

Agenda Item:

Source: Nokia

Title: CR 25.215-041 :UTRAN Transmitted Carrier Power

Document for: Approval

1 Introduction

In Tdoc R1-000041 Ericsson proposed a change for 'transmitted carrier power' definition in 25.215. The proposal was accepted in RAN1#10. Unfortunately, some details in the proposed accuracy requirement need to be clarified.

2 Discussion

Tdoc R1-000041 defines the measurement as:

Transmitted carrier power, is the ratio between the total transmitted power on one carrier [W] from one UTRAN access point and the maximum transmission power [W] that is possible to use on the same carrier during the measurement period, where the maximum transmission power is the configured maximum transmission power for the cell. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the transmitted carrier power measurement shall be the antenna connector. In case of Tx diversity the transmitted carrier power for each branch shall be measured.

This definition in 25.215 uses terms 'total transmitted power' (implies power at the antenna port i.e. analog domain measurement) and 'configured maximum transmission power' (implies power setting or measurement in digital domain). Due to uncertainty in gain in analog parts, the proposed accuracy can not be met if values measured at different points are compared. Therefore both the instantaneous power and maximum power should be defined either in digital parts or at the antenna port. For practical measurements antenna port is preferable.

Transmitted carrier power is the ratio between the total transmitted power and the maximum transmission power. Total transmitted power is the mean power [W] on one carrier from one UTRAN access point. Maximum transmission power is the mean power [W] on one carrier from UTRAN access point when transmitting at the configured maximum power for the cell. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the transmitted carrier power measurement shall be the antenna connector. In case of Tx diversity the transmitted carrier power for each branch shall be measured.

2 Conclusion

Definition for UTRAN transmitted carrier power measurements has been proposed. CR is provided in annex.

3G CHANGE REQUEST

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

25.215 CR 041

Current Version: 3.1.1

3G specification number ↑

↑ CR number as allocated by 3G support team

For submission to TSG RAN#7 for approval X (only one box should be marked with an X)
list TSG meeting no. here ↑ for information

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.rtf

Proposed change affects: USIM ME UTRAN Core Network
(at least one should be marked with an X)

Source: Nokia **Date:** 28.2.2000

Subject: UTRAN Transmitted Carrier Power

3G Work item:

Category: F Correction
(only one category shall be marked with an X)
A Corresponds to a correction in a 2G specification
B Addition of feature
C Functional modification of feature
D Editorial modification

Reason for change: To remove ambiguity in measurement definition.

Clauses affected: 5.2.3

Other specs affected: Other 3G core specifications → List of CRs:
Other 2G 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:

Column field	Comment
Definition	Contains the definition of the measurement.
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.
Range/mapping	<p>RSSI is given with a resolution of 0.5 dB with the range [-105, ..., -74] dBm. RSSI shall be reported in the unit RSSI_LEV where:</p> <p>RSSI_LEV_00: $\text{RSSI} < -105.0 \text{ dBm}$ RSSI_LEV_01: $-105.0 \text{ dBm} \leq \text{RSSI} < -104.5 \text{ dBm}$ RSSI_LEV_02: $-104.5 \text{ dBm} \leq \text{RSSI} < -104.0 \text{ dBm}$... RSSI_LEV_61: $-73.0 \text{ dBm} \leq \text{RSSI} < -73.5 \text{ dBm}$ RSSI_LEV_62: $-73.5 \text{ dBm} \leq \text{RSSI} < -74.0 \text{ dBm}$ RSSI_LEV_63: $-74.0 \text{ dBm} \leq \text{RSSI}$</p>

5.2.2 SIR

Definition	<p>Signal to Interference Ratio, is defined as: $(\text{RSCP}/\text{ISCP}) \times \text{SF}$. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.</p> <p>where:</p> <p>RSCP = Received Signal Code Power, the received power on one code.</p> <p>ISCP = Interference Signal Code Power, the interference on the received signal. Only the non-orthogonal part of the interference is included in the measurement.</p> <p>SF=The spreading factor used on the DPCCH.</p>
Range/mapping	<p>SIR is given with a resolution of 0.5 dB with the range [-11, ..., 20] dB. SIR shall be reported in the unit UTRAN_SIR where:</p> <p>UTRAN_SIR_00: $\text{SIR} < -11.0 \text{ dB}$ UTRAN_SIR_01: $-11.0 \text{ dB} \leq \text{SIR} < -10.5 \text{ dB}$ UTRAN_SIR_02: $-10.5 \text{ dB} \leq \text{SIR} < -10.0 \text{ dB}$... UTRAN_SIR_61: $19.0 \text{ dB} \leq \text{SIR} < 19.5 \text{ dB}$ UTRAN_SIR_62: $19.5 \text{ dB} \leq \text{SIR} < 20.0 \text{ dB}$ UTRAN_SIR_63: $20.0 \text{ dB} \leq \text{SIR}$</p>

5.2.3 Transmitted carrier power

Definition	Transmitted carrier power <u>is the ratio between the total transmitted power and the maximum transmission power. Total transmitted power is the mean power [W] on one carrier from one UTRAN access point. Maximum transmission power is the mean power [W] on one carrier from UTRAN access point when transmitting at the configured maximum power for the cell, is the total transmitted power on one carrier from one UTRAN access point.</u> Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.
Range/mapping	Transmitted carrier power is given with a resolution of 0.5 dB with the range [0, ..., 50] dBm Transmitted carrier power shall be reported in the unit UTRAN_TX_POWER where: UTRAN_TX_POWER_016: 0.0 dBm ≤ Transmitted carrier power < 0.5 dBm UTRAN_TX_POWER_017: 0.5 dBm ≤ Transmitted carrier power < 1.0 dBm UTRAN_TX_POWER_018: 1.0 dBm ≤ Transmitted carrier power < 1.5 dBm ... UTRAN_TX_POWER_114: 49.0 dBm ≤ Transmitted carrier power < 49.5 dBm UTRAN_TX_POWER_115: 49.5 dBm ≤ Transmitted carrier power < 50.0 dBm UTRAN_TX_POWER_116: 50.0 dBm ≤ Transmitted carrier power < 50.5 dBm

5.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one channelisation code on one given scrambling code on one given carrier. Measurement shall be possible on any DPCH transmitted from the UTRAN access point and shall reflect the power on the pilot bits of the DPCH. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.
Range/mapping	Transmitted code power is given with a resolution of 0.5 dB with the range [-10, ..., 46] dBm. Transmitted code power shall be reported in the unit UTRAN_CODE_POWER where: UTRAN_CODE_POWER_010: -10.0 dBm ≤ Transmitted code power < -9.5 dBm UTRAN_CODE_POWER_011: -9.5 dBm ≤ Transmitted code power < -9.0 dBm UTRAN_CODE_POWER_012: -9.0 dBm ≤ Transmitted code power < -8.5 dBm ... UTRAN_CODE_POWER_120: 45.0 dBm ≤ Transmitted code power < 45.5 dBm UTRAN_CODE_POWER_121: 45.5 dBm ≤ Transmitted code power < 46.0 dBm UTRAN_CODE_POWER_122: 46.0 dBm ≤ Transmitted code power < 46.5 dBm

5.2.5 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. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.
Range/mapping	The Transport channel BLER shall be reported for $0 \leq \text{Transport channel BLER} \leq 1$ in the unit BLER_dB where: BLER_dB_00: Transport channel BLER = 0 BLER_dB_01: $-\infty < \text{Log}_{10}(\text{Transport channel BLER}) < -4.03$ BLER_dB_02: $-4.03 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.965$ BLER_dB_03: $-3.965 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -3.9$... BLER_dB_61: $-0.195 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.13$ BLER_dB_62: $-0.13 \leq \text{Log}_{10}(\text{Transport channel BLER}) < -0.065$ BLER_dB_63: $-0.065 \leq \text{Log}_{10}(\text{Transport channel BLER}) \leq 0$