TSG RAN Meeting #15 **RP-020022**

Cheju, Korea, 5 - 8 March 2002

Title: **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.133 (3)**

Source: **TSG RAN WG4**

Agenda Item: **7.4.3**

RAN4 Tdoc	Spec	CR	Rev	Phase	Title	Cat	Curr Ver	New Ver
R4-020493	25.133	307	1	R99	Correction of power spectral density	F	3.8.0	3.9.0
R4-020297	25.133	310		Rel-4	Correction of power spectral density	A	4.3.0	4.4.0
R4-020298	25.133	311		Rel-5	Correction of power spectral density	A	5.1.0	5.2.0
R4-020496	25.133	292	1	R99	UE Tx Timing in soft handover	F	3.8.0	3.9.0
R4-020497	25.133	296	1	Rel-4	UE Tx Timing in soft handover	A	4.3.0	4.4.0
R4-020498	25.133	297	1	Rel-5	UE Tx Timing in soft handover	A	5.1.0	5.2.0
R4-020499	25.133	325		R99	Corrections to section 9	F	3.8.0	3.9.0
R4-020500	25.133	326		Rel-4	Corrections to section 9	A	4.3.0	4.4.0
R4-020501	25.133	327		Rel-5	Corrections to section 9	A	5.1.0	5.2.0
R4-020506	25.133	328		R99	Correction of Cell Reselection in idle mode test case	F	3.8.0	3.9.0
R4-020507	25.133	329		Rel-4	Correction of Cell Reselection in idle mode test case	A	4.3.0	4.4.0
R4-020508	25.133	330		Rel-5	Correction of Cell Reselection in idle mode test case	A	5.1.0	5.2.0
R4-020509	25.133	268	1	R99	Correction of Cell reselection in CELL FACH	F	3.8.0	3.9.0
R4-020510	25.133	269	1	Rel-4	Correction of Cell reselection in CELL FACH	A	4.3.0	4.4.0
R4-020511	25.133	270	1	Rel-5	Correction of Cell reselection in CELL FACH	A	5.1.0	5.2.0
R4-020513	25.133	300	1	R99	SFN decoding for identification of a new cell	F	3.8.0	3.9.0
R4-020514	25.133	301	1	Rel-4	SFN decoding for identification of a new cell	A	4.3.0	4.4.0
R4-020515	25.133	302	1	Rel-5	SFN decoding for identification of a new cell	A	5.1.0	5.2.0

3GPP TSG RAN WG4 Meeting #21 **R4-020509**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **268** ⌘ **rev** **1** ⌘ Current version: **3.8.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of Cell reselection in CELL FACH
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 1/2/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘
- The general requirement for FDD/TDD and FDD/GSM Cell Re-selection delays is not align with FDD/FDD delays.
- The general requirement for Cell Re-selection in CELL FACH has been changed. But in the test case the change is not reflected.
- The additional implementation margin should be taken into account in the test case.

Summary of change: ⌘
- Align general requirement for FDD/TDD and FDD/GSM to FDD/FDD case.
- Add an interruption time described in 5.5.2.2 into the test requirement
- Add an implementation margin into the test requirement

Consequences if not approved: ⌘
The requirement in the test case will not be consistent with the general requirement. Test cases of section A.5.5 may not be achieved.

Isolated Impact Analysis: This CR has small impact on the requirement of FDD/TDD and FDD/GSM Cell Re-selection delays. but the correction does not have any negative impact on the implementation of the UE following the original wording.

Test requirements are also changed in order to align with the corresponding general requirement correctly, hence the correction does not have any impact on the UE following the original general requiremet.

Clauses affected: ⌘ 5.5, A5.5

Other specs affected: ⌘
☐ Other core specifications ⌘
☒ Test specifications 34.121
- O&M Specifications

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

When a Cell Re-selection process is triggered according to TS 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

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

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

5.5.2.1 Cell re-selection delay

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

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

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

5.5.2.1.1 Intra frequency cell reselection

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

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

where

$T_{identify\_intra}$ is specified in 8.4.2.2.1.

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

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

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

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

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

where

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

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

5.5.2.1.2 Inter frequency cell reselection

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

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

.where

$T_{identify,\ ,inter}$ is specified in 8.4.2.3.1.

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

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

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

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

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

where

$T_{Measurement\_inter}$ = Specified in 8.4.2.3.2.

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

5.5.2.1.3 FDD-TDD cell reselection

The cell re-selection delay in CELL_FACH state in FDD to a TDD cell shall be less than

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

$T_{reselection,\ TDD} = T_{identify,TDD} + 100 + T_{SI} + T_{RA}$ ms

where

$T_{identify,\ TDD}$ is specified in 8.4.2.4.1.

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

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

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

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

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

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

where

a) For UE requiring measurement occasions.

$T_{identify,GSM}$ is specified in 8.4.2.5.2.1

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

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

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

where:

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

$N_{GSM\ carrier\ RSSI}$ is specified in 8.4.2.5.1.

b) For UE not requiring measurement occasions

$T_{identify,GSM}$ = 150 ms

$T_{measurement,GSM}$ = 480 ms

5.5.2.2 Interruption time

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

5.5.2.2.1 FDD-FDD cell reselection

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

1) When intra-frequency cell reselection, or inter-frequency cell reselection when the UE does not need measurement occasion to perform inter-frequency measurements, occurs the interruption time shall be less than $T_{interrupt1}$

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

where

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

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

2) When inter-frequency cell reselection occurs and the UE needs measurement occasions to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

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

where

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

5.5.2.2.2 FDD-TDD cell reselection

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

When a FDD-TDD cell reselection occurs the interruption time shall be less than $T_{interrupt, TDD}$

$T_{interrupt,TDD} = 100 + T_{SI}+T_{RA}$ ms

where

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

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

5.5.2.2.3 FDD-GSM cell reselection

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

When FDD-GSM cell reselection occurs the interruption time shall be less than $T_{interrupt, GSM}$

$T_{interrupt,GSM} = 40 +T_{BCCH}+T_{RA}$ ms

where

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

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

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

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

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

The S-critera detection delay in CELL_FACH state shall be less than:

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

where

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

NEXT CHANGED SECTION

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. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.1A and Table A.5.1B.

Table A.5.1A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.1B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset $2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		not sent		not sent		not sent		not sent		not sent		not sent	

A.5.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 1.6s.

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

NOTE: The cell re-selection delay in this case is expressed as:

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

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

where:

$T_{Measurement\_Period\ Intra}$ is specified in 8.4.2.2.2 as 200 ms in this case.

T_{SI}: ~~Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.~~ The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T_{SI} of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~1.52~~ 1.55 s, allow 1.6 s in the test case.

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 tables A5.3 and A5.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.3A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.3B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMP_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		sent		sent		sent		sent		sent		sent	
FACH Measurement occasion cycle length coefficient		3		3		3		3		3		3	
Inter-frequency FDD measurement indicator		TRUE		TRUE		TRUE		TRUE		TRUE		TRUE	
Inter-frequency TDD measurement indicator		FALSE		FALSE		FALSE		FALSE		FALSE		FALSE	

A.5.5.2.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than ~~2.2~~ 1.9 s.

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

NOTE: The cell re-selection delay in this case is expressed as:

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

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

where:

$T_{measurement\ inter}$ is specified in 8.4.2.3.2 as 480 ms in this case.

T_{SI}: ~~Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.~~ The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T_{SI} of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~2.16~~ 1.83 s, allow ~~2.2~~ 1.9 s in the test case.

A.5.5.3 Cell Reselection to GSM

A.5.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 6 GSM cells. Test parameters are given in Table, A.5.4A, A.5.4B, A.5.4C, A.5.4D, A.5.4E.

Table A.5.4A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
Neighbour cell list size			24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	
T1		s	5	
T2		s	10	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.4B: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.4C: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.4D: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
S-CCPCH_Ec/Ior	dB	-12	
OCNS_Ec/Ior	dB	-1.295	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH Ec/Io	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	Not sent	
IE "FACH Measurement occasion info"		Sent	
FACH Measurement occasion cycle length coefficient		3	
Inter-frequency FDD measurement indicator		FALSE	
Inter-frequency TDD measurement indicator		FALSE	
Inter-RAT measurement indicators		Included	
>RAT type		GSM	

Table A.5.4E: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.5.5.3.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to transmit the random access in Cell 2 (the GSM cell).

The cell re-selection delay shall be less than 5.5 + T_{RA} s.

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

NOTE: The cell re-selection delay can be expressed

~~$T_{reselection,GSM} = T_{identify,GSM} + T_{measurement,GSM} + T_{BCCH} + T_{RA}$ ms~~

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

where:

$T_{identify,GSM}$	Specified in 8.4.2.5.2.1, here it is 2880 ms
$T_{measurement,GSM}$	Specified in 5.5.2.1.4, here it is 640 ms
T_{BCCH}	According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.
T_{RA}	The additional delay caused by the random access procedure in the GSM cell. Shall be defined by T1/RF when the test case is further detailed in TS 34.121.

This gives a total of ~~5.4~~ 5.46 +T_{RA} s, allow 5.5 + T_{RA} s.

3GPP TSG RAN WG4 Meeting #21 R4-020508

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v5

CHANGE REQUEST

⌘ 25.133 CR 330 ⌘rev - ⌘ Current version: 5.1.0 ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of Cell reselection in idle mode test case
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The general performance requirements of UTRA to GSM cell reselection are not correctly interpreted in the test case A.4.3.2.1.
Summary of change:	⌘	- The equation for calculating the test requirement is corrected. - The actual value is updated according to the corrected equation, Isolated Impact Analysis: This CR does not affect implementations nor the general performance requirements, because it is a correction of the test case.
Consequences if not approved:	⌘	The test case is not aligned with the general performance requirement.

Clauses affected:	⌘	A4.3		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications	⌘	34.121
Other comments:	⌘			

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With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s		
T2		s		

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75

RXLEV_ACCESS_MIN	dBm	-104
MS_TXPWR_MAX_CCH	dBm	33

A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [21].
According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

A.4.3.2 Scenario 2

A.4.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.7A, A.4.7B, A.4.7C. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.7A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	10	

Table A.4.7B: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	20	-9
I_{oc}	dBm/3.84 MHz	-81	
CPICH_Ec/Io	dB	-10.0	-19.5
CPICH_RSCP	dBm	-70	-100
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7C: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.4.3.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 6.5~~4~~ s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: Max(3*$T_{measureFDD}$, $T_{measureGSM}$) + T_{BCCH}, where:

$T_{measureFDD}$ See Table 4.1 in section 4.2.2.

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [21].
According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 6.4~~3.84~~ s + T_{BCCH}, allow 6.5~~4~~ s + T_{BCCH} in the test case.

3GPP TSG RAN WG4 Meeting #21 R4-020507

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **329** ⌘ **rev** **-** ⌘ Current version: **4.3.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of Cell reselection in idle mode test case
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The general performance requirements of UTRA to GSM cell reselection are not correctly interpreted in the test case A.4.3.2.1.
Summary of change:	⌘	- The equation for calculating the test requirement is corrected. - The actual value is updated according to the corrected equation, Isolated Impact Analysis: This CR does not affect implementations nor the general performance requirements, because it is a correction of the test case.
Consequences if not approved:	⌘	The test case is not aligned with the general performance requirement.

Clauses affected:	⌘	A4.3
Other specs affected:	⌘	☐ Other core specifications ⌘ **X** Test specifications 34.121 **-** O&M Specifications
Other comments:	⌘	

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With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s		
T2		s		

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75

RXLEV_ACCESS_MIN	dBm	-104
MS_TXPWR_MAX_CCH	dBm	33

A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [21].
According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

A.4.3.2 Scenario 2

A.4.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.7A, A.4.7B, A.4.7C. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.7A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	10	

Table A.4.7B: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	20	-9
I_{oc}	dBm/3.84 MHz	-81	
CPICH_Ec/Io	dB	-10.0	-19.5
CPICH_RSCP	dBm	-70	-100
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7C: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.4.3.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 6.5~~4~~ s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: Max(3*$T_{measureFDD}$, $T_{measureGSM}$) + T_{BCCH}, where:

$T_{measureFDD}$ See Table 4.1 in section 4.2.2.

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [21].
According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 6.4~~3.84~~ s + T_{BCCH}, allow 6.5~~4~~ s + T_{BCCH} in the test case.

3GPP TSG RAN WG4 Meeting #21 R4-020506

Sophia Antipolis, France 28th January - 1st February 2002

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CHANGE REQUEST

⌘ 25.133 CR 328 ⌘rev - ⌘ Current version: 3.8.0 ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of Cell reselection in idle mode test case
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 1/2/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

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F *(correction)*
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B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The general performance requirements of UTRA to GSM cell reselection are not correctly interpreted in the test case A.4.3.2.1.
Summary of change:	⌘	- The equation for calculating the test requirement is corrected. - The actual value is updated according to the corrected equation, Isolated Impact Analysis: This CR does not affect implementations nor the general performance requirements, because it is a correction of the test case.
Consequences if not approved:	⌘	The test case is not aligned with the general performance requirement.

Clauses affected:	⌘	A4.3		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications	⌘	34.121
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s		
T2		s		

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75

RXLEV_ACCESS_MIN	dBm	-104
MS_TXPWR_MAX_CCH	dBm	33

A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [21].
According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

A.4.3.2 Scenario 2

A.4.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 12 GSM cells. Test parameters are given in Table, A.4.7A, A.4.7B, A.4.7C. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.7A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	10	

Table A.4.7B: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	20	-9
I_{oc}	dBm/3.84 MHz	-81	
CPICH_Ec/Io	dB	-10.0	-19.5
CPICH_RSCP	dBm	-70	-100
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7C: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-80	-80
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.4.3.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 6.5~~4~~ s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: Max(3*$T_{measureFDD}$, $T_{measureGSM}$) + T_{BCCH}, where:

$T_{measureFDD}$ See Table 4.1 in section 4.2.2.

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [21].
According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

This gives a total of 6.4~~3.84~~ s + T_{BCCH}, allow 6.5~~4~~ s + T_{BCCH} in the test case.

3GPP TSG RAN WG4 Meeting #21 **R4-020501**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **327** ⌘ ev ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to Section 9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ T1/RF requested corrections to TS25.133.

Summary of change: ⌘

- Section 9.1.3.2: UTRAN RSSI is corrected to UTRA Carrier RSSI as the measurement quantity is called elsewhere in TS25.133
- Section A.9.1.3.1: The clarification "In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22." is added into the section.
- Section A.9.1.4.1.2: The clarification "Set 1 of Table A.22" is added and "[14 slots is FSS]" is removed.

Isolated Impact Analysis:

The CR makes obvious corrections based on the current requirements of TS25.133. Hence, the CR has no impact on requirements or implementation.

Consequences if not approved: ⌘ T1/RF has to interpret our requirements, since they are not fully completed.

Clauses affected: ⌘ 9.1.3.2, A.9.1.3.1 and A.9.1.4.1.2

Other specs affected: ⌘

- ☐ Other core specifications
- **X** Test specifications
- ☐ O&M Specifications

⌘ 34.121

Other comments: ⌘

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm]	Io [dBm]	Io [dBm]
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70	-92…-70	-91…-70
	dBm	± 6	± 9	-70...-50	-70…-50	-70…-50

9.1.3.2 Relative accuracy requirement

The relative accuracy requirement is defined as the UTRA~~N~~ Carrier RSSI measured from one frequency compared to the UTRA~~N~~ Carrier RSSI measured from another frequency.

The accuracy requirements in table 9.11 are valid under the following condition:

$| \text{Channel 1\_Io}|_{\text{dBm}} - \text{Channel 2\_Io}|_{\text{dBm}} | < 20$ dB.

Table 9.11: UTRA Carrier RSSIInter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm]	Io [dBm]	Io [dBm]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-70	-92…-70	-91…-70

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.5A.

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

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.

3GPP TSG RAN WG4 Meeting #21 **R4-020500**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **326** ⌘ ev ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to Section 9
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ T1/RF requested corrections to TS25.133.

Summary of change: ⌘

- Section 9.1.3.2: UTRAN RSSI is corrected to UTRA Carrier RSSI as the measurement quantity is called elsewhere in TS25.133
- Section A.9.1.3.1: The clarification "In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22." is added into the section.
- Section A.9.1.4.1.2: The clarification "Set 1 of Table A.22" is added and "[14 slots is FSS]" is removed.

Isolated Impact Analysis:

The CR makes obvious corrections based on the current requirements of TS25.133. Hence, the CR has no impact on requirements or implementation.

Consequences if not approved: ⌘ T1/RF has to interpret our requirements, since they are not fully completed.

Clauses affected: ⌘ 9.1.3.2, A.9.1.3.1 and A.9.1.4.1.2

Other specs affected: ⌘

- ☐ Other core specifications
- **X** Test specifications
- ☐ O&M Specifications

⌘ 34.121

Other comments: ⌘

How to create CRs using this form:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSIInter frequency absolute accuracy

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

9.1.3.2 Relative accuracy requirement

The relative accuracy requirement is defined as the UTRA~~N~~ Carrier RSSI measured from one frequency compared to the UTRA~~N~~ Carrier RSSI measured from another frequency.

The accuracy requirements in table 9.11 are valid under the following condition:

$| \text{Channel 1\_Io}|_{\text{dBm}} - \text{Channel 2\_Io}|_{\text{dBm}} | < 20$ dB.

Table 9.11: UTRA Carrier RSSIInter frequency relative accuracy

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

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.5A.

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

A.9.1.4 SFN-CFN observed time difference

A.9.1.4.1 Test Purpose and Environment

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

A.9.1.4.1.1 Intra frequency test parameters

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

In this case all cells are in the same frequency. Table A.9.6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.6: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.1.2 Inter frequency test parameters

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

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 ~~[14 slots is FSS]~~. Table A.9.7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.7: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc,* Note 1	*Io -10.6 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.2 Test Requirements

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

3GPP TSG RAN WG4 Meeting #21 **R4-020499**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **325** ⌘ ev ⌘ Current version: **3.8.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections to Section 9
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 1/2/2002
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ T1/RF requested corrections to TS25.133.

Summary of change: ⌘

- Section 9.1.3.2: UTRAN RSSI is corrected to UTRA Carrier RSSI as the measurement quantity is called elsewhere in TS25.133
- Section A.9.1.3.1: The clarification “In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22.” is added into the section.
- Section A.9.1.4.1.2: The clarification “Set 1 of Table A.22” is added and “[14 slots is FSS]” is removed.

Isolated Impact Analysis:

The CR makes obvious corrections based on the current requirements of TS25.133. Hence, the CR has no impact on requirements or implementation.

Consequences if not approved: ⌘ T1/RF has to interpret our requirements, since they are not fully completed.

Clauses affected: ⌘ 9.1.3.2, A.9.1.3.1 and A.9.1.4.1.2

Other specs affected: ⌘

☐	Other core specifications	⌘
X	Test specifications	34.121
☐	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSI Inter frequency absolute accuracy

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

9.1.3.2 Relative accuracy requirement

The relative accuracy requirement is defined as the UTRA~~N~~ Carrier RSSI measured from one frequency compared to the UTRA~~N~~ Carrier RSSI measured from another frequency.

The accuracy requirements in table 9.11 are valid under the following condition:

$| \text{Channel 1\_Io}|_{\text{dBm}} - \text{Channel 2\_Io}|_{\text{dBm}} | < 20$ dB.

Table 9.11: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-50

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

A.9.1.3 UTRA Carrier RSSI

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRA Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.3. In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.5A.

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

A.9.1.4 SFN-CFN observed time difference

A.9.1.4.1 Test Purpose and Environment

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

A.9.1.4.1.1 Intra frequency test parameters

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

In this case all cells are in the same frequency. Table A.9.6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.6: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.1.2 Inter frequency test parameters

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

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22~~ [14 slots is FSS]~~. Table A.9.7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.7: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc,* Note 1	*Io -10.6 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.2 Test Requirements

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

3GPP TSG RAN WG4 Meeting #21 **R4-020298**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **311** ⌘ ev ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of power spectral density
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	The existing requirements relating to power spectral density are incomplete. The bandwidth over which the power spectral density should be integrated is missing. The assumption that this should be 3.84 MHz is incorrect for signals containing information since the energy of the signal extends to (1+α) times the chip rate. For band limited white noise, it is correct to assume a (noise) bandwidth equal to the chip rate. Without these clarifications, it will not be possible to correctly generate or measure any of the quantities involved.
Summary of change:	⌘	3.2 Abbreviations: I_{oc}, I_{or} and $\hat{I}_{or}$ definitions clarified with note. 9, Annex A: Incorrect units of dBm for Io are replaced with dBm/3.84 MHz. "Power" for Io is clarified as "power spectral density".
Consequences if not approved:	⌘	The incomplete requirements can be interpreted differently causing an incorrect understanding of UE performance. Isolated impact statement: Correction of requirements. Should not affect UE implementations or system performance but may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3, 9		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘			

How to create CRs using this form:

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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

3.2 Symbols

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

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

Treselection Defined in TS 25.304, subclause 5.2.6.1.5

UE_TXPWR_MAX_RACH Defined in TS 25.304, subclause 5.2.3.1.2.

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

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band. Definitions of each frequency bands can be found in TS 25.101.

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

9.1 Measurement Performance for UE

The requirements in this clause are applicable for a UE:

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

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

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

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.1.1.1 Absolute accuracy requirement

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

CPICH_RSCP1$|_{\text{dBm}} \geq$ -114 dBm for Band I,

CPICH_RSCP1$|_{\text{dBm}} \geq$ -112 dBm for Band II,

CPICH_RSCP1$|_{\text{dBm}} \geq$ -111 dBm for Band III.

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

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70	-92…-70	-91…-70
	dBm	± 8	± 11	-70...-50	-70…-50	-70…-70

9.1.1.1.2 Relative accuracy requirement

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

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 3	± 3	-94...-50	-92…-50	-91…-50

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.1.2.1 Relative accuracy requirement

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

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
				Band I	Band II	Band III
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 6	-94...-50	-92…-50	-91…-50

9.1.1.3 CPICH RSCP measurement report mapping

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

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

Table 9.4

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _00	CPICH RSCP <-115	dBm
CPICH_RSCP_LEV _01	-115 ≤ CPICH RSCP < -114	dBm
CPICH_RSCP_LEV _02	-114 ≤ CPICH RSCP < -113	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

9.1.2 CPICH Ec/Io

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

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

$CPICH\_RSCP1|_{dBm} \geq$ -114 dBm for Band I,

$CPICH\_RSCP1|_{dBm} \geq$ -112 dBm for Band II,

$CPICH\_RSCP1|_{dBm} \geq$ -111 dBm for Band III.

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

Table 9.5: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.1.2 Relative accuracy requirement

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

The accuracy requirements in table 9.6 are valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

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

Table 9.6: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

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

CPICH_RSCP1$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1$|_{dBm}$ ≥ -111 dBm for Band III.

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

Table 9.7: CPICH_Ec/Io Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.2.2 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 9.8 are valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.8: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.3 CPICH Ec/Io measurement report mapping

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

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

Table 9.9

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

9.1.3 UTRA Carrier RSSI

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
				Band I	Band II	Band III
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70	-92…-70	-91…-70
	dBm	± 6	± 9	-70...-50	-70…-50	-70…-50

9.1.3.2 Relative accuracy requirement

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

The accuracy requirements in table 9.11 are valid under the following condition:

$$| \text{Channel 1\_Io}|_{\text{dBm/3.84 MHz}} - \text{Channel 2\_Io}|_{\text{dBm/3.84 MHz}} | < 20 \text{ dB}.$$

Table 9.11: UTRA Carrier RSSIInter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
				Band I	Band II	Band III
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-70	-92…-70	-91…-70

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

9.1.4 GSM carrier RSSI

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

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

The measurement period for CELL_DCH state can be found in section 8.1.2.5. The measurement period for CELL_FACH state can be found in section 8.4.2.5.

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

If the UE, in CELL_DCH state, needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.5 shall apply.

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

If the UE, in CELL_FACH state, needs measurement occasions to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement stated in section 8.4.2.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 45.008 shall apply.

9.1.5 Transport channel BLER

9.1.5.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a window with the size equal to the IE Reporting interval as specified in section 10.3.7.53 Periodical reporting criteria in TS 25.331.

9.1.5.2 Transport channel BLER measurement report mapping

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

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

Table 9.13

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	-∞ < Log10(Transport channel BLER) < -4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < -3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < -3.9	-
…	…	…
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14 UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

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

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

9.1.7 SFN-CFN observed time difference

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

9.1.7.1 Intra frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.16 is valid under the following conditions:

$CPICH\_RSCP1,2|_{dBm} \geq$ -114 dBm for Band I,

$CPICH\_RSCP1,2|_{dBm} \geq$ -112 dBm for Band II,

$CPICH\_RSCP1,2|_{dBm} \geq$ -111 dBm for Band III.

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

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

$$\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.16

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50	-92…-50	-91…-50

9.1.7.2 Inter frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

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

| Channel 1_Io$|_{dBm 3.84\ MHz}$ -Channel 2_Io$|_{dBm 3.84\ MHz}$| ≤ 20 dB.

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

Table 9.17

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50	-92…-50	-91…-50

9.1.7.3 SFN-CFN observed time difference measurement report mapping

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

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

Table 9.18

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

9.1.8 SFN-SFN observed time difference

9.1.8.1 SFN-SFN observed time difference type 1

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

9.1.8.1.1 Measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.19 is valid under the following conditions:

$CPICH\_RSCP1,2|_{dBm} \geq$ -114 dBm for Band I,

. $CPICH\_RSCP1,2|_{dBm} \geq$ -112 dBm for Band II,

$CPICH\_RSCP1,2|_{dBm} \geq$ -111 dBm for Band III.

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

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

$\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$ is low enough to ensure successful SFN decoding.

Table 9.19

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type1	chip	± 1	-94...-50	-92…-50	-91…-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 9.20 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.20

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

9.1.8.2 SFN-SFN observed time difference type 2

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

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

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

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -111 dBm for Band III.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P - CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50	-92…-50	-91…-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

. CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

$$\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50	-92…-50	-91…-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

. CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band I.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$ | ≤ 20 dB.

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

Table 9.23

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50	-92…-50	-91…-50

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

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

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

9.1.9 UE Rx-Tx time difference

9.1.9.1 UE Rx-Tx time difference type 1

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

The measurement period in CELL_DCH state is [100 ms]

9.1.9.1.1 Measurement requirement

Table 9.25

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± 1.5	-94...-50	-92…-50	-91…-50

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

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

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

Table 9.26

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

9.1.9.2 UE Rx-Tx time difference type 2

NOTE: This measurement is used for UE positioning purposes.

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

9.1.9.2.1 Measurement requirement

Table 9.27

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± TBD	-94...-50	-92…-50	-91…-50

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

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

In table 9.28 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.28

Reported value	Measured quantity value	Unit
RX-TX_TIME _0000	UE Rx-Tx Time difference type 2 < 768.000	chip
RX-TX_TIME _0001	768.000 ≤ UE Rx-Tx Time difference type 2 < 768.0625	chip
RX-TX_TIME _0002	768.0625 ≤ UE Rx-Tx Time difference type 2 < 768.1250	chip
RX-TX_TIME _0003	768.1250 ≤ UE Rx-Tx Time difference type 2 < 768.1875	chip
…	…	…
RX-TX_TIME _8189	1279.7500 ≤ UE Rx-Tx Time difference type 2 < 1279.8125	chip
RX-TX_TIME _8190	1279.8125 ≤ UE Rx-Tx Time difference type 2 < 1279.8750	chip
RX-TX_TIME _8191	1279.8750 ≤ UE Rx-Tx Time difference type 2	chip

9.1.10 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

The measurement period for CELL_DCH state is equal to the maximum time between two successive BSIC re-confirmations for one particular GSM cell according to sub clause 8.1.2.5.2. The measurement period for CELL_FACH state is equal to the maximum time between two successive BSIC re-confirmations according to sub clause 8.4.2.5.2.

NOTE: The conditions for which the accuracy requirement in table 9.29 is valid are FFS.

Table 9.29

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

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

Table 9.30

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

9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.4.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9.31is valid under the following conditions:

P-CCPCH_RSCP ≥ -102 dBm.

$$\left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB} \leq 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm/3.84 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

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

Table 9.32

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV _00	PCCPCH RSCP< -115	dBm
PCCPCH_RSCP_LEV _01	-115 ≤ PCCPCH RSCP< -114	dBm
PCCPCH_RSCP_LEV _02	-114 ≤ PCCPCH RSCP< -113	dBm
PCCPCH_RSCP_LEV _03	-113 ≤ PCCPCH RSCP< -112	dBm
…	…	…
PCCPCH_RSCP_LEV _89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV _90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV _91	-25 ≤ PCCPCH RSCP	dBm

9.1.12 UE GPS Timing of Cell Frames for UE positioning

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

Table 9.33

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

9.1.12.1 UE GPS timing of Cell Frames for UE positioning measurement report mapping

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

In table 9.34 the mapping of measured quantity is defined.

Table 9.34

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for UE positioning < 0.0625	chip
GPS_TIME_00000000000001	0.0625 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1250	chip
GPS_TIME_00000000000002	0.1250 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1875	chip
...	...	...
GPS_TIME_3715891199997	2322431999999.8125 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.8750	chip
GPS_TIME_37158911999998	2322431999999.8750 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.9375	chip
GPS_TIME_37158911999999	2322431999999.9375 ≤ UE GPS timing of Cell Frames for UE positioning < 2322432000000.0000	chip

9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302.

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

9.2.1 Received total wideband power

The measurement period shall be 100 ms.

9.2.1.1 Absolute accuracy requirement

Table 9.35

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 4	–103<= Io <= -74 dBm/3.84 MHz

9.2.1.2 Relative accuracy requirement

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

Table 9.36

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 0.5-	For changes <= ±5.0dB and –103 <= Io <= -74dBm/3.84 MHz

9.2.1.3 Received total wideband power measurement report mapping

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

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

Table 9.37

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

9.2.2 SIR

The measurement period shall be 80 ms.

9.2.2.1 Accuracy requirement

Table 9.38

Parameter	Unit	Accuracy [dB]	Conditions Range
SIR	dB	± 3	For -7<SIR<20 dB when Io > -105 dBm/3.84 MHz

9.2.2.2 SIR measurement report mapping

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

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

Table 9.39

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

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. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-75.54		-59.98		-97.52	
Îor/Ioc	dB	4	0	9	0	0	-6.53
CPICH RSCP, Note 1	dBm	-81.5	-85.5	-60.98	-69.88	-107.5	-114.0
Io, Note 1	dBm/3.84 MHz	-69		-50		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. . CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-60.00	-60.00	-84.00	-94.46
Îor/Ioc	dB	9.54	9.54	0	-9.54
CPICH RSCP, Note 1	dBm	-60.46	-60.46	-94.0	-114.0
Io, Note 1	dBm/3.84 MHz	-50.00	-50.00	-81.0	-94.0
Propagation condition	-	AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.					

A.9.1.1.2 Test Requirements

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

A.9.1.2 CPICH Ec/Io

A.9.1.2.1 Test Purpose and Environment

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

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3

Table A.9.3: CPICH Ec/Io Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94
Ioc	dBm/ 3.84 MHz	-56.98		-89.07		-94.98	
Îor/Ioc	dB	3.0	3.0	-2.9	-2.9	-9.0	-9.0
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50		-86		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.4.

Table A.9.4: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-87.27	-87.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-86	-86	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. In case of the absolute CPICH_Ec/Io measurement accuracy and relative inter-frequency CPICH_Ec/Io measurement accuracy test cases the effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.4A.

Table A.9.4A: CPICH_Ec/Io Intra and Inter frequency absolute accuracy and CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

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. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.5A.

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

A.9.1.3A GSM Carrier RSSI

A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell_DCH state compressed mode with purpose “GSM Carrier RSSI Measurement” is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5A defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Table A.9.5A: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Not required	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/Ioc	dB	-1
Ioc	dBm/ 3.84 MHz	-70
Propagation condition	-	AWGN

A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

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

A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

A.9.1.3C UE transmitted power

A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

The test parameters are given in Table A.9.5C and A.9.5D below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.

Table A.9.5C: General test parameters for UE transmitted power

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	

Table A.9.5D: Cell Specific parameters for UE transmitted power

Parameter	Unit	Cell 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	Note1
OCNS		Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.		

A.9.1.3C.1.1 Test procedure

1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
2) Send continuously during the entire test Up power control commands to the UE.
3) Measure the output power of the UE. The output power shall be averaged over the transmit one timeslot.
4) Check that the reported UE transmitted power is within the specified range.
5) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.
6) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

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

A.9.1.4 SFN-CFN observed time difference

A.9.1.4.1 Test Purpose and Environment

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

A.9.1.4.1.1 Intra frequency test parameters

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

In this case all cells are in the same frequency. Table A.9.6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.6: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc*, Note 1	*Io -13.7 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.1.2 Inter frequency test parameters

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

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9.7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.7: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc*, Note 1	*Io -10.6 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.2 Test Requirements

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

A.9.1.5 SFN-SFN observed time difference

A.9.1.5.1 SFN-SFN observed time difference type 1

A.9.1.5.1.1 Test Purpose and Environment

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

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

In this case all cells are in the same frequency. Table A.9.8 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.8: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.5.1.2 Test Requirements

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

A.9.1.5.2 SFN-SFN observed time difference type 2

A.9.1.5.2.1 Test Purpose and Environment

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

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

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.

Table A.9.10 SFN-SFN observed time difference type 2 idle period test parameters

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

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

A.9.1.5.2.2 Test Requirements

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

A.9.1.6 UE Rx-Tx time difference

A.9.1.6.1 UE Rx-Tx time difference type 1

A.9.1.6.1.1 Test Purpose and Environment

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

Table A.9.11 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.11: UE Rx-Tx time difference type 1 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	*Io –10.9 dB = Ioc*, Note 1
Io	dBm/3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.		

A.9.1.6.1.2 Test Requirements

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

A.9.1.6.2 UE Rx-Tx time difference type 2

A.9.1.6.2.1 Test Purpose and Environment

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

Table A.9.12 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.12: UE Rx-Tx time difference type 2 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	Io –10.9 dB = Ioc, Note 1
Io	dBm/ 3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: Ioc level shall be adjusted according the total signal power spectral density Io at receiver input and the geometry factor Îor/Ioc.		

A.9.1.6.2.2 Test Requirements

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

A.9.1.7 Observed time difference to GSM cell

A.9.1.7.1 Test Purpose and Environment

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

Note: The requirement scenario is FFS.

A.9.1.7.2 Test Requirements

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

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

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

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

In this case the cells are on different frequencies. Table A.9.13 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.9.13 P-CCPCH inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 1	-70
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94 ... -70 -94... -50	-94 ... -70 -94... -50
Propagation condition	-	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.8.2 Test Requirements

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

3GPP TSG RAN WG4 Meeting #21 **R4-020297**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **310** ⌘ ev ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of power spectral density
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The existing requirements relating to power spectral density are incomplete. The bandwidth over which the power spectral density should be integrated is missing. The assumption that this should be 3.84 MHz is incorrect for signals containing information since the energy of the signal extends to (1+α) times the chip rate. For band limited white noise, it is correct to assume a (noise) bandwidth equal to the chip rate. Without these clarifications, it will not be possible to correctly generate or measure any of the quantities involved.
Summary of change:	⌘	3.2 Abbreviations: I_{oc}, I_{or} and $\hat{I}_{or}$ definitions clarified with note. 9, Annex A: Incorrect units of dBm for Io are replaced with dBm/3.84 MHz. "Power" for Io is clarified as "power spectral density".
Consequences if not approved:	⌘	The incomplete requirements can be interpreted differently causing an incorrect understanding of UE performance. Isolated impact statement: Correction of requirements. Should not affect UE implementations or system performance but may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3, 9		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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

3.2 Symbols

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

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

Treselection Defined in TS 25.304, subclause 5.2.6.1.5

UE_TXPWR_MAX_RACH Defined in TS 25.304, subclause 5.2.3.1.2.

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

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.1.1.1 Absolute accuracy requirement

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

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

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

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-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|$_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

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

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 3	± 3	-94...-50

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.1.2.1 Relative accuracy requirement

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

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

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 6	-94...-50

9.1.1.3 CPICH RSCP measurement report mapping

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

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

Table 9.4

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _00	CPICH RSCP <-115	dBm
CPICH_RSCP_LEV _01	-115 ≤ CPICH RSCP < -114	dBm
CPICH_RSCP_LEV _02	-114 ≤ CPICH RSCP < -113	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

9.1.2 CPICH Ec/Io

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

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

$CPICH\_RSCP1|_{dBm} \geq -114$ dBm.

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

Table 9.5: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.1.2 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|$_{dBm}$ ≥ -114 dBm.

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

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

Table 9.6: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

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

CPICH_RSCP1|$_{dBm}$ ≥ -114 dBm.

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

Table 9.7: CPICH_Ec/Io Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.2.2 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 9.8 are valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

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

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.8: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.3 CPICH Ec/Io measurement report mapping

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

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

Table 9.9

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

9.1.3 UTRA Carrier RSSI

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSIInter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70
	dBm	± 6	± 9	-70...-50

9.1.3.2 Relative accuracy requirement

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

The accuracy requirements in table 9.11 are valid under the following condition:

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$| < 20 dB.

Table 9.11: UTRA Carrier RSSIInter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-70

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

9.1.4 GSM carrier RSSI

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

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

The measurement period for CELL_DCH state can be found in section 8.1.2.5. The measurement period for CELL_FACH state can be found in section 8.4.2.5.

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

If the UE, in CELL_DCH state, needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.5 shall apply.

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

If the UE, in CELL_FACH state, needs measurement occasions to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement stated in section 8.4.2.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 45.008 shall apply.

9.1.5 Transport channel BLER

9.1.5.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a window with the size equal to the IE Reporting interval as specified in section 10.3.7.53 Periodical reporting criteria in TS 25.331.

9.1.5.2 Transport channel BLER measurement report mapping

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

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

Table 9.13

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	$-\infty <$ Log10(Transport channel BLER) < -4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < -3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < -3.9	-
…	…	…
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14 UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

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

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

9.1.7 SFN-CFN observed time difference

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

9.1.7.1 Intra frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.16 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P - CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.16

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50

9.1.7.2 Inter frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.17

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50

9.1.7.3 SFN-CFN observed time difference measurement report mapping

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

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

Table 9.18

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

9.1.8 SFN-SFN observed time difference

9.1.8.1 SFN-SFN observed time difference type 1

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

9.1.8.1.1 Measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.19 is valid under the following conditions:

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -114 dBm.

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

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

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.19

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
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 9.20 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.20

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

9.1.8.2 SFN-SFN observed time difference type 2

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

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

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

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

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

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

$$\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.23

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50

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

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

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

9.1.9 UE Rx-Tx time difference

9.1.9.1 UE Rx-Tx time difference type 1

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

The measurement period in CELL_DCH state is [100 ms]

9.1.9.1.1 Measurement requirement

Table 9.25

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± 1.5	-94...-50

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

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

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

Table 9.26

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

9.1.9.2 UE Rx-Tx time difference type 2

NOTE: This measurement is used for UE positioning purposes.

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

9.1.9.2.1 Measurement requirement

Table 9.27

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± TBD	-94...-50

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

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

In table 9.28 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.28

Reported value	Measured quantity value	Unit
RX-TX_TIME _0000	UE Rx-Tx Time difference type 2 < 768.000	chip
RX-TX_TIME _0001	768.000 ≤ UE Rx-Tx Time difference type 2 < 768.0625	chip
RX-TX_TIME _0002	768.0625 ≤ UE Rx-Tx Time difference type 2 < 768.1250	chip
RX-TX_TIME _0003	768.1250 ≤ UE Rx-Tx Time difference type 2 < 768.1875	chip
…	…	…
RX-TX_TIME _8189	1279.7500 ≤ UE Rx-Tx Time difference type 2 < 1279.8125	chip
RX-TX_TIME _8190	1279.8125 ≤ UE Rx-Tx Time difference type 2 < 1279.8750	chip
RX-TX_TIME _8191	1279.8750 ≤ UE Rx-Tx Time difference type 2	chip

9.1.10 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

The measurement period for CELL_DCH state is equal to the maximum time between two successive BSIC re-confirmations for one particular GSM cell according to sub clause 8.1.2.5.2. The measurement period for CELL_FACH state is equal to the maximum time between two successive BSIC re-confirmations according to sub clause 8.4.2.5.2.

NOTE: The conditions for which the accuracy requirement in table 9.29 is valid are FFS.

Table 9.29

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

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

Table 9.30

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

9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.4.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9.31is valid under the following conditions:

P-CCPCH_RSCP ≥ -102 dBm.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{P-CCPCH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm/3.84 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

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

Table 9.32

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV _00	PCCPCH RSCP< -115	dBm
PCCPCH_RSCP_LEV _01	-115 ≤ PCCPCH RSCP< -114	dBm
PCCPCH_RSCP_LEV _02	-114 ≤ PCCPCH RSCP< -113	dBm
PCCPCH_RSCP_LEV _03	-113 ≤ PCCPCH RSCP< -112	dBm
…	…	…
PCCPCH_RSCP_LEV _89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV _90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV _91	-25 ≤ PCCPCH RSCP	dBm

9.1.12 UE GPS Timing of Cell Frames for UE positioning

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

Table 9.33

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

9.1.12.1 UE GPS timing of Cell Frames for UE positioning measurement report mapping

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

In table 9.34 the mapping of measured quantity is defined.

Table 9.34

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for UE positioning < 0.0625	chip
GPS_TIME_00000000000001	0.0625 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1250	chip
GPS_TIME_00000000000002	0.1250 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1875	chip
...	...	...
GPS_TIME_3715891199997	2322431999999.8125 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.8750	chip
GPS_TIME_37158911999998	2322431999999.8750 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.9375	chip
GPS_TIME_37158911999999	2322431999999.9375 ≤ UE GPS timing of Cell Frames for UE positioning < 2322432000000.0000	chip

9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302.

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

9.2.1 Received total wideband power

The measurement period shall be 100 ms.

9.2.1.1 Absolute accuracy requirement

Table 9.35

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	DBm/3.84 MHz	± 4	–103<= Io <= -74 dBm/3.84 MHz

9.2.1.2 Relative accuracy requirement

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

Table 9.36

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 0.5-	For changes <= ±5.0dB and –103 <= Io <= -74dBm/3.84 MHz

9.2.1.3 Received total wideband power measurement report mapping

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

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

Table 9.37

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

9.2.2 SIR

The measurement period shall be 80 ms.

9.2.2.1 Accuracy requirement

Table 9.38

Parameter	Unit	Accuracy [dB]	Conditions Range
SIR	dB	± 3	For -7<SIR<20 dB when Io > -105 dBm/3.84 MHz

9.2.2.2 SIR measurement report mapping

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

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

Table 9.39

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

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. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-75.54		-59.98		-97.52	
Îor/Ioc	dB	4	0	9	0	0	-6.53
CPICH RSCP, Note 1	dBm	-81.5	-85.5	-60.98	-69.88	-107.5	-114.0
Io, Note 1	dBm/3.84 MHz	-69		-50		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. . CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-60.00	-60.00	-84.00	-94.46
Îor/Ioc	dB	9.54	9.54	0	-9.54
CPICH RSCP, Note 1	dBm	-60.46	-60.46	-94.0	-114.0
Io, Note 1	dBm/3.84 MHz	-50.00	-50.00	-81.0	-94.0
Propagation condition	-	AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.					

A.9.1.1.2 Test Requirements

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

A.9.1.2 CPICH Ec/Io

A.9.1.2.1 Test Purpose and Environment

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

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3

Table A.9.3: CPICH Ec/Io Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94
Ioc	dBm/ 3.84 MHz	-56.98		-89.07		-94.98	
Îor/Ioc	dB	3.0	3.0	-2.9	-2.9	-9.0	-9.0
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50		-86		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.4.

Table A.9.4: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-87.27	-87.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-86	-86	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. In case of the absolute CPICH_Ec/Io measurement accuracy and relative inter-frequency CPICH_Ec/Io measurement accuracy test cases the effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.4A.

Table A.9.4A: CPICH_Ec/Io Intra and Inter frequency absolute accuracy and CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

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. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.5A.

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

A.9.1.3A GSM Carrier RSSI

A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell_DCH state compressed mode with purpose “GSM Carrier RSSI Measurement” is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5A defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Table A.9.5A: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Not required	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/Ioc	dB	-1
Ioc	dBm/ 3.84 MHz	-70
Propagation condition	-	AWGN

A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

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

A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

A.9.1.3C UE transmitted power

A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

The test parameters are given in Table A.9.5C and A.9.5D below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.

Table A.9.5C: General test parameters for UE transmitted power

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	

Table A.9.5D: Cell Specific parameters for UE transmitted power

Parameter	Unit	Cell 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	Note1
OCNS		Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.		

A.9.1.3C.1.1 Test procedure

1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
2) Send continuously during the entire test Up power control commands to the UE.
3) Measure the output power of the UE. The output power shall be averaged over the transmit one timeslot.
4) Check that the reported UE transmitted power is within the specified range.
5) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.
6) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

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

A.9.1.4 SFN-CFN observed time difference

A.9.1.4.1 Test Purpose and Environment

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

A.9.1.4.1.1 Intra frequency test parameters

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

In this case all cells are in the same frequency. Table A.9.6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.6: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc*, Note 1	*Io -13.7 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.1.2 Inter frequency test parameters

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

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9.7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.7: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc*, Note 1	*Io -10.6 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.2 Test Requirements

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

A.9.1.5 SFN-SFN observed time difference

A.9.1.5.1 SFN-SFN observed time difference type 1

A.9.1.5.1.1 Test Purpose and Environment

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

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

In this case all cells are in the same frequency. Table A.9.8 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.8: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.5.1.2 Test Requirements

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

A.9.1.5.2 SFN-SFN observed time difference type 2

A.9.1.5.2.1 Test Purpose and Environment

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

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

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.

Table A.9.10 SFN-SFN observed time difference type 2 idle period test parameters

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

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

A.9.1.5.2.2 Test Requirements

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

A.9.1.6 UE Rx-Tx time difference

A.9.1.6.1 UE Rx-Tx time difference type 1

A.9.1.6.1.1 Test Purpose and Environment

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

Table A.9.11 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.11: UE Rx-Tx time difference type 1 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	*Io –10.9 dB = Ioc*, Note 1
Io	dBm/3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.		

A.9.1.6.1.2 Test Requirements

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

A.9.1.6.2 UE Rx-Tx time difference type 2

A.9.1.6.2.1 Test Purpose and Environment

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

Table A.9.12 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.12: UE Rx-Tx time difference type 2 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	Io –10.9 dB = Ioc, Note 1
Io	dBm/ 3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: Ioc level shall be adjusted according the total signal power spectral density Io at receiver input and the geometry factor Îor/Ioc.		

A.9.1.6.2.2 Test Requirements

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

A.9.1.7 Observed time difference to GSM cell

A.9.1.7.1 Test Purpose and Environment

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

Note: The requirement scenario is FFS.

A.9.1.7.2 Test Requirements

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

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

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

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

In this case the cells are on different frequencies. Table A.9.13 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.9.13 P-CCPCH inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 1	-70
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94 ... -70 -94... -50	-94 ... -70 -94... -50
Propagation condition	-	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.8.2 Test Requirements

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

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Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **307** ⌘ ev **1** ⌘ Current version: **3.8.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of power spectral density
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 1/2/2002
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The existing requirements relating to power spectral density are incomplete. The bandwidth over which the power spectral density should be integrated is missing. The assumption that this should be 3.84 MHz is incorrect for signals containing information since the energy of the signal extends to (1+α) times the chip rate. For band limited white noise, it is correct to assume a (noise) bandwidth equal to the chip rate. Without these clarifications, it will not be possible to correctly generate or measure any of the quantities involved.
Summary of change:	⌘	3.2 Abbreviations: I_{oc}, I_{or} and $\hat{I}_{or}$ definitions clarified with note. 9, Annex A: Incorrect units of dBm for Io are replaced with dBm/3.84 MHz. "Power" for Io is clarified as "power spectral density".
Consequences if not approved:	⌘	The incomplete requirements can be interpreted differently causing an incorrect understanding of UE performance. Isolated impact statement: Correction of requirements. Should not affect UE implementations or system performance but may impact conformance test implementation and conformance test results.

Clauses affected:	⌘	3, 9		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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

3.2 Symbols

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

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

Treselection Defined in TS 25.304, subclause 5.2.6.1.5

UE_TXPWR_MAX_RACH Defined in TS 25.304, subclause 5.2.3.1.2.

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

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

9 Measurements Performance Requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The physical layer measurement model and a complete list of measurements is specified in TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for FDD are described and defined in TS25.215 "Physical layer - Measurements (FDD)". In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

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

9.1.1 CPICH RSCP

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

9.1.1.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.1.1.1 Absolute accuracy requirement

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

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

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

Table 9.1: CPICH_RSCP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-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|$_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

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

Table 9.2: CPICH_RSCP Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 3	± 3	-94...-50

9.1.1.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.1.2.1 Relative accuracy requirement

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

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

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.3: CPICH_RSCP Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_RSCP	dBm	± 6	± 6	-94...-50

9.1.1.3 CPICH RSCP measurement report mapping

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

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

Table 9.4

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _00	CPICH RSCP <-115	dBm
CPICH_RSCP_LEV _01	-115 ≤ CPICH RSCP < -114	dBm
CPICH_RSCP_LEV _02	-114 ≤ CPICH RSCP < -113	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

9.1.2 CPICH Ec/Io

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

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

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

$CPICH\_RSCP1|_{dBm} \geq -114$ dBm.

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

Table 9.5: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.1.2 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|$_{dBm}$ ≥ -114 dBm.

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

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

Table 9.6: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

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

CPICH_RSCP1|$_{dBm}$ ≥ -114 dBm.

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

Table 9.7: CPICH_Ec/Io Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.2.2 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 9.8 are valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

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

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.8: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.2.3 CPICH Ec/Io measurement report mapping

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

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

Table 9.9

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

9.1.3 UTRA Carrier RSSI

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2 for intra frequency measurements and in sub clause 8.1.2.2 for inter frequency measurements. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2 for intra frequency measurements and in sub clause 8.4.2.3 for inter frequency measurements.

9.1.3.1 Absolute accuracy requirement

Table 9.10: UTRA Carrier RSSI Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 4	± 7	-94...-70
	dBm	± 6	± 9	-70...-50

9.1.3.2 Relative accuracy requirement

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

The accuracy requirements in table 9.11 are valid under the following condition:

| Channel 1_Io|$_{dBm/3.84\ MHz}$ -Channel 2_Io|$_{dBm/3.84\ MHz}$| < 20 dB.

Table 9.11: UTRA Carrier RSSI Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	± 7	± 11	-94...-50

9.1.3.3 UTRA Carrier RSSI measurement report mapping

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

In table 9.12 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.12

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

9.1.4 GSM carrier RSSI

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

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

The measurement period for CELL_DCH state can be found in section 8.1.2.5. The measurement period for CELL_FACH state can be found in section 8.4.2.5.

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

If the UE, in CELL_DCH state, needs compressed mode to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement is stated in section 8.1.2.5 shall apply.

If the UE, in CELL_FACH state, does not need measurement occasions to perform GSM measurements, the measurement accuracy requirements for RXLEV in TS 05.08 shall apply.

If the UE, in CELL_FACH state, needs measurement occasions to perform GSM measurements, the GSM measurement procedure and measurement accuracy requirement stated in section 8.4.2.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 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 IE Reporting interval as specified in section 10.3.7.53 Periodical reporting criteria in TS 25.331.

9.1.5.2 Transport channel BLER measurement report mapping

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

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

Table 9.13

Reported value	Measured quantity value	Unit
BLER_LOG _00	Transport channel BLER = 0	-
BLER_LOG _01	$-\infty <$ Log10(Transport channel BLER) < -4.03	-
BLER_LOG _02	-4.03 ≤ Log10(Transport channel BLER) < -3.965	-
BLER_LOG _03	-3.965 ≤ Log10(Transport channel BLER) < -3.9	-
…	…	…
BLER_LOG _61	-0.195 ≤ Log10(Transport channel BLER) < -0.13	-
BLER_LOG _62	-0.13 ≤ Log10(Transport channel BLER) < -0.065	-
BLER_LOG _63	-0.065 ≤ Log10(Transport channel BLER) ≤ 0	-

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14 UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

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

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

9.1.7 SFN-CFN observed time difference

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

9.1.7.1 Intra frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.16 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P - CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.16

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50

9.1.7.2 Inter frequency measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

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

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.17

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	± 1	-94...-50

9.1.7.3 SFN-CFN observed time difference measurement report mapping

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

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

Table 9.18

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

9.1.8 SFN-SFN observed time difference

9.1.8.1 SFN-SFN observed time difference type 1

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

9.1.8.1.1 Measurement requirement

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.19 is valid under the following conditions:

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -114 dBm.

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

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

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.19

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
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 9.20 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.20

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

9.1.8.2 SFN-SFN observed time difference type 2

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

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

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

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dBm} - CPICH\_RSCP2\big|_{in\ dBm} \right| \le 20dB$$

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

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

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

$$\left(\frac{I_o}{\hat{I}_{or}} \right)_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$$ is low enough to ensure successful SFN decoding.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \le 20dB$$

| Channel 1_Io$|_{dBm/3.84\ MHz}$ -Channel 2_Io$|_{dBm/3.84\ MHz}$| ≤ 20 dB.

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

Table 9.23

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50

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

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

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

9.1.9 UE Rx-Tx time difference

9.1.9.1 UE Rx-Tx time difference type 1

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

The measurement period in CELL_DCH state is [100 ms]

9.1.9.1.1 Measurement requirement

Table 9.25

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± 1.5	-94...-50

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

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

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

Table 9.26

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

9.1.9.2 UE Rx-Tx time difference type 2

NOTE: This measurement is used for UE positioning purposes.

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

9.1.9.2.1 Measurement requirement

Table 9.27

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
UE RX-TX time difference	chip	± TBD	-94...-50

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

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

In table 9.28 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.28

Reported value	Measured quantity value	Unit
RX-TX_TIME _0000	UE Rx-Tx Time difference type 2 < 768.000	chip
RX-TX_TIME _0001	768.000 ≤ UE Rx-Tx Time difference type 2 < 768.0625	chip
RX-TX_TIME _0002	768.0625 ≤ UE Rx-Tx Time difference type 2 < 768.1250	chip
RX-TX_TIME _0003	768.1250 ≤ UE Rx-Tx Time difference type 2 < 768.1875	chip
…	…	…
RX-TX_TIME _8189	1279.7500 ≤ UE Rx-Tx Time difference type 2 < 1279.8125	chip
RX-TX_TIME _8190	1279.8125 ≤ UE Rx-Tx Time difference type 2 < 1279.8750	chip
RX-TX_TIME _8191	1279.8750 ≤ UE Rx-Tx Time difference type 2	chip

9.1.10 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

The measurement period for CELL_DCH state is equal to the maximum time between two successive BSIC re-confirmations for one particular GSM cell according to sub clause 8.1.2.5.2. The measurement period for CELL_FACH state is equal to the maximum time between two successive BSIC re-confirmations according to sub clause 8.4.2.5.2.

NOTE: The conditions for which the accuracy requirement in table 9.29 is valid are FFS.

Table 9.29

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

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

Table 9.30

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

9.1.11 P-CCPCH RSCP

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

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

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.4. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.4.

9.1.11.1 Absolute accuracy requirements

The accuracy requirement in table 9.31is valid under the following conditions:

P-CCPCH_RSCP ≥ -102 dBm.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{P-CCPCH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 8dB$$

Table 9.31: P-CCPCH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm/3.84 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

9.1.11.2 P-CCPCH RSCP measurement report mapping

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

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

Table 9.32

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV _00	PCCPCH RSCP< -115	dBm
PCCPCH_RSCP_LEV _01	-115 ≤ PCCPCH RSCP< -114	dBm
PCCPCH_RSCP_LEV _02	-114 ≤ PCCPCH RSCP< -113	dBm
PCCPCH_RSCP_LEV _03	-113 ≤ PCCPCH RSCP< -112	dBm
…	…	…
PCCPCH_RSCP_LEV _89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV _90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV _91	-25 ≤ PCCPCH RSCP	dBm

9.1.12 UE GPS Timing of Cell Frames for UE positioning

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

Table 9.33

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

9.1.12.1 UE GPS timing of Cell Frames for UE positioning measurement report mapping

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

In table 9.34 the mapping of measured quantity is defined.

Table 9.34

Reported value	Measured quantity value	Unit
GPS_TIME_00000000000000	UE GPS timing of Cell Frames for UE positioning < 0.0625	chip
GPS_TIME_00000000000001	0.0625 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1250	chip
GPS_TIME_00000000000002	0.1250 ≤ UE GPS timing of Cell Frames for UE positioning < 0.1875	chip
...	...	...
GPS_TIME_37158911999997	2322431999999.8125 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.8750	chip
GPS_TIME_37158911999998	2322431999999.8750 ≤ UE GPS timing of Cell Frames for UE positioning < 2322431999999.9375	chip
GPS_TIME_37158911999999	2322431999999.9375 ≤ UE GPS timing of Cell Frames for UE positioning < 2322432000000.0000	chip

9.2 Measurements Performance for UTRAN

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in TS 25.302.

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

9.2.1 Received total wideband power

The measurement period shall be 100 ms.

9.2.1.1 Absolute accuracy requirement

Table 9.35

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 4	–103<= Io <= -74 dBm/3.84 MHz

9.2.1.2 Relative accuracy requirement

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

Table 9.36

Parameter	Unit	Accuracy [dB]	Conditions
			Range
Io	dBm/3.84 MHz	± 0.5-	For changes <= ±5.0dB and –103 <= Io <= -74dBm/3.84 MHz

9.2.1.3 Received total wideband power measurement report mapping

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

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

Table 9.37

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

9.2.2 SIR

The measurement period shall be 80 ms.

9.2.2.1 Accuracy requirement

Table 9.38

Parameter	Unit	Accuracy [dB]	Conditions Range
SIR	dB	± 3	For -7<SIR<20 dB when Io > -105 dBm/3.84 MHz

9.2.2.2 SIR measurement report mapping

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

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

Table 9.39

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

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. Both CPICH RSCP intra frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.1.

Table A.9.1: CPICH RSCP Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-75.54		-59.98		-97.52	
Îor/Ioc	dB	4	0	9	0	0	-6.53
CPICH RSCP, Note 1	dBm	-81.5	-85.5	-60.98	-69.88	-107.5	-114.0
Io, Note 1	dBm/3.84 MHz	-69		-50		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.1.1.2 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. CPICH RSCP inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.2.

Table A.9.2: CPICH RSCP Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12	
SCH_Ec/Ior	dB	-12		-12	
PICH_Ec/Ior	dB	-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94
Ioc	dBm/ 3.84 MHz	-60.00	-60.00	-84.00	-94.46
Îor/Ioc	dB	9.54	9.54	0	-9.54
CPICH RSCP, Note 1	dBm	-60.46	-60.46	-94.0	-114.0
Io, Note 1	dBm/3.84 MHz	-50.00	-50.00	-81.0	-94.0
Propagation condition	-	AWGN		AWGN	
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.					

A.9.1.1.2 Test Requirements

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

A.9.1.2 CPICH Ec/Io

A.9.1.2.1 Test Purpose and Environment

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

A.9.1.2.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. Both CPICH Ec/Io absolute and relative accuracy requirements are tested by using test parameters in Table A.9.3.

Table A.9.3: CPICH Ec/Io Intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-15	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-1.11	-0.94	.2.56	-0.94
Ioc	dBm/ 3.84 MHz	-56.98		-89.07		-94.98	
Îor/Ioc	dB	3.0	3.0	-2.9	-2.9	-9.0	-9.0
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50		-86		-94	
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5, Set 1 of Table A.22 [14 slots is FSS]. CPICH Ec/Io inter frequency relative accuracy requirements are tested by using test parameters in Table A.9.4.

Table A.9.4: CPICH Ec/Io Inter frequency tests parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-87.27	-87.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-86	-86	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.2.2 Test Requirements

The CPICH Ec/Io measurement accuracy shall meet the requirements in section 9.1.2. In case of the absolute CPICH_Ec/Io measurement accuracy and relative inter-frequency CPICH_Ec/Io measurement accuracy test cases the effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.4A.

Table A.9.4A: CPICH_Ec/Io Intra and Inter frequency absolute accuracy and CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	-2.7…1.5 for -14 ≤ CPICH Ec/Io –3.2…2 for -16 ≤ CPICH Ec/Io < -14 –4.2…3 for -20 ≤ CPICH Ec/Io < -16	-4.2…3	-94...-87
		± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-87...-50

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. UTRA Carrier RSSI accuracy requirements are tested by using test parameters in Table A.9.5.

Table A.9.5: UTRA Carrier RSSI Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15	
DPCH_Ec/Ior	dB	-15	-	-6	-	-6	-
OCNS_Ec/Ior	dB	-1.11	-0.94	-2.56	-0.94	-2.56	-0.94
Ioc	dBm/ 3.84 MHz	-52.22	-52.22	-70.27	-70.27	-94.46	-94.46
Îor/Ioc	dB	-1.75	-1.75	-4.7	-4.7	-9.54	-9.54
CPICH Ec/Io, Note 1	dBm	-14.0	-14.0	-16.0	-16.0	-20.0	-20.0
Io, Note 1	dBm/3.84 MHz	-50	-50	-69	-69	-94	-94
Propagation condition	-	AWGN		AWGN		AWGN	
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.							

A.9.1.3.2 Test Requirements

The UTRA Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.3. The effect of assumed thermal noise and noise generated in the receiver (–99 dBm) shall be added into the required accuracy defined in Section 9.1.2 as shown in Table A.9.5A.

Table A.9.5A: UTRA Carrier RSSI absolute and relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA Carrier RSSI	dBm	-4…5.2	-7…8.2	-94…-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

A.9.1.3A GSM Carrier RSSI

A.9.1.3A.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.4.

In the test in Cell_DCH state compressed mode with purpose “GSM Carrier RSSI Measurement” is applied to measure on GSM. The gap length is 7, detailed definition is in TS 25.101 annex A.5. Table A.9.5A defines the limits of signal strengths and code powers on the UMTS FDD cell, where the requirement is applicable. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement.

The limits of the GSM test parameters are defined in [21].

Table A.9.5A: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement		Compressed mode reference pattern 2 Set 2	As specified in table A.22 TS 25.101 section A.5
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Not required	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.

Table A.9.5B: Cell specific GSM Carrier RSSI test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number	-	Channel 1
Îor/Ioc	dB	-1
Ioc	dBm/ 3.84 MHz	-70
Propagation condition	-	AWGN

A.9.1.3A.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.1.4.

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

A.9.1.3B Transport channel BLER

NOTE: This section is included for consistency with numbering in section 9, currently no test covering requirements in sections 9.1.5 exists.

A.9.1.3C UE transmitted power

A.9.1.3C.1 Test Purpose and Environment

The purpose of this test is to verify that the UE transmitted power measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.6.

The test parameters are given in Table A.9.5C and A.9.5D below. In the measurement control information it shall be indicated to the UE that periodic reporting of the UE transmitted power measurement shall be used.

Table A.9.5C: General test parameters for UE transmitted power

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	

Table A.9.5D: Cell Specific parameters for UE transmitted power

Parameter	Unit	Cell 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	Note1
OCNS		Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.		

A.9.1.3C.1.1 Test procedure

1) Set the UE power and Maximum allowed UL TX power to the maximum power for that UE power class.
2) Send continuously during the entire test Up power control commands to the UE.
3) Measure the output power of the UE. The output power shall be averaged over the transmit one timeslot.
4) Check that the reported UE transmitted power is within the specified range.
5) Decrease the Maximum allowed UL TX power with 1 dB and signal the new value to the UE.
6) Repeat from step 3) until the entire specified range for the UE transmitted power measurement has been tested, i.e. the accuracy requirement for the UE transmitted power measurement is specified 10dB below the maximum power for the UE power class.

A.9.1.3C.2 Test Requirements

The UE transmitted power measurement accuracy shall meet the requirements in section 9.1.6.

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

A.9.1.4 SFN-CFN observed time difference

A.9.1.4.1 Test Purpose and Environment

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

A.9.1.4.1.1 Intra frequency test parameters

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

In this case all cells are in the same frequency. Table A.9.6 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.6: SFN-CFN observed time difference Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc*, Note 1	*Io -13.7 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.1.2 Inter frequency test parameters

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

In this test case both cells are in different frequency and compressed mode is applied. The gap length is 7, detailed definition is in TS 25.101 annex A.5 [14 slots is FSS]. Table A.9.7 defines the limits of signal strengths and code powers, where the requirement is applicable.

Table A.9.7: SFN-CFN observed time difference Inter frequency tests parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.1	10.1
Ioc	dBm/ 3.84 MHz	*Io -10.6 dB = Ioc*, Note 1	*Io -10.6 dB = Ioc*, Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted in each carrier frequency according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.4.2 Test Requirements

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

A.9.1.5 SFN-SFN observed time difference

A.9.1.5.1 SFN-SFN observed time difference type 1

A.9.1.5.1.1 Test Purpose and Environment

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

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

In this case all cells are in the same frequency. Table A.9.8 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.8: SFN-SFN observed time difference type 1 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.5.1.2 Test Requirements

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

A.9.1.5.2 SFN-SFN observed time difference type 2

A.9.1.5.2.1 Test Purpose and Environment

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

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

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.

Table A.9.10 SFN-SFN observed time difference type 2 idle period test parameters

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

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

A.9.1.5.2.2 Test Requirements

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

A.9.1.6 UE Rx-Tx time difference

A.9.1.6.1 UE Rx-Tx time difference type 1

A.9.1.6.1.1 Test Purpose and Environment

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

Table A.9.11 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.11: UE Rx-Tx time difference type 1 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	*Io –10.9 dB = Ioc,* Note 1
Io	dBm/3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.		

A.9.1.6.1.2 Test Requirements

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

A.9.1.6.2 UE Rx-Tx time difference type 2

A.9.1.6.2.1 Test Purpose and Environment

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

Table A.9.12 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.12: UE Rx-Tx time difference type 2 intra frequency test parameters

Parameter	Unit	Cell 1
UTRA RF Channel number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	-15
OCNS	dB	-1.11
Îor/Ioc	dB	10.5
Ioc	dBm/ 3.84 MHz	Io –10.9 dB = Ioc, Note 1
Io	dBm/ 3.84 MHz	-94…-50
Propagation condition	-	AWGN
NOTE 1: Ioc level shall be adjusted according the total signal power spectral density Io at receiver input and the geometry factor Îor/Ioc.		

A.9.1.6.2.2 Test Requirements

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

A.9.1.7 Observed time difference to GSM cell

A.9.1.7.1 Test Purpose and Environment

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

Note: The requirement scenario is FFS.

A.9.1.7.2 Test Requirements

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

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

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

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

In this case the cells are on different frequencies. Table A.9.13 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.9.13 P-CCPCH inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 1	-70
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94 ... -70 -94... -50	-94 ... -70 -94... -50
Propagation condition	-	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

A.9.1.8.2 Test Requirements

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

3GPP TSG RAN WG4 Meeting #21 **R4-020515**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v3

CHANGE REQUEST

⌘ **25.133** **CR** **302** ⌘ rev **1** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	SFN decoding for identification of a new cell
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The requirement for SFN decoding for detected FDD intra-frequency cells
Summary of change:	⌘	In CELL_DCH state in order to decode the SFN and in the case when there are insufficient contiguous uncompressed frame then the UE may prioritise the decoding of the SFN during a compressed frame In CELL_FACH state order to decode the SFN and in the case when the time between measurement occasions is insufficient then the UE may prioritise the decoding of the SFN frame Isolation impact. This change does not propose any requirements for the UE, but clarifies how an UE can resolve the conflict. This has been made explicit to ensure a common behaviour for the UE in CELL_DCH and CELL_FACH state
Consequences if not approved:	⌘	The UE will not be able to decode the SFN and as a consequence a newly identified intra cell may not be able to be reported to the network so it can be included in the active set as a candidate cell for soft –handover. This failure could results in a dropped call or an un-necessary inter frequency FDD or GSM system handover

Clauses affected:	⌘	8.1.2.1, 8.1.2.2.1 and 8.4.2.1		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	TS34.121
Other comments:	⌘			

How to create CRs using this form:

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

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

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

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

- provide transmission gap pattern sequences with TGPL1 > 1, and
- provide the patterns within a transmission gap pattern sequence that are identical (i.e., TGPL1 = TGPL2), and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

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

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

The received CPICH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

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

8.1.2.2 FDD intra frequency measurements

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

8.1.2.2.1 Identification of a new cell

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

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

A cell shall be considered detectable when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

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

8.1.2.2.2 UE CPICH measurement capability

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL_FACH state. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

In CELL_FACH state, the UE shall be able to monitor up to
- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.
It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this three parameters are defined:
N_{FDD} is 0 or 1. If there are inter-frequency FDD cells in the neighbour list N_{FDD}=1, otherwise N_{FDD}=0.
N_{TDD} is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list N_{TDD}=*1* otherwise N_{TDD}=0.
N_{GSM} is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM}=0.

The measurement time T_{meas} is then defined as

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

where
- M_REP is the Measurement Occasion cycle length when K is 0,.. 6. K is the FACH measurement occasion length cofficient as specified in TS25.331
- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.
- N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

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

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

8.4.2.2.1 Identification of a new cell

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

$$T_{identify,intra} = Max\left\{800, Ceil\left\{\frac{T_{basic\ identify\ FDD,intra}}{N_{TTI}\cdot(M\_REP-1)\cdot 10}\right\}\cdot N_{TTI}\cdot M\_REP\cdot 10\right\}\ \text{ms}$$

where

$T_{basic\_identify\_FDD,\ intra}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding

3GPP TSG RAN WG4 Meeting #21 **R4-020514**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v3

CHANGE REQUEST

⌘ **25.133** **CR** **301** ⌘ rev **1** ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	SFN decoding for identification of a new cell
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The requirement for SFN decoding for detected FDD intra-frequency cells
Summary of change:	⌘	In CELL_DCH state in order to decode the SFN and in the case when there are insufficient contiguous uncompressed frame then the UE may prioritise the decoding of the SFN during a compressed frame In CELL_FACH state order to decode the SFN and in the case when the time between measurement occasions is insufficient then the UE may prioritise the decoding of the SFN frame Isolation impact. This change does not propose any requirements for the UE, but clarifies how an UE can resolve the conflict. This has been made explicit to ensure a common behaviour for the UE in CELL_DCH and CELL_FACH state
Consequences if not approved:	⌘	The UE will not be able to decode the SFN and as a consequence a newly identified intra cell may not be able to be reported to the network so it can be included in the active set as a candidate cell for soft –handover. This failure could results in a dropped call or an un-necessary inter frequency FDD or GSM system handover

Clauses affected:	⌘	8.1.2.1, 8.1.2.2.1 and 8.4.2.1		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	TS34.121
Other comments:	⌘			

How to create CRs using this form:

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With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

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

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

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

- provide transmission gap pattern sequences with TGPL1 > 1, and
- provide the patterns within a transmission gap pattern sequence that are identical (i.e., TGPL1 = TGPL2), and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

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

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

The received CPICH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

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

8.1.2.2 FDD intra frequency measurements

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

8.1.2.2.1 Identification of a new cell

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

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

A cell shall be considered detectable when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

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

8.1.2.2.2 UE CPICH measurement capability

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL_FACH state. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

In CELL_FACH state, the UE shall be able to monitor up to
- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.
It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this three parameters are defined:
N_{FDD} is 0 or 1. If there are inter-frequency FDD cells in the neighbour list N_{FDD}=1, otherwise N_{FDD}=0.
N_{TDD} is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list N_{TDD}=*1* otherwise N_{TDD}=0.
N_{GSM} is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM}=0.

The measurement time T_{meas} is then defined as

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

where
- M_REP is the Measurement Occasion cycle length when K is 0,.. 6. K is the FACH measurement occasion length cofficient as specified in TS25.331
- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.
- N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

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

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

8.4.2.2.1 Identification of a new cell

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

$$T_{identify,intra} = Max\left\{800, Ceil\left\{\frac{T_{basic\ identify\ FDD,intra}}{N_{TTI}\cdot(M\_REP-1)\cdot 10}\right\}\cdot N_{TTI}\cdot M\_REP\cdot 10\right\}\ \text{ms}$$

where

$T_{basic\_identify\_FDD,\ intra}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding

3GPP TSG RAN WG4 Meeting #21 **R4-020513**

Sophia Antipolis, France 28th January - 1st February 2002

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CHANGE REQUEST

⌘ **25.133** **CR** **300** ⌘ rev **1** ⌘ Current version: **3.8.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	SFN decoding for identification of a new cell
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 1/2/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
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Consequences if not approved:	⌘	The UE will not be able to decode the SFN and as a consequence a newly identified intra cell may not be able to be reported to the network so it can be included in the active set as a candidate cell for soft –handover. This failure could results in a dropped call or an un-necessary inter frequency FDD or GSM system handover

Clauses affected:	⌘	8.1.2.1, 8.1.2.2.1 and 8.4.2.1		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	TS34.121
Other comments:	⌘			

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8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

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

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

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

- provide transmission gap pattern sequences with TGPL1 > 1, and
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Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH E_c/I_o is defined as

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and the received SCH E_c/I_o is defined as

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

8.1.2.2 FDD intra frequency measurements

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

8.1.2.2.1 Identification of a new cell

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

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

A cell shall be considered detectable when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

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

8.1.2.2.2 UE CPICH measurement capability

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL_FACH state. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

In CELL_FACH state, the UE shall be able to monitor up to
- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.
It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this three parameters are defined:
N_{FDD} is 0 or 1. If there are inter-frequency FDD cells in the neighbour list N_{FDD}=1, otherwise N_{FDD}=0.
N_{TDD} is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list N_{TDD}=*1* otherwise N_{TDD}=0.
N_{GSM} is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM}=0.

The measurement time T_{meas} is then defined as

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

where
- M_REP is the Measurement Occasion cycle length when K is 0,.. 6. K is the FACH measurement occasion length cofficient as specified in TS25.331
- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.
- N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

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

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

8.4.2.2.1 Identification of a new cell

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

$$T_{identify,intra} = Max\left\{800, Ceil\left\{\frac{T_{basic\ identify\ FDD,intra}}{N_{TTI}\cdot(M\_REP-1)\cdot 10}\right\}\cdot N_{TTI}\cdot M\_REP\cdot 10\right\}\ \text{ms}$$

where

$T_{basic\_identify\_FDD,\ intra}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding

3GPP TSG RAN WG4 Meeting #21 **R4-020498**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **297** ⌘ ev **1** ⌘ Current version: **5.1.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	UE Tx Timing in soft handover
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	The general requirements of UE transmit timing, especially in case of soft handover, are missing although the test case refers to the general requirements.
Summary of change:	⌘	The general requirements including soft handover case are defined for UE transmit timing. The general requirements are defined by following the same principles as used in the test case of UE transmit timing. The cases, which are not tested in the test cases, are also included into the general requirements. Some wording in the test case is aligned with wording used else where in the specifications to clarify the measurement. Isolated Impact Analysis: The proposed modification in the general performance requirement follows the related test case of TS25.133. This modification does not change anything related to the test case but it will cover also other kind of soft handover scenarios. Hence, it will have an impact on implementations, which do not follow the proposed general requirements.
Consequences if not approved:	⌘	The general performance requirements for UE transmit timing reference in case of soft handover do not exist.

Clauses affected:	⌘	7.1.1, 7.1.2 and A.7.1.2		
Other specs affected:	⌘	☐ Other core specifications **X** Test specifications ☐ O&M Specifications	⌘	34.121

Other comments: ⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

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

7.1.2 Requirements

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

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

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

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 800*d ms period, the UE transmit timing shall not change in excess of ±d chip from the timing at the beginning of this 800*d ms period, where $0 \leq d \leq 1/4$.

8 UE Measurements Procedures

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

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

A.7 Timing and Signalling Characteristics

A.7.1 UE Transmit Timing

A.7.1.1 Test Purpose and Environment

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

For this test two cells on the same frequency are used. Table A.7.1 defines the transmitted signal strengths, the relative timing and the propagation condition used for the two cells.

Table A.7.1: Test parameters for UE Transmit Timing requirement

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

A.7.1.2 Test Requirements

For parameters specified in Table A.7.1, the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

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

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 1. T_0 is defined in TS 25.211[2].

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

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

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

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

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

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

h) Test system stops sending cell 1 signals.

~~i) Test system verifies that the UE does not start to adjust its Tx timing to cell 2 before it receives an active set update message notifying the UE that cell 1 is deleted from the active set.~~

j) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. ~~with an~~The adjustment step size and the~~an~~ adjustment rate shall according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 2.

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

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

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

n) Test system verifies that the UE transmit timing is still within T_0 +/- 1.5chips with respect to the first detected~~significant~~ path (in time) of the downlink DPCCH/DPDCH of cell 2.

o) Test system stops sending cell 2 signals.

~~p) Test system verifies that the UE does not start to adjust its Tx timing to cell 1 before it receives an active set update message notifying the UE that cell 2 shall beis deleted from the active set.~~

q) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. ~~with an~~The adjustment step size and ~~an~~the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 1.

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

A.8 UE Measurements Procedures

A.8.1 FDD intra frequency measurements

A.8.1.1 Event triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

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

The test parameters are given in Table A.8.1 and A.8.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1: General test parameters for Event triggered reporting in AWGN propagation conditions

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

Table A.8.2: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions

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

3GPP TSG RAN WG4 Meeting #21 **R4-020497**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **296** ⌘ ev **1** ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	UE Tx Timing in soft handover
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘ The general requirements of UE transmit timing, especially in case of soft handover, are missing although the test case refers to the general requirements.

Summary of change: ⌘ The general requirements including soft handover case are defined for UE transmit timing. The general requirements are defined by following the same principles as used in the test case of UE transmit timing. The cases, which are not tested in the test cases, are also included into the general requirements.

Some wording in the test case is aligned with wording used else where in the specifications to clarify the measurement.

Isolated Impact Analysis:

The proposed modification in the general performance requirement follows the related test case of TS25.133. This modification does not change anything related to the test case but it will cover also other kind of soft handover scenarios. Hence, it will have an impact on implementations, which do not follow the proposed general requirements.

Consequences if not approved: ⌘ The general performance requirements for UE transmit timing reference in case of soft handover do not exist.

Clauses affected: ⌘ 7.1.1, 7.1.2 and A.7.1.2

Other specs affected: ⌘

☐	Other core specifications	⌘
X	Test specifications	34.121
☐	O&M Specifications	

Other comments: ⌘	

How to create CRs using this form:

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

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

7.1.2 Requirements

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

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

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

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 800*d ms period, the UE transmit timing shall not change in excess of ±d chip from the timing at the beginning of this 800*d ms period, where $0 \leq d \leq 1/4$.

8 UE Measurements Procedures

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

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

A.6.4.2 Test Requirements

A.6.4.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within [TBD] ms from beginning of time period T2.

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

NOTE: The delay from the begining of T2 can be expressed as:

$$T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$$

where:

T_{ramp}	Margin added for the increase of UE output power to the UE maximum power. A margin of 1 frame (10ms) is used, i.e. 15 TPC commands.
T_{detect_block}	The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Limited TFC Set* criterion is fulfilled for UL_TFC8 and UL_TFC9. This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet.
T_{notify}	Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.
T_{modify}	Equal to MAX(T_{adapt_max},T_{TTI}) = MAX(0, 40)=40ms
T_{adapt_max}	Equals to 0ms for the case without codec.
T_{L1_proc}	Equals 15ms.
T_{align_TTI}	Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.
T_{TTI}	See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of (10 + T_{detect_block} + [15] + 40 + 15 + 40) ms from the beginning of T2.

A.7 Timing and Signalling Characteristics

A.7.1 UE Transmit Timing

A.7.1.1 Test Purpose and Environment

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

For this test two cells on the same frequency are used. Table A.7.1 defines the transmitted signal strengths, the relative timing and the propagation condition used for the two cells.

Table A.7.1: Test parameters for UE Transmit Timing requirement

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

A.7.1.2 Test Requirements

For parameters specified in Table A.7.1, the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

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

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 1. T_0 is defined in TS 25.211[2].

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

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

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

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

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

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

h) Test system stops sending cell 1 signals.

~~i) Test system verifies that the UE does not start to adjust its Tx timing to cell 2 before it receives an active set update message notifying the UE that cell 1 is deleted from the active set.~~

j) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. ~~with an~~The adjustment step size and ~~an~~the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 2.

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

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

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

n) Test system verifies that the UE transmit timing is still within T_0 +/- 1.5chips with respect to the first detected~~significant~~ path (in time) of the downlink DPCCH/DPDCH of cell 2.

o) Test system stops sending cell 2 signals.

p~~) Test system verifies that the UE does not start to adjust its Tx timing to cell 1 before it receives an active set update message notifying the UE that cell 2 shall beis deleted from the active set.~~

q) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. The ~~with an~~ adjustment step size and ~~an~~ the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) ~~-~~of the downlink DPCCH/DPDCH of cell 1.

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

A.8 UE Measurements Procedures

A.8.1 FDD intra frequency measurements

A.8.1.1 Event triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

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

The test parameters are given in Table A.8.1 and A.8.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1: General test parameters for Event triggered reporting in AWGN propagation conditions

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

Table A.8.2: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions

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

3GPP TSG RAN WG4 Meeting #21 **R4-020496**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **292** ⌘ ev **1** ⌘ Current version: **3.8.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	UE Tx Timing in soft handover
Source:	⌘	RAN WG4
Work item code:	⌘	***Date:*** ⌘ 1/2/2002
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The general requirements of UE transmit timing, especially in case of soft handover, are missing although the test case refers to the general requirements.
Summary of change:	⌘	The general requirements including soft handover case are defined for UE transmit timing. The general requirements are defined by following the same principles as used in the test case of UE transmit timing. The cases, which are not tested in the test cases, are also included into the general requirements. Some wording in the test case is aligned with wording used else where in the specifications to clarify the measurement. Isolated Impact Analysis: The proposed modification in the general performance requirement follows the related test case of TS25.133. This modification does not change anything related to the test case but it will cover also other kind of soft handover scenarios. Hence, it will have an impact on implementations, which do not follow the proposed general requirements.
Consequences if not approved:	⌘	The general performance requirements for UE transmit timing reference in case of soft handover do not exist.

Clauses affected:	⌘	7.1.1, 7.1.2 and A.7.1.2		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.121

Other comments: ⌘	

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7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

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

7.1.2 Requirements

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

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

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

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 800*d ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 800*d ms period, where $0 \leq d \leq 1/4$.

8 UE Measurements Procedures

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

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

A.6.4.2 Test Requirements

A.6.4.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within [TBD] ms from beginning of time period T2.

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

NOTE: The delay from the begining of T2 can be expressed as: $T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$, where:

T_{ramp}	Margin added for the increase of UE output power to the UE maximum power. A margin of 1 frame (10ms) is used, i.e. 15 TPC commands.
T_{detect_block}	The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Limited TFC Set* criterion is fulfilled for UL_TFC8 and UL_TFC9. This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet.
T_{notify}	Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.
T_{modify}	Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$
T_{adapt_max}	Equals to 0ms for the case without codec.
T_{L1_proc}	Equals 15ms.
T_{align_TTI}	Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.
T_{TTI}	See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of $(10 + T_{detect\_block} + [15] + 40 + 15 + 40)$ ms from the beginning of T2.

A.7 Timing and Signalling Characteristics

A.7.1 UE Transmit Timing

A.7.1.1 Test Purpose and Environment

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

For this test two cells on the same frequency are used. Table A.7.1 defines the transmitted signal strengths, the relative timing and the propagation condition used for the two cells.

Table A.7.1: Test parameters for UE Transmit Timing requirement

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

A.7.1.2 Test Requirements

For parameters specified in Table A.7.1, the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

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

a) After a connection is set up with cell 1, the test system shall verify that the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 1. T_0 is defined in TS 25.211[2].

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

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

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

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

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

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

h) Test system stops sending cell 1 signals.

i) ~~Test system verifies that the UE does not start to adjust its Tx timing to cell 2 before it receives an active set update message notifying the UE that cell 1 is deleted from the active set.~~

j) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. ~~with an~~ The adjustment step size and the~~an~~ adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 2.

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

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

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

n) Test system verifies that the UE transmit timing is still within T_0 +/- 1.5chips with respect to the first detected~~significant~~ path (in time) of the downlink DPCCH/DPDCH of cell 2.

o) Test system stops sending cell 2 signals.

~~p) Test system verifies that the UE does not start to adjust its Tx timing to cell 1 before it receives an active set update message notifying the UE that cell 2 shall beis deleted from the active set.~~

q) Test system verifies that UE transmit timing adjustment starts no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account. The ~~with an~~ adjustment step size and the~~an~~ adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within T_0 +/- 1.5 chips with respect to the first detected~~significant received~~ path (in time) of the downlink DPCCH/DPDCH of cell 1.

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

A.8 UE Measurements Procedures

A.8.1 FDD intra frequency measurements

A.8.1.1 Event triggered reporting in AWGN propagation conditions

A.8.1.1.1 Test Purpose and Environment

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

The test parameters are given in Table A.8.1 and A.8.2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1: General test parameters for Event triggered reporting in AWGN propagation conditions

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

Table A.8.2: Cell specific test parameters for Event triggered reporting in AWGN propagation conditions

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

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CHANGE REQUEST

⌘ **25.133** **CR** **270** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of Cell reselection in CELL FACH
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	- The general requirement for FDD/TDD and FDD/GSM Cell Re-selection delays is not align with FDD/FDD delays. - The general requirement for Cell Re-selection in CELL FACH has been changed. But in the test case the change is not reflected. - The additional implementation margin should be taken into account in the test case.
Summary of change:	⌘	- Align general requirement for FDD/TDD and FDD/GSM to FDD/FDD case. - Add an interruption time described in 5.5.2.2 into the test requirement - Add an implementation margin into the test requirement
Consequences if not approved:	⌘	The requirement in the test case will not be consistent with the general requirement. Test cases of section A.5.5 may not be achieved. Isolated Impact Analysis: This CR has small impact on the requirement of FDD/TDD and FDD/GSM Cell Re-selection delays. but the correction does not have any negative impact on the implementation of the UE following the original wording. Test requirements are also changed in order to align with the corresponding general requirement correctly, hence the correction does not have any impact on the UE following the original general requiremet.

Clauses affected:	⌘	5.5, A5.5		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications	⌘	34.121
Other comments:	⌘			

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With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

When a Cell Re-selection process is triggered according to TS 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

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

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

5.5.2.1 Cell re-selection delay

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

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

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

5.5.2.1.1 Intra frequency cell reselection

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

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

where

$T_{identify\_intra}$ is specified in 8.4.2.2.1.

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

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

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

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

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

where

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

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

5.5.2.1.2 Inter frequency cell reselection

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

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

.where

$T_{identify,\ ,inter}$ is specified in 8.4.2.3.1.

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

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

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

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

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

where

$T_{Measurement\_inter}$ = Specified in 8.4.2.3.2.

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

5.5.2.1.3 FDD-TDD cell reselection

The cell re-selection delay in CELL_FACH state in FDD to a TDD cell shall be less than

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

$T_{reselection,\ TDD} = T_{identify,TDD} + 100 + T_{SI} + T_{RA}$ ms

where

$T_{identify,\ TDD}$ is specified in 8.4.2.4.1.

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

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

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

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

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

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

where

a) For UE requiring measurement occasions.

$T_{identify,GSM}$ is specified in 8.4.2.5.2.1

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

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

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

where:

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

$N_{GSM\ carrier\ RSSI}$ is specified in 8.4.2.5.1.

b) For UE not requiring measurement occasions

$T_{identify,GSM}$ = 150 ms

$T_{measurement,GSM}$ = 480 ms

5.5.2.2 Interruption time

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

5.5.2.2.1 FDD-FDD cell reselection

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

1) When intra-frequency cell reselection, or inter-frequency cell reselection when the UE does not need measurement occasion to perform inter-frequency measurements, occurs the interruption time shall be less than $T_{interrupt1}$

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

where

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

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

2) When inter-frequency cell reselection occurs and the UE needs measurement occasions to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

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

where

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

5.5.2.2.2 FDD-TDD cell reselection

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

When a FDD-TDD cell reselection occurs the interruption time shall be less than $T_{interrupt, TDD}$

$T_{interrupt,TDD} = 100 + T_{SI}+T_{RA}$ ms

where

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

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

5.5.2.2.3 FDD-GSM cell reselection

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

When FDD-GSM cell reselection occurs the interruption time shall be less than $T_{interrupt, GSM}$

$T_{interrupt,GSM} = 40 +T_{BCCH}+T_{RA}$ ms

where

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

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

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

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

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

The S-critera detection delay in CELL_FACH state shall be less than:

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

where

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

NEXT CHANGED SECTION

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. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.1A and Table A.5.1B.

Table A.5.1A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.1B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset $2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		not sent		not sent		not sent		not sent		not sent		not sent	

A.5.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 1.6s.

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

NOTE: The cell re-selection delay in this case is expressed as:

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

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

where:

$T_{Measurement\_Period\ Intra}$ is specified in 8.4.2.2.2 as 200 ms in this case.

T_{SI}: ~~Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.~~ The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T_{SI} of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~1.52~~ 1.55 s, allow 1.6 s in the test case.

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 tables A5.3 and A5.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.3A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.3B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMP_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		sent		sent		sent		sent		sent		sent	
FACH Measurement occasion cycle length coefficient		3		3		3		3		3		3	
Inter-frequency FDD measurement indicator		TRUE		TRUE		TRUE		TRUE		TRUE		TRUE	
Inter-frequency TDD measurement indicator		FALSE		FALSE		FALSE		FALSE		FALSE		FALSE	

A.5.5.2.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than ~~2.2~~ 1.9 s.

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

NOTE: The cell re-selection delay in this case is expressed as:

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

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

where:

$T_{measurement\ inter}$ is specified in 8.4.2.3.2 as 480 ms in this case.

T_{SI}: ~~Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.~~ The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T_{SI} of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~2.16~~ 1.83 s, allow ~~2.2~~ 1.9 s in the test case.

A.5.5.3 Cell Reselection to GSM

A.5.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 6 GSM cells. Test parameters are given in Table, A.5.4A, A.5.4B, A.5.4C, A.5.4D, A.5.4E.

Table A.5.4A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
Neighbour cell list size			24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	
T1		s	5	
T2		s	10	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.4B: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.4C: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.4D: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
S-CCPCH_Ec/Ior	dB	-12	
OCNS_Ec/Ior	dB	-1.295	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH Ec/Io	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	Not sent	
IE "FACH Measurement occasion info"		Sent	
FACH Measurement occasion cycle length coefficient		3	
Inter-frequency FDD measurement indicator		FALSE	
Inter-frequency TDD measurement indicator		FALSE	
Inter-RAT measurement indicators		Included	
>RAT type		GSM	

Table A.5.4E: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.5.5.3.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to transmit the random access in Cell 2 (the GSM cell).

The cell re-selection delay shall be less than 5.5 + T_{RA} s.

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

NOTE: The cell re-selection delay can be expressed

~~$T_{reselection, GSM} = T_{identify, GSM} + T_{measurement, GSM} + T_{BCCH} + T_{RA}$ ms~~

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

where:

$T_{identify,GSM}$	Specified in 8.4.2.5.2.1, here it is 2880 ms
$T_{measurement, GSM}$	Specified in 5.5.2.1.4, here it is 640 ms
T_{BCCH}	According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.
T_{RA}	The additional delay caused by the random access procedure in the GSM cell. Shall be defined by T1/RF when the test case is further detailed in TS 34.121.

This gives a total of ~~5.4~~ 5.46 +T_{RA} s, allow 5.5 + T_{RA} s.

3GPP TSG RAN WG4 Meeting #21 **R4-020510**

Sophia Antipolis, France 28th January - 1st February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **269** ⌘ **rev** **1** ⌘ Current version: **4.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction of Cell reselection in CELL FACH
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	1/2/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	- The general requirement for FDD/TDD and FDD/GSM Cell Re-selection delays is not align with FDD/FDD delays. - The general requirement for Cell Re-selection in CELL FACH has been changed. But in the test case the change is not reflected. - The additional implementation margin should be taken into account in the test case.
Summary of change:	⌘	- Align general requirement for FDD/TDD and FDD/GSM to FDD/FDD case. - Add an interruption time described in 5.5.2.2 into the test requirement - Add an implementation margin into the test requirement
Consequences if not approved:	⌘	The requirement in the test case will not be consistent with the general requirement. Test cases of section A.5.5 may not be achieved. Isolated Impact Analysis: This CR has small impact on the requirement of FDD/TDD and FDD/GSM Cell Re-selection delays. but the correction does not have any negative impact on the implementation of the UE following the original wording. Test requirements are also changed in order to align with the corresponding general requirement correctly, hence the correction does not have any impact on the UE following the original general requiremet.

Clauses affected:	⌘	5.5, A5.5		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications - O&M Specifications	⌘	34.121
Other comments:	⌘			

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Comprehensive information and tips about how to create CRs can be found at:
http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

When a Cell Re-selection process is triggered according to TS 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

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

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

5.5.2.1 Cell re-selection delay

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

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

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

5.5.2.1.1 Intra frequency cell reselection

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

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

where

$T_{identify\_intra}$ is specified in 8.4.2.2.1.

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

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

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

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

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

where

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

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

5.5.2.1.2 Inter frequency cell reselection

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

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

.where

$T_{identify,\ ,inter}$ is specified in 8.4.2.3.1.

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

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

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

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

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

where

$T_{Measurement\_inter}$ = Specified in 8.4.2.3.2.

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

5.5.2.1.3 FDD-TDD cell reselection

The cell re-selection delay in CELL_FACH state in FDD to a TDD cell shall be less than

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

$T_{reselection,\ TDD} = T_{identify,TDD} + 100 + T_{SI} + T_{RA}$ ms

where

$T_{identify,\ TDD}$ is specified in 8.4.2.4.1.

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

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

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

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

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

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

where

a) For UE requiring measurement occasions.

$T_{identify,GSM}$ is specified in 8.4.2.5.2.1

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

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

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

where:

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

$N_{GSM\ carrier\ RSSI}$ is specified in 8.4.2.5.1.

b) For UE not requiring measurement occasions

$T_{identify,GSM}$ = 150 ms

$T_{measurement,GSM}$ = 480 ms

5.5.2.2 Interruption time

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

5.5.2.2.1 FDD-FDD cell reselection

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

1) When intra-frequency cell reselection, or inter-frequency cell reselection when the UE does not need measurement occasion to perform inter-frequency measurements, occurs the interruption time shall be less than $T_{interrupt1}$

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

where

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

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

2) When inter-frequency cell reselection occurs and the UE needs measurement occasions to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

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

where

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

5.5.2.2.2 FDD-TDD cell reselection

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

When a FDD-TDD cell reselection occurs the interruption time shall be less than $T_{interrupt, TDD}$

$T_{interrupt,TDD} = 100 + T_{SI}+T_{RA}$ ms

where

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

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

5.5.2.2.3 FDD-GSM cell reselection

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

When FDD-GSM cell reselection occurs the interruption time shall be less than $T_{interrupt, GSM}$

$T_{interrupt,GSM} = 40 +T_{BCCH}+T_{RA}$ ms

where

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

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

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

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

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

The S-critera detection delay in CELL_FACH state shall be less than:

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

where

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

NEXT CHANGED SECTION

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. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.1A and Table A.5.1B.

Table A.5.1A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.1B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset $2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		not sent		not sent		not sent		not sent		not sent		not sent	

A.5.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 1.6s.

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

NOTE: The cell re-selection delay in this case is expressed as:

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

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

where:

$T_{Measurement\_Period\ Intra}$ is specified in 8.4.2.2.2 as 200 ms in this case.

T_{SI}: ~~Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.~~ The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T_{SI} of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~1.52~~ 1.55 s, allow 1.6 s in the test case.

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 tables A5.3 and A5.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

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

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.3A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.3B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
$Qoffset2_{s,n}$	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMP_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		sent		sent		sent		sent		sent		sent	
FACH Measurement occasion cycle length coefficient		3		3		3		3		3		3	
Inter-frequency FDD measurement indicator		TRUE		TRUE		TRUE		TRUE		TRUE		TRUE	
Inter-frequency TDD measurement indicator		FALSE		FALSE		FALSE		FALSE		FALSE		FALSE	

A.5.5.2.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than ~~2.2~~ 1.9 s.

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

NOTE: The cell re-selection delay in this case is expressed as:

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

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

where:

$T_{measurement\ inter}$ is specified in 8.4.2.3.2 as 480 ms in this case.

T_{SI}: ~~Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.~~ The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.1280 ms is assumed in this test case.

Note: Since 1280 ms is one of the typical values for repeating system information blocks, T_{SI} of 1280 ms could be increased by the RRC procedure delay in order to allow the SIB repetition period of 1280 ms.

T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~2.16~~ 1.83 s, allow ~~2.2~~ 1.9 s in the test case.

A.5.5.3 Cell Reselection to GSM

A.5.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 6 GSM cells. Test parameters are given in Table, A.5.4A, A.5.4B, A.5.4C, A.5.4D, A.5.4E.

Table A.5.4A: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
Neighbour cell list size			24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	
T1		s	5	
T2		s	10	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.4B: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #I	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.4C: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.4D: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
S-CCPCH_Ec/Ior	dB	-12	
OCNS_Ec/Ior	dB	-1.295	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH Ec/Io	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	Not sent	
IE "FACH Measurement occasion info"		Sent	
FACH Measurement occasion cycle length coefficient		3	
Inter-frequency FDD measurement indicator		FALSE	
Inter-frequency TDD measurement indicator		FALSE	
Inter-RAT measurement indicators		Included	
>RAT type		GSM	

Table A.5.4E: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

A.5.5.3.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to transmit the random access in Cell 2 (the GSM cell).

The cell re-selection delay shall be less than 5.5 + T_{RA} s.

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

NOTE: The cell re-selection delay can be expressed

~~$T_{reselection, GSM} = T_{identify, GSM} + T_{measurement, GSM} + T_{BCCH} + T_{RA}$ ms~~

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

where:

$T_{identify,GSM}$	Specified in 8.4.2.5.2.1, here it is 2880 ms
$T_{measurement, GSM}$	Specified in 5.5.2.1.4, here it is 640 ms
T_{BCCH}	According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.
T_{RA}	The additional delay caused by the random access procedure in the GSM cell. Shall be defined by T1/RF when the test case is further detailed in TS 34.121.

This gives a total of ~~5.4~~ 5.46 +T_{RA} s, allow 5.5 + T_{RA} s.