

**TSG-RAN Meeting #9  
Hawaii, US, 20 - 22 September 2000**

**TSGRP#9(00)0400**

**Title: Agreed CRs to TS 25.133**

**Source: TSG-RAN WG4**

**Agenda item: 5.4.3**

<b>Tdoc Num</b>	<b>TS</b>	<b>CR number</b>	<b>Title</b>	<b>TYPE</b>	<b>Status</b>	<b>Cur_Ver</b>	<b>New_Ver</b>
R4-000617	25.133	43	Inclusion of UTRAN measurements in 25.133	B	agreed	3.2.0	3.3.0
R4-000698	25.133	42	Revision of requirement and range of measurement for CPCH	B	agreed	3.2.0	3.3.0
R4-000745	25.133	36	Corrections to definitions, symbols and abbreviations	F	agreed	3.2.0	3.3.0
R4-000761	25.133	44	Proposal for section 7 and A.7	F	agreed	3.2.0	3.3.0
R4-000766	25.133	46	Proposal for section 6	F	agreed	3.2.0	3.3.0
R4-000768	25.133	41	Proposal for section 9	F	agreed	3.2.0	3.3.0
R4-000769	25.133	45	Text proposal for section A.1, A.2 and A.3	F	agreed	3.2.0	3.3.0
R4-000780	25.133	37	Handling of measurement uncertainties in Base station conformance testing (FDD) for RRM measurements	F	agreed	3.2.0	3.3.0
R4-000781	25.133	38	Proposal for section 4	F	agreed	3.2.0	3.3.0
R4-000782	25.133	39	Proposal for section 5	F	agreed	3.2.0	3.3.0
R4-000783	25.133	40	Proposal for section 8	F	agreed	3.2.0	3.3.0

Turin, Italy, 4 – 8 Sep, 2000

e.g. for 3GPP use the format TP-99-xxx  
or for SMG, use the format P-99-xxx

# CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

**25.133 CR 36**

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **RAN#9**  
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Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

**Proposed change affects:**  
(at least one should be marked with an X)

(U)SIM  ME  UTRAN / Radio  Core Network

**Source:** RAN WG4 **Date:** 2000-09-07

**Subject:** Corrections to definitions, symbols and abbreviations

**Work item:**

**Category:**  
(only one category shall be marked with an X)

F Correction   
A Corresponds to a correction in an earlier release   
B Addition of feature   
C Functional modification of feature   
D Editorial modification

**Release:** Phase 2   
Release 96   
Release 97   
Release 98   
Release 99   
Release 00

**Reason for change:**

- Many abbreviations are being added into abbreviation list (Section 3.3)
- Some abbreviations are more like symbols so they are transferred to list of symbols (Section 3.2)
- Some abbreviations are more like definitions so they are transferred to list of definitions (Section 3.1)

**Clauses affected:** 3.1, 3.2, 3.3

**Other specs Affected:**

Other 3G core specifications  → List of CRs:  
Other GSM core specifications  → List of CRs:  
MS test specifications  → List of CRs:  
BSS test specifications  → List of CRs:  
O&M specifications  → List of CRs:

**Other comments:**

<----- double-click here for help and instructions on how to create a CR.

## 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.
<u>CPICH<sub>Ec</sub></u>	<u>Average energy per PN chip for the CPICH</u>
<u>CPICH<sub>Ec/Ior</sub></u>	<u>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.</u>
<u>CPICH<sub>Ec/Io</sub></u>	<u>The ratio of the received energy per PN chip for the CPICH to the total transmit power spectral density</u>
<u>DPCH<sub>Ec/Ior</sub></u>	<u>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.</u>
<u>Ec</u>	<u>Average energy per PN chip.</u>
<u>Io</u>	<u>The total received power density, including signal and interference, as measured at the UE antenna connector.</u>
<u>Ioc</u>	<u>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.</u>
<u>Ior</u>	<u>The total transmit power spectral density of the downlink at the Node B antenna connector.</u>
<u>Îor</u>	<u>The received power spectral density of the downlink as measured at the UE antenna connector.</u>
<u>OCNS<sub>Ec/Ior</sub></u>	<u>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.</u>
<u>PCCPCH<sub>Ec/Ior</sub></u>	<u>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.</u>
<u>PENALTY TIME</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>PICH<sub>Ec/Ior</sub></u>	<u>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.</u>
<u>Qhyst</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>Qoffset<sub>s,n</sub></u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>Qqualmin</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>Qrxlevmin</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>SCH<sub>Ec/Ior</sub></u>	<u>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.</u>
<u>Sintersearch</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>Sintrasearch</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>SsearchRAT</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>T1</u>	<u>Time period 1</u>
<u>T2</u>	<u>Time period 2</u>
<u>TEMP_OFFSET</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>

<u>T<sub>RE-ESTABLISH-REQ</sub></u>	<u>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.</u>
<u>Treselection</u>	<u>Defined in TS 25.304, subclause 5.2.6.1.5</u>
<u>UE T<sub>XPWR MAX RACH</sub></u>	<u>Defined in TS 25.304, subclause 5.2.3.1.2.</u>

### 3.3 Abbreviations

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

<u>ACPR</u>	<u>Adjacent Channel Power Ratio</u>
BER	Bit Error Ratio
BLER	Block Error Ratio
BS	Base Station
<u>CFN</u>	<u>Connection Frame Number</u>
<u>CPICH</u>	<u>Common Pilot Channel</u>
<u>CW</u>	<u>Continuous wave (unmodulated signal)</u>
DL	Down link (forward link)
<u>DPCH</u>	<u>Dedicated Physical Channel</u>
<u>DRX</u>	<u>Discontinuous Reception</u>
<u>EIRP</u>	<u>Equivalent Isotropic Radiated Power</u>
FDD	Frequency Division Duplexing
<u>FER</u>	<u>Frame Error Ratio</u>
<u>OCNS</u>	<u>Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink.</u>
<u>PCCPCH</u>	<u>Primary Common Control Physical Channel</u>
<u>PICH</u>	<u>Paging Indicator Channel</u>
<u>PIN</u>	<u>Personal Identification Number</u>
<u>PLMN</u>	<u>Public Land Mobile Network</u>
<u>PPM</u>	<u>Parts Per Million</u>
<u>RSCP</u>	<u>Received Signal Code Power</u>
<u>RRC</u>	<u>Radio Resource Control</u>
RRM	Radio Resource Management
RSSI	Received Signal Strength Indicator
<u>SCH</u>	<u>Synchronisation Channel, power of SCH shall be divided equally between Primary and Secondary Synchronous channels.</u>
<u>SFN</u>	<u>System Frame Number</u>
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
<u>USIM</u>	<u>Universal Subscriber Identity Module</u>
UTRA	<u>Universal UMTS Terrestrial Radio Access [TR 21.905]</u>
UTRAN	<u>Universal Terrestrial Radio Access Network</u>

# CHANGE REQUEST

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**25.133 CR 37**

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **RAN #9**

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<input checked="" type="checkbox"/>
<input type="checkbox"/>

strategic   
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Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

**Proposed change affects:**

(at least one should be marked with an X)

(U)SIM

ME

UTRAN / Radio

Core Network

**Source:**

RAN WG4

**Date:**

2000-09-05

**Subject:**

Handling of measurement uncertainties in Base station conformance testing (FDD) for RRM measurements

**Work item:**

**Category:**

(only one category shall be marked with an X)

- F Correction
- A Corresponds to a correction in an earlier release
- B Addition of feature
- C Functional modification of feature
- D Editorial modification

<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

**Release:**

Phase 2  
Release 96  
Release 97  
Release 98  
Release 99  
Release 00

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

**Reason for change:**

Alignment with draft ITU/R recommendation on handling of measurement uncertainties for a global circulation of terminals

**Clauses affected:**

3.4 (new subclause)

**Other specs affected:**

- Other 3G core specifications
- Other GSM core specifications
- MS test specifications
- BSS test specifications
- O&M specifications

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

→ List of CRs:  
→ List of CRs:  
→ List of CRs:  
→ List of CRs:  
→ List of CRs:

**Other comments:**



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## 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 ETR273 Part 1 sub-part 2 section 6.5.

# CHANGE REQUEST

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**25.133 CR 38**

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **TSG RAN#9**  
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Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
*(at least one should be marked with an X)*

**Source:** TSG RAN WG4 **Date:** 2000-09-08

**Subject:** Proposal for section 4

**Work item:**

<b>Category:</b> <i>(only one category shall be marked with an X)</i>	F Correction	<input checked="" type="checkbox"/>	<b>Release:</b>	Phase 2	<input type="checkbox"/>
	A Corresponds to a correction in an earlier release	<input type="checkbox"/>		Release 96	<input type="checkbox"/>
	B Addition of feature	<input type="checkbox"/>		Release 97	<input type="checkbox"/>
	C Functional modification of feature	<input type="checkbox"/>		Release 98	<input type="checkbox"/>
	D Editorial modification	<input type="checkbox"/>		Release 99	<input checked="" type="checkbox"/>
			Release 00	<input type="checkbox"/>	

**Reason for change:** Dividing TS 25.133 into a general part and a testing part.

**Clauses affected:** 4

<b>Other specs affected:</b>	Other 3G core specifications	<input type="checkbox"/>	→ List of CRs:	
	Other GSM core specifications	<input type="checkbox"/>	→ List of CRs:	
	MS test specifications	<input checked="" type="checkbox"/>	→ List of CRs:	
	BSS test specifications	<input type="checkbox"/>	→ List of CRs:	
	O&M specifications	<input type="checkbox"/>	→ List of CRs:	

**Other comments:**



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## ~~4 Idle Mode Tasks~~

### ~~4.1 Introduction~~

~~NOTE: Cell selection and 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.~~

### ~~4.2 RF Cell Selection Scenario~~

~~NOTE: Some performance requirements in agreed scenarios are added into this subclause. More scenarios will be added later.~~

#### ~~4.2.1 Cell Selection Single carrier Single cell case~~

##### ~~4.2.1.1 Cell Selection delay~~

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

##### ~~4.2.1.1.1 Test parameters~~

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



**Table 4-1: Cell selection single carrier single cell case**

<b>Parameter</b>	<b>Unit</b>	<b>Cell 1</b>
<i>UTRA RF Channel Number</i>		<b>Channel 1</b>
<i>CPICH_Ec/Aor</i>	dB	-10
<i>PCCPCH_Ec/Aor</i>	dB	-12
<i>SCH_Ec/Aor</i>	dB	-12
<i>PICH_Ec/Aor</i>	dB	-15
<i>OCNS_Ec/Aor</i>	dB	-0.941
$\hat{I}_{or}/I_{oc}$	dB	0
$I_{oc}$	dBm/3.84 MHz	-70
<i>CPICH_Ec/Ao</i>	dB	-13
<b>Propagation Condition</b>		<b>AWGN</b>
<i>Qqualmin</i>	dB	[ ]
<i>Qrxlevmin</i>	dBm	[ ]
<i>UE_TXPWR_MAX_RACH</i>	dBm	[ ]

#### 4.2.1.1.2 ~~Minimum Requirement~~

Cell selection shall be correct in more than [X %] of the cases. Cell selection is correct if within [5] seconds the UE camps on the cell.

### 4.2.2 ~~Cell Selection multi carrier multi cell case~~

#### 4.2.2.1 ~~Cell selection delay~~

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

##### 4.2.2.1.1 ~~Test parameters~~

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

**NOTE:** ~~Here pilot pollution case with different power levels for cells could be included.~~

**Table 4-2: Cell selection multi-carrier multi-cell case**

Parameter	Unit	Cell-1	Cell-2	Cell-3	Cell-4	Cell-5	Cell-6
<i>UTRA-RF-Channel-Number</i>		Channel-1	Channel-1	Channel-1	Channel-2	Channel-2	Channel-2
<i>CPICH-Ec/Aor</i>	dB	-10	-10	-10	-10	-10	-10
<i>PCCPCH-Ec/Aor</i>	dB	-12	-12	-12	-12	-12	-12
<i>SCH-Ec/Aor</i>	dB	-12	-12	-12	-12	-12	-12
<i>PICH-Ec/Aor</i>	dB	-15	-15	-15	-15	-15	-15
<i>OCNS-Ec/Aor</i>	dB	-0.941	-0.941	-0.941	-0.941	-0.941	-0.941
$\hat{I}_{or}/I_{oc}$	dB	5.3	2.3	-1.7	6.3	14.3	2.3
$I_{oc}$	dBm/3-84 MHz	-70			-70		
<i>CPICH-Ec/Ao</i>	dB	-13	-16	-20	-19	-11	-23
Propagation Condition		AWGN			AWGN		
<i>Qqualmin</i>	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<i>Qrxlevmin</i>	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<i>UE-TXPWR-MAX-RA-CH</i>	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<i>Qoffset<sub>s,n</sub></i>	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]	C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]	C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]	C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]	C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]	C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]

**4.2.2.1.2—Minimum requirement**

Cell selection shall be correct in more than [X%] of the cases. Cell selection is correct if within [5+x] seconds the UE camps on the cell, which fulfils the cell selection criteria.

**4.3—RF Cell Re-Selection Scenario**

NOTE:—One performance requirement in agreed scenario is added into this subclause. More scenarios will be added later.

**4.3.1—Cell Re-Selection single carrier multi-cell case**

**4.3.1.1—Cell re-selection delay**

When the UE is camped on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cells, which are possible to be re-reselected during the test are belonging to different location

areas. The cell re-selection delay is then defined as a time from when  $CPICH_{Ec/Io}$  is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN.

#### 4.3.1.1.1 Test parameters

One of the 6 cells in Table 4-3 is serving cell and all others are given in the measurement control information of the serving cell. 2 of the cells are possible for cell re-selection and 4 of the cells are steady interfering cells.

Table 4-3: 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
<i>UTRA-RF-Channel-Number</i>		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
<i>CPICH-Ec/Ior</i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCPCH-Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH-Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH-Ec/Ior</i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS-Ec/Ior</i>	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	$\frac{10.2}{7}$	$\frac{10.2}{7}$	7.3	0.27		0.27		0.27		0.27	
$I_{oc}$	dBm/3, 84 MHz	-70											
<i>CPICH-Ec/Io</i>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
<i>Cell-selection-and-reselection-quality-measure</i>		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$	
<i>Qqualmin</i>	dB	{}		{}		{}		{}		{}		{}	
<i>Qrxlevmin</i>	dBm	{}		{}		{}		{}		{}		{}	
<i>UE-TXPWR-MAX-RACH</i>	dB	{}		{}		{}		{}		{}		{}	
$Q_{offset_{i,n}}$	dB	C1, C2: {} C1, C3: {} C1, C4: {} C1, C5: {} C1, C6: {}	C2, C1: {} C2, C3: {} C2, C4: {} C2, C5: {} C2, C6: {}	C3, C1: {} C3, C2: {} C3, C4: {} C3, C5: {} C3, C6: {}	C4, C1: {} C4, C2: {} C4, C3: {} C4, C5: {} C4, C6: {}	C5, C1: {} C5, C2: {} C5, C3: {} C5, C4: {} C5, C6: {}	C6, C1: {} C6, C2: {} C6, C3: {} C6, C4: {} C6, C5: {}						
$Q_{hyst}$	dB	{}		{}		{}		{}		{}		{}	
<i>PENALTY_TIME</i>	s	{}		{}		{}		{}		{}		{}	
<i>TEMP_OFFSET</i>	dB	{}		{}		{}		{}		{}		{}	
$T_{reselection}$	s	{}		{}		{}		{}		{}		{}	
$T_{intrasearch}$	dB	{}		{}		{}		{}		{}		{}	

Time T1 is X seconds and T2 is Y seconds.

NOTE: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

#### 4.3.1.1.2 Minimum requirements

Cell re-selection shall be correct in more than [X%] of the cases. Cell re-selection is correct if within [5] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

#### 4.3.1.1.3 Cell List Size

[The UE shall be capable of recording at least [6] of the strongest cells according to the cell re-selection criteria. The number of the strongest cells recorded inside the UE shall be at least [6].]

#### 4.3.1.2 Maximum number of cells to be monitored

For re-selection purposes, the UE shall be capable of monitoring at least up to 32 neighbouring cells given in the measurement control information. The exact number of cells to be monitored will be determined by the measurement control information broadcast in the serving cell.

### 4.3.2 Requirements for Cell Re-Selection multi carrier multi cell case

#### 4.3.2.1 Cell re-selection delay

When the UE is camped on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cells, which are possible to be re-selected during the test are transmitting on different frequencies and are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH<sub>Ec/Io</sub> is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN.

#### 4.3.2.1.1 Test parameters

6 cells are given in the measurement control information of the serving cell, 3 on each of the two frequencies. One of the 6 cells in Table 4.4 is the serving cell, totally 2 of the cells are possible for cell re-selection and 4 of the cells are interfering cells.

**Table 4-4: 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
<i>UTRA-RF-Channel-Number</i>		Channel-1		Channel-2		Channel-1		Channel-1		Channel-2		Channel-2	
<i>CPICH-Ec/Ior</i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCPCH-Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH-Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH-Ec/Ior</i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS-Ec/Ior</i>	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											
<i>CPICH-Ec/Io</i>	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
<i>Cell-selection-and-reselection-quality-measure</i>		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$		$CPICH E_c/N_0$	
<i>Qqualmin</i>	dB	{}		{}		{}		{}		{}		{}	
<i>Qrxlevmin</i>	dBm	{}		{}		{}		{}		{}		{}	
<i>UE-TXPWR-MAX-RACH</i>	dB	{}		{}		{}		{}		{}		{}	
$Q_{offset_{s,n}}$	dB	C1, C2: {} C1, C3: {} C1, C4: {} C1, C5: {} C1, C6: {}	C2, C1: {} C2, C3: {} C2, C4: {} C2, C5: {} C2, C6: {}	C3, C1: {} C3, C2: {} C3, C4: {} C3, C5: {} C3, C6: {}	C4, C1: {} C4, C2: {} C4, C3: {} C4, C5: {} C4, C6: {}	C5, C1: {} C5, C2: {} C5, C3: {} C5, C4: {} C5, C6: {}	C6, C1: {} C6, C2: {} C6, C3: {} C6, C4: {} C6, C5: {}						
$Q_{hyst}$	dB	{2}		{2}		{2}		{2}		{2}		{2}	
<i>PENALTY_TIME</i>	s	{}		{}		{}		{}		{}		{}	
<i>TEMP_OFFSET</i>	dB	{}		{}		{}		{}		{}		{}	
<i>Tresselection</i>	s	{5}		{5}		{5}		{5}		{5}		{5}	
<i>Sintrasearch</i>	dB	{}		{}		{}		{}		{}		{}	
<i>Sintersearch</i>	dB	{8}		{8}		{8}		{8}		{8}		{8}	

~~Time T1 is X seconds and T2 is Y seconds.~~

#### ~~4.3.2.1.2 — Minimum requirements~~

~~Cell re-selection shall be correct in more than [90%] of the cases. Cell re-selection is correct if within Nt seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria and stays steady on that cell until the channel conditions are changed again.~~

### ~~4.3.3 — UTRAN to GSM Cell Re-Selection~~

~~NOTE 1: These requirements are depending on supported UE capabilities.~~

~~NOTE 2: Requirements for GSM to UTRAN Cell Re-Selection are defined in the GSM specifications.~~

#### ~~4.3.3.1 — Cell re-selection delay~~

~~When the UE is camped on UTRAN cell, the UE shall be capable of re-selecting a GSM cell according the cell re-selection criteria for UTRAN to GSM. The cells, which are possible to be re-selected during the test, belong to different location areas. The cell re-selection delay is then defined as a time from when radio conditions are changed to the moment in time when the UE starts sending the RR Channel Request message for location update to GSM.~~

## 4.3.3.1.1 Test parameters

Table 4-5: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
<i>UTRA-RF-Channel-Number</i>		Channel 1	
<i>CPICH-Ec/A<sub>or</sub></i>	dB	-10	
<i>PCCPCH-Ec/A<sub>or</sub></i>	dB	-12	
<i>SCH-Ec/A<sub>or</sub></i>	dB	-12	
<i>PICH-Ec/A<sub>or</sub></i>	dB	-15	
<i>OCNS-Ec/A<sub>or</sub></i>	dB	-0.941	
$\frac{\hat{I}_{or}}{I_{oc}}$	dB	10.3	7.3
$I_{oc}$	dBm/3.84 MHz	-70	
<i>CPICH-Ec/A<sub>o</sub></i>	dB	-13	-16
<i>CPICH-RSCP</i>	dBm	{L1}	{L2}
Propagation Condition		-AWGN	
<i>Cell-selection-and-reselection-quality-measure</i>		$CPICH E_c/N_0$	
<i>Q<sub>qualmin</sub></i>	dB	{}	
<i>Q<sub>rxlevmin</sub></i>	dBm	{}	
<i>UE-TXPWR-MAX-RACH</i>	dBm	{}	
<i>Q<sub>offset<sub>s,n</sub></sub></i>	dB	C1, C2: {}	
<i>Q<sub>hyst</sub></i>	dB	{}	
<i>PENALTY_TIME</i>	s	C2: {}	
<i>TEMP_OFFSET</i>	dB	C2: {}	
<i>T<sub>resselection</sub></i>	s	{}	
<i>S<sub>search<sub>RAT</sub></sub></i>	dB	{}	



**Table 4-6: Cell re-selection UTRAN to GSM cell case (cell 2)**

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

Time T1 is X seconds and T2 is Y seconds.

NOTE:—T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

#### 4.3.3.1.2—Minimum requirement

Cell re-selection shall be correct in more than [90%] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria and stays steady on that cell until the channel conditions are changed again.

## 4 Idle Mode

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*).

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

## 4.1.2 Requirements

### 4.1.2.1 Stored information cell selection delay

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

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

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

#### 4.1.2.1.2 No cell is present in the neighbour list

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

## 4.2 Cell Re-selection

### 4.2.1 Introduction

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

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

### 4.2.2 Requirements

#### 4.2.2.1 Number of cells to be monitored

The UE shall be capable of monitoring at least [32] neighbour cells per carrier frequency for at least [3] carriers.

#### 4.2.2.2 Cell re-selection delay

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

##### 4.2.2.2.1 Single carrier case

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

##### 4.2.2.2.2 Multi carrier case

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

## 4.3 UTRAN to GSM Cell Re-Selection

### 4.3.1 Introduction

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

## 4.3.2 Requirements

### 4.3.2.1 Cell Re-Selection delay

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

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

## A.4 Idle Mode

### A.4.1 Cell selection

Two scenarios are considered:

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

For each of them a test is proposed.

NOTE: More scenarios will be added later.

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

##### A.4.1.1.1 Test Purpose and Environment

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

This scenario implies the presence of 2 carriers and 6 cells (3 cells per carrier) as reported in Table A.4-1 and A.4-2.

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

NOTE: Here pilot pollution case with different power levels for cells could be included.

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

	<b><u>Parameter</u></b>	<b><u>Unit</u></b>	<b><u>Value</u></b>	<b><u>Comment</u></b>
<b><u>Initial condition</u></b>	<b><u>Stored RF channel</u></b>		<b><u>Channel1</u></b>	
	<b><u>Neighbour cells of Cell1</u></b>		<b><u>Cell2, Cell3,Cell4, Cell5, Cell6</u></b>	
	<b><u>Neighbour cells of Cell2</u></b>		<b><u>Cell1, Cell3,Cell4, Cell5, Cell6</u></b>	
	<b><u>Neighbour cells of Cell3</u></b>		<b><u>Cell1, Cell2,Cell4, Cell5, Cell6</u></b>	
<b><u>Final condition</u></b>	<b><u>Active cell</u></b>		<b><u>Cell5</u></b>	

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>	<u>Cell 3</u>	<u>Cell 4</u>	<u>Cell 5</u>	<u>Cell 6</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>	<u>Channel 1</u>	<u>Channel 1</u>	<u>Channel 2</u>	<u>Channel 2</u>	<u>Channel 2</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>	<u>-10</u>	<u>-10</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>	<u>-15</u>	<u>-15</u>	<u>-15</u>	<u>-15</u>
<u>OCNS Ec/Ior</u>	<u>dB</u>	<u>-0.941</u>	<u>-0.941</u>	<u>-0.941</u>	<u>-0.941</u>	<u>-0.941</u>	<u>-0.941</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>5.3</u>	<u>2.3</u>	<u>-1.7</u>	<u>6.3</u>	<u>14.3</u>	<u>2.3</u>
<u><math>I_{oc}</math></u>	<u>dBm/3.84 MHz</u>	<u>-70</u>			<u>-70</u>		
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>-13</u>	<u>-16</u>	<u>-20</u>	<u>-19</u>	<u>-11</u>	<u>-23</u>
<u>Propagation Condition</u>		<u>AWGN</u>			<u>AWGN</u>		
<u>Qualmin</u>	<u>dB</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>
<u>Orxlemin</u>	<u>dBm</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>
<u>UE TXPWR MAX_RACH</u>	<u>dBm</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>
<u>Offsets<sub>s,n</sub></u>	<u>dB</u>	<u>C1, C2: []</u> <u>C1, C3: []</u> <u>C1, C4: []</u> <u>C1, C5: []</u> <u>C1, C6: []</u>	<u>C2, C1: []</u> <u>C2, C3: []</u> <u>C2, C4: []</u> <u>C2, C5: []</u> <u>C2, C6: []</u>	<u>C3, C1: []</u> <u>C3, C2: []</u> <u>C3, C4: []</u> <u>C3, C5: []</u> <u>C3, C6: []</u>	<u>C4, C1: []</u> <u>C4, C2: []</u> <u>C4, C3: []</u> <u>C4, C5: []</u> <u>C4, C6: []</u>	<u>C5, C1: []</u> <u>C5, C2: []</u> <u>C5, C3: []</u> <u>C5, C4: []</u> <u>C5, C6: []</u>	<u>C6, C1: []</u> <u>C6, C2: []</u> <u>C6, C3: []</u> <u>C6, C4: []</u> <u>C6, C5: []</u>

**A.4.1.2.2 Test Requirements**

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

**A.4.1.2 Scenario 2 : no cell is present in the neighbour list****A.4.1.2.1 Test Purpose and Environment**

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

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

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>
<u>OCNS Ec/Ior</u>	<u>dB</u>	<u>-0.941</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>0</u>
<u><math>I_{oc}</math></u>	<u>dBm/3.84 MHz</u>	<u>-70</u>
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>-13</u>
<u>Propagation Condition</u>		<u>AWGN</u>
<u>Qqualmin</u>	<u>dB</u>	<u>[]</u>
<u>Orxlevmin</u>	<u>dBm</u>	<u>[]</u>
<u>UE TXPWR MAX RA CH</u>	<u>dBm</u>	<u>[]</u>

#### A.4.1.2.2 Test Requirements

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

#### A.4.2 Cell Re-Selection

Two scenarios are considered:

- Scenario 1: Single carrier case
- Scenario 2: Multi carrier case

For each of them a test is proposed.

NOTE: 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 caseA.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.4.3: General test parameters for Cell Re-selection single carrier multi-cell case**

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>		<u>Cell 2</u>		<u>Cell 3</u>		<u>Cell 4</u>		<u>Cell 5</u>		<u>Cell 6</u>	
		<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>		<u>Channel 1</u>		<u>Channel 1</u>		<u>Channel 1</u>		<u>Channel 1</u>		<u>Channel 1</u>	
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>		<u>-10</u>		<u>-10</u>		<u>-10</u>		<u>-10</u>		<u>-10</u>	
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>	
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>	
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>	
<u>OCNS Ec/Ior</u>	<u>dB</u>	<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>	
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>7.3</u>	<u>10.27</u>	<u>10.27</u>	<u>7.3</u>	<u>0.27</u>		<u>0.27</u>		<u>0.27</u>		<u>0.27</u>	
<u><math>I_{oc}</math></u>	<u>dBm / 3.84 MHz</u>	<u>-70</u>											
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>-16</u>	<u>-13</u>	<u>-13</u>	<u>-16</u>	<u>-23</u>		<u>-23</u>		<u>-23</u>		<u>-23</u>	
<u>Propagation Condition</u>		<u>AWGN</u>											
<u>Cell selection and reselection quality measure</u>		<u>CPICH <math>E_c/N_0</math></u>		<u>CPICH <math>E_c/N_0</math></u>		<u>CPICH <math>E_c/N_0</math></u>		<u>CPICH <math>E_c/N_0</math></u>		<u>CPICH <math>E_c/N_0</math></u>		<u>CPICH <math>E_c/N_0</math></u>	
<u>Qualmin</u>	<u>dB</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>Qrxlevmin</u>	<u>dBm</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>UE TXPWR MAX_RACH</u>	<u>dB</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>Qoffset<sub>2,s,n</sub></u>	<u>dB</u>	<u>C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []</u>		<u>C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []</u>		<u>C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []</u>		<u>C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []</u>		<u>C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []</u>		<u>C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []</u>	
<u>Qhyst<sub>2</sub></u>	<u>dB</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>PENALTY TIME</u>	<u>s</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>TEMP_OFFSET2</u>	<u>dB</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>Treselection</u>	<u>s</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	
<u>Sintrasearch</u>	<u>dB</u>	<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>		<u>[]</u>	



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 caseA.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.46 and A.4-7.

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

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>		<u>Cell 2</u>		<u>Cell 3</u>		<u>Cell 4</u>		<u>Cell 5</u>		<u>Cell 6</u>	
		<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>		<u>Channel 2</u>		<u>Channel 1</u>		<u>Channel 1</u>		<u>Channel 2</u>		<u>Channel 2</u>	
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>		<u>-10</u>		<u>-10</u>		<u>-10</u>		<u>-10</u>		<u>-10</u>	
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>	
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>		<u>-12</u>	
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>		<u>-15</u>	
<u>OCNS Ec/Ior</u>	<u>dB</u>	<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>		<u>-0.941</u>	
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>-3.4</u>	<u>2.2</u>	<u>2.2</u>	<u>-3.4</u>	<u>-7.4</u>	<u>-4.8</u>	<u>-7.4</u>	<u>-4.8</u>	<u>-4.8</u>	<u>-7.4</u>	<u>-4.8</u>	<u>-7.4</u>
<u><math>I_{oc}</math></u>	<u>dBm / 3.84 MHz</u>	<u>-70</u>											
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>-16</u>	<u>-13</u>	<u>-13</u>	<u>-16</u>	<u>-20</u>		<u>-20</u>		<u>-20</u>		<u>-20</u>	
<u>Propagation Condition</u>		<u>AWGN</u>											
<u>Cell selection and reselection quality measure</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>	
<u>Qualmin</u>	<u>dB</u>	[]		[]		[]		[]		[]		[]	
<u>Qrxlevmin</u>	<u>dBm</u>	[]		[]		[]		[]		[]		[]	
<u>UE TXPWR MAX_RACH</u>	<u>dB</u>	[]		[]		[]		[]		[]		[]	
<u>Offset<sub>s,n</sub></u>	<u>dB</u>	<u>C1, C2: []</u> <u>C1, C3: []</u> <u>C1, C4: []</u> <u>C1, C5: []</u> <u>C1, C6: []</u>	<u>C2, C1: []</u> <u>C2, C3: []</u> <u>C2, C4: []</u> <u>C2, C5: []</u> <u>C2, C6: []</u>	<u>C3, C1: []</u> <u>C3, C2: []</u> <u>C3, C4: []</u> <u>C3, C5: []</u> <u>C3, C6: []</u>	<u>C4, C1: []</u> <u>C4, C2: []</u> <u>C4, C3: []</u> <u>C4, C5: []</u> <u>C4, C6: []</u>	<u>C5, C1: []</u> <u>C5, C2: []</u> <u>C5, C3: []</u> <u>C5, C4: []</u> <u>C5, C6: []</u>	<u>C6, C1: []</u> <u>C6, C2: []</u> <u>C6, C3: []</u> <u>C6, C4: []</u> <u>C6, C5: []</u>						
<u>Ohyst</u>	<u>dB</u>	[2]		[2]		[2]		[2]		[2]		[2]	
<u>PENALTY TIME</u>	<u>s</u>	[]		[]		[]		[]		[]		[]	
<u>TEMP_OFFSET</u>	<u>dB</u>	[]		[]		[]		[]		[]		[]	
<u>Treselection</u>	<u>s</u>	[5]		[5]		[5]		[5]		[5]		[5]	
<u>Sintrasearch</u>	<u>dB</u>	[]		[]		[]		[]		[]		[]	
<u>Sintersearch</u>	<u>dB</u>	[-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-SelectionA.4.3.1 Scenario 1A.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**

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1 (UTRA)</u>	
		<u>T1</u>	<u>T2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>	
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	
<u>OCNS Ec/Ior</u>	<u>dB</u>	<u>-0.941</u>	
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>10.3</u>	<u>7.3</u>
<u><math>I_{oc}</math></u>	<u>dBm/3.84 MHz</u>	<u>-70</u>	
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>-13</u>	<u>-16</u>
<u>CPICH RSCP</u>	<u>dBm</u>	<u>[L1]</u>	<u>[L2]</u>
<u>Propagation Condition</u>		<u>AWGN</u>	
<u>Cell selection and reselection quality measure</u>		<u>CPICH Ec/N0</u>	
<u>Qqualmin</u>	<u>dB</u>	<u>[]</u>	
<u>Qrxlevmin</u>	<u>dBm</u>	<u>[]</u>	
<u>UE TXPWR MAX RACH</u>	<u>dBm</u>	<u>[]</u>	
<u>QoffsetL<sub>s,n</sub></u>	<u>dB</u>	<u>C1, C2: []</u>	
<u>Qhyst1</u>	<u>dB</u>	<u>[]</u>	
<u>PENALTY TIME</u>	<u>s</u>	<u>C2: []</u>	
<u>TEMP_OFFSET1</u>	<u>dB</u>	<u>C2: []</u>	
<u>Treselection</u>	<u>s</u>	<u>[]</u>	
<u>Ssearch<sub>RAT</sub></u>	<u>dB</u>	<u>[]</u>	

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 2 (GSM)</u>	
		<u>T1</u>	<u>T2</u>
<u>Absolute RF Channel Number</u>		<u>ARFCN 1</u>	
<u>RXLEV</u>	<u>dBm</u>	<u>-70</u>	<u>-60</u>
<u>RXLEV ACCESS MIN</u>	<u>dBm</u>	[]	
<u>MS TXPWR MAX CCH</u>	<u>dBm</u>	[]	

**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.

Turin, Italy, 4 – 8 Sep, 2000

e.g. for 3GPP use the format TP-99xxx  
or for SMG, use the format P-99-xxx

# CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

**25.133 CR 39**

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **RAN#9**  
list expected approval meeting # here ↑

for approval   
for information

strategic   
non-strategic  (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
(at least one should be marked with an X)

**Source:** TSG RAN WG#4 **Date:** 2000-09-07

**Subject:** Proposal for new section 5 and A.5

**Work item:**

<b>Category:</b> <i>(only one category shall be marked with an X)</i>	F Correction	<input checked="" type="checkbox"/>	<b>Release:</b>	Phase 2	<input type="checkbox"/>
	A Corresponds to a correction in an earlier release	<input type="checkbox"/>		Release 96	<input type="checkbox"/>
	B Addition of feature	<input type="checkbox"/>		Release 97	<input type="checkbox"/>
	C Functional modification of feature	<input type="checkbox"/>		Release 98	<input type="checkbox"/>
	D Editorial modification	<input type="checkbox"/>		Release 99	<input checked="" type="checkbox"/>
			Release 00	<input type="checkbox"/>	

**Reason for change:** Separation of general requirements and test cases for UE hand over functions.

**Clauses affected:** 5

<b>Other specs Affected:</b>	Other 3G core specifications	<input type="checkbox"/>	→ List of CRs:	
	Other GSM core specifications	<input type="checkbox"/>	→ List of CRs:	
	MS test specifications	<input type="checkbox"/>	→ List of CRs:	
	BSS test specifications	<input type="checkbox"/>	→ List of CRs:	
	O&M specifications	<input type="checkbox"/>	→ List of CRs:	

**Other comments:**

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## 5 RRC Connection mobility

### 5.1 Handover

The handover process should be implemented in both the UE and UTRAN. The UE measurements and which radio links the UE shall use is controlled by UTRAN with RRC signalling. Measurements are specified in TS25.215 and UE behaviour in response to UTRAN RRC messages is described in TS25.331.

#### 5.1.1 FDD Soft/softer Handover

##### 5.1.1.1 General

The soft handover procedure is initiated from UTRAN with an active set update message.

###### 5.1.1.1.1 Maximum number of cells to be reported

The UE shall be capable of reporting the requested measurement quantity of at least [6] cells given in a measurement control message(s)

###### 5.1.1.1.2 Measurement reporting delay

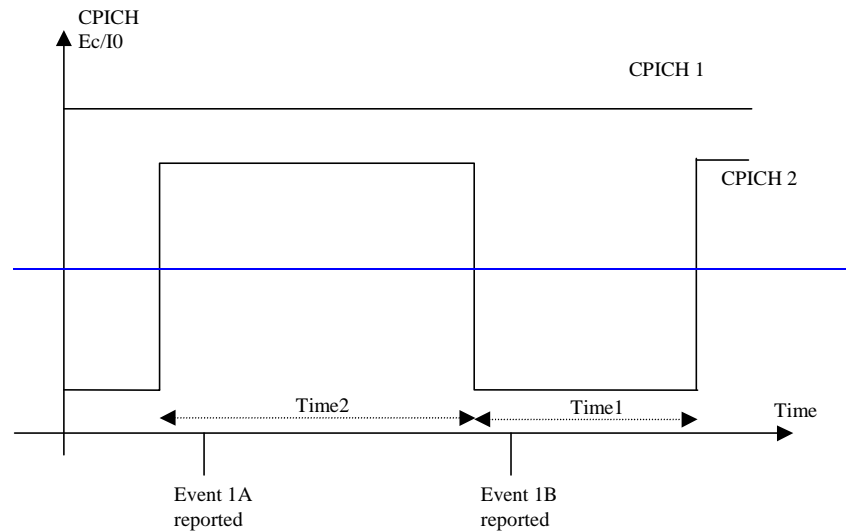
The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface. This measurement reporting delay 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.

##### 5.1.1.2 Event triggered reporting in AWGN propagation conditions

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the CPICH<sub>E<sub>c</sub>/I<sub>o</sub></sub> and SFN-CFN observed timed difference between Cell 1 and Cell 2 is within defined limits in AWGN propagation condition.

###### 5.1.1.2.1 Test parameters

The DL reference measurement channel 12.2 kbps as specified in Annex A, sub-clause A.3.1 of TS25.101 shall be used with power control turned on. Cell 1 is current active cell. The CPICH<sub>E<sub>c</sub>/I<sub>o</sub></sub> level of Cell 1 is kept constant and the CPICH<sub>E<sub>c</sub>/I<sub>o</sub></sub> level of Cell 2 is changed as illustrated in figure 5-1 and table 5.1. Hysteresis, Threshold and Time to Trigger values are given in the table 5.1 below and they are signalled from test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1A and 1B shall be used, SFN has to be decoded for neighbour cells. CPICH<sub>E<sub>c</sub>/I<sub>o</sub></sub> and the SFN-CFN observed timed difference has to reported together with Event 1A reporting. New measurement control information, which defines neighbour cells etc., is always sent during time period Time 1. The number of neighbour cells in the measurement control information is 24.



**Figure 5-1: Illustration of parameters for soft handover measurement reporting test case**

**Table 5-1: Test parameters for handover measurement reporting delay**

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 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	-17		-17	
$OCNS$		-1.049		-1.049	
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	$\infty$	5.97
$I_{oc}$	dBm/3.84 MHz	-70			
$CPICH_{Ec/Io}$	dB	-13	-13	$\infty$	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	ms	0			
Filter coefficient		0			
Propagation Condition	AWGN				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

#### 5.1.1.2.2 — Minimum requirements

The measurement reporting delay shall be less than 0.8 seconds in [90]% of the cases.

Reported  $CPICH_{Ec/Io}$  of Cell 2 in Event 1A shall have an accuracy of  $\pm [1.5]$  dB in [90]% of the 1A reports.

Reported SFN CFN observed time difference shall have an accuracy of  $\pm [Y]$  chips in [90]% of the reports.

#### 5.1.1.3 — Event triggered reporting of multiple neighbours in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the reported values is within the specified limits. In the test 4 cells are present where the



$\hat{I}_{or}/I_{oc}$  level of Cell 1 and 2 is kept at a constant and the power level of cell 3 and 4 is changed over time by changing ( $\hat{I}_{or}/I_{oc}$ ):

#### 5.1.1.3.1 Test parameters

In figure 5-2 an illustration of the test case is shown with the parameters specified in table 5.2 and 5.3. Hysteresis, Threshold and Time to Trigger values are given in the tables below and they are signalled from the test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1C and 1B shall be used. CPICH  $E_c/I_o$  and SFN-CFN observed time difference shall be reported together with Event 1C. New measurement control information, which defines neighbour cells etc., is continuously sent. The number of neighbour cells in the measurement control information is 32.

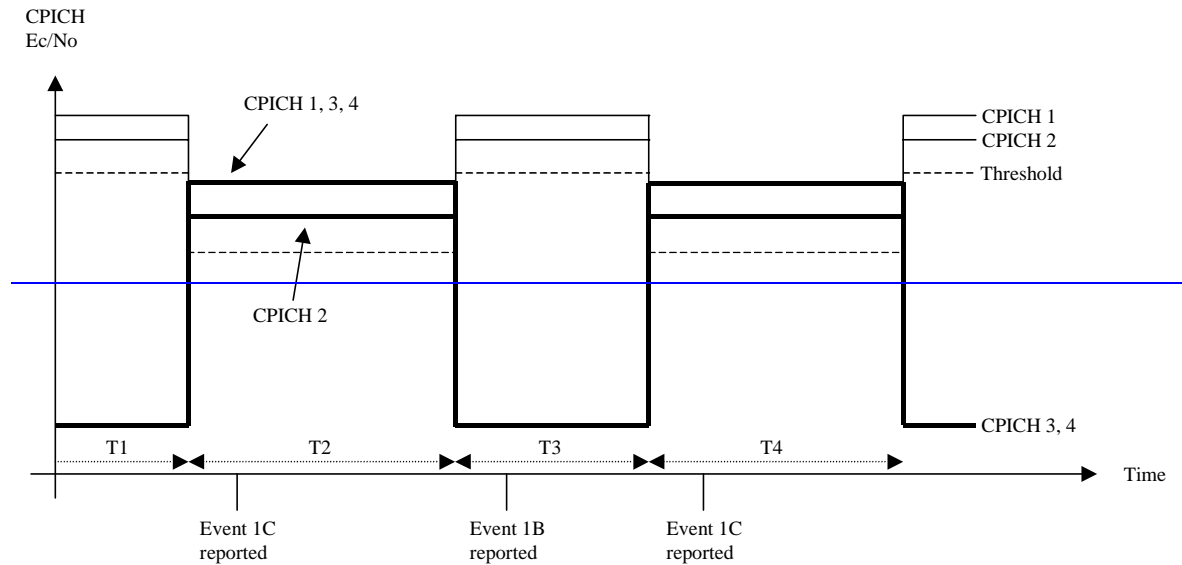


Figure 5.2: Illustration of the test case

Table 5.2: Parameters for Event triggered reporting of multiple neighbours in AWGN

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
$CPICH_{Ec/Ior}$	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				-17			
$OCNS_{Ec/Ior}$	dB	-1.049				-1.049			
$\hat{I}_{or}/I_{oc}$	dB	18.5				17			
$I_{oc}$	dBm/3.84 MHz	-85							
$CPICH_{Ec/Io}$	dB	-12.4	-15.5	-12.4	-15.5	-13.9	-17.0	-13.9	-17.0
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	ms	0							
Filter coefficient		0							
Propagation Condition		AWGN							

**Table 5-3: Parameters for Event triggered reporting of multiple neighbours in AWGN**

Parameter	Unit	Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4
$CPICH_{Ec/Ior}$	dB	-10				-10			
$PCCPCH_{Ec/Ior}$	dB	-12				-12			
$SCH_{Ec/Ior}$	dB	-15				-15			
$PICH_{Ec/Ior}$	dB	-15				-15			
$DPCH_{Ec/Ior}$	dB	N/A				N/A			
$OCNS$	dB	-0.941				-0.941			
$\hat{I}_{or}/I_{oc}$	dB	$-\infty$	18.5	$-\infty$	18.5	$-\infty$	17.5	$-\infty$	17.5
$I_{oc}$	dBm/3.8 4 MHz	-85							
$CPICH_{Ec/Io}$	dB	$-\infty$	-15.5	$-\infty$	-15.5	$-\infty$	-16.5	$-\infty$	-16.5
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	ms	0							
Filter coefficient		0							
Propagation Condition		AWGN							

## 5.1.1.3.2 — Minimum requirements

In table 5-4 the test case is described in detail for each time interval T1 to T4 and Minimum Requirements are given for each time interval.

**Table 5-4: Minimum requirements for Event triggered reporting of multiple neighbours in AWGN**

Time	Value	Cell 1 to 2	Cell 3 to 4
T1	$\geq 20$ s	Included in the active set, keeping a constant $I_{or}/I_{oc}$ level over the test.	Not visible, e.g. the UE has never had synchronisation to them before.
T2	10 s		<p>Will test the time for initial synchronisation when neighbour 3 and 4 suddenly becomes strong. Cell 3 and 4 becomes stronger than one of the cell in the active set (cell 2) and therefore event 1C shall be triggered. Together with the event a report containing measured <math>CPICH_{Ec/Io}</math> for all cells shall be sent together with the SFN-CFN observed time difference for cell 3 and 4.</p> <p>Minimum Requirements</p> <p>Event 1C shall be reported within [800] ms in [90] % of the cases.</p> <p>Reported <math>CPICH_{Ec/Io}</math> of Cell 1 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 1 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p> <p>Reported <math>CPICH_{Ec/Io}</math> of Cell 2 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 2 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p> <p>Reported <math>CPICH_{Ec/Io}</math> of Cell 3 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 3 shall have an accuracy of <math>\pm</math>[TBD] chips in [90] % of the reports.</p> <p>Reported <math>CPICH_{Ec/Io}</math> of Cell 4 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 4 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p>
T3	15 s		<p>Neighbour 3 and 4 suddenly disappears. Event 1B shall be triggered. Together with the event a report containing measured <math>CPICH_{Ec/Io}</math> for all remaining cells shall be sent.</p> <p>Minimum Requirements.</p> <p>Event 1B shall be reported within [150] ms in [90] % of the cases.</p> <p>Reported <math>CPICH_{Ec/Io}</math> of Cell 1 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported <math>CPICH_{Ec/Io}</math> of Cell 2 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p>

Time	Value	Cell 1 to 2	Cell 3 to 4
T4	10 s		<p>Neighbour 4 to 6 suddenly appears again after being gone for T3 s. Event 1C shall be triggered. Together with the event a report containing measured <math>E_c/I_o</math> for all cells shall be sent together with the SFN-CFN observed time difference for cell 3 and 4.</p> <p><b>Minimum Requirements.</b></p> <p>Event 1C shall be reported within [150] ms in [90] % of the cases.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 1 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 2 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 3 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 3 shall have an accuracy of <math>\pm</math>[TBD] chips in [90] % of the reports.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 4 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 4 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p>

**5.1.1.4 — Correct reporting of neighbours in Fading propagation condition**

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell. The CPICH  $E_c/I_o$  level of Cell 1 is kept constant and the power level of Cell 2 is changed using  $(\hat{I}_{or}/I_{oc})$ .

**5.1.1.4.1 — Test parameters**

The test parameters are specified in table 5-5. Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1A shall be used. Only the event number is reported in this case. New measurement control information, which defines neighbour cells etc., is sent always during time period Time 1. The number of neighbour cells in the measurement control information is 24.

**Table 5-5: Test parameters for correct reporting of neighbours**

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 2
CPICH $E_c/I_{or}$	dB	-10		-10	
PCCPCH $E_c/I_{or}$	dB	-12		-12	
SCH $E_c/I_{or}$	dB	-12		-12	
PICH $E_c/I_{or}$	dB	-15		-15	
DPCH $E_c/I_{or}$	dB	TBD		TBD	
OCNS		{To Be Calculated}		{To Be Calculated}	
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	$\infty$	5.97
$I_{oc}$	dBm/3.84 MHz	-70			
CPICH $E_c/I_o$	dB	-13	-13	$\infty$	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	ms	0			
Filter coefficient		0			
Propagation Condition	Case 5 as specified in Annex B of TS25.101				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds

**5.1.1.4.2 — Minimum requirement**

The measurement reporting delay shall be less than XX seconds in YY%.

### 5.1.1.5 — CPICH\_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

The test case will derive the terminal's measurement accuracy of CPICH\_Ec/Io and false detection resistance.

#### 5.1.1.5.1 — Test parameters

The test parameters are specified in table 5-6. The terminal measurement accuracy of CPICH\_Ec/Io is derived using the periodical reporting of active cell's measured CPICH\_Ec/Io. The terminal's false detection resistance is derived by recording the amount of erroneous reports. Both Cell 1 and Cell 2 powers ( $\hat{I}_{or}/I_{oc}$ ) are constant during the test case. Cell 2 is near to reporting range. Hysteresis, Threshold, Time to Trigger values and reporting period for active cell are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that the CPICH\_Ec/Io level of the active set cell has to reported periodically (and reporting period) and event triggered reporting (IA) will also be used. The number of neighbour cells in the measurement control information is 24.

**Table 5-6: Test parameters for CPICH\_Ec/Io measurement accuracy and incorrect reporting of neighbours**

Parameter	Unit	Cell 1	Cell 2
CPICH_Ec/Io	dB	-10	-10
PCCPCH_Ec/Io	dB	-12	-12
SCH_Ec/Io	dB	-12	-12
PICH_Ec/Io	dB	-15	-15
DPCH_Ec/Io	dB	TBD	TBD
OCNS		{To Be Calculated}	{To Be Calculated}
$\hat{I}_{or}/I_{oc}$	dB	1.68	-3.32
$I_{oc}$	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-18
Threshold	dB	3	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Reporting period	ms	TBD	
Filter coefficient		0	
Propagation Condition		AWGN	

#### 5.1.1.5.2 — Minimum requirements

Event triggered report rate shall not exceed X reports in Y seconds.

In the periodical reporting the reported CPICH\_Ec/Io for Cell 1 shall have an accuracy of  $\pm$  [TBD] dB in [90] % of the reports.

#### 5.1.1.6 — Active set dimension

The active set is defined as set of radio links simultaneously involved in a specific communication service between an User Equipment and a UTRAN access point. The UE shall be capable of supporting at least [6] radio links in the active set.

#### 5.1.1.7 — Active set update delay

The active set update delay start is defined as the time from when the UE receives the active set update message from UTRAN, or at the time stated through the activation time when to perform the active set update. The activation time stop is defined as the time when the UE successfully only uses the set of radio links stated in that message for power control. The active set update delay is defined as the time between the active set update start and the active set stop.

The active set update delay for different number of added cells is stated in the table 5.7 below. There is different requirement on the active set update delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

[Editor's Note: the requirement of an active set update of at least [1] second after the reception of the UTRAN acknowledgement as proposed in R4-99712, shall be considered as a starting point for the setting of this requirement].

**Table 5-7**

Number of new cells present in the active set update message	Maximum active set update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1		
2		
3		
4		
5		
6		
...		

If an active set update includes a combination of cells included and not included in the monitored set the maximum active set update delay is the sum of respective maximum delays.

## 5.1.2 FDD Hard Handover

The hard handover procedure is initiated from UTRAN with an handover command message. 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.

### 5.1.2.1 General

#### 5.1.2.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

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

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

#### 5.1.2.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface. 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.

#### 5.1.2.1.3 Test parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on. Test parameters for DL compressed mode are given in Annex A5 (table A-26) of TS25.101.

### 5.1.2.2 Correct reporting of neighbours in AWGN propagation condition.

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a neighbour cell on the used frequency and Cell 3 is a neighbour cell on the unused frequency. The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

#### 5.1.2.2.1 Test parameters

The CPICH<sub>Ec/I<sub>o</sub></sub> level of Cell 1 and Cell 3 are kept constant and the power level of Cell 2 is changed using  $(\hat{I}_{or}/I_{oc})$ , as illustrated in Figure 5-3. Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from the test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1A, 1B and 2C shall be used. The CPICH<sub>Ec/I<sub>o</sub></sub> of the best cell on the un-used frequency has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is 24. The X-number of neighbours are on the un-used frequency. The BLER of the current active link is also measured.

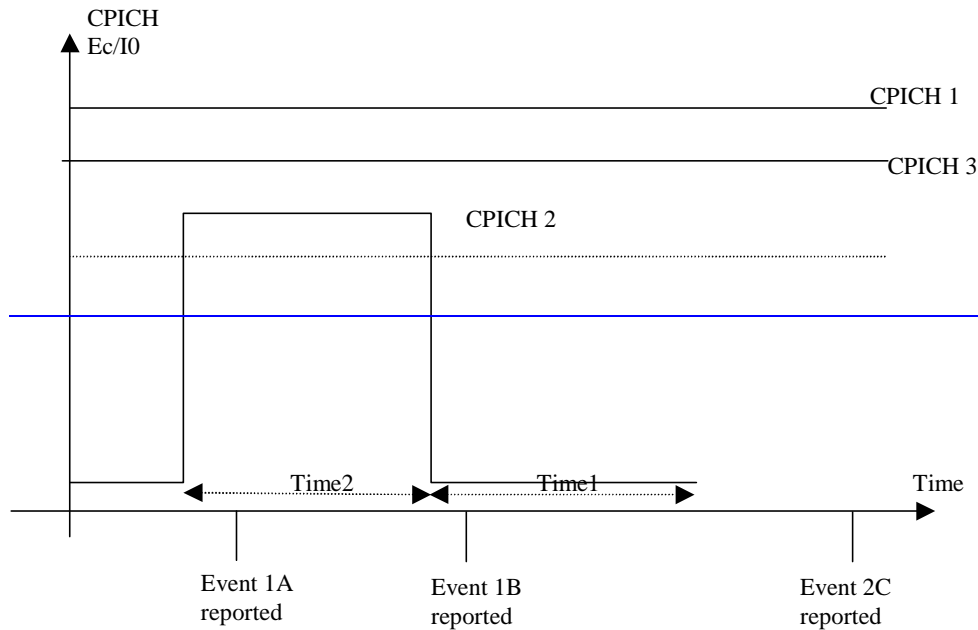


Figure 5-3: Illustration of parameters for handover measurement reporting test case

Table 5-8: Test parameters for CPICH<sub>Ec/I<sub>o</sub></sub> measurement accuracy and correct reporting of neighbours

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 2	
CPICH <sub>Ec/I<sub>o</sub></sub>	dB	-10		-10		-10	
PCCPCH <sub>Ec/I<sub>o</sub></sub>	dB	-12		-12		-12	
SCH <sub>Ec/I<sub>o</sub></sub>	dB	-12		-12		-12	
PICH <sub>Ec/I<sub>o</sub></sub>	dB	-15		-15		-15	
DPCH <sub>Ec/I<sub>o</sub></sub>	dB	TBD		TBD		TBD	
OCNS		{To Be Calculated}		{To Be Calculated}		{To Be Calculated}	
$\hat{I}_{or}/I_{oc}$	dB	0	4.39	-∞	2.39	-1.8	-1.8
$I_{oc}$	dBm/3.84 MHz	-70				-70	
CPICH <sub>Ec/I<sub>o</sub></sub>	dB	-13	-13	-∞	-15	-14	-14
Absolute Threshold (Ec/No)	dB	-18					
Hysteresis	dB	0					
Time to Trigger	ms	0					
Filter coefficient		0					
Propagation Condition		AWGN					

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

#### 5.1.2.2.2—Minimum requirements

The measurement reporting delay shall be less than [5] seconds in [90] % of the cases.

Reported CPICH  $E_c/I_o$  of Cell 3 in Event 2C shall have an accuracy of to  $\pm$ [TBD] dB of the 2C reports.

The BLER of the DCH shall not exceed [TBD] value.

#### 5.1.2.3—Correct reporting of neighbours in Fading propagation condition

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell and Cell 2 is a neighbour cell on the un-used frequency. The CPICH  $E_c/I_o$  level of Cell 1 and Cell 2 are kept constant

##### 5.1.2.3.1—Test parameters

Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used. Only events, which occur, are reported in this case. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is 24. The X number of neighbours are on the un-used frequency. The BLER of the current active link is also measured.

**Table 5-9: Test parameters for Correct reporting of neighbours**

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel Number		Channel 1	Channel 2
CPICH $E_c/I_o$	dB	-10	-10
PCCPCH $E_c/I_o$	dB	-12	-12
SCH $E_c/I_o$	dB	-12	-12
PICH $E_c/I_o$	dB	-15	-15
DPCH $E_c/I_o$	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 $E_c/I_o$	dB	-13	-14
Absolute Threshold (Ec/No)	dB		-18
Hysteresis	dB		0
Time to Trigger	ms		0
Filter coefficient			0
Propagation Condition		Case 5 as specified in Annex B of TS25.101	

##### 5.1.2.3.2—Minimum requirements

The measurement reporting delay shall be less than Y seconds in [90] % of the cases.

The BLER of the DCH shall not exceed [TBD] value.

#### 5.1.2.4—Hard Handover Delay

When the UE receives a RRC message that implies a hard handover (PHYSICAL CHANNEL RECONFIGURATION, RADIO BEARER SETUP, RADIO BEARER RECONFIGURATION, RADIO BEARER RELEASE, or TRANSPORT CHANNEL RECONFIGURATION), it shall be ready to transmit on the new channel within [X ms] from the last TTI containing the RRC command.

However, if the command includes an indicated starting time, the UE shall be ready to transmit on the new channel at the designated starting time, or within [X ms], whichever is the later. 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 the value in table 5-10. The ready to transmit means that the UE should initiate L1 uplink synchronisation. This hard handover delay does not include a delay due to SFN decoding of the new cell in case it is needed.

The hard handover delay requirements are defined in the table (5-10).

**Table 5-10: FDD/FDD hard handover delay**

Number of new cells present in the handover command message	Maximum hard handover delay [ms]	
	Cells in neighbour list and reported to UTRAN	Cells outside neighbour cell list
1	[20]	[4000]
2	∅	∅
3	∅	∅
4	∅	∅
5	∅	∅
6	∅	∅

#### 5.1.2.5 Cell Re-selection in Cell\_FACH

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.

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

##### 5.1.2.5.1 Cell re-selection single carrier multi-cell case

###### 5.1.2.5.1.1 Cell re-selection delay

When the UE is camped in Cell\_FACH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.



5.1.2.5.1.2 Test parameters

Table 5-11: 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
<i>UTRA_RF_Channel Number</i>		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
<i>CPICH_Ec/Ior</i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCCPCH_Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH_Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH_Ec/Ior</i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS_Ec/Ior</i>	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											
<i>CPICH_Ec/Io</i>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
<i>Cell_selection_and_reselection_quality_measure</i>		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$	
<i>Qqualmin</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Qrxlevmin</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>UE_TXPWR_MAX_RACH</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>Qoffset</i>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<i>Qhyst</i>	dB	[]		[]		[]		[]		[]		[]	
<i>PENALTY_TIME</i>	s	[]		[]		[]		[]		[]		[]	
<i>TEMP_OFFSET</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Treselection</i>	s	[]		[]		[]		[]		[]		[]	
<i>Sintrasearch</i>	dB	[]		[]		[]		[]		[]		[]	

Time T1 is X seconds and T2 is Y seconds.

NOTE: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

5.1.2.5.1.3 Minimum requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.5.2 Cell re-selection multi-carrier multi-cell case

NOTE: The scheduling of Measurement Occasions needs to be defined for the purpose of these scenarios.

5.1.2.5.2.1 Cell re-selection delay

When the UE is camped in Cell\_FACH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time

from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.5.2.2 Test Parameters

**Table 5-12: 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
<i>UTRA RF Channel Number</i>		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
<i>CPICH<sub>E_c/A_c</sub></i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCCPCH<sub>E_c/A_c</sub></i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH<sub>E_c/A_c</sub></i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH<sub>E_c/A_c</sub></i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS<sub>E_c/A_c</sub></i>	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											
<i>CPICH<sub>E_c/A_c</sub></i>	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
<i>Cell_selection_and_reselection_quality_measure</i>		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 $E_c/N_0$	
<i>Qqualmin</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Qrxlevmin</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>UE_TXPWR_MAX_RACH</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>Qoffset</i>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<i>Qhyst</i>	dB	[]		[]		[]		[]		[]		[]	
<i>PENALTY_TIME</i>	s	[]		[]		[]		[]		[]		[]	
<i>TEMP_OFFSET</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Treselection</i>	s	[]		[]		[]		[]		[]		[]	
<i>Sintrasearch</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Sintersearch</i>	dB	[]		[]		[]		[]		[]		[]	

Time T1 is X seconds and T2 is Y seconds.

5.1.2.5.2.3 Minimum requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.6 Cell Re-selection in Cell\_PCH

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

5.1.2.6.1 Requirements for Cell re-selection single carrier multi-cell case

5.1.2.6.1.1 Cell re-selection delay

When the UE is camped in Cell\_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.6.1.2 Test Parameters

Table 5-13: 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
<i>UTRA_RF_Channel Number</i>		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
<i>CPICH_Ec/Ior</i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCCPCH_Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH_Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH_Ec/Ior</i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS_Ec/Ior</i>	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/3.8 4 MHz	-70											
<i>CPICH_Ec/Io</i>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
<i>Cell_selection_and_reselection_quality_measure</i>		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$		$CPICH_{E_c}/N_0$	
<i>Qqualmin</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Qrxlevmin</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>UE_TXPWR_MAX_RACH</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>Qoffset</i>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<i>Qhyst</i>	dB	[]		[]		[]		[]		[]		[]	
<i>PENALTY_TIME</i>	s	[]		[]		[]		[]		[]		[]	
<i>TEMP_OFFSET</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Tresselection</i>	s	[]		[]		[]		[]		[]		[]	
<i>Sintrasearch</i>	dB	[]		[]		[]		[]		[]		[]	

Time T1 is X seconds and T2 is Y seconds.

NOTE: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

5.1.2.6.1.3 Performance Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [5] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.6.5 Cell re-selection multi-carrier multi-cell case

5.1.2.6.5.1 Cell re-selection delay

When the UE is camped in Cell\_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.6.5.2 Test Parameters

Table 5-14: 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
<i>UTRA RF Channel Number</i>		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
<i>CPICH<sub>E<sub>c</sub>/A<sub>or</sub></sub></i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCCPCH<sub>E<sub>c</sub>/A<sub>or</sub></sub></i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH<sub>E<sub>c</sub>/A<sub>or</sub></sub></i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH<sub>E<sub>c</sub>/A<sub>or</sub></sub></i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS<sub>E<sub>c</sub>/A<sub>or</sub></sub></i>	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											
<i>CPICH<sub>E<sub>c</sub>/A<sub>o</sub></sub></i>	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
<i>Cell selection and reselection quality measure</i>		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 $E_c/N_0$	
<i>Q<sub>qualmin</sub></i>	dB	[]		[]		[]		[]		[]		[]	
<i>Q<sub>rxlevmin</sub></i>	dBm	[]		[]		[]		[]		[]		[]	
<i>UE_TXPWR_MAX_RACH</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>Q<sub>offset</sub></i>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<i>Q<sub>hyst</sub></i>	dB	[]		[]		[]		[]		[]		[]	
<i>PENALTY_TIME</i>	s	[]		[]		[]		[]		[]		[]	
<i>TEMP_OFFSET</i>	dB	[]		[]		[]		[]		[]		[]	
<i>T<sub>reselection</sub></i>	s	[]		[]		[]		[]		[]		[]	
<i>S<sub>intrasearch</sub></i>	dB	[]		[]		[]		[]		[]		[]	
<i>S<sub>intersearch</sub></i>	dB	[]		[]		[]		[]		[]		[]	

Time T1 is X seconds and T2 is Y seconds.

5.1.2.6.5.3 Minimum Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

5.1.2.7 Cell Re-selection in URA\_PCH

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

5.1.2.7.1 Requirements for Cell re-selection single carrier multi-cell case

5.1.2.7.1.1 Cell re-selection delay

When the UE is camped URA\_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

5.1.2.7.1.2 Test Parameters

Table 5-15: 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 <sub>E<sub>c</sub>/I<sub>or</sub></sub>	dB	-10		-10		-10		-10		-10		-10	
PCCPCH <sub>E<sub>c</sub>/I<sub>or</sub></sub>	dB	-12		-12		-12		-12		-12		-12	
SCH <sub>E<sub>c</sub>/I<sub>or</sub></sub>	dB	-12		-12		-12		-12		-12		-12	
PICH <sub>E<sub>c</sub>/I<sub>or</sub></sub>	dB	-15		-15		-15		-15		-15		-15	
OCNS <sub>E<sub>c</sub>/I<sub>or</sub></sub>	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 <sub>E<sub>c</sub>/I<sub>o</sub></sub>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		-AWGN											
Cell_selection_and_reselection_quality_measure		CPICH <sub>E<sub>c</sub>/N<sub>0</sub></sub>		CPICH <sub>E<sub>c</sub>/N<sub>0</sub></sub>		CPICH <sub>E<sub>c</sub>/N<sub>0</sub></sub>		CPICH <sub>E<sub>c</sub>/N<sub>0</sub></sub>		CPICH <sub>E<sub>c</sub>/N<sub>0</sub></sub>		CPICH <sub>E<sub>c</sub>/N<sub>0</sub></sub>	
Q <sub>qualmin</sub>	dB	[]		[]		[]		[]		[]		[]	
Q <sub>rxlevmin</sub>	dBm	[]		[]		[]		[]		[]		[]	
UE_TXPWR_MAX_RACH	dBm	[]		[]		[]		[]		[]		[]	
Q <sub>offset</sub>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []		C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []		C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []		C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []		C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []		C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []	
Q <sub>hyst</sub>	dB	[]		[]		[]		[]		[]		[]	
PENALTY_TIME	s	[]		[]		[]		[]		[]		[]	
TEMP_OFFSET	dB	[]		[]		[]		[]		[]		[]	
T <sub>resselection</sub>	s	[]		[]		[]		[]		[]		[]	
Sintrasearch	dB	[]		[]		[]		[]		[]		[]	

All cells shall belong to different UTRAN Registration Areas (URA)

Time T1 is X seconds and T2 is Y seconds.

NOTE: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

5.1.2.7.1.3 Minimum Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

## 5.1.2.7.2 Requirements for Cell re-selection multi-carrier multi-cell case

## 5.1.2.7.2.1 Cell re-selection delay

When the UE is camped in URA\_PCH state on one of the cells, the UE shall be capable of re-selecting a new cell according the cell re-selection criteria. The cell re-selection delay is then defined as a time from when radio conditions are changed according to the test scenario to the moment in time when the UE starts sending the RRC Cell Update message to the UTRAN.

## 5.1.2.7.2.2 Test Parameters

Table 5-16: 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
<i>UTRA_RF_Channel Number</i>		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
<i>CPICH_Ec/Aor</i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCCPCH_Ec/Aor</i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH_Ec/Aor</i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH_Ec/Aor</i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS_Ec/Aor</i>	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											
<i>CPICH_Ec/Ao</i>	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_resselection_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 $E_c/N_0$	
<i>Qqualmin</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Qrxlevmin</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>UE_TXPWR_MAX_RACH</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>Qoffset</i>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<i>Qhyst</i>	dB	[]		[]		[]		[]		[]		[]	
<i>PENALTY_TIME</i>	s	[]		[]		[]		[]		[]		[]	
<i>TEMP_OFFSET</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Freselection</i>	s	[]		[]		[]		[]		[]		[]	
<i>Sintrasearch</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Sintersearch</i>	dB	[]		[]		[]		[]		[]		[]	

All cells shall belong to different UTRAN Registration Areas (URA)  
Time T1 is X seconds and T2 is Y seconds.

## 5.1.2.7.2.3 Minimum Requirements

Cell re-selection shall be correct in more than [X %] of the cases. Cell re-selection is correct if within [x] seconds the UE re-selects a new cell, which fulfils the cell re-selection criteria.

### 5.1.3 FDD/TDD Handover

The handover procedure is initiated from UTRAN with an handover command message. The 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.

#### 5.1.3.1 General

##### 5.1.3.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

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

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

##### 5.1.3.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

##### 5.1.3.1.3 Test parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on [see 25.101]. Test parameters for DL compressed mode are given in Annex A.4 of TS25.101.

#### 5.1.3.2 Correct reporting of TDD neighbours in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a TDD cell. The power level of P-CCPCH-RSCP of cell 2 and the CPICH-Ec/Io of cell 1 is changed.

##### 5.1.3.2.1 Test parameters

Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is FFS.

Table 5-16: Correct reporting of TDD neighbours in AWGN

Parameter	Unit	Cell 1		Cell 2			
<i>Timeslot Number</i>		n.a.		0	8		
		T1	T2	T1	T2	T1	T2
<i>UTRA RF Channel Number</i>		Channel 1		Channel 2			
<i>CPICH_Ec/A<sub>0</sub></i>	dB	[ ]	[ ]	n.a.		n.a.	
<i>PCCPCH_Ec/A<sub>0</sub></i>	dB	[ ]	[ ]	-3	-3		
<i>SCH_Ec/A<sub>0</sub></i>	dB	[ ]	[ ]	-9	-9	-9	-9
<i>SCH_t<sub>offset</sub></i>		n.a.	n.a.	15	15	15	15
<i>PICH_Ec/A<sub>0</sub></i>		[ ]	[ ]			-3	-3
<i>DCH_Ec/A<sub>0</sub></i>	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<i>OCNS</i>	dB	[ ]	[ ]	-4.28	-4.28	-4.28	-4.28
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
$I_{oc}$	dBm/3.84 MHz	-70		-70			
<i>CPICH_Ec/A<sub>0</sub></i>		[ ]		n.a.			
<i>PCCPCH_RSCP</i>	dB	n.a.	n.a.	[ ]	[ ]	[ ]	[ ]
Absolute Threshold (SIR)	dB	[ ]					
Hysteresis	dB	[ ]					
Time to Trigger	ms	[ ]					
Filter coefficient		[ ]					
Propagation Condition		AWGN					

#### 5.1.3.2.2 Minimum requirements

The measurement reporting delay shall be less than [5] seconds in [90]% of the cases.

All the reported entities shall be within the requirements, as defined in clause 8.

Editor's note: Reported quantities are not defined in the test.

The BLER of the DCH shall not exceed [TBD] value.

#### 5.1.3.3 Handover Delay

The handover delay is defined as the time from when the UE receives the handover command message from UTRAN, until the UE successfully uses the entire set of radio links stated in that message for power control.

The handover delay is stated in the table below. There is different requirement on the handover delay depending on if the cell has been within the monitored set of cells for the last [FFS] [s] or not.

Table 5-17: FDD/TDD handover delay

Number of new cells present in the handover command message	Maximum update delay [ms]	
	Cells within monitored set	Cells outside monitored set
1-6...		

### 5.1.4 Handover 3G to 2G

#### 5.1.4.1 Handover to GSM

The requirements in this section shall apply to multi-RAT UE.

##### 5.1.4.1.1 BSIC Verification



~~Note: The definition of the BSIC verification will be inserted when it is clarified.  
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.~~

#### ~~5.1.4.1.2 Switching requirements~~

~~When the UE receives a RRC INTER SYSTEM HANDOVER COMMAND it shall be ready to transmit 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 120 ms, whichever is the later. 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.  
The definition of "ready to transmit" is specified in GSM 05.10.~~

## 5.2 Radio Link Management

### 5.2.1 Link adaptation

#### 5.2.1.1 Definition of the function

Radio link adaptation is the ability of the UE to select the suitable transport format combination from the assigned transport format combination set, in order to maintain inner loop power control, in the case of reaching its maximum transmit power. This is necessary for supporting the highest bit rate as possible when enough transmit power is not available.

#### 5.2.1.2 Link adaptation minimum delay requirement

~~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.~~

~~When the UE output power is approaching the UE maximum transmit power and the inner loop power control can no longer be maintained for coverage reasons, the UE shall adapt to the transport format combination corresponding to the next lower bit rate. Before doing that, the UE output power measured over at least [t1] ms shall be [margin1] dB within the maximum (margin1 is FFS).~~

~~As soon as the UE output power is [margin1] dB below the UE maximum transmit power and the UE has enough data to send, it shall continuously estimate whether the output power needed for a switch to the transport format combination corresponding to the next higher bit rate does not exceed [margin1] dB below the maximum. Before the UE switches to the next higher rate transport format it shall have enough power to support that up switch for at least [t2] ms.~~

~~The minimum delay requirements t1 and t2 shall be zero or a multiple of 10 ms. (Whether t1, t2 and margin1 should be configurable is FFS).~~

#### 5.2.1.3 Link adaptation maximum delay requirement

~~As soon as the UE has detected the switching feasibility, it shall start to use the transport format combination corresponding to the new bit rate selected within 10 ms.~~

---

## 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 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**

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

## 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**

<a href="#">Number of new cells present in the handover command message</a>	<a href="#">Interruption time [ms]</a>	
	<a href="#">Cells in monitored cells list and reported to UTRAN</a>	<a href="#">Cells outside monitored cells list</a>
<a href="#">1</a>	<a href="#">[]</a>	<a href="#">[]</a>

## 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 occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN.

#### 5.5.2.1.1 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

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.

### 5.6.2 Requirements

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

#### 5.6.2.1 Cell re-selection delay

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

---

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

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

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

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

## 5.7 Cell Re-selection in URA\_PCH

### 5.7.1 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.

## 5.7.2 Requirements

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

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

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

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

5.7.2.1.2 The cells in the neighbour list belong to different frequencies

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

## 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**

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

**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
<u>UTRA RF Channel Number</u>		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
<u>CPICH Ec/Ior</u>	dB	-10		-10		-10		-10		-10		-10	
<u>PCCPCH Ec/Ior</u>	dB	-12		-12		-12		-12		-12		-12	
<u>SCH Ec/Ior</u>	dB	-12		-12		-12		-12		-12		-12	
<u>PICH Ec/Ior</u>	dB	-15		-15		-15		-15		-15		-15	
<u>OCNS Ec/Ior</u>	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
<u>I<sub>or</sub>/I<sub>oc</sub></u>	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
<u>I<sub>oc</sub></u>	<u>dBm/3.84 MHz</u>	-70											
<u>CPICH Ec/Io</u>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
<u>Propagation Condition</u>		AWGN											
<u>Cell selection and reselection quality measure</u>		<u>CPICH E<sub>c</sub>/N<sub>0</sub></u>		<u>CPICH E<sub>c</sub>/N<sub>0</sub></u>		<u>CPICH E<sub>c</sub>/N<sub>0</sub></u>		<u>CPICH E<sub>c</sub>/N<sub>0</sub></u>		<u>CPICH E<sub>c</sub>/N<sub>0</sub></u>		<u>CPICH E<sub>c</sub>/N<sub>0</sub></u>	
<u>O<sub>qualmin</sub></u>	dB	[]		[]		[]		[]		[]		[]	
<u>O<sub>rxlevmin</sub></u>	dBm	[]		[]		[]		[]		[]		[]	
<u>UE_TXPWR_MAX_RACH</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>O<sub>offset</sub></u>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []		C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []		C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []		C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []		C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []		C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []	
<u>O<sub>hyst</sub></u>	dB	[]		[]		[]		[]		[]		[]	
<u>PENALTY_TIME</u>	s	[]		[]		[]		[]		[]		[]	
<u>TEMP_OFFSET</u>	dB	[]		[]		[]		[]		[]		[]	
<u>T<sub>reselection</sub></u>	s	[]		[]		[]		[]		[]		[]	
<u>S<sub>intrasearch</sub></u>	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
<u>UTRA RF Channel Number</u>		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
<u>CPICH Ec/Ior</u>	dB	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
<u>PCCPCH Ec/Ior</u>	dB	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
<u>SCH Ec/Ior</u>	dB	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
<u>PICH Ec/Ior</u>	dB	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
<u>OCNS Ec/Ior</u>	dB	-0.941	-0.941	-0.941	-0.941	-0.941	-0.941	-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											
<u>CPICH Ec/Io</u>	dB	-16	-13	-13	-16	-20	-20	-20	-20	-20	-20	-20	-20
<u>Propagation Condition</u>		AWGN											
<u>Cell selection and reselection quality measure</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>	
<u>Qqualmin</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Qrxlevmin</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>UE TXPWR MAX RACH</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>Qoffset</u>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<u>Qhyst</u>	dB	[]		[]		[]		[]		[]		[]	
<u>PENALTY TIME</u>	s	[]		[]		[]		[]		[]		[]	
<u>TEMP OFFSET</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Treselection</u>	s	[]		[]		[]		[]		[]		[]	
<u>Sintrasearch</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Sintersearch</u>	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**

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

**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
<u>UTRA RF Channel Number</u>		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
<u>CPICH Ec/Ior</u>	dB	-10		-10		-10		-10		-10		-10	
<u>PCCPCH Ec/Ior</u>	dB	-12		-12		-12		-12		-12		-12	
<u>SCH Ec/Ior</u>	dB	-12		-12		-12		-12		-12		-12	
<u>PICH Ec/Ior</u>	dB	-15		-15		-15		-15		-15		-15	
<u>OCNS Ec/Ior</u>	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
<u>I<sub>or</sub>/I<sub>oc</sub></u>	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
<u>I<sub>oc</sub></u>	dBm/3.84 MHz	-70											
<u>CPICH Ec/Io</u>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
<u>Propagation Condition</u>		AWGN											
<u>Cell selection and reselection quality measure</u>		CPICH E <sub>c</sub> /N <sub>0</sub>		CPICH E <sub>c</sub> /N <sub>0</sub>		CPICH E <sub>c</sub> /N <sub>0</sub>		CPICH E <sub>c</sub> /N <sub>0</sub>		CPICH E <sub>c</sub> /N <sub>0</sub>		CPICH E <sub>c</sub> /N <sub>0</sub>	
<u>Qqualmin</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Qrxlevmin</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>UE_TXPWR_MAX_RACH</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>Qoffset</u>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<u>Qhyst</u>	dB	[]		[]		[]		[]		[]		[]	
<u>PENALTY_TIME</u>	s	[]		[]		[]		[]		[]		[]	
<u>TEMP_OFFSET</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Treselection</u>	s	[]		[]		[]		[]		[]		[]	
<u>Sintrasearch</u>	dB	[]		[]		[]		[]		[]		[]	

**A.5.6.1.2 Test Requirements**

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

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


**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
<u>UTRA RF Channel Number</u>		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
<u>CPICH Ec/Ior</u>	dB	-10		-10		-10		-10		-10		-10	
<u>PCCPCH Ec/Ior</u>	dB	-12		-12		-12		-12		-12		-12	
<u>SCH Ec/Ior</u>	dB	-12		-12		-12		-12		-12		-12	
<u>PICH Ec/Ior</u>	dB	-15		-15		-15		-15		-15		-15	
<u>OCNS Ec/Ior</u>	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											
<u>CPICH Ec/Io</u>	dB	-16	-13	-13	-16	-20		-20		-20		-20	
<u>Propagation Condition</u>		AWGN											
<u>Cell selection and reselection quality measure</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>		<u>CPICH Ec/N0</u>	
<u>Qualmin</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Orxlevmin</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>UE TXPWR MAX RACH</u>	dBm	[]		[]		[]		[]		[]		[]	
<u>Qoffset</u>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<u>Qhyst</u>	dB	[]		[]		[]		[]		[]		[]	
<u>PENALTY TIME</u>	s	[]		[]		[]		[]		[]		[]	
<u>TEMP_OFFSET</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Treselection</u>	s	[]		[]		[]		[]		[]		[]	
<u>Sintrasearch</u>	dB	[]		[]		[]		[]		[]		[]	
<u>Sintersearch</u>	dB	[]		[]		[]		[]		[]		[]	

A.5.6.2.2 Test Requirements

The UE shall select cell 1 within a cell re-selection delay specified in 5.6.2.1.2A.5.7 Cell Re-selection in URA\_PCH

A.5.7.1 One frequency present in the neighbour listA.5.7.1.1 Test Purpose and Environment

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

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**

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


**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
<i>UTRA RF Channel Number</i>		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
<i>CPICH Ec/Ior</i>	dB	-10		-10		-10		-10		-10		-10	
<i>PCCPCH Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>SCH Ec/Ior</i>	dB	-12		-12		-12		-12		-12		-12	
<i>PICH Ec/Ior</i>	dB	-15		-15		-15		-15		-15		-15	
<i>OCNS Ec/Ior</i>	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											
<i>CPICH Ec/Io</i>	dB	-16	-13	-13	-16	-23		-23		-23		-23	
<i>Propagation Condition</i>		AWGN											
<i>Cell selection and reselection quality measure</i>		<i>CPICH Ec/N0</i>		<i>CPICH Ec/N0</i>		<i>CPICH Ec/N0</i>		<i>CPICH Ec/N0</i>		<i>CPICH Ec/N0</i>		<i>CPICH Ec/N0</i>	
<i>Qqualmin</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Qrxlevmin</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>UE_TXPWR_MAX_RACH</i>	dBm	[]		[]		[]		[]		[]		[]	
<i>Qoffset</i>	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []	C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []	C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []	C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []	C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []	C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []						
<i>Qhyst</i>	dB	[]		[]		[]		[]		[]		[]	
<i>PENALTY_TIME</i>	s	[]		[]		[]		[]		[]		[]	
<i>TEMP_OFFSET</i>	dB	[]		[]		[]		[]		[]		[]	
<i>Treselection</i>	s	[]		[]		[]		[]		[]		[]	
<i>Sintrasearch</i>	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**





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

<h2 style="margin: 0;">CHANGE REQUEST</h2>			Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.
<b>25.133</b>	<b>CR</b>	<b>40</b>	Current Version: <b>3.2.0</b>
GSM (AA.BB) or 3G (AA.BBB) specification number ↑		↑ CR number as allocated by MCC support team	
For submission to: <b>TSG RAN#9</b> <i>list expected approval meeting # here</i> ↑	for approval <input checked="" type="checkbox"/> for information <input type="checkbox"/>		Strategic <input type="checkbox"/> non-strategic <input type="checkbox"/> <i>(for SMG use only)</i>

Form: CR cover sheet, version 2 for 3GPP and SMG      The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:** (U)SIM     ME     UTRAN / Radio     Core Network   
*(at least one should be marked with an X)*

**Source:** TSG RAN WG4      **Date:** \_\_\_\_\_

**Subject:** Proposal for new section 8

**Work item:** \_\_\_\_\_

<b>Category:</b>	F Correction <input checked="" type="checkbox"/> A Corresponds to a correction in an earlier release <input type="checkbox"/> B Addition of feature <input type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	<b>Release:</b>	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input checked="" type="checkbox"/> Release 00 <input type="checkbox"/>
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*(only one category Shall be marked With an X)*

**Reason for change:** Separation of general requirements and test cases for UE measurement functions.

**Clauses affected:** 5, 8 (new)

<b>Other specs affected:</b>	Other 3G core specifications <input type="checkbox"/> Other GSM core specifications <input type="checkbox"/> MS test specifications <input checked="" type="checkbox"/> BSS test specifications <input type="checkbox"/> O&M specifications <input type="checkbox"/>	→ List of CRs: _____ → List of CRs: _____ → List of CRs: _____ → List of CRs: _____ → List of CRs: _____
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**Other comments:** \_\_\_\_\_



help.doc

<----- double-click here for help and instructions on how to create a CR.

## 8 UE Measurements Procedures

### 8.1 Measurements in CELL\_DCH State

#### 8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL\_DCH state. The requirements are split in 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 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 request the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. If a compressed mode pattern sequence is activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

##### 8.1.2.1.1 Identification of a new cell

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

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

##### 8.1.2.1.2 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 as many detected intra-frequency cells as defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.s.t and 9.p.q.

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

$X_{\text{basic\_measurement\_FDD}} = [8]$

$T_{\text{Measurement Period Intra}} = [200]$  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.*

#### 8.1.2.1.3 Periodic Reporting

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

#### 8.1.2.1.4 Event-triggered Periodic Reporting

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

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.1.3 Event Triggered Reporting.

#### 8.1.2.1.5 Event Triggered Reporting

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

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

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

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

Unless otherwise stated, event triggered measurement reporting delay shall be less than 800 ms.

If a cell, which the UE has detected and at least once measured over the measurement period indicated by the L3 filter coefficient, becomes undetectable for the UE and then within [5] seconds the cell becomes detectable again and triggers an event, the measurement reporting delay shall be less than [TBD] ms. This requirement shall apply when the timing to the cell that triggered the event has not changed more than +/-[32] chips from the time when the cell was detectable and at least once measured before becoming undetectable until the event was triggered.

### 8.1.2.2 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.

#### 8.1.2.2.1 Identification of a new cell

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

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

### 8.1.2.2.2 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.x.y and 9.z.y with measurement period given by

$$T_{\text{measurement\_inter}} = \text{Max} \left\{ [480] \text{ms}, T_{\text{basic\_measurement\_FDD\_inter}} \cdot \frac{T_{\text{Measurement\_Period\_Inter}}}{T_{\text{Inter}}} \cdot N_{\text{Freq}} \right\}$$

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

$T_{\text{Measurement\_Period\_Inter}} = [480] \text{ms}$ . 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 transmission gap as given in the table 11 of Annex B in TS 25.212.

$T_{\text{basic\_identify\_FDD\_inter}} = \text{TBD ms}$ . 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.

$T_{\text{basic\_measurement\_FDD\_inter}} = \text{TBD ms}$ . 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.*

### 8.1.2.2.3 Periodic Reporting

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

### 8.1.2.2.4 Event Triggered Reporting

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

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

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

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

### 8.1.2.3 TDD measurements

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

*Editors note: The requirements in this section need to be revised.*

The requirements in this section apply when a compressed mode pattern according to the parameters in TS 25.101, Annex A5, Table A-22 is used.

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

#### 8.1.2.3.1 Periodic Reporting

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

#### 8.1.2.3.2 Event Triggered Reporting

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

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

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

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

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

### 8.1.2.4 GSM measurements

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

*Editors note: The following requirements have been taken as a working assumption, but might need revision when RAN WG2 concludes the feasibility of several measurement purposes for GSM measurements.*

In CELL\_DCH state when a transmission gap pattern sequence is provided by the UTRAN the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

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.

#### 8.1.2.4.1 GSM carrier RSSI

A UE supporting GSM measurements shall be able to measure GSM carrier RSSI levels of GSM cells from the monitored set with acquisition speed defined in table 8.x. 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 the same amount of GSM carrier RSSI samples as stated in the GSM specification during the measurement period.

**Table 8.x**

<u>TGL</u>	<u>Number of GSM carrier RSSI samples in each gap.</u>
<u>3</u>	<u>1</u>
<u>4</u>	<u>2</u>

<u>5</u>	<u>3</u>
<u>7,10,14</u>	<u>5</u>

**8.1.2.4.2 BSIC verification**

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

1. **Initial BSIC identification**  
Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within the available transmission gaps with purpose “GSM Initial BSIC identification”.
2. **BSIC re-confirmation**  
Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available transmission gaps with purpose “GSM BSIC re-confirmation”.

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

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

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

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

**8.1.2.4.2.1 Initial BSIC identification**

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

For GSM cells that is requested with BSIC verified the UE shall attempt to demodulate the SCH on the BCCH carrier of as many GSM cells indicated in the measurement control information as possible. The UE shall give priority for synchronisation attempts in signal strength order. The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified as  $T_{identify\ GSM}$  in Table 8.y. When N new GSM cells are to be BSIC identified the time is changed to  $N * T_{identify\ GSM}$

**Table 8.y: The maximum time for identification of a previously not identified GSM cell**

	<u>TGL1</u>	<u>TGL2</u>	<u>TGD</u>	<u>TGPL1</u>	<u>TGPL2</u>	<u>T<sub>identify GSM</sub> (ms)</u>
<u>Pattern 1</u>	<u>7</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	
<u>Pattern 2</u>	<u>7</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>0</u>	
<u>Pattern 3</u>	<u>7</u>	<u>0</u>	<u>2</u>	<u>9</u>	<u>0</u>	
<u>Pattern 4</u>	<u>7</u>	<u>0</u>	<u>3</u>	<u>12</u>	<u>0</u>	
<u>Pattern 5</u>	<u>14</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	
<u>Pattern 6</u>	<u>14</u>	<u>0</u>	<u>2</u>	<u>6</u>	<u>0</u>	
<u>Pattern 7</u>	<u>14</u>	<u>0</u>	<u>2</u>	<u>8</u>	<u>0</u>	
<u>Pattern 8</u>	<u>14</u>	<u>0</u>	<u>2</u>	<u>12</u>	<u>0</u>	
<u>Pattern 9</u>	<u>10</u>	<u>0</u>	<u>12</u>	<u>48</u>	<u>0</u>	
<u>Pattern 10</u>	<u>10</u>	<u>0</u>	<u>0</u>	<u>48</u>	<u>0</u>	

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

8.1.2.4.2.2 BSIC re-confirmation

This measurement shall be based on a transmission gap pattern sequence with purpose “GSM BSIC re-confirmation”

The time requirement for BSIC re-confirmation is specified as  $T_{re-confirm\ GSM}$  in Table 8.z.

**Table 8.z: The maximum time for BSIC re-confirmation**

	<u>TGL1</u>	<u>TGL2</u>	<u>TGD</u>	<u>TGPL1</u>	<u>TGPL2</u>	<u><math>T_{re-confirm\ GSM}</math> (ms)</u>
<u>Pattern 1</u>						
<u>Pattern 2</u>						
<u>Pattern 3</u>						
<u>Pattern 4</u>						
<u>Pattern 5</u>						
<u>Pattern 6</u>						
<u>Pattern 7</u>						
<u>Pattern 8</u>						
<u>Pattern 9</u>						
<u>Pattern 10</u>						

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

**8.2 Parallel Measurements in CELL\_DCH State**

**8.2.1 Introduction**

The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel. The measurements are defined in TS 25.215, 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 measurements reporting delays are specified in section 8.1. Compressed mode is specified in TS 25.215.

**8.2.2 Requirements**

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

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

The UE shall be able to handle at least 32 FDD cells per carrier on at least 3 FDD carriers + 32 GSM cells in the monitored set.

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

In addition to the requirements in table 8-2 the UE shall in parallel, in state CELL\_DCH, also be able to measure and report the quantities according to section 8.1.

**Table 8-2 Parallel measurement requirements**

<u>Measurement quantity</u>	<u>Number of parallel measurements possible to request from the UE</u>
<u>Transport channel BLER</u>	<u>[1] per TrCh</u>
<u>UE transmitted power</u>	<u>[1]</u>
<u>UE Rx-Tx time difference</u>	<u>[1] including timing to all radio links in active set</u>
<u>SFN-SFN observed time difference type 2</u>	<u>[1]</u>



<a href="#">UE GPS Timing of Cell Frames for LCS</a>	□
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Editors Note: The presence of the measurements for location services needs to be revised.

## 8.3 Measurements in CELL\_FACH State

### 8.3.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL\_FACH state. The measurements are defined in TS 25.215, 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.

### 8.3.2 Requirements

TBD

<b>NEXT CHANGED SECTION</b>
-----------------------------

## 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
<u>DCH parameters</u>		<u>DL Reference Measurement Channel</u> <u>12.2 kbps</u>	<u>As specified in TS 25.101 section A.3.1</u>
<u>Power Control</u>		<u>On</u>	
<u>Active cell</u>		<u>Cell 1</u>	
<u>Reporting Threshold</u>	<u>dB</u>	<u>3</u>	
<u>Hysteresis</u>	<u>dB</u>	<u>0</u>	
<u>Time to Trigger</u>	<u>ms</u>	<u>0</u>	
<u>Filter coefficient</u>		<u>0</u>	
<u>Monitored cell list size</u>		<u>24</u>	<u>Signalled during time T1.</u>
<u>T1</u>	<u>s</u>		
<u>T2</u>	<u>s</u>		
<u>T3</u>	<u>s</u>		

**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
<u>CPICH Ec/Ior</u>	<u>DB</u>		<u>-10</u>			<u>-10</u>	
<u>PCCPCH Ec/Ior</u>	<u>DB</u>		<u>-12</u>			<u>-12</u>	
<u>SCH Ec/Ior</u>	<u>DB</u>		<u>-12</u>			<u>-12</u>	
<u>PICH Ec/Ior</u>	<u>DB</u>		<u>-15</u>			<u>-15</u>	
<u>DPCH Ec/Ior</u>	<u>DB</u>		<u>-17</u>			<u>-17</u>	
<u>OCNS</u>			<u>-1.049</u>			<u>-1.049</u>	
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>DB</u>	<u>0</u>	<u>6.97</u>	<u>0</u>	<u>-Infinity</u>	<u>5.97</u>	<u>-Infinity</u>
<u><math>I_{oc}</math></u>	<u>DBm/3.84 MHz</u>	<u>-70</u>					
<u>CPICH Ec/Io</u>	<u>DB</u>	<u>-13</u>	<u>-13</u>	<u>-13</u>	<u>-Infinity</u>	<u>-14</u>	<u>-Infinity</u>
<u>Propagation Condition</u>		<u>AWGN</u>					

#### 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 [150] 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

Editors note: Both test cases in Tdoc R4 00 0661 have been agreed for inclusion. They should however be updated to reflect the general requirement in section 8.1.2 regarding appearing and disappearing cells.

The purpose of this test is to verify that the UE makes correct reporting of an event and that the measurement accuracy of the reported values are within the specified limits. This test will partly verify the requirements in section 8.1.2 and 9.1.

The test parameters are given in Table A.8-3, A.8-4 and A.8-5. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1C and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed time difference shall be reported. 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**

<u>Parameter</u>	<u>Unit</u>	<u>Value</u>	<u>Comment</u>
<u>DCH parameters</u>		<u>DL Reference Measurement Channel</u> <u>12.2 kbps</u>	<u>As specified in TS 25.101 section</u> <u>A.3.1</u>
<u>Power Control</u>		<u>On</u>	
<u>Active cell</u>		<u>Cell 1</u>	
<u>Reporting Threshold</u>	<u>DB</u>	<u>3</u>	
<u>Hysteresis</u>	<u>DB</u>	<u>0</u>	
<u>Time to Trigger</u>	<u>Ms</u>	<u>0</u>	
<u>Filter coefficient</u>		<u>0</u>	
<u>Monitored cell list</u> <u>size</u>		<u>32</u>	
<u>T1</u>	<u>S</u>	<u>&gt;20</u>	
<u>T2</u>	<u>S</u>	<u>10</u>	
<u>T3</u>	<u>S</u>	<u>14</u>	
<u>T4</u>	<u>S</u>	<u>10</u>	

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>				<u>Cell 2</u>			
		<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T4</u>	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T4</u>
<u>CPICH Ec/Ior</u>	<u>DB</u>	<u>-10</u>				<u>-10</u>			
<u>PCCPCH Ec/Ior</u>	<u>DB</u>	<u>-12</u>				<u>-12</u>			
<u>SCH Ec/Ior</u>	<u>DB</u>	<u>-12</u>				<u>-12</u>			
<u>PICH Ec/Ior</u>	<u>DB</u>	<u>-15</u>				<u>-15</u>			
<u>DPCH Ec/Ior</u>	<u>DB</u>	<u>-17</u>				<u>-17</u>			
<u>OCNS Ec/Ior</u>	<u>DB</u>	<u>-1.049</u>				<u>-1.049</u>			
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>DB</u>	<u>18.5</u>				<u>17</u>			
<u><math>I_{oc}</math></u>	<u>DBm/3.84</u> <u>MHz</u>	<u>-85</u>							
<u>CPICH Ec/Io</u>	<u>DB</u>	<u>-12.4</u>	<u>-15.5</u>	<u>-12.4</u>	<u>-15.5</u>	<u>-13.9</u>	<u>-17.0</u>	<u>-13.9</u>	<u>-17.0</u>
<u>Propagation Condition</u>		<u>AWGN</u>							

**Table A.8-5: Cell Specific test parameters for Event triggered reporting of multiple neighbours in AWGN propagation condition**

Parameter	Unit	Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4
<i>CPICH Ec/Ior</i>	DB	-10				-10			
<i>PCCPCH Ec/Ior</i>	DB	-12				-12			
<i>SCH Ec/Ior</i>	DB	-15				-15			
<i>PICH Ec/Ior</i>	DB	-15				-15			
<i>DPCH Ec/Ior</i>	DB	N/A				N/A			
<i>OCNS</i>	DB	-0.941				-0.941			
$\hat{I}_{or}/I_{oc}$	DB	-Inf	18.5	-Inf	18.5	-Inf	17.5	-Inf	17.5
$I_{oc}$	DBm/3.84 MHz	-85							
<i>CPICH Ec/Io</i>	DB	-Inf	-15.5	-Inf	-15.5	-Inf	-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 [150] 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 150 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 Correct reporting of neighbours in fading 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 an event in a fading propagation condition. This test will partly verify the requirements in section 8.1.2.

The test parameters are given in Table A.8-6 and A.8-7. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A shall be used. The test consists of two successive time periods, each with a time duration of T1 and T2 respectively.

**Table A.8-6: General test parameters for correct reporting of neighbours in fading propagation condition**

<b>Parameter</b>	<b>Unit</b>	<b>Value</b>	<b>Comment</b>
<u>DCH parameters</u>		<u>DL Reference Measurement Channel</u> <u>12.2 kbps</u>	<u>As specified in TS 25.101 section A.3.1</u>
<u>Power Control</u>		<u>On</u>	
<u>Active cell</u>		<u>Cell 1</u>	
<u>Reporting Threshold</u>	<u>dB</u>	<u>3</u>	
<u>Hysteresis</u>	<u>dB</u>	<u>0</u>	
<u>Time to Trigger</u>	<u>ms</u>	<u>0</u>	
<u>Filter coefficient</u>		<u>0</u>	
<u>Monitored cell list size</u>		<u>24</u>	<u>Signalled during time T1.</u>
<u>T1</u>	<u>s</u>		
<u>T2</u>	<u>s</u>		

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

<b>Parameter</b>	<b>Unit</b>	<b>Cell 1</b>		<b>Cell 2</b>	
		<b>T1</b>	<b>T2</b>	<b>T1</b>	<b>T2</b>
<u>CPICH Ec/Ior</u>	<u>DB</u>	<u>-10</u>		<u>-10</u>	
<u>PCCPCH Ec/Ior</u>	<u>DB</u>	<u>-12</u>		<u>-12</u>	
<u>SCH Ec/Ior</u>	<u>DB</u>	<u>-12</u>		<u>-12</u>	
<u>PICH Ec/Ior</u>	<u>DB</u>	<u>-15</u>		<u>-15</u>	
<u>DPCH Ec/Ior</u>	<u>DB</u>	<u>TBD</u>		<u>TBD</u>	
<u>OCNS</u>		<u>[To Be Calculated]</u>		<u>[To Be Calculated]</u>	
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>DB</u>	<u>0</u>	<u>6.97</u>	<u>-Infinity</u>	<u>5.97</u>
<u><math>I_{oc}</math></u>	<u>DBm/3.84 MHz</u>	<u>-70</u>			
<u>CPICH Ec/Io</u>	<u>DB</u>	<u>-13</u>	<u>-13</u>	<u>-Infinity</u>	<u>-14</u>
<u>Propagation Condition</u>	<u>Case 5 as specified in Annex B of TS25.101</u>				

#### A.8.1.3.2 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 not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

#### A.8.1.4 CPICH Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

##### A.8.1.4.1 Test Purpose and Environment

The purpose of this test is to verify the UE measurement accuracy of CPICH Ec/Io and that the UE does not send any measurement reports when the reporting criteria is not fulfilled. This test will partly verify the requirements in section 8.1.2 and section 9.1.

The UE measurement accuracy of CPICH Ec/Io is derived by using the periodical reporting of the active cell's measured CPICH Ec/Io. The UE false detection resistance is derived by monitoring the amount of false triggered Event

1A measurement reports. The test parameters are given in Table A.8-8 and A.8-9. In the measurement control information it is indicated to the UE that the CPICH  $E_c/I_o$  level of the active set cell shall be reported periodically and that event-triggered reporting with Event 1A shall be used.

**Table A.8-8: General test parameters for CPICH  $E_c/I_o$  measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition**

<u>Parameter</u>	<u>Unit</u>	<u>Value</u>	<u>Comment</u>
<u>DCH parameters</u>		<u>DL Reference Measurement Channel</u> <u>12.2 kbps</u>	<u>As specified in TS 25.101 section</u> <u>A.3.1</u>
<u>Power Control</u>		<u>On</u>	
<u>Active cell</u>		<u>Cell 1</u>	
<u>Reporting Threshold</u>	<u>dB</u>	<u>3</u>	
<u>Hysteresis</u>	<u>dB</u>	<u>0</u>	
<u>Time to Trigger</u>	<u>ms</u>	<u>0</u>	
<u>Filter coefficient</u>		<u>0</u>	
<u>Reporting period</u>	<u>ms</u>	<u>TBD</u>	
<u>Monitored cell list</u> <u>size</u>		<u>24</u>	

**Table A.8-9: Cell specific test parameters for CPICH  $E_c/I_o$  measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>CPICH <math>E_c/I_o</math></u>	<u>DB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH <math>E_c/I_o</math></u>	<u>DB</u>	<u>-12</u>	<u>-12</u>
<u>SCH <math>E_c/I_o</math></u>	<u>DB</u>	<u>-12</u>	<u>-12</u>
<u>PICH <math>E_c/I_o</math></u>	<u>DB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH <math>E_c/I_o</math></u>	<u>DB</u>	<u>TBD</u>	<u>TBD</u>
<u>OCNS</u>		<u>[To Be Calculated]</u>	<u>[To Be Calculated]</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>DB</u>	<u>1.68</u>	<u>-3.32</u>
<u><math>I_{oc}</math></u>	<u>DBm/3.84</u> <u>MHz</u>	<u>-70</u>	
<u>CPICH <math>E_c/I_o</math></u>	<u>DB</u>	<u>-13</u>	<u>-18</u>
<u>Propagation Condition</u>		<u>AWGN</u>	

#### A.8.1.4.2 Test Requirements

The measurement reports shall have an accuracy according to section 9.

The UE shall not send any Event 1A triggered measurement reports.

## 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, 1B and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency has to be reported together with Event 2C reporting.



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

<b>Parameter</b>	<b>Unit</b>	<b>Value</b>	<b>Comment</b>
<u>DCH parameters</u>		<u>DL Reference Measurement Channel</u> 12.2 kbps	<u>As specified in TS 25.101 section A.3.1</u>
<u>Power Control</u>		<u>On</u>	
<u>Compressed mode</u>		<u>Case 2.1</u>	<u>As specified in TS 25.101 section A.5.</u>
<u>Active cell</u>		<u>Cell 1</u>	
<u>Absolute Threshold (Ec/N0) for Event 2c</u>	<u>dB</u>	<u>-18</u>	
<u>Reporting Threshold</u>	<u>dB</u>	<u>3</u>	
<u>Hysteresis</u>	<u>dB</u>	<u>0</u>	
<u>Time to Trigger</u>	<u>ms</u>	<u>0</u>	
<u>Filter coefficient</u>		<u>0</u>	
<u>Monitored cell list size</u>		<u>Total 24</u> <u>X on frequency Channel 2</u>	<u>Measurement control information is sent before the compressed mode pattern starts.</u>
<u>T1</u>	<u>s</u>		
<u>T2</u>	<u>s</u>		

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

<b>Parameter</b>	<b>Unit</b>	<b>Cell 1</b>		<b>Cell 2</b>		<b>Cell 3</b>	
		<b>T1</b>	<b>T2</b>	<b>T1</b>	<b>T2</b>	<b>T1</b>	<b>T2</b>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>		<u>Channel 1</u>		<u>Channel 2</u>	
<u>CPICH Ec/Ior</u>	<u>DB</u>	<u>-10</u>		<u>-10</u>		<u>-10</u>	
<u>PCCPCH Ec/Ior</u>	<u>DB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>	
<u>SCH Ec/Ior</u>	<u>DB</u>	<u>-12</u>		<u>-12</u>		<u>-12</u>	
<u>PICH Ec/Ior</u>	<u>DB</u>	<u>-15</u>		<u>-15</u>		<u>-15</u>	
<u>DPCH Ec/Ior</u>	<u>DB</u>	<u>TBD</u>		<u>TBD</u>		<u>TBD</u>	
<u>OCNS</u>		<u>[To Be Calculated]</u>		<u>[To Be Calculated]</u>		<u>[To Be Calculated]</u>	
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>DB</u>	<u>0</u>	<u>4.39</u>	<u>-∞</u>	<u>2.39</u>	<u>-1.8</u>	<u>-1.8</u>
<u>I<sub>oc</sub></u>	<u>dBm/3.84 MHz</u>	<u>-70</u>				<u>-70</u>	
<u>CPICH Ec/Io</u>	<u>DB</u>	<u>-13</u>	<u>-13</u>	<u>-∞</u>	<u>-15</u>	<u>-14</u>	<u>-14</u>
<u>Propagation Condition</u>		<u>AWGN</u>					

**A.8.2.1.2 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 2C triggered measurement report, with a measurement reporting delay less than 5 seconds from the beginning of time period T1.

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**

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>	<u>Channel 2</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>TBD</u>	<u>TBD</u>
<u>OCNS</u>		<u>[To Be Calculated]</u>	<u>[To Be Calculated]</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>0</u>	<u>-1.8</u>
<u><math>I_{oc}</math></u>	<u>DBm/3.84 MHz</u>	<u>-70</u>	<u>-70</u>
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>-13</u>	<u>-14</u>
<u>Propagation Condition</u>		<u>Case 5 as specified in Annex B of TS25.101</u>	

### 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 XX shall be used.

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

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>		<u>Cell 2</u>			
<u>Timeslot Number</u>		<u>n.a.</u>		<u>0</u>		<u>8</u>	
		<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>	<u>T1</u>	<u>T2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>		<u>Channel 2</u>			
<u>CPICH Ec/Ior</u>	<u>DB</u>	<u>[]</u>	<u>[]</u>	<u>n.a.</u>		<u>n.a.</u>	
<u>PCCPCH Ec/Ior</u>	<u>DB</u>	<u>[]</u>	<u>[]</u>	<u>-3</u>	<u>-3</u>		
<u>SCH Ec/Ior</u>	<u>DB</u>	<u>[]</u>	<u>[]</u>	<u>-9</u>	<u>-9</u>	<u>-9</u>	<u>-9</u>
<u>SCH L<sub>offset</sub></u>		<u>n.a.</u>	<u>n.a.</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>
<u>PICH Ec/Ior</u>		<u>[]</u>	<u>[]</u>			<u>-3</u>	<u>-3</u>
<u>DCH Ec/Ior</u>	<u>DB</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>
<u>QCNS</u>	<u>DB</u>	<u>[]</u>	<u>[]</u>	<u>-4.28</u>	<u>-4.28</u>	<u>-4.28</u>	<u>-4.28</u>
<u>I<sub>or</sub>/I<sub>oc</sub></u>	<u>DB</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>
<u>I<sub>oc</sub></u>	<u>DBm/3.84 MHz</u>	<u>-70</u>		<u>-70</u>			
<u>CPICH Ec/Io</u>		<u>[]</u>		<u>n.a.</u>			
<u>PCCPCH RSCP</u>	<u>DB</u>	<u>n.a.</u>	<u>n.a.</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>	<u>[]</u>
<u>Propagation Condition</u>		<u>AWGN</u>					

**A.8.3.1.2 Test Requirements**

The UE shall send one Event XX triggered measurement report, with a measurement reporting delay less than X 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.

**NEXT CHANGED SECTION**

## 5 RRC Connection mobility

### 5.1 Handover

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

Measurements are specified in TS25.215 and UE behaviour in response to UTRAN RRC messages is described in TS25.331.

#### 5.1.1 FDD Soft/softer Handover

##### 5.1.1.1 General

The soft handover procedure is initiated from UTRAN with an active set update message.

##### 5.1.1.1.1 Maximum number of cells to be reported

The UE shall be capable of reporting the requested measurement quantity of at least [6] cells given in a measurement control message(s)

##### 5.1.1.1.2 Measurement reporting delay

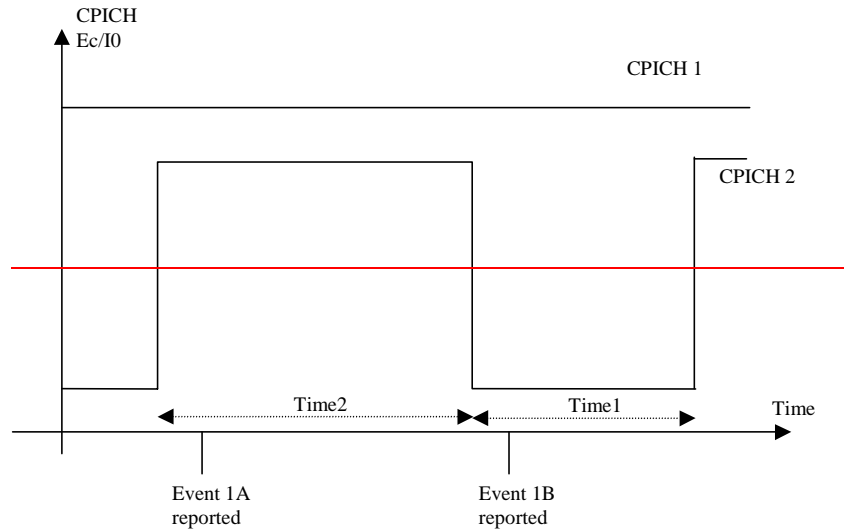
The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface. This measurement reporting delay 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.

#### 5.1.1.2 Event triggered reporting in AWGN propagation conditions

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the CPICH<sub>Ec/Io</sub> and SFN-CFN observed timed difference between Cell 1 and Cell 2 is within defined limits in AWGN propagation condition.

##### 5.1.1.2.1 Test parameters

The DL reference measurement channel 12.2 kbps as specified in Annex A, sub-clause A.3.1 of TS25.101 shall be used with power control turned on. Cell 1 is current active cell. The CPICH<sub>Ec/Io</sub> level of Cell 1 is kept constant and the CPICH<sub>Ec/Io</sub> level of Cell 2 is changed as illustrated in figure 5-1 and table 5.1. Hysteresis, Threshold and Time to Trigger values are given in the table 5.1 below and they are signalled from test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1A and 1B shall be used, SFN has to be decoded for neighbour cells. CPICH<sub>Ec/Io</sub> and the SFN-CFN observed timed difference has to reported together with Event 1A reporting. New measurement control information, which defines neighbour cells etc., is always sent during time period Time 1. The number of neighbour cells in the measurement control information is 24.



**Figure 5-1: Illustration of parameters for soft handover measurement reporting test case**

**Table 5-1: Test parameters for handover measurement reporting delay**

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 2
$CPICH\_Ec/I_{or}$	dB	-10	-10	-10	-10
$PCCPCH\_Ec/I_{or}$	dB	-12	-12	-12	-12
$SCH\_Ec/I_{or}$	dB	-12	-12	-12	-12
$PICH\_Ec/I_{or}$	dB	-15	-15	-15	-15
$DPCH\_Ec/I_{or}$	dB	-17	-17	-17	-17
$OCNS$		-1.049	-1.049	-1.049	-1.049
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	$\infty$	5.97
$I_{oc}$	DBm/3.84 MHz	-70			
$CPICH\_Ec/I_o$	dB	-13	-13	$\infty$	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	ms	0			
Filter coefficient		0			
Propagation Condition	AWGN				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

**5.1.1.2.2—Minimum requirements**

The measurement reporting delay shall be less than 0.8 seconds in [90]% of the cases.

Reported CPICH Ec/Io of Cell 2 in Event 1A shall have an accuracy of  $\pm [1.5]$  dB in [90]% of the 1A reports.

Reported SFN-CFN observed time difference shall have an accuracy of  $\pm [Y]$  chips in [90]% of the reports.

**5.1.1.3—Event triggered reporting of multiple neighbours in AWGN propagation condition**

This test will derive that the terminal makes correct reporting of an event and that the measurement accuracy of the reported values is within the specified limits. In the test 4 cells are present where the  $\hat{I}_{or}/I_{oc}$  level of Cell 1 and 2 is kept at a constant and the power level of cell 3 and 4 is changed over time by changing ( $\hat{I}_{or}/I_{oc}$ ).

5.1.1.3.1 Test parameters

In figure 5-2 an illustration of the test case is shown with the parameters specified in table 5.2 and 5.3. Hysteresis, Threshold and Time to Trigger values are given in the tables below and they are signalled from the test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1C and 1B shall be used. CPICH  $E_c/I_o$  and SFN CFN observed time difference shall be reported together with Event 1C. New measurement control information, which defines neighbour cells etc., is continuously sent. The number of neighbour cells in the measurement control information is 32.

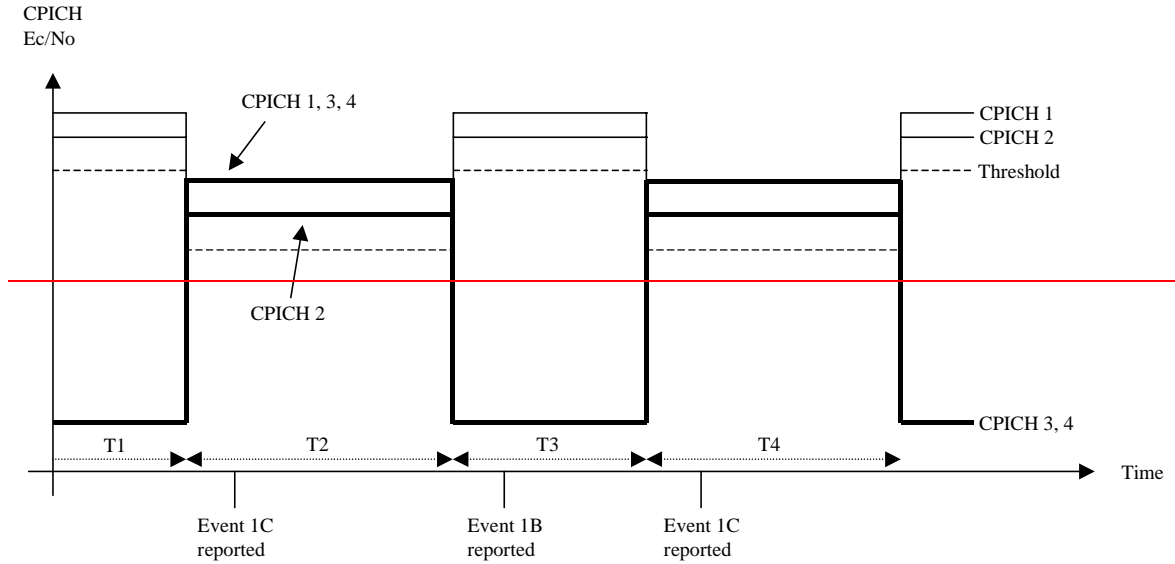


Figure 5.2: Illustration of the test case

Table 5.2: Parameters for Event triggered reporting of multiple neighbours in AWGN

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
$CPICH_{Ec/Ior}$	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				-17			
$QCNS_{Ec/Ior}$	dB	-1.049				-1.049			
$\hat{I}_{or}/I_{oc}$	dB	18.5				17			
$I_{oc}$	dBm/3.84 MHz	-85							
$CPICH_{Ec/Io}$	dB	-12.4	-15.5	-12.4	-15.5	-13.9	-17.0	-13.9	-17.0
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	ms	0							
Filter coefficient		0							
Propagation Condition		AWGN							

**Table 5-3: Parameters for Event triggered reporting of multiple neighbours in AWGN**

Parameter	Unit	Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4
$CPICH\_Ec/Ior$	dB	-10				-10			
$PCCPCH\_Ec/Ior$	dB	-12				-12			
$SCH\_Ec/Ior$	dB	-15				-15			
$PICH\_Ec/Ior$	dB	-15				-15			
$DPCH\_Ec/Ior$	dB	N/A				N/A			
$OCNS$	dB	-0.941				-0.941			
$\hat{I}_{or}/I_{oc}$	dB	$-\infty$	18.5	$-\infty$	18.5	$-\infty$	17.5	$-\infty$	17.5
$I_{oc}$	dBm/3.8 4 MHz	-85							
$CPICH\_Ec/Io$	dB	$-\infty$	-15.5	$-\infty$	-15.5	$-\infty$	-16.5	$-\infty$	-16.5
Threshold	dB	3							
Hysteresis	dB	0							
Time to Trigger	ms	0							
Filter coefficient		0							
Propagation Condition		AWGN							

#### 5.1.1.3.2—Minimum requirements

In table 5-4 the test case is described in detail for each time interval T1 to T4 and Minimum Requirements are given for each time interval.



**Table 5-4: Minimum requirements for Event triggered reporting of multiple neighbours in AWGN**

Time	Value	Cell 1 to 2	Cell 3 to 4
T1	>20 s	Included in the active set, keeping a constant $\hat{I}_{or}/I_{oc}$ level over the test.	Not visible, e.g. the UE has never had synchronisation to them before.
T2	10 s		<p>Will test the time for initial synchronisation when neighbour 3 and 4 suddenly becomes strong. Cell 3 and 4 becomes stronger than one of the cell in the active set (cell 2) and therefore event 1C shall be triggered. Together with the event a report containing measured CPICH <math>E_c/I_o</math> for all cells shall be sent together with the SFN-CFN observed time difference for cell 3 and 4.</p> <p><b>Minimum Requirements</b></p> <p>Event 1C shall be reported within [800] ms in [90] % of the cases.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 1 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 1 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 2 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported CFN-SFN observed time difference for Cell 2 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 3 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 3 shall have an accuracy of <math>\pm</math>[TBD] chips in [90] % of the reports.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 4 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 4 shall have an accuracy of <math>\pm</math>[Y] chips in [90] % of the reports.</p>
T3	15 s		<p>Neighbour 3 and 4 suddenly disappears. Event 1B shall be triggered. Together with the event a report containing measured CPICH <math>E_c/I_o</math> for all remaining cells shall be sent.</p> <p><b>Minimum Requirements.</b></p> <p>Event 1B shall be reported within [150] ms in [90] % of the cases.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 1 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p> <p>Reported CPICH <math>E_c/I_o</math> of Cell 2 shall have an accuracy of <math>\pm</math> [TBD] dB in [90] %.</p>

Time	Value	Cell 1 to 2	Cell 3 to 4
T4	10 s		<p>Neighbour 4 to 6 suddenly appears again after being gone for T3 s. Event 1C shall be triggered. Together with the event a report containing measured Ec/Io for all cells shall be sent together with the SFN-CFN observed time difference for cell 3 and 4.</p> <p>Minimum Requirements.</p> <p>Event 1C shall be reported within [150] ms in [90] % of the cases.</p> <p>Reported CPICH Ec/Io of Cell 1 shall have an accuracy of ± [TBD] dB in [90] %.</p> <p>Reported CPICH Ec/Io of Cell 2 shall have an accuracy of ± [TBD] dB in [90] %.</p> <p>Reported CPICH Ec/Io of Cell 3 shall have an accuracy of ± [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 3 shall have an accuracy of ±[TBD] chips in [90] % of the reports.</p> <p>Reported CPICH Ec/Io of Cell 4 shall have an accuracy of ± [TBD] dB in [90] %.</p> <p>Reported SFN-CFN observed time difference for Cell 4 shall have an accuracy of ±[Y] chips in [90] % of the reports.</p>

**5.1.1.4 — Correct reporting of neighbours in Fading propagation condition**

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell. The CPICH\_Ec/Io level of Cell 1 is kept constant and the power level of Cell 2 is changed using  $(\hat{I}_{or}/I_{oc})$ .

**5.1.1.4.1 — Test parameters**

The test parameters are specified in table 5-5. Hysteresis, Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1A shall be used. Only the event number is reported in this case. New measurement control information, which defines neighbour cells etc., is sent always during time period Time 1. The number of neighbour cells in the measurement control information is 24.

**Table 5-5: Test parameters for correct reporting of neighbours**

Parameter	Unit	Cell 1		Cell 2	
		Time 1	Time 2	Time 1	Time 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	
QCNS		{To Be Calculated}		{To Be Calculated}	
$\hat{I}_{or}/I_{oc}$	dB	0	6.97	-∞	5.97
$I_{oc}$	DBm/3.84 MHz	-70			
CPICH_Ec/Io	dB	-13	-13	-∞	-14
Threshold	dB	3			
Hysteresis	dB	0			
Time to Trigger	ms	0			
Filter coefficient		0			
Propagation Condition	Case 5 as specified in Annex B of TS25.101				

Time period Time 1 is X seconds. Time period Time 2 is Y seconds

#### 5.1.1.4.2—Minimum requirement

The measurement reporting delay shall be less than XX seconds in YY%.

#### 5.1.1.5—CPICH\_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition

The test case will derive the terminal's measurement accuracy of CPICH\_Ec/Io and false detection resistance.

##### 5.1.1.5.1—Test parameters

The test parameters are specified in table 5-6. The terminal measurement accuracy of CPICH\_Ec/Io is derived using the periodical reporting of active cell's measured CPICH\_Ec/Io. The terminal's false detection resistance is derived by recording the amount of erroneous reports. Both Cell 1 and Cell 2 powers ( $\hat{I}_{or}/I_{oc}$ ) are constant during the test case. Cell 2 is near to reporting range. Hysteresis, Threshold, Time to Trigger values and reporting period for active cell are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that the CPICH\_Ec/Io level of the active set cell has to reported periodically (and reporting period) and event triggered reporting (1A) will also be used. The number of neighbour cells in the measurement control information is 24.

**Table 5-6: Test parameters for CPICH\_Ec/Io measurement accuracy and incorrect reporting of neighbours**

Parameter	Unit	Cell 1	Cell 2
<del>CPICH_Ec/Io<sub>r</sub></del>	dB	-10	-10
<del>PCCPCH_Ec/Io<sub>r</sub></del>	dB	-12	-12
<del>SCH_Ec/Io<sub>r</sub></del>	dB	-12	-12
<del>PICH_Ec/Io<sub>r</sub></del>	dB	-15	-15
<del>DPCH_Ec/Io<sub>r</sub></del>	dB	TBD	TBD
<del>OCNS</del>		[To Be Calculated]	[To Be Calculated]
<del><math>\hat{I}_{or}/I_{oc}</math></del>	dB	1.68	-3.32
<del><math>I_{oc}</math></del>	dBm/3.84 MHz	-70	
<del>CPICH_Ec/Io</del>	dB	-13	-18
<del>Threshold</del>	dB	3	
<del>Hysteresis</del>	dB	0	
<del>Time to Trigger</del>	ms	0	
<del>Reporting period</del>	ms	TBD	
<del>Filter coefficient</del>		0	
<del>Propagation Condition</del>		AWGN	

##### 5.1.1.5.2—Minimum requirements

Event triggered report rate shall not exceed X reports in Y seconds.

In the periodical reporting the reported CPICH\_Ec/Io for Cell 1 shall have an accuracy of  $\pm$  [TBD] dB in [90] % of the reports.

## NEXT CHANGED SECTION

### 5.1.2—FDD Hard Handover

The hard handover procedure is initiated from UTRAN with an handover command message. 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.

## 5.1.2.1 — General

### 5.1.2.1.1 — Maximum number of cells/frequencies to be monitored on other frequencies

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

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

### 5.1.2.1.2 — Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface. 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.

### 5.1.2.1.3 — Test parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on. Test parameters for DL compressed mode are given in Annex A5 (table A-26) of TS25.101.

## 5.1.2.2 — Correct reporting of neighbours in AWGN propagation condition.

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a neighbour cell on the used frequency and Cell 3 is a neighbour cell on the unused frequency. The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

### 5.1.2.2.1 — Test parameters

The CPICH<sub>Ec/I<sub>0</sub></sub> level of Cell 1 and Cell 3 are kept constant and the power level of Cell 2 is changed using  $(\hat{I}_{or}/I_{oc})$ , as illustrated in Figure 5-3. Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from the test device. In the measurement control information it is indicated to the UE that event triggered reporting with Event 1A, 1B and 2C shall be used. The CPICH<sub>Ec/I<sub>0</sub></sub> of the best cell on the un-used frequency has to reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is 24. The X number of neighbours are on the un-used frequency. The BLER of the current active link is also measured.

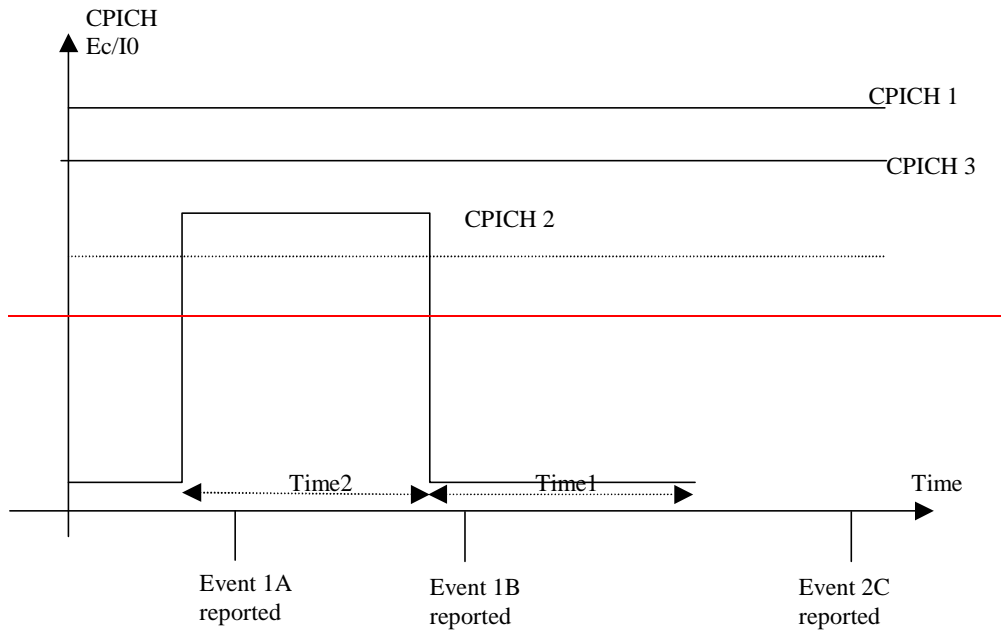


Figure 5-3: Illustration of parameters for handover measurement reporting test case

Table 5-8: Test parameters for CPICH\_Ec/Io measurement accuracy and correct reporting of neighbours

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
UTRA-RF Channel Number		Channel 1		Channel 1		Channel 2	
CPICH_Ec/Io	dB	-10		-10		-10	
PCCPCH_Ec/Io	dB	-12		-12		-12	
SCH_Ec/Io	dB	-12		-12		-12	
PICH_Ec/Io	dB	-15		-15		-15	
DPCH_Ec/Io	dB	TBD		TBD		TBD	
OCNS		{To Be Calculated}		{To Be Calculated}		{To Be Calculated}	
$\hat{I}_{or}/I_{oc}$	dB	0	4.39	$\infty$	2.39	-1.8	-1.8
$I_{oc}$	dBm/3.84 MHz	-70				-70	
CPICH_Ec/Io	dB	-13	-13	$\infty$	-15	-14	-14
Absolute Threshold (Ec/No)	dB	-18					
Hysteresis	dB	0					
Time to Trigger	ms	0					
Filter coefficient		0					
Propagation Condition		AWGN					

Time period Time 1 is X seconds. Time period Time 2 is Y seconds.

5.1.2.2.2—Minimum requirements

The measurement reporting delay shall be less than [5] seconds in [90] % of the cases.

Reported CPICH Ec/Io of Cell 3 in Event 2C shall have an accuracy of to ±[TBD] dB of the 2C reports.

The BLER of the DCH shall not exceed [TBD] value.

### 5.1.2.3 — Correct reporting of neighbours in Fading propagation condition

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell and Cell 2 is a neighbour cell on the un-used frequency. The CPICH\_Ec/Io level of Cell 1 and Cell 2 are kept constant

#### 5.1.2.3.1 — Test parameters

Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting 2C shall be used. Only events, which occur, are reported in this case. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is 24. The X number of neighbours are on the un-used frequency. The BLER of the current active link is also measured.

**Table 5-9: Test parameters for Correct reporting of neighbours**

Parameter	Unit	Cell 1	Cell 2
<i>UTRA RF Channel Number</i>		Channel 1	Channel 2
<i>CPICH_Ec/Io</i>	dB	-10	-10
<i>PCCPCH_Ec/Io</i>	dB	-12	-12
<i>SCH_Ec/Io</i>	dB	-12	-12
<i>PICH_Ec/Io</i>	dB	-15	-15
<i>DPCH_Ec/Io</i>	dB	TBD	TBD
<i>QCNS</i>		{To Be Calculated}	{To Be Calculated}
$\hat{I}_{or}/I_{oc}$	dB	0	-1.8
$I_{oc}$	DBm/3.84 MHz	-70	-70
<i>CPICH_Ec/Io</i>	dB	-13	-14
Absolute Threshold (Ec/No)	dB	-18	
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Propagation Condition	Case 5 as specified in Annex B of TS25.101		

#### 5.1.2.3.2 — Minimum requirements

The measurement reporting delay shall be less than Y seconds in [90] % of the cases.

The BLER of the DCH shall not exceed [TBD] value.

## NEXT CHANGED SECTION

### 5.1.3 — FDD/TDD Handover

The handover procedure is initiated from UTRAN with an handover command message. The 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.

#### 5.1.3.1 — General

##### 5.1.3.1.1 — Maximum number of cells/frequencies to be monitored on other frequencies

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

The cells and frequencies are given to the UE in a measurement control message(s), and the measurement slots available with compressed mode is given through physical channel reconfiguration parameters.

### 5.1.3.1.2 Measurement reporting delay

The measurement reporting delay is defined as the time from when a report is triggered at the physical layer according to the event or periodic mechanism set to trigger the measurement report, until the UE starts to transmit the measurement report over the Uu interface.

### 5.1.3.1.3 Test parameters for DL compressed mode

The DL reference measurement channel 12.2 kbps shall be used, with power control turned on [see 25.101]. Test parameters for DL compressed mode are given in Annex A.4 of TS25.101.

### 5.1.3.2 Correct reporting of TDD neighbours in AWGN propagation condition

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a TDD cell. The power level of P-CCPCH-RSCP of cell 2 and the CPICH-Ec/Io of cell 1 is changed.

#### 5.1.3.2.1 Test parameters

Hysteresis, Absolute threshold and Time to Trigger values are given in the table below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before compressed mode pattern starts. The number of neighbour cells in the measurement control information is FFS.

**Table 5-16: Correct reporting of TDD neighbours in AWGN**

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T1	T2	T1	T2
<i>Timeslot Number</i>		n.a.		0	8		
<i>UTRA-RF Channel Number</i>		Channel 1		Channel 2			
<i>CPICH-Ec/Ior</i>	DB	[ ]	[ ]	n.a.		n.a.	
<i>PCCPCH-Ec/Ior</i>	DB	[ ]	[ ]	-3	-3		
<i>SCH-Ec/Ior</i>	DB	[ ]	[ ]	-9	-9	-9	-9
<i>SCH-t<sub>offset</sub></i>		n.a.	n.a.	15	15	15	15
<i>PICH-Ec/Ior</i>		[ ]	[ ]			-3	-3
<i>DCH-Ec/Ior</i>	DB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<i>OCNS</i>	DB	[ ]	[ ]	-4.28	-4.28	-4.28	-4.28
$\hat{I}_{or}/I_{oc}$	DB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
$I_{oc}$	dBm/3.84 MHz	-70		-70			
<i>CPICH-Ec/Io</i>		[ ]		n.a.			
<i>PCCPCH-RSCP</i>	DB	n.a.	n.a.	[ ]	[ ]	[ ]	[ ]
Absolute Threshold (SIR)	DB	[ ]					
Hysteresis	DB	[ ]					
Time to Trigger	Ms	[ ]					
Filter coefficient		[ ]					
Propagation Condition		AWGN					

#### 5.1.3.2.2 Minimum requirements

The measurement reporting delay shall be less than [5] seconds in [90]% of the cases.

All the reported entities shall be within the requirements, as defined in clause 8.

Editor's note: Reported quantities are not defined in the test.

The BLER of the DCH shall not exceed [TBD] value.

## NEXT CHANGED SECTION

### ~~5.1.4 Handover 3G to 2G~~

#### ~~5.1.4.1 Handover to GSM~~

The requirements in this section shall apply to multi-RAT UE.

##### ~~5.1.4.1.1 BSIC Verification~~

Note: The definition of the BSIC verification will be inserted when it is clarified.

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.

## NEXT CHANGED SECTION

## ~~9 UE parallel measurements~~

### ~~9.1 General~~

The UE shall be able to perform parallel measurements according to table 9-2.

In addition to the requirements in table 9-2 the UE shall in parallel, in state CELL\_DCH, also be able to measure and report the quantities according to table 9-1.

**Table 9-1**

<b>Measurement quantity</b>	<b>Number of parallel measurements possible to request from the UE</b>
Transport channel BLER	[1] per TrCh
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	[1]
UE GPS Timing of Cell Frames for LCS	[1]

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

### ~~9.2 Parallel Measurement Requirements~~

Table 9-2 shall be read as follows:

If the UE receives a neighbour list of  
not more than X1 cells on Freq. #0 and



not more than X2 cells on Freq. #1 and

not more than X3 cells on Freq. #2 and

not more than X4 GSM cells;

the UE-L1 shall be able to deliver

—Y1 CPICH measurements on Freq. #0 and

—Y2 CPICH measurements on Freq. #1 and

—Y3 CPICH measurements on Freq. #2 and

—Y4 UTRAN carrier RSSI measurements on Freq. #0 and

—Y5 UTRAN carrier RSSI measurements on Freq. #1 and

—Y6 UTRAN carrier RSSI measurements on Freq. #2 and

—Y7 GSM carrier RSSI measurements (BSIC verified)

—Y8 GSM carrier RSSI measurements (BSIC non-verified)

with the periodicity given by the measurement periods in section 8 and accuracy requirements given in section 8.

Xn and Yn are numbers taken from the same column in Table 9-2.

**Table 9-2: UE Layer 1 parallel measurement capability**

Scenario (see annex B)			1a	2b	2c	3a	4b	4c
Neighbour list size	X1	Freq #0	[32]	[24]	[24]	[24]	[24]	[24]
	X2	Freq #1	[0]	[12]	[12]	[0]	[12]	[12]
	X3	Freq #2	[0]	[0]	[12]	[0]	[0]	[12]
	X4	GSM (any band/ carrier)	[0]	[0]	[0]	[20] Note4	[12]	[8]
Parallel measurement requirements	Y1	CPICH meas. Freq#0	[6]	[6]	[6]	[6]	[6]	[6]
	Y2	CPICH meas. Freq#1	[0]	[6]	[4]	[0]	[6]	[3]
	Y3	CPICH meas. Freq#2	[0]	[0]	[4]	[0]	[0]	[3]
	Y4	UTRAN carrier-RSSI Freq #0	[1]	[1]	[1]	[1]	[1]	[1]
	Y5	UTRAN carrier-RSSI Freq #1	[0]	[1]	[1]	[0]	[1]	[1]
	Y6	UTRAN carrier-RSSI Freq #2	[0]	[0]	[1]	[0]	[0]	[1]
	Y7	GSM-RSSI, BSIC non-verified	[0]	[0]	[0]	[1]	[1]	[1]
	Y8	GSM-RSSI, BSIC verified	[0]	[0]	[0]	[1]	[1]	[1]

Note 1: Although table 9.2 puts requirements on L1, these requirements can be verified from L3 with a filter coefficient = 0, in the higher layer filter.

Note 2: Compressed mode reference pattern 2.1 is assumed for the requirements in table 9.2. If other compressed mode patterns are used, the UE L1 shall deliver as many measurements as possible.

Note 3: In table 9.2, CPICH measurements can be either the CPICH E<sub>c</sub>/I<sub>0</sub> or the CPICH RSCP measurement.

Note 4: This figure will be checked after the BSIC definition is resolved.

## NEXT CHANGED SECTION

### Annex A (Informative): Scenario Description for Parallel Measurements

The following table gives a brief explanation on which scenarios that have been used to set up the parallel measurement requirements.

#### General Assumptions

- Freq. #0, #1 and #2 are arbitrary UMTS frequencies, assigned for one operator.
- The UE is assumed to have the active set on Freq. #0

Case	Network scenario	Number of UMTS carriers present	Neighbour List Size			
			Freq. #0	Freq. #1	Freq. #2	GSM
1a	Single carrier UMTS network with no interaction with GSM networks or other UMTS networks	1	32	0	0	0
2b	Multi carrier UMTS network with no interaction with GSM networks	2	24	12	0	0
2e		3	24	12	12	0
3a	Single carrier UMTS network together with a GSM network	1	24	0	0	20
4b	Multi carrier UMTS network together with a GSM network	2	24	12	0	12
4e		3	24	12	12	8



## ~~8 Measurements Performance Requirements~~

~~One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The complete list of measurements is specified in TSG RAN WG2 S25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TSG RAN WG1 TS25.215 "Physical layer Measurements (FDD)". In this clause for FDD, per each measurement the relevant requirements on the reporting range, granularity and performance in terms of accuracy are reported.~~

~~Unless explicitly stated:~~

- ~~• Reported measurements shall be within defined range in 90 % of the cases.~~
- ~~• Measurement channel is 12.2 kbps as defined in 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.~~
- ~~• All requirements are defined when UE is in a CELL\_DCH or CELL\_FACH stage. The difference between modes are the reporting delay. Some of the measurements are not requested to be reported in both stages.~~
- ~~• Cell 1 is the active cell.~~
- ~~• Single task reporting.~~
- ~~• Power control is active.~~

### ~~8.1 Measurements Performance for UE~~

#### ~~8.1.1 CPICH measurements~~

~~These measurement consider CPICH\_RSCP, CPICH\_Ec/I<sub>0</sub>, SFN-CFN observed time difference, SFN-SFN observed time difference type 1 and 2 and UE RX/TX timing measurements.~~

##### ~~8.1.1.1 Intra frequency test parameters~~

~~In this case all cells are in the same frequency. The table 8-1 and notes 1-4 define the limits of signal strengths and code powers, when the requirements are applicable.~~

**Table 8-1: CPICH Intra frequency test parameters**

<b>Parameter</b>	<b>Unit</b>	<b>Cell 1</b>	<b>Cell 2</b>
<i>UTRA_RF_Channel_number</i>		Channel 1	Channel 1
<i>CPICH_Ec/I<sub>0</sub></i>	dB	-10	-10
<i>PCCPCH_Ec/I<sub>0</sub></i>	dB	-12	-12
<i>SCH_Ec/I<sub>0</sub></i>	dB	-12	-12
<i>PICH_Ec/I<sub>0</sub></i>	dB	-15	-15
<i>DPCH_Ec/I<sub>0</sub></i>	dB	-15	-15
<i>OCNS</i>	dB	-1.11	-1.11
<i>I<sub>0</sub>/I<sub>0e</sub></i>	dB	+0.5	+0.5

<i>I<sub>oc</sub></i>	dBm/3.84 MHz	Note 4	Note 4
<i>Range 1: I<sub>o</sub></i>	dBm	-94...-70	-94...-70
<i>Range 2: I<sub>o</sub></i>		-94...-50	-94...-50
<i>Propagation condition</i>	-	AWGN	

NOTE 1:  $CPICH\_RSCP_{1,2} \geq -114$  dBm.

NOTE 2:  $|CPICH\_RSCP1 - CPICH\_RSCP2| \leq 20$  dB.

NOTE 3:  $|I_o - CPICH\_Ec/Ior| \leq 20$  dB.

NOTE 4: *I<sub>oc</sub>* level shall be adjusted according the total signal power *I<sub>o</sub>* at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .  $I_o - 13.7$  dB = *I<sub>oc</sub>*.

### 8.1.1.2 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]. The table 8-2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.

**Table 8-2: CPICH Inter frequency tests parameters**

Parameter	Unit	Cell 1	Cell 2
<i>UTRA-RF Channel number</i>		Channel 1	Channel 2
<i>CPICH_Ec/Ior</i>	dB	-10	-10
<i>PCCPCH_Ec/Ior</i>	dB	-12	-12
<i>SCH_Ec/Ior</i>	dB	-12	-12
<i>PICH_Ec/Ior</i>	dB	-15	-15
<i>DPCH_Ec/Ior</i>	dB	-15	-15
<i>GCNS</i>	dB	-1.11	-1.11
$\hat{I}_{or}/I_{oc}$	dB	10.1	10.1
<i>I<sub>oc</sub></i>	dBm/3.84 MHz	Note 5	Note 5
<i>Range 1: I<sub>o</sub></i>	dBm	-94...-70	-94...-70
<i>Range 2: I<sub>o</sub></i>		-94...-50	-94...-50
<i>Propagation condition</i>	-	AWGN	

NOTE 1:  $CPICH\_RSCP_{1,2} \geq -114$  dBm.

NOTE 2:  $|CPICH\_RSCP1 - CPICH\_RSCP2| \leq 20$  dB.

NOTE 3:  $|Channel\ 1\ I_o - Channel\ 2\ I_o| \leq 20$  dB.

NOTE 4:  $|I_o - CPICH\_Ec/Ior| \leq 20$  dB.

NOTE 5: *I<sub>oc</sub>* level shall be adjusted in each carrier frequency according the total signal power *I<sub>o</sub>* at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .  $I_o - 10.6$  dB = *I<sub>oc</sub>*.

## 8.1.2 ~~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.~~

### 8.1.2.1 ~~Intra frequency measurements accuracy~~

~~The measurement period for CELL\_DCH state is [150 ms] and for CELL\_FACH stage [600 ms].~~

#### 8.1.2.1.1 ~~Absolute accuracy requirement~~

~~The absolute accuracy of CPICH RSCP is defined as measured one code power after de-spreading. In this test only Cell 1 in table 8-1 is present.~~

**Table 8-3: ~~CPICH\_RSCP Intra frequency absolute accuracy~~**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
<del>CPICH_RSCP</del>	dB	±	±6	±9
	dB	±	±8	±11

#### 8.1.2.1.2 ~~Relative accuracy requirement~~

~~The relative accuracy of CPICH RSCP is defined as measured code powers from active cell and one or more cells after de-spreading. The reported value is relative to active cell value. In this test Cell 1 and 2 in table 1 are present.~~

**Table 8-4: ~~CPICH\_RSCP Intra frequency relative accuracy~~**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
<del>CPICH_RSCP</del>	dB	±	±3	±3

## 8.1.2.2 ~~Inter frequency measurement accuracy~~

~~The measurement period for CELL\_DCH state is [480 ms], and for CELL\_FACH state [960 ms].~~

### 8.1.2.2.1 ~~Relative accuracy requirement~~

~~The relative accuracy of CPICH RSCP in inter frequency case is defined as measured code powers after de-spreading from active cell and one or more cells received from two or more RF carriers. The reported values are relative to active cell value. In this test parameters in table 8-2 is used. In this test cells 1 and 2 are present.~~

**Table 8-5: ~~CPICH\_RSCP Inter frequency relative accuracy~~**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
<del>CPICH_RSCP</del>	dB	±	±6	±6

## 8.1.2.3 ~~CPICH RSCP measurement report mapping~~

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

In table 8-6 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-6**

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_00	$CPICH\_RSCP < -115$	dBm
CPICH_RSCP_LEV_01	$-115 \leq CPICH\_RSCP < -114$	dBm
CPICH_RSCP_LEV_02	$-114 \leq CPICH\_RSCP < -113$	dBm
...	...	...
CPICH_RSCP_LEV_89	$-27 \leq CPICH\_RSCP < -26$	dBm
CPICH_RSCP_LEV_90	$-26 \leq CPICH\_RSCP < -25$	dBm
CPICH_RSCP_LEV_91	$-25 \leq CPICH\_RSCP$	dBm

### 8.1.3 CPICH $E_c/I_0$

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

#### 8.1.3.1 Intra frequency measurements accuracy

The measurement period for CELL\_DCH state is [150 ms], and for CELL\_FACH state [600 ms].

##### 8.1.3.1.1 Absolute accuracy requirement

The absolute accuracy of CPICH  $E_c/I_0$  is defined as measured energy per chip divided by power density in the band from one cell. In this test only Cell 1 in table 8-1 is present.

**Table 8-7: CPICH  $E_c/I_0$  Intra frequency absolute accuracy**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH $E_c/I_0$	dB	2	$\pm 4$	$\pm 4$

##### 8.1.3.1.2 Relative accuracy requirement

The relative accuracy of CPICH  $E_c/I_0$  is defined as measured energy per chip divided by power density in the band received from active cell and one more cells. The reported value is relative to active cell value. In this test Cells 1 and 2 in table 8-1 are present.

**Table 8-8: CPICH  $E_c/I_0$  Intra frequency relative accuracy**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH $E_c/I_0$	dB	2	$\pm 3$	$\pm 3$

### 8.1.3.2—Inter frequency measurement accuracy

The measurement period for CELL\_DCH state is [480 ms], and for CELL\_FACH state [960 ms].

#### 8.1.3.2.1—Relative accuracy requirement

The relative accuracy of CPICH  $E_c/I_o$  in the inter frequency case is defined as measured energy per chip divided by power density in the band. The reported values are relative to active cell value. In this test the parameters in table 8-2 is used. In this test cells 1 and 2 are present.

**Table 8-9: CPICH  $E_c/I_o$  Inter frequency relative accuracy**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
CPICH $E_c/I_o$	dB	2	±6	±6

### 8.1.3.3—CPICH $E_c/I_o$ measurement report mapping

The reporting range is for CPICH  $E_c/I_o$  is from -24 ...0 dB.

In table 8-10 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-10**

Reported value	Measured quantity value	Unit
CPICH $E_c/I_o$ _00	CPICH $E_c/I_o$ < -24	dB
CPICH $E_c/I_o$ _01	-24 ≤ CPICH $E_c/I_o$ < -23.5	dB
CPICH $E_c/I_o$ _02	-23.5 ≤ CPICH $E_c/I_o$ < -23	dB
...	...	...
CPICH $E_c/I_o$ _48	-1 ≤ CPICH $E_c/I_o$ < -0.5	dB
CPICH $E_c/I_o$ _49	-0.5 ≤ CPICH $E_c/I_o$ < 0	dB
CPICH $E_c/I_o$ _50	0 ≤ CPICH $E_c/I_o$	dB

### 8.1.4—DCH measurements

These measurement consider SIR, which is based on dedicated channel. The power ratio between DPDCH bits and DPCCH bits is 1. The relative power of PO1, PO2 and PO3 for TPC, TCFI and Pilot fields are same. The number of dedicated pilot bits is 8. Dedicated channel measurements are always intra frequency type.

#### 8.1.4.1—Test parameters

**Table 8-11: DCH Intra frequency test parameters**

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH $E_c/I_o$	dB	-10	-10
PCCPCH $E_c/I_o$	dB	-12	-12



<i>SCH_Ec/Ior</i>	dB	-12	-12
<i>PICH_Ec/Ior</i>	dB	-12	-12
<i>DPCH_Ec/Ior</i>	dB	-15	-15
<i>OCNS</i>	dB	-1.11	-1.11
$\hat{I}_{or}/I_{oc}$	dB	10.5	10.5
<i>I<sub>oc</sub></i>	dBm/3.84 MHz	Note 5	Note 5
<i>Range 1: I<sub>o</sub></i>	dBm	-94... 70	-94... 70
<i>Range 2: I<sub>o</sub></i>		-94... 50	-94... 50
<i>Propagation condition</i>	-	AWGN	

NOTE 1:  $DPCH\_Ec/Ior \geq -114$  dBm.

NOTE 2:  $|DPCH\_Ec/Ior1 - DPCH\_Ec/Ior2| \leq 20$  dB.

NOTE 3:  $|I_o - CPICH\_Ec/Ior| \leq 20$  dB.

NOTE 4: *I<sub>oc</sub>* level shall be adjusted according the total signal power *I<sub>o</sub>* at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .  $I_o - 13.7$  dB = *I<sub>oc</sub>*.

## 8.1.5 UTRA Carrier RSSI

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

### 8.1.5.1 Test parameters

The table 8-12 and notes 1, 2 define the limits of signal strengths, where the requirement is applicable.

**Table 8-12: UTRA RSSI Inter frequency test parameters**

Parameter	Unit	Cell 1	Cell 2
<i>UTRA RF Channel number</i>	-	Channel 1	Channel 2
$\hat{I}_{or}/I_{oc}$	dB	-1	-1
<i>I<sub>oc</sub></i>	dBm/3.84 MHz	Note 3	Note 3
<i>Range 1: I<sub>o</sub></i>	dBm/3.84 MHz	-94... 70	-94... 70
<i>Range 2: I<sub>o</sub></i>		-94... 50	-94... 50
<i>Propagation condition</i>	-	AWGN	

NOTE 1: For relative accuracy requirement  $|Channel\ 1\_I_o - Channel\ 2\_I_o| < 20$  dB.

NOTE 2: *I<sub>oc</sub>* level shall be adjusted according the total signal power *I<sub>o</sub>* at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .  $I_o - 4.13$  dB = *I<sub>oc</sub>*.

### 8.1.5.2 Absolute accuracy requirement

The measurement period is in CELL\_DCH state [150 ms] for intra frequency measurements and [480 ms] for inter frequency measurements. For CELL\_FACH state the measurement period is [600 ms].

Absolute accuracy case only one carrier is applied (Cell 1).

**Table 8-13:  $f_0$  Inter frequency absolute accuracy**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
$f_0$	dBm	±	±4	±7
	dBm	±	±6	±9

### 8.1.5.3 Relative accuracy requirement

The measurement period in CELL\_DCH stage is [240 ms], and in CELL\_FACH stage [960 ms].

Relative accuracy requirement is defined as active cell frequency UTRAN RSSI compared to measured other frequency UTRAN RSSI level. In relative accuracy test case both carriers in table 8-14 are used.

**Table 8-14:  $f_0$  Inter frequency relative accuracy**

Parameter	Value	Range	Accuracy	
			Normal condition	Extreme condition
$f_0$	dBm	±	±7	±11

### 8.1.5.4 UTRA Carrier RSSI measurement report mapping

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

In table 8-15 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-15**

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

### 8.1.6 GSM carrier RSSI

NOTE: The measurement is for Inter radio access technology (RAT) handover.

For terminals supporting this capability.

The accuracy requirement and reporting range is specified in GSM 05.08.

The measurement period in CELL\_DCH state is [480 ms], and in CELL\_FACH state [960 ms].

[The GSM reporting period is 480 ms. In case of parallel measurements, the reporting period of each single neighbour can be a multiple of 480 ms, and the reporting period of each neighbour can be irregular.]

## 8.1.7 Transport channel BLER

### 8.1.7.1 BLER measurement requirement

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

### 8.1.7.2 Transport channel BLER measurement report mapping

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

In table 8-16 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-16**

Reported value	Measured quantity value	Unit
BLER_LOG_00	Transport channel BLER = 0	-
BLER_LOG_01	$-\infty < \text{Log}_{10}(\text{Transport channel BLER}) < -4.03$	-
BLER_LOG_02	$-4.03 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.965$	-
BLER_LOG_03	$-3.965 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.9$	-
...	...	...
BLER_LOG_61	$-0.195 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.13$	-
BLER_LOG_62	$-0.13 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.065$	-
BLER_LOG_63	$-0.065 \leq \text{Log}_{10}(\text{Transport channel BLER}) \leq 0$	-

## 8.1.8 UE transmitted power

### 8.1.8.1 Accuracy requirement

The measurement period in CELL\_DCH state is 1 slot.

**Table 8-17 UE transmitted power absolute accuracy**

Parameter	Unit	PUEMAX	
		24dBm	21dBm
<i>UE transmitted power = PUEMAX</i>	dB	+1/-3	±2
<i>UE transmitted power = PUEMAX-1</i>	dB	+1.5/-3.5	±2.5
<i>UE transmitted power = PUEMAX-2</i>	dB	+2/-4	±3
<i>UE transmitted power = PUEMAX-3</i>	dB	+2.5/-4.5	±3.5
<i>PUEMAX-10 ≤ UE transmitted power &lt; PUEMAX-3</i>	dB	+3/-5	±4

Note 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in 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.

### 8.1.8.2 UE transmitted power measurement report mapping

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

In table 8-18 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-18**

Reported value	Measured quantity value	Unit
UE_TX_POWER_021	$-50 \leq \text{UE transmitted power} \leq -49$	dBm
UE_TX_POWER_022	$-49 \leq \text{UE transmitted power} < -48$	dBm
UE_TX_POWER_023	$-48 \leq \text{UE transmitted power} < -47$	dBm
...	...	...
UE_TX_POWER_102	$31 \leq \text{UE transmitted power} < 32$	dBm
UE_TX_POWER_103	$32 \leq \text{UE transmitted power} < 33$	dBm
UE_TX_POWER_104	$33 \leq \text{UE transmitted power} \leq 34$	dBm

### 8.1.9 SFN-CFN observed time difference

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

#### 8.1.9.1 Intra frequency measurement requirement

The measurement period in CELL\_DCH state is [150 ms].

Test parameters are defined in section 8.1.1, in the table 8-1 and notes 1-4. During the test the timing difference between Cell 1 and 2 can be set to value from 0...9830399 chips.

**Table 8-19: Range 2**

Parameter	Value	Accuracy
SFN-CFN observed time difference	chip	$\pm 1$

#### 8.1.9.2 Inter frequency measurement requirement

The measurement period in CELL\_DCH stage is [ ] ms.

Test parameters are defined in section 8.1.1, in the table 8-2 and notes 1-5. During the test the timing difference between Cell 1 and 2 can be set to value from 0...9830399 chips.

**Table 8-20: Range 2**

Parameter	Value	Accuracy
<i>SFN-CFN-observed-time difference</i>	chip	$\pm 1$

### 8.1.9.3 ~~CFN-SFN-observed time difference measurement report mapping~~

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

In table 8-21 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-21**

Reported value	Measured quantity value	Unit
CFN-SFN_TIME_0000000	$0 \leq \text{Time difference} \leq 1$	chip
CFN-SFN_TIME_0000001	$1 \leq \text{Time difference} < 2$	chip
CFN-SFN_TIME_0000002	$2 \leq \text{Time difference} < 3$	chip
...	...	...
CFN-SFN_TIME_9830397	$9830397 \leq \text{Time difference} < 9830398$	chip
CFN-SFN_TIME_9830398	$9830398 \leq \text{Time difference} < 9830399$	chip
CFN-SFN_TIME_9830399	$9830399 \leq \text{Time difference} \leq 9830400$	chip

### 8.1.10 ~~SFN-SFN-observed time difference~~

#### 8.1.10.1 ~~SFN-SFN-observed time difference type 1~~

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

##### 8.1.10.1.1 ~~Measurement requirement~~

The measurement period in CELL\_DCH state is [150 ms], and in CELL\_FACH state [600 ms].

The test parameters are defined in section 8.1.1. During the test the timing difference between Cell 1 and 2 can be set to value from 0...9830399 chips.

**Table 8-22: Range 2**

Parameter	Value	Accuracy
<i>SFN-SFN-observed-time difference type 1</i>	Chip period	$\pm 1$

### 8.1.10.1.2 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 8-23 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-23**

Reported value	Measured quantity value	Unit
T1_SFN-SFN_TIME_0000000	$0 \leq \text{Time difference} \leq 1$	chip
T1_SFN-SFN_TIME_0000001	$1 \leq \text{Time difference} < 2$	chip
T1_SFN-SFN_TIME_0000002	$2 \leq \text{Time difference} < 3$	chip
...	...	...
T1_SFN-SFN_TIME_9830397	$9830397 \leq \text{Time difference} < 9830398$	chip
T1_SFN-SFN_TIME_9830398	$9830398 \leq \text{Time difference} < 9830399$	chip
T1_SFN-SFN_TIME_9830399	$9830399 \leq \text{Time difference} \leq 9830400$	chip

### 8.1.10.2 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.

#### 8.1.10.2.1 Test parameters

The test scenario is defined in section 8.1.1. During the test the time difference between Cell 1 and 2 can be set to value from -1279.75 to 1280 chips.

##### 8.1.10.2.1.1 Test parameters for IPDL pattern

In table 8-24 shows the idle period parameters.

**Table 8-24**

Parameter	Unit	Cell 1	Cell 2
IP_Status	-	continous	continous
IP_Spacing	Frames	{10}	{10}
IP_Length	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  $I_0$  will change only downwards during BS transmission gap.

### 8.1.10.2.2 ~~Intra frequency measurement requirement accuracy without IPDL period active~~

The measurement period in ~~CELL\_DCH~~ state is ~~[150 ms]~~, and in ~~CELL\_FACH~~ state ~~[600 ms]~~.

**Table 8-25: Range 2**

Parameter	Value	Accuracy
<del><i>SFN-SFN observed time difference type 2</i></del>	Chip period	$\pm 0.5$

### 8.1.10.2.3 ~~Intra frequency measurement requirement accuracy with IPDL period active~~

The measurement period in ~~CELL\_DCH~~ stage is ~~[600 ms]~~, and in ~~CELL\_FACH~~ stage ~~[600 ms]~~.

**Table 8-26: Range 2**

Parameter	Value	Accuracy
<del><i>SFN-SFN observed time difference type 2</i></del>	Chip period	$\pm 0.5$

### 8.1.10.2.4 ~~Inter frequency measurement requirement accuracy~~

The measurement period in ~~CELL\_DCH~~ state is ~~[150 ms]~~, and in ~~CELL\_FACH~~ state ~~[600 ms]~~.

**Table 8-27: Range 2**

Parameter	Value	Accuracy
<del><i>SFN-SFN observed time difference type 2</i></del>	Chip period	$\pm 1$

### 8.1.10.2.5 ~~SFN-SFN observed time difference type 2 measurement report mapping~~

The reporting range is for ~~*SFN-SFN observed time difference type 2*~~ is from ~~-1279.75 ... 1280 chip~~.

In table 8-28 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-28**

Reported value	Measured quantity value	Unit
<del>T2_SFN-CFN_TIME_00000</del>	<del><math>-1279.75 &lt; \text{Time difference} \leq -1279.50</math></del>	<del>chip</del>
<del>T2_SFN-CFN_TIME_00001</del>	<del><math>-1279.50 \leq \text{Time difference} &lt; -1279.25</math></del>	<del>chip</del>
<del>T2_SFN-CFN_TIME_00002</del>	<del><math>-1279.25 \leq \text{Time difference} &lt; -1279.00</math></del>	<del>chip</del>

...	...	...
T2_SF_N_CFN_TIME_10236	$1279.25 \leq \text{Time difference} < 1279.50$	chip
T2_SF_N_CFN_TIME_10237	$1279.50 \leq \text{Time difference} < 1279.75$	chip
T2_SF_N_CFN_TIME_10238	$1279.75 \leq \text{Time difference} \leq 1280.00$	chip

### 8.1.11—UE Rx-Tx time difference

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

The UE shall adjust the transmission initial time based on measurement result. See also the detailed requirement for UE TX timing is in the subclause 7.3. This is intra frequency measurement. The test scenario is defined in section 8.1.1 in table 8-1 and notes 1-4.

The measurement period in CELL\_DCH state is [100 ms]

#### 8.1.11.1—Measurement requirement

**Table 8-29: Range 2**

Parameter	Value	Accuracy
UE_RX_TX_time_difference	Chip period	$\pm 1.5$

#### 8.1.11.2—UE Rx-Tx time difference measurement report mapping

The reporting range is for UE Rx-Tx time difference is from 876 ... 1170 chip.

In table 8-30 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-30**

Reported value	Measured quantity value	Unit
RX_TX_TIME_0000	$\text{UE Rx-Tx Time difference} < 876.00$	chip
RX_TX_TIME_0001	$876.00 \leq \text{UE Rx-Tx Time difference} < 876.25$	chip
RX_TX_TIME_0002	$876.25 \leq \text{UE Rx-Tx Time difference} < 876.50$	chip
RX_TX_TIME_0003	$876.50 \leq \text{UE Rx-Tx Time difference} < 876.75$	chip
...	...	...
RX_TX_TIME_1182	$1171.25 \leq \text{UE Rx-Tx Time difference} < 1171.50$	chip
RX_TX_TIME_1183	$1171.50 \leq \text{UE Rx-Tx Time difference} < 1171.75$	chip
RX_TX_TIME_1184	$1171.75 \leq \text{UE Rx-Tx Time difference} \leq 1172.00$	chip
RX_TX_TIME_1185	$1172.00 \leq \text{UE Rx-Tx Time difference}$	chip



## 8.1.12 ~~Observed time difference to GSM cell~~

~~Note: This measurement is used for defining the system time difference between UTRAN and GSM cells.~~

~~For terminal supporting this capability:~~

### 8.1.12.1 ~~Test parameters~~

~~Note: The requirement scenario is FFS.~~

### 8.1.12.2 ~~Measurement requirement~~

~~The time difference is defined as time difference between the beginning of UTRAN P-CCPCH with SFN equal to 0 and the starting point of 51-multiframe of BCCH in GSM system.~~

**Table 8-31:**

Parameter	Value	Accuracy
<i>Observed time difference to GSM cell</i>	Chip period	$\pm 20$

~~The measurement period in CELL\_DCH state is [10 s].~~

### 8.1.12.3 ~~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 8-32 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.~~

**Table 8-32**

Reported value	Measured quantity value
<del>GSM_TIME_0000</del>	<del><math>0 \leq \text{Observed time difference to GSM cell} &lt; 1 \times 3060 / (4096 \times 13)</math></del>
<del>GSM_TIME_0001</del>	<del><math>1 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 2 \times 3060 / (4096 \times 13)</math></del>
<del>GSM_TIME_0002</del>	<del><math>2 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 3 \times 3060 / (4096 \times 13)</math></del>
<del>GSM_TIME_0003</del>	<del><math>3 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 4 \times 3060 / (4096 \times 13)</math></del>
<del>...</del>	<del>...</del>
<del>GSM_TIME_4093</del>	<del><math>4093 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 4094 \times 3060 / (4096 \times 13)</math></del>
<del>GSM_TIME_4094</del>	<del><math>4094 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 4095 \times 3060 / (4096 \times 13)</math></del>
<del>GSM_TIME_4095</del>	<del><math>4095 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 3060 / 13</math></del>

## 8.1.13 ~~P-CCPCH measurements~~

~~These measurements consider *P-CCPCH RSCP* measurements. Only necessary for UEs supporting TDD.~~

### 8.1.13.1—Inter frequency test parameters

In this case the cells are on different frequencies. The table 8-33 and notes 1-3 define 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 8-33 P-CCPCH inter frequency test parameters**

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

NOTE 1:  $P_{CCPCH\_RSCP} \geq -102$  dBm.

NOTE 2:  $|I_o - P_{CCPCH\_Ec/Ior}| \leq [20]$  dB.

NOTE 3:  $I_{oc}$  level shall be adjusted according the total signal power  $I_o$  at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

### 8.1.14—P-CCPCH RSCP

#### 8.1.14.1—Absolute accuracy requirements

The absolute accuracy of P-CCPCH RSCP is defined as measured one code power after de-spreading.

**Table 8-34: P-CCPCH\_RSCP Inter frequency absolute accuracy**

Parameter	Value	Range	Accuracy	
			Normal conditions	Extreme conditions

<i>P-CCPCH_RSCP</i>	dB	±	±6	±9
	dB	±	±8	±11

### 8.1.14.2—~~P-CCPCH RSCP measurement report mapping~~

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

In table 8-35 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-35**

Reported value	Measured quantity value	Unit
<i>PCCPCH_RSCP_LEV_00</i>	$PCCPCH\_RSCP < -115$	dBm
<i>PCCPCH_RSCP_LEV_01</i>	$-115 \leq PCCPCH\_RSCP < -114$	dBm
<i>PCCPCH_RSCP_LEV_02</i>	$-114 \leq PCCPCH\_RSCP < -113$	dBm
<i>PCCPCH_RSCP_LEV_03</i>	$-113 \leq PCCPCH\_RSCP < -112$	dBm
...	...	...
<i>PCCPCH_RSCP_LEV_89</i>	$-27 \leq PCCPCH\_RSCP < -26$	dBm
<i>PCCPCH_RSCP_LEV_90</i>	$-26 \leq PCCPCH\_RSCP < -25$	dBm
<i>PCCPCH_RSCP_LEV_91</i>	$-25 \leq PCCPCH\_RSCP$	dBm

### 8.1.15—~~UE GPS Timing of Cell Frames for LCS~~

For terminals supporting this capability:

<b>Requirement</b>	[ ] chips/period.
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#### 8.1.15.1—~~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 8-36 the mapping of measured quantity is defined.

**Table 8-36**

Reported value	Measured quantity value	Unit
<i>GPS_TIME_00000000000000</i>	$UE\_GPS\_timing\_of\_Cell\_Frames\_for\_LCS < 0.125$	chip
<i>GPS_TIME_00000000000001</i>	$0.125 \leq UE\_GPS\_timing\_of\_Cell\_Frames\_for\_LCS < 0.250$	chip
<i>GPS_TIME_00000000000002</i>	$0.250 \leq UE\_GPS\_timing\_of\_Cell\_Frames\_for\_LCS < 0.375$	chip
<i>GPS_TIME_18554879999997</i>	$231935999999.625 \leq UE\_GPS\_timing\_of\_Cell\_Frames\_for\_LCS < 231935999999.750$	chip
<i>GPS_TIME_18554879999998</i>	$231935999999.750 \leq UE\_GPS\_timing\_of\_Cell\_Frames\_for\_LCS < 231935999999.875$	chip

GPS_TIME_18554879999999	$2319.359999.999.875 \leq$ UE GPS timing of Cell Frames for LCS $< 2319360000000.000$	chip
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## ~~8.2 Measurements Performance for UTRAN~~

### ~~8.2.1 RSSI~~

The measurement period shall be ~~{100}~~ ms.

#### ~~8.2.1.1 Absolute accuracy requirement~~

**Table 8-37**

Parameter	Accuracy	Range
<i>I<sub>0</sub></i>	$\pm 4$ dB	For levels $\leq -74$ dBm

#### ~~8.2.1.2 Relative accuracy requirement~~

**Table 8-38**

Parameter	Accuracy	Range
<i>I<sub>0</sub></i>	$\pm \{0.5\}$ dB	For changes $\leq \pm 5.0$ dB for levels $\leq -74$ dBm

#### ~~8.2.1.3 RSSI measurement report mapping~~

The reporting range for *RSSI* is from ~~-112 ... -50~~ dBm.

In table 8-39 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-39**

Reported value	Measured quantity value	Unit
RSSI_LEV_000	$RSSI < -112.0$	dBm
RSSI_LEV_001	$-112.0 \leq RSSI < -111.9$	dBm
RSSI_LEV_002	$-111.9 \leq RSSI < -111.8$	dBm
...	...	...
RSSI_LEV_619	$-50.2 \leq RSSI < -50.1$	dBm
RSSI_LEV_620	$-50.1 \leq RSSI < -50.0$	dBm
RSSI_LEV_621	$-50.0 \leq RSSI$	dBm

## 8.2.2 SIR

The measurement period shall be 80 ms.

### 8.2.2.1 Accuracy requirement

**Table 8-40**

Parameter	Accuracy	Range
<i>SIR</i>	$\pm 3$ dB	For $-7 < SIR < 20$ dB when RSSI $> -105$ dBm

### 8.2.2.2 SIR measurement report mapping

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

In table 8-41 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-41**

Reported value	Measured quantity value	Unit
UTRAN_SIR_00	$SIR < -11.0$	dB
UTRAN_SIR_01	$-11.0 \leq SIR < -10.5$	dB
UTRAN_SIR_02	$-10.5 \leq SIR < -10.0$	dB
...	...	...
UTRAN_SIR_61	$19.0 \leq SIR < 19.5$	dB
UTRAN_SIR_62	$19.5 \leq SIR < 20.0$	dB
UTRAN_SIR_63	$20.0 \leq SIR$	dB

## 8.2.3 Transmitted carrier power

The measurement period shall be [100] ms.

### 8.2.3.1 Relative accuracy requirement

**Table 8-42**

Parameter	Accuracy	Range
<i>P<sub>tot</sub></i>	$\pm 5\%$ units	For $5\% \leq$ Transmitted carrier power $\leq 95\%$

### 8.2.3.2 Transmitted carrier power measurement report mapping

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

In table 8-43 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-43**

Reported value	Measured quantity value	Unit
UTRAN_TX_POWER_000	Transmitted carrier power = 0	%
UTRAN_TX_POWER_001	$0 < \text{Transmitted carrier power} \leq 1$	%
UTRAN_TX_POWER_002	$1 < \text{Transmitted carrier power} \leq 2$	%
UTRAN_TX_POWER_003	$2 < \text{Transmitted carrier power} \leq 3$	%
...	...	...
UTRAN_TX_POWER_098	$97 < \text{Transmitted carrier power} \leq 98$	%
UTRAN_TX_POWER_099	$98 < \text{Transmitted carrier power} \leq 99$	%
UTRAN_TX_POWER_100	$99 < \text{Transmitted carrier power} \leq 100$	%

## 8.2.4 Transmitted code power

The measurement period shall be [100] ms.

### 8.2.4.1 Absolute accuracy requirement

**Table 8-44**

Parameter	Accuracy	Range
<i>P<sub>code</sub></i>	$\pm 3$ dB	Over the full range

### 8.2.4.2 Relative accuracy requirement

**Table 8-45**

Parameter	Accuracy	Range
<i>I<sub>o</sub></i>	$\pm 2$ dB	Over the full range

### 8.2.4.3 Transmitted code power measurement report mapping

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

In table 8-46 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-46**

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER_010	$-10.0 \leq \text{Transmitted code power} < -9.5$	dBm
UTRAN_CODE_POWER_011	$-9.5 \leq \text{Transmitted code power} < -9.0$	dBm
UTRAN_CODE_POWER_012	$-9.0 \leq \text{Transmitted code power} < -8.5$	dBm

Reported value	Measured quantity value	Unit
...	...	...
UTRAN_CODE_POWER_120	$45.0 \leq \text{Transmitted code power} < 45.5$	dBm
UTRAN_CODE_POWER_121	$45.5 \leq \text{Transmitted code power} < 46.0$	dBm
UTRAN_CODE_POWER_122	$46.0 \leq \text{Transmitted code power} < 46.5$	dBm

## 8.2.5 Transport channel BLER

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

### 8.2.5.1 Accuracy requirement

**Table 8-47**

Parameter	Accuracy	Range
BLER		

### 8.2.5.2 Transport channel BLER measurement report mapping

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

In table 8-48 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-48**

Reported value	Measured quantity value	Unit
BLER_LOG_00	Transport channel BLER = 0	-
BLER_LOG_01	$-\infty < \text{Log}_{10}(\text{Transport channel BLER}) < -4.03$	-
BLER_LOG_02	$-4.03 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.965$	-
BLER_LOG_03	$-3.965 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.9$	-
...	...	...
BLER_LOG_61	$-0.195 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.13$	-
BLER_LOG_62	$-0.13 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.065$	-
BLER_LOG_63	$-0.065 \leq \text{Log}_{10}(\text{Transport channel BLER}) \leq 0$	-

## 8.2.6 Physical channel BER

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

### 8.2.6.1 Accuracy requirement

**Table 8-49**

Parameter	Accuracy	Range
<i>BER</i>	+/- 10% of the absolute BER value.	

### 8.2.6.2 Physical channel BER measurement report mapping

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

In table 8-50 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-50**

Reported value	Measured quantity value	Unit
PhCh_BER_LOG_000	Physical channel BER = 0	-
PhCh_BER_LOG_001	$-\infty < \text{Log}_{10}(\text{Physical channel BER}) < -2.06375$	-
PhCh_BER_LOG_002	$-2.06375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.055625$	-
PhCh_BER_LOG_003	$-2.055625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.0475$	-
...	...	...
PhCh_BER_LOG_253	$-0.024375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.01625$	-
PhCh_BER_LOG_254	$-0.01625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.008125$	-
PhCh_BER_LOG_255	$-0.008125 \leq \text{Log}_{10}(\text{Physical channel BER}) \leq 0$	-

### 8.2.7 Round trip time

The measurement period shall be [100] ms.

#### 8.2.7.1 Absolute accuracy requirement

**Table 8-51**

Parameter	Accuracy	Range
<i>RTT</i>	+/- 0.5 chip	[876, ..., 2923.75] chips

#### 8.2.7.2 Round trip time measurement report mapping

The *Round trip time* reporting range is from 876.00 ... 2923.50 chip.

In table 8-52 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.



**Table 8-52**

Reported value	Measured quantity value	Unit
RT_TIME_0000	Round trip time < 876.00	chip
RT_TIME_0001	$876.00 \leq \text{Round trip time} < 876.25$	chip
RT_TIME_0002	$876.25 \leq \text{Round trip time} < 876.50$	chip
RT_TIME_0003	$876.50 \leq \text{Round trip time} < 876.75$	chip
...	...	...
RT_TIME_8188	$2922.75 \leq \text{Round trip time} < 2923.00$	chip
RT_TIME_8189	$2923.00 \leq \text{Round trip time} < 2923.25$	chip
RT_TIME_8190	$2923.25 \leq \text{Round trip time} < 2923.50$	chip
RT_TIME_8191	$2923.50 \leq \text{Round trip time}$	chip

## 8.2.8 Transport Channel BER

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

### 8.2.8.1 Accuracy requirement

**Table 8-53**

Parameter	Accuracy	Range
<i>TrpBER</i>	+/- []% of the absolute BER value.	

### 8.2.8.2 Transport channel BER measurement report mapping

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

In table 8-54 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-54**

Reported value	Measured quantity value	Unit
TrCh_BER_LOG_000	Transport channel BER = 0	-
TrCh_BER_LOG_001	$-\infty < \text{Log}_{10}(\text{Transport channel BER}) < -2.06375$	-
TrCh_BER_LOG_002	$-2.06375 \leq \text{Log}_{10}(\text{Transport channel BER}) < -2.055625$	-
TrCh_BER_LOG_003	$-2.055625 \leq \text{Log}_{10}(\text{Transport channel BER}) < -2.0475$	-
...	...	...
TrCh_BER_LOG_253	$-0.024375 \leq \text{Log}_{10}(\text{Transport channel BER}) < -0.01625$	-
TrCh_BER_LOG_254	$-0.01625 \leq \text{Log}_{10}(\text{Transport channel BER}) < -0.008125$	-
TrCh_BER_LOG_255	$-0.008125 \leq \text{Log}_{10}(\text{Transport channel BER}) \leq 0$	-

## 8.2.9 UTRAN GPS Timing of Cell Frames for LCS

<b>Requirement</b>	$\pm$ chips/period.
--------------------	---------------------

### 8.2.9.1 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 8-55 the mapping of measured quantity is defined.

**Table 8-55**

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for LCS < 0.125	chip
GPS_TIME_00000000000001	$0.125 \leq$ UTRAN GPS timing of Cell Frames for LCS < 0.250	chip
GPS_TIME_00000000000002	$0.250 \leq$ UTRAN GPS timing of Cell Frames for LCS < 0.375	chip
...	...	...
GPS_TIME_18554879999997	$231935999999.625 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231935999999.750	chip
GPS_TIME_18554879999998	$231935999999.750 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231935999999.875	chip
GPS_TIME_18554879999999	$231935999999.875 \leq$ UTRAN GPS timing of Cell Frames for LCS < 2319360000000.000	chip

## 8.2.10 Propagation delay

### 8.2.10.1 Accuracy requirement

Parameter	Accuracy	Range
<i>PropDelay</i>	$\pm$ chip	

### 8.2.10.2 Propagation delay measurement report mapping

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

In table 8-56 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-56**

Reported value	Measured quantity value	Unit
PROP_DELAY_000	$0 \leq$ Propagation delay < 3	chip

PROP_DELAY_001	$3 \leq \text{Propagation delay} < 6$	ehip
PROP_DELAY_002	$6 \leq \text{Propagation delay} < 9$	ehip
...	...	...
PROP_DELAY_252	$756 \leq \text{Propagation delay} < 759$	ehip
PROP_DELAY_253	$759 \leq \text{Propagation delay} < 762$	ehip
PROP_DELAY_254	$762 \leq \text{Propagation delay} < 765$	ehip
PROP_DELAY_255	$765 \leq \text{Propagation delay}$	ehip

## 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 referred to as point B in the measurement model described in TS25.302.

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

Note: 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.
- $$\left( \frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left( \frac{CPICH - E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$$
- $$\left( \frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left( \frac{SCH - E_c}{I_{or}} \right)_{in\ dB} \leq XdB$$

**Table 9-1: CPICH\_RSCP Intra frequency absolute accuracy**

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	I <sub>o</sub> [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.
- $$\left| CPICH\_RSCP1 \right|_{in\ dB} - \left| CPICH\_RSCP2 \right|_{in\ dB} \leq 20dB$$
- $$\left( \frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left( \frac{CPICH - E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$$
- $$\left( \frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left( \frac{SCH - E_c}{I_{or}} \right)_{in\ dB} \leq XdB$$

**Table 9-2: CPICH RSCP Intra frequency relative accuracy**

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
<u>CPICH RSCP</u>	<u>dBm</u>	<u>± 3</u>	<u>± 3</u>	<u>-94...-50</u>

### 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.
- $\left| CPICH\_RSCP1 \Big|_{in\ dB} - CPICH\_RSCP2 \Big|_{in\ dB} \right| \leq 20dB$
- |Channel 1 Io - Channel 2 Io| ≤ 20 dB.
- $\frac{I_o}{\left( \hat{I}_{or} \right)_{in\ dB}} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$
- $\frac{I_o}{\left( \hat{I}_{or} \right)_{in\ dB}} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq XdB$

**Table 9-3: CPICH RSCP Inter frequency relative accuracy**

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

### 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
<u>CPICH_RSCP_LEV_00</u>	<u>CPICH_RSCP &lt; -115</u>	<u>dBm</u>

<u>CPICH RSCP LEV 01</u>	<u>-115 ≤ CPICH RSCP &lt; -114</u>	<u>dBm</u>
<u>CPICH RSCP LEV 02</u>	<u>-114 ≤ CPICH RSCP &lt; -113</u>	<u>dBm</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>CPICH RSCP LEV 89</u>	<u>-27 ≤ CPICH RSCP &lt; -26</u>	<u>dBm</u>
<u>CPICH RSCP LEV 90</u>	<u>-26 ≤ CPICH RSCP &lt; -25</u>	<u>dBm</u>
<u>CPICH RSCP LEV 91</u>	<u>-25 ≤ CPICH RSCP</u>	<u>dBm</u>

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

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

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>		<u>Conditions</u>
		<u>Normal condition</u>	<u>Extreme condition</u>	<u>Io [dBm]</u>
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>± 4</u>	<u>± 4</u>	<u>-94...-50</u>

#### 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.
- $$\left| CPICH\_RSCP1 \Big|_{in\ dB} - CPICH\_RSCP2 \Big|_{in\ dB} \right| \leq 20dB$$

$$\bullet \frac{I_o}{\left(\hat{I}_{or}\right)_{in \text{ dB}}} - \left(\frac{CPICH\_Ec}{I_{or}}\right)_{in \text{ dB}} \leq 20dB$$

$$\bullet \frac{I_o}{\left(\hat{I}_{or}\right)_{in \text{ dB}}} - \left(\frac{SCH\_Ec}{I_{or}}\right)_{in \text{ dB}} \leq XdB$$

**Table 9-6: CPICH Ec/Io Intra frequency relative accuracy**

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

### 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.
- $\left|CPICH\_RSCP1\right|_{in \text{ dB}} - CPICH\_RSCP2\right|_{in \text{ dB}} \leq 20dB$
- |Channel 1 Io - Channel 2 Io| ≤ 20 dB.
- $\frac{I_o}{\left(\hat{I}_{or}\right)_{in \text{ dB}}} - \left(\frac{CPICH\_Ec}{I_{or}}\right)_{in \text{ dB}} \leq 20dB$
- $\frac{I_o}{\left(\hat{I}_{or}\right)_{in \text{ dB}}} - \left(\frac{SCH\_Ec}{I_{or}}\right)_{in \text{ dB}} \leq XdB$

**Table 9-7: CPICH Ec/Io Inter frequency relative accuracy**

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>± 6</u>	<u>± 6</u>	<u>-94...-50</u>

### 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>CPICH Ec/No_00</u>	<u>CPICH Ec/Io &lt; -24</u>	<u>dB</u>
<u>CPICH Ec/No_01</u>	<u>-24 ≤ CPICH Ec/Io &lt; -23.5</u>	<u>dB</u>
<u>CPICH Ec/No_02</u>	<u>-23.5 ≤ CPICH Ec/Io &lt; -23</u>	<u>dB</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>CPICH Ec/No_48</u>	<u>-1 ≤ CPICH Ec/Io &lt; -0.5</u>	<u>dB</u>
<u>CPICH Ec/No_49</u>	<u>-0.5 ≤ CPICH Ec/Io &lt; 0</u>	<u>dB</u>
<u>CPICH Ec/No_50</u>	<u>0 ≤ CPICH Ec/Io</u>	<u>dB</u>

### 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**

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

#### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	<u>Conditions</u>
------------------	-------------	----------------------	-------------------



		<u>Normal condition</u>	<u>Extreme condition</u>	<u>Io [dBm]</u>
<u>Io</u>	<u>dBm</u>	<u>±7</u>	<u>±11</u>	<u>-94...-70</u>

### 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>UTRA carrier RSSI LEV_00</u>	<u>UTRA carrier RSSI &lt; -100</u>	<u>dBm</u>
<u>UTRA carrier RSSI LEV_01</u>	<u>-100 ≤ UTRA carrier RSSI &lt; -99</u>	<u>dBm</u>
<u>UTRA carrier RSSI LEV_02</u>	<u>-99 ≤ UTRA carrier RSSI &lt; -98</u>	<u>dBm</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UTRA carrier RSSI LEV_74</u>	<u>-27 ≤ UTRA carrier RSSI &lt; -26</u>	<u>dBm</u>
<u>UTRA carrier RSSI LEV_75</u>	<u>-26 ≤ UTRA carrier RSSI &lt; -25</u>	<u>dBm</u>
<u>UTRA carrier RSSI LEV_76</u>	<u>-25 ≤ UTRA carrier RSSI</u>	<u>dBm</u>

### 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>BLER_LOG_00</u>	<u>Transport channel BLER = 0</u>	<u>=</u>
<u>BLER_LOG_01</u>	<u><math>-\infty &lt; \text{Log10(Transport channel BLER)} &lt; -4.03</math></u>	<u>=</u>
<u>BLER_LOG_02</u>	<u><math>-4.03 \leq \text{Log10(Transport channel BLER)} &lt; -3.965</math></u>	<u>=</u>
<u>BLER_LOG_03</u>	<u><math>-3.965 \leq \text{Log10(Transport channel BLER)} &lt; -3.9</math></u>	<u>=</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>BLER_LOG_61</u>	<u><math>-0.195 \leq \text{Log10(Transport channel BLER)} &lt; -0.13</math></u>	<u>=</u>
<u>BLER_LOG_62</u>	<u><math>-0.13 \leq \text{Log10(Transport channel BLER)} &lt; -0.065</math></u>	<u>=</u>
<u>BLER_LOG_63</u>	<u><math>-0.065 \leq \text{Log10(Transport channel BLER)} \leq 0</math></u>	<u>=</u>

## 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**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	
		<u>PUEMAX 24dBm</u>	<u>PUEMAX 21dBm</u>
<u><math>UE\ transmitted\ power = PUEMAX</math></u>	<u>dBm</u>	<u>+1/-3</u>	<u><math>\pm 2</math></u>
<u><math>UE\ transmitted\ power = PUEMAX - 1</math></u>	<u>dBm</u>	<u>+1.5/-3.5</u>	<u><math>\pm 2.5</math></u>
<u><math>UE\ transmitted\ power = PUEMAX - 2</math></u>	<u>dBm</u>	<u>+2/-4</u>	<u><math>\pm 3</math></u>
<u><math>UE\ transmitted\ power = PUEMAX - 3</math></u>	<u>dBm</u>	<u>+2.5/-4.5</u>	<u><math>\pm 3.5</math></u>
<u><math>PUEMAX - 10 \leq UE\ transmitted\ power &lt; PUEMAX - 3</math></u>	<u>dBm</u>	<u>+3/-5</u>	<u><math>\pm 4</math></u>

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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>UE TX POWER_021</u>	<u>-50 ≤ UE transmitted power &lt; -49</u>	<u>dBm</u>
<u>UE TX POWER_022</u>	<u>-49 ≤ UE transmitted power &lt; -48</u>	<u>dBm</u>
<u>UE TX POWER_023</u>	<u>-48 ≤ UE transmitted power &lt; -47</u>	<u>dBm</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UE TX POWER_102</u>	<u>31 ≤ UE transmitted power &lt; 32</u>	<u>dBm</u>
<u>UE TX POWER_103</u>	<u>32 ≤ UE transmitted power &lt; 33</u>	<u>dBm</u>
<u>UE TX POWER_104</u>	<u>33 ≤ UE transmitted power &lt; 34</u>	<u>dBm</u>

### 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:

- $CPICH\_RSCP_{1,2} \geq -114$  dBm.
- $\left| CPICH\_RSCP1 \Big|_{in\ dB} - CPICH\_RSCP2 \Big|_{in\ dB} \right| \leq 20dB$
- $\frac{I_o}{\left( \hat{I}_{or} \right)_{in\ dB}} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$
- $\frac{I_o}{\left( \hat{I}_{or} \right)_{in\ dB}} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq XdB$

**Table 9-15**

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

#### 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:

- $CPICH\_RSCP_{1,2} \geq -114$  dBm.
- $\left| CPICH\_RSCP1 \Big|_{in\ dB} - CPICH\_RSCP2 \Big|_{in\ dB} \right| \leq 20dB$
- $|Channel\ 1\ I_o - Channel\ 2\ I_o| \leq 20$  dB.
- $\frac{I_o}{\hat{I}_{or}} \Big|_{in\ dB} - \left( \frac{CPICH - E_c}{I_{or}} \right) \Big|_{in\ dB} \leq 20dB$
- $\frac{I_o}{\hat{I}_{or}} \Big|_{in\ dB} - \left( \frac{SCH - E_c}{I_{or}} \right) \Big|_{in\ dB} \leq XdB$

**Table 9-16**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [chip]</u>	<u>Conditions</u>
			<u>I<sub>o</sub> [dBm]</u>
<u>SFN-CFN observed time difference</u>	<u>chip</u>	<u>± 1</u>	<u>-94...-50</u>

### 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>SFN-CFN_TIME_000000</u>	<u>0 ≤ SFN-CFN observed time difference &lt; 1</u>	<u>chip</u>
<u>SFN-CFN_TIME_000001</u>	<u>1 ≤ SFN-CFN observed time difference &lt; 2</u>	<u>chip</u>
<u>SFN-CFN_TIME_000002</u>	<u>2 ≤ SFN-CFN observed time difference &lt; 3</u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>SFN-CFN_TIME_9830397</u>	<u>9830397 ≤ SFN-CFN observed time difference &lt; 9830398</u>	<u>chip</u>
<u>SFN-CFN_TIME_9830398</u>	<u>9830398 ≤ SFN-CFN observed time difference &lt; 9830399</u>	<u>chip</u>
<u>SFN-CFN_TIME_9830399</u>	<u>9830399 ≤ SFN-CFN observed time difference &lt; 9830400</u>	<u>chip</u>

## 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:

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

**Table 9-18**

Parameter	Unit	Accuracy [chip]	Conditions
			I <sub>o</sub> [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_000000	$0 \leq$ SFN-SFN observed time difference type 1 < 1	chip
T1_SFN-SFN_TIME_000001	$1 \leq$ SFN-SFN observed time difference type 1 < 2	chip
T1_SFN-SFN_TIME_000002	$2 \leq$ SFN-SFN observed time difference type 1 < 3	chip
...	...	...
T1_SFN-SFN_TIME_9830397	$9830397 \leq$ SFN-SFN observed time	chip

	<u>difference type 1 &lt; 9830398</u>	
<u>T1 SFN-SFN TIME 9830398</u>	<u>9830398 ≤ SFN-SFN observed time</u> <u>difference type 1 &lt; 980399</u>	<u>chip</u>
<u>T1 SFN-SFN TIME 9830399</u>	<u>9830399 ≤ SFN-SFN observed time</u> <u>difference type 1 &lt; 9830400</u>	<u>chip</u>

### 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:

- $CPICH\_RSCP_{1,2} \geq -114$  dBm.
- $\left| CPICH\_RSCP1 \Big|_{in\ dB} - CPICH\_RSCP2 \Big|_{in\ dB} \right| \leq 20$  dB
- $\frac{I_o}{\left( \hat{I}_{or} \right)_{in\ dB}} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20$  dB
- $\frac{I_o}{\left( \hat{I}_{or} \right)_{in\ dB}} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq X$  dB

**Table 9-20**

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

#### 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:

- $CPICH\_RSCP_{1,2} \geq -114$  dBm.
- $\left| CPICH\_RSCP1 \Big|_{in\ dB} - CPICH\_RSCP2 \Big|_{in\ dB} \right| \leq 20$  dB

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

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

**Table 9-21**

Parameter	Unit	Accuracy [chip]	Conditions
			<u>I<sub>o</sub> [dBm]</u>
<u>SFN-SFN observed time difference type 2</u>	<u>chip</u>	<u>± 0.5</u>	<u>-94...-50</u>

### 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.
- $$\left| CPICH\_RSCP1_{in\ dB} - CPICH\_RSCP2_{in\ dB} \right| \leq 20dB$$
- |Channel 1 I<sub>o</sub> - Channel 2 I<sub>o</sub>| ≤ 20 dB.
- $$\frac{I_o}{(\hat{I}_{or})_{in\ dB}} - \left( \frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB$$
- $$\frac{I_o}{(\hat{I}_{or})_{in\ dB}} - \left( \frac{SCH\_E_c}{I_{or}} \right)_{in\ dB} \leq XdB$$

**Table 9-22**

Parameter	Unit	Accuracy [chip]	Conditions
			<u>I<sub>o</sub> [dBm]</u>
<u>SFN-SFN observed time difference type 2</u>	<u>chip</u>	<u>± 1</u>	<u>-94...-50</u>

#### 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  $-1280 \dots +1280$  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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>T2 SFN-SFN TIME 00000</u>	<u>SFN-SFN observed time difference type 2 &lt; -1280.0000</u>	<u>chip</u>
<u>T2 SFN-SFN TIME 00001</u>	<u><math>-1280.0000 \leq</math> SFN-SFN observed time difference type 2 &lt; <math>-1279.9375</math></u>	<u>chip</u>
<u>T2 SFN-SFN TIME 00002</u>	<u><math>-1279.9375 \leq</math> SFN-SFN observed time difference type 2 &lt; <math>-1279.8750</math></u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>T2 SFN-SFN TIME 40959</u>	<u><math>1279.8750 \leq</math> SFN-SFN observed time difference type 2 &lt; <math>1279.9375</math></u>	<u>chip</u>
<u>T2 SFN-SFN TIME 40960</u>	<u><math>1279.9375 \leq</math> SFN-SFN observed time difference type 2 &lt; <math>1280.0000</math></u>	<u>chip</u>
<u>T2 SFN-SFN TIME 40961</u>	<u><math>1280.0000 \leq</math> SFN-SFN observed time difference type 2</u>	<u>chip</u>

#### 9.1.9 UE Rx-Tx time difference

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 Measurement requirement

**Table 9-24**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [chip]</u>	<u>Conditions</u>
			<u>Io [dBm]</u>
<u>UE RX-TX time difference</u>	<u>chip</u>	<u><math>\pm 1.5</math></u>	<u><math>-94 \dots -50</math></u>

##### 9.1.9.2 UE Rx-Tx time difference measurement report mapping

The reporting range is for *UE Rx-Tx time difference* is from  $768 \dots 1280$  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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>RX-TX TIME 0000</u>	<u>UE Rx-Tx Time difference &lt; 768.000</u>	<u>chip</u>
<u>RX-TX TIME 0001</u>	<u><math>768.000 \leq</math> UE Rx-Tx Time difference &lt; <math>768.0625</math></u>	<u>chip</u>



<u>RX-TX TIME 0002</u>	<u><math>768.0625 \leq \text{UE Rx-Tx Time difference} &lt; 768.1250</math></u>	<u>chip</u>
<u>RX-TX TIME 0003</u>	<u><math>768.1250 \leq \text{UE Rx-Tx Time difference} &lt; 768.1875</math></u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>RX-TX TIME 8190</u>	<u><math>1279.8125 \leq \text{UE Rx-Tx Time difference} &lt; 1279.8750</math></u>	<u>chip</u>
<u>RX-TX TIME 8191</u>	<u><math>1279.8750 \leq \text{UE Rx-Tx Time difference} &lt; 1279.9375</math></u>	<u>chip</u>
<u>RX-TX TIME 8192</u>	<u><math>1279.9375 \leq \text{UE Rx-Tx Time difference} &lt; 1280.0000</math></u>	<u>chip</u>
<u>RX-TX TIME 8193</u>	<u><math>1280.0000 \leq \text{UE Rx-Tx Time difference}</math></u>	<u>chip</u>

### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [chip]</u>	<u>Conditions</u>
<u>Observed time difference to GSM cell</u>	<u>ms</u>	<u><math>\pm 20</math></u>	

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**

<u>Reported value</u>	<u>Measured quantity value</u>
<u>GSM_TIME_0000</u>	<u><math>0 \leq \text{Observed time difference to GSM cell} &lt; 1 \times 3060 / (4096 \times 13)</math></u>
<u>GSM_TIME_0001</u>	<u><math>1 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 2 \times 3060 / (4096 \times 13)</math></u>
<u>GSM_TIME_0002</u>	<u><math>2 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 3 \times 3060 / (4096 \times 13)</math></u>
<u>GSM_TIME_0003</u>	<u><math>3 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt; 4 \times 3060 / (4096 \times 13)</math></u>
<u>...</u>	<u>...</u>
<u>GSM_TIME_4093</u>	<u><math>4093 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} &lt;</math></u>

	$4094 \times 3060 / (4096 \times 13)$
<u>GSM TIME 4094</u>	$4094 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} < 4095 \times 3060 / (4096 \times 13)$
<u>GSM TIME 4095</u>	$4095 \times 3060 / (4096 \times 13) \leq \text{Observed time difference to GSM cell} < 3060 / 13$

### 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:

- $P\text{-CCPCH RSCP} \geq -102$  dBm.
- $|I_o - P\text{-CCPCH Ec/Ior}| \leq [20]$  dB.

**Table 9-28: P-CCPCH RSCP Inter frequency absolute accuracy**

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	$I_o$ [dBm]
<u>P-CCPCH RSCP</u>	<u>dBm</u>	$\pm 6$	$\pm 9$	<u>-94...-70</u>
	<u>dBm</u>	$\pm 8$	$\pm 11$	<u>-94...-50</u>

#### 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
<u>PCCPCH RSCP LEV 00</u>	<u>PCCPCH RSCP &lt; -115</u>	<u>dBm</u>
<u>PCCPCH RSCP LEV 01</u>	<u>-115 ≤ PCCPCH RSCP &lt; -114</u>	<u>dBm</u>
<u>PCCPCH RSCP LEV 02</u>	<u>-114 ≤ PCCPCH RSCP &lt; -113</u>	<u>dBm</u>
<u>PCCPCH RSCP LEV 03</u>	<u>-113 ≤ PCCPCH RSCP &lt; -112</u>	<u>dBm</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>PCCPCH RSCP LEV 89</u>	<u>-27 ≤ PCCPCH RSCP &lt; -26</u>	<u>dBm</u>

<u>PCCPCH RSCP LEV 90</u>	<u><math>-26 \leq \text{PCCPCH RSCP} &lt; -25</math></u>	<u>dBm</u>
<u>PCCPCH RSCP LEV 91</u>	<u><math>-25 \leq \text{PCCPCH RSCP}</math></u>	<u>dBm</u>

### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [chip]</u>	<u>Conditions</u>
<u>UE GPS Timing of Cell Frames for LCS</u>	<u>chip</u>	<u>1</u>	

#### 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>GPS_TIME_00000000000000</u>	<u>UE GPS timing of Cell Frames for LCS &lt; 0.0625</u>	<u>chip</u>
<u>GPS_TIME_00000000000001</u>	<u><math>0.0625 \leq \text{UE GPS timing of Cell Frames for LCS} &lt; 0.1250</math></u>	<u>chip</u>
<u>GPS_TIME_00000000000002</u>	<u><math>0.1250 \leq \text{UE GPS timing of Cell Frames for LCS} &lt; 0.1875</math></u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>GPS_TIME_37109759999997</u>	<u><math>231935999999.8125 \leq \text{UE GPS timing of Cell Frames for LCS} &lt; 231935999999.8750</math></u>	<u>chip</u>
<u>GPS_TIME_37109759999998</u>	<u><math>231935999999.8750 \leq \text{UE GPS timing of Cell Frames for LCS} &lt; 231935999999.9375</math></u>	<u>chip</u>
<u>GPS_TIME_37109759999999</u>	<u><math>231935999999.9375 \leq \text{UE GPS timing of Cell Frames for LCS} &lt; 231936000000.0000</math></u>	<u>chip</u>

## 9.2 Measurements Performance for UTRAN

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

The measurement period shall be [100] ms.

### 9.2.1.1 Absolute accuracy requirement

**Table 9-32**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	<u>Conditions</u>
			<u>Range</u>
<u><i>I<sub>o</sub></i></u>	<u>dBm</u>	<u>± 4</u>	<u>For levels ≤ -74 dBm</u>

### 9.2.1.2 Relative accuracy requirement

The relative accuracy of RSSI is defined as the RSSI measured at one frequency compared to the RSSI 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 definiton of the UTRAN RSSI measurement is decided within WG1.

**Table 9-33**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	<u>Conditions</u>
			<u>Range</u>
<u><i>I<sub>o</sub></i></u>	<u>dBm</u>	<u>± [0.5]</u>	<u>For changes ≤ ±5.0dB for <i>I<sub>o</sub></i> ≤ -74dBm</u>

### 9.2.1.3 RSSI measurement report mapping

The reporting range for RSSI 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>RSSI LEV_000</u>	<u>RSSI &lt; -112.0</u>	<u>dBm</u>
<u>RSSI LEV_001</u>	<u>-112.0 ≤ RSSI &lt; -111.9</u>	<u>dBm</u>
<u>RSSI LEV_002</u>	<u>-111.9 ≤ RSSI &lt; -111.8</u>	<u>dBm</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>RSSI LEV_619</u>	<u>-50.2 ≤ RSSI &lt; -50.1</u>	<u>dBm</u>
<u>RSSI LEV_620</u>	<u>-50.1 ≤ RSSI &lt; -50.0</u>	<u>dBm</u>
<u>RSSI LEV_621</u>	<u>-50.0 ≤ RSSI</u>	<u>dBm</u>

## 9.2.2 SIR

The measurement period shall be 80 ms.

### 9.2.2.1 Accuracy requirement

**Table 9-35**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	<u>Conditions</u>
			<u>Range</u>
<u>SIR</u>	<u>dB</u>	<u>± 3</u>	<u>For -7&lt;SIR&lt;20 dB when I<sub>o</sub> &gt; -105 dBm</u>

### 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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>UTRAN SIR_00</u>	<u>SIR &lt; -11.0</u>	<u>dB</u>
<u>UTRAN SIR_01</u>	<u>-11.0 ≤ SIR &lt; -10.5</u>	<u>dB</u>
<u>UTRAN SIR_02</u>	<u>-10.5 ≤ SIR &lt; -10.0</u>	<u>dB</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UTRAN SIR_61</u>	<u>19.0 ≤ SIR &lt; 19.5</u>	<u>dB</u>
<u>UTRAN SIR_62</u>	<u>19.5 ≤ SIR &lt; 20.0</u>	<u>dB</u>
<u>UTRAN SIR_63</u>	<u>20.0 ≤ SIR</u>	<u>dB</u>

## 9.2.3 Transmitted carrier power

The measurement period shall be [100] ms.

### 9.2.3.1 Accuracy requirement

**Table 9-37**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [% units]</u>	<u>Conditions</u>
			<u>Range</u>
<u>P<sub>tot</sub></u>	<u>%</u>	<u>± 5</u>	<u>For 5% ≤ Transmitted carrier power ≤ 95%</u>

### 9.2.3.2 Transmitted carrier power measurement report mapping

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

In table 9-38 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-38**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>UTRAN TX POWER 000</u>	<u>Transmitted carrier power = 0</u>	<u>%</u>
<u>UTRAN TX POWER 001</u>	<u>0 &lt; Transmitted carrier power ≤ 1</u>	<u>%</u>
<u>UTRAN TX POWER 002</u>	<u>1 &lt; Transmitted carrier power ≤ 2</u>	<u>%</u>
<u>UTRAN TX POWER 003</u>	<u>2 &lt; Transmitted carrier power ≤ 3</u>	<u>%</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UTRAN TX POWER 098</u>	<u>97 &lt; Transmitted carrier power ≤ 98</u>	<u>%</u>
<u>UTRAN TX POWER 099</u>	<u>98 &lt; Transmitted carrier power ≤ 99</u>	<u>%</u>
<u>UTRAN TX POWER 100</u>	<u>99 &lt; Transmitted carrier power ≤ 100</u>	<u>%</u>

## 9.2.4 Transmitted code power

The measurement period shall be [100] ms.

### 9.2.4.1 Absolute accuracy requirement

**Table 9-39**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	<u>Conditions</u>
			<u>Range</u>
<u>Pcode</u>	<u>dBm</u>	<u>± 3</u>	<u>Over the full range</u>

### 9.2.4.2 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 9-40**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [dB]</u>	<u>Conditions</u>
			<u>Range</u>
<u>Pcode</u>	<u>dBm</u>	<u>± 2</u>	<u>Over the full range</u>

### 9.2.4.3 Transmitted code power measurement report mapping

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

In table 9-41 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-41**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>UTRAN_CODE_POWER_010</u>	<u><math>-10.0 \leq \text{Transmitted code power} &lt; -9.5</math></u>	<u>dBm</u>
<u>UTRAN_CODE_POWER_011</u>	<u><math>-9.5 \leq \text{Transmitted code power} &lt; -9.0</math></u>	<u>dBm</u>
<u>UTRAN_CODE_POWER_012</u>	<u><math>-9.0 \leq \text{Transmitted code power} &lt; -8.5</math></u>	<u>dBm</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UTRAN_CODE_POWER_120</u>	<u><math>45.0 \leq \text{Transmitted code power} &lt; 45.5</math></u>	<u>dBm</u>
<u>UTRAN_CODE_POWER_121</u>	<u><math>45.5 \leq \text{Transmitted code power} &lt; 46.0</math></u>	<u>dBm</u>
<u>UTRAN_CODE_POWER_122</u>	<u><math>46.0 \leq \text{Transmitted code power} &lt; 46.5</math></u>	<u>dBm</u>

## 9.2.5 Transport channel BLER

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

### 9.2.5.1 Accuracy requirement

**Table 9-42**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy</u>	<u>Conditions</u>
			<u>Range</u>
<u>BLER</u>	<u>=</u>		

### 9.2.5.2 Transport channel BLER measurement report mapping

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

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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>BLER_LOG_00</u>	<u>Transport channel BLER = 0</u>	<u>=</u>
<u>BLER_LOG_01</u>	<u><math>-\infty &lt; \text{Log}_{10}(\text{Transport channel BLER}) &lt; -4.03</math></u>	<u>=</u>
<u>BLER_LOG_02</u>	<u><math>-4.03 \leq \text{Log}_{10}(\text{Transport channel BLER}) &lt; -3.965</math></u>	<u>=</u>
<u>BLER_LOG_03</u>	<u><math>-3.965 \leq \text{Log}_{10}(\text{Transport channel BLER}) &lt; -3.9</math></u>	<u>=</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>BLER_LOG_61</u>	<u><math>-0.195 \leq \text{Log}_{10}(\text{Transport channel BLER}) &lt; -0.13</math></u>	<u>=</u>
<u>BLER_LOG_62</u>	<u><math>-0.13 \leq \text{Log}_{10}(\text{Transport channel BLER}) &lt; -0.065</math></u>	<u>=</u>
<u>BLER_LOG_63</u>	<u><math>-0.065 \leq \text{Log}_{10}(\text{Transport channel BLER}) \leq 0</math></u>	<u>=</u>

## 9.2.6 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.

### 9.2.6.1 Accuracy requirement

**Table 9-44**

Parameter	Unit	Accuracy [% of absolute BER value]	Conditions
			Range
<i>BER</i>	=	+/- 10%	

### 9.2.6.2 Physical channel BER measurement report mapping

The Physical channel BER 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
<i>PhCh_BER_LOG_000</i>	Physical channel BER = 0	=
<i>PhCh_BER_LOG_001</i>	$-\infty < \text{Log}_{10}(\text{Physical channel BER}) < -2.06375$	=
<i>PhCh_BER_LOG_002</i>	$-2.06375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.055625$	=
<i>PhCh_BER_LOG_003</i>	$-2.055625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.0475$	=
...	...	...
<i>PhCh_BER_LOG_253</i>	$-0.024375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.01625$	=
<i>PhCh_BER_LOG_254</i>	$-0.01625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.008125$	=
<i>PhCh_BER_LOG_255</i>	$-0.008125 \leq \text{Log}_{10}(\text{Physical channel BER}) \leq 0$	=

## 9.2.7 Round trip time

The measurement period shall be [100] ms.

### 9.2.7.1 Absolute accuracy requirement

**Table 9-46**

Parameter	Unit	Accuracy [chip]	Conditions
			Range [chips]
<i>RTT</i>	chip	+/- 0.5	876, ..., 2923.50



### 9.2.7.2 Round trip time measurement report mapping

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

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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>RT_TIME_0000</u>	<u>Round trip time &lt; 876.0000</u>	<u>chip</u>
<u>RT_TIME_0001</u>	<u>876.0000 ≤ Round trip time &lt; 876.0625</u>	<u>chip</u>
<u>RT_TIME_0002</u>	<u>876.0625 ≤ Round trip time &lt; 876.1250</u>	<u>chip</u>
<u>RT_TIME_0003</u>	<u>876.1250 ≤ Round trip time &lt; 876.1875</u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>RT_TIME_32764</u>	<u>2922.6875 ≤ Round trip time &lt; 2923.7500</u>	<u>chip</u>
<u>RT_TIME_32765</u>	<u>2923.7500 ≤ Round trip time &lt; 2923.8125</u>	<u>chip</u>
<u>RT_TIME_32766</u>	<u>2923.8125 ≤ Round trip time &lt; 2923.8750</u>	<u>chip</u>
<u>RT_TIME_32767</u>	<u>2923.8750 ≤ Round trip time</u>	<u>chip</u>

### 9.2.8 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.

#### 9.2.8.1 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 9-48.

**Table 9-48**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [% of the absolute BER value]</u>	<u>Conditions</u>
			<u>Range</u>
<u>TrpBER</u>	<u>=</u>	<u>+/- 10</u>	<u>Convolutional coding 1/3<sup>rd</sup> with any amount of repetition or a maximum of 25% puncturing:</u> <u>for absolute BER value ≤ 15%</u>  <u>Convolutional coding 1/2 with any amount of repetition or no puncturing:</u> <u>for absolute BER value ≤ 15%</u>  <u>Turbo coding 1/3<sup>rd</sup> with any amount of repetition or a maximum of 20% puncturing:</u> <u>for absolute BER value ≤ 15%.</u>

#### 9.2.8.2 Transport channel BER measurement report mapping

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

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**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>TrCh BER LOG 000</u>	<u>Transport channel BER = 0</u>	<u>=</u>
<u>TrCh BER LOG 001</u>	<u><math>-\infty &lt; \text{Log10(Transport channel BER)} &lt; -2.06375</math></u>	<u>=</u>
<u>TrCh BER LOG 002</u>	<u><math>-2.06375 \leq \text{Log10(Transport channel BER)} &lt; -2.055625</math></u>	<u>=</u>
<u>TrCh BER LOG 003</u>	<u><math>-2.055625 \leq \text{Log10(Transport channel BER)} &lt; -2.0475</math></u>	<u>=</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>TrCh BER LOG 253</u>	<u><math>-0.024375 \leq \text{Log10(Transport channel BER)} &lt; -0.01625</math></u>	<u>=</u>
<u>TrCh BER LOG 254</u>	<u><math>-0.01625 \leq \text{Log10(Transport channel BER)} &lt; -0.008125</math></u>	<u>=</u>
<u>TrCh BER LOG 255</u>	<u><math>-0.008125 \leq \text{Log10(Transport channel BER)} \leq 0</math></u>	<u>=</u>

### 9.2.9 UTRAN GPS Timing of Cell Frames for LCS

**Table 9-50**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [chip]</u>	<u>Conditions</u>
<u>UTRAN GPS Timing of Cell Frames for LCS</u>	<u>chip</u>	<u>[ ]</u>	

#### 9.2.9.1 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 9-51 the mapping of measured quantity is defined.

**Table 9-51**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>GPS_TIME_0000000000000</u>	<u>UTRAN GPS timing of Cell Frames for LCS <math>\leq 0.0625</math></u>	<u>chip</u>
<u>GPS_TIME_0000000000001</u>	<u><math>0.0625 \leq \text{UTRAN GPS timing of Cell Frames for LCS} &lt; 0.1250</math></u>	<u>chip</u>
<u>GPS_TIME_0000000000002</u>	<u><math>0.1250 \leq \text{UTRAN GPS timing of Cell Frames for LCS} &lt; 0.1875</math></u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>GPS_TIME_37109759999997</u>	<u><math>231935999999.8125 \leq \text{UTRAN GPS timing of Cell}</math></u>	<u>chip</u>

	<u>Frames for LCS &lt; 231935999999.8750</u>	
<u>GPS TIME 37109759999998</u>	<u>231935999999.8750 ≤ UTRAN GPS timing of Cell Frames for LCS &lt; 231935999999.9375</u>	<u>chip</u>
<u>GPS TIME 37109759999999</u>	<u>231935999999.9375 ≤ UTRAN GPS timing of Cell Frames for LCS &lt; 2319360000000.0000</u>	<u>chip</u>

## 9.2.10 PRACH/PCPCH Propagation delay

### 9.2.10.1 Accuracy requirement

**Table 9-52**

<u>Parameter</u>	<u>Unit</u>	<u>Accuracy [chip]</u>	<u>Conditions</u>
			<u>Range</u>
<u>PropDelay</u>	<u>chip</u>	<u>+/- []</u>	

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

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

In table 9-53 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 9-53**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>PROP_DELAY_000</u>	<u>0 ≤ PRACH/PCPCH Propagation delay &lt; 3</u>	<u>chip</u>
<u>PROP_DELAY_001</u>	<u>3 ≤ PRACH/PCPCH Propagation delay &lt; 6</u>	<u>chip</u>
<u>PROP_DELAY_002</u>	<u>6 ≤ PRACH/PCPCH Propagation delay &lt; 9</u>	<u>chip</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>PROP_DELAY_252</u>	<u>756 ≤ PRACH/PCPCH Propagation delay &lt; 759</u>	<u>chip</u>
<u>PROP_DELAY_253</u>	<u>759 ≤ PRACH/PCPCH Propagation delay &lt; 762</u>	<u>chip</u>
<u>PROP_DELAY_254</u>	<u>762 ≤ PRACH/PCPCH Propagation delay &lt; 765</u>	<u>chip</u>
<u>PROP_DELAY_255</u>	<u>765 ≤ PRACH/PCPCH Propagation delay</u>	<u>chip</u>

## 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 1</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u>Ior/Ioc</u>	<u>dB</u>	<u>10.5</u>	<u>10.5</u>
<u>Ioc</u>	<u>dBm/ 3.84 MHz</u>	<u>Io -13.7 dB = Ioc,</u> <u>Note 1</u>	<u>Io -13.7 dB = Ioc,</u> <u>Note 1</u>
<u>Range 1:Io</u>		<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: Io</u>	<u>dBm</u>	<u>-94...-50</u>	<u>-94...-50</u>

<u>Propagation condition</u>	=	<u>AWGN</u>
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NOTE 1:  $I_{oc}$  level shall be adjusted according the total signal power  $I_o$  at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 2</u>
<u>CPICH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>10.1</u>	<u>10.1</u>
<u><math>I_{oc}</math></u>	<u>dBm/ 3.84 MHz</u>	<u><math>I_o - 10.6 \text{ dB} = I_{oc}, \text{ Note 1}</math></u>	<u><math>I_o - 10.6 \text{ dB} = I_{oc}, \text{ Note 1}</math></u>
<u>Range 1: <math>I_o</math></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: <math>I_o</math></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	=	<u>AWGN</u>	

NOTE 1:  $I_{oc}$  level shall be adjusted in each carrier frequency according the total signal power  $I_o$  at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

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  $E_c/I_o$

A.9.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH  $E_c/I_o$  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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 1</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u>I<sub>or</sub>/I<sub>oc</sub></u>	<u>dB</u>	<u>10.5</u>	<u>10.5</u>
<u>I<sub>oc</sub></u>	<u>dBm/ 3.84 MHz</u>	<u>I<sub>o</sub> -13.7 dB = I<sub>oc</sub>, Note 1</u>	<u>I<sub>o</sub> -13.7 dB = I<sub>oc</sub>, Note 1</u>
<u>Range 1: I<sub>o</sub></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: I<sub>o</sub></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1: I<sub>oc</sub> level shall be adjusted according the total signal power I<sub>o</sub> at receiver input and the geometry factor I<sub>or</sub>/I<sub>oc</sub>.

#### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 2</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>10.1</u>	<u>10.1</u>
<u><math>I_{oc}</math></u>	<u>dBm/ 3.84 MHz</u>	<u><math>I_{o} -10.6 \text{ dB} = I_{oc}</math>, Note 1</u>	<u><math>I_{o} -10.6 \text{ dB} = I_{oc}</math>, Note 1</u>
<u>Range 1: <math>I_{o}</math></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: <math>I_{o}</math></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1:  $I_{oc}$  level shall be adjusted in each carrier frequency according the total signal power  $I_{o}$  at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

#### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>	<u>=</u>	<u>Channel 1</u>	<u>Channel 2</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>-1</u>	<u>-1</u>
<u><math>I_{oc}</math></u>	<u>dBm/ 3.84 MHz</u>	<u><math>I_{o} -4.13 \text{ dB} = I_{oc}</math>, Note 1</u>	<u><math>I_{o} -4.13 \text{ dB} = I_{oc}</math>, Note 1</u>
<u>Range 1: <math>I_{o}</math></u>	<u>dBm/ 3.84 MHz</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: <math>I_{o}</math></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1:  $I_{oc}$  level shall be adjusted according the total signal power  $I_{o}$  at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

##### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 1</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>10.5</u>	<u>10.5</u>
<u>I<sub>oc</sub></u>	<u>dBm/ 3.84 MHz</u>	<u>I<sub>o</sub> -13.7 dB = I<sub>oc</sub>, Note 1</u>	<u>I<sub>o</sub> -13.7 dB = I<sub>oc</sub>, Note 1</u>
<u>Range 1: I<sub>o</sub></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: I<sub>o</sub></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1: I<sub>oc</sub> level shall be adjusted according the total signal power I<sub>o</sub> at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

#### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 2</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>



<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u>I<sub>or</sub>/I<sub>oc</sub></u>	<u>dB</u>	<u>10.1</u>	<u>10.1</u>
<u>I<sub>oc</sub></u>	<u>dBm/ 3.84 MHz</u>	<u>I<sub>o</sub> -10.6 dB = I<sub>oc</sub>, Note 1</u>	<u>I<sub>o</sub> -10.6 dB = I<sub>oc</sub>, Note 1</u>
<u>Range 1: I<sub>o</sub></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: I<sub>o</sub></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1: I<sub>oc</sub> level shall be adjusted in each carrier frequency according the total signal power I<sub>o</sub> at receiver input and the geometry factor I<sub>or</sub>/I<sub>oc</sub>.

#### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 1</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>

<u><math>\hat{I}_{or/Ioc}</math></u>	<u>dB</u>	<u>10.5</u>	<u>10.5</u>
<u><math>I_{oc}</math></u>	<u>dBm/ 3.84 MHz</u>	<u><math>I_o -13.7\text{ dB} = I_{oc}</math>, Note 1</u>	<u><math>I_o -13.7\text{ dB} = I_{oc}</math>, Note 1</u>
<u>Range 1:<math>I_o</math></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: <math>I_o</math></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1:  $I_{oc}$  level shall be adjusted according the total signal power  $I_o$  at receiver input and the geometry factor  $\hat{I}_{or/Ioc}$ .

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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>	<u>Channel 1</u>
<u>CPICH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-10</u>	<u>-10</u>
<u>PCCPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>SCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-12</u>	<u>-12</u>
<u>PICH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>DPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-15</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>	<u>-1.11</u>
<u><math>\hat{I}_{or/Ioc}</math></u>	<u>dB</u>	<u>10.5</u>	<u>10.5</u>
<u><math>I_{oc}</math></u>	<u>dBm/ 3.84 MHz</u>	<u><math>I_o -13.7\text{ dB} = I_{oc}</math>, Note 1</u>	<u><math>I_o -13.7\text{ dB} = I_{oc}</math>, Note 1</u>
<u>Range 1:<math>I_o</math></u>	<u>dBm</u>	<u>-94...-70</u>	<u>-94...-70</u>
<u>Range 2: <math>I_o</math></u>		<u>-94...-50</u>	<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	

NOTE 1:  $I_{oc}$  level shall be adjusted according the total signal power  $I_o$  at receiver input and the geometry factor  $\hat{I}_{or/Ioc}$ .

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**

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

Note The total signal  $I_o$  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 Test Purpose and Environment

The purpose of this test is to verify that the UE Rx-Tx time difference measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.9.

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 Intra frequency test parameters**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>
<u>UTRA RF Channel number</u>		<u>Channel 1</u>
<u>CPICH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-10</u>
<u>PCCPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-12</u>
<u>SCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-12</u>
<u>PICH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-15</u>
<u>DPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-15</u>
<u>OCNS</u>	<u>dB</u>	<u>-1.11</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>10.5</u>
<u><math>I_{oc}</math></u>	<u>dBm/ 3.84 MHz</u>	<u><math>I_o - 13.7 \text{ dB} = I_{oc}</math>, Note 1</u>
<u>Range 1:<math>I_o</math></u>	<u>dBm</u>	<u>-94...-70</u>

<u>Range 2: <math>I_o</math></u>		<u>-94...-50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>

NOTE 1:  $I_{oc}$  level shall be adjusted according the total signal power  $I_o$  at receiver input and the geometry factor  $\hat{I}_{oc}$ .

#### A.9.1.6.2 Test Requirements

The UE Rx-Tx time difference measurement accuracy shall meet the requirements in section 9.1.9.

#### 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>	<u>Cell 2</u>
<u>Timeslot Number</u>		<u>n.a.</u>	<u>k</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>	<u>Channel 2</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>-10</u>	<u>n.a.</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>-3</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>-12</u>	<u>=</u>
<u>SCH t<sub>offset</sub></u>		<u>n.a.</u>	<u>=</u>
<u>PICH Ec/Ior</u>		<u>-15</u>	<u>=</u>
<u>DPCH Ec/Ior</u>	<u>dB</u>	<u>[ ]</u>	<u>[ ]</u>
<u>OCNS</u>	<u>dB</u>	<u>[To Be Calculated]</u>	<u>[ ]</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>[ ]</u>	<u>[ ]</u>
<u>I<sub>oc</sub></u>	<u>dBm/3.84 MHz</u>	<u>Note 1</u>	<u>-70</u>
<u>Range 1: I<sub>o</sub></u>	<u>dBm</u>	<u>-94 ... -70</u>	<u>-94 ... -70</u>
<u>Range 2: I<sub>o</sub></u>		<u>-94... -50</u>	<u>-94... -50</u>
<u>Propagation condition</u>	<u>=</u>	<u>AWGN</u>	<u>AWGN</u>

NOTE 1: I<sub>oc</sub> level shall be adjusted according the total signal power I<sub>o</sub> at receiver input and the geometry factor  $\hat{I}_{or}/I_{oc}$ .

#### A.9.1.8.2 Test Requirements

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

<b>CHANGE REQUEST</b>		Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.
<b>25.133</b>	<b>CR 42</b>	Current Version: <b>3.2.0</b>
GSM (AA.BB) or 3G (AA.BBB) specification number ↑	↑ CR number as allocated by MCC support team	
For submission to: <b>TSG RAN#9</b> <small>list expected approval meeting # here ↑</small>	for approval <input checked="" type="checkbox"/> For information <input type="checkbox"/>	strategic <input type="checkbox"/> non-strategic <input type="checkbox"/> <small>(for SMG use only)</small>

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
(at least one should be marked with an X)

**Source:** RAN WG4 **Date:** 2000-09-05

**Subject:** Revision of requirement and range of measurement for CPCH

**Work item:**

<b>Category:</b>	F Correction <input type="checkbox"/> A Corresponds to a correction in an earlier release <input type="checkbox"/> B Addition of feature <input checked="" type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	<b>Release:</b>	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input checked="" type="checkbox"/> Release 00 <input type="checkbox"/>
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(only one category shall be marked with an X)

**Reason for change:** Since the measurements 'Detected PCPCH access preambles' and 'Acknowledged PCPCH access preambles' are already specified in RAN1, RAN2, and RAN3 specifications, it also should be included in RAN 4 specification

**Clauses affected:** 8.2

<b>Other specs affected:</b>	Other 3G core specifications <input type="checkbox"/> Other GSM core specifications <input type="checkbox"/> MS test specifications <input type="checkbox"/> BSS test specifications <input type="checkbox"/> O&M specifications <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs: → List of CRs:	
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**Other comments:**



<----- double-click here for help and instructions on how to create a CR.

## 8.2.5 Transport channel BLER

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

### 8.2.5.1 Accuracy requirement

**Table 8-47**

Parameter	Accuracy	Range
<i>BLER</i>		

### 8.2.5.2 Transport channel BLER measurement report mapping

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

In table 8-48 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-48**

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	$-\infty < \text{Log}_{10}(\text{Transport channel BLER}) < -4.03$	-
BLER_LOG _02	$-4.03 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.965$	-
BLER_LOG _03	$-3.965 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.9$	-
...	...	...
BLER_LOG _61	$-0.195 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.13$	-
BLER_LOG _62	$-0.13 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.065$	-
BLER_LOG _63	$-0.065 \leq \text{Log}_{10}(\text{Transport channel BLER}) \leq 0$	-

## 8.2.6 Physical channel BER

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

### 8.2.6.1 Accuracy requirement

**Table 8-49**

Parameter	Accuracy	Range
<i>BER</i>	+/- 10% of the absolute BER value.	

### 8.2.6.2 Physical channel BER measurement report mapping

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

In table 8-50 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-50**

Reported value	Measured quantity value	Unit
PhCh_BER_LOG_000	Physical channel BER = 0	-
PhCh_BER_LOG_001	$-\infty < \text{Log}_{10}(\text{Physical channel BER}) < -2.06375$	-
PhCh_BER_LOG_002	$-2.06375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.055625$	-
PhCh_BER_LOG_003	$-2.055625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.0475$	-
...	...	...
PhCh_BER_LOG_253	$-0.024375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.01625$	-
PhCh_BER_LOG_254	$-0.01625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.008125$	-
PhCh_BER_LOG_255	$-0.008125 \leq \text{Log}_{10}(\text{Physical channel BER}) \leq 0$	-

## 8.2.7 Round trip time

The measurement period shall be [100] ms.

### 8.2.7.1 Absolute accuracy requirement

**Table 8-51**

Parameter	Accuracy	Range
<i>RTT</i>	+/- 0.5 chip	[876, ..., 2923.75] chips

### 8.2.7.2 Round trip time measurement report mapping

The *Round trip time* reporting range is from 876.00 ... 2923.50 chip.

In table 8-52 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-52**

Reported value	Measured quantity value	Unit
RT_TIME_0000	Round trip time < 876.00	chip
RT_TIME_0001	$876.00 \leq \text{Round trip time} < 876.25$	chip
RT_TIME_0002	$876.25 \leq \text{Round trip time} < 876.50$	chip
RT_TIME_0003	$876.50 \leq \text{Round trip time} < 876.75$	chip
...	...	...
RT_TIME_8188	$2922.75 \leq \text{Round trip time} < 2923.00$	chip
RT_TIME_8189	$2923.00 \leq \text{Round trip time} < 2923.25$	chip



RT_TIME_8190	$2923.25 \leq \text{Round trip time} < 2923.50$	chip
RT_TIME_8191	$2923.50 \leq \text{Round trip time}$	chip

## 8.2.8 Transport Channel BER

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

### 8.2.8.1 Accuracy requirement

**Table 8-53**

Parameter	Accuracy	Range
<i>TrpBER</i>	+/- [%] of the absolute BER value.	

### 8.2.8.2 Transport channel BER measurement report mapping

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

In table 8-54 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-54**

Reported value	Measured quantity value	Unit
TrCh_BER_LOG_000	Transport channel BER = 0	-
TrCh_BER_LOG_001	$-\infty < \text{Log}_{10}(\text{Transport channel BER}) < -2.06375$	-
TrCh_BER_LOG_002	$-2.06375 \leq \text{Log}_{10}(\text{Transport channel BER}) < -2.055625$	-
TrCh_BER_LOG_003	$-2.055625 \leq \text{Log}_{10}(\text{Transport channel BER}) < -2.0475$	-
...	...	...
TrCh_BER_LOG_253	$-0.024375 \leq \text{Log}_{10}(\text{Transport channel BER}) < -0.01625$	-
TrCh_BER_LOG_254	$-0.01625 \leq \text{Log}_{10}(\text{Transport channel BER}) < -0.008125$	-
TrCh_BER_LOG_255	$-0.008125 \leq \text{Log}_{10}(\text{Transport channel BER}) \leq 0$	-

## 8.2.9 UTRAN GPS Timing of Cell Frames for LCS

<b>Requirement</b>	[ ] chips period.
--------------------	-------------------

### 8.2.9.1 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 8-55 the mapping of measured quantity is defined.

Table 8-55

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for LCS < 0.125	chip
GPS_TIME_00000000000001	$0.125 \leq$ UTRAN GPS timing of Cell Frames for LCS < 0.250	chip
GPS_TIME_00000000000002	$0.250 \leq$ UTRAN GPS timing of Cell Frames for LCS < 0.375	chip
...	...	...
GPS_TIME_18554879999997	$231935999999.625 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231935999999.750	chip
GPS_TIME_18554879999998	$231935999999.750 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231935999999.875	chip
GPS_TIME_18554879999999	$2319\ 359999\ 999.875 \leq$ UTRAN GPS timing of Cell Frames for LCS < 2319360000000.000	chip

## 8.2.10 Propagation delay

### 8.2.10.1 Accuracy requirement

Parameter	Accuracy	Range
<i>PropDelay</i>	+/- [] chip	

### 8.2.10.2 Propagation delay measurement report mapping

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

In table 8-56 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

Table 8-56

Reported value	Measured quantity value	Unit
PROP_DELAY_000	$0 \leq$ Propagation delay < 3	chip
PROP_DELAY_001	$3 \leq$ Propagation delay < 6	chip
PROP_DELAY_002	$6 \leq$ Propagation delay < 9	chip
...	...	...
PROP_DELAY_252	$756 \leq$ Propagation delay < 759	chip
PROP_DELAY_253	$759 \leq$ Propagation delay < 762	chip
PROP_DELAY_254	$762 \leq$ Propagation delay < 765	chip
PROP_DELAY_255	$765 \leq$ Propagation delay	chip

## 8.2.11 Detected PCPCH access preambles

The measurement period shall be 20 ms.

### 8.2.11.1 Accuracy requirement

**Table 8-57**

<u>Parameter</u>	<u>Accuracy</u>	<u>Range</u>
<u>DetectPCPCHAp</u>	<u>+/- 0 acknowledgements</u>	<u>full range</u>

### 8.2.11.2 Detected PCPCH access preambles measurement report mapping

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

In Table 8-58, the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 8-58**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>DETECT_PCPCH_AP_000</u>	<u>Detected PCPCH access preambles = 0</u>	<u>=</u>
<u>DETECT_PCPCH_AP_001</u>	<u>Detected PCPCH access preambles = 1</u>	<u>=</u>
<u>DETECT_PCPCH_AP_002</u>	<u>Detected PCPCH access preambles = 2</u>	<u>=</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>DETECT_PCPCH_AP_237</u>	<u>Detected PCPCH access preambles = 237</u>	<u>=</u>
<u>DETECT_PCPCH_AP_238</u>	<u>Detected PCPCH access preambles = 238</u>	<u>=</u>
<u>DETECT_PCPCH_AP_239</u>	<u>Detected PCPCH access preambles = 239</u>	<u>=</u>
<u>DETECT_PCPCH_AP_240</u>	<u>Detected PCPCH access preambles = 240</u>	<u>=</u>

## 8.2.12 Acknowledged PCPCH access preambles

The measurement period shall be 20 ms.

### 8.2.12.1 Accuracy requirement

**Table 8-59**

<u>Parameter</u>	<u>Accuracy</u>	<u>Range</u>
<u>AckPCPCHAp</u>	<u>+/- 0 acknowledgements</u>	<u>full range</u>

### 8.2.12.2 Acknowledged PCPCH access preambles measurement report mapping

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

In Table 8-60, the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

**Table 8-60**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>ACK_PCPCH_AP_00</u>	<u>Acknowledged PCPCH access preambles = 0</u>	-
<u>ACK_PCPCH_AP_01</u>	<u>Acknowledged PCPCH access preambles = 1</u>	-
<u>ACK_PCPCH_AP_02</u>	<u>Acknowledged PCPCH access preambles = 2</u>	-
...	...	...
<u>ACK_PCPCH_AP_12</u>	<u>Acknowledged PCPCH access preambles = 12</u>	-
<u>ACK_PCPCH_AP_13</u>	<u>Acknowledged PCPCH access preambles = 13</u>	-
<u>ACK_PCPCH_AP_14</u>	<u>Acknowledged PCPCH access preambles = 14</u>	-
<u>ACK_PCPCH_AP_15</u>	<u>Acknowledged PCPCH access preambles = 15</u>	-

## 9 UE parallel measurements

### 9.1 General

The UE shall be able to perform parallel measurements according to table 9-2.

In addition to the requirements in table 9-2 the UE shall in parallel, in state CELL\_DCH, also be able to measure and report the quantities according to table 9-1.

**Table 9-1**

<b>Measurement quantity</b>	<b>Number of parallel measurements possible to request from the UE</b>
Transport channel BLER	[1] per TrCh
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.

### 9.2 Parallel Measurement Requirements

Table 9-2 shall be read as follows:

If the UE receives a neighbour list of  
not more than X1 cells on Freq. #0 and

not more than X2 cells on Freq. #1 and

not more than X3 cells on Freq. #2 and

not more than X4 GSM cells,

the UE L1 shall be able to deliver

Y1 CPICH measurements on Freq. #0 and

Y2 CPICH measurements on Freq. #1 and

Y3 CPICH measurements on Freq. #2 and

Y4 UTRAN carrier RSSI measurements on Freq. #0 and

Y5 UTRAN carrier RSSI measurements on Freq. #1 and

Y6 UTRAN carrier RSSI measurements on Freq. #2 and

Y7 GSM carrier RSSI measurements (BSIC verified)

Y8 GSM carrier RSSI measurements (BSIC non-verified)

with the periodicity given by the measurement periods in section 8 and accuracy requirements given in section 8.

Xn and Yn are numbers taken from the same column in Table 9-2.

**Table 9-2: UE Layer 1 parallel measurement capability**

Scenario (see annex B)			1a	2b	2c	3a	4b	4c
Neighbour list size	X1	Freq #0	[32]	[24]	[24]	[24]	[24]	[24]
	X2	Freq #1	[0]	[12]	[12]	[0]	[12]	[12]
	X3	Freq #2	[0]	[0]	[12]	[0]	[0]	[12]
	X4	GSM (any band / carrier)	[0]	[0]	[0]	[20] Note4	[12]	[8]
Parallell measurement requirements	Y1	CPICH meas. Freq#0	[6]	[6]	[6]	[6]	[6]	[6]
	Y2	CPICH meas. Freq#1	[0]	[6]	[4]	[0]	[6]	[3]
	Y3	CPICH meas. Freq#2	[0]	[0]	[4]	[0]	[0]	[3]
	Y4	UTRAN carrier RSSI Freq #0	[1]	[1]	[1]	[1]	[1]	[1]
	Y5	UTRAN carrier RSSI Freq #1	[0]	[1]	[1]	[0]	[1]	[1]
	Y6	UTRAN carrier RSSI Freq #2	[0]	[0]	[1]	[0]	[0]	[1]
	Y7	GSM RSSI, BSIC non- verified	[0]	[0]	[0]	[]	[]	[]
	Y8	GSM RSSI, BSIC verified	[0]	[0]	[0]	[]	[]	[]

- Note 1: Although table 9-2 puts requirements on L1, these requirements can be verified from L3 with a filter coefficient  $=0$ , in the higher layer filter.
- Note 2: Compressed mode reference pattern 2.1 is assumed for the requirements in table 9-2. If other compressed mode patterns are used, the UE L1 shall deliver as many measurements as possible.
- Note 3: In table 9-2, CPICH measurements can be either the CPICH Ec/Io or the CPICH RSCP measurement.
- Note 4: This figure will be checked after the BSIC definition is resolved.

<b>CHANGE REQUEST</b>			Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.
<b>25.133</b>	<b>CR</b>	<b>43</b>	Current Version: <b>3.2.0</b>
GSM (AA.BB) or 3G (AA.BBB) specification number ↑		↑ CR number as allocated by MCC support team	
For submission to: <b>TSG RAN#9</b> <small>list expected approval meeting # here ↑</small>	for approval for information	<input checked="" type="checkbox"/> <input type="checkbox"/>	strategic <input type="checkbox"/> non-strategic <input type="checkbox"/> <small>(for SMG use only)</small>

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**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
(at least one should be marked with an X)

**Source:** RAN WG4 **Date:** 2000-08-17

**Subject:** Inclusion of UTRAN measurements in 25.133

**Work item:**

<b>Category:</b>	F Correction <input type="checkbox"/> A Corresponds to a correction in an earlier release <input type="checkbox"/> B Addition of feature <input checked="" type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	<b>Release:</b>	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input checked="" type="checkbox"/> Release 00 <input type="checkbox"/>
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(only one category shall be marked with an X)

**Reason for change:** In R3-001811 Liaison Statement on measurements WG4 are asked by WG3 to include the relevant requirements on the Acknowledged PRACH preambles and SIR<sub>error</sub> measurements in their specifications (25.133) for release-99. The requirements for these measurements are currently present in 25.433 (NBAP) and the measurements are defined in 25.215. This CR includes the two measurements in 25.133 with the requirements currently defined in 25.433.

**Clauses affected:** 8.2

<b>Other specs affected:</b>	Other 3G core specifications <input type="checkbox"/> Other GSM core specifications <input type="checkbox"/> MS test specifications <input type="checkbox"/> BSS test specifications <input type="checkbox"/> O&M specifications <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs: → List of CRs:
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**Other comments:**



help.doc

<----- double-click here for help and instructions on how to create a CR.

## 8.2.2 SIR

The measurement period shall be 80 ms.

### 8.2.2.1 Accuracy requirement

**Table 8-40**

Parameter	Accuracy	Range
<i>SIR</i>	$\pm 3$ dB	For $-7 < SIR < 20$ dB when RSSI $> -105$ dBm

### 8.2.2.2 SIR measurement report mapping

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

In table 8-41 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-41**

Reported value	Measured quantity value	Unit
UTRAN_SIR_00	$SIR < -11.0$	dB
UTRAN_SIR_01	$-11.0 \leq SIR < -10.5$	dB
UTRAN_SIR_02	$-10.5 \leq SIR < -10.0$	dB
...	...	...
UTRAN_SIR_61	$19.0 \leq SIR < 19.5$	dB
UTRAN_SIR_62	$19.5 \leq SIR < 20.0$	dB
UTRAN_SIR_63	$20.0 \leq SIR$	dB

### 8.2.3 *SIR*<sub>error</sub>

The measurement period shall be 80 ms.

Note: The measurement period is the same as for the *SIR* measurement in section 8.2.2. *SIR*<sub>error</sub> is calculated from *SIR* and *SIR*<sub>target</sub>, see TS 25.215..

#### 8.2.3.1 Accuracy requirement

**Table x-y**

<u>Parameter</u>	<u>Accuracy</u>	<u>Range</u>
<i>SIR</i> <sub>error</sub>	$\pm 3$ dB	The accuracy requirement for <i>SIR</i> <sub>error</sub> is valid for <i>SIR</i> within the guaranteed accuracy range specified in section 8.2.2.

Note: The accuracy requirement for *SIR*<sub>error</sub> is the same as for the *SIR* measurement specified in section 8.2.2. *SIR*<sub>error</sub> is calculated from *SIR* and *SIR*<sub>target</sub>, see TS 25.215..



### 8.2.3.2 SIR<sub>error</sub> measurement report mapping

The reporting range for *SIR<sub>error</sub>* is from -31 ... 31 dB.

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

**Table x-y**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>UTRAN_SIR_ERROR_000</u>	<u><math>SIR_{error} &lt; -31.0</math></u>	<u>dB</u>
<u>UTRAN_SIR_ERROR_001</u>	<u><math>-31.0 \leq SIR_{error} &lt; -30.5</math></u>	<u>dB</u>
<u>UTRAN_SIR_ERROR_002</u>	<u><math>-30.5 \leq SIR_{error} &lt; -30.0</math></u>	<u>dB</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UTRAN_SIR_ERROR_062</u>	<u><math>-0.5 \leq SIR_{error} &lt; 0.0</math></u>	<u>dB</u>
<u>UTRAN_SIR_ERROR_063</u>	<u><math>0.0 \leq SIR_{error} &lt; 0.5</math></u>	<u>dB</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>UTRAN_SIR_ERROR_123</u>	<u><math>30.0 \leq SIR_{error} &lt; 30.5</math></u>	<u>dB</u>
<u>UTRAN_SIR_ERROR_124</u>	<u><math>30.5 \leq SIR_{error} &lt; 31.0</math></u>	<u>dB</u>
<u>UTRAN_SIR_ERROR_125</u>	<u><math>31.0 \leq SIR_{error}</math></u>	<u>dB</u>

### 8.2.43 Transmitted carrier power

The measurement period shall be [100] ms.

#### 8.2.43.1 Relative accuracy requirement

**Table 8-42**

Parameter	Accuracy	Range
<i>P<sub>tot</sub></i>	± 5% units	For $5\% \leq$ Transmitted carrier power $\leq 95\%$

### 8.2.43.2 Transmitted carrier power measurement report mapping

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

In table 8-43 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-43**

Reported value	Measured quantity value	Unit
UTRAN_TX_POWER_000	Transmitted carrier power = 0	%
UTRAN_TX_POWER_001	$0 < \text{Transmitted carrier power} \leq 1$	%

Reported value	Measured quantity value	Unit
UTRAN_TX_POWER_002	$1 < \text{Transmitted carrier power} \leq 2$	%
UTRAN_TX_POWER_003	$2 < \text{Transmitted carrier power} \leq 3$	%
...	...	...
UTRAN_TX_POWER_098	$97 < \text{Transmitted carrier power} \leq 98$	%
UTRAN_TX_POWER_099	$98 < \text{Transmitted carrier power} \leq 99$	%
UTRAN_TX_POWER_100	$99 < \text{Transmitted carrier power} \leq 100$	%

### 8.2.54 Transmitted code power

The measurement period shall be [100] ms.

#### 8.2.54.1 Absolute accuracy requirement

**Table 8-44**

Parameter	Accuracy	Range
<i>Pcode</i>	$\pm 3$ dB	Over the full range

#### 8.2.54.2 Relative accuracy requirement

**Table 8-45**

Parameter	Accuracy	Range
<i>I<sub>o</sub></i>	$\pm 2$ dB	Over the full range

#### 8.2.54.3 Transmitted code power measurement report mapping

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

In table 8-46 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-46**

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER_010	$-10.0 \leq \text{Transmitted code power} < -9.5$	dBm
UTRAN_CODE_POWER_011	$-9.5 \leq \text{Transmitted code power} < -9.0$	dBm
UTRAN_CODE_POWER_012	$-9.0 \leq \text{Transmitted code power} < -8.5$	dBm
...	...	...
UTRAN_CODE_POWER_120	$45.0 \leq \text{Transmitted code power} < 45.5$	dBm
UTRAN_CODE_POWER_121	$45.5 \leq \text{Transmitted code power} < 46.0$	dBm

Reported value	Measured quantity value	Unit
UTRAN_CODE_POWER_122	$46.0 \leq \text{Transmitted code power} < 46.5$	dBm

## 8.2.65 Transport channel BLER

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

### 8.2.65.1 Accuracy requirement

**Table 8-47**

Parameter	Accuracy	Range
<i>BLER</i>		

### 8.2.65.2 Transport channel BLER measurement report mapping

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

In table 8-48 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-48**

Reported value	Measured quantity value	Unit
BLER_LOG_00	Transport channel BLER = 0	-
BLER_LOG_01	$-\infty < \text{Log}_{10}(\text{Transport channel BLER}) < -4.03$	-
BLER_LOG_02	$-4.03 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.965$	-
BLER_LOG_03	$-3.965 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.9$	-
...	...	...
BLER_LOG_61	$-0.195 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.13$	-
BLER_LOG_62	$-0.13 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.065$	-
BLER_LOG_63	$-0.065 \leq \text{Log}_{10}(\text{Transport channel BLER}) \leq 0$	-

## 8.2.76 Physical channel BER

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

### 8.2.76.1 Accuracy requirement

**Table 8-49**

Parameter	Accuracy	Range
<i>BER</i>	+/- 10% of the absolute BER value.	

## 8.2.76.2 Physical channel BER measurement report mapping

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

In table 8-50 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-50**

Reported value	Measured quantity value	Unit
PhCh_BER_LOG_000	Physical channel BER = 0	-
PhCh_BER_LOG_001	$-\infty < \text{Log}_{10}(\text{Physical channel BER}) < -2.06375$	-
PhCh_BER_LOG_002	$-2.06375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.055625$	-
PhCh_BER_LOG_003	$-2.055625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -2.0475$	-
...	...	...
PhCh_BER_LOG_253	$-0.024375 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.01625$	-
PhCh_BER_LOG_254	$-0.01625 \leq \text{Log}_{10}(\text{Physical channel BER}) < -0.008125$	-
PhCh_BER_LOG_255	$-0.008125 \leq \text{Log}_{10}(\text{Physical channel BER}) \leq 0$	-

## 8.2.87 Round trip time

The measurement period shall be [100] ms.

### 8.2.87.1 Absolute accuracy requirement

**Table 8-51**

Parameter	Accuracy	Range
<i>RTT</i>	+/- 0.5 chip	[876, ..., 2923.75] chips

### 8.2.87.2 Round trip time measurement report mapping

The *Round trip time* reporting range is from 876.00 ... 2923.50 chip.

In table 8-52 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-52**

Reported value	Measured quantity value	Unit
RT_TIME_0000	Round trip time < 876.00	chip
RT_TIME_0001	$876.00 \leq \text{Round trip time} < 876.25$	chip
RT_TIME_0002	$876.25 \leq \text{Round trip time} < 876.50$	chip
RT_TIME_0003	$876.50 \leq \text{Round trip time} < 876.75$	chip
...	...	...

RT_TIME_8188	$2922.75 \leq \text{Round trip time} < 2923.00$	chip
RT_TIME_8189	$2923.00 \leq \text{Round trip time} < 2923.25$	chip
RT_TIME_8190	$2923.25 \leq \text{Round trip time} < 2923.50$	chip
RT_TIME_8191	$2923.50 \leq \text{Round trip time}$	chip

## 8.2.98 Transport Channel BER

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

### 8.2.98.1 Accuracy requirement

**Table 8-53**

Parameter	Accuracy	Range
<i>TrpBER</i>	+/- [%] of the absolute BER value.	

### 8.2.98.2 Transport channel BER measurement report mapping

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

In table 8-54 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-54**

Reported value	Measured quantity value	Unit
TrCh_BER_LOG_000	Transport channel BER = 0	-
TrCh_BER_LOG_001	$-\infty < \text{Log}_{10}(\text{Transport channel BER}) < -2.06375$	-
TrCh_BER_LOG_002	$-2.06375 \leq \text{Log}_{10}(\text{Transport channel BER}) < -2.055625$	-
TrCh_BER_LOG_003	$-2.055625 \leq \text{Log}_{10}(\text{Transport channel BER}) < -2.0475$	-
...	...	...
TrCh_BER_LOG_253	$-0.024375 \leq \text{Log}_{10}(\text{Transport channel BER}) < -0.01625$	-
TrCh_BER_LOG_254	$-0.01625 \leq \text{Log}_{10}(\text{Transport channel BER}) < -0.008125$	-
TrCh_BER_LOG_255	$-0.008125 \leq \text{Log}_{10}(\text{Transport channel BER}) \leq 0$	-

## 8.2.109 UTRAN GPS Timing of Cell Frames for LCS

<b>Requirement</b>	[ ] chips period.
--------------------	-------------------

### 8.2.109.1 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 8-55 the mapping of measured quantity is defined.

**Table 8-55**

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UTRAN GPS timing of Cell Frames for LCS < 0.125	chip
GPS_TIME_00000000000001	$0.125 \leq$ UTRAN GPS timing of Cell Frames for LCS < 0.250	chip
GPS_TIME_00000000000002	$0.250 \leq$ UTRAN GPS timing of Cell Frames for LCS < 0.375	chip
...	...	...
GPS_TIME_18554879999997	$231935999999.625 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231935999999.750	chip
GPS_TIME_18554879999998	$231935999999.750 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231935999999.875	chip
GPS_TIME_18554879999999	$2319\ 359999\ 999.875 \leq$ UTRAN GPS timing of Cell Frames for LCS < 231936000000.000	chip

## 8.2.110 Propagation delay

### 8.2.110.1 Accuracy requirement

Parameter	Accuracy	Range
<i>PropDelay</i>	+/- [] chip	

### 8.2.110.2 Propagation delay measurement report mapping

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

In table 8-56 the mapping of measured quantity is defined. The range in the signalling may be larger than guaranteed accuracy range.

**Table 8-56**

Reported value	Measured quantity value	Unit
PROP_DELAY_000	$0 \leq$ Propagation delay < 3	chip
PROP_DELAY_001	$3 \leq$ Propagation delay < 6	chip
PROP_DELAY_002	$6 \leq$ Propagation delay < 9	chip
...	...	...
PROP_DELAY_252	$756 \leq$ Propagation delay < 759	chip
PROP_DELAY_253	$759 \leq$ Propagation delay < 762	chip
PROP_DELAY_254	$762 \leq$ Propagation delay < 765	chip
PROP_DELAY_255	$765 \leq$ Propagation delay	chip

## 8.2.12 Acknowledged PRACH preambles

The measurement period shall be 20 ms.

### 8.2.12.1 Accuracy requirement

**Table x-y**

<u>Parameter</u>	<u>Accuracy</u>	<u>Range</u>
<u>AckPRACHPreamble</u>	<u>+/- 0 acknowledgements</u>	<u>full range</u>

### 8.2.12.2 Acknowledged PRACH preambles measurement report mapping

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

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 x-y**

<u>Reported value</u>	<u>Measured quantity value</u>	<u>Unit</u>
<u>ACK_PRACH_PREAMBLE_000</u>	<u>Acknowledged PRACH preambles = 0</u>	<u>=</u>
<u>ACK_PRACH_PREAMBLE_001</u>	<u>Acknowledged PRACH preambles = 1</u>	<u>=</u>
<u>ACK_PRACH_PREAMBLE_002</u>	<u>Acknowledged PRACH preambles = 2</u>	<u>=</u>
<u>...</u>	<u>...</u>	<u>...</u>
<u>ACK_PRACH_PREAMBLE_237</u>	<u>Acknowledged PRACH preambles = 237</u>	<u>=</u>
<u>ACK_PRACH_PREAMBLE_238</u>	<u>Acknowledged PRACH preambles = 238</u>	<u>=</u>
<u>ACK_PRACH_PREAMBLE_239</u>	<u>Acknowledged PRACH preambles = 239</u>	<u>=</u>
<u>ACK_PRACH_PREAMBLE_240</u>	<u>Acknowledged PRACH preambles = 240</u>	<u>=</u>

Turin, Italy, 4 – 8 Sep, 2000

e.g. for 3GPP use the format TP-99xxx  
or for SMG, use the format P-99-xxx

# CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

**25.133 CR 44**

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **RAN#9**  
list expected approval meeting # here  
↑

for approval   
for information

strategic   
non-strategic  (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

**Proposed change affects:**  
(at least one should be marked with an X)

(U)SIM  ME  UTRAN / Radio  Core Network

**Source:** RAN WG4

**Date:** 2000-09-07

**Subject:** Proposal for section 7 and A.7

**Work item:**

**Category:**  
(only one category shall be marked with an X)  
F Correction   
A Corresponds to a correction in an earlier release   
B Addition of feature   
C Functional modification of feature   
D Editorial modification

**Release:**  
Phase 2   
Release 96   
Release 97   
Release 98   
Release 99   
Release 00

**Reason for change:**  
• Separating general requirement and test requirement in section 7.

**Clauses affected:** 7

**Other specs Affected:**  
Other 3G core specifications  → List of CRs:  
Other GSM core specifications  → List of CRs:  
MS test specifications  → List of CRs:  
BSS test specifications  → List of CRs:  
O&M specifications  → List of CRs:

**Other comments:**

<----- double-click here for help and instructions on how to create a CR.



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## 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.

- [1] 3GPP Homepage: [www.3gpp.org](http://www.3gpp.org).
- [2] [TS 25.211: "Physical channels and mapping of transport channels onto physical channels \(FDD\)".  
spare](#)
- [3] TS 25.101: "UE Radio transmission and reception (FDD)".
- [4] TS 25.104: "BTS Radio transmission and reception (FDD)".
- [5] TS 25.102: "UE Radio transmission and reception (TDD)".
- [6] TS 25.105: "BTS Radio transmission and reception (TDD)".
- [7] TS 25.103: "RF parameters in support of RRM".
- [8] TS 25.141: "Base station conformance testing (FDD)".
- [9] TS 25.142: "Base station conformance testing (TDD)".
- [10] TS 25.113: "Base station EMC".
- [11] ~~TR~~ 25.942: "RF System scenarios".
- [12] TR 25.922: "RRM Strategies".
- [13] TS 25.215: "Physical Layer Measurements (FDD)".
- [14] TS 25.225: "Physical Layer Measurements (TDD)".
- [15] TS 25.302: "Services provided by Physical Layer".
- [16] [TS 25.331: "RRC Protocol Specification"](#).

## 7 Timing and Signalling Characteristics

### 7.1 UE Transmit Timing

#### 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 significant 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.

#### 7.1.1 Requirements

~~For parameters specified in Table 7-1,~~ The UE initial transmission timing error shall be less than or equal to  $\pm 1.5$  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 ~~1024~~  $T_0$  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  $\frac{1}{4}$  Chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be  $\frac{1}{4}$  chip per 200ms. In particular, within any given 200 ms period, the UE transmit timing shall not change in excess of  $\pm \frac{1}{4}$  chip from the timing at the beginning of this 200ms period.

### ~~7.2 UE Receive Timing~~

#### ~~7.2.1 Introduction~~

~~The reception timing of the MS is determined during the specified operation.~~

#### ~~7.2.2 Requirements~~

~~TBD~~

### 7.23 Signalling Response Delay

#### 7.23.1 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.

#### 7.23.2 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 7.12 below.

**Table 7.12: 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.

## 7.37.4 Signalling Processing

### 7.3.17.4.1 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.

### 7.3.27.4.2 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 7.2.27.3.1 test in 9.4.1 in 90 % of the cases-.

## 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 Transmission Timing requirement**

Parameter	Unit	Cell 1 and 2 level
<u>DPCH Ec/Ior, Cell 1 and Cell 2</u>	<u>dB</u>	-17
<u>CPICH Ec/Ior, Cell 1 and Cell 2</u>	<u>dB</u>	-10
<u>PCCPH Ec/Ior, Cell 1 and Cell 2</u>	<u>dB</u>	-12
<u>SCH Ec/Ior, Cell 1 and Cell 2</u>	<u>dB</u>	-12
<u>PICH Ec/Ior, Cell 1 and Cell 2</u>	<u>dB</u>	-15
<u>OCNS Ec/Ior, Cell 1 and Cell 2</u>	<u>dB</u>	-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	$\mu$ s	+2
Propagation condition	AWGN	

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.

- a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCCH/DPDCH of cell 1.
- b) Test system introduces cell 2 into the test system at delay +2  $\mu$ s from cell 1.
- e) Test system verifies that cell 2 is added to the active set.
- d) Test system shall verify that the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCCH/DPDCH of cell 1.
- e) Test system stops sending cell 1 signal.
- f) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements until the UE transmit timing offset is within 1024 +/- 1.5 chips with respect to the first significant received path of the downlink DPCCCH/DPDCH cell 2.

- ~~g) Test system shall verify that the UE transmit timing offset is within  $1024 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.~~
- ~~h) Test system starts sending cell 1 signal again with its original timing.~~
- ~~i) Test system verifies that cell 1 is added to the active set.~~
- ~~j) Test system verifies that UE transmit timing adjustment starts with an adjustment step size and an adjustment rate according to the requirements until the UE transmit timing offset is within  $1024 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.~~
- ~~k) Test system shall verify that the UE transmit timing offset is within  $1024 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.~~

### 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. UE initial transmission timing error shall be less than or equal to  $\pm 1.5$  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 1024 chips.

~~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  $\frac{1}{4}$  Chip.~~

~~The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be  $\frac{1}{4}$  chip per 200ms. In particular, within any given 200 ms period, the UE transmit timing shall not change in excess of  $\pm \frac{1}{4}$  chip from the timing at the beginning of this 200ms period.~~

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  $T_0 \pm 1.5$  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  $+2 \mu\text{s}$  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  $T_0 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.
- e) Test system stops sending cell 1 signals.
- f) 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  $T_0 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.
- g) Test system shall verify that the UE transmit timing offset stays within  $T_0 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 2.
- h) Test system starts sending cell 1 signal again with its original timing.
- i) Test system verifies that cell 1 is added to the active set.
- j) Test system stops sending cell 2 signals.
- k) 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  $T_0 \pm 1.5$  chips with respect to the first significant received path of the downlink DPCCH/DPDCH of cell 1.

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

## 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 7.2.27.3.2 for all received messages that require a RRC 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 according to the test in 9.4.1 in 90 % of the cases.

The UE shall be able to respond to all received RRC messages within the delay limits specified in section 7.2.27.3.2 in a certain percentage of all cases as defined in 7.3.27.4.2.

## CHANGE REQUEST

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**25.133 CR 45**

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **TSG RAN#9**

list expected approval meeting # here ↑

for approval   
for information

strategic   
non-strategic  (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:**

(at least one should be marked with an X)

(U)SIM  ME  UTRAN / Radio  Core Network

**Source:**

**TSG RAN WG#4**

**Date:**

**Subject:**

Text proposal for section A.1, A.2 and A.3

**Work item:**

**Category:**

(only one category shall be marked with an X)

F Correction   
A Corresponds to a correction in an earlier release   
B Addition of feature   
C Functional modification of feature   
D Editorial modification

**Release:**

Phase 2   
Release 96   
Release 97   
Release 98   
Release 99   
Release 00

**Reason for change:**

This CR proposes text clarifying how different requirements in 25.133 shall be interpreted from a statistical point of view.

**Clauses affected:**

**Annex A**

**Other specs affected:**

Other 3G core specifications  → List of CRs:  
Other GSM core specifications  → List of CRs:  
MS test specifications  → List of CRs:  
BSS test specifications  → List of CRs:  
O&M specifications  → List of CRs:

**Other comments:**



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<----- double-click here for help and instructions on how to create a CR.



## 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.*

3GPP WG4 (Radio) meeting#13  
4<sup>th</sup>-8<sup>th</sup> of September, 2000, Turin, Italy

Document R4-(00)0766

e.g. for 3GPP use the format TP-99xxx  
or for SMG, use the format P-99-xxx

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25.133 CR 46

Current Version: 3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: RAN#9  
list expected approval meeting # here  
↑

for approval for information

strategic   
non-strategic  (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
(at least one should be marked with an X)

**Source:** WG4 **Date:** 8-09-2000

**Subject:** Proposal for chapter 6

**Work item:**

<b>Category:</b> <small>(only one category shall be marked with an X)</small>	F Correction	<input checked="" type="checkbox"/>	<b>Release:</b>	Phase 2	<input type="checkbox"/>
	A Corresponds to a correction in an earlier release	<input type="checkbox"/>		Release 96	<input type="checkbox"/>
	B Addition of feature	<input type="checkbox"/>		Release 97	<input type="checkbox"/>
	C Functional modification of feature	<input type="checkbox"/>		Release 98	<input type="checkbox"/>
	D Editorial modification	<input type="checkbox"/>		Release 99	<input checked="" type="checkbox"/>
			Release 00	<input type="checkbox"/>	

**Reason for change:** To separate core requirements and test requirements

**Clauses affected:** 6

<b>Other specs affected:</b>	Other 3G core specifications	<input type="checkbox"/>	→ List of CRs:	
	Other GSM core specifications	<input type="checkbox"/>	→ List of CRs:	
	MS test specifications	<input checked="" type="checkbox"/>	→ List of CRs:	
	BSS test specifications	<input type="checkbox"/>	→ List of CRs:	
	O&M specifications	<input type="checkbox"/>	→ List of CRs:	

**Other comments:**

## 6 RRC Connection Control

### 6.1 Requirements for RRC Re-establishment

#### 6.1.1 RRC Re-establishment delay

When the UE is in Cell\_DCH state, the UE shall be capable of sending a RRC CONNECTION RE ESTABLISHMENT CONNECT message within  $T_{RE-ESTABLISH}$  seconds from when the CPHY Out Of Synch primitive indicates lost synchronisation. The RRC Re-establishment delay requirement ( $T_{RE-ESTABLISH-REQ}$ ) is defined as the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH. This is illustrated in Figure 6.1, where the RRC Re-establishment delay ( $T_{RE-ESTABLISH-REQ}$ ) is the time between  $T_{start}$  and  $T_{stop} - T_{PRIM}$  is the time it takes for the CPHY Out Of Synch primitive to detect lost synchronisation and  $T_{RE-ESTABLISH}$  is the time to perform higher layer functionality.

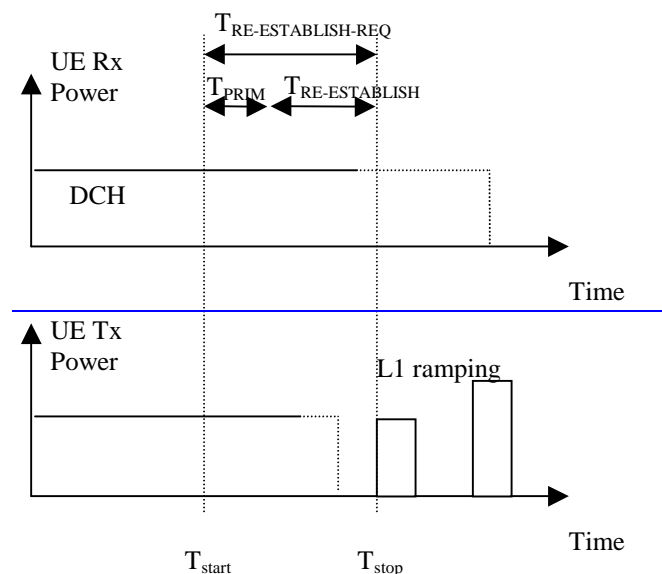


Figure 6.1: RRC Connection Re-establishment Requirement

##### 6.1.1.1 Test parameters

This test shall include 6 cells, one serving, one target and four steady interferers. The UE shall be in connected mode with a DL reference measurement channel 12.2 kbps dedicated traffic channel ongoing to one cell (serving cell). Measurement control information shall be signalled from the test device at least 5 seconds before  $T_{start}$ . At  $T_{start}$  faulty CRCs are applied on all transport blocks on all transport channels.  $T_{stop}$  is defined as the time when the UE starts to send preambles on PRACH to the target cell.

Unless explicitly stated the test parameters should be similar to the test parameters for Cell Reselection, time T1, sub-clause 4.3.1.1.1 System information shall be provided in the same manner as for the test for cell re-selection, sub-clause 4.3.1.1.1.

The following additional parameters are needed:

**Table 6-1: Test parameters for RRC connection re-establishment**

Parameter	Unit	Value
<i>DPCH_Ec/Ior</i>	dB	-16.6
N313	Frames	20
N315	Frames	20
T313	seconds	0 and 3

### 6.1.1.2 ~~Test 1 – Target Cell known by UE~~

~~All six cells in the test shall be given in the measurement control information to the UE before the test is started.~~

### 6.1.1.3 ~~Test 2 – Target cell not known by UE~~

~~All cells except the target cell shall be in the measurement control information to the UE before the test is started.~~

### 6.1.1.4 ~~Minimum requirements~~

~~RRC Re-establishment is correct if within  $T_{RE-ESTABLISH-REQ}$  seconds the UE tries to re-establish the RRC connection with the target cell.  $T_{RE-ESTABLISH-REQ}$  is defined in Table 6.2.~~

**Table 6.2: Requirements for RRC Re-establishment**

	Test 1	Test 2
<del>Intra Frequency, T313=0</del>	<del><math>T_{RE-ESTABLISH-REQ}=1000\text{ ms}</math></del>	<del><math>T_{RE-ESTABLISH-REQ}=3200\text{ ms}</math></del>
<del>Intra Frequency, T313=3</del>	<del><math>T_{RE-ESTABLISH-REQ}=4000\text{ ms}</math></del>	<del><math>T_{RE-ESTABLISH-REQ}=6200\text{ ms}</math></del>

## 6.2 ~~Radio Access Bearer Control~~

~~[Editor's Note: Radio Access Bearer Control Procedures are a series of mechanisms used to control the UE and system resources. Some of these procedures cause Physical Channel Reconfiguration and Transport Channel Reconfiguration. This sub-clause specifies time delay requirements on Physical Channel Reconfiguration and Transport Channel configuration in different reconfiguration cases.]~~

## 6.3 ~~Requirements for Random Access~~

~~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.~~

## 6.3.1 Test Parameters

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

Parameter	Unit	Cell 1
		Channel 1
<i>UTRA-RF Channel Number</i>		
<i>CPICH<sub>-Ec/Ac</sub></i>	dB	{-10}
<i>PCCPCH<sub>-Ec/Ac</sub></i>	dB	{-12}
<i>SCH<sub>-Ec/Ac</sub></i>	dB	{-12}
<i>AICH<sub>-Ec/Ac</sub></i>	dB	{-10}
<i>PICH<sub>-Ec/Ac</sub></i>	dB	{-15}
<i>OCNS<sub>-Ec/Ac</sub></i>	dB	{-0.941}
$\hat{I}_{or}/I_{oc}$	dB	{0}
$I_{oc}$	dBm/3.84 MHz	{-70}
<i>CPICH<sub>-Ec/Ac</sub></i>	dB	{-13}
Propagation Condition		AWGN
<i>UE_TXPWR_MAX_RACH</i>	dBm	{15}

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

Parameter	Unit	Value
<i>RACH Transport Format IEs</i>		{}
– Number of Transport blocks		{}
– Octet mode RLC size info (i.e. RLC block size)		{}
– Transmission time interval	ms	{10}
– Type of channel coding		{}
– Coding Rate		{}
– Rate matching attribute		{}
– CRC size	bits	{}
<i>Access Service Class (ASC)</i>		
– <i>PRACH partition</i>		{}
– <i>Persistence value</i>	0..1	{}
<i>Maximum number of preamble ramping cycles (M<sub>max</sub>)</i>		{2}
<i>Maximum number of preambles in one preamble ramping cycle (Preamble Retrans Max)</i>		{20}
<i>The backoff time T<sub>BOI</sub></i>		
– <i>T<sub>BOImin</sub></i>	ms	{}
– <i>T<sub>BOImax</sub></i>	ms	{}
<i>Power step when no acquisition indicator is received (Power offset P<sub>0</sub>)</i>	dB	{3}

<i>Power offset between the last transmitted preamble and the control part of the message (Power offset P<sub>p-m</sub>)</i>	dB	{0}
--	----	-----

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

Parameter	Unit	Value
<i>RACH Transport Format IEs</i>		{}
<i>– Number of Transport blocks</i>		{}
<i>– Octet mode RLC size info (i.e. RLC block size)</i>		{}
<i>– Transmission time interval</i>	ms	{10}
<i>– Type of channel coding</i>		{}
<i>– Coding Rate</i>		{}
<i>– Rate matching attribute</i>		{}
<i>– CRC size</i>	bits	{}
<i>Primary CPICH DL TX power</i>	dBm	{}
<i>UL interference</i>	dBm	{noise floor}
<i>Constant value</i>	dB	{0}

## 6.3.2 ~~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 the {10} preambles have been received by the UTRAN.

### 6.3.2.1 ~~Minimum requirement~~

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.

## 6.3.3 ~~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. The NACK shall be transmitted after the {10} preambles have been received by the UTRAN.

### 6.3.3.1 ~~Minimum requirement~~

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

The relative power increase applied to the first preamble of the second cycle shall have an accuracy of +/- {} dB (or +/- {} dB in extreme conditions). The power increase shall be compared to the last preamble of the first cycle.

## 6.3.4 ~~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.

### 6.3.4.1 Minimum requirements

The UE shall transmit [2] preamble cycles, consisting of [20] preambles in each preamble cycle.

### 6.3.5 Correct behaviour when reaching maximum transmit power

The UE shall not exceed the maximum transmit power specified by the UTRAN. No ACK/NACK shall be sent by UTRAN during this test.

#### 6.3.5.1 Minimum Requirements

The absolute power of the preambles belonging to the first or second preamble cycle shall not exceed [15] dBm with an accuracy of +/- [ ] dB (or +/- [ ] dB in extreme conditions).

## 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  $T_{RE-ESTABLISH}$  seconds from when the CPHY-Out-Of-Synch primitive indicates lost synchronisation. The RRC Re-establishment delay requirement ( $T_{RE-ESTABLISH-REQ}$ ) is defined as the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH. This is illustrated in Figure 6.1, where the RRC Re-establishment delay ( $T_{RE-ESTABLISH-REQ}$ ) is the time between  $T_{start}$  and  $T_{stop} - T_{PRIM}$  is the time it takes for the CPHY-Out-Of-Synch primitive to detect lost synchronisation and  $T_{RE-ESTABLISH}$  is the time to perform higher layer functionality.

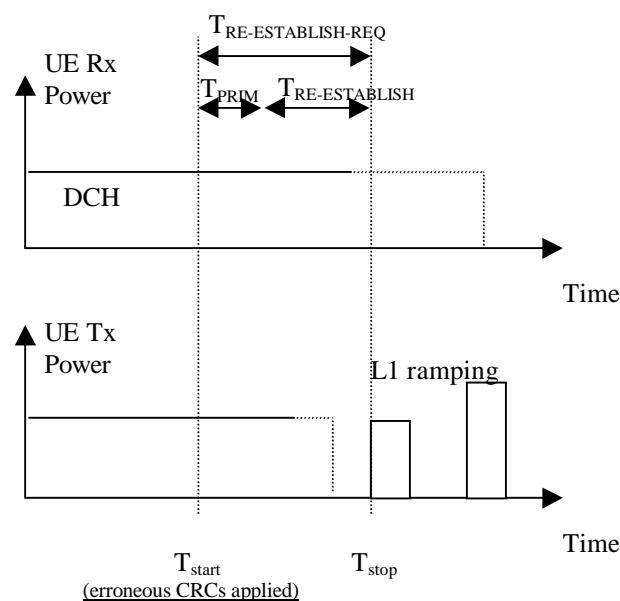


Figure 6.1: RRC Connection Re-establishment Requirement



RRC Re-establishment is correct if within  $T_{RE-ESTABLISH-REQ}$  seconds the UE tries to re-establish the RRC connection with the target cell.  $T_{RE-ESTABLISH-REQ}$  is defined in Table 6.2.

**Table 6.2: Requirements for Intra Frequency RRC Re-establishment**

	<u>Target cell known by the UE</u>	<u>Target cell not known by the UE</u>
<u>Radio link failure timer</u> <u>T313=0 s</u>	$T_{RE-ESTABLISH-REQ} = 1000 \text{ ms}$	$T_{RE-ESTABLISH-REQ} = 3200 \text{ ms}$
<u>Radio link failure timer</u> <u>T313=3 s</u>	$T_{RE-ESTABLISH-REQ} = 4000 \text{ ms}$	$T_{RE-ESTABLISH-REQ} = 6200 \text{ ms}$

## 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.

The relative power increase applied to the first preamble of the subsequent cycle shall have an accuracy of +/- [] dB (or +/- [] dB in extreme conditions). The power increase shall be compared to the last preamble of the previous cycle.

#### 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.

## 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.

This test shall include 6 cells, one serving, one target and four steady interferes. The UE shall be in connected mode with a DL reference measurement channel 12.2 kbps dedicated traffic channel ongoing to one cell (serving cell). Measurement control information shall be signalled from the test device at least 5 seconds before  $T_{start}$ . At  $T_{start}$  faulty CRCs are applied on all transport blocks on all transport channels.  $T_{stop}$  is defined as the time when the UE starts to send preambles on PRACH to the target cell.

Unless explicitly stated the test parameters should be similar to the test parameters for Cell Reselection, time T1, sub-clause 4.3.1.1.1 System information shall be provided in the same manner as for the test for cell re-selection, sub-clause 4.3.1.1.1.

The following additional parameters are needed:

**Table A.6-1: Test parameters for RRC connection re-establishment**

<u>Parameter</u>	<u>Unit</u>	<u>Value</u>
<u>DPCH <math>E_c/I_{or}</math></u>	<u>dB</u>	<u>-16.6</u>
<u>N313</u>	<u>Frames</u>	<u>20</u>
<u>N315</u>	<u>Frames</u>	<u>20</u>
<u>T313</u>	<u>seconds</u>	<u>0 and 3</u>

#### A.6.1.1.1 Test 1 – Target Cell known by UE

All six cells in the test shall be given in the measurement control information to the UE before the test is started.

#### A.6.1.1.2 Test 2 – Target cell not known by UE

All cells except the target cell shall be in the measurement control information to the UE before the test is started.

### A.6.1.2 Test Requirements

RRC Re-establishment is correct if within  $T_{RE-ESTABLISH-REQ}$  seconds the UE tries to re-establish the RRC connection with the target cell.  $T_{RE-ESTABLISH-REQ}$  is defined in Table 6.2.

**Table A.6.2: Requirements for Intra Frequency RRC Re-establishment**

	<u>Test 1</u>	<u>Test 2</u>
<u>Radio link failure timer</u> <u>T313=0 s</u>	<u><math>T_{RE-ESTABLISH-REQ} = 1000 \text{ ms}</math></u>	<u><math>T_{RE-ESTABLISH-REQ} = 3200 \text{ ms}</math></u>
<u>Radio link failure timer</u> <u>T313=3 s</u>	<u><math>T_{RE-ESTABLISH-REQ} = 4000 \text{ ms}</math></u>	<u><math>T_{RE-ESTABLISH-REQ} = 6200 \text{ ms}</math></u>

## 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**

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>
<u>CPICH Ec/Ior</u>	<u>dB</u>	<u>[-10]</u>
<u>PCCPCH Ec/Ior</u>	<u>dB</u>	<u>[-12]</u>
<u>SCH Ec/Ior</u>	<u>dB</u>	<u>[-12]</u>
<u>Number of other transmitted Acquisition Indicators</u>	<u>-</u>	<u>0</u>
<u>AICH Ec/Ior</u>	<u>dB</u>	<u>[-10]</u>
<u>PICH Ec/Ior</u>	<u>dB</u>	<u>[-15]</u>
<u>OCNS Ec/Ior when an AI is not transmitted</u>	<u>dB</u>	<u>[-0.941]</u>
<u>OCNS Ec/Ior when an AI is transmitted</u>	<u>dB</u>	<u>[-1.516]</u>
<u><math>\hat{I}_{or}/I_{oc}</math></u>	<u>dB</u>	<u>[0]</u>
<u><math>I_{oc}</math></u>	<u>dBm/3.84 MHz</u>	<u>[-70]</u>
<u>CPICH Ec/Io</u>	<u>dB</u>	<u>[-13]</u>
<u>Propagation Condition</u>		<u>AWGN</u>
<u>UE TXPWR MAX RACH</u>	<u>dBm</u>	<u>[15]</u>

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

<u>Parameter</u>	<u>Unit</u>	<u>Value</u>
<u>RACH Transport Format IEs</u> - <u>Number of Transport blocks</u> - <u>Octet mode RLC size info</u> (i.e. RLC block size) <u>Transmission time interval</u> - <u>Type of channel coding</u> - <u>Coding Rate</u> - <u>Rate matching attribute</u> - <u>CRC size</u>	<u>ms</u>       <u>bits</u>	<u>[1]</u> <u>[1]</u> <u>[10]</u> <u>[1]</u> <u>[1]</u> <u>[1]</u> <u>[1]</u>
<u>Access Service Class (ASC)</u> - <u>PRACH partition</u> - <u>Persistence value</u>	<u>0..1</u>	<u>[1]</u> <u>[1]</u>
<u>Maximum number of preamble ramping cycles</u> ( $M_{max}$ ).		<u>[2]</u>
<u>Maximum number of preambles in one preamble ramping cycle</u> (Preamble Retrans Max)		<u>[20]</u>
<u>The backoff time <math>T_{B01}</math></u> $N_{B01min} \sim N_{B01max}$	<u>ms</u>	<u>N/A</u> <u>[1]</u>
<u>Power step when no acquisition indicator is received</u> (Power offset P <sub>0</sub> )	<u>dB</u>	<u>[3]</u>
<u>Power offset between the last transmitted preamble and the control part of the message</u> (Power offset P <sub>p-m</sub> )	<u>dB</u>	<u>[0]</u>
<u>Maximum allowed UL TX power</u>	<u>dBm</u>	<u>[15]</u>

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

<u>Parameter</u>	<u>Unit</u>	<u>Value</u>
<u>RACH Transport Format IEs</u> - <u>Number of Transport blocks</u> - <u>Octet mode RLC size info</u> (i.e. RLC block size) - <u>Transmission time interval</u> - <u>Type of channel coding</u> - <u>Coding Rate</u> - <u>Rate matching attribute</u> - <u>CRC size</u>	<u>ms</u>       <u>bits</u>	<u>[]</u> <u>[]</u> <u>[10]</u> <u>[]</u> <u>[]</u> <u>[]</u> <u>[]</u>
<u>Primary CPICH DL TX power</u>	<u>dBm</u>	<u>[]</u>
<u>UL interference</u>	<u>dBm</u>	<u>[noise floor]</u>
<u>Constant value</u>	<u>dB</u>	<u>[0]</u>
<u>AICH Power Offset</u>	<u>dB</u>	<u>0</u>

## 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  $T_{BO1}$  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 [] ms after the NACK has been transmitted by the UTRAN. Then the UE shall start the second preamble ramping cycle.

The relative power increase applied to the first preamble of the second cycle shall have an accuracy of +/- [] dB (or +/- [] dB in extreme conditions). The power increase shall be compared to the last preamble of the first 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 [20] 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  $[15]$  dBm  $\pm [ ]$  dB (or  $\pm [ ]$  dB in extreme conditions).