CHANGE REQUEST

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

25.133	CR	005r1	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

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

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

Source: RAN WG4 **Date:**

Subject: UE measurement requirement update.

Work item:

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

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

Release:

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

Reason for change: This is a revised version of CR 005 of 25.133. The measurement definitions were incomplete. This CR will update the missing definitions.

Clauses affected: Section 10, 10.1.

Other specs affected:

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

Other comments:

help.doc

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

10 Measurements Performance Requirements

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

Unless explicitly stated,

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.101 annex A, section A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in TS 25.101 annex C.
- All requirements are defined when UE is in a CELL_DCH or CELL_FACH stage. The difference between modes are the reporting delay. Some of the measurements are not requested to be reported in both stages.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

10.1 Measurements Performance for UE

Test conditions are specified in sections 10.1.1, 10.1.4 and 10.1.7.

10.1.1 COMMON PILOT MEASUREMENTS

These measurement consider *CPICH RSCP* and *CPICH Ec/Io* measurements.

10.1.1.1 Intra frequency test parameters

In this case all cells are in the same frequency. The table 10-1 and notes 1-4 define the limits of signal strengths and code powers, where the requirement is applicable.

Table 10-1

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	Note 4	Note 4

Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: *CPICH_RSCP1,2* ³ -114 dBm.

Note 2: | *CPICH_RSCP1 – CPICH_RSCP2* | £ 20 dB.

Note 3: | *Io – CPICH_Ec/Ior*| £ 20 dB.

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io – 13.7 dB= Ioc*.

10.1.1.2 Inter frequency test parameters

In this case both cells are in different frequency and compressed mode is applied. The gap length is 7 [14 slots is FSS]. The table 10-2 and notes 1-5 define the limits of signal strengths and code powers, where the requirement is applicable.

Table 10-2

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	Note 5	Note 5
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: *CPICH_RSCP1,2* ≥ -114 dBm.

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

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

Note 4: | *Io – CPICH_Ec/Ior*| £20 dB

Note 5: *Ioc* level shall be adjusted in each carrier frequency according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io –10.6 dB = Ioc*.

10.1.2 CPICH RSCP

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

10.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH stage is [150 ms] and for CELL_FACH stage [600 ms].

10.1.2.1.1 Absolute accuracy requirement

The absolute accuracy of CPICH RSCP is defined as measured one code power after de-spreading. In this test only Cell 1 in table 10-1 is present.

Table 10-3 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 6	± 9

Table 10-4 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 8	± 11

10.1.2.1.2 Relative accuracy requirement

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

Table 10-5 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 3	± 3

10.1.2.2 Inter frequency measurement relative accuracy requirement

The measurement period for CELL_DCH stage is [240 ms], and for CELL_FACH stage [960 ms].

The relative accuracy of CPICH RSCP in inter frequency case is defined as measured code powers after de-spreading from active cell and one or more cells received from two or more RF–carriers. The reported values are relative to active cell value. In this test parameters in table 10-2 is used. In this test cells 1and 2 are present.

Table 10-6 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_RSCP	dB	± 6	± 6

10.1.3 CPICH Ec/Io

[Informative note: This measurement is for Cell selection/re-selection and for handover evaluation.]

~~10.1.1.1~~10.1.3.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH stage is [150 ms], and for CELL_FACH stage [600ms].

10.1.3.1.1 Absolute accuracy requirement

The absolute accuracy of CPICH Ec/Io is defined as measured energy per chip divided by power density in the band from one cell. In this test only Cell 1 in table 10-1 is present.

Table 10-7 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_Ec/Io	dB	± 4	± 4

10.1.3.1.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as measured energy per chip divided by power density in the band received from active cell and one more cells. The reported value is relative to active cell value. In this test Cells 1 and 2 in table 10-1 are present.

Table 10-8 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_Ec/Io	dB	± 3	± 3

~~10.1.1.2~~10.1.3.2 Inter frequency measurement relative accuracy requirement

The measurement period for CELL_DCH stage is [240 ms], and for CELL_FACH stage [960 ms].

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as measured energy per chip divided by power density in the band. The reported valus are relative to active cell value. In this test the parameters in table 10-2 is used. In this test cells 1and 2 are present.

Table 10-9 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
CPICH_Ec/Io	dB	± 6	± 6

10.1.4 DEDICATED CHANNEL MEASUREMENTS

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

10.1.4.1 Test parameters

Table 10-10

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	-12	-12
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	Note 5	Note 5
Range 1:Io *Range 2: Io*	dBm	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	

Note 1: *DPCH_Ec/Ior* ≥-114 dBm.

Note 2: | *DPCH_Ec/Ior1 – DPCH_Ec/Ior2* | £ 20 dB

Note 3: | *Io – CPICH_Ec/Ior*| £ 20 dB

Note 4: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io – 13.7 dB = Ioc*.

10.1.5 SIR

[Informative note: The purpose of this measurement is for DL inner/outer loop power control, DL open loop power control.]

10.1.5.1 Absolute accuracy requirement

The basic measurement period is in CELL_DCH stage is [100 ms].

The SIR absolute accuracy is defined as RSCP divided by ISCP after RL combination. In this test only Cell 1 in table 10-10 is present.

Table 10-11 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
DPCCH_SIR	dB	± [ ]	± [ ]

Table 10-12 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
DPCCH_SIR	dB	± [ ]	± [ ]

10.1.6 UTRA Carrier RSSI

[Informative note: The purpose of measurement is for Inter-frequency handover evaluation.]

10.1.6.1 Test parameters for requirement

The table 13 and notes 1,2 define the limits of signal strengths, where the requirement is applicable.

Table 10-13

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

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

Note 2: *Ioc* level shall be adjusted according the total signal power *Io* at receiver input and the geometry factor *Îor/Ioc*. *Io – 4.13 dB = Ioc.*

10.1.6.2 Absolute accuracy requirement

The measurement period is in CELL_DCH stage [150 ms], and CELL_FACH stage [600 ms].

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

Table 10-14 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
Io	dBm	± 4	± 7

Table 10-15 Range 2

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
Io	dBm	± 6	± 9

10.1.6.3 Relative accuracy requirement

The measurement period in CELL_DCH stage is [240 ms], and in CELL_FACH stage [960 ms].

Relative accuracy requirement is defined as active cell frequency UTRAN RSSI compared to measured other frequency UTRAN RSSI level. In relative accuracy test case both carriers in table 10-13 are used.

Table 10-16 Range 1

Parameter	Value	Accuracy	
		Normal condition	Extreme condition
Io	dBm	± 7	± 11

10.1.7 GSM carrier RSSI

[Informative note: The measurement is for Inter radio access technology (RAT) handover.]

For terminals supporting this capability.

The accuracy requirement is specified in GSM 05.08.

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

10.1.8 Transport channel BLER

[Informative note: This measurement is for outer loop power control.]

10.1.8.1 BLER measurement requirement

Transport channel BLER value shall be calculated from a sliding window containing [20] CRC errors.

10.1.9 UE transmitted power

10.1.10.1 CFN-SFN observed time difference

Requirement	+/-0.5 chips period

The measurement period in CELL_DCH stage is [150 ms]

10.1.12.1 SFN-SFN observed time difference

Requirement	+/-0.5 chips period for both type 1 and type 2.

The measurement period in CELL_DCH stage is [150 ms], and in CELL_FACH stage [600 ms].

10.1.13 UE Rx-Tx time difference

Requirement	+/-1.5 chips period.

The measurement period in CELL_DCH stage is [ms]

10.1.14.1 Observed time difference to GSM cell

For terminal supporting this capability.

Requirement	+- 20 chips.

10 Measurements Performance Requirements

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

Unless explicitly stated,

- all measurements shall be reported within the defined requirements in 90% of the cases with 95% confidence, on the confidence level applying for all measurements.
- Measurement periods FFS
- Measurement channel 12.2 kbps as per TS25.101
- Single event reporting

10.1 Measurements Performance for UE

10.1.6CPICH RSCP

Requirement	**Absolute accuracy:** **Normal Conditions** +/ 6dB for levels below -70dBm; +/ 8dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Extreme Conditions** +/ 9dB for levels below -70dBm; +/ 11dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Relative accuracy:** + 3 dB for intra-frequency + 6 dB for inter-frequency Valid when the minimum level > -114 dBm, the difference in signal level < 20 dB and UTRA carrier RSSI>= -94dBm.

10.1.7RSCP

[Note: there is general assumption that the Pilot Bit Number of DCCH should be equal to 8]

Requirement	**Absolute accuracy:** **Normal Conditions** [ ]dB for levels below –70dBm; [ ]dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Extreme Conditions** +/- []dB for levels below –70dBm; +/- []dB over the full range Valid for UTRA carrier RSSI >= -94dBm. **Relative accuracy:** [ ] dB for intra-frequency Valid when the minimum level > -91-10log10(SF) dBm, the difference in signal level < 20 dB and UTRA carrier RSSI>= -94dBm

10.1.8SIR

Requirement	**Absolute accuracy:** for []<SIR<[] dB when UTRA carrier RSSI>= -94dBm.

10.1.9UTRA carrier RSSI

Requirement	**Absolute accuracy:** **Normal Conditions** +/- 4dB for levels below –70dBm Valid for levels > -94dBm. **Extreme Conditions** +/- 7dB for levels below –70dBm Valid for levels > -94dBm. **Relative accuracy** (between measurements on two carriers): + 5 dB over the full range Valid when the minimum level > -94 dBm and the difference < 20 dB.

10.1.10GSM carrier RSSI

Requirement	According to the requirements in GSM 05.08

10.1.11CPICH Ec/No

Requirement	**Absolute accuracy** (measured on one code): +/- 4dB over the full range when UTRA carrier RSSI>= -94dBm and CPICH RSCP >= -115dBm. **Relative accuracy** (between measurements on two codes): + 3 dB for intra-frequency + 6 dB for inter frequency When UTRA carrier RSSI>= -94dBm and CPICH RSCP >= -114dBm.

10.1.12Transport channel BLER

Requirement	The UE shall report the CRC results

10.1.13Physical channel BER

Requirement	+/-10% of the absolute Physical channel BER value

10.1.14UE transmitted power

Requirement	**Absolute accuracy:** **Normal Conditions** + 9dB for the upper 20dB of the range. **Extreme Conditions** + 12dB for the upper 20dB of the range.

10.1.15CFN-SFN observed time difference

Requirement	+/-0.5 chips period

10.1.16SFN-SFN observed time difference

Requirement	+/-0.5 chips period for both type 1 and type 2.

10.1.17UE Rx-Tx time difference

Requirement	+/-1.5 chips period.

10.1.18Observed time difference to GSM cell

Requirement	+ 20 chips.