2.2 1.28 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH or the SYNC-UL in case that a handover with SYNCH uplink exchange is recommended, shall be less than the value in table 5.1A. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not..

A cell shall be regarded as known by the UE if either or both of the following conditions are true:

- it has been measured during the last 5 seconds or
- a dedicated connection existed between the UE and the cell during the last 5 seconds.

The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:

- a handover with timing maintain is commanded by the UTRAN or
- the SFN of the target cell is known by the UE or

Table 5.1A: TDD/ TDD handover – interruption time

cell in the handover command message	Maximum delay [ms]			
	Known Cell		Unknown Cell	
	SFN not to be decoded	SFN needs to be decoded	SFN not to be decoded	SFN needs to be decoded
Intra-frequency	[40]	[70]	[350]	[400]
Inter-frequency	[40]	[70]	[350]	[400]

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation. And the time that can elapse till the appearance of the new uplink DPCH or the UpPTS in which the SYNC-UL shall be transmitted , which can be up to one frame (10ms).

The requirement in Table 5.1A for the cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

NOTE: One synchronisation attempt can consist of coherent averaging using several frames.

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 , refer to TS25.331. The handover procedure causes the UE to change its frequency.

5.2.2 Requirements

These requirements shall apply only to TDD/FDD UE.

The requirements do not apply if FDD macro-diversity is used.

5.2.2.1 Handover delay

5.2.2.1.1 3.84 Mcps TDD option

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

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

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.

5.2.2.1.2 1.28 Mcps TDD option

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

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.2.

5.2.2.2 Interruption time

5.2.2.2.1 3.84 Mcps TDD option

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 . The interruption time shall be less than the value in table 5.2.

There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not..

The definition of known cell can be found in section 5.1.2.2.

Table 5.2 TDD/FDD interruption time

cell present in the handover command message	Maximum delay [ms]		
	Known Cell		Unknown cell
	SFN not to be decoded	SFN needs to be decoded	SFN needs to be decoded
1	[100]	[130]	[400]

The interruption time includes the interruption uncertainty when changing the timing from the old TDD to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

The requirement in Table 5.2 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

5.2.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5.2A

There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not.

The definition of known cell can be found in section 5.1.2.2.2.

Table 5.2A: 1.28 Mcps TDD/FDD interruption time

cell in the handover command message	Maximum update delay [ms]		
	Known Cell		Unknown Cell
	SFN not to be decoded	SFN needs to be decoded	SFN needs to be decoded
1	[100]	[130]	[400]

The interruption time includes the interruption uncertainty when changing the timing from the old 1.28 Mcps TDD OPTION to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

The requirement in Table 5.2A for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

5.3 TDD/GSM Handover

5.3.1 Introduction

The purpose of inter-RAT 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 (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS25.331 section 8.3.7.

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.

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 Handover delay

5.3.2.1.1 3.84 Mcps TDD option

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in Table 5.3 from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in TS 45.010) on the new channel of the new RAT within the value in Table 5.3 from the last TTI containing the RRC command. If the access is delayed to an indicated activation time later than the value in Table 5.3 from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in TS 45.010) on the channel of the new RAT at the designated activation time.

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

Table 5.3: TDD/GSM handover –handover delay

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

5.3.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC HANDOVER COMMAND with the activation time "now" or earlier than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UEit shall be ready to transmit (as specified in GSM 45.010) on the new channel within the new RAT within the value in Table 5.3A from the last TTI containing the RRC command, If the access is delayed to an indicated activation time later than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 45.010) on the channel of the new RAT at the designated activation time.

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

Table 5.3.A: 1.28 Mcps TDD/GSM handover –handover delay

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

5.3.2.2 Interruption time

5.3.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value in Table 5.4. The requirement in Table 5.4 for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.4: TDD/GSM handover - interruption time

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

5.3.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value in Table 5.4A. The requirement in Table 5.4A for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.4A: TDD/GSM handover - interruption time

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

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 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.4.2 Requirements for 3.84Mcps TDD option

The cell re-selection delays specified below are applicable when the RRC parameter $T_{reselection}$ is set to 0. Otherwise the Cell reselection delay is increase by $T_{reselection}$ s.

P-CCPCH RSCP shall be used for cell reselection in Cell-FACH state to another TDD cell, CPICH RSCP shall be used for re-selection to a FDD cell and GSM carrier RSSI shall be used for cell re-selection to a GSM cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in chapter 9.

5.4.2.1 Measurements

The UE measurement capability according to section 8.4.2.1 shall apply.

5.4.2.2 Cell re-selection delay

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

5.4.2.2.1 Intra-frequency cell re-selection

The cell re-selection delay in CELL_FACH state for intra frequency cells shall be less than:

$$T_{reselection,\,intra} = T_{identify,\,intra} + T_{SI}$$

where

$T_{identify_intra}$ =Specified in 8.4.2.2.1.

T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

5.4.2.2.2 Inter-frequency TDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency TDD cells shall be less than:

$$T_{reselection,\,TDD,inter} = T_{identify,\,inter} + T_{SI}$$

where

$T_{identify_inter}$ =Specified in 8.4.2.3.1.

T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

5.4.2.2.3 Inter-frequency FDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency FDD cells shall be less than:

$$T_{reselection,\,FDD} = T_{identify,\,FDD} + T_{SI}$$

where

$T_{identify,\,FDD}$ =Specified in 8.4.2.4.1T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

5.4.2.2.4 Inter-RAT cell re-selection

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

$$T_{reselection,\,GSM} = T_{identify,\,GSM} + T_{Measurement_GSM} + T_{SI}$$

where

$T_{identify,\,GSM}$ = Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.

$T_{Measurement,GSM}$ = is the worst case time for measuring one previously identified GSM carrier

T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

where

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ can be derived from the values in table 8.7 section 8.4.2.5.1.

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

5.4.2.3 Maximum interruption in FACH message reception

The UE shall perform the cell re-selection with minimum interruption in FACH message reception.

The UE shall not interrupt the FACH message reception during measurements required for cell re-selection The UE shall not interrupt the FACH message reception during the evaluation process of a cell required for a cell re-selection.

In case the UE reselects a cell the interruption time shall not exceed T_{SI}+50ms. T_{SI} is the longest repetition period for the system information to be read by the UE to camp on the cell.

5.4.3 Requirements for 1.28Mcps TDD option

P-CCPCH RSCP shall be used for cell reselection in Cell-FACH state to another TDD cell, CPICH RSCP and if requested in addition CPICH Ec/Io shall be used for re-selection to a FDD cell and GSM carrier RSSI shall be used for cell re-selection to a GSM cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in chapter 9.

5.4.3.1 Measurements

The UE measurement capability according to section 8.4A shall apply.

5.4.3.2 Cell re-selection delay

For TDD, the cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts to send SYNCH-UL sequence for sending the RRC CELL UPDATE message to the UTRAN.

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

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

5.4.3.2.1 Intra-frequency cell re-selection

The cell re-selection delay in CELL_FACH state for intra frequency cells shall be less than:

$$T_{reselection,\,intra} = T_{identify\ \ intra} + 40ms + T_{SI} + T_{RA}$$

If a cell has been detectable at least for $T_{identify,intra}$, the cell re-selection delay in CELL_FACH state for intra frequency cells shall be less than:

$$T_{reselection,intra} = T_{Measurement\ Period\ Intra} + 40ms + T_{SI} + T_{RA}$$

where

$T_{identify\ intra}$ = Specified in 8.4A.2.2.1

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

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

5.4.2.3.2 Inter-frequency TDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency TDD cells shall be less than:

$$T_{reselection,TDD,inter} = T_{identify\ inter} + 40ms + T_{SI} + T_{RA}$$

If a cell has been detectable at least for $T_{identify,inter}$, the cell re-selection delay in CELL_FACH state for inter frequency cells shall be less than:

$$T_{reselection,TDD,inter} = T_{measurement\ inter} + 40ms + T_{SI} + T_{RA}$$

where

$T_{identify_inter}$ = Specified in 8.4A.2.3.1

$T_{measurement\ inter}$ = Specified in 8.4A.2.3.2

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

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

5.4.2.3.3 Inter-frequency FDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency FDD cells shall be less than:

$$T_{reselection,FDD} = T_{identify\ FDD\ inter} + T_{SI} + T_{RA}$$

where

$T_{identify\ FDD\ inter}$ = Specified in 8.4A.2.4.1

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

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

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

5.4.2.3.4 Inter-RAT cell re-selection

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

$$T_{reselection,GSM} = T_{identify\ GSM} + T_{Measurement\ GSM} + T_{SI}$$

where

$T_{identify\ GSM}$ = Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.

$T_{Measurement\ GSM}$ is the worst case time for measuring one previously identified GSM carrier.

$$T_{Measurement\ GSM} = Max\left\{[480]ms, 8 \cdot \frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}} \cdot T_{meas}\right\}$$

where

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ can be derived from the values in table 8.7 section 8.4A.2.5.1.

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

T_{BCCH} = the maximum time allowed to read BCCH data from GSM cell [TS 45.008].

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

5.5 Cell Re-selection in Cell_PCH

5.5.1 Introduction

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

5.5.2 Requirements

5.5.2.1 3.84 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to TS25.331.

5.5.2.2 1.28 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1A, according to TS25.331.

5.6 Cell Re-selection in URA_PCH

5.6.1 Introduction

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

5.6.2 Requirements

5.6.2.1 3.84 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to TS25.331.

5.6.2.2 1.28 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1A, according to TS25.331.

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

6.3.1 3.84 Mcps TDD option

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.

6.3.2 1.28 Mcps TDD option

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 [6], but in worst case the UE shall be capable to measure [6] 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.

6A RRC Connection Control

6A.1 RRC Connection re-establishment

6A.1.1 Introduction

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

6A.1.2 Requirements

6A.1.2.1 3.84Mcps option

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

When the UE is in CELL_DCH state, the UE shall be capable of sending a CELL UPDATE message using the cause "radio link failure" within $T_{RE-ESTABLISH}$ seconds from when the CPHY-Out-Of-Synch primitive indicates lost synchronisation.

The RRC connection re-establishment delay requirement ($T_{RE-ESTABLISH-REQ}$) is defined as the time between the moment when the CPHY-Out-Of-Synch primitive indicates lost synchronisation, to when the UE starts to send a CELL UPDATE message using the cause "radio link failure" on the PRACH.

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

- the UE has had a dedicated connection to the cell during the last 5 seconds
- the cell has been measured by the UE during the last 5 seconds

The RRC connection re-establishment delay shall be less than

$50ms+T_{search}+ T_{SI}$

in case that the target cell is known by the UE, and

$50ms+T_{search}*NF + T_{SI}$

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

where

T_{search} is the time it takes for the UE to search the cell.

T_{search} =100 ms if the target cell is known by the UE, and

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

T_{SI} is the maximum repetition period of all relevant system information blocks that needs to be received by the UE to camp on a cell (ms).

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

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

6A.1.2.2 1.28Mcps TDD option

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

When the UE is in CELL_DCH state, the UE shall be capable of sending a CELL UPDATE message using the cause "radio link failure" within $T_{RE-ESTABLISH}$ seconds from when the CPHY-Out-Of-Synch primitive indicates lost synchronisation.

The RRC connection re-establishment delay requirement ($T_{RE-ESTABLISH-REQ}$) is defined as the time between the moment when the CPHY-Out-Of-Synch primitive indicates lost synchronisation, to when the UE starts to send SYNC-UL in the UpPTS for sending a CELL UPDATE message using the cause "radio link failure".

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

- the UE has had a dedicated connection to the cell during the last 5 seconds

- the cell has been measured by the UE during the last 5 seconds

The RRC connection re-establishment delay shall be less than

$50ms+T_{search} + T_{SI}$

in case that the target cell is known by the UE, and

$50ms+T_{search}*NF + T_{SI}$

in case that the target cell is unknown by the UE

where

T_{search} is the time it takes for the UE to search the cell.

T_{search} =100 ms if the target cell is known by the UE, and

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

T_{SI} is the maximum repetition period of all relevant system information blocks that needs to be received by the UE to camp on a cell (ms).

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

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

6A.2 Transport format combination selection in UE

6A.2.1 Introduction

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

6A.2.2 Requirements

6A.2.2.1 3.84 Mcps option

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given TFC. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.

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

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within [15 ms] from the moment the *Elimination* criterion was fulfilled.

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

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

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

$$(T_{notify} + T_{modify} + T_{L1_proc}).$$

where:

T_{notify} equals [15] ms, and

T_{modify} equals $MAX(T_{adapt_max}, T_{TTI})$, and

$T_{L1\ proc}$ equals 15 ms, and

T_{adapt_max} equals $MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N})$, and

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

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6A.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.1: T_{adapt}

Service	T_{adapt} [ms]
AMR	40

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.2.2.2 1.28 Mcps option

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given TFC. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.

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

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within [15 ms] from the moment the *Elimination* criterion was fulfilled.

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

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

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of (T_{notify} + T_{modify}+ T_{L1_proc}).

where:

T_{notify} equals [15] ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals 15 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

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

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6A.2 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6A.2: T_{adapt}

Service	T_{adapt} [ms]
AMR	40

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [5].

6A.3 Maximum allowed UL TX Power

6A.3.1 Introduction

UTRAN may limit the power the UE is using on the uplink by setting the maximum allowed UL TX power IE defined in TS25.331.

6A.3.2 Requirements

6A.3.2.1 3.84 Mcps option

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

6A.3.2.2 1.28 Mcps option

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

7 Timing characteristics

7.1 Timing Advance (TA) requirements

7.1.1 3.84 Mcps TDD option

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.

7.1.2 1.28 Mcps TDD option

For 1.28 Mcps TDD the timing advance in the UE is adjusted by means of uplink synchronization. For the random access procedure the node B commands the UE to adjust its synchronisation shift by means of signalling the received position of the UpPTS in the FPACH. During the connection the node B measures the timing in the uplink and transmits a SS (Synchronization Shift) command to the UE at least once per sub-frame.

These SS commands determined whether the UE synchronization shift is either left unchanged, or adjusted 1 step up or 1 step down. The step size of the SS adjustment is (k/8)Tc where k (=1,2, …,8) is signalled by higher layer signalling.

7.1.2.1 Uplink synchronization control requirements for UE for 1.28 Mcps TDD option

Uplink synchronization control is the ability of the UE transmitter to adjust its TX timing in accordance with one or more SS commands received in the downlink.

7.1.2.1.1 Uplink synchronization control steps

The SS step is the change in UE transmission timing in response to a single SS command, SS_cmd, received by the UE.

7.1.2.1.1.1 Minimum requirement

The UE transmitter shall have the capability of changing the transmission timing with a step size of 1/8, 2/8, 3/8, …, 1 chip according to the value of Δ_{SS}, n=(1,2,…,14) time slot after the SS_cmd arrived (closed loop). For the open loop any step being a multiple of 1/8 chip has to be allowed.

(a) The minimum transmission timing step $\Delta_{SS,min}$ due to closed loop uplink synchronization control shall be within the range shown in Table 7.1.

(b) In case uplink synchronization control implies to perform a bigger step than the minimum step the UE shall perform the a multiple number of minimum steps m. Within the implementation grid of the applicable timing steps of the UE the step being closest to the required step should be executed.

Table 7.1: Uplink synchronisation control range

SS_cmd	Uplink synchronisation control range for minimum step	
	1/8 chip step size	
	Lower	Upper
Up	1/9 chip – 0.1 ppm	1/7 chip + 0.1 ppm
Down	1/9 chip – 0.1 ppm	1/7 chip + 0.1 ppm

7.1.2.1.2 Timing Advance (T_{ADV}) for 1.28 Mcps TDD

This measurement refers to TS25.225 subsection 5.1.14.

7.1.2.1.2.1 Accuracy requirements

Table 7.2

Parameter	Unit	Accuracy	Conditions
			Range [chips]
Timing Advance	Chips period	+/- 0.125	0, …, 255.875

7.1.2.1.2.2 Range/mapping

The reporting range for *Timing Advance* is from 0 ... 255.875 chips.

In table 7.3 the mapping of the measured quantity is defined. The signalling range may be larger than the guaranteed accuracy range.

Table 7.3

Reported value	Measured quantity value	Unit
TIMING_ADVANCE_0000	Timing Advance < 0	chip
TIMING_ADVANCE_0001	0 ≤ Timing Advance < 0.125	chip
TIMING_ADVANCE_0002	0.125 ≤ Timing Advance < 0.25	chip
…	…	…
TIMING_ADVANCE_1024	127.875≤ Timing Advance < 128	chip
…	…	…
TIMING_ADVANCE_2045	255.625 ≤ Timing Advance < 255.75	chip
TIMING_ADVANCE_2046	255.75 ≤ Timing Advance < 255.875	chip
TIMING_ADVANCE_2047	255.875 ≤ RX Timing Advance	chip

NOTE: This measurement can be used for timing advance (synchronisation shift) calculation for uplink synchronisation or location services.

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 on the same frequency that have overlapping coverage areas.

7.2.2 Minimum requirements

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

7.3 UE Transmit Timing for 3.84 Mcps TDD Option

7.3.1 Definition

UE transmit timing is defined as the frame start time of uplink transmissions relative to the downlink frame timing at zero propagation delay with timing advance turned off. The reference point for UE transmit timing shall be the antenna connector. This is applicable for the AWGN propagation condition. In the case of multi-path fading conditions, the reference point for UE transmit timing shall be the first significant path of the received PCCPCH.

7.3.2 Minimum Requirement

The UE transmit timing error shall be within 0 to +3 chips for the AWGN propagation condition.

8 UE Measurements Procedures

8.1 Measurements in CELL_DCH State (3.84 Mcps option)

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.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

The UE shall be able to monitor up to

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

Performance requirements for different types of measurements and different number of cells are defined in the following sections.

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

8.1.2.2 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.

8.1.2.2.1 Identification of a new cell

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

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

8.1.2.2.2 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. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

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

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

T_{Intra} : This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.

$T_{basic_identify_TDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

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 Periodic Reporting

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

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

8.1.2.2.5 Event Triggered Reporting

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

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

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

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1.2.2.1. When L3 filtering is used an additional delay can be expected..

If a cell has been detectable at least for the time period $T_{identify\ intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Intra}$ when the L3 filter has not been used.

8.1.2.3 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.

8.1.2.3.1 Identification of a new cell

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

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

8.1.2.3.2 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

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

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 (representing a time corresponding to an integer number of full slots) 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 and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

$T_{basic_identify_TDD,inter}$ = 800ms. 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. (side conditions are defined in subclause 8.1.2.6).

$T_{basic_measurement_TDD\ inter}$ = 50 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 inter frequency measurement control information.

8.1.2.3.3 Periodic Reporting

Reported measurements in periodically triggered 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 8.1.2.3.4 Event Triggered Reporting.

8.1.2.3.4 Event Triggered Reporting

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

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

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

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected.If a cell has been detectable at least for the time period $T_{identify_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Inter}$ when the L3 filter has not been used.

8.1.2.4 FDD measurements

The requirements in this section apply only to UE supporting both TDD and FDD mode.

In the CELL_DCH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.1.2.4.1 Identification of a new cell

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

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

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

8.1.2.4.2 Measurement period

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

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

$T_{Measurement_Period\ FDD\ inter}$ = 480 ms. The period used for calculating the measurement period $T_{measurement_FDD\ inter}$ for inter frequency CPICH measurements.

$T_{FDD\ inter:}$ This is the minimum time as full slots that is available for inter frequency measurements, during the period $T_{Measurement_Period\ FDD\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

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

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

N_{Freq}: Number of FDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

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

8.1.2.4.4 Event Triggered Reporting

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

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

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that 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 uncertanty is twice the TTI of the uplink DCCH.

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

If a cell has been detectable at least for the time period $T_{identify_FDD\ inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ FDD\ Inter}$ provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.

8.1.2.5 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” according to section 8.1.2.5.2 "BSIC verification". 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 according to section 8.1.2.5.2 "BSIC verification"

If the UE does not need to perform GSM measurements in the idle intervals only, the requirements of handover measurements in TS 45.008 shall apply.

8.1.2.5.1 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 TS 45.008, when the given measurement time allows the UE to the take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.1

Idle Interval Length (slots)	Number of GSM carrier RSSI meaqsurements
3	1
4	2
5	3
7	6
10	10
13	14

For the description of the idle intervals see Annex A of 25.225.
In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

8.1.2.5.2 BSIC verification

The procedure for BSIC verification on a GSM cell can be divided into 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 TDD 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). The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.1,"Initial BSIC identification".

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). The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.2, "BSIC re-confirmation".

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

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as “non-verified”. The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

8.1.2.5.2.1 Initial BSIC identification

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

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

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

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

The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier 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 *$T_{identify\ abort}$, with

$T_{identify\ abort}$ = 5000 ms. This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

8.1.2.5.2.2 BSIC re-confirmation

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

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

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, priority shall be given to the least recently decoded BSIC.

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

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.

$T_{re\text{-}confirm\ abort}$ =5000 ms. This is the BSIC reconfirmation interval.

It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

8.1.2.6 TDD Synchronisation to new cells

Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.

These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.

The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:

$$\left.\left(\frac{P-CCPCH_E_c}{I_o}\right)\right|_{in\ dB} \geq -8dB$$

$$\left.\left(\frac{SCH_E_c}{I_o}\right)\right|_{in\ dB} \geq -13dB$$

where the received P-CCPCH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH_E_c}{I_o}\right)\Bigg|_{in\ dB} = \left(\frac{SCH_E_c}{I_{or}}\right)\Bigg|_{in\ dB} - \frac{I_o}{\left(\hat{I}_{or}\right)}\Bigg|_{in\ dB}$$

and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

8.1A Measurements in CELL_DCH State (1.28 Mcps option)

8.1A.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 8.2A. For the description of the idle intervals see TS 25.225, Annex A.

8.1A.2 Requirements

8.1A.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells, and
- 32 inter frequency cells, including
- TDD mode cells distributed on up to [x] additional TDD carriers and
- Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.

Depending on UE capability, the UE shall also in addition be able to support and process at least 32 GSM cells distributed on up to 32 GSM carriers.

Performance requirements for different types of measurements and different number of cells are defined in the following sections.

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

8.1A.2.2 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 used for inter frequency measurements.

8.1A.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

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

8.1A.2.2.2 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. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

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

$T_{Measurement_Period,\ Intra}$ = [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. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.

$T_{basic_identify_TDD,\ intra}$ = [800] ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1A.2.6).

8.1A.2.2.3 Periodic Reporting

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

8.1A.2.2.4 Event-triggered Periodic Reporting

Reported measurements 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 8.1A.2.2.5 Event Triggered Reporting.

8.1A.2.2.5 Event Triggered Reporting

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

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

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

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1A.2.2.1. When L3 filtering is used an additional delay can be expected..

If a cell has been detectable at least for the time period $T_{identify\ intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Intra}$ when the L3 filter has not been used.

8.1A.2.3 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.

8.1A.2.3.1 Identification of a new cell

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

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

8.1A.2.3.2 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

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

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

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

$T_{\text{Inter:}}$ This is the minimum time available for inter frequency measurements during the period $T_{\text{Measurement_Period inter}}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming [2*0.1] ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

$T_{\text{basic_identify_TDD,inter}}$ = [800]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. (side conditions are defined in subclause 8.1A.2.6).

$T_{\text{basic_measurement_TDD inter}}$ = [50] 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 inter frequency measurement control information.

8.1A.2.3.3 Periodic Reporting

Reported measurements in periodically triggered 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 8.1A.2.3.4 Event Triggered Reporting.

8.1A.2.3.4 Event Triggered Reporting

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

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

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

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in Section 8.1A.2.3.1. When L3 filtering is used an additional delay can be expected. If a cell has been detectable at least for the time period $T_{identify_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Inter}$ when the L3 filter has not been used.

8.1A.2.4 FDD measurements

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

In the CELL_DCH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.1A.2.4.1 Identification of a new cell

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

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

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

8.1A.2.4.2 Measurement period

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

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

$T_{Measurement_Period\ FDD\ inter}$ = [480] ms. The period used for calculating the measurement period $T_{measurement_FDD\ inter}$ for inter frequency CPICH measurements.

$T_{FDD\ inter:}$ This is the minimum time that is available for inter frequency measurements, during the period $T_{Measurement_Period\ FDD\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and is calculated by assuming [2*0.1] ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

$T_{basic_identify_FDD,inter}$ = [800] ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

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

N_{Freq}: Number of FDD frequencies indicated in the inter frequency measurement control information.

8.1A.2.4.3 Periodic Reporting

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

8.1A.2.4.4 Event Triggered Reporting

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

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

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that 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 uncertanty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify FDD inter}}$ defined in Section 8.1A.2.4.1. When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{\text{identify_FDD inter}}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement_Period FDD Inter}}$ provided the timing to that cell has not changed more than +/-32 chips while transmission gap has not been available and the L3 filter has not been used.

8.1A.2.5 GSM measurements

The requirements in this section applies only to UE supporting 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” according to section 8.1A.2.5.2 "BSIC verification". 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 according to section 8.1A.2.5.2 "BSIC verification"

If the UE does not need to perform GSM measurements in the idle intervals only, the requirements of handover measurements in TS 45.008 shall apply.

8.1A.2.5.1 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 8.1A. 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 TS 45.008, when the given measurement time allows the UE to the take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.1A

Idle Interval Length (slots)	Number of GSM carrier RSSI meaqsurements
3	[1]
4	[2]
5	[3]

For the description of the idle intervals see Annex A of 25.225.
In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least [3] samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

8.1A.2.5.2 BSIC verification

The procedure for BSIC verification on a GSM cell can be divided into 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 TDD 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). The requirements for Initial BSIC identification can be found in section 8.1A.2.5.2.1,"Initial BSIC identification".

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). The requirements for Initial BSIC identification can be found in section 8.1A.2.5.2.2, "BSIC re-confirmation".

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

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as “non-verified”. The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

8.1A.2.5.2.1 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 are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of the [8] strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering.

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

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

The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier 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 $N * T_{\text{identify abort}}$, with

$T_{\text{identify abort}}$ = [5000] ms. This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

8.1A.2.5.2.2 BSIC re-confirmation

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

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

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM BCCH carrier within $T_{re\text{-}confirm_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM BCCH carrier. The GSM BCCH carrier shall be treated as a new GSM BCCH carrier with unidentified BSIC and the GSM BCCH carrier shall be moved to the initial BSIC decoding procedure, see section 8.1A.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

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.

$T_{re\text{-}confirm\ abort}$ =[5000] ms. This is the BSIC reconfirmation interval.

It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

8.1A.2.6 TDD Synchronisation to new cells

Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.

These time limits are used in the requirements for the measurements in paragraph 8.1A.2 as well as preconditions in paragraph 9.

The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:

$$\left.\left(\frac{P-CCPCH_E_c}{I_o}\right)\right|_{in\ dB} \geq [-8]dB$$

$$\left.\left(\frac{DwPCH_E_c}{I_o}\right)\right|_{in\ dB} \geq [-5]dB$$

where the received P-CCPCH E_c/I_o is defined as

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

and the received DwPTS E_c/I_o is defined as

$$\left.\left(\frac{DwPCH_E_c}{I_o}\right)\right|_{in\ dB} = \left.\left(\frac{DwPCH_E_c}{I_{or}}\right)\right|_{in\ dB} - \left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB}$$

8.2 Parallel Measurements in CELL_DCH State (3.84 Mcps option)

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

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

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 8.1.

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 UP	[]

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

8.2A Parallel Measurements in CELL_DCH State (1.28 Mcps option)

8.2A.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 8.1A. For the description of the idle intervals see TS 25.225, Annex A.

8.2A.2 Requirements

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

The UE shall be able to perform parallel measurements according to table 8.2A.

In addition to the requirements in table 8.2A the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8.1A.

Table 8.2A: 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 UP	[]

8.3 Capabilities for Support of Event Triggering and Reporting Criteria (3.84 Mcps option)

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.6.

For the measurement categories: Intra-frequency, Inter frequency and Inter-RAT the UE need not support more than 14 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Table 8.6: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Intra-frequency	4	Applicable for periodic reporting or TDD events (1G-1I).
Inter-frequency	6	Applicable for periodic reporting or Event 2A-2F
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

8.3A Capabilities for Support of Event Triggering and Reporting Criteria (1.28 Mcps option)

8.3A.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3A.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.6A.

For the measurement categories: Intra-frequency, Inter frequency and Inter-RAT the UE need not support more than 14 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Table 8.6A: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Intra-frequency	[4]	Applicable for periodic reporting or TDD events (1G-1I).
Inter-frequency	[6]	Applicable for periodic reporting or Event 2A-2F
Inter-RAT	[4]	Only applicable for UE with this capability
UE internal measurements	[8]	
Traffic volume measurements	[2 + (2 per Transport Channel)]	
Quality measurements	[2 per Transport Channel]	
UP measurements	[2]	Only applicable for UE with this capability.

8.4 Measurements in CELL_FACH State (3.84 Mcps option)

8.4.1 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.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

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

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 and idle intervals as described in TS 25.225 are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The time during the measurement occasions and idle intervals that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

The UE is required to measure periodically once every time period T_{meas} on each of the modes and systems, FDD interfrequency cells, TDD interfrequency cells and GSM carriers, for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1, within the measurement time T_{meas}

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot N_{TTI} \cdot \text{M_REP} \cdot 10\right] \text{ms}$$

where the following parameters are defined:

N_{TDD} = 0 or 1. If there are inter-frequency TDD cells in the neighbour list N_{TDD}=1, otherwise N_{TDD}=0.

N_{FDD} = 0 or 1. If the UE is capable of FDD and there are FDD cells in the neighbour list $N_{FDD}=1$ otherwise N_{FDD} =0.

N_{GSM} = 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, $N_{GSM}=1$, otherwise N_{GSM} =0.

M_REP is the Measurement Occasion cycle length in number of frames as specified in TS 25.331.

N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

8.4.2.2 TDD intra frequency measurements

During the CELL_FACH 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.

8.4.2.2.1 Identification of a new cell

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

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

8.4.2.2.2 UE P-CCPCH measurement capability

In the CELL_FACH 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. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{\text{measurement intra}}$ cells , where $Y_{\text{measurement intra}}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

$X_{\text{basic measurement TDD}}$ is specified in section 8.1.2.2.2

$T_{\text{Measurement_Period, Intra}}$ is specified in section 8.1.2.2.2

T_{Intra} : is specified in section 8.1.2.2.2

$T_{\text{basic_identify_TDD, intra}}$ is specified in section 8.1.2.2.2

8.4.2.2.3 Periodic Reporting

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

8.4.2.2.4 Event Triggered Reporting

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

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

8.4.2.3 TDD inter frequency measurements

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

8.4.2.3.1 Identification of a new cell

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

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

8.4.2.3.2 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

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

$T_{Measurement_Period\ Inter}$ is specified in section 8.1.2.3.2

$T_{\text{Inter FACH:}}$ This is the minimum time as full slots that is available for the inter frequency measurements during the period $T_{Measurement_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls.

$T_{basic_identify_TDD,inter}$ is specified in section 8.1.2.3.2

$T_{basic_measurement_TDD\ inter}$ is specified in section 8.1.2.3.2

N_{Freq} is specified in section 8.1.2.3.2

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

8.4.2.3.3 Periodic Reporting

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

8.4.2.3.4 Event Triggered Reporting

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

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

8.4.2.4 FDD measurements

The requirements in this section apply only to UE supporting both TDD and FDD mode.

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.4.2.4.1 Identification of a new cell

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

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

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

8.4.2.4.2 Measurement period

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

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

$T_{\text{Measurement_Period FDD inter}}$ is specified in section 8.1.2.4.2

$T_{\text{Inter FACH:}}$ is specified in section 8.4.2.3.2

$T_{\text{basic_identify_FDD,inter}}$ is specified in section 8.1.2.4.2

$T_{\text{basic_measurement_FDD inter}}$ is specified in section 8.1.2.4.2.

N_{Freq} is specified in section 8.1.2.4.2

8.4.2.4.3 Periodic Reporting

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

8.4.2.4.4 Event Triggered Reporting

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

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

8.4.2.5 GSM measurements

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

When signalled by UTRAN during CELL_FACH 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.

The measurement windows due to idle intervals and measurements occasions used for GSM measurements shall be scheduled as follows. 3 occasions out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement windows between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

For the UE performing GSM measurements, the requirements in TS 45.008 shall apply.

8.4.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall meet the minimum number of GSM carrier RSSI measurements specified in table 8.7. In the CELL_FACH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.7

Measurement Window Length (slots)	Number of GSM carrier RSSI measurements.
3	1
4	2
5	3
7	6
10	10
13	14
15	16
30	32
60	64
120	128

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

8.4.2.5.2 BSIC verification

The procedure for BSIC verification on a GSM cell can be divided into 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 TDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement windows. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1 Initial BSIC identification

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 measurement windows. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.2 BSIC re-confirmation

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

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as “non-verified”. The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

8.4.2.5.2.1 Initial BSIC identification

This measurement is performed in the measurement windows as described in 8.4.2.5.

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

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurements occasions allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

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

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

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 *$T_{identify\ abort}$, with

$T_{identify\ abort}$ is specified in section 8.1.2.5.

8.4.2.5.2.2 BSIC re-confirmation

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

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

For each measurement window allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the effective idle interval duration. If more than one BSIC can be decoded within the same measurement window, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

$T_{re\text{-}confirm\ abort}$ is specified in section 8.1.2.5.

It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.

8.4A Measurements in CELL_FACH State (1.28 Mcps option)

8.4A.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.

8.4A.2 Requirements

8.4A.2.1 UE Measurement Capability

The UE shall be able to monitor up to

- 32 intra frequency TDD cells, and
- 32 inter frequency cells, including
- TDD mode cells distributed on up to [x] additional TDD carriers and
- Depending on UE capability, FDD mode cells, distributed on up to 3 FDD carriers.

Depending on UE capability, the UE shall also in addition be able to support and process at least 32 GSM cells distributed on up to 32 GSM carriers.

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 and, in addition, idle intervals as described in TS 25.225 are used to find and measure on these cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The time during the measurement occasions and idle intervals that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

The UE is required to measure periodically once every time period T_{meas} on each of the modes and systems, FDD interfrequency cells, TDD interfrequency cells and GSM carriers, for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1, within the measurement time T_{meas}

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot N_{TTI} \cdot \mathrm{M_REP} \cdot 10\right] \mathrm{ms}$$

where the following parameters are defined:

N_{TDD}	= 0 or 1. If there are inter-frequency TDD cells in the neighbour list N_{TDD}=1, otherwise N_{TDD}=0.
N_{FDD}	= 0 or 1. If the UE is capable of FDD and there are FDD cells in the neighbour list N_{FDD}=*1* otherwise N_{FDD} =0.
N_{GSM}	= 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1,* otherwise N_{GSM} =0.
M_REP	is the Measurement Occasion cycle length in number of frames as specified in TS 25.331.
N_{TTI}	is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

8.4A.2.2 TDD intra frequency measurements

During the CELL_FACH 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 used for inter frequency measurements.

8.4A.2.2.1 Identification of a new cell

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

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

8.4A.2.2.2 UE P-CCPCH measurement capability

In the CELL_FACH 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. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

$X_{basic\ measurement\ TDD}$ is specified in section 8.1A.2.2.2

$T_{Measurement_Period,\ Intra}$ is specified in section 8.1A.2.2.2

T_{Intra} : is specified in section 8.1A.2.2.2

$T_{basic_identify_TDD,\ intra}$ is specified in section 8.1A.2.2.2

8.4A.2.2.3 Periodic Reporting

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

8.4A.2.2.4 Event Triggered Reporting

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

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

8.4A.2.3 TDD inter frequency measurements

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

8.4A.2.3.1 Identification of a new cell

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

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

8.4A.2.3.2 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

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

$T_{Measurement_Period\ Inter}$ is specified in section 8.1A.2.3.2

$T_{Inter\ FACH}$: This is the minimum time that is available for the inter frequency measurements during the period $T_{Measurement_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming [2*0.1] ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls.

$T_{basic_identify_TDD,inter}$ is specified in section 8.1A.2.3.2

$T_{basic_measurement_TDD\ inter}$ is specified in section 8.1A.2.3.2

N_{Freq} is specified in section 8.1A.2.3.2

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

8.4A.2.3.3 Periodic Reporting

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

8.4A.2.3.4 Event Triggered Reporting

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

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

8.4A.2.4 FDD measurements

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

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

8.4A.2.4.1 Identification of a new cell

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

$$T_{identify\ FDD\ \ inter} = Max\left\{[5000], T_{basic\ identify\ FDD\ inter} \cdot \frac{T_{Measurement\ \ Period\ \ FDD\ inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$

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

8.4A.2.4.2 Measurement period

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

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

$T_{Measurement_Period\ FDD\ inter}$ is specified in section 8.1A.2.4.2

$T_{Inter\ FACH:}$ is specified in section 8.4A.2.3.2

$T_{basic_identify_FDD,inter}$ is specified in section 8.1A.2.4.2

$T_{basic_measurement_FDD\ inter}$ is specified in section 8.1A.2.4.2.

N_{Freq} is specified in section 8.1A.2.4.2

8.4A.2.4.3 Periodic Reporting

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

8.4A.2.4.4 Event Triggered Reporting

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

In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.

8.4A.2.5 GSM measurements

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

When signalled by UTRAN during CELL_FACH 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.

The measurement windows due to idle intervals and measurements occasions used for GSM measurements shall be scheduled as follows. 3 occasions out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement windows between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

For the UE performing GSM measurements, the requirements in TS 45.008 shall apply.

8.4A.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall meet the minimum number of GSM carrier RSSI measurements specified in table 8.8. In the CELL_FACH state the measurement period for the GSM carrier RSSI measurement is [480] ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008, when the given measurement time allows the UE to take at least [3] GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.8

Measurement Window Length (slots)	Number of GSM carrier RSSI measurements.
3	[1]
4	[2]
5	[3]
7	[6]
15	[16]
30	[32]
60	[64]
120	[128]

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least [3] samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the

following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

8.4A.2.5.2 BSIC verification

The procedure for BSIC verification on a GSM cell can be divided into 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 TDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement windows. The requirements for Initial BSIC identification can be found in 8.4A.2.5.2.1 Initial BSIC identification

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 measurement windows. The requirements for Initial BSIC identification can be found in 8.4A.2.5.2.2BSIC re-confirmation.

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

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

8.4A.2.5.2.1 Initial BSIC identification

This measurement is performed in the measurement windows as described in 8.4A.2.5.

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

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurements occasions allocated for GSM initial BSIC identification according section 8.4A.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

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

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

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 $N * T_{\text{identify abort}}$, with

$T_{\text{identify abort}}$ is specified in section 8.1A.2.5.

8.4A.2.5.2.2 BSIC re-confirmation

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

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

For each measurement window allocated for GSM BSIC reconfirmation as described in 8.4A.2.5, the UE shall attempt to decode the BSIC falling within the effective idle interval duration. If more than one BSIC can be decoded within the same measurement window, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4A.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the [8] strongest GSM cells in the monitored list.

The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

$T_{re\text{-}confirm\ abort}$ is specified in section 8.1A.2.5.

It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.

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. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in 3GPP TS 25.102 annex A.
- 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.
- Single task reporting.
- Power control is active.

9.1 Measurements performance for UE

The requirements in this clause are applicable for a UE:

- in state CELL_DCH and state CELL_FACH.
- performing measurements according to section 8.
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS25.302.

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

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.

The accuracy requirements in table 9.1 are valid under the following conditions:

P-CCPCH RSCP ≥ -102 dBm.

The received signal levels on SCH and P-CCPCH are according the requirements in paragraph 8.1.2.6

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

The P-CCPCH_RSCP intra-frequency relative accuracy is defined as the P-CCPCH_RSCP measured from one cell compared to the P-CCPCH_RSCP measured from another cell on the same frequency.

The accuracy requirements in table 9.2 are valid under the following conditions:

P-CCPCH RSCP1,2 ≥ -102 dBm.

$$\left| \text{P - CCPCH RSCP1}|_{in\ dB} - \text{P - CCPCH RSCP2}|_{in\ dB} \right| \leq 20dB$$

Relative Io difference [dB] ≤ relative RSCP difference [dB]

The received signal levels on SCH and P-CCPCH are according the requirements in paragraph 8.1.2.6

It is assumed that the measurements of P-CCPCH RSCP1 and P-CCPCH RSCP2 can be performed within 20ms due to slot allocations in the cells concerned.

Table 9.2: P-CCPCH_RSCP intra-frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions	
		Normal condition	Extreme condition	Io [dBm]	relative RSCP difference [dbB]
P-CCPCH_RSCP	dBm	±1	±1	-94...-50	<2
		±2	±2		2...14
		±3	± 3		>14

The P-CCPCH_RSCP inter-frequency relative accuracy is defined as the P-CCPCH_RSCP measured from one cell compared to the P-CCPCH_RSCP measured from another cell on a different frequency.

The accuracy requirements in table 9.3 are valid under the following conditions:

P-CCPCH RSCP1,2 ≥ -102 dBm.

$$\left| \text{P - CCPCH RSCP1}|_{in\ dB} - \text{P - CCPCH RSCP2}|_{in\ dB} \right| \leq 20dB$$

The received signal levels on SCH and P-CCPCH are according the requirements in paragraph 8.1.2.6

Table 9.3: P-CCPCH_RSCP inter-frequency relative accuracy

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

9.1.1.1.3 Range/mapping

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

In table 9.4 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.4

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* measurements. The requirements in this section are valid for terminals supporting this capability.

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

9.1.1.2.1 CPICH RSCP

9.1.1.2.1.1 Inter frequency measurement absolute accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

CPICH_RSCP1$|_{\text{dBm}}$ ≥ -114 dBm.

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left. \left(\frac{CPICH_E_c}{I_{or}} \right) \right|_{in\ dB} \leq 20dB$$

Table 9.5: CPICH_RSCP Inter frequency absolute accuracy

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

9.1.1.2.1.2 Range/mapping

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

In table 9.6 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.6

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 relative accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency.

The accuracy requirements in table 9.7 are valid under the following conditions:

CPICH_RSC1,2 ≥ -114 dBm.

$$\left| CPICH_RSCP1\big|_{in\ dB} - CPICH_RSCP2\big|_{in\ dB} \right| \le 20dB$$

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

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

Table 9.7: CPICH Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.1.2.2.2 Range/mapping

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

In table 9.8 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.8

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 _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/Io _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/Io _49	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 9.9: 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 9.10 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.10

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 9.11: 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 9.12 are valid under the following conditions:

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

Table 9.12: UTRA carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dB	± 7	± 11	-94...-70

9.1.1.4.3 Range/mapping

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

In table 9.13 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.13

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 8.1.2.5 and 8.1A.2.5. The measurement period for CELL_FACH state can be found in section 8.4.2.5 and 8.4A.2.5..

If the UE, in CELL_DCH state, does not need idle intervals to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 45.008 shall apply.

If the UE, in CELL_DCH state needs idle intervals to perform GSM measurements, the measurement accuracy requirement is stated in section 8.1.2.5 and 8.1A.2.5.

If the UE, in CELL_FACH state, does not need measurement occasions and/or idle intervals to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 45.008 shall apply.

If the UE, in CELL_FACH state needs measurement occasions and/or idle intervals to perform GSM measurements, the measurement accuracy requirement is stated in section 8.4.2.5 and and 8.4A.2.5.

The reporting range and mapping specified for RXLEV in TS 45.008 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 9.14: 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 dB.

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

Table 9.16

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

9.1.1.8.1.1 3.84 Mcps TDD option

The accuracy requirement in table 9.17 is valid under the following conditions:

P-CCPCH_RSCP1,2 ≥ -102 dBm..

$$\left| \text{P - CCPCH RSCP1}\big|_{in\ dB} - \text{P - CCPCH RSCP2}\big|_{in\ dB} \right| \leq 20dB$$

The received signal levels on SCH and P-CCPCH are according the requirements in paragraph 8.1.2.6.

Table 9.17: 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

9.1.1.8.1.2 1.28 Mcps TDD option

Table 9.17A: SFN-SFN observed time difference accuracy

Parameter	Unit	Accuracy	Conditions
			Io [dBm]
SFN-SFN observed time difference	Chip	+/-0,5 for type 1 but +/- 0.125 for type 2	-94...-50

9.1.1.8.2 Range/mapping

9.1.1.8.2.1 3.84 Mcps TDD option

The reporting range for *SFN-SFN observed time difference type 1* is from 0 ... 9830400 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
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 9.19 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.19

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

9.1.1.8.2.2 1.28 Mcps TDD option

The reporting range for *SFN-SFN observed time difference type 1* is from 0 ... 3276800 chip.

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

Table 9.18A

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 _3276797	3276797 ≤ SFN-SFN observed time difference type 1 < 3276798	chip
T1_SFN-SFN_TIME _3276798	3276798 ≤ SFN-SFN observed time difference type 1 < 3276799	chip
T1_SFN-SFN_TIME _3276799	3276799 ≤ SFN-SFN observed time difference type 1 < 3276800	chip

The reporting range for *SFN-SFN observed time difference type 2* is from –6400 ... +6400 chip.

In table 9.19A mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.19A

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -6400,00	chip
T2_SFN-SFN_TIME _00001	-6400,00 ≤ SFN-SFN observed time difference type 2 < -6399,75	chip
T2_SFN-SFN_TIME _00002	-6399,75 ≤ SFN-SFN observed time difference type 2 < -6399,50	chip
…	…	…
T2_SFN-SFN_TIME _51199	6399,50 ≤ SFN-SFN observed time difference type 2 < 6399,75	chip
T2_SFN-SFN_TIME _51200	6399,75 ≤ SFN-SFN observed time difference type 2 < 6400,00	chip
T2_SFN-SFN_TIME _51201	6400,00 ≤ SFN-SFN observed time difference type 2	chip

There are 3 kind of special time slot (DwPTS, UpPTS and GP) in 1.28 Mcps TDD frame structure. When calculation the SFN-SFN observed time difference in type 2, it needs to consider the position and affection of these 3 special time slots.

Let us suppose:

T_{RxTSi} : time of start of timeslot#0 received of the serving TDD cell i.

T_{RxTSk} : time of start of timeslot#0 received from the target UTRA cell k that is closest in time to the start of the timeslot of the serving TDD cell i.

SFN-SFN observed time difference = T_{RxTSk} - T_{RxTSi}, in chips, which means to calculate the the time difference of the start position of the current frame in cell i to the closest starting position of one frame in cell k.

Editor Note: Here in type 2 we only consider to measure the difference of two cells of 1.28 Mcps TDD. The measurement method is like that in TS25.215. In type 2 measurement of TS25.215, it measures the time difference of the start position of the P-CPICH of two cells. That is just something like in 1.28 Mcps TDD.

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 can be found in section 8.

9.1.1.9.1 Accuracy requirements

Table 9.20 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 9.21 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.21

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 UP

9.1.1.10.1 Accuracy requirement

9.1.1.10.1.1 3.84 Mcps TDD Option

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 9.22

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

9.1.1.10.1.2 1.28 Mcps TDD Option

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 9.22A

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 UP measurement report mapping

9.1.1.10.2.1 3.84 Mcps TDD Option

The reporting range for *UE GPS timing of Cell Frames for UP* is from 0 ... 2322432000000 chip.

In table 9.23 mapping of the measured quantity is defined.

Table 9.23

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for UP < 0,0625	chip
GPS_TIME_00000000000001	0,0625 ≤ UE GPS timing of Cell Frames for UP < 0,1250	chip
GPS_TIME_00000000000002	0,1250 ≤ UE GPS timing of Cell Frames for UP < 0,1875	chip
...	...	...
GPS_TIME_37158911999997	2322431999999,8125 ≤ UE GPS timing of Cell Frames for UP < 2322431999999,8750	chip
GPS_TIME_37158911999998	2322431999999,8750 ≤ UE GPS timing of Cell Frames for UP < 2322431999999,9375	chip
GPS_TIME_37158911999999	2322431999999,9375 ≤ UE GPS timing of Cell Frames for UP < 2322432000000,0000	chip

9.1.1.10.2.2 1.28 Mcps TDD Option

The reporting range for *UE GPS timing of Cell Frames for UP* is from 0 ... 774144000000 chip.

In table 9.23A mapping of the measured quantity is defined.

Table 9.23A

Reported value	Measured quantity value	Unit
GPS_TIME_0000000000000	UE GPS timing of Cell Frames for UP< 0,25	chip
GPS_TIME_0000000000001	0,25 ≤ UE GPS timing of Cell Frames for UP< 0,50	chip
GPS_TIME_0000000000002	0,50 ≤ UE GPS timing of Cell Frames for UP < 0,75	chip
...	...	...
GPS_TIME_3096575999997	774143999999,25 ≤ UE GPS timing of Cell Frames for UP < 774143999999,50	chip
GPS_TIME_3096575999998	774143999999,50 ≤ UE GPS timing of Cell Frames for UP < 774143999999,75	chip
GPS_TIME_3096575999999	774143999999,75 ≤ UE GPS timing of Cell Frames for UP < 774144000000,00	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

The accuracy requirements in tables 9.24 are valid under the following conditions:

P-CCPCH_RSCP1,2 ≥ -102dBm.

$$\left|\text{P - CCPCH RSCP1}\big|_{in\ dB} - \text{P - CCPCH RSCP2}\big|_{in\ dB}\right| \le 20dB$$

The received signal levels on SCH and P-CCPCH are according the requirements in paragraph 8.1.2.6

Table 9.24 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

The accuracy requirements in tables 9.25 are valid under the following conditions:

CPICH_RSCP1,2 ≥ -114 dBm.

$$\left|CPICH_RSCP1\big|_{in\ dB} - CPICH_RSCP2\big|_{in\ dB}\right| \le 20dB$$

The received signal levels on SCH and CPICH are according the requirements in paragraph 8.1.2.6

Table 9.25 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 9.26 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 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 9.27 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.27 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 9.28 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 ...+34 dBm.

In table 9.29 mapping of the measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.29

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 9.30 RSCP absolute accuracy

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

9.2.1.1.2 Relative accuracy requirements

The relative accuracy of RSCP in inter frequency case is defined as the RSCP measured from one UE compared to the RSCP measured from another UE.

Table 9.31 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 ...-57 dBm.

In table 9.32 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.32

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 _125	-58,0 ≤ RSCP < -57,5	dBm
RSCP_LEV _126	-57,5 ≤ RSCP < -57,0	dBm
RSCP_LEV _127	-57,0 ≤ RSCP	dBm

9.2.1.2 Timeslot ISCP

The measurement period shall be 100 ms.

9.2.1.2.1 Absolute accuracy requirements

Table 9.33: Timeslot ISCP Intra frequency absolute accuracy

Parameter	Unit	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...-57 dBm.

In table 9.34 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.34

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_125	-58,0 ≤ Timeslot_ISCP < -57,5	dBm
UTRAN_TS_ISCP_LEV_126	-57,5 ≤ Timeslot_ISCP < -57,0	dBm
UTRAN_TS_ISCP_LEV_127	-57,0 ≤ 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 9.35: 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 9.36 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.36

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 9.37: 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 9.38 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.38

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 table9.39 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 table9.39.

Table 9.39: 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 9.40 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.40

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

9.2.1.6.1.1 3.84 Mcps TDD option

Table 9.41: RX Timing Deviation accuracy

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

9.2.1.6.1.2 1.28 Mcps TDD option

Table 9.41A: RX Timing Deviation accuracy

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
RX Timing Deviation	Chips period	+/- 0.125	0, ..., 16

9.2.1.6.2 Range/mapping

9.2.1.6.2.1 3.84 Mcps TDD option

The reporting range for *RX Timing Deviation* is from -255,9375 ... 255,9375 chips.

In table 9.42 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.42

Reported value	Measured quantity value	Unit
RX_TIME_DEV_0000	RX Timing Deviation < –255,9375	chip
RX_TIME_DEV_0001	-255,9375≤ RX Timing Deviation < 255,875	chip
RX_TIME_DEV_0002	-255,875≤ RX Timing Deviation < –255,8125	chip
…	…	…
RX_TIME_DEV_4096	000,00≤ RX Timing Deviation <0,0625	chip
…	…	…
RX_TIME_DEV_8189	255,8125 ≤ RX Timing Deviation < 255,875	chip
RX_TIME_DEV_8190	255,875≤ RX Timing Deviation < 255,9375	chip
RX_TIME_DEV_8191	255,9375 ≤ RX Timing Deviation	chip

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

9.2.1.6.2.2 1.28 Mcps TDD option

The reporting range for *RX Timing Deviation* is from 0 .... 16 chips.

In table 9.42A mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.42A

Reported value	Measured quantity value	Unit
RX_TIME_DEV_000	0 ≤ RX Timing Deviation < 0,0625	chip
RX_TIME_DEV_001	0,0625 ≤ RX Timing Deviation < 0,125	chip
RX_TIME_DEV_002	0,125 ≤ RX Timing Deviation < 0,1875	chip
…	…	…
RX_TIME_DEV_253	15,8125 ≤ RX Timing Deviation < 15,875	chip
RX_TIME_DEV_254	15,875 ≤ RX Timing Deviation < 15,9375	chip
RX_TIME_DEV_255	15,9375 ≤ RX Timing Deviation	chip

NOTE: This measurement can be used for timing advance (synchronisation shift) calculation for uplink synchronisation or location services.

9.2.1.7 (void)

9.2.1.8 (void)

9.2.1.9 UTRAN GPS Timing of Cell Frames for UP

NOTE: This measurement is used for UP purposes.

The measurement period shall be [1] second.

9.2.1.9.1 Accuracy requirement

9.2.1.9.1.1 3.84 Mcps TDD Option

Three accuracy classes are defined for the UTRAN GPS Timing of Cell Frames for UP measurement, i.e. accuracy class A, B and C. The implemented accuracy class depends on the UP methods that are supported.

Table 9.43

Parameter	Unit	Accuracy [chip]	Conditions
UTRAN GPS timing of Cell Frames for UP	chip	Accuracy Class A: +/- [20000] chip Accuracy Class B: +/- [20] chip Accuracy Class C: +/- [X] chip	Over the full range

9.2.1.9.1.2 1.28 Mcps TDD Option

Three accuracy classes are defined for the UTRAN GPS Timing of Cell Frames for UP measurement, i.e. accuracy class A, B and C. The implemented accuracy class depends on the UP methods that are supported.

Table 9.43A

Parameter	Unit	Accuracy [chip]	Conditions
UTRAN GPS timing of Cell Frames for UP	chip	Accuracy Class A: +/- [5000] chip Accuracy Class B: +/- [5] chip Accuracy Class C: +/- [X] chip	Over the full range

9.2.1.9.2 Range/mapping

9.2.1.9.2.1 3.84 Mcps TDD Option

The reporting range for *UTRAN GPS timing of Cell Frames for UP* is from 0 ... 2322432000000 chip.

In table 9.44 the mapping of measured quantity is defined.

Table 9.44

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for UP < 0,0625	chip
GPS_TIME_00000000000001	0,0625 ≤ UTRAN GPS timing of Cell Frames for UP < 0,1250	chip
GPS_TIME_00000000000002	0,1250 ≤ UTRAN GPS timing of Cell Frames for UP < 0,1875	chip
…	…	…
GPS_TIME_37158911999997	2322431999999,8125 ≤ UTRAN GPS timing of Cell Frames for UP < 2322431999999,8750	chip
GPS_TIME_37158911999998	2322431999999,8750 ≤ UTRAN GPS timing of Cell Frames for UP < 2322431999999,9375	chip
GPS_TIME_37158911999999	2322431999999,9375 ≤ UTRAN GPS timing of Cell Frames for UP < 2322432000000,0000	chip

9.2.1.9.2.2 1.28 Mcps TDD Option

The reporting range for *UTRAN GPS timing of Cell Frames for UP* is from 0 ... 774144000000 chip.

In table 9.44A mapping of the measured quantity is defined.

Table 9.44A

Reported value	Measured quantity value	Unit
GPS_TIME_0000000000000	UTRAN GPS timing of Cell Frames for UP < 0,25	chip
GPS_TIME_0000000000001	0,25 ≤ UTRAN GPS timing of Cell Frames for UP < 0,50	chip
GPS_TIME_0000000000002	0,50 ≤ UTRAN GPS timing of Cell Frames for UP < 0,75	chip
...	...	...
GPS_TIME_3096575999997	774143999999,25 ≤ UTRAN GPS timing of Cell Frames for UP < 774143999999,50	chip
GPS_TIME_3096575999998	774143999999,50 ≤ UTRAN GPS timing of Cell Frames for UP <774143999999,75	chip
GPS_TIME_3096575999999	774143999999,75 ≤ UTRAN GPS timing of Cell Frames for UP < 774144000000,00	chip

9.2.1.10 SYNC-UL Timing Deviation for 1.28 Mcps

This measurement refers to TS25.225 subsection 5.2.8.1.

9.2.1.10.1 Accuracy requirements

Table 9.44AA

Parameter	Unit	Accuracy	Conditions
			Range [chips]
SYNC-UL Timing Deviation	chips period	+/- 0.125	0, …, 255.875

9.2.1.10.2 Range/mapping

The reporting range for *SYNC-UL Timing Deviation* is from 0 ... 255.875 chips.

In table 9.44B the mapping of the measured quantity is defined. Signaling range may be larger than the guaranteed accuracy range.

Table 9.44B

Reported value	Measured quantity value	Unit
SYNC_UL_TIME_DEV_0000	**SYNC-UL** Timing Deviation < 0	chip
SYNC_UL_TIME_DEV_0001	0 ≤ **SYNC-UL** Timing Deviation < 0.125	chip
SYNC_UL_TIME_DEV_0002	0.125 ≤ **SYNC-UL** Timing Deviation < 0.25	chip
…	…	…
SYNC_UL_TIME_DEV_1024	127.875 ≤ **SYNC-UL** Timing Deviation < 128	chip
…	…	…
SYNC_UL_TIME_DEV_2045	255.625 ≤ **SYNC-UL** Timing Deviation < 255.75	chip
SYNC_UL_TIME_DEV_2046	255.75 ≤ **SYNC-UL** Timing Deviation < 255.875	chip
SYNC_UL_TIME_DEV_2047	255.875 ≤ **SYNC-UL** Timing Deviation	chip

NOTE: This measurement can be used for timing advance (synchronisation shift) calculation for uplink synchronisation or location services.

9.2.1.11 Node B Synchronisation for 3.84 Mcps

Cell synchronisation burst timing is the time of start (defined by the first detected path in time) of the cell sync burst of a neighbouring cell. Type 1 is used for the initial phase of Node B synchronization. Type 2 is used for the steady-state phase of Node B synchronization. Both have different range.

The reference point for the cell sync burst timing measurement shall be the Rx antenna connector.

9.2.1.11.1 Cell Synchronisation burst timing Type1 and Type 2

Table 9.44C

Parameter	Unit	Accuracy [chip]	Conditions
Cell Synchronisation burst timing	chip	[+/-0,5 for both type 1 and type 2]	

9.2.1.11.2 Range/mapping Type 1

The reporting range for Cell Synchronisation burst timing type 1 is from -131072 to +131072 chips with 1/4 chip resolution.

In table 9.44D the mapping of measured quantity is defined for burst type 1.

Table 9.44D

Reported value	Measured quantity value	Unit
Burst_TIME__TYPE1_0000000	-131072 ≤ burst timing Type 2< -131071.75	chip
Burst_TIME__TYPE1_0000001	-131071.75 ≤ burst timing Type 2< -131071.5	chip
Burst_TIME__TYPE1_0000002	-131071.5 ≤ burst timing Type 2< -131071.25	chip
…	…	…
Burst_TIME__TYPE1_1048473	131071.25 ≤ burst timing Type 2< 131071.5	chip
Burst_TIME__TYPE1_1048574	131071.5 ≤ burst timing Type 2< 131071.75	chip
Burst_TIME__TYPE1_1048575	131071.75 ≤ burst timing Type 2< 131072	chip

9.2.1.11.3 Range/mapping Type 2

The reporting range for Cell Synchronisation burst timing type 2 is from –16 to +16 chips with 1/8 chip resolution. In table 9.44E the mapping of measured quantity is defined for burst type 2.

Table 9.44E

Reported value	Measured quantity value	Unit
Burst_TIME__TYPE2_0000	-16 ≤ burst timing Type 2< -15.875	chip
Burst_TIME__TYPE2_0001	-15.875 ≤ burst timing Type 2< -15.750	chip
Burst_TIME__TYPE2_0002	-15.750 ≤ burst timing Type 2< -15.625	chip
…	…	…
Burst_TIME__TYPE2_0253	15.625 ≤ burst timing Type 2< 15.750	chip
Burst_TIME__TYPE2_0254	15.750 ≤ burst timing Type 2< 15.875	chip
Burst_TIME__TYPE2_0255	15.875 ≤ burst timing Type 2< 16	chip

9.2.1.11.4 Cell Synchronisation burst SIR Type1 and Type2

Signal to Interference Ratio for the cell sync burst, defined according to TS25.225.

The reference point for the cell synchronisation burst SIR shall be the Rx antenna connector.

Table 9.44F

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	
Cell Synchronisation burst SIR	dB	±3 dB for both type 1 and 2	[ ]	

9.2.1.11.5 Range/Mapping for Type1 and Type 2

The reporting range for *SIR* is from 0 ... 60 dB with a resolution of 2dB.

In table 9.44H mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.44H

Reported value	Measured quantity value	Unit
Cell_Synch_Burst_SIR_00	SIR< 0	dB
Cell_Synch_Burst_SIR_01	0 ≤ SIR< 2	dB
Cell_Synch_Burst_SIR_02	2 ≤ SIR< 4	dB
…	…	…
Cell_Synch_Burst_SIR_29	56≤ SIR< 58	dB
Cell_Synch_Burst_SIR_30	58 ≤ SIR< 60	dB
Cell_Synch_Burst_SIR_31	60 ≤ SIR	dB

9.2.1.12 SFN-SFN observed time difference

The measurement period shall be 100 ms.

9.2.1.12.1 Accuracy requirements

9.2.1.12.1.1 3.84 Mcps TDD option

Table 9.44I: SFN-SFN observed time difference accuracy

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
SFN-SFN observed time difference	chip	+/-0,5	–1280 ... +1280

9.2.1.12.1.2 1.28 Mcps TDD option

Table 9.44J: SFN-SFN observed time difference accuracy

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
SFN-SFN observed time difference	Chip	+/- 0.125	–6400 ... +6400

9.2.1.12.2 Range/mapping

9.2.1.12.2.1 3.84 Mcps TDD option

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

In table 9.44K mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.44K

Reported value	Measured quantity value	Unit
SFN-SFN_TIME _00000	SFN-SFN observed time difference < -1280,0000	chip
SFN-SFN_TIME _00001	-1280,0000 ≤ SFN-SFN observed time difference < -1279,9375	chip
SFN-SFN_TIME _00002	-1279,9375 ≤ SFN-SFN observed time difference < -1279,8750	chip
…	…	…
SFN-SFN_TIME _40959	1279,8750 ≤ SFN-SFN observed time difference < 1279,9375	chip
SFN-SFN_TIME _40960	1279,9375 ≤ SFN-SFN observed time difference < 1280,0000	chip
SFN-SFN_TIME _40961	1280,0000 ≤ SFN-SFN observed time difference	chip

9.2.1.12.2.2 1.28 Mcps TDD option

The reporting range for *SFN-SFN observed time difference* is from –6400 ... +6400 chip.

In table 9.44L mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.44L

Reported value	Measured quantity value	Unit
SFN-SFN_TIME _00000	SFN-SFN observed time difference < -6400,00	chip
SFN-SFN_TIME _00001	-6400,00 ≤ SFN-SFN observed time difference < -6399,75	chip
SFN-SFN_TIME _00002	-6399,75 ≤ SFN-SFN observed time difference < -6399,50	chip
…	…	…
SFN-SFN_TIME _51199	6399,50 ≤ SFN-SFN observed time difference < 6399,75	chip
SFN-SFN_TIME _51200	6399,75 ≤ SFN-SFN observed time difference < 6400,00	chip
SFN-SFN_TIME _51201	6400,00 ≤ SFN-SFN observed time difference	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 9.45 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 9.46 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.46

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 9.47 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

The relative accuracy of transmitted code power is defined as the transmitted code power measured at one dedicated radio link compared to the transmitted code power measured from a different dedicated radio link in the same cell.

Table 9.48 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/mapping

The reporting range for *Transmitted code power* is from -10 ... 46 dBm.

In table 9.49 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.49

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

10 FPACH physical layer information field definition (1.28 Mcps TDD)

1.28 Mcps TDD introduces the FPACH (Forward Physical Access CHannel) which carries physical layer information. Two of these information fields are the 'received starting position of the UpPCH' (Uplink Pilot CHannel) and the 'transmit power level command for the RACH message'. Both information fields are directly (received starting position of the UpPCH) or can be indirectly (transmit power level command for the RACH message) derived from measurements but are no measurements themselves.

10.1 Received starting position of the UpPCH ($UpPCH_{POS}$) (1.28 Mcps TDD)

10.1.1 Range/mapping

Table 10.1

Range/mapping	$UpPCH_{POS}$ FIELD is given with a resolution of 1/8 chip with the range [0,255.875] chip. $UpPCH_{POS}$ FIELD shall be transmitted in the FPACH where: $UpPCH_{POS}$ FIELD_LEV_0000: $UpPCH_{POS}$ < 0 chip $UpPCH_{POS}$ FIELD_LEV_0001: 0 chip ≤ $UpPCH_{POS}$ < 0.125 chip $UpPCH_{POS}$ FIELD_LEV_0002: 0.125 chip ≤ $UpPCH_{POS}$ < 0.25 chip ... $UpPCH_{POS}$ FIELD_LEV_2045: 255.625 chip ≤ $UpPCH_{POS}$ < 255.75 chip $UpPCH_{POS}$ FIELD_LEV_2046: 255.75 chip ≤ $UpPCH_{POS}$ < 255.875 chip $UpPCH_{POS}$ FIELD_LEV_2047: 255.875 chip ≤ $UpPCH_{POS}$

10.1.2 Accuracy requirements

Table 10.2

Parameter	Unit	Accuracy	Conditions
			Range [chips]
Received starting position of the UpPCH	chips period	+/- 0.125	0, …, 255.875

10.2 Transmit Power Level Command for the RACH message (1.28 Mcps TDD)

10.2.1 Range/mapping

Table 10.3

Range/mapping	$PRX_{PRACH,des}$ FIELD is given with a resolution of 0.5 dB with the range [-120,-80] dBm. $PRX_{PRACH,des}$ FIELD shall be transmitted in the FPACH where: $PRX_{PRACH,des}$ FIELD_LEV_00: $PRX_{PRACH,des}$ < -120 dBm $PRX_{PRACH,des}$ FIELD_LEV_01: -120 dBm ≤ $PRX_{PRACH,des}$ < -119.5 dBm $PRX_{PRACH,des}$ FIELD_LEV_02: -119.5 dBm ≤ $PRX_{PRACH,des}$ < -119 dBm ... $PRX_{PRACH,des}$ FIELD_LEV_78: -81 dBm ≤ $PRX_{PRACH,des}$ < -80.5 dBm $PRX_{PRACH,des}$ FIELD_LEV_79: -80.5 dBm≤ $PRX_{PRACH,des}$ < -80 dBm $PRX_{PRACH,des}$ FIELD_LEV_80: -80 dBm ≤ $PRX_{PRACH,des}$

10.2.2 Accuracy requirements

Since this is a desired RX power at the node B and this is no measured value and the derivation of this value in the node B is implementation specific, accuracy requirements are not applicable.

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

A.2.1.1 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 re-selection delay.
- In UTRAN Connected Mode Mobility (A.5) there is measurement reporting delay, handover delay and cell re-selection delay.
- In RRC Connection Control (A.6) there is RRC re-establishment delay. In case of 1,28Mcps TDD option there is also TFC blocking delay.

All have in common that the UE is required to perform an action observable in higher layers (e.g. camp on the correct cell) within a certain time after a specific event (e.g. a new strong pilot arises). The delay time is statistical in nature for several reasons, among others that measurements required by the UE are performed in a fading radio environment.

The variations make a strict limit unsuitable for a test. Instead there is a condition set for a correct action by the UE, e.g. that the UE shall camp on the correct cell within X seconds. Then the rate of correct events as observed during repeated tests shall be at least 90% in case of AWGN propagation condition. How the limit is applied in the test depends on the confidence required, further detailed are in TS 34.122.

A.2.1.2 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.

A.2.1.3 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)

A.2.1.4 Physical layer timing requirements

All requirements on "Timing Characteristics" (A.7) are absolute limits on timing accuracy.

A.2.1.5 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

NOTE: This section is included for consistency with numbering with section 4; no test covering requirements exist.

A.4.2 Cell Re-Selection

For each of the re-selection scenarios in section 4.2 a test is proposed.

For TDD/TDD cell reselection two scenarios are considered:

Scenario 1: Single carrier case

Scenario 2: Multi carrier case

A.4.2.1 Scenario 1: TDD/TDD cell re-selection 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.

A.4.2.1.1.1 3.84 Mcps TDD option

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.4.1and A.4.2. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.1: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table A.4.2: 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		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2,C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3,C6:0			
Qhyst 1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		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_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	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A.4.2.1.1.2 1.28 Mcps TDD option

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.4.1A and A.4.2A.

Table A.4.1A: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) -– Persistence value		0..1	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table A.4.2A: Cell re-selection single carrier multi-cell case

Parameter	**Unit**	**Cell 1**				**Cell 2**				**Cell 3**			
Timeslot Number		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		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		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-64]	[-66]			[-66]	[-64]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		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		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-74]	[-74]			[-74]	[-74]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/1.28 MHz	-70											
Propagation Condition		AWGN											

A.4.2.1.2 Test Requirements

A.4.2.1.2.1 3.84 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.1.2.2 1.28 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateNTDD} + T_{SI}$, where:

$T_{evaluateNTDD}$: A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ NTDD}$ of 6.4s according to Table 4.1A in section 4.2.

T_{SI}:Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.2 Scenario 2: TDD/TDD cell re-selection 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.

A.4.2.2.1.1 3.84 Mcps TDD option

This scenario implies the presence of 2 carriers and 6 cells as given in Table A.4.3 and A.4.4. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.3: General test parameters for Cell Re-selection in Multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.4.4: 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	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		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	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A.4.2.2.1.2 1.28 Mcps TDD option

This scenario implies the presence of 2 carriers and 6 cells as given in Table A.4.3A and A.4.4A. For this test purpose the broadcast repetition period of the target cell shall be [x] s. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.3A: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.4.4A: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		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		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-64]	[-66]			[-66]	[-64]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Qintrasearch	dB	not sent				not sent				not sent			
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel				Channel 2				Channel			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-74]	[-74]			[-74]	[-74]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Qintrasearch	dB	[not sent]				[not sent]				[not sent]			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A.4.2.2.2 Test Requirements

A.4.2.2.2.1 3.84 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.2.2.2 1.28 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateNTDD} + T_{SI}$, where:

$T_{evaluateNTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ NTDD}$ of 6.4s according to Table 4.1A in section 4.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.2A Scenario 2A: 3.84 Mcps TDD cell re-selection for 1.28 Mcps TDD UE

A.4.2.2A.1 Test Purpose and Environment

This test is to verify the requirement for the 1.28 Mcps TDD OPTION/TDD cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 low chip rate (1.28 Mcps TDD OPTION) and 1 high chip rate (TDD) cell as given in Table A.4.3B and A.4.4B.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.3B: General test parameters for TDD low chip rate to TDD high chip rate cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	1.28 Mcps TDD OPTION cell
	Neighbour cell		Cell2	TDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1,28	The value shall be used for all cells in the test.
DRX cycle length		s	1,28	The value shall be used for all cells in the test.

Table A.4.4B: Test parameters for TDD low chip rate to TDD high chip rate cell re-selection

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPts		0		8	
		T1	T2	T 1	T 2	T1	T2	T 1	T 2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0	n.a.		n.a.	
SCH_Ec/Ior	dB	n.a.		n.a.		-9	-9	-9	-9
SCH_t_{offset}		n.a.		n.a.		0	0	0	0
PICH_Ec/Ior	dB							-3	-3
OCNS_Ec/Ior	dB	n.a.		n.a.		-4,28	-4,28	-4,28	-4,28
$\hat{I}_{or}/I_{oc}$	dB	[10]	[7]			[7]	[10]	[7]	[10]
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dBm	[-63]	[-66]			[-66]	[-63]		
Qrxlevmin	dBm	-102				-102			
$Qoffset1_{s,n}$	dB	C1, C2: 0				C2, C1: 0			
$Qhyst1_s$	dB	0				0			
Treselection	s	0				0			
Propagation Condition		AWGN				AWGN			

A.4.2.2A.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The re-selection delay equals $T_{TDDevaluate} + T_{rep}$ repetition period of the broadcast information of the selected cell

A.4.2.3 Scenario 3: TDD/FDD cell re-selection

A.4.2.3.1 Test Purpose and Environment

A.4.2.3.1.1 3.84 Mcps TDD option

This test is to verify the requirement for the TDD/FDD cell re-selection delay reported in section 4.2.2.

This scenario implies the presence of 1 TDD and 1 FDD cell as given in Table A.4.5 and A.4.6.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	During T1 cell 1 better ranked than cell 2
T2		s	15	During T2 cell 2 better ranked than cell 1

Table A.4.6: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		**0**		**8**		**n.a**	**n.a.**
		T1	T2	T 1	T 2	T 1	T 2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12	-12
SCH_t_{offset}		0	0	0	0	n.a.	n.a.
PICH_Ec/Ior	dB			-3	-3	-15	-15
OCNS_EcIor	dB	-4,28	-4,28	-4,28	-4,28	-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	3	-2	3	-2	-2	3
I_{oc}	dBm/3.84 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection_and reselection_quality _measure		CPICH_RSCP				*CPICH_RSCP*	
Qrxlevmin	dBm	-102				-115	
Qoffset1$_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
Qhyst1$_s$	dB	0				0	
Treselection	s	0				0	
Propagation Condition		AWGN				AWGN	

NOTE: The purpose of this test case is to evaluate the delay of the TDD/FDD re-selection process, it is not intended to give reasonable values for a TDD/FDD cell re-selection.

A.4.2.3.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the 1.28 Mcps TDD OPTION/FDD cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 low chip rate TDD and 1 FDD cell as given in Table A.4.5A and A.4.6A.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5A: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	1.28 Mcps TDD OPTION cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.4.6A: Test parameters for the 1.28 Mcps TDD OPTION/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		DwPts		n.a.	
		T1	T2	T 1	T 2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
PCCPCH_Ec/Ior	dB	-3	-3			-12	-12
DwPCH_Ec/Ior	dB			0	0	n.a.	
CPICH_Ec/Ior	dB	n.a.		n.a.		-10	-10
SCH_Ec/Ior	dB	n.a.		n.a.		-12	-12
PICH_Ec/Ior	dB					-15	-15
OCNS_Ec/Ior	dB	n.a.		n.a.		-0,941	-0,941
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]			[ ]	[ ]
I_{oc}	dBm/1.28 MHz	-70					
PCCPCH_RSCP	dBm	[ ]	[ ]			n.a.	n.a.
CPICH_RSCP		n.a.				[ ]	[ ]
Cell_selection_and_reselection quality _measure		CPICH_RSCP				*CPICH_RSCP*	
Qrxlevmin	dBm	-102				-115	
$Qoffset1_{s,n}$	dB	C1, C2: -12				C2, C1: +12	
$Qhyst1_{s}$	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent					
Propagation Condition		AWGN					

A.4.2.3.2 Test Requirements

A.4.2.3.2.1 3.84 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See Table 4.1 in section 4.2.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.3.2.2 1.28 Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateFDD} + T_{SI}$, where:

$T_{evaluateFDD}$ See Table 4.1A in section 4.2.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.4.2.4 Scenario 4: inter RAT cell re-selection

A.4.2.4.1 Test Purpose and Environment

A.4.2.4.1.1 3.84 Mcps TDD option

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.4.7, A.4.8, A.4.9.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

For this test environment the ranking/mapping function indicated in the broadcast of cell 1 shall be in such a way as to enable the UE to evaluate that the TDD cell 1 is better ranked as the GSM cell 2 during T1 and the GSM cell 2 is better ranked than the TDD cell 1 during T2.

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.7: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	UTRAN cell
BCCH repetition period (GSM cell)		s	1,87	In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (TS 45.002)
T1		s	15	
T2		s	15	

Table A.4.8: 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	3	-2	3	-2
I_{oc}	dBm/3, 84 MHz	–70		–70	
PCCPCH RSCP	dBm	-70	-75		
Propagation Condition		AWGN		AWGN	
Treselection	s	0			
$Ssearch_{RAT}$	dB	not sent			

Table A.4.9: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	**T2**
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-70
RXLEV_ACCESS_MIN	dBm	-100	
MS_TXPWR_MAX_CCH	dBm	30	

NOTE: The purpose of this test case is to evaluate the delay of the TDD/GSM re-selection process, it is not intended to give reasonable values for a TDD/GSM cell re-selection.

A.4.2.4.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. Test parameters are given in Table A.4.7A, A.4.8A, A.4.9A.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

For this test environment the ranking/mapping function indicated in the broadcast of cell 1 shall be in such a way as to enable the UE to evaluate that the 1.28 Mcps TDD OPTION cell 1 is better ranked as the GSM cell 2 during T1 and the GSM cell 2 is better ranked than the 1.28 Mcps TDD OPTION cell 1 during T2.

Table A.4.7A: General test parameters for UTRAN (1.28 Mcps TDD OPTION) to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	
T1		s	15	
T2		s	15	

Table A.4 8A: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]
I_{oc}	dBm/1.28 MHz	–70		–70	
PCCPCH RSCP	dBm	[-64]	[-66]		
Propagation Condition		AWGN		AWGN	
Cell_selection_and_reselection_quality_measure		P-CCPCH RSCP			
Treselection	s	[ ]			
$Ssearch_{RAT}$	dB	[ ]			

Table A.4.9A: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-70
RXLEV_ACCESS_MIN	dBm	-100	
MS_TXPWR_MAX_CCH	dBm	30	

A.4.2.4.2 Test Requirements

A.4.2.4.2.1 3.84 Mpcs TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send LOCATION UPDATING REQUEST message to perform a Location update.

The cell re-selection delay shall be less than [8] s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The UE shall keep a running average of 4 measurements, thus gives 4*1280ms ($T_{measureGSM}$ Table 4.1), means 5.12 seconds can elapse from the beginning of time period T2 before the UE has finished the measurements to evaluate that the GSM cell fulfils the re-selection criteria.

The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.

A.4.2.4.2.2 1.28 Mpcs TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send LOCATION UPDATING REQUEST message to perform a Location update.

The cell re-selection delay shall be less than [8] s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The UE shall keep a running average of 4 measurements, thus gives 4*1280ms ($T_{measureGSM}$ Table 4.5), means 5.12 seconds can elapse from the beginning of time period T2 before the UE has finished the measurements to evaluate that the GSM cell fulfils the re-selection criteria.

The cell selection parameters in the BCCH of the GSM cell in system info 3 and 4 are transmitted at least every second.

A.5 UTRAN Connected Mode Mobility

A.5.1 TDD/TDD Handover

A.5.1.1 3.84Mcps TDD option

void

A.5.1.2 1.28Mcps TDD option

A.5.1.2.1 Handover to intra-frequency cell

A.5.1.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state as reported in section 5.1.2.1.2.

The test parameters are given in Table A.5.1.1 and A.5.1.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that PCCPCH RSCP and SFN-CFN observed timed difference shall be reported together. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at the beginning of T3 with a new active cell, cell 2.

Table A.5.1.1: General test parameters for intra-frequency handover

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2
Power Control			On	
Target quality value on DPCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
O		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table A.5.1.2: Cell specific test parameters for intra-frequency handover

Parameter	Unit	Cell 1						Cell 2					
Timeslot Number		**0**			**5**			**0**			**5**		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/Ior	dB	-3						-3					
DPCH_Ec/Ior	dB				Note1		n.a.				n.a.		Note1
OCNS		Note2			Note2			Note2			Note2		
$\hat{I}_{or}/I_{oc}$	dB	3			[x]			-Inf.	5				[x]
I_{oc}	dBm/ 1.28 MHz	-70											
PCCPCH_RSCP	dBm	-70						-Inf.	-68				
Propagation Condition		AWGN											

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

A.5.1.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than [40] ms from the beginning of time period T3.

The rate of correct handovers observed during repeated tests shall be at least 90%.

A.5.1.2.2 Handover to inter-frequency cell

A.5.1.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH as reported in section 5.1.2.1.2.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in tables A.5.1.3 and A.5.1.4 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed timed difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at beginning of T2 with a new active cell, cell 2.

Table A.5.1.3: General test parameters for inter-frequency handover

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2.2
Power Control			On	
Target quality value on DPCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dBm	-75	Absolute RSCP threshold for event 2C
O		dB	0	cell-individual-offset The value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	10	
T2		s	5	

TableA.5.1.4: Cell Specific parameters for inter-frequency handover

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		**0**		**5**		**0**		**5**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DPCH_Ec/Ior	dB			Note1	n.a.			n.a.	Note1
OCNS		Note2		Note2		Note2		Note2	
$\hat{I}_{or}/I_{oc}$	dB	3		[x]		6			[x]
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	-70				-67			
Propagation Condition		AWGN							

Note 1: The DPCH level is controlled by the power control loop

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.

A.5.1.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCH to cell 2 less than [40] ms from the beginning of time period T2.

The rate of correct handovers observed during repeated tests shall be at least 90%.

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 3.84 Mcps TDD option

A.5.4.1.1 Scenario 1: TDD/TDD cell re-selection single carrier case

A.5.4.1.1.1 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 5.4.2.2.1. The test parameters are given in Tables A.5.4.1 to A.5.4.4.

Table A.5.4.1: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1,28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table A.5.4.2: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	Kbps	24,4
Channel symbol rate	Ksps	12,2
Slot Format #	-	0
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Default Midamble

Table A.5.4.3: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolutional Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16

Table A.5.4.4: 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		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											
		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_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	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset**1**$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH shall not be located in TS0.

A.5.4.1.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the CELL UPDATE message with cause value “cell reselection“ in cell 2.

The cell re-selection delay shall be less than 2,5 s.

NOTE:

The cell re-selection delay can be expressed as: $T_{reselection,intra}=T_{identify\ intra} + T_{SI}$, where:

$T_{identify\ intra}$ Specified in 8.4.2.2.1, gives 800 ms for this test case.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 2,08s, allow 2,5 s in the test case.

A.5.4.1.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

A.5.4.1.2.1 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 the multi carrier case reported in section 5.4.2.2.2. The test parameters are given in Tables A.5.4.5 to A.5.4.8.

Table A.5.4.5: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1,28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table A.5.4.6: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	Kbps	24,4
Channel symbol rate	Ksps	12,2
Slot Format #	-	0
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Default Midamble

Table A.5.4.7: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolutional Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16

Table A.5.4.8: 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 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	9	3	9	3	3	9	3	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-70			-70	-64			-74	-74		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											
		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_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	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset**1**$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH shall not be located in TS0.

A.5.4.1.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the CELL UPDATE message with cause value “cell reselection“ in cell 2.

The cell re-selection delay shall be less than 7 s.

NOTE:

The cell re-selection delay can be expressed as: $T_{reselection,inter}=T_{identify\ inter} + T_{SI}$, where:

$T_{identify\ intra}$ Specified in 8.4.2.3.1, gives 5 s for this test case.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 6,28s, allow 7 s in the test case.

A.5.4.2 1.28 Mcps TDD option

A.5.4.2.1 One frequency present in neighbour list

A.5.4.2.1.1 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 5.4.3.2.1.

The test parameters are given in Tables A.5.4.9to A.5.4.12

Table A.5.4.9: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-103	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	5	
T2		s	5	

Table A.5.4.10: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	35.2
Channel symbol rate	ksps	17.6
Slot Format #	-	0; 2
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Common Midamble

Table A.5.4.11: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16

Table A.5.4.12: Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		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		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		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		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset**1**$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
I_{oc}	dBm/1.28 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH is located in an other downlink TS than TS0.

A.5.4.2.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST to perform a CELL UPDATE message with cause cell reselection.

The cell re-selection delay shall be less than [1.6] s.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as:

$$T_{reselection,intra} = T_{Measurement\ Period\ Intra} + 40ms + T_{SI} + T_{RA} \ ,$$

where:

$T_{Measurement\ Period\ Intra}$ Specified in 8.4A.2.2.2 gives [200]ms for this test case.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

T_{RA} The additional delay caused by the random access procedure described in TS25.224. In this test case the persistence value is 1 thus T_{RA} is set to 35ms in the test case.

This gives a total of 1.55s, allow 1.6s in the test case.

A.5.4.2.2 Two frequency present in neighbour list

A.5.4.2.2.1 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 Tables A.5.4.13 to A.5.4.16

Table A.5.4.13: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-103	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	10	
T2		s	15	

Table A.5.4.14: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	35.2
Channel symbol rate	ksps	17.6
Slot Format #	-	0; 2
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Common Midamble

Table A.5.4.15: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16

Table A.5.4.16: Cell specific test parameters for Cell re-selection in CELL_FACH state

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		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		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-64]	[-66]			[-66]	[-64]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2:C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3:C6:0			
$Qhyst1_s$	dBm	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
FACH measurement occasion cycle length		4				4				4			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
Inter-frequency FDD measurement indicator		FALSE				FALSE				FALSE			
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
UTRA RF Channel Number		Channel				Channel 2				Channel			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]
PCCPCH RSCP	dBm	[-74]	[-74]			[-74]	[-74]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, C5:0; C4:C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5:C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6:C5:0			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Qintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
FACH measurement occasion cycle length		4				4				4			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
Inter-frequency FDD measurement indicator		FALSE				FALSE				FALSE			
I_{oc}	dBm/1.28 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH is located in an other downlink TS than TS0..

A.5.4.2.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST to perform a CELL UPDATE message with cause cell reselection.

The cell re-selection delay shall be less than [2] s.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as:

$$T_{reselection,\,TDD,inter} = T_{measurement\ inter} + 40ms + T_{SI} + T_{RA} \ ,$$

where:

$T_{measurement\ inter}$ Specified in 8.4A.2.3.2 gives [480]ms for this test case.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

T_{RA} The additional delay caused by the random access procedure described in TS25.224. In this test case the persistence value is 1 thus T_{RA} is set to 35ms in the test case.

This gives a total of 1.84s, allow 2s in the test case.

A.5.5 Cell Re-selection in CELL_PCH

A.5.5.1 Scenario 1: TDD/TDD cell re-selection single carrier case

A.5.5.1.1 Test Purpose and Environment

A5.5.1.1.1 3.84Mcps TDD option

This test is to verify the requirement for the cell re-selection delay in CELL_PCH state in section 5.5.2.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.5.5and A.5.6.

Table A.5.5: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table A.5.6: 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		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		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_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	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A5.5.1.1.2 1.28Mcps TDD option

(void)

A.5.5.1.2 Test Requirements

A5.5.1.2.1 for 3.84Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the CELL UPDATE message with cause "cell reselection" in cell 2.

The cell re-selection delay shall be less than 8 s.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A5.5.1.2.2 1.28Mcps TDD option

void

A.5.5.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

A.5.5.2.1 Test Purpose and Environment

A.5.5.2.1.1 for 3.84Mcps TDD option

This test is to verify the requirement for the cell re-selection delay in CELL_PCH state in section 5.5.2.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.5.7 and A.5.8.

Table A.5.7: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.5.8: 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	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		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_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	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A.5.5.2.1.2 for 1.28Mcps TDD option

(void)

A.5.5.2.2 Test Requirements

A.5.5.2.2.1 for 3.84Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the CELL UPDATE message with cause "cell reselection" in cell 2.

The cell re-selection delay shall be less than 8 s.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.5.5.2.2.2 for 1.28Mcps TDD option

(void)

A.5.6 Cell Re-selection in URA_PCH

A.5.6.1 Scenario 1: TDD/TDD cell re-selection single carrier case

A.5.6.1.1 Test Purpose and Environment

A.5.6.1.1.1 for 3.84Mcps TDD option

This test is to verify the requirement for the cell re-selection delay in URA_PCH state in section 5.6.2.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.5.9 and A.5.10.

Cell1 and Cell2 shall belong to different UTRAN Registration Areas (URA).

Table A.5.9: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table A.5.10: 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		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		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_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	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A.5.6.1.1.2 for 1.28Mcps TDD option

(void)

A.5.6.1.2 Test Requirements

A.5.6.1.2.1 for 3.84Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the URA UPDATE message with URA update cause value “change of URA “ in cell 2.

The cell re-selection delay shall be less than 8 s.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.5.6.1.2.2 for 1.28Mcps TDD option

(void)

A.5.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

A.5.6.2.1 Test Purpose and Environment

A.5.6.2.1.1 for 3.84Mcps TDD option

This test is to verify the requirement for the cell re-selection delay in URA_PCH state in section 5.6.2.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.5.11 and A.5.12.

Table A.5.11: 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	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table A.5.12: 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	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		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_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	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

A.5.6.2.1.2 1.28Mcps TDD option

(void)

A.5.6.2.2 Test Requirements

A.5.6.2.2.1 3.84Mcps TDD option

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the URA UPDATE message with URA update cause "change of URA " in cell 2.

The cell re-selection delay shall be less than 8 s.

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$, where:

$T_{evaluateTDD}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 7.68 s, allow 8s in the test case.

A.5.6.2.2.2 1.28Mcps TDD option

(void)

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.6A RRC Connection Control

A.6A.1 RRC Connection re-establishment delay

A.6A.1.1 Test Purpose and Environment

A.6A.1.1.1 3.84Mcps TDD option

The purpose is to verify that the RRC connection re-establishment delay is within the specified limits. These tests will verify the requirements in section 6A.1.2.1.

The test parameters are given in table A.6A.1 and table A.6A.2 below. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively. At the start of time period T2, the dedicated channel is removed.

Table A.6A.1 General test parameters for RRC connection re-establishment delay, Test 1

Parameter	Unit	Value	Comment
Power Control		On	
Active cell		Cell 1	
N313	Frames	20	
N315	Frames	20	
T313	Seconds	0	
T_{SI}	ms	1280	
Monitored cell list size		24	Monitored set shall only include intra frequency neighbours, P-CCPCH RSCP of all cells in the monitored set shall be below –86dBm for this test case except cell 2.
Cell 2		included in monitored set	Cell parameters according table A6.2.
Reporting frequency	Seconds	4	
T1		10	
T2		6	

Table A.6A.2 Cell specific parameters for RRC connection re-establishment delay test, Test 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			
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	-13	3	-13	5	5	5	5
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-86			-68	-68		
Propagation Condition		AWGN							

NOTE: The DPCH of cell 1 is located in an other timeslot than 0 or 8, at the start of time period T2, the dedicated channel is removed.

Table A.6A.3 General test parameters for RRC connection re-establishment delay, Test 2

Parameter	Unit	Value	Comment
DCH Parameters		DL Reference measurement channel 12.2 kbps	Located in an other TS than 0 or 8
Power Control		On	
Active cell		Cell 1	
N313	Frames	20	
N315	Frames	20	
T313	Seconds	0	
T_{SI}	ms	1280	
Cells in the monitored set		24	P-CCPCH RSCP of all cells in the monitored set below –86dBm
Channels in the monitored set		Channel 1, Channel 2, Channel 3	
Cell 2		Located on channel 2, cell 2 not included in monitored set	Parameters according table A6.4
Reporting frequency	Seconds	4	
T1		10	
T2		6	

Table A.6A.4 Cell specific parameters for RRC connection re-establishment delay test, Test 2

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 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	-13	3	-13	5	5	5	5
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-86			-68	-68		
Propagation Condition		AWGN							

NOTE: The DPCH of cell 1 is located in an other timeslot than 0 or 8, at the start of time period T2, the dedicated channel is removed.

A.6A.1.1.2 for1.28Mcps TDD option

The purpose is to verify that the RRC connection re-establishment delay is within the specified limits. These tests will verify the requirements in section 6A.1.2.2.

The test parameters are given in table A.6A.5 and table A.6A.6 below. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively. At the start of time period T2, the dedicated channel is removed.

Table A.6A.5 General test parameters for RRC connection re-establishment delay, Test 1

Parameter	Unit	Value	Comment
DCH Parameters		DL Reference measurement channel 12.2 kbps	As specified in TS25.102, section A.2.2.2
Power Control		On	
Active cell		Cell 1	
N313	Frames	20	
N315	Frames	20	
T313	Seconds	0	
T_{SI}	ms	1280	
Monitored cell list size		24	Monitored set shall only include intra frequency neighbours
Cell 2		included in monitored set	Cell parameters according table A6.6
Reporting frequency	Seconds	4	
T1		10	
T2		6	

Table A.6A.6 Cell specific parameters for RRC connection re-establishment delay test, Test 1

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[-13]			[6]	[6]		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	[-70]	[-86]			[-67]	[-67]		
Propagation Condition		AWGN							

NOTE: The DPCH of cell 1 is located in an other timeslot than 0, at the start of time period T2, the dedicated channel is removed.

Table A.6A.7 General test parameters for RRC connection re-establishment delay, Test 2

Parameter	Unit	Value	Comment
DCH Parameters		DL Reference measurement channel 12.2 kbps	As specified in TS25.102, section A.2.2.2
Power Control		On	
Active cell		Cell 1	
N313	Frames	20	
N315	Frames	20	
T313	Seconds	0	
T_{SI}	ms	1280	
Cells in the monitored set		24	
Channels in the monitored set		Channel 1, Channel 2, Channel 3	
Cell 2		Located on channel 2, cell 2 not included in monitored set	Parameters according table A6.8
Reporting frequency	Seconds	4	
T1		10	
T2		6	

Table A.6A.8: Cell specific parameters for RRC connection re-establishment delay test, Test 2

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[-13]			[6]	[6]		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	[-70]	[-86]			[-67]	[-67]		
Propagation Condition		AWGN							

NOTE: The DPCH of cell 1 is located in an other timeslot than 0, at the start of time period T2, the dedicated channel is removed.

A.6A.1.2 Test Requirements

A.6A.1.2.1 3.84Mcps TDD option

A.6A.1.2.1.1 Test 1

The RRC connection re-establishment delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send of a CELL UPDATE message using the cause "radio link failure".

The RRC connection re-establishment delay shall be less than 1630 ms.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

N313 is the number in frames of consecutive "out of synch" indications from layer 1 for the established dedicated physical channel before starting timer T313. In this test case N313=20 frames, resulting in 200ms to be taken into account for the test case.

The RRC connection re- establishment delay can be expressed as: $50ms+T_{search} + T_{SI}$ where:

T_{search} is the time it takes for the UE to search the cell. T_{search} =100 ms in case of a known target cell.

T_{SI} Maximum repetition rate of relevant system information blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total delay of 1.63s in the test case.

A.6A.1.2.1.2 Test 2

The RRC connection re-establishment delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send of a CELL UPDATE message using the cause "radio link failure".

The RRC re-establishment delay shall be less than 3930 ms.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

N313 is the number in frames of consecutive "out of synch" indications from layer 1 for the established dedicated physical channel before starting timer T313. In this test case N313=20 frames, resulting in 200ms to be taken into account for the test case.

The RRC connection re-establishment delay can be expressed as: $50ms+T_{search}*NF + T_{SI}$ where:

T_{search} is the time it takes for the UE to search the cell. T_{search} =800 ms in case of an unknown target cell.

NF is the number of different frequencies in the monitored set. NF=3

T_{SI} Maximum repetition rate of relevant system information blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of 3.93s in the test case.

A.6A.1.2.2 for 1.28Mcps TDD option

A.6A.1.2.2.1 Test 1

The RRC connection re-establishment delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNC-UL in the UpPTS for sending a CELL UPDATE message using the cause "radio link failure".

The RRC connection re-establishment delay shall be less than 1630 ms.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

N313 is the number in frames of consecutive "out of synch" indications from layer 1 for the established dedicated physical channel before starting timer T313. In this test case N313=20 frames, resulting in 200ms to be taken into account for the test case.

The RRC connection re- establishment delay can be expressed as: $50ms+T_{search} + T_{SI}$ where:

T_{search} is the time it takes for the UE to search the cell. T_{search} =100 ms in case of a known target cell.

T_{SI} Maximum repetition rate of relevant system information blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total delay of 1.63s in the test case.

A.6A.1.2.2.2 Test 2

The RRC connection re-establishment delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNC-UL in the UpPTS for sending a CELL UPDATE message using the cause "radio link failure".

The RRC re-establishment delay shall be less than [3930] ms.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

N313 is the number in frames of consecutive "out of synch" indications from layer 1 for the established dedicated physical channel before starting timer T313. In this test case N313=20 frames, resulting in 200ms to be taken into account for the test case.

The RRC connection re-establishment delay can be expressed as: $50ms+T_{search}*NF + T_{SI}$ where:

T_{search} is the time it takes for the UE to search the cell. T_{search} =[800] ms in case of an unknown target cell.

NF is the number of different frequencies in the monitored set. NF=3

T_{SI} Maximum repetition rate of relevant system information blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

This gives a total of [3.93]s in the test case.

A.6A.2 Transport format combination selection in UE for 1.28Mcps TDD option

A.6.6A.2.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

A.6.6A.2.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6A.9 , A.6A.10 and Table A.6A.11 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6A.9 and A.6A.10 can be found in TS 34.108 section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table A.6A.9: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6A.10: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6A.11 General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
TPC step size	dB	1	
Maximum allowed UL TX power	dBm	21	
T1	s	30	
T2	s	10	

The test shall be performed in AWGN channel propagation conditions.

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.x.z shall be signalled to the UE.

During time period T1:

The system simulator shall ensure that the UE output power is commanded to be between 9to 10 dB below the UE Maximum allowed UL TX power.

During time period T2:

The system simulator shall continously send TPC_cmd=Up to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL_TFC8 to UL_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured.

A.6A.2.2 Test Requirements

A.6A.2.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within [TBD] ms from beginning of time period T2.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE: The delay from the begining of T2 can be expressed as: $T_{ramp} + T_{detect_block} + T_{notify} + T_{modify} + T_{L1_proc} + T_{align_TTI}$, where:

T_{ramp} Margin added for the increase of UE output power to the UE maximum power. A margin of 7 frames (70ms) is used, i.e. 14 TPC commands.

T_{detect_block} The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Limited TFC Set* criterion is fulfilled for UL_TFC8 and UL_TFC9. This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet.

T_{notify} Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.

T_{modify} Equal to $MAX(T_{adapt_max}, T_{TTI}) = MAX(0, 40)=40ms$

T_{adapt_max} Equals to 0ms for the case without codec.

T_{L1_proc} Equals 15ms.

T_{align_TTI} Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.

T_{TTI} See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of $(70 + T_{detect_block} + [15] + 40 + 15 + 40)$ ms from the beginning of T2.

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

A.8.1.1.1.1 3.84 Mcps TDD option

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. General test parameters are given in the table A.8.1A 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. The cell specific test parameters are given in Table A.8.1B below.

Table A.8.1A: General test parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8
Power Control		On	
Active cell		Cell 1	
Threshold used frequency	dB	-71	Absolute P-CCPCH RSCP threshold for event 1G
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

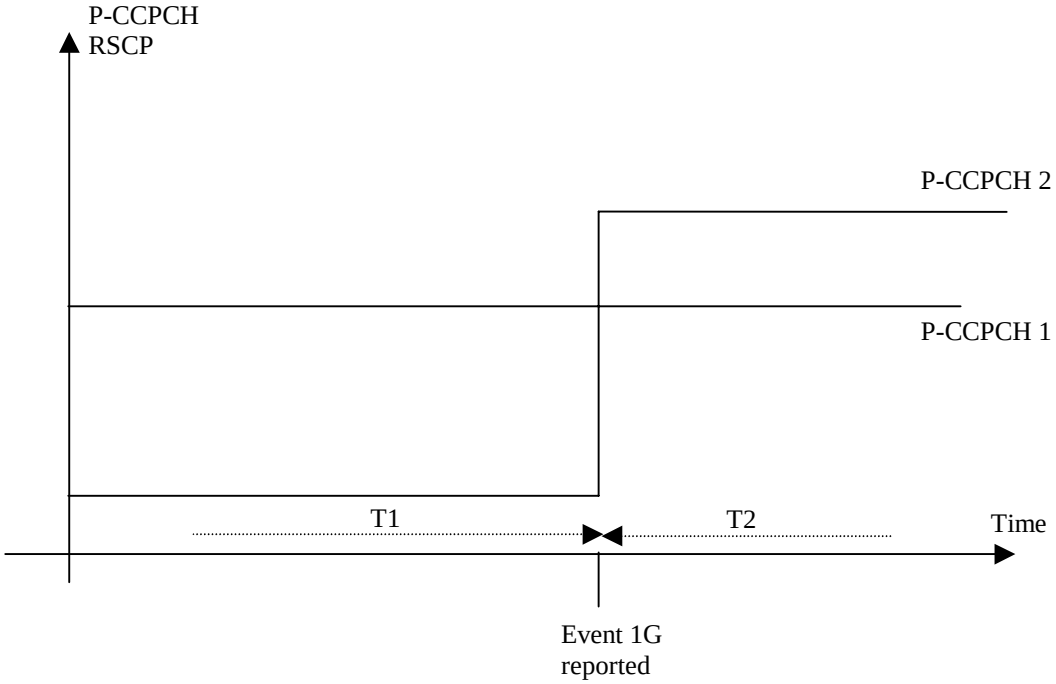

Figure A.8.1: Illustration of parameters for handover measurement reporting test case

Table A.8.1B: Cell specific parameters for correct reporting of intra frequency 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			
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		
Propagation Condition		AWGN							

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

A.8.1.1.1.2 1.28 Mcps TDD option

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. 8.1A. General test parameters are given in the table A.8.1C 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. The cell specific test parameters are given in Table A.8.1D below.

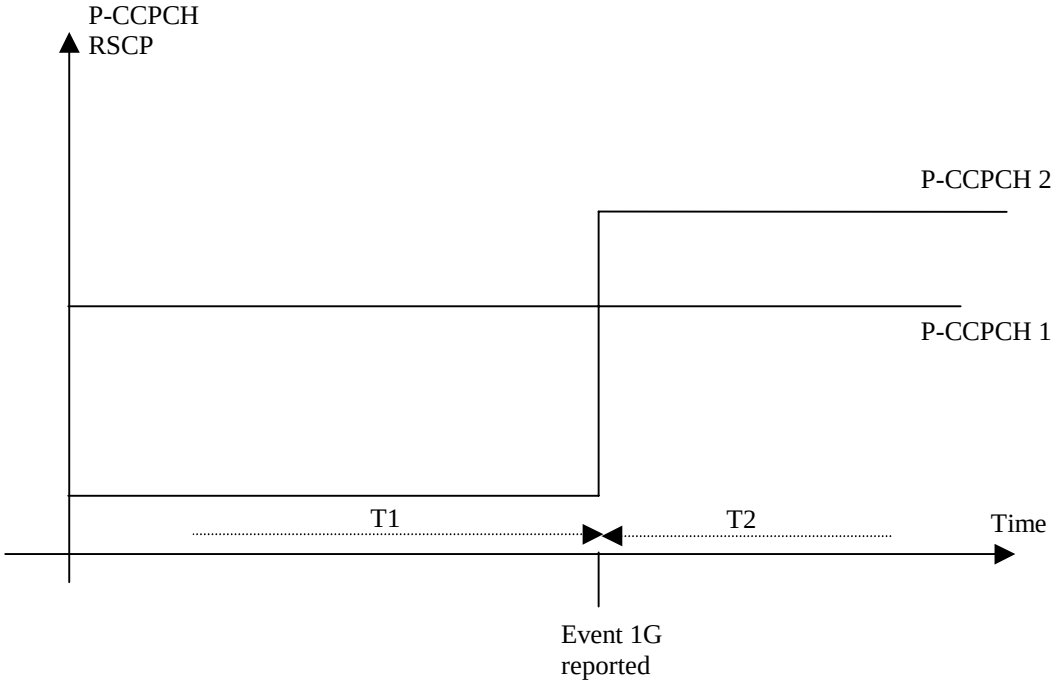

Figure A. 8.1A: Illustration of parameters for handover measurement reporting test case

Table A.8.1C: General test parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0
Power Control		On	
Active cell		Cell 1	
Threshold used frequency	dB	[-71]	Absolute P-CCPCH RSCP threshold for event 1G
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		[24]	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A. 8.1D: Cell specific parameters for correct reporting of intra frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	[-70]	[-70]			-Infinity	[-67]		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in a timeslot other than 0.

A.8.1.1.2 Test Requirements

A.8.1.1.2.1 3.84Mcps TDD option

The UE shall send one Event 1G triggered measurement report, with a measurement reporting delay less than 800 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.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.1.1.2.2 1.28Mcps TDD option

The UE shall send one Event 1G triggered measurement report, with a measurement reporting delay less than [800] 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.

The rate of correct events observed during repeated tests shall be at least 90%.

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

A.8.2.1.1.1 for 3.84Mcps TDD option

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". General test parameters are given in the table A.8.2A 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 cell specific test parameters are shown in Table A.8.2B.

Table A.8.2A: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-71	Absolute P-CCPCH RSCP threshold for event 2C
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.2B: 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 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	9	-Infinity	9
I_{oc}	dBm/3.84 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-64		
Propagation Condition		AWGN							

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

A.8.2.1.1.2 for 1.28Mcps TDD option

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.

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". General test parameters are given in the table A.8.2C 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 cell specific test parameters are shown in Table A.8.2D.

Table A.8.2C: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	[-71]	Absolute P-CCPCH RSCP threshold for event 2C
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		[24] on channel 1 [16] on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.2D Cell Specific Parameters for Correct Reporting of Neighbours in AWGN Propagation Condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
PCCPCH_RSCP	dBm	[-70]	[-70]			-Infinity	[-67]		
Propagation Condition		AWGN							

NOTE: The DPCH of all cells are located in a timeslot other than 0.

A.8.2.1.2 Test Requirements

A.8.2.1.2.1 3.84Mcps TDD option

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.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.2.1.2.2 1.28Mcps TDD option

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 event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.3 FDD measurements

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

A.8.3.1.1 Test Purpose and Environment

A.8.3.1.1.1 3.84 Mcps TDD option

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 RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3A 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 test parameters are given in Table A.8.3B below.

Table A.8.3A: General test parameters for Correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-86	Absolute CPICH RSCP threshold for event 2C
Hysteresis	dB	0	
W non-used frequency		1	Applicable for event 2C
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A.8.3B: Cell Specific parameters for Correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		8		n.a			
		T1	T2	T1	T2	T1	T2		
UTRA RF Channel Number		Channel 1				Channel 2			
CPICH_Ec/Ior	dB	n.a.		n.a.		-10			
PCCPCH_Ec/Ior	dB	-3	-3			-12			
SCH_Ec/Ior	dB	-9	-9	-9	-9	-12			
SCH_t_{offset}		0	0	0	0	n.a.			
PICH_Ec/Ior				-3	-3	-15			
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-0,941			
$\hat{I}_{or}/I_{oc}$	dB	3	3	3	3	-infinty	-2		
I_{oc}	dBm/3.84 MHz	-70				-70			
CPICH_RSCP		n.a.				-infinity	-82		
PCCPCH_RSCP	dB	-70	-70	-70	-70	n.a.			
Propagation Condition		AWGN				AWGN			

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

A.8.3.1.1.2 1.28 Mcps TDD option

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 RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed. General test parameters are given in the table A.8.3C 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 test parameters are given in Table A.8.3D below.

Table A.8.3C: General test parameters for Correct reporting of FDD neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters active cell		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0.
Power Control		On	
Active cell		Cell 1	
Threshold non used frequency	dB	-86	Absolute CPICH RSCP threshold for event 2C
Hysteresis	dB	0	
W non-used frequency		1	Applicable for event 2C
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 on channel 1 16 on channel 2	Measurement control information is sent before T1 starts.
T1	s	10	
T2	s	10	

Table A. 8.3D Cell Specific parameters for Correct reporting of FDD neighbours in AWGN propagation condition:

Parameter	Unit	Cell 1				Cell 2	
Timeslot Number		0		DwPTS		n.a	n.a.
		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/Ior	dB	n.a.		n.a.		[-10]	[-10]
PCCPCH_Ec/Ior	dB	-3	-3			[-12]	[-12]
SCH_Ec/Ior	dB					[-12]	[-12]
PICH_Ec/Ior	dB					[-15]	[-15]
DwPCH_Ec/Ior	dB			0	0	n.a.	n.a.
OCNS	dB	[ ]	[ ]			[-0,941]	[-0,941]
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]	[3]	[3]	[-Infinity]	[-2]
I_{oc}	dBm/3.84 MHz	-70				-70	
CPICH_RSCP		n.a.				[-Infinity]	[-82]
PCCPCH_RSCP	dB	[-70]	[-70]			n.a.	n.a.
Propagation Condition		AWGN				AWGN	

Note: The DPCH of cell 1 is located in a timeslot other than 0.

A.8.3.1.2 Test Requirements

A.8.3.1.2.1 3.84 Mcps TDD option

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.

The rate of correct events observed during repeated tests shall be at least 90%.

A.8.3.1.2.2 1.28 Mcps TDD option

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.

The rate of correct events observed during repeated tests shall be at least 90%.

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, in this clause the test parameters in table A.9.1 should be applied for 3.84 Mcps TDD UE RX measurements requirements and the test parameters in table A.9.1A should be applied for 1.28 Mcps TDD UE RX measurements requirements.

A.9.1.1 TDD intra frequency measurements

A.9.1.1.1 3.84 Mcps TDD option

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.9.1.1.2 1.28 Mcps TDD option

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

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

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
Range 1:Io Range 2:Io	dBm	-94..-70 –94..-50				-94..-70 –94..-50			
Propagation condition	AWGN								

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

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

Note 3: | *Io – P-CCPCH_RSCP*| ≤ [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 a timeslot other than 0

A.9.1.2 TDD inter frequency measurements

A.9.1.2.1 3.84 Mcps TDD option

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.9.1.2.2 1.28 Mcps TDD option

If not otherwise stated, the test parameters in table A. 9.2A should be applied for UE RX measurements requirements in this section.

Table A. 9.2A: Intra frequency test parameters for UE RX Measurements

Parameter	Unit	Cell 1				Cell 2			
Timeslot Number		0		DwPTS		0		DwPTS	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3				-3			
DwPCH_Ec/Ior	dB			0				0	
$\hat{I}_{or}/I_{oc}$	dB	[3]	[3]			-Infinity	[6]		
I_{oc}	dBm/1.28 MHz	-70							
Range 1:Io Range 2:Io	dBm	-94..-70 –94..-50				-94..-70 –94..-50			
Propagation condition		AWGN							

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

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

Note 3: | *Io –P-CCPCH_RSCP1,2*| ≤ [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 a timeslot other than 0

A.9.1.3 FDD inter frequency measurements

A.9.1.3.1 3.84 Mcps TDD option

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

A.9.1.4.1 3.84 Mcps TDD option

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

Table A.9.4: UTRA 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.9.1.4.2 1.28 Mcps TDD option

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

Table A.9.4A: UTRA 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/1.28 MHz	Note 2	Note 2
Range 1: Io Range 2: Io	dBm/1.28 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*.

Annex B (informative): Change History

Table B.1: CRs approved by TSG-RAN#7.

RAN Doc	Spec	CR	R	Ph	Subject	Cat	Curr	New
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

Table B.2: CRs approved by TSG-RAN#8.

RAN Doc	Spec	CR	R	Ph	Subject	Cat	Curr	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

Table B.3: CRs approved by TSG-RAN#9.

RAN Doc	Spec	CR	R	Ph	Subject	Cat	Curr	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

Table B.4: CRs approved by TSG RAN #10

RAN Doc	Spec	CR	R	Ph	Subject	Cat	Curr	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

Table B.5: Release 99 CRs approved by TSG RAN #11

RAN Doc	Spec	CR	R	Ph	Subject	Cat	Curr	New
RP-010090	25.123	35		R99	Deletion of cell-selection requirements	F	3.4.0	3.5.0
RP-010090	25.123	37		R99	Corrections in idle mode and corresponding test cases.	F	3.4.0	3.5.0
RP-010090	25.123	38		R99	Section 8 changes	F	3.4.0	3.5.0
RP-010090	25.123	39		R99	Section 9 Changes	F	3.4.0	3.5.0
RP-010090	25.123	40		R99	Correction of the cell-reselection and handover requirements in connected mode.	F	3.4.0	3.5.0
RP-010090	25.123	41		R99	Change and completion of the cell-reselection requirements in CELL-FACH state.	F	3.4.0	3.5.0
RP-010090	25.123	42		R99	Change of the cell-reselection requirements.	F	3.4.0	3.5.0
RP-010090	25.123	43		R99	Extension of reporting range for UTRAN UL measurements	F	3.4.0	3.5.0

Table B.6: Release 4 CRs approved by TSG RAN #11

RAN Doc	Spec	CR	R	Ph	Subject	Cat	Curr	New
RP-010097	25.123	44		R4	Requirements for Support of Radio Resources Management (TDD) for 1.28 Mcps TDD	B	3.5.0	4.0.0
RP-010099	25.123	45		R4	UE/UTRAN GPS timing of Cell Frames for UP	B	3.5.0	4.0.0
RP-010101	25.123	36		R4	NodeB Synchronisation Measurements performance requirements	B	3.5.0	4.0.0

Table B.7: Release 4 CRs approved by TSG RAN #12

RAN Doc	Spec	CR	R	Ph	Title	Cat	Curr	New
RP-010351	25.123	47		Rel-4	UTRAN Measurement Test Cases	A	4.0.0	4.1.0
RP-010351	25.123	49		Rel-4	Cell synchronisation definition	A	4.0.0	4.1.0
RP-010351	25.123	51		Rel-4	UE measurement capability	A	4.0.0	4.1.0
RP-010351	25.123	53		Rel-4	Measurement performance requirements	A	4.0.0	4.1.0
RP-010351	25.123	55		Rel-4	FDD measurements in Cell DCH State	A	4.0.0	4.1.0
RP-010351	25.123	57		Rel-4	Test tolerances	A	4.0.0	4.1.0
RP-010351	25.123	59		Rel-4	UE P-CCPCH RSCP relative accuracy	A	4.0.0	4.1.0
RP-010351	25.123	61		Rel-4	UE P-CCPCH RSCP inter-frequency accuracy	A	4.0.0	4.1.0
RP-010351	25.123	63		Rel-4	UE Tx Timing	A	4.0.0	4.1.0
RP-010351	25.123	65		Rel-4	Correction of re-selection requirements in cell_FACH	A	4.0.0	4.1.0
RP-010352	25.123	67		Rel-4	General section 5 corrections	A	4.0.0	4.1.0
RP-010352	25.123	69		Rel-4	Correction to chapter 4.2 Cell re-selection	A	4.0.0	4.1.0
RP-010352	25.123	71		Rel-4	TDD measurements in Cell DCH State	A	4.0.0	4.1.0
RP-010352	25.123	73		Rel-4	GSM measurement in CELL_DCH State	A	4.0.0	4.1.0
RP-010363	25.123	74		Rel-4	UTRAN SFN-SFN observed time difference	F	4.0.0	4.1.0
RP-010363	25.123	75		Rel-4	UE SFN-SFN mapping	F	4.0.0	4.1.0
RP-010363	25.123	76		Rel-4	Clarification of NodeBsynch	F	4.0.0	4.1.0
RP-010363	25.123	77		Rel-4	UTRAN GPS timing of cell frames for UP mapping	F	4.0.0	4.1.0
RP-010363	25.123	78		Rel-4	LCR UE/UTRAN GPS timing of cell frames for UP	F	4.0.0	4.1.0
RP-010352	25.123	80		Rel-4	Measurements in cell_FACH state	A	4.0.0	4.1.0
RP-010352	25.123	82		Rel-4	TDD measurement test cases	A	4.0.0	4.1.0
RP-010352	25.123	84		Rel-4	FDD measurement test cases	A	4.0.0	4.1.0
RP-010363	25.123	85		Rel-4	General section 5 corrections for 1.28 Mcps TDD	F	4.0.0	4.1.0
RP-010363	25.123	86		Rel-4	Correction of re-selection requirements in cell_FACH	F	4.0.0	4.1.0
RP-010363	25.123	87		Rel-4	1.28 TDD test cases for TDD and FDD measurements	F	4.0.0	4.1.0

Table B.8: Release 4 CRs approved by TSG RAN #13

RAN Tdoc	Spec	CR	R	Ph	Title	Cat	Curr	New
RP-010618	25.123	89		Rel-4	Section 4 corrections and clarifications in the test cases	A	4.1.0	4.2.0
RP-010618	25.123	91		Rel-4	General section 5 corrections	A	4.1.0	4.2.0
RP-010618	25.123	93		Rel-4	Introduction of intra- and inter-frequency test cases for Cell-PCH and URA-PCH	A	4.1.0	4.2.0
RP-010618	25.123	95		Rel-4	Transport Channel BER accuracy requirement	A	4.1.0	4.2.0
RP-010618	25.123	97		Rel-4	Success Rates in Test Cases	A	4.1.0	4.2.0
RP-010618	25.123	99		Rel-4	Introduction of RRC Connection re-establishment requirements	A	4.1.0	4.2.0
RP-010618	25.123	101		Rel-4	Introduction of RRC Connection re-establishment test cases	A	4.1.0	4.2.0
RP-010618	25.123	103		Rel-4	Correction of UE CPICH RSCP reporting range	A	4.1.0	4.2.0
RP-010618	25.123	105		Rel-4	Clarification to requirement classification for statistical testing	A	4.1.0	4.2.0
RP-010618	25.123	107		Rel-4	Corrections to sections on inter-frequency measurements in Idle Mode and UE measurement capabilities in Cell-DCH and Cell-FACH for UTRA TDD	A	4.1.0	4.2.0
RP-010630	25.123	109		Rel-4	Measurements in CELL_DCH State for 1.28 Mcps option	F	4.1.0	4.2.0
RP-010630	25.123	110		Rel-4	Measurements in CELL_FACH State for 1.28 Mcps option	F	4.1.0	4.2.0
RP-010630	25.123	111		Rel-4	Section 4 corrections and clarifications in the test cases	F	4.1.0	4.2.0
RP-010630	25.123	112		Rel-4	General section 5 corrections	F	4.1.0	4.2.0
RP-010630	25.123	113		Rel-4	Introduction of Cell re-selection requirements in Cell-Fach state for 1.28Mcps TDD option	F	4.1.0	4.2.0
RP-010630	25.123	114		Rel-4	Success Rates in Test Cases	F	4.1.0	4.2.0
RP-010630	25.123	115		Rel-4	UTRAN SFN-SFN otd corrections	F	4.1.0	4.2.0
RP-010630	25.123	116		Rel-4	UTRAN Rx Timing Deviation for LCR	F	4.1.0	4.2.0
RP-010630	25.123	117		Rel-4	Introduction of RRC connection re-establishment requirements for 1.28Mcps TDD option	F	4.1.0	4.2.0
RP-010630	25.123	118		Rel-4	Introduction of RRC Connection re-establishment test cases for 1.28Mcps TDD option	F	4.1.0	4.2.0
RP-010630	25.123	119		Rel-4	Cell re-selection tests case in Cell-FACH state	F	4.1.0	4.2.0
RP-010630	25.123	120		Rel-4	TFC selection at the UE maximum power	F	4.1.0	4.2.0
RP-010630	25.123	121		Rel-4	TDD/TDD handover test cases	F	4.1.0	4.2.0
RP-010630	25.123	122		Rel-4	Clarification to requirement classification for statistical testing	F	4.1.0	4.2.0

Table B.9: Release 4 CRs approved by TSG RAN #14

RAN Tdoc	Spec	CR	R	Ph	Title	Cat	Curr	New
RP-010781	25.123	124		Rel-4	Clarification of CPICH measurement accuracy	A	4.2.0	4.3.0
RP-010781	25.123	126		Rel-4	CELL_FACH test cases for UTRA TDD	A	4.2.0	4.3.0
RP-010781	25.123	128		Rel-4	Correction to test requirement for URA_PCH test cases	A	4.2.0	4.3.0
RP-010781	25.123	130		Rel-4	Correction of RSSI relative accuracy requirements	A	4.2.0	4.3.0
RP-010781	25.123	132		Rel-4	Corrections to TDD/TDD inter-frequency test cases in Annex A	A	4.2.0	4.3.0
RP-010781	25.123	134		Rel-4	Correction to GSM carrier RSSI	A	4.2.0	4.3.0
RP-010781	25.123	136		Rel-4	Requirements for TFC selection at UE maximum power	A	4.2.0	4.3.0
RP-010786	25.123	137		Rel-4	TFC selection at the UE maximum power	F	4.2.0	4.3.0
RP-010786	25.123	138		Rel-4	Clarification of CPICH measurement accuracy	F	4.2.0	4.3.0
RP-010786	25.123	139		Rel-4	Correction of Cell-Fach state requirements for 1.28Mcps TDD	F	4.2.0	4.3.0
RP-010786	25.123	140		Rel-4	Clarification of 1.28Mcps TDD/TDD handover	F	4.2.0	4.3.0

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