TSG-RAN Meeting #6 *TSGRP#6(99)700*
Nice, France, 13 – 15 December 1999

Title: **Agreed CRs of category "C" (Modifications) and "F" (Corrections) to TS 25.225**

Source: **TSG-RAN WG1**

Agenda item: **5.1.3**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc
25.225	001	1	R99	Primary and Secondary CCPCH in TDD	F	3.0.0	3.1.0	R1-99i87
25.225	003	1	R99	Update concerning measurement definitions…	F	3.0.0	3.1.0	R1-99l43

NOTE: The source of this document is TSG-RAN WG1. The source shown on each CR cover sheet is the originating organisation.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, 30 Nov – 3 Dec 1999

Document R1-99l87
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.225	CR	001r1	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: RAN #6	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	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 [X] UTRAN / Radio [X] Core Network [ ]

Source: Siemens AG **Date:** 1999-11-17

Subject: Primary and Secondary CCPCH in TDD

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: Due to recent changes in WG2 (CR25.321-014 and CR25.301-018r1) the transport to physical channel mapping in TDD can be changed in order to facilitate the channel description and harmonize TDD and FDD mapping.

Clauses affected: 3, 4.3, 5.1, 5.1.1, 5.1.12

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs: 25.221-001r1, 25.223-001r1, 25.224-001r1
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:


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3 Abbreviations

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

BER	Bit Error Rate
BLER	Block Error Rate
~~CCPCH~~	~~Common Control Physical Channel~~
DCH	Dedicated Channel
DPCH	Dedicated Physical Channel
Ec/No	Received energy per chip divided by the power density in the band
FACH	Forward Access Channel
ISCP	Interference Signal Code Power
P-CCPCH	Primary Common Control Physical Channel
PCH	Paging Channel
PRACH	Physical Random Access Channel
RACH	Random Access Channel
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
S-CCPCH	Secondary Common Control Physical Channel
SCH	Synchronisation Channel
SIR	Signal-to-Interference Ratio
UE	User Equipment

4.3 Measurements for Handover

For the handover preparation the UE receives from the UTRAN a list of cells (e.g. TDD, FDD or GSM).which the UE shall monitor (see 'monitored set' in [14]) in its idle timeslots.

At the beginning of the measurement process the UE shall find synchronization to the cell to measure using the synchronization channel. This is described under 'cell search' in [9] if the monitored cell is a TDD cell and in [4] if it is an FDD cell.

For a TDD cell to monitor after this procedure the exact timing of the midamble of the P-CCPCH is known and the measurements can be performed. Depending on the UE implementation and if timing information about the cell to monitor is available, the UE may perform the measurements on the P-CCPCH directly without prior SCH synchronisation.

5.1 UE measurement abilities

NOTE 1: Measurements for TDD which are specified on the ~~carried out on~~ Primary CCPCH (P-CCPCH) are ~~can also be~~ carried out on the P-CCPCH or ~~an~~other ~~CCPCH~~ physical channels with beacon function, see [6].~~if it has the same constant power level as the PCCPCH and no beamforming is used.~~

NOTE 2: The UTRAN has to take into account the UE capabilities when specifying the timeslots to be measured in the measurement control message.

NOTE 3: The RSCP can either be measured on the data part or the midamble of a burst, since there is no power offset between both. However, in order to have a common reference, the measurement on the midamble is assumed.

NOTE 4: The line 'applicable for' indicates whether the measurement is applicable for inter-frequency and/or intra-frequency and furthermore for idle and/or connected mode.

5.1.1 P-CCPCH RSCP

Definition	Received Signal Code Power, the received power on P-CCPCH of own or neighbour cell after despreading. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	idle mode, connected mode (intra-frequency & inter-frequency)
Range/mapping	

5.1.12 SFN-SFN observed time difference

Definition	Time difference in the frame timing between the serving TDD cell and the frame timing of the target UTRA cell measured by means of P-CCPCH for a TDD cell and by means of CPICH for an FDD cell. .
Applicable for	idle mode, connected mode (intra-frequency)
Range/mapping	

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

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25.225	CR	003rev1	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: RAN #6 *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 [X] UTRAN / Radio [X] Core Network [ ]

Source: Siemens AG **Date:** 2.12.1999

Subject: Update concerning measurement definitions, ranges and mappings

Work item:

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

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Time measurement definitions were updated to be more precise and range & mapping values for the measurements were added. Revision 1: Unit of the resolutions of the RF measurements are now expressed in dB instead of dBm.

Clauses affected: Chapter 5

Other specs affected:

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

Other comments: This CR is based on RAN WG1 #9 Tdoc (99) K21 and the agreed modifications of RAN WG1 #9 and it is a revision of RAN WG1 #9 Tdoc (99) K98.


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monitor is available, the UE may perform the measurements on the PCCPCH directly without prior SCH synchronisation.

4.4 Measurements for DCA

DCA is used to optimise the resource allocation by means of a channel quality criteria or traffic parameters. The DCA measurements are configured by the UTRAN. The UE reports the measurements to the UTRAN.

For DCA no measurements are performed in idle mode in the serving TDD cell.

When connecting with the initial access the UE immediately starts measuring the ISCP of time slots which are communicated on the BCH. The measurements and the preprocessing are done while the UTRAN assigns an UL channel for the UE for signalling and measurement reporting.

In connected mode the UE performs measurements according to a measurement control message from the UTRAN.

4.5 Measurements for timing advance

To update timing advance of a moving UE the UTRAN measures 'Received Timing Deviation', i.e. the time difference of the received UL transmission (PRACH, DPCH, PUSCH) in relation to its timeslot structure that means in relation to the ideal case where an UL transmission would have zero propagation delay. The measurements are reported to higher layers, where timing advance values are calculated and signalled to the UE.

5 Measurement abilities for UTRA TDD

In this chapter the physical layer measurements reported to higher layers. (this may also include UE internal measurements not reported over the air-interface) are defined.

5.1 UE measurement abilities

NOTE 1: Measurements for TDD which are carried out on Primary CCPCH (PCCPCH) can also be carried out on another CCPCH if it has the same constant power level as the PCCPCH and no beamforming is used.

NOTE 2: The UTRAN has to take into account the UE capabilities when specifying the timeslots to be measured in the measurement control message.

NOTE 3: The RSCP can either be measured on the data part or the midamble of a burst, since there is no power offset between both. However, in order to have a common reference, the measurement on the midamble is assumed.

NOTE 4: The line 'applicable for' indicates whether the measurement is applicable for inter-frequency and/or intra-frequency and furthermore for idle and/or connected mode.

5.1.1 PCCPCH RSCP

Definition	Received Signal Code Power, the received power on PCCPCH of own or neighbour cell after despreading. The reference point for the RSCP is the antenna connector at the UE.

Applicable for	idle mode, connected mode (intra-frequency & inter-frequency)
Range/mapping	P-CCPCH RSCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. P-CCPCH RSCP shall be reported in the unit P-CCPCH_RSCP_LEV where: P-CCPCH_RSCP_LEV00: P-CCPCH_RSCP < -115dBm P-CCPCH_RSCP_LEV01: -115dBm ≤ P-CCPCH_RSCP < –114dBm P-CCPCH_RSCP_LEV02: -114dBm ≤ P-CCPCH_RSCP < –113dBm ... P-CCPCH_RSCP_LEV89: -27dBm ≤ P-CCPCH_RSCP < –26dBm P-CCPCH_RSCP_LEV90: -26dBm ≤ P-CCPCH_RSCP < –25dBm P-CCPCH_RSCP_LEV91: -25dBm ≤ P-CCPCH_RSCP

5.1.2 CPICH RSCP

Definition	Received Signal Code Power, the received power on the CPICH code after despreading. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	idle mode, connected mode (inter-frequency)
Range/mapping	CPICH RSCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. CPICH RSCP shall be reported in the unit CPICH_RSCP_LEV where: CPICH_RSCP_LEV00: CPICH_RSCP < -115dBm CPICH_RSCP_LEV01: -115dBm ≤ CPICH_RSCP < –114dBm CPICH_RSCP_LEV02: -114dBm ≤ CPICH_RSCP < –113dBm ... CPICH_RSCP_LEV89: -27dBm ≤ CPICH_RSCP < –26dBm CPICH_RSCP_LEV90: -26dBm ≤ CPICH_RSCP < –25dBm CPICH_RSCP_LEV91: -25dBm ≤ CPICH_RSCP

5.1.3 RSCP

Definition	Received Signal Code Power, the received power on the code of a specified DPCH or PDSCH after despreading. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	connected mode (intra-frequency)
Range/mapping	RSCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. RSCP shall be reported in the unit UE_RSCP_LEV where: UE_RSCP_LEV00: RSCP < -115dBm UE_RSCP_LEV01: -115dBm ≤ RSCP < –114dBm UE_RSCP_LEV02: -114dBm ≤ RSCP < –113dBm ... UE_RSCP_LEV89: -27dBm ≤ RSCP < –26dBm UE_RSCP_LEV90: -26dBm ≤ RSCP < –25dBm UE_RSCP_LEV91: -25dBm ≤ RSCP

5.1.4 Timeslot ISCP

Definition	Interference Signal Code Power, the interference on the received signal in a specified timeslot after despreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.
Applicable for	connected mode (intra-frequency)
Range/mapping	Timeslot ISCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. Timeslot ISCP shall be reported in the unit UE_TS_ISCP_LEV where: UE_TS_ISCP_LEV00: Timeslot_ISCP < -115dBm UE_TS_ISCP_LEV01: -115dBm ≤ Timeslot_ISCP < –114dBm UE_TS_ISCP_LEV02: -114dBm ≤ Timeslot_ISCP < –113dBm ... UE_TS_ISCP_LEV89: -27dBm ≤ Timeslot_ISCP < –26dBm UE_TS_ISCP_LEV90: -26dBm ≤ Timeslot_ISCP < –25dBm UE_TS_ISCP_LEV91: -25dBm ≤ Timeslot_ISCP

5.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth in a specified timeslot. Measurement shall be performed on a UTRAN DL carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	idle mode, connected mode (intra- & inter-frequency)
Range/mapping	UTRA carrier RSSI is given with a resolution of 1 dB with the range [-94, ..., -32] dBm. UTRA carrier RSSI shall be reported in the unit UTRA_carrier_RSSI_LEV where: UTRA_carrier_RSSI_LEV00: UTRA_carrier_RSSI < -94dBm UTRA_carrier_RSSI_LEV01: -94dBm ≤ UTRA_carrier_RSSI < –93dBm UTRA_carrier_RSSI_LEV02: -93dBm ≤ UTRA_carrier_RSSI < –92dBm ... UTRA_carrier_RSSI_LEV61: -34dBm ≤ UTRA_carrier_RSSI < –33dBm UTRA_carrier_RSSI_LEV62: -33dBm ≤ UTRA_carrier_RSSI < –32dBm UTRA_carrier_RSSI_LEV63: -32dBm ≤ UTRA_carrier_RSSI

5.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth in a specified timeslot. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	idle mode, connected mode (inter-frequency)
Range/mapping	~~For GSM: a~~According to the definition of RXLEV in GSM 05.08.

5.1.7 SIR

Definition	Signal to Interference Ratio, defined as the RSCP of a DPCH or PDSCH divided by ISCP of the same timeslot. The reference point for the SIR is the antenna connector of the UE.
Applicable for	connected mode (intra-frequency)
Range/mapping	SIR is given with a resolution of 0.5 dB with the range [-11, ..., 20] dB. SIR shall be reported in the unit SIR where: SIR_00: SIR < -11.0dB SIR_01: -11.0dB ≤ SIR < -10.5dB SIR_02: -10.5dB ≤ SIR < -10.0dB .... SIR_61: 19.0dB ≤ SIR < 19.5dB SIR_62: 19.5dB ≤ SIR < 20.0dB SIR_63: 20.0dB ≤ SIR

5.1.8 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. The reference point for Ec/No is the antenna connector at the UE.
Applicable for	idle mode, connected mode (inter-frequency)
Range/mapping	CPICH Ec/No is given with a resolution of 1 dB with the range [-24, ..., 0] dB. CPICH Ec/No shall be reported in the unit CPICH_Ec/No where: CPICH_Ec/No_00: CPICH_Ec/No < -24dB CPICH_Ec/No_01: -24dB ≤ CPICH_Ec/No < -23dB CPICH_Ec/No_02: -23dB ≤ CPICH_Ec/No < -22dB ... CPICH_Ec/No_23: -2dB ≤ CPICH_Ec/No < -1dB CPICH_Ec/No_24: -1dB ≤ CPICH_Ec/No < 0dB CPICH_Ec/No_25: 0dB ≤ CPICH_Ec/No

5.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the data.
Applicable for	connected mode (intra-frequency)
Range/mapping	Physical channel BER is given with a logarithmic resolution of 0.065 with the range [10^-4.03 ... 1] including a separate case Physical channel BER=0. Physical channel BER shall be reported in the unit PhCH_BER_dB, where: PhCH_BER_dB_00: BER = 0 PhCH_BER_dB_01: -∞ < Log10(Physical channel BER) < -4.030 PhCH_BER_dB_02: -4.030 ≤ Log10(Physical channel BER) < -3.965 PhCH_BER_dB_03: -3.965 ≤ Log10(Physical channel BER) < -3.900 ... PhCH_BER_dB_61: -0.195 ≤ Log10(Physical channel BER) < -0.130 PhCH_BER_dB_62: -0.130 ≤ Log10(Physical channel BER) < -0.065 PhCH_BER_dB_63: -0.065 ≤ Log10(Physical channel BER) ≤ 0.000

5.1.10 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block.
Applicable for	Connected mode (intra-frequency)
Range/mapping	Transport channel BLER is given with a logarithmic resolution of 0.065 with the range [10^-4.03 ... 1] including a separate case Transport channel BLER=0. Transport channel BLER shall be reported in the unit TCH_BLER_dB, where: TCH_BLER_dB_00: BLER = 0 TCH_BLER_dB_01: -∞ < Log10(Transport channel BLER) < -4.030 TCH_BLER_dB_02: -4.030 ≤ Log10(Transport channel BLER) < -3.965 TCH_BLER_dB_03: -3.965 ≤ Log10(Transport channel BLER) < -3.900 ... TCH_BLER_dB_61: -0.195 ≤ Log10(Transport channel BLER) < -0.130 TCH_BLER_dB_62: -0.130 ≤ Log10(Transport channel BLER) < -0.065 TCH_BLER_dB_63: -0.065 ≤ Log10(Transport channel BLER) ≤ 0.000

5.1.11 UE transmitted power

Definition	The total UE transmitted power on one carrier measured in a timeslot. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	Connected mode (intra-frequency).
Range/mapping	UE transmitted power is given with a resolution of 1dB with the range [-50, ..., 33] dBm. UE transmitted power shall be reported in the unit UE_TX_POWER, where: - UE_TX_POWER_000 to UE_TX_POWER_020: reserved UE_TX_POWER_021: -50dBm ≤ UE_transmitted_power < -49dBm UE_TX_POWER_022: -49dBm ≤ UE_transmitted_power < -48dBm UE_TX_POWER_023: -48dBm ≤ UE_transmitted_power < -47dBm ... UE_TX_POWER_102: 31dBm ≤ UE_transmitted_power < 32dBm UE_TX_POWER_103: 32dBm ≤ UE_transmitted_power < 33dBm UE_TX_POWER_104: 33dBm ≤ UE_transmitted_power < 34dBm

5.1.12 SFN-SFN observed time difference

Definition	~~Time difference in the frame timing between the serving TDD cell and the frame timing of the target UTRA cell measured by means of PCCPCH for a TDD cell and by means of CPICH for an FDD cell.~~ SFN-SFN observed time difference is the time difference of the reception times of frames from two cells (serving and target) measured in the UE and expressed in chips. It is distinguished in two types: Type 2 applies if the serving and the target cell have the same frame timing and SFN numbering. Type 1 applies in all other cases. **Type 1:** SFN-SFN observed time difference = OFF×38400+ T_m in chips, where: $T_m = T_{RxSFNk} - T_{RxSFNi}$, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNi}: time of start of the received frame SFN_i of the serving TDD cell i. T_{RxSFNk}: time of start of the received frame SFN_k of the target UTRA cell k after the time instant T_{RxSFNi} in the UE. If the next frame of the target UTRA cell is received exactly at T_{RxSFNi} then $T_{RxSFNk} = T_{RxSFNi}$ (which leads to T_m=0) OFF=(SFN_k- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFNi : system frame number for downlink frame from serving TDD cell i in the UE at the time T_{RxSFNi}. SFNk : system frame number for downlink frame from target UTRA cell k received in the UE at the time T_{RxSFNk} (for FDD: the P-CCPCH frame) **Type 2:** SFN-SFN observed time difference = $T_{RxTSk} - T_{RxTSi}$, in chips, where T_{RxTSi}: time of start of a timeslot received of the serving TDD cell i. T_{RxTSk}: time of start of a timeslot received from the target UTRA cell k that is closest in time to the start of the timeslot of the serving TDD cell i.
Applicable for	idle mode, connected mode (intra-frequency)
Range/mapping	**Type 1:** SFN-SFN observed time difference is given with a resolution of 1 chip with the range [0; 9830400) chips (24 bits). SFN-SFN observed time difference shall be reported in the unit T1_SFN-SFN_TIME, where T1_SFN-SFN_TIME_N: N* 1 chip ≤ SFN-SFN observed time difference < (N+1)* 1 chip With N= 0, 1, 2, ..., 9830399 **Type 2:** SFN-SFN observed time difference is given with a resolution of 0.25 chip with the range (-1280; 1280] chips (14 bits). SFN-SFN observed time difference shall be reported in the unit T2_SFN-SFN_TIME, where T2_SFN-SFN_TIME_N: N* 0.25 chip –1280 chips < SFN-SFN observed time difference ≤ (N+1)* 0.25 chip –1280 chips With N= 0, 1, 2, ..., 10239

5.1.13 Observed time difference to GSM cell

Definition	~~Time difference between the Primary CCPCH of the current cell and the timing of the GSM cell~~ Observed time difference to GSM cell is the time difference T_m in ms, where $T_m = T_{RxGSMk} - T_{RxSFN0i}$ $T_{RxSFN0i}$: time of start of the received frame SFN=0 of the serving TDD cell i T_{RxGSMk}: time of start of the received 51-GSM-multiframe of the considered target GSM beacon frequency k which is following next after the start of frame SFN=0 of the serving TDD cell.

Applicable for	Idle mode, connected mode (inter-frequency)
Range/mapping	Observed time difference to GSM cell is given with a resolution of 3060ms/(13*4096) (12 bit) with the range [0, 3060) ms. Observed time difference to GSM cell shall be reported in the unit GSM_TIME, where GSM_TIME_N: N* 3060ms/(13*4096) ≤ Observed time difference to GSM cell < (N+1)* 3060ms/(13*4096) With N= 0, 1, 2, ..., 4095

5.2 UTRAN measurement abilities

NOTE 1: If the UTRAN supports multiple frequency bands then the measurements apply for each frequency band individually.

NOTE 2: The RSCP can either be measured on the data part or the midamble of a burst, since there is no power offset between both. However, in order to have a common reference, the measurement on the midamble is assumed.

5.2.1 RSCP

Definition	Received Signal Code Power, the received power on one DPCH, PRACH or PUSCH code after despreading. The reference point for the RSCP shall be the antenna connector.
Range/mapping	RSCP is given with a resolution of 0.5 dB with the range [-120, ..., -80] dBm. RSCP shall be reported in the unit UTRAN_RSCP_LEV where: UTRAN_RSCP_LEV00: RSCP < -120.0dBm UTRAN_RSCP_LEV01: -120.0dBm ≤ RSCP < –119.5dBm UTRAN_RSCP_LEV02: -119.5dBm ≤ RSCP < –119.0dBm ... UTRAN_RSCP_LEV79: -81.0dBm ≤ RSCP < –80.5dBm UTRAN_RSCP_LEV80: -80.5dBm ≤ RSCP < –80.0dBm UTRAN_RSCP_LEV81: -80.0dBm ≤ RSCP

5.2.2 Timeslot ISCP

Definition	Interference Signal Code Power, the interference on the received signal in a specified timeslot after despreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP shall be the antenna connector.
Range/mapping	Timeslot ISCP is given with a resolution of 0.5 dB with the range [-120, ..., -80] dBm. Timeslot ISCP shall be reported in the unit UTRAN_TS_ISCP_LEV where: UTRAN_TS_ISCP_LEV00: Timeslot_ISCP < -120.0dBm UTRAN_TS_ISCP_LEV01: -120.0dBm ≤ Timeslot_ISCP < –119.5dBm UTRAN_TS_ISCP_LEV02: -119.5dBm ≤ Timeslot_ISCP < –119.0dBm ... UTRAN_TS_ISCP_LEV79: -81.0dBm ≤ Timeslot_ISCP < –80.5dBm UTRAN_TS_ISCP_LEV80: -80.5dBm ≤ Timeslot_ISCP < –80.0dBm UTRAN_TS_ISCP_LEV81: -80.0dBm ≤ Timeslot_ISCP

5.2.3 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN UL channel bandwidth in a specified timeslot. The reference point for the RSSI shall be the antenna connector.

Range/mapping	RSSI is given with a resolution of 0.5dB with the range [-105, ..., -74] dBm. RSSI shall be reported in the unit RSSI_LEV, where: RSSI_LEV00: RSSI < -105.0dBm RSSI_LEV01: -105.0dBm ≤ RSSI < –104.5dBm RSSI_LEV02: -104.5dBm ≤ RSSI < –104.0dBm ... RSSI_LEV61: -75.0dBm ≤ RSSI < –74.5dBm RSSI_LEV62: -74.5dBm ≤ RSSI < –74.0dBm RSSI_LEV63: -74.0dBm ≤ RSSI

5.2.4 SIR

Definition	Signal to Interference Ratio, defined as the RSCP of the DPCH or PUSCH divided by ISCP of the same timeslot. The reference point for the SIR shall be the antenna connector.
Range/mapping	SIR is given with a resolution of 0.5 dB with the range [-11, ..., 20] dB. SIR shall be reported in the unit SIR where: SIR_00: SIR < -11.0dB SIR_01: -11.0dB ≤ SIR < -10.5dB SIR_02: -10.5dB ≤ SIR < -10.0dB .... SIR_61: 19.0dB ≤ SIR < 19.5dB SIR_62: 19.5dB ≤ SIR < 20.0dB SIR_63: 20.0dB ≤ SIR

5.2.5 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) of a DPCH or PUSCH before channel decoding of the data.
Range/mapping	Physical channel BER is given with a logarithmic resolution of 0.065 with the range [10^-4.03 ... 1] including a separate case Physical channel BER=0. Physical channel BER shall be reported in the unit PhCH_BER_dB, where: PhCH_BER_dB_00: BER = 0 PhCH_BER_dB_01: -∞ < Log10(Physical channel BER) < -4.030 PhCH_BER_dB_02: -4.030 ≤ Log10(Physical channel BER) < -3.965 PhCH_BER_dB_03: -3.965 ≤ Log10(Physical channel BER) < -3.900 ... PhCH_BER_dB_61: -0.195 ≤ Log10(Physical channel BER) < -0.130 PhCH_BER_dB_62: -0.130 ≤ Log10(Physical channel BER) < -0.065 PhCH_BER_dB_63: -0.065 ≤ Log10(Physical channel BER) ≤ 0.000

5.2.6 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER) of a DCH or USCH. The BLER estimation shall be based on evaluating the CRC on each transport block.
Range/mapping	Transport channel BLER is given with a logarithmic resolution of 0.065 with the range [10^-4.03 ... 1] including a separate case Transport channel BLER=0. Transport channel BLER shall be reported in the unit TCH_BLER_dB, where: TCH_BLER_dB_00: BLER = 0 TCH_BLER_dB_01: -∞ < Log10(Transport channel BLER) < -4.030 TCH_BLER_dB_02: -4.030 ≤ Log10(Transport channel BLER) < -3.965 TCH_BLER_dB_03: -3.965 ≤ Log10(Transport channel BLER) < -3.900 ... TCH_BLER_dB_61: -0.195 ≤ Log10(Transport channel BLER) < -0.130 TCH_BLER_dB_62: -0.130 ≤ Log10(Transport channel BLER) < -0.065 TCH_BLER_dB_63: -0.065 ≤ Log10(Transport channel BLER) ≤ 0.000

5.2.7 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one DL carrier from one UTRAN access point measured in a timeslot. The reference point for the UTRAN total transmitted power measurement shall be the antenna connector.
Range/mapping	Transmitted carrier power is given with a resolution of 0.5dB with the range [0, ..., 50] dBm. Transmitted carrier power shall be reported in the unit UTRAN_TX_POWER, where: UTRAN_TX_POWER_000 to UTRAN_TX_POWER_015: reserved UTRAN_TX_POWER_016: 0.0dBm ≤ Transmitted carrier power < 0.5dBm UTRAN_TX_POWER_017: 0.5dBm ≤ Transmitted carrier power < 1.0dBm UTRAN_TX_POWER_018: 1.0dBm ≤ Transmitted carrier power < 1.5dBm ... UTRAN_TX_POWER_114: 49.0dBm ≤ Transmitted carrier power < 49.5dBm UTRAN_TX_POWER_115: 49.5dBm ≤ Transmitted carrier power < 50.0dBm UTRAN_TX_POWER_116: 50.0dBm ≤ Transmitted carrier power < 50.5dBm

5.2.8 Transmitted code power

Definition	Transmitted Code Power, is the transmitted power on one carrier and one channelisation code in one timeslot. The reference point for the transmitted code power measurement shall be the antenna connector at the UTRAN access point cabinet.
Range/mapping	Transmitted code power is given with a resolution of 0.5dB with the range [-10, ..., 46] dBm. Transmitted code power shall be reported in the unit UTRAN_TX_CODE_POWER, where: UTRAN_TX_CODE_POWER_000 to UTRAN_TX_POWER_009: reserved UTRAN_TX_CODE_POWER_010: -10.0dBm ≤ CODE_POWER < -9.5dBm UTRAN_TX_CODE_POWER_011: -9.5dBm ≤ CODE_POWER < -8.5dBm UTRAN_TX_CODE_POWER_012: -8.5dBm ≤ CODE_POWER < -7.5dBm ... UTRAN_TX_CODE_POWER_120: 45.0dBm ≤ CODE_POWER < 45.5dBm UTRAN_TX_CODE_POWER_121: 45.5dBm ≤ CODE_POWER < 46.0dBm UTRAN_TX_CODE_POWER_122: 46.0dBm ≤ CODE_POWER < 46.5dBm

5.2.9 RX Timing Deviation

Definition	~~The difference of the time of arrival of the UL transmissions in relation to the arrival time of a signal with zero propagation delay.~~ 'RX Timing Deviation' is the time difference $T_{RXdev} = T_{TS} - T_{RXpath}$ in chips, with T_{RXpath} : time of the reception in the Node B of the first significant uplink path to be used in the detection process T_{TS} : time of the beginning of the respective slot according to the Node B internal timing
Range/mapping	RX Timing Deviation is given with a resolution of 0.25 chip with the range [0; 1024) chips (12 bit). RX Timing Deviation cell shall be reported in the unit RX_TIME_DEV, where RX_TIME_DEV: N* 0.25 chips ≤ RX Timing Deviation < (N+1)* 0.25 chips With N= 0, 1, 2, ..., 4095

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