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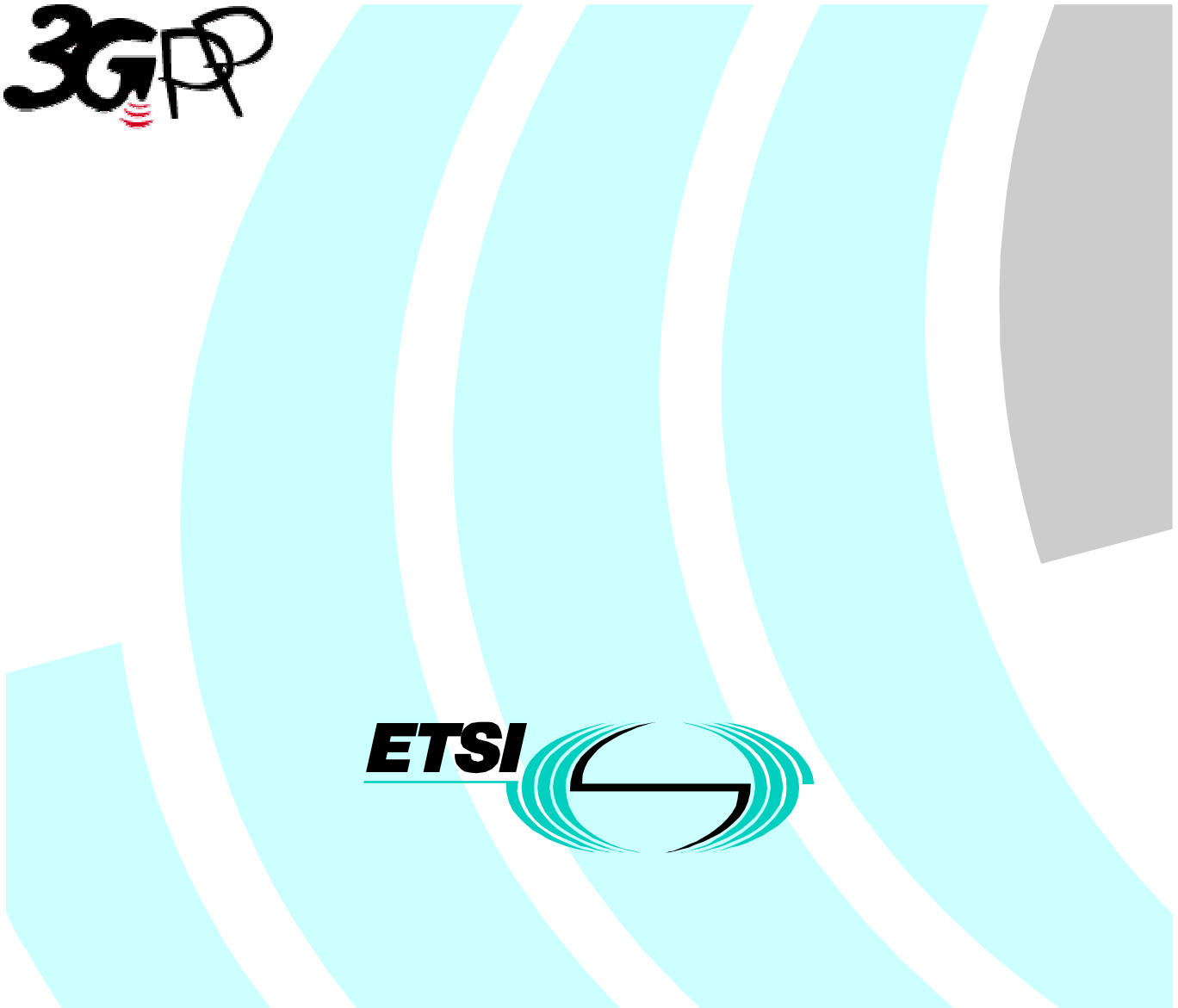
*Technical Specification*

**Universal Mobile Telecommunications System (UMTS);
Requirements for Support of Radio Resource Management (FDD)
(3GPP TS 25.133 version 3.4.0 Release 1999)**



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# Contents

# Foreword

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# 1 Scope

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

# 2 References

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

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


[1] (void)

[2] 3GPP TS 25.211: “Physical channels and mapping of transport channels onto physical channels (FDD)”.

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

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

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

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

[7] 3GPP TS 25.103: "RF parameters in support of RRM".

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

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

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

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

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "RRC Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measuremement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

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

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

## 3.2 Symbols

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

| | |
|---|---|
| […] | Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken. |
| CPICH_Ec | Average energy per PN chip for the CPICH |
| CPICH_Ec/Ior | The ratio of the transmit energy per PN chip of the CPICH to the total transmit power spectral density at the Node B antenna connector. |
| CPICH_Ec/Io | The ratio of the received energy per PN chip for the CPICH to the total transmit power spectral density |
| DPCH_Ec/Ior | The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B antenna connector. |
| Ec | Average energy per PN chip. |
| Io | The total received power density, including signal and interference, as measured at the UE antenna connector. |
| Ioc | The power spectral density of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector. |
| Ior | The total transmit power spectral density of the downlink at the Node B antenna connector. |
| Îor | The received power spectral density of the downlink as measured at the UE antenna connector. |
| OCNS_Ec/Ior | The ratio of the transmit energy per PN chip of the OCNS to the total transmit power spectral density at the Node B antenna connector. |
| PCCPCH_Ec/Ior | The ratio of the transmit energy per PN chip of the PCCPCH to the total transmit power spectral density at the Node B antenna connector. |
| PENALTY_TIME | Defined in TS 25.304, subclause 5.2.6.1.5 |
| PICH_Ec/Ior | The ratio of the transmit energy per PN chip of the PICH to the total transmit power spectral density at the Node B antenna connector. |
| Qhyst | Defined in TS 25.304, subclause 5.2.6.1.5 |
| $Qoffset_{s,n}$ | Defined in TS 25.304, subclause 5.2.6.1.5 |
| Qqualmin | Defined in TS 25.304, subclause 5.2.6.1.5 |
| Qrxlevmin | Defined in TS 25.304, subclause 5.2.6.1.5 |
| SCH_Ec/Ior | The ratio of the transmit energy per PN chip of the SCH to the total transmit power spectral density at the Node B antenna connector. |
| Sintersearch | Defined in TS 25.304, subclause 5.2.6.1.5 |
| Sintrasearch | Defined in TS 25.304, subclause 5.2.6.1.5 |
| SsearchRAT | Defined in TS 25.304, subclause 5.2.6.1.5 |
| T1 | Time period 1 |
| T2 | Time period 2 |
| TEMP_OFFSET | Defined in TS 25.304, subclause 5.2.6.1.5 |
| $T_{RE\text{-}ESTABLISH\text{-}REQ}$ | The RRC Re-establishment delay requirement, the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH. |
| Treselection | Defined in TS 25.304, subclause 5.2.6.1.5 |
| UE_TXPWR_MAX_RACH | Defined in TS 25.304, subclause 5.2.3.1.2. |

## 3.3 Abbreviations

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

| | |
|---|---|
| BER | Bit Error Ratio |
| BLER | Block Error Ratio |
| BS | Base Station |
| CFN | Connection Frame Number |
| CPICH | Common Pilot Channel |
| DL | Down link (forward link) |
| DPCH | Dedicated Physical Channel |
| DRX | Discontinuous Reception |
| 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 downlink. |
| PCCPCH | Primary Common Control Physical Channel |
| PICH | Paging Indicator Channel |
| PIN | Personal Identification Number |
| PLMN | Public Land Mobile Network |
| RSCP | Received Signal Code Power |
| RRC | Radio Resource Control |
| RRM | Radio Resource Management |
| RSSI | Received Signal Strength Indicator |
| SCH | Synchronisation Channel, power of SCH shall be divided equally between Primary and Secondary Synchronous channels. |
| SFN | System Frame Number |
| SIR | Signal to Interference ratio |
| TDD | Time Division Duplex |
| TPC | Transmit Power Control |
| UE | User Equipment |
| UL | Up link (reverse link) |
| USIM | Universal Subscriber Identity Module |
| UTRA | Universal Terrestrial Radio Access [TR 21.905] |
| UTRAN | Universal Terrestrial Radio Access Network |

## 3.4 Test tolerances

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

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

# 4 Idle Mode Tasks

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

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

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

## 4.2.2 Requirements

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

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

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

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

### 4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table x.y. The UE shall filter CPICH Ec/Io and CPICH 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 $T_{measureFDD}/2$.

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 $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If parameter Treselection has value different from zero, the UE shall evaluate an intra-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.

### 4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (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 FDD cells. The UE shall filter CPICH Ec/Io and CPICH 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 $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ (see table 4.1) 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 CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ 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.

If Treselection timer has value different from zero, the UE shall evaluate an inter-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.

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

TBD.

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

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.

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

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

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 in paging reception

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

At intra-frequency cell re-selection, the UE shall monitor the downlink of 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 $T_{measureFDD}$, $T_{evaluateFDD}$ and $T_{measureGSM}$**

| DRX cycle length [s] | $N_{serv}$ [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) | 2.56 (32 DRX cycles) |
| 0.16 | 4 | 0.64 (4) | 2.56 (16) | 2.56 (16) |
| 0.32 | 4 | 1.28 (4) | 5.12 (16) | 5.12 (16) |
| 0.64 | 4 | 1.28 (2) | 5.12 (8) | 5.12 (8) |
| 1.28 | 2 | 1.28 (1) | 6.4 (5) | 6.4 (5) |
| 2.56 | 2 | 2.56 (1) | 7.68 (3) | 7.68 (3) |
| 5.12 | 1 | 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].

#### 4.2.2.8 Number of cells in neighbouring cell lists

The UE shall be capable of monitoring [32] intra-frequency cells and 32 inter-frequency cells on 2 additional carriers.

# 5 UTRAN Connected mode mobility

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

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

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

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

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

## 5.1 FDD/FDD Soft Handover

### 5.1.1 Introduction

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

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

## 5.1.2 Requirements

### 5.1.2.1 Active set dimension

The UE shall be capable of supporting at least [6] radio links in the active set.

### 5.1.2.2 Active set update delay

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

The active set update delay is depending on the number of known cells referred to in the ACTIVE SET UPDATE message. A cell is known if either:

- the UE has had radio links connected to the cell in the previous (old) active set, or
- the cell has been reported by the UE in a measurement report during the last [5] seconds.

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

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

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

If the UE have radio links in the active set that it can not use for data detection (due to low signal level), the UE shall every [150] ms search for the radio link and start to use it as soon as it is found.

Editor's note: The wording of the last sentence might need reformulation.

# 5.2 FDD/FDD Hard Handover

## 5.2.1 Introduction

The purpose of FDD/FDD hard handover is to change the frequency of the connection between UE and UTRAN or to change cell if the network does not support macrodiversity.

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION).

The hard handover procedure may cause the UE to change its frequency. Compressed mode according to the UE Capability may be used to be able to make any measurements on other frequencies.

## 5.2.2 Requirements

### 5.2.2.1 Hard handover delay

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

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

### 5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5-2. This requirement does not include a delay due to SFN decoding of the new cell when this is needed.

**Table 5-2: FDD/FDD hard handover - interruption time**

| Number of new cells present in the handover command message | Interruption time [ms] | |
|---|---|---|
| | Cells in monitored cells list and reported to UTRAN | Cells outside monitored cells list |
| 1 | [20] | [4000] |
| | | |
| | | |
| | | |
| | | |
| | | |

# 5.3 FDD/TDD Handover

## 5.3.1 Introduction

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

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

## 5.3.2 Requirements

These requirements shall apply only to FDD/TDD UE.

### 5.3.2.1 Hard handover delay

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

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

### 5.3.2.2 Interruption time

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

**Table 5-3: FDD/TDD interruption time**

| Number of new cells present in the handover command message | Interruption time [ms] | |
|---|---|---|
| | Cells in monitored cells list and reported to UTRAN | Cells outside monitored cells list |
| 1 | [] | [] |

# 5.4 FDD/GSM Handover

## 5.4.1 Introduction

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

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

NOTE: Support of Blind Handover should be stated.

## 5.4.2 Requirements

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

### 5.4.2.1 Inter-system handover delay

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

### 5.4.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than 40 ms.

# 5.5 Cell Re-selection in CELL_FACH

## 5.5.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

## 5.5.2 Requirements

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

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

### 5.5.2.1 Cell re-selection delay

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

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

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

#### 5.5.2.1.2 The cells in the neighbour list belong to different frequencies

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

The cell re-selection delay in CELL_FACH state shall be less than [x] seconds when the cells in the neighbour list belong to less than [3] frequencies.

## 5.6 Cell Re-selection in CELL_PCH

### 5.6.1 Introduction

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

### 5.6.2 Requirements

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

## 5.7 Cell Re-selection in URA_PCH

### 5.7.1 Introduction

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

### 5.7.2 Requirements

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

# 6 RRC Connection Control

## 6.1 RRC Re-establishment

### 6.1.1 Introduction

RRC connection re-establishment is needed, when a UE loses radio connection due to radio link failure. The RRC connection re-establishment procedure is specified in section 8.5.1 of TS 25.331 and a RRC connection re-establishment sequence is described in section 6.4.8 of TS 25.303.

### 6.1.2 Requirements

When the UE is in Cell_DCH state, the UE shall be capable of sending a RRC CONNECTION RE-ESTABLISHMENT CONNECT message within $T_{RE\text{-}ESTABLISH}$ seconds from when the CPHY-Out-Of-Synch primitive indicates lost synchronisation.

The RRC Re-establishment delay requirement ($T_{RE\text{-}ESTABLISH\text{-}REQ}$) 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 preambles on the PRACH.

$T_{RE\text{-}ESTABLISH\text{-}REQ}$ is depending on whether the target cell (that best fulfil the cell re-selection criteria) is known by the UE or not. A cell is known if either:

- the UE has had radio links connected to the cell in the previous (old) active set, or

- the cell has been reported by the UE in a measurement report during the last 5 seconds.

The RRC re-establishment delay shall be less than

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

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.

$T_{SI}$ = MAX($T_{rep}(3)$, $T_{rep}(5)$ , $T_{rep}(6)$ , $T_{rep}(7)$)

where $T_{rep}(X)$ is the repetition frequency of system information block $X$ in the target 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.

# 6.3 Random Access

## 6.3.1 Introduction

The random access procedure is used when establishing the layer 1 communication between the UE and UTRAN. The random access shall provide a fast access but without disturbing ongoing connections. The random access is specified in section 6 of TS 25.214 and the control of the RACH transmission is specified in section 11.2 of TS 25.321. A random access transmit sequence is described in section 6.7.2 of TS 25.303.

## 6.3.2 Requirements

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

### 6.3.2.1 Correct behaviour when receiving an ACK

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

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

### 6.3.2.2 Correct behaviour when receiving an NACK

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

### 6.3.2.3 Correct behaviour at Time-out

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

#### 6.3.2.4 Correct behaviour when reaching maximum transmit power

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

The absolute power of any preamble shall not exceed the maximum allowed UL TX power +/-[] dB (or +/- [] dB in extreme conditions).

## 6.4 Transport format combination selection in UE

Editor's note: WG4 has identified an inconsistency in this section and WG2 TS 25.321. This should be resolved

### 6.4.1 Introduction

When the UE reaches the maximum transmit power is 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.

### 6.4.2 Requirements

In this sub clause, the UE maximum transmit power is defined as the UE maximum output power, which is defined by the UE power class.

For each measurement period of the UE transmitted power measurement the UE shall estimate if it has reached its maximum transmit power or not.

If the UE output power as requested by UTRAN have been larger than the UE maximum transmit power for a period of more than [T1] ms, it shall adapt to the transport format combination corresponding to the next lower bit-rate according to the rules in TS 25.321, at the next of the longest uplink TTIs, following [T1+10] ms from when the UE maximum transmit power was reached.

If the UE has limited the usage of the transport format combination set, according to the above clause, and the UE estimates that it for a period of more than [T2] ms has had sufficient power to support a transport format combination, that has previously been removed, the temporary blocked transport format shall again be considered in the transport format combination selection.

# 7 Timing and Signalling characteristics

## 7.1 UE Transmit Timing

### 7.1.1 Introduction

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

### 7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ±1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first significant path of the corresponding downlink DPCCH/DPDCH frame is received plus $T_0$ chips. $T_0$ is defined in [2].

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be ¼ Chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 200 ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 200ms period.

# 7.2 Signalling Response Delay

## 7.2.1 Introduction

For all messages requiring a RRC response to be sent to UTRAN as defined in [16], the UE shall send that response with a maximum signalling response delay specified in this subclause. This delay consists of several delay parts. The first part is a general processing delay in order to create the response. The second part is dependent on some specific actions the UE shall perform according to that particular message.

## 7.2.2 Requirements

The signalling response delay is defined as the time from when the UE has received the last complete TTI containing RRC message from UTRAN, until the UE successfully has performed actions according to the RRC message and the UE starts to transmit the first TTI of the RRC response message over the Uu interface. The signalling response delay excludes a delay uncertainty resulted when inserting the RRC response message to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

This signalling response delay shall not exceed the sum of the limit for the general processing delay and all applicable limits for action delays related to the specific RRC message.

General processing delay shall not exceed 100 ms..

Delay parts related to actions are listed in table 7.1 below.

**Table 7-1: Signalling response delay**

| Delay part caused by a specific action | Maximum delay for this action [ms] |
|---|---|
| Establishment of new dedicated channel | 140 |
| Establishment of all radio bearer(s) in one RRC message | 50 |
| Re-configuration of all radio bearer(s) in one RRC message | 50 |
| Release of all radio bearer(s) in one RRC message | 10 |

NOTE: For all actions not listed the requirement on delay is FFS.

# 7.3 Signalling Processing

## 7.3.1 Introduction

If several consecutive RRC messages are sent to the UE, the UE shall be able to process the messages in parallel with the receiving of the next messages. The UE shall also perform actions according to the RRC messages and if applicable send answers to the messages in parallel (for those messages where procedure interaction is allowed according to TS 25.331) with receiving new messages.

## 7.3.2 Requirements

The UE shall be able to respond to RRC messages sent to the UE at a rate of 10 messages per second according to the requirements specified in 7.2.2 in 90 % of the cases.

# 8 UE Measurements Procedures

## 8.1 General Measurement Requirements in CELL_DCH State

### 8.1.1 Introduction

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

### 8.1.2 Requirements

#### 8.1.2.1 UE Measurement Capability

The UE shall be able to support and process up to

32 intra frequency FDD cells, and

32 inter frequency FDD cells, distributed on up to 2 additional FDD carriers.

Depending on UE capability, the UE shall also in addition be able to support and process 32 TDD cells, distributed on up to 3 TDD 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 compressed mode patterns and different number of cells is defined in the following sections.

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

#### 8.1.2.2 FDD 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. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

##### 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

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

##### 8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 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 one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the

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

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

$X_{\text{basic measurement FDD}}$ = 8

$T_{\text{Measurement\_Period Intra}}$ = 200 ms. The measurement period for Intra frequency CPICH measurements.

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

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

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

#### 8.1.2.2.3 Periodic Reporting

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

#### 8.1.2.2.4 Event-triggered Periodic Reporting

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

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

#### 8.1.2.2.5 Event Triggered Reporting

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

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

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

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

The event triggered measurement reporting delay, measured without L3 filtering, shall be less than the above defined $T_{\text{identify intra}}$.

If a cell, which the UE has detected and measured without L3 filtering at least once over the measurement period, becomes undetectable for a period < 5 seconds and then the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than [$T_{\text{Measurement\_Period Intra}}$ ] ms provided the timing to that cell has not changed more than +/-32 chips. When L3 filtering is used an additional delay can be expected.

### 8.1.2.3 FDD inter frequency measurements

In the CELL_DCH state when a transmission gap pattern sequence with the “FDD measurements” purpose and gap lengths of 5, 7, 10 or 14 slots is provided by the network 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

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

#### 8.1.2.3.2 Measurement period

When transmission gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.1 and 9.1.2 with measurement period given by

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

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

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

$T_{\text{Inter:}}$ This is the minimum time that is available for inter frequency measurements , during the period $T_{\text{Measurement\_Period inter}}$ with an arbitrarily chosen timing. The minimum time is calculated by using the actual idle length within the tranmission gap as given in the table 11 of Annex B in TS 25.212.

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

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

$N_{\text{Freq}}$: Number of FDD frequencies indicated in the measurement control information.

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

#### 8.1.2.3.3 Periodic Reporting

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

#### 8.1.2.3.4 Event Triggered Reporting

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

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

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that 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 the above defined $T_{\text{identify inter}}$ When L3 filtering is used an additional delay can be expected.

### 8.1.2.4 TDD measurements

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

In the CELL_DCH state when a transmission gap pattern sequence with the "TDD measurements" purpose and gap length of 11 or a dual gap pattern with gap length of 14 and 7 slots is provided by the network the UE shall continuously measure detected inter frequency TDD 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

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

#### 8.1.2.4.2 Measurement period

When transmission gaps as priviously described are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and 9.z.y with measurement period given by

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

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

$T_{TDD\ inter:}$ This is the minimum time that is available for inter frequency measurements , during the period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing. The minimum time is calculated by using the actual idle length within the transmission gap as given in the table 11 of Annex B in TS 25.212.

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

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

$N_{Freq}$: Number of TDD frequencies indicated in the 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.

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

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

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.. This measurement reporting delay

excludes a delay uncertanty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

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

### 8.1.2.5 GSM measurements

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

In CELL_DCH state when a transmission gap pattern sequence is provided by the UTRAN the UE shall continously 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 9.2.5.2. 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 9.2.5.2.

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

#### 8.1.2.5.1 GSM carrier RSSI

A UE supporting GSM measurements using compressed mode shall meet the minimum number of GSM RSSI carrier measurements specified in Table 8.1. This measurement shall be based on a transmission gap pattern sequence with purpose "GSM carrier RSSI measurements"In the CELL_DCH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in GSM 05.08, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

**Table 8.1**

| TGL | Number of GSM carrier RSSI samples in each gap. |
|---|---|
| 3 | 1 |
| 4 | 2 |
| 5 | 3 |
| 7,10,14 | 5 |

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 UE measurements on a GSM cell with BSIC verified requested can be divided into the following two tasks:

Initial BSIC identification

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

BSIC re-confirmation

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

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

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 $T_{re\text{-}confirm\_abort}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

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

The UE shall be able to decode a BSIC within a transmission gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective transmission gap is within the limits specified in table 8.2.

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

**Table 8.2: The gap length and maximum time difference for BSIC verification**

| **Gap length** [slots] | **Maximum time difference** [μs] |
|---|---|
| 5 | ± 500 |
| 7 | ± 1200 |
| 8 | ± 1500 |
| 10 | ± 2200 |
| 14 | ± 3500 |

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in GSM 05.05.

#### 8.1.2.5.2.1 Initial BSIC identification

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

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of at least [6] GSM cells indicated in the measurement control information. The UE shall give priority for synchronisation attempts in decreasing signal strength order to GSM cells with unknown BSIC. The UE shall be able to perform initial BSIC identification on one new GSM cell, with unknown BSIC, within $N_{identify\_abort}$ patterns of the transmission gap pattern sequence. $N_{identify\_abort}$ values are given for a set of reference patterns in Table 8.2. The number of patterns needed to identify N new GSM cells is N times $N_{identify\_abort}$. $T_{identify\_abort}$ as given in table 8.2 gives information about the time in seconds corresponding to $N_{identify\_abort}$ patterns.

**Table 8.3: The worst-case time for identification of one previously not identified GSM cell**

| | TGL1 [slots] | TGL2 [slots] | TGD [slots] | TGPL1 [frames] | TGPL2 [frames] | $T_{identify\ abort}$ [s] | $N_{identify\_abort}$ [patterns] |
|---|---|---|---|---|---|---|---|
| Pattern 1 | 7 | 0 | 0 | 3 | 0 | 1.53 | 51 |
| Pattern 2 | 7 | 0 | 0 | 8 | 0 | 5.20 | 65 |
| Pattern 3 | 7 | 7 | 47 | 8 | 0 | 2.00 | 25 |
| Pattern 4 | 7 | 7 | 38 | 12 | 0 | 2.88 | 24 |
| Pattern 5 | 14 | 0 | 0 | 8 | 0 | 1.76 | 22 |
| Pattern 6 | 14 | 0 | 0 | 24 | 0 | 5.04 | 21 |
| Pattern 7 | 14 | 14 | 45 | 12 | 0 | 1.44 | 12 |
| Pattern 8 | 10 | 0 | 0 | 12 | 0 | 2.76 | 23 |
| Pattern 9 | 10 | 10 | 75 | 12 | 0 | 1.56 | 13 |
| Pattern 10 | 8 | 0 | 0 | 8 | 0 | 2.80 | 35 |
| Pattern 11 | 8 | 0 | 0 | 4 | 0 | 1.52 | 38 |

If the BSIC of a GSM cell has been successfully identified the UE shall continue BSIC identification with the next cell, in signal strength order, for at least the [6] strongest GSM cells 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 within $N_{identify\_abort}$ patterns, the UE shall abort the BSIC identification attempts for that GSM cell. The UE shall continue to try to perform BSIC identification on the next GSM cell in signal strength order. The GSM cell for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the [6] strongest GSM cells with unknown BSIC in the monitored set.

#### 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 [6] identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

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

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ 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 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the [6] strongest GSM cells in the monitored list.

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

**Table 8.4: The worst-case time for BSIC re-confirmation of one GSM cell**

| | TGL1 [slots] | TGL2 [slots] | TGD [slots] | TGPL1 [frames] | TGPL2 [frames] | $T_{re\text{-}confirm\_abort}$ [s] | $N_{re\text{-}confirm\_abort}$ [patterns] |
|---|---|---|---|---|---|---|---|
| Pattern 1 | 7 | 0 | 0 | 3 | 0 | 1.29 | 43 |
| Pattern 2 | 7 | 0 | 0 | 8 | 0 | 4.96 | 62 |
| Pattern 3 | 7 | 0 | 0 | 15 | 0 | 7.95 | 53 |
| Pattern 4 | 7 | 7 | 69 | 23 | 0 | 9.89 | 43 |
| Pattern 5 | 7 | 7 | 69 | 8 | 0 | 2.64 | 33 |
| Pattern 6 | 14 | 0 | 0 | 8 | 0 | 1.52 | 19 |
| Pattern 7 | 14 | 14 | 60 | 8 | 0 | 0.80 | 10 |
| Pattern 8 | 10 | 0 | 0 | 8 | 0 | 1.76 | 22 |
| Pattern 9 | 10 | 0 | 0 | 24 | 0 | 4.80 | 20 |
| Pattern 10 | 8 | 0 | 0 | 8 | 0 | 2.56 | 32 |
| Pattern 11 | 8 | 0 | 0 | 23 | 0 | 7.82 | 34 |
| Pattern 12 | 7 | 7 | 47 | 8 | 0 | 1.76 | 22 |
| Pattern 13 | 7 | 7 | 38 | 12 | 0 | 2.64 | 22 |
| Pattern 14 | 14 | 0 | 0 | 24 | 0 | 4.80 | 20 |
| Pattern 15 | 14 | 14 | 45 | 12 | 0 | 1.20 | 10 |
| Pattern 16 | 10 | 0 | 0 | 12 | 0 | 2.52 | 21 |
| Pattern 17 | 10 | 10 | 75 | 12 | 0 | 1.32 | 11 |
| Pattern 18 | 8 | 0 | 0 | 4 | 0 | 1.28 | 32 |

Note: This table will be removed after inclusion in TR 25.922.

# 8.2 Measurements in CELL_DCH State with special requirements

## 8.2.1 Introduction

This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. Compressed mode is specified in TS 25.215.

## 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 measurements according to table 8.5

In addition to the requirements in table 8.5 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8.1.

**Table 8.5 Parallel measurement requirements**

| Measurement quantity | Number of parallel measurements possible to request from the UE |
|---|---|
| Transport channel BLER | 1 per Transport Channel |
| UE transmitted power | 1 |
| UE Rx-Tx time difference | 1 including timing to all radio links in active set |
| SFN-SFN observed time difference type 2 | [] |
| UE GPS Timing of Cell Frames for LCS | [] |

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

## 8.3 Capabilities for Support of Event Triggering and Reporting Criteria

### 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 track in parallel per category up to $E_{cat}$ reporting criteria according to Table 8.6. Beyond the individual limits per measurement category, the UE need not track more than [TBD] reporting criteria in total.

**Table 8-6 Requirements for reporting criteria per measurement category**

| Measurement category | $E_{cat}$ |
|---|---|
| Intra-frequency | [] |
| Inter-frequency | [] |
| Inter-system | [] |
| UE internal measurements | [] |
| Traffic volume measurements | [] |
| Quality measurements | [] |
| LCS measurements | [] |
| Additional measurements | [] |

## 8.4 Measurements in CELL_FACH State

### 8.4.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

### 8.4.2 Requirements

TBD

# 9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 “Physical layer - Measurements (FDD)”. In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions.

# 9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

- in state CELL_DCH and 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 refered to as point B in the measurement model described in TS25.302.

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

Note: The synchronisation channel side condition for the requirements in this section to apply needs to be further clarified.

Note: It needs to be clarified how the accuracy requirements shall be handled when the UE is measuring on cells using IPDL.

Note: Currently the measurement periods for UE measurements in CELL_FACH state are missing. This needs to be clarified when the requirements in section 8.3 Measurements in CELL_FACH State are completed.

Note: The measurement period for the measurement Observed time difference to GSM cell needs to be clarified when the requirements for that measurement is completed in section 8.

## 9.1.1 CPICH RSCP

Note: This measurement is for handover evaluation, DL open loop power control, UL open loop power control and for the calculation of pathloss.

### 9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

#### 9.1.1.1.1 Absolute accuracy requirement

The accuracy requirements in table 9-1 are valid under the following conditions:

- CPICH_RSCP1 ≥ -114 dBm.
- $\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$
- $\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq XdB$

**Table 9-1: CPICH_RSCP Intra 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 |

#### 9.1.1.1.2 Relative accuracy requirement

The relative accuracy of CPICH RSCP is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on the same frequency

The accuracy requirements in table 9-2 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left. \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left. \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \le XdB$

**Table 9-2: CPICH_RSCP Intra frequency relative accuracy**

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

### 9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

#### 9.1.1.2.1 Relative accuracy requirement

The relative accuracy of CPICH RSCP in inter frequency case is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on a different frequency.

The accuracy requirements in table 9-3 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- | *Channel 1_Io -Channel 2_Io*| ≤ 20 dB.
- $\left. \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left. \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \le XdB$

**Table 9-3: CPICH_RSCP Inter frequency relative accuracy**

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

#### 9.1.1.3 CPICH RSCP measurement report mapping

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

In table 9-4 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-4**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| CPICH_RSCP_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 |

### 9.1.2 CPICH Ec/Io

Note: This measurement is for Cell selection/re-selection and for handover evaluation.

#### 9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

##### 9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9-5 are valid under the following conditions:

- *CPICH_RSCP1* ≥ -114 dBm.
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} \leq XdB$

**Table 9-5: CPICH_Ec/Io Intra frequency absolute accuracy**

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

##### 9.1.2.1.2 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 the same frequency.

The accuracy requirements in table 9-6 are valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.

- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \le XdB$

**Table 9-6: CPICH_Ec/Io Intra 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<br>± 2 for -16 ≤ CPICH Ec/Io < -14<br>± 3 for -20 ≤ CPICH Ec/Io < -16 | ± 3 | -94...-50 |

### 9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

#### 9.1.2.2.1 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io in the inter frequency case 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_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- | *Channel 1_Io -Channel 2_Io*| ≤ 20 dB.
- $\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \le XdB$

**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 | ± 6 | ± 6 | -94...-50 |

### 9.1.2.3 CPICH Ec/Io measurement report mapping

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

In table 9-8 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-8**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| CPICH_Ec/No _00 | CPICH Ec/Io < -24 | dB |
| CPICH_Ec/No _01 | -24 ≤ CPICH Ec/Io < -23.5 | dB |
| CPICH_Ec/No _02 | -23.5 ≤ CPICH Ec/Io < -23 | dB |
| … | … | … |
| CPICH_Ec/No _48 | -1 ≤ CPICH Ec/Io < -0.5 | dB |
| CPICH_Ec/No _49 | -0.5 ≤ CPICH Ec/Io < 0 | dB |
| CPICH_Ec/No _50 | 0 ≤ CPICH Ec/Io | dB |

## 9.1.3 UTRA Carrier RSSI

Note: This measurement is for Inter-frequency handover evaluation.

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements.

### 9.1.3.1 Absolute accuracy requirement

**Table 9-9: Io Inter frequency absolute accuracy**

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

### 9.1.3.2 Relative accuracy requirement

The relative accuracy requirement is defined as the UTRAN RSSI measured from one frequency compared to the UTRAN RSSI measured from another frequency.

The accuracy requirements in table 9-10 are valid under the following conditions:

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

**Table 9-10: Io Inter frequency relative accuracy**

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

### 9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9-11 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-11**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| UTRA_carrier_RSSI_LEV _00 | UTRA carrier RSSI < -100 | dBm |
| UTRA_carrier_RSSI_LEV _01 | -100 ≤ UTRA carrier RSSI < -99 | dBm |
| UTRA_carrier_RSSI_LEV _02 | -99 ≤ UTRA carrier RSSI < -98 | dBm |
| … | … | … |
| UTRA_carrier_RSSI_LEV _74 | -27 ≤ UTRA carrier RSSI < -26 | dBm |
| UTRA_carrier_RSSI_LEV _75 | -26 ≤ UTRA carrier RSSI < -25 | dBm |
| UTRA_carrier_RSSI_LEV _76 | -25 ≤ UTRA carrier RSSI | dBm |

## 9.1.4 GSM carrier RSSI

Note: This measurement is for handover between UTRAN and GSM.

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

The measurement period for CELL_DCH state can be found in section 8.1.2.4.

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

If the UE needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.4.

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

## 9.1.5 Transport channel BLER

### 9.1.5.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a window with the size equal to the reporting interval as specified in section 10.3.7.78 Periodical reporting criteria in TS 25.331.

### 9.1.5.2 Transport channel BLER measurement report mapping

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

In table 9-12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-12**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| 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 | - |

## 9.1.6 UE transmitted power

### 9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

**Table 9-13 UE transmitted power absolute accuracy**

| Parameter | Unit | Accuracy [dB] | |
|---|---|---|---|
| | | PUEMAX 24dBm | PUEMAX 21dBm |
| UE transmitted power=PUEMAX | dBm | +1/-3 | ±2 |
| UE transmitted power=PUEMAX-1 | dBm | +1.5/-3.5 | ±2.5 |
| UE transmitted power=PUEMAX-2 | dBm | +2/-4 | ±3 |
| UE transmitted power=PUEMAX-3 | dBm | +2.5/-4.5 | ±3.5 |
| PUEMAX-10≤UE transmitted power<PUEMAX-3 | dBm | +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 3G TS 25.101 'UTRA (UE) FDD; Radio Transmission and Reception' section 6.2.1 table 6.1.

Note 2: UE transmitted power is the reported value.

For each empty slot created by compressed mode, the UE L1 shall respond with a value of -50 dBm.

### 9.1.6.2 UE transmitted power measurement report mapping

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

In table 9-14 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-14**

| 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 |

## 9.1.7 SFN-CFN observed time difference

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

### 9.1.7.1 Intra frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-15 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$

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

**Table 9-15**

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

### 9.1.7.2 Inter frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

The accuracy requirement in table 9-16 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left|CPICH\_RSCP1|_{in\ dB} - CPICH\_RSCP2|_{in\ dB}\right| \leq 20dB$
- | *Channel 1_Io -Channel 2_Io*| ≤ 20 dB.
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \leq 20dB$
- $\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} \leq XdB$

**Table 9-16**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| *SFN-CFN observed time difference* | chip | ± 1 | -94...-50 |

### 9.1.7.3 SFN-CFN observed time difference measurement report mapping

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

In table 9-17 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-17**

| 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 |

## 9.1.8 SFN-SFN observed time difference

### 9.1.8.1 SFN-SFN observed time difference type 1

Note: This measurement is for identifying time difference between two cells.

#### 9.1.8.1.1 Measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-18 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \le 20dB$
- $\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \le XdB$

**Table 9-18**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| SFN-SFN observed time difference type1 | chip | ± 1 | -94...-50 |

#### 9.1.8.1.2 SFN-SFN observed time difference type 1 measurement report mapping

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

In table 9-19 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-19**

| 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 |

### 9.1.8.2 SFN-SFN observed time difference type 2

Note: This measurement is for location service purposes to identify time difference between two cells.

It is optional for terminal to support a subset of LCS methods.

Note: Requirement on the UE shall be reconsidered when the state of the art technology progress.

#### 9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-20 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)\Big|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$
- $\left(\frac{I_o}{\hat{I}_{or}}\right)\Big|_{in\ dB} - \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} \le XdB$

**Table 9-20**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| SFN-SFN observed time difference type2 | chip | ± 0.5 | -94...-50 |

#### 9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.1.

The accuracy requirement in table 9-21 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.

- $\left| CPICH\_RSCP1 \right|_{in\ dB} - CPICH\_RSCP2 \left|_{in\ dB} \right| \leq 20dB$
- $\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$
- $\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq XdB$

Note: Additional general conditions are needed for the requirements in table 9-21 to be valid.

**Table 9-21**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| *SFN-SFN observed time difference type 2* | chip | ± 0.5 | -94...-50 |

### 9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2.

The accuracy requirement in table 9-22 is valid under the following conditions:

- *CPICH_RSCP1,2* ≥ -114 dBm.
- $\left| CPICH\_RSCP1 \right|_{in\ dB} - CPICH\_RSCP2 \left|_{in\ dB} \right| \leq 20dB$
- | *Channel 1_Io -Channel 2_Io*| ≤ 20 dB.
- $\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$
- $\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq XdB$

**Table 9-22**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| SFN-SFN observed time difference type 2 | chip | ± 1 | -94...-50 |

### 9.1.8.2.4 SFN-SFN observed time difference type 2 measurement report mapping

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

In table 9-23 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-23**

| 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 |

## 9.1.9 UE Rx-Tx time difference

### 9.1.9.1 UE Rx-Tx time difference type 1

Note: This measurement is used for call set up purposes to compensate propagation delay of DL and UL.

The measurement period in CELL_DCH state is [100 ms]

#### 9.1.9.1.1 Measurement requirement

**Table 9-24**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| UE RX-TX time difference | chip | ± 1.5 | -94...-50 |

#### 9.1.9.1.2 UE Rx-Tx time difference type 1 measurement report mapping

The reporting range is for *UE Rx-Tx time difference type 1* is from 768 ... 1280 chip.

In table 9-25 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-25**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| RX-TX_TIME _0000 | UE Rx-Tx Time difference type 1< 768.000 | chip |
| RX-TX_TIME _0001 | 768.000 ≤ UE Rx-Tx Time difference type 1< 768.0625 | chip |
| RX-TX_TIME _0002 | 768.0625 ≤ UE Rx-Tx Time difference type 1< 768.1250 | chip |
| RX-TX_TIME _0003 | 768.1250 ≤ UE Rx-Tx Time difference type 1< 768.1875 | chip |
| … | … | … |
| RX-TX_TIME _8190 | 1279.8125 ≤ UE Rx-Tx Time difference type 1< 1279.8750 | chip |
| RX-TX_TIME _8191 | 1279.8750 ≤ UE Rx-Tx Time difference type 1< 1279.9375 | chip |
| RX-TX_TIME _8192 | 1279.9375 ≤ UE Rx-Tx Time difference type 1< 1280.0000 | chip |
| RX-TX_TIME _8193 | 1280.0000 ≤ UE Rx-Tx Time difference type 1 | chip |

### 9.1.9.2 UE Rx-Tx time difference type 2

Note: This measurement is used for LCS purposes.

It is optional for a terminal to support a subset of LCS methods. This measurement represents an instantaneous value that is time stamped as defined in the IE description in 25.331 [16].

#### 9.1.9.2.1 Measurement requirement

**Table 9-24b**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Io [dBm] |
| UE RX-TX time difference | chip | ± TBD | -94...-50 |

#### 9.1.9.2.2 UE Rx-Tx time difference type 2 measurement report mapping

The reporting range is for *UE Rx-Tx time difference type2* is from 768 ... 1280 chip.

In table 9-25b the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-25b**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| RX-TX_TIME _0000 | UE Rx-Tx Time difference type 2 < 768.000 | chip |
| RX-TX_TIME _0001 | 768.000 ≤ UE Rx-Tx Time difference type 2 < 768.0625 | chip |
| RX-TX_TIME _0002 | 768.0625 ≤ UE Rx-Tx Time difference type 2 < 768.1250 | chip |
| RX-TX_TIME _0003 | 768.1250 ≤ UE Rx-Tx Time difference type 2 < 768.1875 | chip |
| … | … | … |
| RX-TX_TIME _8190 | 1279.8125 ≤ UE Rx-Tx Time difference type 2 < 1279.8750 | chip |
| RX-TX_TIME _8191 | 1279.8750 ≤ UE Rx-Tx Time difference type 2 < 1279.9375 | chip |
| RX-TX_TIME _8192 | 1279.9375 ≤ UE Rx-Tx Time difference type 2 < 1280.0000 | chip |
| RX-TX_TIME _8193 | 1280.0000 ≤ UE Rx-Tx Time difference type 2 | chip |

### 9.1.10 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 and GSM.

#### 9.1.10.1 Measurement requirement

Note: The conditions for which the accuracy requirement in table 9-26 is valid are FFS.

**Table 9-26**

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

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

#### 9.1.10.2 Observed time difference to GSM cell measurement report mapping

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

In table 9-27 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-27**

| 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 |

## 9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3.

### 9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9-28 is valid under the following conditions:

- *P-CCPCH_RSCP* ≥ -102 dBm.
- | *Io* - *P-CCPCH_Ec/Ior*| ≤ [20] dB.

**Table 9-28: P-CCPCH_RSCP Inter frequency absolute accuracy**

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

### 9.1.11.2 P-CCPCH RSCP measurement report mapping

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

In table 9-29 the mapping of 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 |
|---|---|---|
| PCCPCH_RSCP_LEV _00 | PCCPCH RSCP< -115 | dBm |
| PCCPCH_RSCP_LEV _01 | -115 ≤ PCCPCH RSCP< -114 | dBm |
| PCCPCH_RSCP_LEV _02 | -114 ≤ PCCPCH RSCP< -113 | dBm |
| PCCPCH_RSCP_LEV _03 | -113 ≤ PCCPCH RSCP< -112 | dBm |
| … | … | … |
| PCCPCH_RSCP_LEV _89 | -27 ≤ PCCPCH RSCP< -26 | dBm |
| PCCPCH_RSCP_LEV _90 | -26 ≤ PCCPCH RSCP< -25 | dBm |
| PCCPCH_RSCP_LEV _91 | -25 ≤ PCCPCH RSCP | dBm |

## 9.1.12 UE GPS Timing of Cell Frames for LCS

The requirements in this section are valid for terminals supporting this capability:

**Table 9-30**

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

### 9.1.12.1 UE GPS timing of Cell Frames for LCS measurement report mapping

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

In table 9-31 the mapping of measured quantity is defined.

**Table 9-31**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| GPS_TIME_00000000000000 | UE GPS timing of Cell Frames for LCS < 0.0625 | chip |
| GPS_TIME_00000000000001 | 0.0625 ≤ UE GPS timing of Cell Frames for LCS < 0.1250 | chip |
| GPS_TIME_00000000000002 | 0.1250 ≤ UE GPS timing of Cell Frames for LCS < 0.1875 | chip |
| ... | ... | ... |
| GPS_TIME_37109759999997 | 2319359999999.8125 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999.8750 | chip |
| GPS_TIME_37109759999998 | 2319359999999.8750 ≤ UE GPS timing of Cell Frames for LCS < 2319359999999.9375 | chip |
| GPS_TIME_37109759999999 | 2319359999999.9375 ≤ UE GPS timing of Cell Frames for LCS < 2319360000000.0000 | chip |

## 9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is refered 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.

## 9.2.1 Received total wideband power

The measurement period shall be [100] ms.

### 9.2.1.1 Absolute accuracy requirement

**Table 9-32**

| Parameter | Unit | Accuracy [dB] | Conditions |
|---|---|---|---|
| | | | Range |
| Io | dBm | ± 4 | –103<= Io <= -74 dBm |

### 9.2.1.2 Relative accuracy requirement

The relative accuracy is defined as the Received total wideband power measured at one frequency compared to the Received total wideband power measured from the same frequency at a different time.

Note: The accuracy requirement and the conditions in table 9-33 to needs to be revised when the definition of the UTRAN RSSI measurement is decided within WG1.

**Table 9-33**

| Parameter | Unit | Accuracy [dB] | Conditions |
|---|---|---|---|
| | | | Range |
| *Io* | dBm | ± [0.5] | For changes <= ±5.0dB and –103 <= Io <= -74dBm |

### 9.2.1.3 Received total wideband power measurement report mapping

The reporting range for *Received total wideband power (RTWP)* is from -112 ... -50 dBm.

In table 9-34 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-34**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| RTWP_LEV _000 | RTWP < -112.0 | dBm |
| RTWP_LEV _001 | -112.0 ≤ RTWP < -111.9 | dBm |
| RTWP_LEV _002 | -111.9 ≤ RTWP < -111.8 | dBm |
| … | … | … |
| RTWP_LEV _619 | -50.2 ≤ RTWP < -50.1 | dBm |
| RTWP_LEV _620 | -50.1 ≤ RTWP < -50.0 | dBm |
| RTWP_LEV _621 | -50.0 ≤ RTWP | dBm |

## 9.2.2 SIR

The measurement period shall be 80 ms.

### 9.2.2.1 Accuracy requirement

**Table 9-35**

| Parameter | Unit | Accuracy [dB] | Conditions |
|---|---|---|---|
| | | | Range |
| SIR | dB | ± 3 | For -7<SIR<20 dB when Io > -105 dBm |

### 9.2.2.2 SIR measurement report mapping

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

In table 9-36 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-36**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| UTRAN_SIR_00 | SIR < -11.0 | dB |
| UTRAN_SIR_01 | -11.0 ≤ SIR < -10.5 | dB |
| UTRAN_SIR_02 | -10.5 ≤ SIR < -10.0 | dB |
| … | … | … |
| UTRAN_SIR_61 | 19.0 ≤ SIR < 19.5 | dB |
| UTRAN_SIR_62 | 19.5 ≤ SIR < 20.0 | dB |
| UTRAN_SIR_63 | 20.0 ≤ SIR | dB |

## 9.2.3 $SIR_{error}$

The measurement period shall be 80 ms.

Note: The measurement period is the same as for the SIR measurement in section 8.2.2. $SIR_{error}$ is calculated from SIR and $SIR_{target}$, see TS 25.215..

### 9.2.3.1 Accuracy requirement

**Table 9-37**

| Parameter | Accuracy | Range |
|---|---|---|
| $SIR_{error}$ | ± 3 dB | The accuracy requirement for $SIR_{error}$ is valid for SIR within the guaranteed accuarcy range specified in section 8.2.2. |

Note: The accuracy requirement for $SIR_{error}$ is the same as for the SIR measurement specified in section 8.2.2. $SIR_{error}$ is calculated from SIR and $SIR_{target}$, see TS 25.215.

### 9.2.3.2 $SIR_{error}$ measurement report mapping

The reporting range for $SIR_{error}$ is from -31 ... 31 dB.

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

**Table 9-38**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| UTRAN_SIR_ERROR_000 | $SIR_{error} < -31.0$ | dB |
| UTRAN_SIR_ERROR_001 | $-31.0 \le SIR_{error} < -30.5$ | dB |
| UTRAN_SIR_ERROR_002 | $-30.5 \le SIR_{error} < -30.0$ | dB |
| … | … | … |
| UTRAN_SIR_ERROR_062 | $-0.5 \le SIR_{error} < 0.0$ | dB |
| UTRAN_SIR_ERROR_063 | $0.0 \le SIR_{error} < 0.5$ | dB |
| … | … | … |
| UTRAN_SIR_ERROR_123 | $30.0 \le SIR_{error} < 30.5$ | dB |
| UTRAN_SIR_ERROR_124 | $30.5 \le SIR_{error} < 31.0$ | dB |
| UTRAN_SIR_ERROR_125 | $31.0 \le SIR_{error}$ | dB |

## 9.2.4 Transmitted carrier power

The measurement period shall be [100] ms.

### 9.2.4.1 Accuracy requirement

**Table 9-39**

| Parameter | Unit | Accuracy [% units] | Conditions |
|---|---|---|---|
| | | | Range |
| Ptot | % | ± 5 | For 5% ≤ Transmitted carrier power ≤95% |

### 9.2.4.2 Transmitted carrier power measurement report mapping

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

In table 9-40 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-40**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| UTRAN_TX_POWER _000 | Transmitted carrier power = 0 | % |
| UTRAN_TX_POWER _001 | 0 < Transmitted carrier power ≤ 1 | % |
| UTRAN_TX_POWER _002 | 1 < Transmitted carrier power ≤ 2 | % |
| UTRAN_TX_POWER _003 | 2 < Transmitted carrier power ≤ 3 | % |
| … | … | … |
| UTRAN_TX_POWER _098 | 97 < Transmitted carrier power ≤ 98 | % |
| UTRAN_TX_POWER _099 | 98 < Transmitted carrier power ≤ 99 | % |
| UTRAN_TX_POWER _100 | 99 < Transmitted carrier power ≤ 100 | % |

## 9.2.5 Transmitted code power

The measurement period shall be [100] ms.

### 9.2.5.1 Absolute accuracy requirement

**Table 9-41**

| Parameter | Unit | Accuracy [dB] | Conditions |
|---|---|---|---|
| | | | Range |
| Pcode | dBm | ± 3 | Over the full range |

### 9.2.5.2 Relative accuracy requirement

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

**Table 9-42**

| Parameter | Unit | Accuracy [dB] | Conditions |
|---|---|---|---|
| | | | Range |
| Pcode | dBm | ± 2 | Over the full range |

### 9.2.5.3 Transmitted code power measurement report mapping

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

In table 9-43 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-43**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| UTRAN_CODE_POWER _010 | -10.0 ≤ Transmitted code power < -9.5 | dBm |
| UTRAN_CODE_POWER _011 | -9.5 ≤ Transmitted code power < -9.0 | dBm |
| UTRAN_CODE_POWER _012 | -9.0 ≤ Transmitted code power < -8.5 | dBm |
| … | … | … |
| UTRAN_CODE_POWER _120 | 45.0 ≤ Transmitted code power < 45.5 | dBm |
| UTRAN_CODE_POWER _121 | 45.5 ≤ Transmitted code power < 46.0 | dBm |
| UTRAN_CODE_POWER _122 | 46.0 ≤ Transmitted code power < 46.5 | dBm |

## 9.2.6 Transport channel BLER

The measurement period shall be equal to the [TTI] of the transport channel.

### 9.2.6.1 Accuracy requirement

**Table 9-44**

| Parameter | Unit | Accuracy | Conditions |
|---|---|---|---|
| | | | Range |
| BLER | - | | |

### 9.2.6.2 Transport channel BLER measurement report mapping

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

In table 9-45 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-45**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| BLER_LOG _00 | Transport channel BLER = 0 | - |
| BLER_LOG _01 | $-\infty <$ 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 | - |

## 9.2.7 Physical channel BER

The measurement period shall be equal to the TTI of the transport channel, to which the Physical channel BER is associated via the IE QE-Selector, see TS 25.433 section 9.2.2.58 QE-Selector. Each reported Physical channel BER measurement shall be an estimate of the BER averaged over one measurement period only.

### 9.2.7.1 Accuracy requirement

The average of consecutive Physical channel BER measurements is required to fulfil the accuracy stated in table 9-46 if the total number of erroneous bits during these measurements is at least 500 and the absolute BER value for each of the measurements is within the range given in table 9-46.

**Table 9-46**

| Parameter | Unit | Accuracy [% of absolute BER value] | Conditions |
|---|---|---|---|
| | | | Range |
| PhyBER | - | +/- 10 | for absolute BER value ≤ 30% |

### 9.2.7.2 Physical channel BER measurement report mapping

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

In table 9-47 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-47**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| PhCh_BER_LOG_000 | Physical channel BER = 0 | - |
| PhCh_BER_LOG_001 | -∞ < Log10(Physical channel BER) < -2.06375 | - |
| PhCh_BER_LOG_002 | -2.06375≤ Log10(Physical channel BER) < -2.055625 | - |
| PhCh_BER_LOG_003 | -2.055625 ≤ Log10(Physical channel BER) < -2.0475 | - |
| … | … | … |
| PhCh_BER_LOG_253 | -0.024375 ≤ Log10(Physical channel BER) < -0.01625 | - |
| PhCh_BER_LOG_254 | -0.01625 ≤ Log10(Physical channel BER) < -0.008125 | - |
| PhCh_BER_LOG_255 | -0.008125 ≤ Log10(Physical channel BER) ≤ 0 | - |

## 9.2.8 Round trip time

The measurement period shall be [100] ms.

### 9.2.8.1 Absolute accuracy requirement

**Table 9-48**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Range [chips] |
| RTT | chip | +/- 0.5 | 876, …, 2923.50 |

### 9.2.8.2 Round trip time measurement report mapping

The *Round trip time* reporting range is from 876.0000 ... 2923.8750 chip.

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 |
|---|---|---|
| RT_TIME_0000 | Round trip time < 876.0000 | chip |
| RT_TIME_0001 | 876.0000 ≤ Round trip time < 876.0625 | chip |
| RT_TIME_0002 | 876.0625 ≤ Round trip time < 876.1250 | chip |
| RT_TIME_0003 | 876.1250 ≤ Round trip time < 876.1875 | chip |
| … | … | … |
| RT_TIME_32764 | 2922.6875 ≤ Round trip time < 2923.7500 | chip |
| RT_TIME_32765 | 2923.7500 ≤ Round trip time < 2923.8125 | chip |
| RT_TIME_32766 | 2923.8125 ≤ Round trip time < 2923.8750 | chip |
| RT_TIME_32767 | 2923.8750 ≤ Round trip time | chip |

## 9.2.9 Transport Channel BER

The measurement period shall be equal to the TTI of the transport channel. Each reported Transport channel BER measurement shall be an estimate of the BER averaged over one measurement period only.

### 9.2.9.1 Accuracy requirement

The average of consecutive Transport channel BER measurements is required to fulfil the accuracy stated in table 9-48 if the total number of erroneous bits during these measurements is at least 500 and the absolute BER value for each of the measurements is within the range given in table 9-50.

**Table 9-50**

| 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:<br>for absolute BER value ≤ 15%<br>Convolutional coding 1/2 with any amount of repetition or no puncturing:<br>for absolute BER value ≤ 15%<br>Turbo coding 1/3rd with any amount of repetition or a maximum of 20% puncturing:<br>for absolute BER value ≤ 15%. |

### 9.2.9.2 Transport channel BER measurement report mapping

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

In table 9-51 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-51**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| TrCh_BER_LOG_000 | Transport channel BER = 0 | - |
| TrCh_BER_LOG_001 | -∞ < Log10(Transport channel BER) < -2.06375 | - |
| TrCh_BER_LOG_002 | -2.06375≤ Log10(Transport channel BER) < -2.055625 | - |
| TrCh_BER_LOG_003 | -2.055625 ≤ Log10(Transport channel BER) < -2.0475 | - |
| … | … | … |
| TrCh_BER_LOG_253 | -0.024375 ≤ Log10(Transport channel BER) < -0.01625 | - |
| TrCh_BER_LOG_254 | -0.01625 ≤ Log10(Transport channel BER) < -0.008125 | - |
| TrCh_BER_LOG_255 | -0.008125 ≤ Log10(Transport channel BER) ≤ 0 | - |

## 9.2.10 UTRAN GPS Timing of Cell Frames for LCS

**Table 9-52**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| UTRAN GPS Timing of Cell Frames for LCS | chip | [ ] | |

### 9.2.10.1 UTRAN GPS timing of Cell Frames for LCS measurement report mapping

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

In table 9-53 the mapping of measured quantity is defined.

**Table 9-53**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| GPS_TIME_00000000000000 | UTRAN GPS timing of Cell Frames for LCS < 0.0625 | chip |
| GPS_TIME_00000000000001 | 0.0625 ≤ UTRAN GPS timing of Cell Frames for LCS < 0.1250 | chip |
| GPS_TIME_00000000000002 | 0.1250 ≤ UTRAN GPS timing of Cell Frames for LCS < 0.1875 | chip |
| … | … | … |
| GPS_TIME_37109759999997 | 2319359999999.8125 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999.8750 | chip |
| GPS_TIME_37109759999998 | 2319359999999.8750 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319359999999.9375 | chip |
| GPS_TIME_37109759999999 | 2319359999999.9375 ≤ UTRAN GPS timing of Cell Frames for LCS < 2319360000000.0000 | chip |

## 9.2.11 PRACH/PCPCH Propagation delay

### 9.2.11.1 Accuracy requirement

**Table 9-54**

| Parameter | Unit | Accuracy [chip] | Conditions |
|---|---|---|---|
| | | | Range |
| PropDelay | chip | +/- [] | |

### 9.2.11.2 PRACH/PCPCH Propagation delay measurement report mapping

The *PRACH/PCPCH Propagation delay* reporting range is from 0 ... 765 chip.

In table 9-55 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-55**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| PROP_DELAY_000 | 0 ≤ PRACH/PCPCH Propagation delay < 3 | chip |
| PROP_DELAY_001 | 3 ≤ PRACH/PCPCH Propagation delay < 6 | chip |
| PROP_DELAY_002 | 6 ≤ PRACH/PCPCH Propagation delay < 9 | chip |
| … | … | … |
| PROP_DELAY_252 | 756 ≤ PRACH/PCPCH Propagation delay < 759 | chip |
| PROP_DELAY_253 | 759 ≤ PRACH/PCPCH Propagation delay < 762 | chip |
| PROP_DELAY_254 | 762 ≤ PRACH/PCPCH Propagation delay < 765 | chip |
| PROP_DELAY_255 | 765 ≤ PRACH/PCPCH Propagation delay | chip |

## 9.2.12 Acknowledged PRACH preambles

The measurement period shall be 20 ms.

### 9.2.12.1 Acknowledged PRACH preambles measurement report mapping

The *Acknowledged PRACH preambles* reporting range is from 0 ... 240 acknowledgements.

In table 9-56 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-56**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| ACK_PRACH_PREAMPLE_000 | Acknowledged PRACH preambles = 0 | - |
| ACK_PRACH_PREAMPLE_001 | Acknowledged PRACH preambles = 1 | - |
| ACK_PRACH_PREAMPLE_002 | Acknowledged PRACH preambles = 2 | - |
| … | … | … |
| ACK_PRACH_PREAMPLE_237 | Acknowledged PRACH preambles = 237 | - |
| ACK_PRACH_PREAMPLE_238 | Acknowledged PRACH preambles = 238 | - |
| ACK_PRACH_PREAMPLE_239 | Acknowledged PRACH preambles = 239 | - |
| ACK_PRACH_PREAMPLE_240 | Acknowledged PRACH preambles = 240 | - |

## 9.2.13 Detected PCPCH access preambles

The measurement period shall be 20 ms.

### 9.2.13.1 Detected PCPCH access preambles measurement report mapping

The *Detected PCPCH access preambles* reporting range is 0 … 240.

In Table 9-57, the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-57**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| DETECT_PCPCH_AP_000 | Detected PCPCH access preambles = 0 | - |
| DETECT_PCPCH_AP _001 | Detected PCPCH access preambles = 1 | - |
| DETECT_PCPCH_AP _002 | Detected PCPCH access preambles = 2 | - |
| … | … | … |
| DETECT_PCPCH_AP _237 | Detected PCPCH access preambles = 237 | - |
| DETECT_PCPCH_AP _238 | Detected PCPCH access preambles = 238 | - |
| DETECT_PCPCH_AP _239 | Detected PCPCH access preambles = 239 | - |
| DETECT_PCPCH_AP _240 | Detected PCPCH access preambles = 240 | - |

## 9.2.14 Acknowledged PCPCH access preambles

The measurement period shall be 20 ms.

### 9.2.14.1 Acknowledged PCPCH access preambles measurement report mapping

The *Acknowledged PCPCH access preambles* reporting range is 0 … 15.

In Table 9-58, the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-58**

| Reported value | Measured quantity value | Unit |
|---|---|---|
| ACK_PCPCH_AP_00 | Acknowledged PCPCH access preambles = 0 | - |
| ACK_PCPCH_AP _01 | Acknowledged PCPCH access preambles = 1 | - |
| ACK_PCPCH_AP _02 | Acknowledged PCPCH access preambles = 2 | - |
| … | … | … |
| ACK_PCPCH_AP _12 | Acknowledged PCPCH access preambles = 12 | - |
| ACK_PCPCH_AP _13 | Acknowledged PCPCH access preambles = 13 | - |
| ACK_PCPCH_AP _14 | Acknowledged PCPCH access preambles = 14 | - |
| ACK_PCPCH_AP _15 | Acknowledged PCPCH access preambles = 15 | - |

# Annex A (normative): Test Cases

## A.1 Purpose of Annex

This Annex specifies test specific parameters for some of the functional requirements in chapters 4 to 9. The tests provide additional information to how the requirements should be interpreted for the purpose of conformance testing. The tests in this Annex are described such that one functional requirement may be tested in one or several test and one test may verify several requirements. Some requirements may lack a test.

The conformance tests are specified in TS34.121. Statistical interpretation of the requirements is described in Annex A.2.

## A.2 Requirement classification for statistical testing

*Editors note: Each requirement in the annex have to be gone through and updated with which type it belongs to and in applicable cases, which success rate that defines the requirement. Tdoc R4 00 619 shall be used as a base for that work.*

Requirements in this specification are either expressed as absolute requirements with a single value stating the requirement, or expressed as a success rate. There are no provisions for the statistical variations that will occur when the parameter is tested.

Annex A outlines the test in more detail and lists the test parameters needed. The test will result in an outcome of a test variable value for the DUT inside or outside the test limit. Overall, the probability of a "good" DUT being inside the test limit(s) and the probability of a "bad" DUT being outside the test limit(s) should be as high as possible. For this reason, when selecting the test variable and the test limit(s), the statistical nature of the test is accounted for.

The statistical nature depends on the type of requirement. Some have large statistical variations, while others are not statistical in nature at all. When testing a parameter with a statistical nature, a confidence level is set. This establishes the probability that a DUT passing the test actually meets the requirement and determines how many times a test has to be repeated and what the pass and fail criteria are. Those aspects are not covered by TS 25.133. The details of the tests, how many times to run it and how to establish confidence in the tests are described in TS 34.121. This Annex establishes what the test variable is and whether it can be viewed as statistical in nature or not.

### A.2.1 Types of requirements in TS 25.133

**Time and delay requirements on UE higher layer actions**

A very large part of the RRM requirements are delay requirements:

- In idle mode (A.4) there is cell selection delay and cell re-selection delay.
- In UTRAN Connected Mode Mobility (A.5) there is measurement reporting delay and cell re-selection delay.
- In RRC Connection Control (A.6) there is RRC re-establishment delay.

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

The variations make a strict limit unsuitable for a test. Instead there is a condition set for a correct action by the UE, e.g. that the UE shall camp on the correct cell within X seconds. Then the rate of correct events is observed during repeated tests and a limit is set on the rate of correct events, usually 90% correct events are required. How the limit is applied in the test depends on the confidence required, further detailed are in TS 34.121.

**Measurements of power levels, relative powers and time**

A very large number of requirements are on measurements that the UE performs:

- In UTRAN Connected Mode Mobility (A.5) there are measurement reports.
- Measurement performance requirements (A.8) has requirements on all type of measurements.

The accuracy requirements on measurements are expressed in this specification as a fixed limit (e.g. +/-X dB), but the measurement error will have a distribution that is not easily confined in fixed limits. Assuming a Gaussian distribution of the error, the limits will have to be set at +/-3.29$\sigma$ if the probability of failing a "good DUT" in a single test is to be kept at 0.1%. It is more reasonable to set the limit tighter and test the DUT by counting the rate of measurements that are within he limits, in a way similar to the requirements on delay.

**Implementation requirements**

A few requirements are strict actions the UE should take or capabilities the UE should have, without any allowance for deviations. These requirements are absolute and should be tested as such. Examples are

- "Event triggered report rate" and "Active set dimension" in UTRAN Connected Mode Mobility (A.5)
- "Correct behaviour at time-out" in RRC connection control (A.6)

**Physical layer timing requirements**

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

**BER and BLER requirements**

Some measurement report procedures in "UE Measurement procedures" (A.8) have requirements on DCH BLER. These are tested in the same way as BLER requirements in TS 25.101.

# A.3 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

## A.4.2 Cell Re-Selection

Two scenarios are considered:

Scenario 1: Single carrier case

Scenario 2: Multi carrier case

For each of them a test is proposed.

NOTE: Existing scenarios cover only requirements in section 4.2.2.2. More scenarios, covering requirements in section 4.2.2.1, will be added later.

### A.4.2.1 Scenario 1: Single carrier case

#### A.4.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the cell re-selection delay in the single carrier case reported in section 4.2.2.2.1.

This scenario implies the presence of 1 carrier and 6 cells as given in Table A.4.4 and A.4-5.

**Table A.4.4: General test parameters for Cell Re-selection single carrier multi-cell case**

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

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

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 7.3 | 10.27 | 10.27 | 7.3 | 0.27 | | 0.27 | | 0.27 | | 0.27 | |
| $I_{oc}$ | dBm / 3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -23 | | -23 | | -23 | | -23 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| $Qoffset2_{s,n}$ | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst2 | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET2 | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

#### A.4.2.1.2 Test Requirements

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

### A.4.2.2 Scenario 2: Multi carrier case

#### A.4.2.2.1 Test Purpose and Environment

This test is to verify the requirement for the cell re-selection delay in the multi carrier case reported in section 4.2.2.2.2.

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

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

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

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

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 2 | | Channel 1 | | Channel 1 | | Channel 2 | | Channel 2 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | -3.4 | 2.2 | 2.2 | -3.4 | -7.4 | -4.8 | -7.4 | -4.8 | -4.8 | -7.4 | -4.8 | -7.4 |
| $I_{oc}$ | dBm / 3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -20 | | -20 | | -20 | | -20 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| $Qoffset_{s,n}$ | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [2] | | [2] | | [2] | | [ 2] | | [2] | | [2] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ 5] | | [ 5] | | [5] | | [ 5] | | [ 5] | | [5] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintersearch | dB | [-8 ] | | [-8 ] | | [-8 ] | | [-8 ] | | [-8 ] | | [-8 ] | |

#### A.4.2.2.2 Test Requirements

The requirements reported in section 4.2.2.2.2 shall be verified in more than [90%] of the cases.

## A.4.3 UTRAN to GSM Cell Re-Selection

### A.4.3.1 Scenario 1

#### A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.3.2.1.

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

**Table A.4.8: General test parameters for UTRAN to GSM Cell Re-selection**

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

**Table A.4.9: Cell re-selection UTRAN to GSM cell case (cell 1)**

| Parameter | Unit | Cell 1 (UTRA) | |
|---|---|---|---|
| | | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | |
| CPICH_Ec/Ior | dB | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | |
| SCH_Ec/Ior | dB | -12 | |
| PICH_Ec/Ior | dB | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 10.3 | 7.3 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | |
| CPICH_Ec/Io | dB | -13 | -16 |
| CPICH_RSCP | dBm | [L1] | [L2] |
| Propagation Condition | | AWGN | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | |
| Qrxlevmin | dBm | [ ] | |
| UE_TXPWR_MAX_RACH | dBm | [ ] | |
| $Qoffset1_{s,n}$ | dB | C1, C2: [ ] | |
| Qhyst1 | dB | [ ] | |
| PENALTY_TIME | s | C2: [ ] | |
| TEMP_OFFSET1 | dB | C2: [ ] | |
| Treselection | s | [ ] | |
| $Ssearch_{RAT}$ | dB | [ ] | |

**Table A.4.10: Cell re-selection UTRAN to GSM cell case (cell 2)**

| Parameter | Unit | Cell 2 (GSM) | |
|---|---|---|---|
| | | T1 | T2 |
| Absolute RF Channel Number | | ARFCN 1 | |
| RXLEV | dBm | -70 | -60 |
| RXLEV_ACCESS_MIN | dBm | [ ] | |
| MS_TXPWR_MAX_CCH | dBm | [ ] | |

#### A.4.3.1.2 Test Requirements

The requirements reported in section 4.3.2.1 shall be verified in more than [90%] of the cases.

# A.5 UTRAN Connected Mode Mobility

## A.5.1 FDD/FDD Soft Handover

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

## A.5.2 FDD/FDD Hard 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 FDD/TDD Hard 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 Inter-system Handover from UTRAN FDD to GSM

NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.4.2.1 and 5.4.2.2 exists.

## A.5.5 Cell Re-selection in CELL_FACH

### A.5.5.1 One frequency present in neighbour list

#### A.5.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in the single carrier case reported in section 5.5.2.1.1.

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

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

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

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

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 7.3 | 10.27 | 10.27 | 7.3 | 0.27 | | 0.27 | | 0.27 | | 0.27 | |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -23 | | -23 | | -23 | | -23 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qoffset | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

#### A.5.5.1.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.5.2.1.1

### A.5.5.2 Two frequencies present in the neighbour list

#### A.5.5.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.2.The test parameters are given in Table A5-3 and A5-4.

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

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

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

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 2 | | Channel 1 | | Channel 1 | | Channel 2 | | Channel 2 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | -3.4 | 2.2 | 2.2 | -3.4 | -7.4 | -4.8 | -7.4 | -4.8 | -4.8 | -7.4 | -4.8 | -7.4 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -20 | | -20 | | -20 | | -20 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qoffset | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintersearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

### A.5.5.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.5.2.1.2

# A.5.6 Cell Re-selection in CELL_PCH

## A.5.6.1 One frequency present in the neighbour list

### A.5.6.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_PCH state in section 5.6.2.1.1.

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

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

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

**Table A.5.6: Cell specific test parameters for Cell re-selection in CELL_PCH state**

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 7.3 | 10.27 | 10.27 | 7.3 | 0.27 | | 0.27 | | 0.27 | | 0.27 | |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -23 | | -23 | | -23 | | -23 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qoffset | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

### A.5.6.1.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.6.2.1.1

## A.5.6.2 Two frequencies present in the neighbour list

### A.5.6.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_PCH state in in section 5.6.2.1.2.

The test parameters are given in Table A.5.7 and A.5.8

**Table A.5.7: General test parameters for Cell Re-selection in CELL_PCH**

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

**Table A.5.8: Cell specific test parameters for Cell re-selection in CELL_PCH state**

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 2 | | Channel 1 | | Channel 1 | | Channel 2 | | Channel 2 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | -3.4 | 2.2 | 2.2 | -3.4 | -7.4 | -4.8 | -7.4 | -4.8 | -4.8 | -7.4 | -4.8 | -7.4 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -20 | | -20 | | -20 | | -20 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qoffset | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintersearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

### A.5.6.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.6.2.1.2

# A.5.7 Cell Re-selection in URA_PCH

## A.5.7.1 One frequency present in the neighbour list

### A.5.7.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in URA_PCH state in in section 5.7.2.1.1.

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

Cells possible for re-selection shall belong to different UTRAN Registration Areas (URA).

**Table A.5.9: General test parameters for Cell Re-selection in URA_PCH**

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

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

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | | Channel 1 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 7.3 | 10.27 | 10.27 | 7.3 | 0.27 | | 0.27 | | 0.27 | | 0.27 | |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -23 | | -23 | | -23 | | -23 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_and_reselection_quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_MAX_RACH | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qoffset | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

### A.5.7.1.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.7.2.1.1

## A.5.7.2 Two frequencies present in the neighbour list

### A.5.7.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in URA_PCH state in section 5.7.2.1.2.

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

Cells possible for re-selection shall belong to different UTRAN Registration Areas (URA).

**Table A.5.11: General test parameters for Cell Re-selection in URA_PCH**

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

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

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | | Cell 4 | | Cell 5 | | Cell 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 2 | | Channel 1 | | Channel 1 | | Channel 2 | | Channel 2 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | | -15 | | -15 | | -15 | |
| OCNS_Ec/Ior | dB | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | -3.4 | 2.2 | 2.2 | -3.4 | -7.4 | -4.8 | -7.4 | -4.8 | -4.8 | -7.4 | -4.8 | -7.4 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | | | | | |
| CPICH_Ec/Io | dB | -16 | -13 | -13 | -16 | -20 | | -20 | | -20 | | -20 | |
| Propagation Condition | | AWGN | | | | | | | | | | | |
| Cell_selection_ and_reselection_ quality_measure | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | | CPICH $E_c/N_0$ | |
| Qqualmin | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qrxlevmin | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| UE_TXPWR_ MAX_RACH | dBm | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Qoffset | dB | C1, C2: [ ]<br>C1, C3: [ ]<br>C1, C4: [ ]<br>C1, C5: [ ]<br>C1, C6: [ ] | | C2, C1: [ ]<br>C2, C3: [ ]<br>C2, C4: [ ]<br>C2, C5: [ ]<br>C2, C6: [ ] | | C3, C1: [ ]<br>C3, C2: [ ]<br>C3, C4: [ ]<br>C3, C5: [ ]<br>C3, C6: [ ] | | C4, C1: [ ]<br>C4, C2: [ ]<br>C4, C3: [ ]<br>C4, C5: [ ]<br>C4, C6: [ ] | | C5, C1: [ ]<br>C5, C2: [ ]<br>C5, C3: [ ]<br>C5, C4: [ ]<br>C5, C6: [ ] | | C6, C1: [ ]<br>C6, C2: [ ]<br>C6, C3: [ ]<br>C6, C4: [ ]<br>C6, C5: [ ] | |
| Qhyst | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| PENALTY_TIME | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| TEMP_OFFSET | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Treselection | s | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintrasearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |
| Sintersearch | dB | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | | [ ] | |

### A.5.7.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.7.2.1.2

# A.6 RRC Connection Control

## A.6.1 RRC Re-establishment delay

### A.6.1.1 Test Purpose and Environment

The purpose is to verify that the RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

The test parameters are given in Table A.6.1-A and Table A.6.1-B below. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consist of 2 successive time periods, with a time duration of T1 and T2 respectively. At the start of time period T2, the dedicated channel is removed.

**Table A.6.1-A General test parameters for RRC re-establishment delay, Test 1**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH Parameters | | DL Reference measurement channel 12.2 kbps | As specified in TS 25.101, section A.3.1 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| N313 | Frames | 20 | |
| N315 | Frames | 20 | |
| T313 | Seconds | 0 | |
| Trep(3) | ms | 1280 | |
| Trep(5) | ms | 1280 | |
| Trep(6) | ms | 1280 | |
| Trep(7) | ms | 1280 | |
| Monitored cell list size | | 24 | Monitored set shall only include intra frequency neighbours. |
| Cell 2 included in monitored set | | Included | |
| Reporting frequency | Seconds | 4 | |
| T1 | | 10 | |
| T2 | | 6 | |

**Table A.6.1-B Cell specific parameters for RRC re-establishment delay test, Test 1**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 |
| *Cell Frequency* | ChNr | 1 | | 1 | |
| *CPICH_Ec/Ior* | dB | -10 | | -10 | |
| *PCCPCH_Ec/Ior* | dB | -12 | | -12 | |
| *SCH_Ec/Ior* | dB | -12 | | -12 | |
| *PICH_Ec/Ior* | dB | -15 | | -15 | |
| *DCH_Ec/Ior* | dB | -17 | -Inf | Not applicable | |
| OCNS_Ec/Ior | dB | -1.049 | -0.941 | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 2,39 | | 4,39 | |
| $I_{oc}$ | dBm/ 3.84 MHz | -70 | | | |
| *CPICH_Ec/Io* | dB | -15 | | -13 | |
| Propagation Condition | | AWGN | | | |

**Table A.6.1-C General test parameters for RRC re-establishment delay, Test 2**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH Parameters | | DL Reference measurement channel 12.2 kbps | As specified in TS 25.101, section A.3.1 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| N313 | Frames | 20 | |
| N315 | Frames | 20 | |
| T313 | Seconds | 0 | |
| Trep(3) | ms | 1280 | |
| Trep(5) | ms | 1280 | |
| Trep(6) | ms | 1280 | |
| Trep(7) | ms | 1280 | |
| Monitored cell list size | | 24 | Monitored set shall include 2 additional frequencies. |
| Cell 2 included in monitored set | | Not Included | |
| Reporting frequency | Seconds | 4 | |
| T1 | | 10 | |
| T2 | | 6 | |

**Table A.6.1-D Cell specific parameters for RRC re-establishment delay test, Test 2**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 |
| *Cell Frequency* | ChNr | 1 | | 2 | |
| *CPICH_Ec/Ior* | dB | -10 | | -10 | |
| *PCCPCH_Ec/Ior* | dB | -12 | | -12 | |
| *SCH_Ec/Ior* | dB | -12 | | -12 | |
| *PICH_Ec/Ior* | dB | -15 | | -15 | |
| *DCH_Ec/Ior* | dB | -17 | -Inf | Not applicable | |
| OCNS_Ec/Ior | dB | -1.049 | -0.941 | -0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | -3,35 | | 0,02 | |
| $I_{oc}$ | dBm/ 3.84 MHz | -70 | | | |
| *CPICH_Ec/Io* | dB | -15 | | -13 | |
| Propagation Condition | | AWGN | | | |

## A.6.1.2 Test Requirements

**Test 1**

RRC re-establishment delay shall be less than 1630 ms.

**Test 2**

RRC re-establishment delay shall be less than 6490 ms.

# A.6.2 Random Access

## A.6.2.1 Test Purpose and Environment

The purpose of these tests are to verify that the behaviour of the random access procedure is according to the requirements and that the PRACH power settings are within specified limits. This tests will verify the requirements in section 6.3.2.

**Table A.6-3: RF Parameters for Random Access test**

| Parameter | Unit | Cell 1 |
|---|---|---|
| UTRA RF Channel Number | | Channel 1 |
| CPICH_Ec/Ior | dB | -10 |
| PCCPCH_Ec/Ior | dB | -12 |
| SCH_Ec/Ior | dB | -12 |
| Number of other transmitted Acquisition Indicators | - | 0 |
| AICH_Ec/Ior | dB | -10 |
| PICH_Ec/Ior | dB | -15 |
| OCNS_Ec/Ior when an AI is not transmitted | dB | -0.941 |
| OCNS_Ec/Ior when an AI is transmitted | dB | -1.516 |
| $\hat{I}_{or}/I_{oc}$ | dB | 0 |
| $I_{oc}$ | dBm/3.84 MHz | -70 |
| CPICH_Ec/Io | dB | -13 |
| Propagation Condition | | AWGN |
| | | |

The test parameters “System Information Block (SIB) type 5 (ASC #0)” defined in section 6.1 of TS34.108, shall be used in all random access tests. Crucial parameters for the test requirements are repeated in Table A.6-4 and A.6-5 and these overrule the parameters defined in SIB type 5.

**Table A.6-4: UE parameters for Random Access test**

| Parameter | Unit | Value |
|---|---|---|
| *Access Service Class (ASC#0)*<br><br>*- Persistence value* | <br><br>0..1 | <br><br>1 |
| *Maximum number of preamble ramping cycles* ($M_{max}$). | | 2 |
| *Maximum number of preambles in one preamble ramping cycle*<br>(Preamble Retrans Max) | | 12 |
| *The backoff time* $T_{B01}$<br>$N_{B01min}$=$N_{B01max}$ | ms<br>#TTI | N/A<br>10 |
| *Power step when no acquisition indicator is received*<br>(Power offset P0) | dB | 3 |
| *Power offset between the last transmitted preamble and the control part of the message*<br>(Power offset P p-m) | dB | 0 |
| Maximum allowed UL TX power | dBm | 0 |

**Table A.6-5: UTRAN parameters for Random Access test**

| Parameter | Unit | Value |
|---|---|---|
| Primary CPICH DL TX power | dBm | -8 |
| UL interference | dBm | -102 |
| SIR in open loop power control (Constant value) | dB | 0 |
| AICH Power Offset | dB | 0 |

## A.6.2.2 Test Requirements

### A.6.2.2.1 Correct behaviour when receiving an ACK

The UE shall stop transmitting preambles upon a ACK on the AICH has been received and then transmit a message. An ACK shall be transmitted after 10 preambles have been received by the UTRAN.

The absolute power applied to the first preamble shall be -30 dBm with an accuracy as specified in table 6.3 of 25.101 [3]. The relative power applied to additional preambles shall have an accuracy as specified in section 6.5.2.1 of 25.101 [3].

The UE shall transmit 10 preambles and 1 message.

### A.6.2.2.2 Correct behaviour when receiving an NACK

The UE shall stop transmitting preambles upon a NACK on the AICH has been received and then repeat the ramping procedure when the backoff timer $T_{B01}$ expires. The NACK shall be transmitted after the 10 preambles have been received by the UTRAN.

The UE shall transmit 10 preambles in the first ramping cycle and no transmission shall be done by the UE within 100 ms after the NACK has been transmitted by the UTRAN. Then the UE shall start the second preamble ramping cycle.

#### A.6.2.2.3 Correct behaviour at Time-out

The UE shall stop transmit preambles when reaching the maximum number of preambles allowed in a cycle. The UE shall then repeat the ramping procedure until the maximum number of preamble ramping cycles are reached. No ACK/NACK shall be sent by UTRAN during this test.

The UE shall transmit 2 preambles cycles, consisting of 12 preambles in each preamble cycle.

#### A.6.2.2.4 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum allowed UL TX power configured by the UTRAN. No ACK/NACK shall be sent by UTRAN during this test.

The absolute power of any preambles belonging to the first or second preamble cycle shall not exceed 0 dBm +/-[] dB (or +/- [] dB in extreme conditions).

# A.7 Timing and Signalling Characteristics

## A.7.1 UE Transmit Timing

### A.7.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in section 7.1.2.

For this test two cells on the same frequency are used. Table A.7-1 defines the transmitted signal strengths, the relative timing and the propagation condition used for the two cells.

**Table A.7-1: Test parameters for UE Transmit Timing requirement**

| Parameter | Unit | level |
|---|---|---|
| DPCH_Ec/ Ior, Cell 1 and Cell 2 | dB | -17 |
| CPICH_Ec/ Ior, Cell 1 and Cell 2 | dB | -10 |
| PCCPH_Ec/ Ior, Cell 1 and Cell 2 | dB | -12 |
| SCH_Ec/ Ior, Cell 1 and Cell 2 | dB | -12 |
| PICH_Ec/ Ior, Cell 1 and Cell 2 | dB | -15 |
| OCNS_Ec/ Ior, Cell 1 and Cell 2 | dB | -1.05 |
| $\hat{I}_{or,}$ Cell 1 | dBm/3.84 MHz | -96 |
| $\hat{I}_{or,}$ Cell 2 | dBm/3.84 MHz | -99 |
| Information data rate | kbps | 12.2 |
| Relative delay of path received from cell 2 with respect to cell 1 | μs | +/-2 |
| Propagation condition | AWGN | |

### A.7.1.2 Test Requirements

For parameters specified in Table A.7-1, the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

The relevant soft handover parameters shall be set such that the UE enters soft handover with cell 1 and cell 2 when both cells are sending a signal. The following sequence of events shall be used to verify that the requirements are met.

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1. $T_0$ is defined in [2].

b) Test system introduces cell 2 into the test system at delay +2 μs from cell 1.

c) Test system verifies that cell 2 is added to the active set.

d) Test system shall verify that the UE transmit timing offset is still within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

e) Test system switches Tx timing of cell 2 to a delay of -2 μs with respect to cell 1.

f) Test system verifies cell 2 remains in the active set.

g) Test system shall verify that the UE transmit timing offset is still within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

h) Test system stops sending cell 1 signals.

i) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements in section 7.1.2 until the UE transmit timing offset is within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

j) Test system shall verify that the UE transmit timing offset stays within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.

k) Test system starts sending cell 1 signal again with its original timing.

l) Test system verifies that cell 1 is added to the active set.

m) Test system stops sending cell 2 signals.

n) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements in section 7.1.2 until the UE transmit timing offset is within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

o) Test system shall verify that the UE transmit timing offset stays within $T_0$ +/- 1.5 chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

k)

## A.7.2 Signalling Response Delay

### A.7.2.1 Test Purpose and Environment

This test shall verify that the UE sends a RRC response to the UTRAN within the delay limits specified in section 7.2.2 for all received messages that require a RCC response to be sent to the UTRAN.

For all the tests the TTI for the DCCH shall be set to 40 ms.

NOTE: There should be one test of reconfiguring TFS and TFCS without changing the physical layer. A similar test could then also be made where a new dedicated physical channel activation is included.

### A.7.2.2 Test Requirements

*Editors note: This requirement should be rewritten, with exact times for the procedures that will be tested.*

This signalling response delay shall not exceed the sum of general processing delay and all action delays related to the specific RRC message.

General processing delay shall not exceed 100 ms..

Delay parts related to actions are listed in table A.7.2 below.

**Table A.7-2: Signalling response delay**

| Delay part caused by a specific action | Maximum delay for this action [ms] |
|---|---|
| Establishment of new dedicated channel | 140 |
| Establishment of all radio bearer(s) in one RRC message | 50 |
| Re-configuration of all radio bearer(s) in one RRC message | 50 |
| Release of all radio bearer(s) in one RRC message | 10 |

NOTE: For all actions not listed the requirement on delay is FFS.

## A.7.3 Signalling Processing

### A.7.3.1 Test Purpose and Environment

This test shall verify that the UE is capable of processing a sequence of received RRC messages within specified delay limits in a certain percentage of the cases.

For all the tests the TTI for the transport channel carrying DCCH shall be 40 ms.

Messages shall be sent to the UE at a rate of 10 messages per second.

The rest of the parameters are TBD.

### A.7.3.2 Test Requirements

The UE shall be able to respond to all received RRC messages within the delay limits specified in section 7.2.2 in a certain percentage of all cases as defined in 7.3.2.

# A.8 UE Measurements Procedures

## A.8.1 FDD intra frequency measurements

### A.8.1.1 Event triggered reporting in AWGN propagation conditions

#### A.8.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event and that the measurement accuracy of the CPICH_Ec/Io and SFN-CFN observed timed difference between Cell 1 and Cell 2 are within the defined limits. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8-1 and A.8-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

**Table A.8-1: General test parameters for Event triggered reporting in AWGN propagation conditions**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Reporting range | dB | 3 | Applicable for event 1A and 1B |
| Hysteresis | dB | 0 | |
| W | | 1 | Applicable for event 1A and 1B |
| Reporting deactivation threshold | | 0 | Applicable for event 1A |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 | Signalled during time T1. |
| T1 | s | 5 | |
| T2 | s | 5 | |
| T3 | s | 5 | |

**Table A.8-2: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions**

| Parameter | Unit | Cell 1 | | | Cell 2 | | |
|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T3 | T1 | T2 | T3 |
| CPICH_Ec/Ior | dB | -10 | | | -10 | | |
| PCCPCH_Ec/Ior | dB | -12 | | | -12 | | |
| SCH_Ec/Ior | dB | -12 | | | -12 | | |
| PICH_Ec/Ior | dB | -15 | | | -15 | | |
| DPCH_Ec/Ior | dB | -17 | | | N/A | | |
| OCNS | | -1.049 | | | -0.941 | | |
| $\hat{I}_{or}/I_{oc}$ | dB | 0 | 6.97 | 0 | -Infinity | 5.97 | -Infinity |
| $I_{oc}$ | dBm/ 3.84 MHz | -70 | | | | | |
| CPICH_Ec/Io | dB | -13 | -13 | -13 | -Infinity | -14 | -Infinity |
| Propagation Condition | | AWGN | | | | | |

### A.8.1.1.2 Test Requirements

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall send one Event 1B triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T3.

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

## A.8.1.2 Event triggered reporting of multiple neighbours in AWGN propagation condition

### A.8.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8-3 and A.8-4. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1C and 1B shall be used. The test consists of four successive time periods, with a time duration of T1, T2, T3 and T4 respectively..

**Table A.8-3: General test parameters for Event triggered reporting of multiple neighbours in AWGN propagation conditions**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Reporting range | dB | 3 | Applicable for event 1A and 1B |
| Hysteresis | dB | 0 | |
| W | | 1 | Applicable for event 1A and 1B |
| Replacement activation threshold | | 0 | Applicable for event 1C |
| Reporting deactivation threshold | | 0 | Applicable for event 1A |
| Time to Trigger | Ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 32 | |
| T1 | S | 10 | |
| T2 | S | 10 | |
| T3 | S | 5 | |
| T4 | S | 10 | |

**Table A.8-4: Cell specific test parameters for Event triggered reporting of multiple neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | | Cell3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 |
| *CPICH_Ec/Ior* | dB | -10 | | | | -10 | | | | -10 | | | |
| *PCCPCH_Ec/Ior* | dB | -12 | | | | -12 | | | | -12 | | | |
| *SCH_Ec/Ior* | dB | -12 | | | | -12 | | | | -12 | | | |
| *PICH_Ec/Ior* | dB | -15 | | | | -15 | | | | -15 | | | |
| *DPCH_Ec/Ior* | dB | -17 | | | | N/A | | | | N/A | | | |
| *OCNS_Ec/Ior* | dB | -1.049 | | | | -0.941 | | | | -0.941 | | | |
| $\hat{I}_{or}/I_{oc}$ | dB | 6.97 | 7,72 | 5,97 | 7,72 | -Inf | 9,72 | 6,97 | 9,72 | 5.97 | 6,72 | -Inf | 6,72 |
| $I_{oc}$ | dBm/ 3.84 MHz | -85 | | | | | | | | | | | |
| *CPICH_Ec/Io* | dB | -13 | -15.5 | -14 | -15.5 | -Inf | -13.5 | -13 | -13.5 | -14 | -16.5 | -Inf | -16.5 |
| Propagation Condition | AWGN | | | | | | | | | | | | |

### A.8.1.2.2 Test Requirements

The UE shall send one Event 1C triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall send one Event 1B triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T3.

The UE shall send one Event 1C triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T4.

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

## A.8.1.3 Event triggered reporting of two detectable neighbours in AWGN propagation condition

### A.8.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of events. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8-5 and A.8-6. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used. The test consists of four successive time periods, with a time duration of T1, T2, T3 and T4 respectively.

**Table A.8-5: General test parameters for Event triggered reporting of two detectable neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Reporting range | dB | 3 | Applicable for event 1A and 1B |
| Hysteresis | dB | 0 | |
| W | | 1 | Applicable for event 1A and 1B |
| Reporting deactivation threshold | | 0 | Applicable for event 1A |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 32 | |
| T1 | s | 10 | |
| T2 | s | 10 | |
| T3 | s | 10 | |
| T4 | s | 10 | |

**Table A.8-6: Cell specific test parameters for Event triggered reporting of two detectable neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | | Cell3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 | T1 | T2 | T3 | T4 |
| *CPICH_Ec/Ior* | dB | -10 | | | | -10 | | | | -10 | | | |
| *PCCPCH_Ec/Ior* | dB | -12 | | | | -12 | | | | -12 | | | |
| *SCH_Ec/Ior* | dB | -12 | | | | -12 | | | | -12 | | | |
| *PICH_Ec/Ior* | dB | -15 | | | | -15 | | | | -15 | | | |
| *DPCH_Ec/Ior* | dB | -17 | | | | N/A | | | | N/A | | | |
| *OCNS_Ec/Ior* | dB | -1.049 | | | | -0.941 | | | | -0.941 | | | |
| $\hat{I}_{or}/I_{oc}$ | dB | 8.36 | 11.83 | 14.45 | 7.89 | 3.36 | 11.33 | 13.95 | 2.39 | 3.36 | 6.33 | 13.95 | 6.89 |
| $I_{oc}$ | dBm/3.84 MHz | -85 | | | | | | | | | | | |
| *CPICH_Ec/Io* | dB | -12.5 | -13.5 | -14.5 | -13.5 | -17.5 | -14.0 | -15 | -19 | -17.5 | -19 | -15 | -14.5 |
| Propagation Condition | AWGN | | | | | | | | | | | | |

### A.8.1.3.2 Test Requirements

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T2.

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T3.

The UE shall send one Event 1B triggered measurement report, with a measurement reporting delay less than 200 ms from the beginning of time period T4.

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

## A.8.1.4 Correct reporting of neighbours in fading propagation condition

### A.8.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs sufficient layer 1 filtering of the measurements, see section 9.1, which are the base for the event evaluation. The test is performed in fading propagation conditions. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8-7 and A.8-8.In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and Event 1B shall be used. The test consists of two successive time periods, each with a time duration of T1 and T2 respectively.

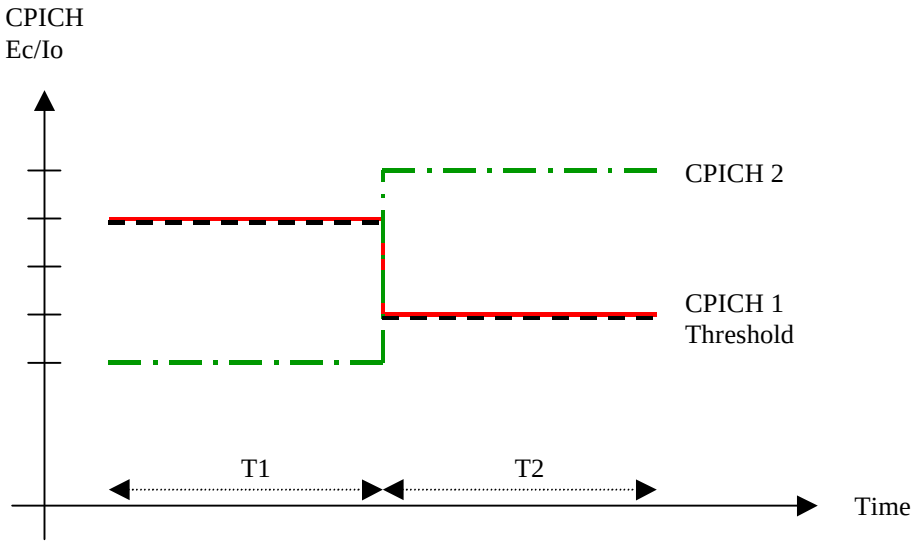


**Figure A.8-1: Illustration of the test case**

**Table A.8-7: General test parameters for correct reporting of neighbours in fading propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Reporting range | dB | 0 | Applicable for event 1A and 1B |
| Hysteresis | dB | 0 | |
| W | | 1 | Applicable for event 1A and 1B |
| Reporting deactivation threshold | | 0 | Applicable for event 1A |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 | Signalled before time T1. |
| T1 | s | [200] | |
| T2 | s | [200] | |

**Table A.8-8: Cell specific test parameters for correct reporting of neighbours in fading propagation condition**

| Parameter | Unit | Cell 1 | | Cell 2 | |
|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 |
| CPICH_Ec/Ior | dB | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | |
| DPCH_Ec/Ior | dB | -17 | | N/A | |
| OCNS | | -1.386 | | -1.286 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 3.06 | 7.77 | 0.06 | 10.77 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | |
| CPICH_Ec/Io | dB | -13 | -15 | -16 | -12 |
| Propagation Condition | Case 5 as specified in Annex B of TS25.101 | | | | |

#### A.8.1.4.2 Test Requirements

## A.8.2 FDD inter frequency measurements

### A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

#### A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.

The test consists of two successive time periods, with a time duration T1 and T2. The test parameters are given in Table A.8-10 and A.8-11 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting.

**Table A.8-10: General test parameters for Correct reporting of neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Compressed mode | | A.22 set 1 | As specified in TS 25.101 section A.5. |
| Active cell | | Cell 1 | |
| Threshold non used frequency | dB | -18 | Absolute Ec/I0 threshold for event 2C |
| Reporting range | dB | 4 | Applicable for event 1A |
| Hysteresis | dB | 0 | |
| W | | 1 | Applicable for event 1A |
| W non-used frequency | | 1 | Applicable for event 2C |
| Reporting deactivation threshold | | 0 | Applicable for event 1A |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 on channel 1<br>16 on channel 2 | Measurement control information is sent before the compressed mode pattern starts. |
| T1 | s | [10] | |
| T2 | s | [5] | |

**TableA.8-11: Cell Specific parameters for Correct reporting of neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | Cell 2 | | Cell 3 | |
|---|---|---|---|---|---|---|---|
| | | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 1 | | Channel 2 | |
| CPICH_Ec/Ior | dB | -10 | | -10 | | -10 | |
| PCCPCH_Ec/Ior | dB | -12 | | -12 | | -12 | |
| SCH_Ec/Ior | dB | -12 | | -12 | | -12 | |
| PICH_Ec/Ior | dB | -15 | | -15 | | -15 | |
| DPCH_Ec/Ior | dB | -17 | | N/A | | N/A | |
| OCNS | | -1.049 | | –0.941 | | –0.941 | |
| $\hat{I}_{or}/I_{oc}$ | dB | 0 | 4.39 | Infinity | 2.39 | -1.8 | -1.8 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | -70 | |
| CPICH_Ec/Io | dB | -13 | -13 | Infinity | -15 | -14 | -14 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Propagation Condition | AWGN | | | | | | |

### A.8.2.1.2 Test Requirements

The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than 5 seconds from the beginning of time period T1.

The UE shall send one Event 1A triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.

## A.8.2.2 Correct reporting of neighbours in Fading propagation condition

### A.8.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.The test parameters are given in Table A.8-12 and A.8-13. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used.

**Table A.8-12: General test parameters for Correct reporting of neighbours in Fading propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Compressed mode | | Case 2.1 | As specified in TS 25.101 section A.5. |
| Active cell | | Cell 1 | |
| Absolute Threshold (Ec/N0) for Event 2c | dB | -18 | |
| Hysteresis | dB | 0 | |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | Total 24<br>X on frequency Channel 2 | Measurement control information is sent before the compressed mode pattern starts. |

**Table A.8-13: Test parameters for Correct reporting of neighbours in Fading propagation condition**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel Number | | Channel 1 | Channel 2 |
| CPICH_Ec/Ior | dB | -10 | -10 |
| PCCPCH_Ec/Ior | dB | -12 | -12 |
| SCH_Ec/Ior | dB | -12 | -12 |
| PICH_Ec/Ior | dB | -15 | -15 |
| DPCH_Ec/Ior | dB | TBD | TBD |
| OCNS | | [To Be Calculated] | [To Be Calculated] |
| $\hat{I}_{or}/I_{oc}$ | dB | 0 | -1.8 |
| $I_{oc}$ | DBm/3.84 MHz | -70 | -70 |
| CPICH_Ec/Io | dB | -13 | -14 |
| Propagation Condition | Case 5 as specified in Annex B of TS25.101 | | |

#### A.8.2.2.2 Test Requirements

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

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

## A.8.3 TDD measurements

### A.8.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

#### A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when measuring on a TDD cell. The test will partly verify the requirements in section 8.1.2.3.

The test consists of two successive time periods, with a time duration T1 and T2 respectively. The test parameters are given in Table A.8-14 and A.8-15. In the measurement control information it is indicated to the UE that event triggered reporting with Event 2C shall be used.

**Table A.8-14: General test parameters for Correct reporting of TDD neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DCH parameters | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.101 section A.3.1 |
| Power Control | | On | |
| Compressed mode | | Case 2.1 | Gap length specified in section 8.1.2.3 and the other parameters as specified in TS 25.101 section A.5. |
| Active cell | | Cell 1 | |
| Reporting Threshold | dB | | |
| Hysteresis | dB | | |
| Time to Trigger | ms | | |
| Filter coefficient | | | |
| Monitored cell list size | | Total X<br>Y on frequency Channel 2 | Measurement control information is sent before the compressed mode pattern starts. |
| T1 | s | | |
| T2 | s | | |

**Table A.8-15: Cell specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|
| Timeslot Number | | n.a. | | 0 | | 8 | |
| | | **T1** | **T2** | **T1** | **T2** | **T1** | T2 |
| UTRA RF Channel Number | | Channel 1 | | Channel 2 | | | |
| CPICH_Ec/Ior | dB | [ ] | [ ] | n.a. | | n.a. | |
| PCCPCH_Ec/Ior | dB | [ ] | [ ] | -3 | -3 | | |
| SCH_Ec/Ior | dB | [ ] | [ ] | -9 | -9 | -9 | -9 |
| SCH_$t_{offset}$ | | n.a. | n.a. | 15 | 15 | 15 | 15 |
| PICH_Ec/Ior | | [ ] | [ ] | | | -3 | -3 |
| DCH_Ec/Ior | dB | [ ] | [ ] | - | - | - | - |
| OCNS | dB | [ ] | [ ] | -4.28 | -4.28 | -4.28 | -4.28 |
| $\hat{I}_{or}/I_{oc}$ | dB | [ ] | [ ] | [ ] | [ ] | [ ] | [ ] |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | -70 | | | |
| CPICH_Ec/Io | | [ ] | | n.a. | | | |
| PCCPCH_RSCP | dB | n.a. | n.a. | [ ] | [ ] | [ ] | [ ] |
| Propagation Condition | | AWGN | | | | | |

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

### A.8.3.1.2 Test Requirements

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

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

## A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, sub-clause A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in TS 25.101 annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

# A.9.1 Measurement Performance for UE

## A.9.1.1 CPICH RSCP

### A.9.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.1.

#### A.9.1.1.1.1 Intra frequency test parameters

In this case all cells are on the same frequency. Table A.9-1 defines the limits of signal strengths and code powers, when the requirements are applicable.

When verifying the CPICH RSCP intra frequency absolute accuracy requirement only cell 1 in table A.9-1 shall be present. When verifying the CPICH RSCP intra frequency relative accuracy requirement both cell 1 and 2 in table A.9-1 shall be present.

**Table A.9-1: CPICH RSCP Intra frequency test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 | -12 |
| *SCH_Ec/Ior* | dB | -12 | -12 |
| *PICH_Ec/Ior* | dB | -15 | -15 |
| *DPCH_Ec/Ior* | dB | -15 | -15 |
| *OCNS* | dB | -1.11 | -1.11 |
| *Îor/Ioc* | dB | 10.5 | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io -13.7 dB = Ioc*, Note 1 | *Io -13.7 dB = Ioc*, Note 1 |
| *Range 1:Io*<br>*Range 2: Io* | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

#### A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9-2 defines the limits of signal strengths and code powers, where the requirement is applicable.

When verifying the CPICH RSCP inter frequency relative accuracy requirement both cell 1 and 2 in table A.9-2 shall be present.

**Table A.9-2: CPICH RSCP Inter frequency tests parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 2 |
| CPICH_Ec/Ior | dB | -10 | -10 |
| PCCPCH_Ec/Ior | dB | -12 | -12 |
| SCH_Ec/Ior | dB | -12 | -12 |
| PICH_Ec/Ior | dB | -15 | -15 |
| DPCH_Ec/Ior | dB | -15 | -15 |
| OCNS | dB | -1.11 | -1.11 |
| Îor/Ioc | dB | 10.1 | 10.1 |
| Ioc | dBm/ 3.84 MHz | *Io -10.6 dB = Ioc,* Note 1 | *Io -10.6 dB = Ioc,* Note 1 |
| Range 1:Io<br>Range 2: Io | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.1.2 Test Requirements

The CPICH RSCP measurement accuracy shall meet the requirements in section 9.1.1.

## A.9.1.2 CPICH Ec/Io

### A.9.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/Io measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.2.

#### A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Table A.9-3 defines the limits of signal strengths and code powers, where the requirements are applicable.

When verifying the CPICH Ec/Io intra frequency absolute accuracy requirement only cell 1 in table A.9-3 shall be present. When verifying the CPICH Ec/Io intra frequency relative accuracy requirement both cell 1 and 2 in table A.9-3 shall be present.

**Table A.9-3: CPICH Ec/Io Intra frequency test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 | -12 |
| *SCH_Ec/Ior* | dB | -12 | -12 |
| *PICH_Ec/Ior* | dB | -15 | -15 |
| *DPCH_Ec/Ior* | dB | -15 | -15 |
| *OCNS* | dB | -1.11 | -1.11 |
| *Îor/Ioc* | dB | 10.5 | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io -13.7 dB = Ioc,* Note 1 | *Io -13.7 dB = Ioc,* Note 1 |
| *Range 1:Io*<br>*Range 2: Io* | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

#### A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9-4 defines the limits of signal strengths and code powers, where the requirement is applicable.

When verifying the CPICH Ec/Io inter frequency relative accuracy requirement both cell 1 and 2 in table A.9-4 shall be present.

**Table A.9-4: CPICH Ec/Io Inter frequency tests parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 2 |
| CPICH_Ec/Ior | dB | -10 | -10 |
| PCCPCH_Ec/Ior | dB | -12 | -12 |
| SCH_Ec/Ior | dB | -12 | -12 |
| PICH_Ec/Ior | dB | -15 | -15 |
| DPCH_Ec/Ior | dB | -15 | -15 |
| OCNS | dB | -1.11 | -1.11 |
| Îor/Ioc | dB | 10.1 | 10.1 |
| Ioc | dBm/ 3.84 MHz | *Io -10.6 dB = Ioc,* Note 1 | *Io -10.6 dB = Ioc,* Note 1 |
| Range 1:Io<br>Range 2: Io | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2.

## A.9.1.3 UTRA Carrier RSSI

### A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3.

Table A.9-5 defines the limits of signal strengths, where the requirement is applicable.

When verifying the UTRA Carrier RSSI absolute accuracy requirement only cell 1 in table A.9-5 shall be present.
When verifying the UTRA Carrier RSSI relative accuracy requirement both cell 1 and 2 in table A.9-5 shall be present.

**Table A.9-5: 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 | *Io -4.13 dB = Ioc,* Note 1 | *Io -4.13 dB = Ioc,* Note 1 |
| *Range 1: Io*<br>*Range 2: Io* | dBm/ 3.84 MHz | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| *Propagation condition* | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3.

## A.9.1.4 SFN-CFN observed time difference

### A.9.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-CFN observed time difference measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.7.

#### A.9.1.4.1.1 Intra frequency test parameters

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this case all cells are in the same frequency. Table A.9-6 defines the limits of signal strengths and code powers, where the requirements are applicable.

**Table A.9-6: SFN-CFN observed time difference Intra frequency test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 | -12 |
| *SCH_Ec/Ior* | dB | -12 | -12 |
| *PICH_Ec/Ior* | dB | -15 | -15 |
| *DPCH_Ec/Ior* | dB | -15 | -15 |
| *OCNS* | dB | -1.11 | -1.11 |
| *Îor/Ioc* | dB | 10.5 | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io -13.7 dB = Ioc*, Note 1 | *Io -13.7 dB = Ioc*, Note 1 |
| *Range 1:Io*<br>*Range 2: Io* | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

#### A.9.1.4.1.2 Inter frequency test parameters

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9-7 defines the limits of signal strengths and code powers, where the requirement is applicable.

**Table A.9-7: SFN-CFN observed time difference Inter frequency tests parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 2 |
| CPICH_Ec/Ior | dB | -10 | -10 |
| PCCPCH_Ec/Ior | dB | -12 | -12 |
| SCH_Ec/Ior | dB | -12 | -12 |
| PICH_Ec/Ior | dB | -15 | -15 |
| DPCH_Ec/Ior | dB | -15 | -15 |
| OCNS | dB | -1.11 | -1.11 |
| Îor/Ioc | dB | 10.1 | 10.1 |
| Ioc | dBm/ 3.84 MHz | *Io -10.6 dB = Ioc,* Note 1 | *Io -10.6 dB = Ioc,* Note 1 |
| Range 1:Io<br>Range 2: Io | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.4.2 Test Requirements

The SFN-CFN observed time difference measurement accuracy shall meet the requirements in section 9.1.7.

## A.9.1.5 SFN-SFN observed time difference

### A.9.1.5.1 SFN-SFN observed time difference type 1

#### A.9.1.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 1 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.1.

During the test the timing difference between Cell 1 and 2 can be set to value from 0…9830399 chips.

In this case all cells are in the same frequency. Table A.9-8 defines the limits of signal strengths and code powers, where the requirements are applicable.

**Table A.9-8: SFN-SFN observed time difference type 1 Intra frequency test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 | -12 |
| *SCH_Ec/Ior* | dB | -12 | -12 |
| *PICH_Ec/Ior* | dB | -15 | -15 |
| *DPCH_Ec/Ior* | dB | -15 | -15 |
| *OCNS* | dB | -1.11 | -1.11 |
| *Îor/Ioc* | dB | 10.5 | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io -13.7 dB = Ioc,* Note 1 | *Io -13.7 dB = Ioc,* Note 1 |
| *Range 1:Io*<br>*Range 2: Io* | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

#### A.9.1.5.1.2 Test Requirements

The SFN-SFN observed time difference type 1 measurement accuracy shall meet the requirements in section 9.1.8.1

### A.9.1.5.2 SFN-SFN observed time difference type 2

#### A.9.1.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 can be set to value from -1279.75 to 1280 chips.

In this case all cells are in the same frequency. Table A.9-9 defines the limits of signal strengths and code powers, where the requirements are applicable.

**Table A.9-9: SFN-SFN observed time difference type 2 Intra frequency test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| UTRA RF Channel number | | Channel 1 | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 | -12 |
| *SCH_Ec/Ior* | dB | -12 | -12 |
| *PICH_Ec/Ior* | dB | -15 | -15 |
| *DPCH_Ec/Ior* | dB | -15 | -15 |
| *OCNS* | dB | -1.11 | -1.11 |
| *Îor/Ioc* | dB | 10.5 | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io -13.7 dB = Ioc,* Note 1 | *Io -13.7 dB = Ioc,* Note 1 |
| *Range 1:Io*<br>*Range 2: Io* | dBm | -94…-70<br>-94…-50 | -94…-70<br>-94…-50 |
| Propagation condition | - | AWGN | |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9-10 shall be used.

**Table A.9-10 SFN-SFN observed time difference type 2 idle period test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| IP_Status | - | continous | continous |
| IP_Spacing | Frames | [10] | [10] |
| IP_Lenght | Symbols | 10 | 10 |
| IP_Offset | frame | NA | NA |
| Seed | integer | [13] | [4] |
| Burst_Start | | NA | NA |
| Burst_Length | | NA | NA |
| Burst_Freq | | NA | NA |

Note The total signal *Io* will change only downwards during BS transmission gap.

#### A.9.1.5.2.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

## A.9.1.6 UE Rx-Tx time difference

### A.9.1.6.1 UE Rx-Tx time difference type 1

#### A.9.1.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE Rx-Tx time difference type 1 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.9.1

Table A.9-11 defines the limits of signal strengths and code powers, where the requirements are applicable.

**Table A.9-11: UE Rx-Tx time difference type 1 intra frequency test parameters**

| Parameter | Unit | Cell 1 |
|---|---|---|
| UTRA RF Channel number | | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 |
| *SCH_Ec/Ior* | dB | -12 |
| *PICH_Ec/Ior* | dB | -15 |
| *DPCH_Ec/Ior* | dB | -15 |
| *OCNS* | dB | -1.11 |
| *Îor/Ioc* | dB | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io –10.9 dB = Ioc,* Note 1 |
| *Io* | dBm | -94…-50 |
| Propagation condition | - | AWGN |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.6.1.2 Test Requirements

The UE Rx-Tx time difference type 1 measurement accuracy shall meet the requirements in section 9.1.9.1.

## A.9.1.6.2 UE Rx-Tx time difference type 2

### A.9.1.6.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE Rx-Tx time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.9.2.

Table A.9-12 defines the limits of signal strengths and code powers, where the requirements are applicable.

**Table A.9-12: UE Rx-Tx time difference type 2 intra frequency test parameters**

| Parameter | Unit | Cell 1 |
|---|---|---|
| UTRA RF Channel number | | Channel 1 |
| *CPICH_Ec/Ior* | dB | -10 |
| *PCCPCH_Ec/Ior* | dB | -12 |
| *SCH_Ec/Ior* | dB | -12 |
| *PICH_Ec/Ior* | dB | -15 |
| *DPCH_Ec/Ior* | dB | -15 |
| *OCNS* | dB | -1.11 |
| *Îor/Ioc* | dB | 10.5 |
| *Ioc* | dBm/ 3.84 MHz | *Io –10.9 dB = Ioc,* Note 1 |
| *Io* | dBm/ 3.84 MHz | -94…-50 |
| Propagation condition | - | AWGN |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.6.2.2 Test Requirements

The UE Rx-Tx time difference type 2 measurement accuracy shall meet the requirements in section 9.1.9.2.

## A.9.1.7 Observed time difference to GSM cell

### A.9.1.7.1 Test Purpose and Environment

The purpose of this test is to verify that the Observed time difference to GSM cell measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.10.

Note: The requirement scenario is FFS.

### A.9.1.7.2 Test Requirements

Note: Requirements will be added when the requirement scenario is defined.

## A.9.1.8 P-CCPCH RSCP

### A.9.1.8.1 Test Purpose and Environment

These measurements consider *P-CCPCH RSCP* measurements. This requirement is only valid for UEs supporting FDD and TDD.

The purpose of this test is to verify that the P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.11.

In this case the cells are on different frequencies. Table A.9-12 defines the limits of signal strengths and code powers, where the requirement is applicable. Cell 1 is the active cell (FDD) and cell 2 is a TDD cell.

**Table A.9-12 P-CCPCH inter frequency test parameters**

| Parameter | Unit | Cell 1 | Cell 2 |
|---|---|---|---|
| Timeslot Number | | n.a. | k |
| UTRA RF Channel Number | | Channel 1 | Channel 2 |
| CPICH_Ec/Ior | dB | -10 | n.a. |
| PCCPCH_Ec/Ior | dB | -12 | -3 |
| SCH_Ec/Ior | dB | -12 | - |
| SCH_$t_{offset}$ | | n.a. | - |
| PICH_Ec/Ior | | -15 | - |
| DPCH_Ec/Ior | dB | [ ] | [ ] |
| OCNS | dB | [To Be Calculated] | [ ] |
| $\hat{I}_{or}/I_{oc}$ | dB | [ ] | [ ] |
| $I_{oc}$ | dBm/3.84 MHz | Note 1 | -70 |
| Range 1:Io<br>Range 2: Io | dBm | -94 ... -70<br>-94... -50 | -94 ... -70<br>-94... -50 |
| Propagation condition | - | AWGN | AWGN |

NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.

### A.9.1.8.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.11.

# Annex B (informative): Change History

Initial version at TSG-RAN#6 (December 1999): 3.0.0

CRs approved by TSG-RAN#7.

| RAN doc | Spec | CR | Re | Phas | Subject | Cat | Current | New |
|---|---|---|---|---|---|---|---|---|
| RP-000021 | 25.133 | 001 | | R99 | Modification of RL Failure Requirement | F | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 002 | | R99 | Idle Mode Tasks | C | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 003 | | R99 | Revised UE handover requirements | F | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 004 | | R99 | Editorial corrections | D | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 005 | | R99 | UE measurement requirement update | F | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 006 | | R99 | TDD Measurements Performance Requirements | B | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 007 | | R99 | UTRAN measurement requirement update | F | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 008 | | R99 | Requirements on parallel measurements | F | 3.0.0 | 3.1.0 |
| RP-000021 | 25.133 | 009 | | R99 | Inclusion on transport channel BER. | F | 3.0.0 | 3.1.0 |

Note on implementation of CR 25.133-003. On page 16 there is a dotted line above title 5.1.2.1.4 ACTIVE SET DIMENSION. The text following is a duplication of version 3.0.0 to the point of sub-clause 5.1.2.2.1.3. HARD HANDOVER DELAY. Therefore all text from page 16 starting from 5.1.2.1.4 ACTIVE SET DIMENSION is moved to sub-clause 5.1.2.2.1.3 HARD HANDOVER DELAY on page 19.

CRs approved by TSG-RAN#8.

| RAN Doc | Spec | CR | R | Phas | Subject | Cat | Current | New |
|---|---|---|---|---|---|---|---|---|
| RP-000210 | 25.133 | 010 | | R99 | Measurement period for UTRAN SIR | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 011 | | R99 | Measurement period for UE BLER | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 013 | | R99 | Measurement delay reporting | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 015 | | R99 | Correction - Propagation conditions | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 016 | | R99 | Remove requirements on SSDT from 5.1.1.8. | D | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 017 | | R99 | Update of test parameters to P-CCPCH | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 018 | | R99 | Repetition Period of System Information | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 019 | | R99 | Alignment of Cell Selection/reselection test | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 020 | | R99 | Editorial corrections for TS25.133 | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 021 | | R99 | Removal of Annex A | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 022 | | R99 | Requirement for UE Tx Power Measurement | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 023 | | R99 | Insertion of Range/Mapping from TS 25.215 | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 024 | | R99 | Signalling response delay | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 025 | | R99 | Missing measurement periods | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 026 | | R99 | RRC Connection mobility in Cell_FACH, | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 027 | | R99 | Switching delay requirement for inter-system | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 028 | | R99 | UE Chip time measurements | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 029 | | R99 | UE Transmit Timing Adjustment | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 030 | | R99 | Add GPS timing measurements to TS 25.133 | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 031 | | R99 | Test scenario for UTRAN to GSM cell re-selection | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 032 | | R99 | Proposed test case for random access procedure | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 033 | | R99 | Inclusion of measurement granularities and | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 034 | | R99 | Parallel measurement requirements | F | 3.1.0 | 3.2.0 |
| RP-000210 | 25.133 | 035 | | R99 | UE Hard handover switching time | F | 3.1.0 | 3.2.0 |

CRs approved by TSG-RAN#9

| RAN Doc | Spec | CR | R | Phas | Subject | Cat | Old vers | New |
|---|---|---|---|---|---|---|---|---|
| RP-000400 | 25.133 | 036 | | R99 | Corrections to definitions, symbols and | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 037 | | R99 | Handling of measurement uncertainties in Base | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 038 | | R99 | Proposal for section 4 | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 039 | | R99 | Proposal for section 5 | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 040 | | R99 | Proposal for section 8 | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 041 | | R99 | Proposal for section 9 | F | 3.2.0 | 3.3.0 |
| RP-000497 | 25.133 | 042 | 1 | R99 | Revision of requirement and range of | F | 3.2.0 | 3.3.0 |
| RP-000497 | 25.133 | 043 | 1 | R99 | Inclusion of UTRAN measurements in 25.133 | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 044 | | R99 | Proposal for section 7 and A.7 | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 045 | | R99 | Text proposal for section A.1, A.2 and A.3 | F | 3.2.0 | 3.3.0 |
| RP-000400 | 25.133 | 046 | | R99 | Proposal for section 6 | F | 3.2.0 | 3.3.0 |

CRs approved by TSG RAN#10

| RAN Doc | Spec | CR | R | Phas s | Subject | Cat | Old vers | New vers |
|---|---|---|---|---|---|---|---|---|
| RP-000591 | 25.133 | 47 | | R99 | Received total wideband power | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 48 | | R99 | Removal of cell selection delay requirements | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 49 | | R99 | Clarification of the random access requirements | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 50 | | R99 | Correction of RRC re-establishment requirements | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 51 | | R99 | Event triggered reporting in AWGN conditions | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 52 | | R99 | Inter frequency measurements in AWGN | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 53 | 1 | R99 | Physical channel BER accuracy | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 54 | 1 | R99 | Event triggered reporting in fading conditions | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 55 | | R99 | Periodic reporting in AWGN | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 56 | | R99 | Introduction of UE Rx-Tx time difference type 1 & 2 | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 57 | | R99 | Correction of UE Tx timing adjustment | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 58 | | R99 | Alignment of intra frequency CPICH Ec/Io measurement requirements in TS25.133 | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 59 | | R99 | Multiple neighbour test cases | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 60 | | R99 | Correction of intra- and inter frequency measurement requirement. | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 61 | | R99 | Correction of TDD measurement requirements. | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 62 | | R99 | General cell re-selection requirements | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 63 | | R99 | BSIC verification requirements in TS25.133 | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 64 | | R99 | GSM RSSI measurement | F | 3.3.0 | 3.4.0 |
| RP-000591 | 25.133 | 65 | | R99 | Clarification of parallel measurement section | F | 3.3.0 | 3.4.0 |

# History

| Document history | | |
|---|---|---|
| V3.0.0 | January 2000 | Publication |
| V3.1.0 | March 2000 | Publication |
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