

ETSI TS 125 101 V8.5.1 (2009-01)

Technical Specification

Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101 version 8.5.1 Release 8)



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Reference

RTS/TSGR-0425101v851

Keywords

UMTS**ETSI**

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1 Scope

The present document establishes the minimum RF characteristics of the FDD mode of UTRA for the User Equipment (UE).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] (void)
- [2] ITU-R Recommendation SM.329: "Unwanted emissions in the spurious domain".
- [3] (void)
- [4] 3GPP TS 25.433: "UTRAN Iub Interface NBAP Signalling".
- [5] ETSI ETR 273: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".
- [6] 3GPP TS 45.004: "Modulation".
- [7] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".
- [8] 3GPP TS 25.214: "Physical layer procedures (FDD)".
- [9] 3GPP TS 25.307: "Requirements on User Equipments (UEs) supporting a release-independent frequency band".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Enhanced performance requirements type 1: This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise receiver diversity.

Enhanced performance requirements type 2: This defines performance requirements which are optional for the UE. The requirements are based on UEs which utilise a chip equaliser receiver structure.

Power Spectral Density: 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.

Maximum Output Power: This is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

Mean power: When applied to a W-CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot unless otherwise stated.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class.

RRC filtered mean power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

NOTE 1: The RRC filtered mean power of a perfectly modulated W-CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in section 6.8.1.

Throughput: Number of information bits per second excluding CRC bits successfully received on HS-DSCH by a HSDPA capable UE.

3.2 Abbreviations

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

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
AICH	Acquisition Indication Channel
BER	Bit Error Ratio
BLER	Block Error Ratio
CQI	Channel Quality Indicator
CW	Continuous Wave (un-modulated signal)
DCH	Dedicated Channel, which is mapped into Dedicated Physical Channel.
DIP	Dominant Interferer Proportion ratio
DL	Down Link (forward link)
DTX	Discontinuous Transmission
DPCCCH	Dedicated Physical Control Channel
DPCH	Dedicated Physical Channel
DPCH_ E_c	Average energy per PN chip for DPCH.
$\frac{DPCH_E_c}{I_{or}}$	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.
DPDCH	Dedicated Physical Data Channel
DC-HSDPA	Dual Cell HSDPA
E-DCH	Enhanced Dedicated Channel
E-AGCH	E-DCH Absolute Grant Channel
E-HICH	E-DCH HARQ ACK Indicator Channel
E-RGCH	E-DCH Relative Grant Channel
EIRP	Effective Isotropic Radiated Power
E_c	Average energy per PN chip.
$\frac{E_c}{I_{or}}$	The ratio of the average transmit energy per PN chip for different fields or physical channels to the total transmit power spectral density.