ETSI EN 301 908-2 V13.1.1 (2020-06)

IMT cellular networks;
Harmonised Standard ~~covering the essential requirements~~for access to radio spectrum;
~~of article 3.2 of Directive 2014/53/EU;~~
Part 2: CDMA Direct Spread (UTRA FDD)
User Equipment (UE)

Reference
REN/MSG-TFES-13-02

Keywords
3G, 3GPP, cellular, digital, IMT, mobile, radio, regulation, UMTS, UTRA, WCDMA

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

The present document has been prepared under the Commission's standardization request C(2015) 5376 final [i.9] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A-1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.10].

National transposition dates	
Date of adoption of this EN:	9 June 2020
Date of latest announcement of this EN (doa):	30 September 2020
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2021
Date of withdrawal of any conflicting National Standard (dow):	31 March 2022

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the Radio Equipment Directive [i.2]. The present document is produced following the guidance in ETSI EG 203 336 [i.3] as applicable.

1 Scope

The present document applies to the following radio equipment type:

- User Equipment for IMT-2000 CDMA Direct Spread (UTRA FDD).

These radio equipment types are capable of operating in all or any part of the frequency bands given in table 1-1.

Table 1-1: UTRA FDD operating bands

UTRA FDD Band	Direction of transmission	UTRA FDD operating bands
I	Transmit	1 920 MHz to 1 980 MHz
	Receive	2 110 MHz to 2 170 MHz
III	Transmit	1 710 MHz to 1 785 MHz
	Receive	1 805 MHz to 1 880 MHz
VII	Transmit	2 500 MHz to 2 570 MHz
	Receive	2 620 MHz to 2 690 MHz
VIII	Transmit	880 MHz to 915 MHz
	Receive	925 MHz to 960 MHz
XV	Transmit	1 900 MHz to 1 920 MHz
	Receive	2 600 MHz to 2 620 MHz
XVI	Transmit	2 010 MHz to 2 025 MHz
	Receive	2 585 MHz to 2 600 MHz
XX	Transmit	832 MHz to 862 MHz
	Receive	791 MHz to 821 MHz
XXII	Transmit	3 410 MHz to 3 490 MHz
	Receive	3 510 MHz to 3 590 MHz
XXXII (see notes 1 and 2)	Transmit	-
	Receive	1 452 MHz to 1 496 MHz
NOTE 1: The down link frequencies of this band are paired with the uplink frequencies of the other FDD band (external) of the dual band configuration. NOTE 2: Radio equipment in band XXXII is only allowed to operate between 1 452 MHz and 1 492 MHz.		

NOTE 1: The relationship between the present document and essential requirements of article 3.2 of Directive 2014/53/EU [i.2] is given in annex A.

The present document covers requirements for UTRA FDD User Equipment from 3GPP™ Releases 99, 4, 5, 6, 7, 8, 9, 10 and 11 defined in ETSI TS 125 101 [4]. This ~~include~~includes the requirements for UE operating bands from 3GPP™ Release 12 defined in ETSI TS 125 101 [4]. In addition, the present document covers requirements for UTRA FDD User Equipment in the operating bands specified in ETSI TS 102 735 [i.4].

NOTE 2: For Band XX:

- for user equipment designed to be mobile or nomadic, the requirements in the present document measured at the antenna port also show conformity to the corresponding requirement defined as TRP (Total Radiated Power), as described in Commission Decision 2010/267/EU [i.6], ECC Decision (09)03 [i.7] and CEPT Report 30 [i.8];
- for user equipment designed to be fixed or installed, the present document does not address the requirements described in Commission Decision 2010/267/EU [i.6], ECC Decision (09)03 [i.7] and CEPT Report 30 [i.8].

The present document contains requirements to demonstrate that radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

~~The present document covers the essential requirements of article 3.2 of Directive 2014/53/EU [i.2] under the conditions identified in annex A.~~

2 References

2.1 Normative references

References are specific, identified by date of publication and/or edition number or version number. Only the cited version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 134 121-1 (V12.1.0) (10-2015): "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification (3GPP TS 34.121-1 version 12.1.0 Release 12)".

[2] ETSI TS 134 108 (V12.1.0) (10-2015): "Universal Mobile Telecommunications System (UMTS); LTE; Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108 version 12.1.0 Release 12)".

[3] ETSI TS 134 109 (V12.0.0) (09-2014): "Universal Mobile Telecommunications System (UMTS); Terminal logical test interface; Special conformance testing functions (3GPP TS 34.109 version 12.0.0 Release 12)".

[4] ETSI TS 125 101 (V11.11.0) (01-2015): "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101 version 11.11.0 Release 11)".

[5] IEC 60068-2-1 (03-2007): "Environmental testing - Part 2-1: Tests - Test A: Cold".

[6] IEC 60068-2-2 (07-2007): "Environmental testing - Part 2-2: Tests - Test B: Dry heat".

[7] ETSI TS 125 214 (V11.12.0) (07-2015): "Universal Mobile Telecommunications System (UMTS); Physical layer procedures (FDD) (3GPP TS 25.214 version 11.12.0 Release 11)".

[8] ETSI TS 145 004 (V11.0.0) (10-2012): "Digital cellular telecommunications system (Phase 2+); Modulation (3GPP TS 45.004 version 11.0.0 Release 11)".

[9] ETSI TS 137 544 (V14.3.0) (10-2017): "Universal Mobile Telecommunications System (UMTS); LTE; Universal Terrestrial Radio Access (UTRA) and Evolved UTRA (E-UTRA); User Equipment (UE) Over The Air (OTA) performance; Conformance testing (3GPP TS 37.544 version 14.3.0 Release 14)".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Void.

[i.2] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

[i.3] ETSI EG 203 336 (V1.1.1) (08-2015): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

[i.4] ETSI TS 102 735 (V7.1.0): "Universal Mobile Telecommunications System (UMTS); Band-specific requirements for UMTS Frequency Division Duplex (FDD) operation in the bands 1 900 MHz to 1 920 MHz paired with 2 600 MHz to 2 620 MHz and 2 010 MHz to 2 025 MHz paired with 2 585 MHz to 2 600 MHz".

[i.5] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[i.6] Commission Decision 2010/267/EU of 6 May 2010 on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.

[i.7] ECC Decision (09)03 of 30 October 2009 on harmonised conditions for mobile/fixed communications networks (MFCN) operating in the band 790 - 862 MHz.

[i.8] CEPT Report 30 of 30 October 2009 to the European Commission in response to the Mandate on the identification of common and minimal (least restrictive) technical conditions for 790 - 862 MHz for the digital dividend in the European Union.

[i.9] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.10] ETSI EN 301 908-1 (V11.1.1): "IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements".

[i.11] Void.

[i.12] ETSI TR 125 914 (V15.0.1) (09-2018): "Universal Mobile Telecommunications System (UMTS); Measurements of radio performances for UMTS terminals in speech mode (3GPP TR 25.914 version 15.0.1 Release 15)".

3 ~~Definitions~~Definition of terms, symbols and abbreviations

3.1 ~~Definitions~~Terms

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

chip rate: rate of "chips" (modulated symbols after spreading) per second

NOTE: The UTRA FDD chip rate is 3,84 Mchip/s.

data rate: rate of the user information, which is transmitted over the Air Interface

EXAMPLE: Output rate of the voice codec.

enhanced performance receiver type 1 for DCH: receiver with performance requirements which are optional for the UE and utilize receiver diversity during DCH reception

environmental profile: range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

maximum output power: 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 + α) times the chip rate of the radio access mode

NOTE: The period of measurement is assumed to be at least one timeslot.

mean power: power (transmitted or received) in a bandwidth of at least (1 + α) times the chip rate of the radio access mode, when applied to a WCDMA modulated signal

NOTE: The period of measurement is assumed to be at least one timeslot unless otherwise stated.

node B: logical node responsible for radio transmission/reception in one or more cells to/from the User Equipment

nominal maximum output power: nominal power defined by the UE power class

operating band: frequency range that is defined with a specific set of technical requirements, in which UTRA FDD operates

NOTE: Operating bands for UTRA are designated with Roman numerals, while the corresponding operating bands for E-UTRA are designated with Arabic numerals.

power spectral density: function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth

NOTE 1: When the mean power is normalized 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_Ec, Ec, OCNS_Ec and S-CCPCH_Ec) 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.

NOTE 2: 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.

NOTE 3: The units of Power Spectral Density (PSD) are extensively used in the present document.

RRC filtered mean power: 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: The RRC filtered mean power of a perfectly modulated WCDMA signal is 0,246 dB lower than the mean power of the same signal.

3.2 Symbols

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

α	Roll-off factor of the root raised cosine filter, α = 0,22
DPCH_Ec	Average energy per PN chip for DPCH
E_c	Average energy per PN chip
F_{uw}	Frequency of unwanted signal

NOTE: This ~~is specified in bracket in terms of~~symbol represents either an absolute frequency~~(s)~~ or a frequency offset from the assigned channel frequency as it is clarified by the text in brackets.

<REF $\hat{I}_{or}$ >	Reference $\hat{I}_{or}$
I_o	The total received power spectral density, including signal and interference, as measured at the UE antenna connector

I_{oc} Power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector

I_{or} Total transmit power spectral density (integrated in a bandwidth of $(1 + \alpha)$ times the chip rate and normalized to the chip rate) of the downlink signal at the Node B antenna connector

$\hat{I}_{or}$ Received power spectral density (integrated in a bandwidth of $(1 + \alpha)$ times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector

β_c Gain factor for DPCCH

β_d Gain factor for DPDCH

β_{hs} Gain factor for HS-DPCCH

β_{ec} Gain factor for E-DPCCH

β_{ed} Gain factor for E-DPDCH

3.3 Abbreviations

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

4C-HSDPA 4 Carrier HSDPA
<REFSENS> Reference sensitivity
AC ~~Access Channel~~Alternating Current
ACLR Adjacent Channel Leakage power Ratio
ACS Adjacent Channel Selectivity
BER Bit Error Ratio
CA Carrier Aggregation
CDMA Code Division Multiple Access
~~CEPT European Conference of Postal and Telecommunications administrations~~
CLTD Closed Loop Transmit Diversity
CW Continuous Wave

NOTE: Unmodulated signal.

DB-DC-HSDPA Dual Band Dual Cell HSDPA
DCH Dedicated Channel

NOTE: Which is mapped into Dedicated Physical Channel.

DC-HSUPA Dual Cell HSUPA
DL DownLink
DPCCH Dedicated Physical Control CHannel
DPCH Dedicated Physical CHannel
DPDCH Dedicated Physical Data CHannel
DUT Device Under Test
E-DCH Enhanced Dedicated CHannel
E-DPCCH Enhanced DPCCH
E-DPDCH Enhanced DPDCH
E-UTRA Evolved Universal Terrestrial Radio Access
~~EC European Commission~~
~~ECC Electronic Communications Committee~~
EFTA European Free Trade Association
EIS Effective Isotropic Sensitivity
EMC ElectroMagnetic Compatibility
ERM Electromagnetic compatibility and Radio spectrum Matters
~~EU European Union~~
EUT Equipment Under Test
FDD Frequency Division Duplex
FRC Fixed Reference Channel
GMSK Gaussian Minimum Shift Keying
GSM Global System for Mobile

HSDPA	High Speed Downlink Packet Access
HS-DPCCH	High Speed DPCCH
HSUPA	High Speed Uplink Packet Access
~~IEC~~	~~International Electrotechnical Commission~~
IMT	International Mobile Telecommunications
LTE	Long Term Evolution
MCC	Mobile Country Code
MPR	Maximum Power Reduction
MS	Mobile Station
MSG	Mobile Standards Group
OCNS	Orthogonal Channel Noise Simulator

NOTE: A mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink.

OLTD	Open Loop Transmit Diversity
OTA	Over The Air
PCH	Paging Channel
PN	PseudoNoise
PSD	Power Spectral Density
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
RRC	Root Raised Cosine
SS	System Simulator

NOTE: See ETSI TS 134 121-1 [1].

TFES	Task Force for European Standards for IMT
TH	Temperature High
TH/VH	High extreme Temperature/High extreme Voltage
TH/VL	High extreme Temperature/Low extreme Voltage
TL	Temperature Low
TL/VH	Low extreme Temperature/High extreme Voltage
TL/VL	Low extreme Temperature/Low extreme Voltage
TPC	Transmit Power Control
TRP	Total Radiated Power
TRS	Total Radiated Sensitivity
TX	Transmitter
UARFCN	UTRA Absolute Radio Frequency Channel Number
UE	User Equipment
UL	UpLink
UMTS	Universal Mobile Telecommunications System
UTRA	Universal Terrestrial Radio Access
VH	Higher extreme Voltage
VL	Lower extreme Voltage
WCDMA	Wideband Code Division Multiple Access

4 Technical requirements specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the manufacturer. The equipment shall comply with all the technical requirements of the present document which are identified as applicable in annex A at all times when operating within the boundary limits of the declared operational environmental profile.

4.2 Conformance requirements

4.2.0 General

The requirements in the present document are based on the assumption that the operating band (see table 1-1) is shared between systems of the IMT family (for band III and VIII also GSM) or systems having compatible characteristics.

4.2.1 Introduction

To meet the essential requirement under article 3.2 of the Directive 2014/53/EU [i.2] for IMT User Equipment (UE), a set of essential parameters in addition to those in ETSI EN 301 908-1 [i.10] have been identified. Table 4.2.1-1 provides a cross reference between these essential parameters and the corresponding technical requirements for equipment within the scope of the present document.

Table 4.2.1-1: Cross references

Essential parameter	Corresponding technical requirements		Corresponding test suite
Transmitter spectrum mask	4.2.3	Transmitter Spectrum emissions mask	5.3.2
Transmitter unwanted emissions in the out of band domain	4.2.12	Transmitter adjacent channel leakage power ratio	5.3.11
Transmitter unwanted emissions in the spurious domain	4.2.4	Transmitter spurious emissions	5.3.3
Transmitter power limits	4.2.2	Transmitter maximum output power	5.3.1
Transmitter Power Control (TPC)	4.2.5	Transmitter minimum output power	5.3.4
Transmitter power accuracy	4.2.5	Transmitter minimum output power	5.3.4
Receiver unwanted emissions in the spurious domain	4.2.10	Receiver spurious emissions	5.3.9
Receiver blocking	4.2.7	Receiver Blocking characteristics	5.3.6
Receiver desensitization			
Receiver spurious response rejection	4.2.8	Receiver spurious response	5.3.7
Receiver radio-frequency intermodulation	4.2.9	Receiver Intermodulation characteristics	5.3.8
Receiver adjacent signal selectivity	4.2.6	Receiver Adjacent Channel Selectivity (ACS)	5.3.5
Receiver sensitivity	4.2.13	Receiver Reference Sensitivity level	5.3.12
Antenna	4.2.14	Receiver Total Radiated Sensitivity (TRS)	5.3.13
	4.2.15	Total Radiated Power (TRP)	5.3.14
Equipment operating under the control of a network	4.2.11	Out-of-synchronization handling of output power	5.3.10

The technical requirements in the present document apply for UEs supporting UTRA FDD in declared operating bands. The technical requirements for HSDPA and E-DCH shall apply only to UEs supporting these features. The technical requirements for DC-HSUPA shall apply only to UEs supporting this feature.

Unless otherwise stated, the transmitter and receiver characteristics are specified at the antenna connector(s) of the UE. For UE(s) with an integral antenna only, a reference antenna(s) with a gain of 0 dBi should be assumed for each antenna port(s). A UE with integral antenna(s) may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. A 0 dBi gain is a substantial assumption for isotropic antenna. Over the air (OTA) antenna characteristics are specified in terms of Receiver Total Radiated Sensitivity (TRS) and Total Radiated Power (TRP).

4.2.2 Transmitter maximum output power

4.2.2.1 Transmitter maximum output power

4.2.2.1.1 Definition

The nominal maximum output power and its tolerance are defined according to the power class of the UE.

The nominal power defined is the broadband transmit power of the UE, i.e. the power 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.

4.2.2.1.2 Limits

The UE maximum output power shall be within the shown value in table 4.2.2.1.2-1 even for the multi-code DPDCH transmission mode.

Table 4.2.2.1.2-1: UE power classes

Operating Band	Power Class 3		Power Class 3bis		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+24	+1,7/-3,7			+21	+2,7/-2,7
Band III	+24	+1,7/-3,7			+21	+2,7/-2,7
Band VII	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band VIII	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XV	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-1,7
Band XVI	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-1,7
Band XX	+24	+1,7/-3,7	+23	+2,7/-2,7	+21	+2,7/-2,7
Band XXII	+24	+1,7/-5,2	+23	+2,7/-4,2	+21	+2,7/-4,2

NOTE 1: These requirements do not take into account the maximum power reduction allowed to the UE in the presence of HS-DPCCH and E-DCH specified in ETSI TS 125 101 [4].

NOTE 2: The range of UE maximum output power for the various power classes are specified in ETSI TS 125 101 [4], clause 6.2.1. The values in table 4.2.2.1.2-1 correspond to the measurement limits ~~taking into account the measurement uncertainty of measurement equipment (see clause 5.2).~~.

4.2.2.1.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

4.2.2.2 Transmitter maximum output power for DC-HSUPA

4.2.2.2.1 Definition for DC-HSUPA

The maximum output power with DC-HSUPA and its tolerance are defined according to the UE MPR for the nominal maximum output power.

The maximum output power with DC-HSUPA is a measure of the maximum power the UE can transmit when HS-DPCCH and E-DCH is fully or partially transmitted during a DPCCH timeslot. For DC-HSUPA, the nominal transmit power is defined by the sum of the broadband transmit power of each carrier in the UE. The measurement period shall be at least one timeslot.

4.2.2.2.2 Limits for DC-HSUPA

The maximum output power with DC-HSUPA shall not exceed the range prescribed by the maximum output power for DC-HSUPA in table 4.2.2.2.2-1.

Table 4.2.2.2.2-1: Maximum Output Power for DC-HSUPA

Sub-test in ETSI TS 134 121-1 [1], table C.11A.1.1	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
1	+22,5	+3,2/-3,7	+19,5	+4,2/-2,7
NOTE: In Band XV and Band XVI the Power Class 4 Tol (dB) is +4,2/-1,7.				

NOTE 1: The range of UE maximum output power for DC-HSUPA takes into account all combinations of DPCCH, HS-DPCCH, E-DPDCH, and E-DPCCH in the UL channel configuration.

NOTE 2: The details of cubic ~~meter~~metric and maximum power reduction specified for this requirement are specified in ETSI TS 125 101 [4], clause 6.2.2A.

4.2.2.2.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

4.2.2.3 Transmitter maximum output power for UL OLTD

4.2.2.3.1 Definition for UL OLTD

The nominal maximum output power with UL OLTD and its tolerance are defined according to the Power Class of the UE.

The maximum output power 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+ α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

4.2.2.3.2 Limits for UL OLTD

For UE with two active transmit antenna connectors in UL OLTD operation, the nominal maximum output power shall not exceed the range prescribed in table 4.2.2.3.2-1. The nominal transmit power is defined by the sum of transmit power at each transmit antenna connector.

Table 4.2.2.3.2-1: Nominal Maximum Output Power for UL OLTD

Operating Band	Power Class 3		Power Class 3bis	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+24	+1,7/-4,7	23	+2,7/-3,7
Band III	+24	+1,7/-4,7	23	+2,7/-3,7
Band VII	+24	+1,7/-4,7	23	+2,7/-3,7
Band VIII	+24	+1,7/-4,7	23	+2,7/-3,7
Band XX	+24	+1,7/-4,7	23	+2,7/-3,7
Band XXII	+24	+1,7/-6,2	23	+2,7/-5,2

NOTE 1: These requirements do not take into account the additional maximum output power tolerances allowed to the UE with supported DB-DC-HSDPA, dual carrier 4C-HSDPA, and E-UTRA CA configurations specified in clause 5.2AB.5 in ETSI TS 134 121-1 [1].

NOTE 2: The range of UE maximum output power for the various power classes are specified in ETSI TS 125 101 [4], clause 6.2.1A. The values in table 4.2.2.3.2-1 correspond to the measurement limits ~~taking into account the measurement uncertainty of measurement equipment (see clause 5.2).~~.

4.2.2.3.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

4.2.3 Transmitter spectrum emission mask

4.2.3.1 Transmitter spectrum emission mask

4.2.3.1.1 Definition

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

4.2.3.1.2 Limits

The power of any UE emission shall not exceed the levels specified in table 4.2.3.1.2-1. The requirements are applicable for all for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} defined in ETSI TS 125 214 [7].

Table 4.2.3.1.2-1: Spectrum emission mask requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth (note 5)
	Relative requirement	Absolute requirement (in measurement bandwidth)	
2,5 MHz to 3,5 MHz	$\left\{-33{,}5-15\cdot\left(\frac{\Delta f}{MHz}-2{,}5\right)\right\}dBc$	-69,6 dBm	30 kHz (see note 3)
3,5 MHz to 7,5 MHz	$\left\{-33{,}5-1\cdot\left(\frac{\Delta f}{MHz}-3{,}5\right)\right\}dBc$	-54,3 dBm	1 MHz (see note 4)
7,5 MHz to 8,5 MHz	$\left\{-37{,}5-10\cdot\left(\frac{\Delta f}{MHz}-7{,}5\right)\right\}dBc$	-54,3 dBm	1 MHz (see note 4)
8,5 MHz to 12,5 MHz	-47,5 dBc	-54,3 dBm	1 MHz (see note 4)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.
NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.
NOTE 5: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

4.2.3.1.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

4.2.3.2 Transmitter spectrum emission mask for DC-HSUPA

4.2.3.2.1 Definition for DC-HSUPA

The spectrum emission mask of the UE applies to frequencies, which are between 5 MHz and 20 MHz away from the UE centre frequency of the two assigned channel frequencies. The requirements assume that the UE output power shall be maximum level.

4.2.3.2.2 Limits for DC-HSUPA

The power of any UE emission, during DC-HSUPA transmission, shall not exceed the prescribed limits of table 4.2.3.2.2-1. The requirements are applicable for all for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} defined in ETSI TS 125 214 [7].

Table 4.2.3.2.2-1: Spectrum Emission Mask Requirement for DC-HSUPA

Δf (MHz)	Spectrum emission limit (dBm)	Measurement bandwidth
±5 - 6	-16,5	30 kHz
±6 - 10	-8,5	1 MHz
±10 - 19	-11,5	1 MHz
±19 - 20	-23,5	1 MHz
NOTE: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.		

4.2.3.2.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

4.2.3.3 Transmitter spectrum emission mask for UL OLTD

4.2.3.3.1 Definition for UL OLTD

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

4.2.3.3.2 Limits for UL OLTD

The power of any UE emission shall not exceed the levels specified in table 4.2.3.3.2-1. The requirements are applicable for all values of β_c, β_d, β_{hs} as specified in ETSI TS 125 214 [7].

For UE with two active transmit antenna connectors in UL OLTD, the spectrum emission mask requirements shall apply at each transmit antenna connector.

Table 4.2.3.3.2-1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2,5 - 3,5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-69,6 dBm	30 kHz (note 3)
3,5 - 7,5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-54,3 dBm	1 MHz (note 4)
7,5 - 8,5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-54,3 dBm	1 MHz (note 4)
8,5 - 12,5 ~~MHz~~	-47,5 dBc	-54,3 dBm	1 MHz (note 4)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.
NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.

4.2.3.3.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

4.2.3.4 Transmitter spectrum emission mask for UL CLTD Activation state 1

4.2.3.4.1 Definition for UL CLTD Activation state 1

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

4.2.3.4.2 Limits for UL CLTD Activation state 1

The power of any UE emission shall not exceed the levels specified in table 4.2.3.4.2-1. The requirements are applicable for all values of β_c, β_d, β_{hs} as specified in ETSI TS 125 214 [7].

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the spectrum emission mask requirements shall apply at each transmit antenna connector.

Table 4.2.3.4.2-1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement (note 2)		Measurement bandwidth
	Relative requirement	Absolute requirement	
2,5 - 3,5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-69,6 dBm	30 kHz (note 3)
3,5 - 7,5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-54,3 dBm	1 MHz (note 4)
7,5 - 8,5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-54,3 dBm	1 MHz (note 4)
8,5 - 12,5 ~~MHz~~	-47,5 dBc	-54,3 dBm	1 MHz (note 4)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.
NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.

4.2.3.4.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

4.2.4 Transmitter spurious emissions

4.2.4.1 Transmitter spurious emissions

4.2.4.1.1 Definition

Spurious emissions are emissions, which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

4.2.4.1.2 Limits

The power of spurious emissions shall not exceed the limits defined in tables 4.2.4.1.2-1 and 4.2.4.1.2-2. The limits shown in tables 4.2.4.1.2-1 and 4.2.4.1.2-2 are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 4.2.4.1.2-1: General spurious emissions requirements

Frequency bandwidth	Measurement bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	-30 dBm
12,75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	-30 dBm (note)

NOTE: Applies only for Band XXII.

Table 4.2.4.1.2-2: Additional spurious emissions requirements

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
I	462,5 MHz ≤ f ≤ 467,5 MHz	1 MHz	-50 dBm
~~I~~	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	2 ~~110~~010 MHz ~~≤~~< f ~~≤~~< 2 ~~170~~025 MHz	3,84 MHz	-60 dBm
	2 ~~585~~110 MHz ≤ f ≤ 2 ~~690~~170 MHz	3,84 MHz	-60 dBm
	2 300 MHz ≤ f ≤ 2 400 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
III	462,5 MHz ≤ f ≤ 467,5 MHz	1 MHz	-50 dBm
~~III~~	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	1 880 MHz ≤ f ≤ 1 920 MHz	3,84 MHz	-60 dBm
	2 010 MHz < f < 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 300 MHz ≤ f ≤ 2 400 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
VII	462,5 MHz ≤ f ≤ 467,5 MHz	1 MHz	-50 dBm
	729 MHz ≤ f ≤ 746 MHz	3,84 MHz	-60 dBm
	746 MHz ≤ f ≤ 756 MHz	3,84 MHz	-60 dBm
	758 MHz ≤ f ≤ 768 MHz	3,84 MHz	-60 dBm
	859 MHz ≤ f ≤ 894 MHz	3,84 MHz	-60 dBm
~~VII~~	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	1 900 MHz ≤ f ≤ 1 920 MHz	3,84 MHz	-60 dBm
	1 930 MHz ≤ f ≤ 1 995 MHz	3,84 MHz	-60 dBm
	2 010 MHz < f < 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 300 MHz < f < 2 400 MHz	3,84 MHz	-60 dBm
	2 350 MHz ≤ f ≤ 2 360 MHz	1 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	2 ~~590~~595 MHz ≤ f ≤ 2 620 MHz	~~3,84~~1 MHz	-~~50~~40 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz < f ≤ 1 830 MHz	100 kHz 3,84 MHz	-71 dBm (notes 1 and 2) -60 dBm (note 2)
	1 830 MHz < f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	1 880 MHz ≤ f ≤ 1 920 MHz	3,84 MHz	-60 dBm
	2 010 MHz ≤ f ≤ 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 300 MHz < f < 2 400 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 640 MHz	3,84 MHz	-60 dBm

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
	2 640 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm (note 2)
XV	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XVI	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	470 MHz ≤ f ≤ 790 MHz	8 MHz	-65 dBm (note 3)
	758 MHz ≤ f ≤ 788 MHz	1 MHz	-50 dBm
	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	2 010 MHz ≤ f ≤ 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 300 MHz ≤ f ≤ 2 400 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XXII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	3 510 MHz ≤ f ≤ 3 525 MHz	1 MHz	-40 dBm
	3 525 MHz ≤ f ≤ 3 590 MHz	1 MHz	-50 dBm
	3 600 MHz ≤ f ≤ 3 800 MHz	3,84 MHz	-50 dBm

NOTE 1: The transmitter additional spurious emission measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.4.1.2-1 are permitted for each UARFCN used in the measurement.

NOTE 2: The transmitter additional spurious emission measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in table 4.2.4.1.2-1 are permitted for each UARFCN used in the measurement due to 2nd, 3rd and 4th harmonic spurious emissions.

NOTE 3: The conformance shall be assessed using the measurement position placed at the following centre frequencies: 474 MHz, 586 MHz, 690 MHz, 754 MHz, 770 MHz and 786 MHz.

4.2.4.1.3 Conformance

Conformance tests described in clause 5.3.3 shall be carried out.

4.2.4.2 Transmitter spurious emissions for DC-HSUPA

4.2.4.2.1 Definition for DC-HSUPA

For DC-HSUPA, the spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

4.2.4.2.2 Limits for DC-HSUPA

The power of spurious emissions in DC-HSUPA transmission mode, shall not exceed the limits defined in tables 4.2.4.2.2-1 and 4.2.4.2.2-2.

The limits shown in table 4.2.4.2.2-1 are only applicable for frequencies, which are greater than 20 MHz away from the centre of the assigned carrier frequencies when dual adjacent carriers are assigned on the uplink.

Table 4.2.4.2.2-1: General spurious emissions requirements for DC-HSUPA

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	-36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	-36 dBm
30 MHz ≤ f < 1 000 MHz	100 kHz	-36 dBm
1 GHz ≤ f < 12,75 GHz	1 MHz	-30 dBm
12,75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz	1 MHz	-30 dBm (note)
NOTE: Applies only for Band XXII.		

The limits shown in table 4.2.4.2.2-2 are only applicable for frequencies, which are greater than 25 MHz away from the centre of the assigned frequencies when dual adjacent carriers are assigned on the uplink.

Table 4.2.4.2.2-2: Additional spurious emissions requirements for DC-HSUPA

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
I	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
III	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) - 60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
VII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	2 590 MHz ≤ f ≤ 2 620 MHz	1 MHz	-37 dBm
VIII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-57 dBm (notes 1 and 3) -50 dBm
	935 MHz < f ≤ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz < f ≤ 1 830 MHz	100 kHz 3,84 MHz	-71 dBm (notes 1 and 2) -60 dBm (note 2)
	1 830 MHz < f ≤ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 640 MHz	3,84 MHz	-60 dBm
	2 640 MHz < f ≤ 2 690 MHz	3,84 MHz	-60 dBm (note 2)
XV	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XVI	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f ≤ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	470 MHz ≤ f ≤ 790 MHz	8 MHz	-65 dBm (note 4)
	811 MHz ≤ f ≤ 821 MHz	3,84 MHz	-50 dBm (note 3)
	791 MHz ≤ f ≤ 811 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	1 MHz	-37 dBm
XXII	791 MHz ≤ f ≤ 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz ≤ f ≤ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
	3 510 MHz ≤ f ≤ 3 525 MHz	1 MHz	-40 dBm
	3 525 MHz ≤ f ≤ 3 590 MHz	1 MHz	-50 dBm
	3 600 MHz ≤ f ≤ 3 800 MHz	3,84 MHz	-50 dBm

Operating Band	Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.4.2.2-1 are permitted for each UARFCN used in the measurement. NOTE 2: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, measurements with a level up to the applicable requirements defined in table 4.2.4.2.2-1 are permitted for each UARFCN used in the measurement due to 2nd or 3rd harmonic spurious emissions. NOTE 3: This requirement is applicable also for frequencies, which are between 5 MHz and 25 MHz away from the UE centre carrier frequency. NOTE 4: The conformance shall be assessed using the measurement position placed at the following centre frequencies: 474 MHz, 586 MHz, 690 MHz, 754 MHz, 770 MHz and 786 MHz.			

4.2.4.2.3 Conformance

Conformance tests described in clause 5.3.3 shall be carried out.

4.2.5 Transmitter minimum output power

4.2.5.1 Transmitter minimum output power

4.2.5.1.1 Definition

The minimum controlled output power of the UE is when the power is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The minimum transmit power is defined as a mean power in one time slot.

4.2.5.1.2 Limits

The minimum output power shall be less than -49 dBm.

4.2.5.1.3 Conformance

Conformance tests described in clause 5.3.4 shall be carried out.

4.2.5.2 Transmitter minimum output power for DC-HSUPA

4.2.5.2.1 Definition for DC-HSUPA

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

The minimum output power is defined as the mean power in one time slot in each carrier.

4.2.5.2.2 Limits for DC-HSUPA

The minimum output power in each carrier shall be less than -49 dBm, when both carriers are set to minimum output power.

4.2.5.2.3 Conformance

Conformance tests described in clause 5.3.4 shall be carried out.

4.2.5.3 Transmitter minimum output power for UL CLTD Activation state 1

4.2.5.3.1 Definition for UL CLTD Activation state 1

The minimum controlled output power of the UE is when the power control setting is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required.

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the minimum output power specified in clause 4.2.5.1.2 applies at each transmit antenna connector, when the UE power is set to a minimum value.

4.2.5.3.2 Limits for UL CLTD Activation state 1

The minimum output power at each antenna connector shall be less than -49 dBm.

4.2.5.3.3 Conformance

Conformance tests described in clause 5.3.4 shall be carried out.

4.2.6 Receiver Adjacent Channel Selectivity (ACS)

4.2.6.1 Definition

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a WCDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

4.2.6.2 Limits

For the UE of power class 3 and 4, the BER shall not exceed 0,001 for the parameters specified in table 4.2.6.2-1. This test condition is equivalent to the ACS value 33 dB.

Table 4.2.6.2-1: Test parameters for adjacent channel selectivity

Parameter	Unit	Case 1	Case 2
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 14 dB	<REFSENS> + 41 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 14 dB	<REF$\hat{I}_{or}$> + 41 dB
I_{oac} mean power (modulated)	dBm	-52	-25
F_{uw} (offset)	MHz	+5 or -5	+5 or -5
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	20 (for Power class 3) 18 (for Power class 4)
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2.			
NOTE 2: The I_{oac} (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in ETSI TS 125 101 [4], clause 7.5.			

4.2.6.3 Conformance

Conformance tests described in clause 5.3.5 shall be carried out.

4.2.7 Receiver blocking characteristics

4.2.7.1 Definition

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

4.2.7.2 Limits

The BER shall not exceed 0,001 for the parameters specified in tables 4.2.7.2-1 and 4.2.7.2-2. For table 4.2.7.2-2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.

Table 4.2.7.2-1: Test parameters for in-band blocking characteristics

Parameter	Unit	Level	
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 3 dB	
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for F_{uw} offset ±10 MHz)	-44 (for F_{uw} offset ±15 MHz)
F_{uw} (Band I operation)	MHz	2 102,4 ≤ f ≤ 2 177,6	2 095 ≤ f ≤ 2 185
F_{uw} (Band III operation)	MHz	1 797,4 ≤ f ≤ 1 887,6	1 790 ≤ f ≤ 1 895
F_{uw} (Band VII operation)	MHz	2 612,4 ≤ f ≤ 2 697,6	2 605 ≤ f ≤ 2 705
F_{uw} (Band VIII operation)	MHz	917,4 ≤ f ≤ 967,6	910 ≤ f ≤ 975
F_{uw} (Band XX operation)	MHz	783,4 ≤ f ≤ 828,6	776 ≤ f ≤ 836
F_{uw} (Band XXII operation)	MHz	3 502,4 ≤ f ≤ 3 597,6	3 495 ≤ f ≤ 3 605
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4) (note 3)	
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2.			
NOTE 2: The $I_{blocking}$ (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in ETSI TS 125 101 [4], clause 7.6.			
NOTE 3: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII.			

Table 4.2.7.2-2: Test parameters for out-of-band blocking characteristics

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 3 dB	<REFSENS> + 3 dB	<REFSENS> + 3 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB	<REF$\hat{I}_{or}$> + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15
F_{uw} (Band I operation)	MHz	2 050 < f < 2 095 2 185 < f < 2 230	2 025 < f ≤ 2 050 2 230 ≤ f < 2 255	1 < f ≤ 2 025 2 255 ≤ f < 12 750
F_{uw} (Band III operation)	MHz	1 745 < f < 1 790 1 895 < f < 1 940	1 720 < f ≤ 1 745 1 940 ≤ f < 1 965	1 < f ≤ 1 720 1 965 ≤ f < 12 750
F_{uw} (Band VII operation)	MHz	2 570 < f < 2 605 2 705 < f < 2 750	Na 2 750 ≤ f < 2 775	1 < f ≤ 2 570 2 775 ≤ f < 12 750

Parameter	Unit	Frequency range 1	Frequency range 2	Frequency range 3
F_{uw} (Band VIII operation)	MHz	865 < f < 910 975 < f < 1 020	840 < f < 865 1 020 ≤ f < 1 045	1 < f ≤ 840 1 045 ≤ f < 12 750
F_{uw} (Band XV operation)	MHz	2 570 < f < 2 585 2 705 < f < 2 750	Na 2 750 ≤ f < 2 775	1 < f ≤ 2 570 2 775 ≤ f < 12 750
F_{uw} (Band XVI operation)	MHz	Na 2 705 < f < 2 750	2 500 < f ≤ 2 570 2 750 ≤ f < 2 775	1 < f ≤ 2 500 2 775 ≤ f < 12 750
F_{uw} (Band XX operation)	MHz	731 < f < 776 836 < f < 881	706 < f ≤ 731 881 ≤ f < 906	1 < f ≤ 706 906 ≤ f < 12 750
F_{uw} (Band XXII operation)	MHz	3 450 < f < 3 495 3 605 < f < 3 650	3 425 < f ≤ 3 450 3 650 ≤ f < 3 675	1 < f ≤ 3 425 3 675 ≤ f < 12 750
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)		
Band I operation	For 2 095 MHz ≤ f ≤ 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band III operation	For 1 790 MHz ≤ f ≤ 1 895 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band VII operation	For 2 605 MHz ≤ f ≤ 2 705 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band VIII operation	For 910 MHz ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XV operation	For 2 585 MHz ≤ f ≤ 2 705 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XVI operation	For 2 570 MHz ≤ f ≤ 2 705 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XX operation	For 776 MHz ≤ f ≤ 836 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied.			
Band XXII operation	For 3 495 ≤ f ≤ 3 605 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and ~~clause~~table 4.2.7.2-1 shall be applied~~.~~ (note 2~~)~~).			
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2. NOTE 2: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII.				

Table 4.2.7.2-3: Test parameters for narrow band blocking

Parameter	Unit	Band III, VIII
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 10 dB
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 10 dB
$I_{blocking}$ (GMSK)	dBm	-56
F_{uw} (offset)	MHz	2,8
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2. NOTE 2: $I_{blocking}$ (GMSK) is an interfering signal as defined in ETSI TS 145 004 [8], clause 2. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.		

4.2.7.3 Conformance

Conformance tests described in clause 5.3.6 shall be carried out.

4.2.8 Receiver spurious response

4.2.8.1 Definition

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out-of-band blocking limit as specified in table 4.2.7.2-2 is not met.

4.2.8.2 Limits

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2-1.

Table 4.2.8.2-1: Test parameters for spurious response

Parameter	Level	Unit
DPCH_Ec	<REFSENS> + 3 dB	dBm/3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB	dBm/3,84 MHz
$I_{blocking}$(CW)	-44	dBm
F_{uw}	Spurious response frequencies	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4) (note 2)	dBm
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2.		
NOTE 2: The UE transmitted mean power shall be reduced by 0,5 dB, for a UE operating in band XXII.		

4.2.8.3 Conformance

Conformance tests described in clause 5.3.7 shall be carried out.

4.2.9 Receiver intermodulation characteristics

4.2.9.1 Definition

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to ~~receiver~~receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

4.2.9.2 Limits

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2-1.

Table 4.2.9.2-1: Receive intermodulation characteristics

Parameter	Level		Unit
DPCH_Ec	<REFSENS> + 3 dB		dBm/3,84 MHz
$\hat{I}_{or}$	<REF$\hat{I}_{or}$> + 3 dB		dBm/3,84 MHz
I_{ouw1} (CW)	-46		dBm
I_{ouw2} mean power (modulated)	-46		dBm
F_{uw1} (offset)	10	-10	MHz
F_{uw2} (offset)	20	-20	MHz
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4) (note 3)		dBm
NOTE 1: I_{ouw2} (modulated) consists of the common channels needed for tests as specified in table C.7 and the 16 dedicated data channels in table C.6 as specified in ETSI TS 125 101 [4]. NOTE 2: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2. NOTE 3: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII.			

Table 4.2.9.2-2: Test parameters for narrow band intermodulation characteristics

Parameter	Unit	Band III, VIII	
DPCH_Ec	dBm/3,84 MHz	<REFSENS> + 10 dB	
$\hat{I}_{or}$	dBm/3,84 MHz	<REF$\hat{I}_{or}$> + 10 dB	
I_{ouw1} (CW)	dBm	-43	
I_{ouw2} (GMSK)	dBm	-43	
F_{uw1} (offset)	MHz	3,6	-3,6
F_{uw2} (offset)	MHz	6,0	-6,0
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	
NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in ETSI TS 134 121-1 [1], clause 6.2. NOTE 2: I_{ouw2} (GMSK) is an interfering signal as defined in ETSI TS 145 004 [8], clause 2. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream.			

4.2.9.3 Conformance

Conformance tests described in clause 5.3.8 shall be carried out.

4.2.10 Receiver spurious emissions

4.2.10.1 Definition

The spurious emissions power is the power of emissions, generated or amplified in a receiver, which appear at the UE antenna connector. The requirements in UE transmit bands are valid in URA_PCH, Cell_PCH and idle state.

4.2.10.2 Limits

The power of any narrow band CW spurious emission shall not exceed the maximum level specified in tables 4.2.10.2-1 and 4.2.10.2-2.

Table 4.2.10.2-1: General receiver spurious emission requirements

Frequency band	Measurement bandwidth	Maximum level
30 MHz ≤ f < 1 GHz	100 kHz	-57 dBm
1 GHz ≤ f ≤ 12,75 GHz	1 MHz	-47 dBm

Table 4.2.10.2-2: Additional receiver spurious emission requirements

Band	Frequency ~~Range~~band	Measurement Bandwidth	Maximum level
I	1 920 MHz ≤ f ≤ 1 980 MHz	3,84 MHz	-60 dBm
III	1 710 MHz ≤ f ≤ 1 785 MHz	3,84 MHz	-60 dBm
VII	2 500 MHz ≤ f ≤ 2 570 MHz	3,84 MHz	-60 dBm
VIII	880 MHz ≤ f ≤ 915 MHz	3,84 MHz	-60 dBm
XV	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f < 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 900 MHz ≤ f ≤ 1 920 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XVI	791 MHz ≤ f < 821 MHz	3,84 MHz	-60 dBm
	921 MHz ≤ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz ≤ f < 935 MHz	100 kHz 3,84 MHz	-67 dBm (see note) -60 dBm
	935 MHz ≤ f ≤ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm (see note)
	2 010 MHz ≤ f ≤ 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz ≤ f ≤ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-60 dBm
XX	832 MHz ≤ f ≤ 862 MHz	3,84 MHz	-60 dBm
XXII	3 410 MHz ≤ f ≤ 3 490 MHz	3,84 MHz	-60 dBm
NOTE: The receiver additional spurious emission measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 4.2.10.2-1 are permitted for each UARFCN used in the measurement. This note applies also to receiver additional spurious emission measurements according to table 4.2.12.1.2-1.			

4.2.10.3 Conformance

Conformance tests described in clause 5.3.9 shall be carried out.

4.2.11 Out-of-synchronization handling of output power

4.2.11.1 Definition

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1. The threshold Q_{out} specifies at what DPCCH quality levels the UE shall shut its power off. The threshold is not defined explicitly, but is defined by the conditions under which the UE shall shut its transmitter off, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the threshold Q_{out} for the purpose of monitoring synchronization. The threshold Q_{out} should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 20 %.

4.2.11.2 Limits

When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold Q_{out}, the UE shall shut its transmitter off within 40 ms.

The quality level at the thresholds Q_{out}correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2-1, a signal with the quality at the level Q_{out} can be generated by a DPCCH_E_c/I_{or} ratio of -25 dB. The DL reference measurement channel 12,2 kbit/s is specified in ETSI TS 134 121-1 [1], clause C.3.1 and with static propagation conditions. The downlink physical channels, other than those specified in table 4.2.11.2-1, are as specified in table E.3.3 of annex E in ETSI TS 134 121-1 [1].

Table 4.2.11.2-1: DCH parameters for test of out-of-synchronization handling

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	-1	dB
I_{oc}	-60	dBm/3,84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See figure 4.2.11.2-1: Before point A: • 16,6 for UEs not supporting enhanced receiver performance type 1 for DCH • 19,6 for UEs supporting enhanced receiver performance type 1 for DCH After point A not defined	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See figure 4.2.11.2-1	dB
Information Data Rate	12,2	kbit/s

Figure 4.2.11.2-1 and table 4.2.11.2-2 show an example scenario where the DPCCH_E_c/I_{or} ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off.

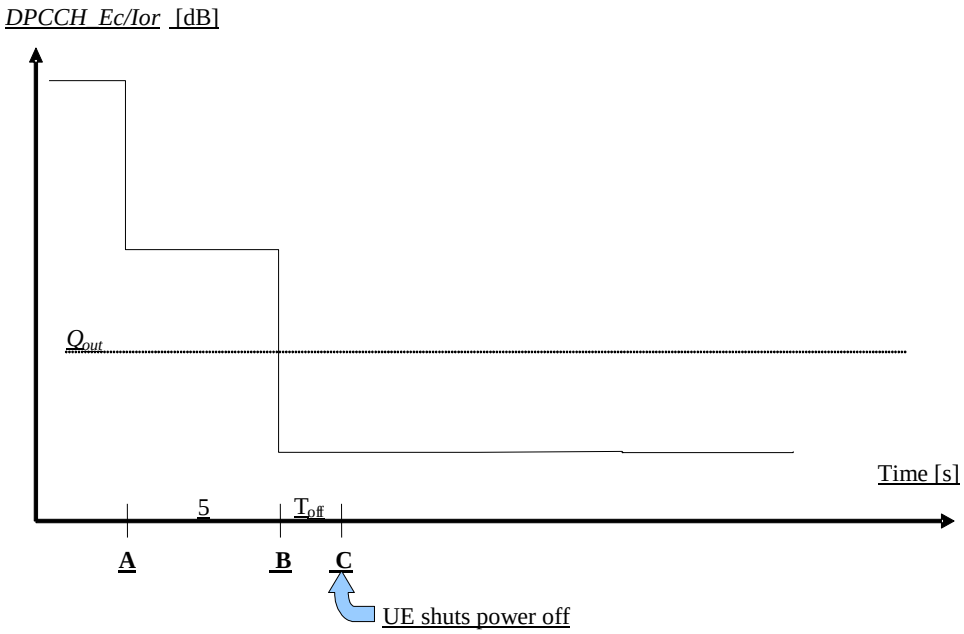

Figure 4.2.11.2-1: Conditions for out-of-synchronization handling in the UE

Table 4.2.11.2-2: Conditions for out-of-synchronization handling in the UE

Clause from figure 4.2.11.2-1	DPCCH_E_c/I_{or} (UE, not supporting enhanced receiver performance requirements type 1 for DCH)	DPCCH_E_c/I_{or} (UE, supporting enhanced receiver performance requirements type 1 for DCH)	Unit
Before A	-16,6	-19,6	dB
A to B	-21,6	-24,6	dB
After B	-28,4	-31,4	dB

The requirements for the UE are that it shall shut its transmitter off before point C.

The UE transmitter is considered to be OFF if the measured RRC filtered mean power is less than -55 dBm.

4.2.11.3 Conformance

Conformance tests described in clause 5.3.10 shall be carried out.

4.2.12 Transmitter Adjacent Channel Leakage power Ratio (ACLR)

4.2.12.1 Transmitter adjacent channel leakage power ratio (ACLR)

4.2.12.1.1 Definition

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

4.2.12.1.2 Limits

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.1.2-1.The requirements are applicable for all for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} defined in ETSI TS 125 214 [7].

Table 4.2.12.1.2-1: UE ACLR

Power Class	Adjacent channel frequency relative to assigned channel frequency	ACLR limit
3	+5 MHz or -5 MHz	32,2 dB
3	+10 MHz or -10 MHz	42,2 dB
4	+5 MHz or -5 MHz	32,2 dB
4	+10 MHz or -10 MHz	42,2 dB
NOTE: The requirement shall still be met in the presence of switching transients.		

4.2.12.1.3 Conformance

Conformance tests described in clause 5.3.11 shall be carried out.

4.2.12.2 Adjacent channel leakage power ratio for DC-HSUPA

4.2.12.2.1 Definition for DC-HSUPA

In the case dual adjacent carriers are assigned on the uplink, ACLR is the ratio of the sum of the RRC filtered mean powers ~~centered~~centred on each of the two assigned channel frequencies to the RRC filtered mean power ~~centered~~centred on an adjacent channel frequency.

4.2.12.2.2 Limits for DC-HSUPA

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.2.2-1.The requirements are applicable for all for the values of β_c, β_d, β_{hs}, β_{ec} and β_{ed} defined in ETSI TS 125 214 [7].

Table 4.2.12.2.2-1: UE ACLR for DC-HSUPA

Power Class	Adjacent channel frequency relative to the ~~center~~centre of two assigned channel frequencies	ACLR limit
3	+7,5 MHz or -7,5 MHz	32,2 dB
3	+12,5 MHz or -12,5 MHz	35,2 dB
4	+7,5 MHz or -7,5 MHz	32,2 dB
4	+12,5 MHz or -12,5 MHz	35,2 dB
NOTE: The requirement shall still be met in the presence of switching transients.		

4.2.12.2.3 Conformance

Conformance tests described in clause 5.3.11 shall be carried out.

4.2.12.3 Adjacent channel leakage power ratio for UL OLTD

4.2.12.3.1 Definition for UL OLTD

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

4.2.12.3.2 Limits for UL OLTD

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.3.2-1.The requirements are applicable for all for the values of β_c, β_d, and β_{hs}, defined in ETSI TS 125 214 [7].

For UE with two active transmit antenna connectors in UL OLTD, the ACLR requirements shall apply at each transmit antenna connector.

Table 4.2.12.3.2-1: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or -5 MHz	32,2 dB
3	+10 MHz or -10 MHz	42,2 dB
4	+5 MHz or -5 MHz	32,2 dB
4	+10 MHz or -10 MHz	42,2 dB
NOTE: The requirement shall still be met in the presence of switching transients.		

4.2.12.3.3 Conformance

Conformance tests described in clause 5.3.11 shall be carried out.

4.2.12.4 Adjacent channel leakage power ratio for UL CLTD Activation state 1

4.2.12.4.1 Definition for UL CLTD Activation state 1

ACLR is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

4.2.12.4.2 Limits for UL CLTD Activation state 1

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.4.2-1. The requirements are applicable for all for the values of β_c, β_d, and β_{hs}, defined in ETSI TS 125 214 [7].

For UE with two active transmit antenna connectors in UL CLTD activation state 1, the ACLR requirements shall apply at each transmit antenna connector.

Table 4.2.12.4.2-1: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or -5 MHz	32,2 dB
3	+10 MHz or -10 MHz	42,2 dB
4	+5 MHz or -5 MHz	32,2 dB
4	+10 MHz or -10 MHz	42,2 dB
NOTE: The requirement shall still be met in the presence of switching transients.		

4.2.12.4.3 Conformance

Conformance tests described in clause 5.3.11 shall be carried out.

4.2.13 Receiver Reference Sensitivity level

4.2.13.0 General

Unless otherwise stated, the receiver characteristics are specified at the antenna connector(s) of the UE. For UE(s) with an integral antenna only, a reference antenna(s) with a gain of 0 dBi should be assumed for each antenna port(s).
A 0 dBi gain is a substantial assumption for an isotropic antenna.

4.2.13.1 Definition

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value.

4.2.13.2 Limits

The measured BER shall not exceed 0,001.

Table 4.2.13.2-1: Test parameters for Reference Sensitivity Level

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I	dBm/3,84 MHz	-116,3	-106
III	dBm/3,84 MHz	-113,3	-103
VII	dBm/3,84 MHz	-114,3	-104
VIII	dBm/3,84 MHz	-113,3	-103
XX	dBm/3,84 MHz	-113,3	-103
XXII	dBm/3,84 MHz	-113,3	-103
NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power. NOTE 2: For Power class 4 this shall be at the maximum output power.			

NOTE: These requirements do not take into account the allowed increase of the reference sensitivity level of DPCH_Ec <REFSENS> and corresponding < REF$\hat{I}_{or}$>in ETSI TS 134 121-1 [1], table 6.2.2 by the amount defined in minimum requirement clause for the UE, which supports DB-DC-HSDPA or dual band 4C-HSDPA and/or E-UTRA inter-band carrier aggregation.

4.2.13.3 Conformance

Conformance tests described in clause 5.3.12 shall be carried out.

4.2.14 Receiver Total Radiated Sensitivity (TRS)

4.2.14.0 Applicability

The present requirement applies to handheld phones/DUTs that are narrower than 72 mm.

4.2.14.1 Definition

The Total Radiated Sensitivity is defined as:

$$TRS = \frac{4\pi}{\oint\left[\frac{1}{EIS_{\theta}(\Omega; f)} + \frac{1}{EIS_{\varphi}(\Omega; f)}\right]d\Omega}$$

Where the effective isotropic sensitivity (*EIS*) is defined as the power available at the antenna output such as the sensitivity threshold is achieved for each polarization. Ω is the solid angle describing the direction, f is frequency. θ and φ are the orthogonal polarizations.

$$TRS \approx \frac{2NM}{\pi\sum_{n=0}^{N-1}\sum_{m=0}^{M-1}\left[\frac{1}{EIS_{\theta}(\theta_n, \varphi_m; f)} + \frac{1}{EIS_{\varphi}(\theta_n, \varphi_m; f)}\right]\sin(\theta_n)}$$

In these formulas N and M are the number of sampling intervals for theta and phi. θ_n and φ_m are the measurement angles. The sampling intervals are discussed further in clause 4.4 of ETSI TS 137 544 [9].

The TRS can also be calculated from measurements in a Rayleigh fading 3 dimensional isotropic environment with in average uniform elevation and azimuth distribution. The calculation of the TRS is in this case based on searching for the lowest power received by the UE/MS for a discrete number of field combinations in the chamber that gives a BER that is better than the specified target BER level. By calibrating the average power transfer function, an absolute value of the TRS can be obtained. The following expression can be used to find the TRS.

$$TRS \approx 2N\frac{\left(\sum_{n=1}^{N}\left(C_n(1-R_n)P_{thres,n}\right)\right)^{-1}}{\sum_{n=1}^{N}P_{ref,n}}$$

where $P_{ref,n}$ is the reference power transfer function for fixed measurement antenna n, R_n is the reflection coefficient for fixed measurement antenna n and C_n is the path loss in the cables connecting the measurement receiver to fixed measurement antenna n. These parameters are calculated from the calibration measurement and are further discussed in clause B.2 of ETSI TS 137 544 [9]. $P_{thres,n}$ is calculated by using the following equation:

$$P_{thres,n} = \frac{\sum_{m=1}^{M}\frac{1}{\left|S_{21,n,m}^{thres}\right|^2}}{M}$$

where $S_{21,n,m}^{thres}$ is the m:th value of the transfer function for fixed measurement antenna n, which gives the BER threshold. M is the total number of values of the BER threshold power measured for each fixed measurement antenna.

4.2.14.2 Limits

The average measured total radiated sensitivity (TRS) of low, mid and high channel for handheld UE shall be lower than the average TRS requirement specified in table 4.2.14.2-1. The averaging shall be done in linear scale for the TRS results of both right and left side of the phantom head. Average TRS requirement is shown in the column "Average" on the requirement tables.

$$TRS_{average} = 10\log\left[6\Big/\left(\frac{1}{10^{P_{left\_low}/10}}+\frac{1}{10^{P_{left\_mid}/10}}+\frac{1}{10^{P_{left\_high}/10}}+\frac{1}{10^{P_{right\_low}/10}}+\frac{1}{10^{P_{right\_mid}/10}}+\frac{1}{10^{P_{right\_high}/10}}\right)\right]$$

Table 4.2.14.2-1: TRS minimum requirements for UTRA FDD bands in the speech position Beside Head Hand Left and Beside Head Hand Right (BHHL/BHHR) for the primary mechanical mode

Operating band	Unit	<REFÎ$_{or}$>
		Average
I	dBm/3,84 MHz	-100,1
VIII	dBm/3,84 MHz	-95,85
NOTE 1: For power class 3, 3bis and 4 this shall be achieved at the maximum output power.		
NOTE 2: Applicable for dual-mode GSM/UMTS.		
NOTE 3: Not applicable for devices supporting CDMA or carrier aggregation.		

NOTE: The TRS minimum requirements are derived from table 7.1.3.5-1 of ETSI TS 137 544 [9]. The TRS minimum requirements are applicable for devices wider than 56 mm and narrower than 72 mm as defined in ETSI TR 125 914 [i.12].

4.2.14.3 Conformance

Conformance tests described in clause 5.3.13 shall be carried out.

4.2.15 Total Radiated Power (TRP)

4.2.15.0 Applicability

The present requirement applies to handheld phones/DUTs that are narrower than 72 mm.

4.2.15.1 Definition

The Total Radiated Power (TRP) is a measure of how much power the DUT actually radiates. The TRP is defined as the integral of the power transmitted in different directions over the entire radiation sphere:

$$TRP = \frac{1}{4\pi}\oint\left(EIRP_{\theta}(\Omega; f) + EIRP_{\varphi}(\Omega; f)\right)d\Omega$$

Where Ω is the solid angle describing the direction, f is frequency. θ and φ are the orthogonal polarizations. $EIRP_{\theta}$ and $EIRP_{\varphi}$ are the actually transmitted power-levels in corresponding polarizations.

Thus:

$$TRP \approx \frac{\pi}{2NM} \sum_{n=0}^{N-1} \sum_{m=0}^{M-1} \left[EIRP_{\theta}(\theta_n, \varphi_m; f) + EIRP_{\varphi}(\theta_n, \varphi_m; f) \right] \sin(\theta_n)$$

In these formulas N and M are the number of sampling intervals for theta and phi. θ_n and φ_m are the measurement angles. The sampling intervals are discussed further in clause 4.4 of ETSI TS 137 544 [9].

The TRP can also be calculated from Rayleigh faded samples of the total power transmitted from the UE. The measurement of transmitter performance in an isotropic Rayleigh fading environment is based on sampling the radiated power of the UE for a discrete number of field combinations in the chamber. The average value of these statistically distributed samples is proportional to the TRP and by calibrating the average power transfer function, an absolute value of the TRP can be obtained. Thus:

$$TRP \approx \frac{\sum_{n=1}^{N} \left(\frac{P_n}{C_n (1 - R_n)} \right)}{\sum_{n=1}^{N} P_{ref,n}}$$

where $P_{ref,n}$ is the reference power transfer function for fixed measurement antenna n, R_n is the reflection coefficient for fixed measurement antenna n and C_n is the path loss in the cables connecting the measurement receiver to fixed measurement antenna n. These parameters are calculated from the calibration measurement and are further discussed in clause B.2 of ETSI TS 137 544 [9]. P_n is the average power measured by fixed measurement antenna n and can be calculated using the following expression:

$$P_n = \frac{\sum_{m=1}^{M} \left| S_{21,n,m} \right|^2}{M}$$

where $S_{21,n,m}$ is sample number m of the complex transfer function measured with fixed measurement antenna n and M is the total number of samples measured for each fixed measurement antenna.

Note that all averaging shall be performed using linear power values (e.g. measurements in Watts).

The requirements and this test apply to all types of UTRA for the FDD UE for Release 7 and later releases.

4.2.15.2 Limits

The average TRP of low, mid and high channel in beside head position shall be higher than minimum performance requirements for roaming bands shown in table 4.2.15.2-1. The averaging shall be done in linear scale for the TRP results of both right and left side of the phantom head.

$$TRP_{average} = 10 \log \left[\frac{10^{P_{left\_low}/10} + 10^{P_{left\_mid}/10} + 10^{P_{left\_high}/10} + 10^{P_{right\_low}/10} + 10^{P_{right\_mid}/10} + 10^{P_{right\_high}/10}}{6} \right]$$

Table 4.2.15.2-1: TRP minimum performance requirement for UTRA FDD bands in the speech position Beside Head Hand Left and Beside Head Hand Right (BHHL/BHHR) for primary mechanical mode

Operating band	Power Class 3 Power (dBm) Average
I	12,55
VIII	8,70
NOTE 1: Applicable for dual-mode GSM/UMTS. NOTE 2: Not applicable for devices supporting CDMA or carrier aggregation.	

NOTE: The TRP minimum requirements are derived from table 6.1.3.5-1 of ETSI TS 137 544 [9]. The TRP minimum requirements are applicable for devices wider than 56 mm and narrower than or equal to 72 mm as defined in ETSI TR 125 914 [i.12].

4.2.15.3 Conformance

Conformance tests described in clause 5.3.14.

5 Testing for compliance with technical requirements

5.1 Environmental conditions for testing

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

Normally it should be sufficient for all tests to be conducted using normal test conditions except where otherwise stated. For guidance on the use of other conditions to be used in order to show compliance reference can be made to ETSI TS 134 121-1 [1].

For each operating frequency band of the UE, the tests in the present document are performed with appropriate frequencies defined in ETSI TS 134 108 [2], clause 5.1.

5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit will be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report~~;~~.
- ~~the recorded value of the measurement uncertainty shall be, for each measurement, equal to or less than the figures in table 5.2-1.~~

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence ~~level~~levels of respectively 95- % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Principles for the calculation of measurement uncertainty are contained in ETSI TR 100- 028- [i.5], in particular in annex ~~C~~ D of ~~the~~ ETSI TR 100 028-2 [~~i.5]. For guidance on other measurement conditions reference can be made to annex(s) of ETSI TS 134 121-1 [1~~i.5].

~~Table 5.2-1 is based on this expansion factor.~~

~~Table 5.2-1: Maximum measurement~~Recommended values for the maximum measurements uncertainty ~~of the test system~~can be found in annex C.

~~Parameter~~	~~Conditions~~	~~Test system uncertainty~~
~~Transmitter maximum output power~~		~~±0,7 dB~~
~~Transmitter spectrum emissions mask~~		~~±1,5 dB~~
~~Transmitter spurious emissions~~	~~f ≤ 2,2 GHz~~ ~~2,2 GHz < f ≤ 4 GHz~~ ~~f > 4 GHz~~ ~~Co-existence band (≥ -60 dBm)~~ ~~Co-existence band (< -60 dBm)~~	~~±1,5 dB~~ ~~±2,0 dB~~ ~~±4,0 dB~~ ~~±2,0 dB~~ ~~±3,0 dB~~
~~Transmitter Minimum output power~~		~~±1,0 dB~~
~~Receiver Adjacent Channel Selectivity (ACS)~~		~~±1,1 dB~~
~~Receiver Blocking characteristics~~	~~f < 15 MHz offset:~~ ~~15 MHz offset ≤ f ≤ 2,2 GHz~~ ~~2,2 GHz < f ≤ 4 GHz~~ ~~f > 4 GHz~~	~~±1,4 dB~~ ~~±1,0 dB~~ ~~±1,7 dB~~ ~~±3,1 dB~~
~~Receiver spurious response~~	~~f ≤ 2,2 GHz~~ ~~2,2 GHz < f ≤ 4 GHz~~ ~~f > 4 GHz~~	~~±1,0 dB~~ ~~±1,7 dB~~ ~~±3,1 dB~~
~~Receiver intermodulation characteristics~~		~~±1,3 dB~~
~~Receiver spurious emissions~~	~~For UE receive band (-60 dBm)~~ ~~For UE transmit band (-60 dBm)~~ ~~Outside the UE receive band:~~ ~~f ≤ 2,2 GHz~~ ~~2,2 GHz < f ≤ 4 GHz~~ ~~f > 4 GHz~~	~~±3,0 dB~~ ~~±3,0 dB~~ ~~±2,0 dB~~ ~~±2,0 dB~~ ~~±4,0 dB~~
~~Out of synchronization of handling power~~	~~DPCCH Ec/Ior~~ ~~Transmit OFF power~~	~~±0,4 dB~~ ~~±1,0 dB~~
~~Transmitter adjacent channel leakage power ratio~~	~~-~~	~~±0,8 dB~~

~~NOTE 1: For RF tests it should be noted that the uncertainties in table 5.2-1 apply to the test system operating into a nominal 50 Ω load and do not include system effects due to mismatch between the EUT and the test system.~~

~~NOTE 2: If the test system for a test is known to have a measurement uncertainty greater than that specified in table 5.2-1, this equipment can still be used provided that an adjustment is made as follows: any additional uncertainty in the test system over and above that specified in table 5.2-1 should be used to tighten the test requirements - making the test harder to pass (for some tests, e.g. receiver tests, this may require modification of stimulus signals). This procedure will ensure that a test system not compliant with table 5.2-1 does not increase the probability of passing an EUT that would otherwise have failed a test if a test system compliant with table 5.2-1 had been used.~~

5.3 Essential radio test suites

5.3.0 General

This clause describes the test suites that shall be used for UTRA FDD.

When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

5.3.1 Transmitter maximum output power

5.3.1.1 Method of test

5.3.1.1.1 UTRA

5.3.1.1.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.2.

5.3.1.1.1.2 Procedure

1) Set and send continuously Up power control commands to the UE.

2) Measure the mean power of the UE in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot.

Details of test method for UEs supporting UTRA can be found in ETSI TS 134 121-1 [1], clause 5.2.

5.3.1.1.1A DC-HSUPA

5.3.1.1.1A.1 Initial conditions for DC-HSUPA

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.2BA.

5.3.1.1.1A.2 Procedure for DC-HSUPA

1) Set the Absolute Grant.

2) The SS starts transmitting HSDPA and the UE loops the received data back on E-DCH.

3) Generate suitable TPC commands to each individual carrier from the SS to set the total power in each of the assigned carriers to be equal to each other within ±1 dB and the total output power of the UE to be at least 7,5 dB lower than the maximum output power. Wait 150 ms.

4) Set and send continuously Up power control commands to both carriers in the UE and wait 150 ms.

5) Measure the mean power of the UE. The mean power shall be averaged over at least one timeslot.

6) The SS shall verify that UE is still in a DC-HSUPA call by verifying that UE transmits signal on each carrier. If UE is not transmitting signal on each carrier the SS shall fail the UE in this test.

7) Repeat steps 1-) to 6) for all the different combinations of beta values as given in tables C.11A.1.1 and C.11A.1.2 in ETSI TS 134 121-1 [1], annex C.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.2BA.

5.3.1.1.1B UL OLTD

5.3.1.1.1B.1 Initial conditions for UL OLTD

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1) with the beta values.

3) An HSDPA call is set up. The RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting OLTD and HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.2AB.

5.3.1.1.1B.2 Procedure for UL OLTD

1) Set and send continuously Up power control commands to both carriers in the UE.

2) Start transmitting HSDPA data.

3) Measure the mean power of the UE in a bandwidth of at least (1+ α) times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot and measured at each transmit antenna connector

Details of test method for UEs supporting OLTD and HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.2AB.

5.3.1.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.2.2 in order to show compliance.

5.3.2 Transmitter spectrum emission mask

5.3.2.1 Method of test

5.3.2.1.1 UEs not supporting HSDPA and/or E-DCH

5.3.2.1.1.1 Initial conditions for UEs not supporting HSDPA and/or E-DCH

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs not supporting HSDPA and/or E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.9.

5.3.2.1.1.2 Procedure for UEs not supporting HSDPA and/or E-DCH

1) Set and send continuously Up power control commands to the UE until the UE output power shall be at the maximum level.

2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.2.2-1. Measurements with an offset from the carrier centre frequency between 2,515 MHz and 3,485 MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyser filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2.2-1. The measured power shall be recorded for each step.

3) Measure the RRC filtered mean power centred on the assigned channel frequency.

4) Calculate the ratio of the power 2) with respect to 3) in dBc.

Details of test method for UEs not supporting HSDPA and/or E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.9.

5.3.2.1.1A UEs supporting HSDPA and/or E-DCH

5.3.2.1.1A.1 Initial conditions for UEs supporting HSDPA and/or E-DCH

Details of initial conditions for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.9A. Details of initial conditions for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.9B.

5.3.2.1.1A.2 Procedure for UEs supporting HSDPA and/or E-DCH

Details of test method for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.9A. Details of test method for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.9B.

5.3.2.1.1B DC-HSUPA

5.3.2.1.1B.1 Initial conditions for DC-HSUPA

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.9C.

5.3.2.1.1B.2 Procedure for DC-HSUPA

1) ~~1)~~ Set the UE to maximum output power according to clause 5.3.1.1.1A.2 steps 1) to 4~~.~~).

2) ~~2)~~ When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.2.2-1. For measurements using 1 MHz or 100 KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥ 3 kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyser filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2.2-1. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

3) ~~3)~~ Repeat steps 1~~-~~) to 2) for all the different combinations of beta values as given in ETSI TS 134 121-1 [1], clause 5.9C.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.9C.

5.3.2.1.1C UL OLTD

5.3.2.1.1C.1 Initial conditions for UL OLTD

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1).

3) An HSDPA call is set up. The RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting HS-PDCCH for UL OLTD can be found in ETSI TS 134 121-1 [1], clause 5.9AA.

5.3.2.1.1C.2 Procedure for UL OLTD

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.3.2-1. For measurements using 1 MHz or 100 ~~KHz~~kHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥ 3 kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyser filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.3.2-1. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency and calculate the ratio of the power in dBc.

6) Repeat steps 1-) to 5) for all the different combinations of beta values as given in ETSI TS 134 121-1 [1] clause 5.9AA.

Details of test method for UEs supporting HS-PDCCH for UL OLTD can be found in ETSI TS 134 121-1 [1], clause 5.9AA.

5.3.2.1.1D UL CLTD Activation state 1

5.3.2.1.1D.1 Initial conditions for UL CLTD Activation state 1

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and the Fixed Reference Channels (FRC H-Set 1).

3) An HSDPA call is set up. The RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting HS-PDCCH for UL CLTD Activation state 1 can be found in ETSI TS 134 121-1 [1], clause 5.9AB.

5.3.2.1.1D.2 Procedure for UL CLTD Activation state 1

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) Set and send continuously Up power control commands to the UE.

3) Start transmitting HSDPA Data.

4) When UE has reached the maximum power, measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.4.2-1. For measurements using 1 MHz or 100 KHz measurement bandwidths the result may be calculated by integrating multiple 50 kHz or narrower filter(≥ 3 kHz) measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyser filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.4.2-1. The measured power shall be recorded for each step. The measurement duration with the filter on one frequency shall last at least the filter settling time and the measurement period shall be inside the HS-DPCCH on-period.

5) Measure the RRC filtered mean power centred on the assigned channel frequency and calculate the ratio of the power in dBc.

6) Repeat steps 1-) to 5) for all the different combinations of beta values as given in ETSI TS 134 121-1 [1], clause 5.9AB.

Details of test method for UEs supporting HS-PDCCH for UL CLTD Activation state 1 can be found in ETSI TS 134 121-1 [1], clause 5.9AB.

5.3.2.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.3.2 in order to show compliance.

5.3.3 Transmitter spurious emissions

5.3.3.1 Method of test

5.3.3.1.1 UTRA

5.3.3.1.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.11.

5.3.3.1.1.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.11.

5.3.3.1.1A DC-HSUPA

5.3.3.1.1A.1 Initial conditions for DC-HSUPA

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) ~~1)~~ Connect the SS (node B emulator) to the UE antenna connector.

2) ~~2)~~ Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) ~~3)~~ An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) ~~4)~~ Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.11A.

5.3.3.1.1A.2 Procedure for DC-HSUPA

1) Set the UE to maximum output power according to clause 5.3.1.1.1A.2 steps 1) to 4.).

2) Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.11A.

5.3.3.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.4.2 in order to show compliance.

5.3.4 Transmitter minimum output power

5.3.4.1 Method of test

5.3.4.1.1 UTRA

5.3.4.1.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3].

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.4.3.

5.3.4.1.1.2 Procedure

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power of the UE.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.4.3.

5.3.4.1.1A DC-HSUPA

5.3.4.1.1A.1 Initial conditions for DC-HSUPA

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

Frequencies to be tested are low range, mid range, high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.4.3A.

5.3.4.1.1A.2 Procedure for DC-HSUPA

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power in each carrier of the UE.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.4.3A.

5.3.4.1.1B UL CLTD Activation state 1

5.3.4.1.1B.1 Initial conditions for UL CLTD Activation state 1

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

Frequencies to be tested are low range, mid range, high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) An HSDPA call is set up. The RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting UL CLTD Activation state 1 can be found in ETSI TS 134 121-1 [1], clause 5.4.3C.

5.3.4.1.1B.2 Procedure for UL CLTD Activation state 1

1) Set and send continuously Down power control commands to the UE.

2) Measure the mean power of the UE at each antenna connector.

Details of test method for UEs supporting UL CLTD Activation state 1 can be found in ETSI TS 134 121-1 [1], clause 5.4.3C.

5.3.4.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.5.2 in order to show compliance.

5.3.5 Receiver Adjacent Channel Selectivity (ACS)

5.3.5.1 Method of test

5.3.5.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 4.2.6.2-1.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clauses 6.4 and 6.4A.

5.3.5.1.2 Procedure

1) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 1.
2) Set the power level of UE according to the table 4.2.6.2-1 case 1 with ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.
4) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 2.
5) Set the power level of UE according to the table 4.2.6.2-1 case 2 with ±1 dB tolerance.
6) Measure the BER of DCH received from the UE at the SS.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clauses 6.4 and 6.4A.

5.3.5.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.6.2 in order to show compliance.

5.3.6 Receiver blocking characteristics

5.3.6.1 Method of test

5.3.6.1.1 Initial requirements

Test environment: normal (see annex B).

For in-band case, the frequencies to be tested are mid range as defined in ETSI TS 134 108 [2]. For out-of-band case, frequencies to be tested are mid range as defined in ETSI TS 134 108 [2].

For narrow band case, frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.
2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3.
3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.5.

5.3.6.1.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3. For table 4.2.7.2-2 the frequency step size is 1 MHz.
2) Set the power level of the UE according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3 with a ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.

4) For table 4.2.7.2-2, record the frequencies for which the BER exceeds the test requirements.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.5.

5.3.6.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.7.2 in order to show compliance.

5.3.7 Receiver spurious response

5.3.7.1 Method of test

5.3.7.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to table 4.2.8.2-1.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.6.

5.3.7.1.2 Procedure

1) Set the parameter of the CW generator as shown in table 4.2.8.2-1. The spurious response frequencies are determined in step 4) of clause 5.3.6.1.2.

2) Set the power level of the UE according to table 4.2.8.2-1 with a ±1 dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.6.

5.3.7.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.8.2 in order to show compliance.

5.3.8 Receiver Intermodulation characteristics

5.3.8.1 Method of test

5.3.8.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure as per ETSI TS 134 108 [2], and RF parameters are set up according to tables 4.2.9.2-1 and 4.2.9.2-2.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3].

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.7.

5.3.8.1.2 Procedure

1) Set the parameters of the CW generator and interference generator as shown in tables 4.2.9.2-1 and 4.2.9.2-2.

2) Set the power level of the UE according to tables 4.2.9.2-1 and 4.2.9.2-2 with a ±1 dB tolerance.

3) Measure the BER of DCH received from the UE at the SS.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.7.

5.3.8.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.9.2 in order to show compliance.

5.3.9 Receiver spurious emissions

5.3.9.1 Method of test

5.3.9.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect a spectrum analyser (or other suitable test equipment) to the UE antenna connector.

2) UE shall be in CELL_FACH state.

3) The UE shall be setup such that UE will not transmit during the measurement. (For guidance see ETSI TS 134 121-1 [1], clause 6.8.4).

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.8.

5.3.9.1.2 Procedure

Sweep the spectrum analyser (or other suitable test equipment) over a frequency range from 30 MHz to 12,75 GHz and measure the average power of the spurious emissions.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.8.

5.3.9.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.10.2 in order to show compliance.

5.3.10 Out-of-synchronization handling of output power

5.3.10.1 Method of test

5.3.10.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure, with the following exception according to table 5.3.10.1.1-1 for information elements in System Information Block type 1 found in ETSI TS 134 108 [2].

Table 5.3.10.1.1-1: System Information Block type 1 message

Information Element	Value
UE Timers and constants in connected mode	
- T313	15 s
- N313	200

3) RF parameters are set up according to table 4.2.11.2-1 with DPCCH_E_c/I_{or} ratio level according to table 4.2.11.2-2, 'before A'.

4) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.4.4.

5.3.10.1.2 Procedure

1) The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.

2) The SS controls the DPCCH_E_c/I_{or} ratio level according to table 4.2.11.2-2, 'A to B'.

3) The SS controls the DPCCH_E_c/I_{or} ratio level according to table 4.2.11.2-2, 'after B'. The SS waits 200 ms and then verifies that the UE transmitter has been switched off.

4) The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

Details of test method for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 5.4.4.

5.3.10.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.11.2 in order to show compliance.

5.3.11 Transmitter adjacent channel leakage power ratio

5.3.11.1 Method of test

5.3.11.1.1 UEs not supporting HSDPA and/or E-DCH

5.3.11.1.1.1 Initial conditions for UEs not supporting HSDPA and/or E-DCH

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are mid range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS to the UE antenna connector.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3] respectively.

Details of initial conditions for UEs not supporting HSDPA and/or E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.10.

5.3.11.1.1.2 Procedure for UEs not supporting HSDPA and/or E-DCH

1) The SS sends continuously Up power control commands to the UE until the UE transmitter power reaches maximum level.

2) Measure the RRC filtered mean power.

3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

4) Calculate the ratio of the power between the values measured in 2) and 3) above.

Details of test method for UEs not supporting HSDPA and/or E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.10.

5.3.11.1.1A UEs supporting HSDPA and/or E-DCH

5.3.11.1.1A.1 Initial conditions for UEs supporting HSDPA and/or E-DCH

Details of initial conditions for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.10A. Details of initial conditions for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.10B.

5.3.11.1.1A.2 Procedure for UEs supporting HSDPA and/or E-DCH

Details of test method for UEs supporting HSDPA can be found in ETSI TS 134 121-1 [1], clause 5.10A. Details of test method for UEs supporting E-DCH can be found in ETSI TS 134 121-1 [1], clause 5.10B.

5.3.11.1.1B DC-HSUPA

5.3.11.1.1B.1 Initial conditions for DC-HSUPA

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and parameters, and the DL Reference Measurement Channel.

3) An E-DCH call is set up with relevant exceptions in the RADIO BEARER SETUP message in order to allow the beta values to be set and each UL physical channel to be at constant power during the measurement. RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode 1 looping back HSDPA to E-DCH and start the loopback test using the procedure defined in ETSI TS 134 109 [3].

Details of initial conditions for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.10C.

5.3.11.1.1B.2 Procedure for DC-HSUPA

1) Set the UE to maximum output power according to clause 5.3.1.1.1A.2 steps 1) to 4.).
2) Measure the sum of the RRC filtered mean powers ~~centered~~centred on each of the two assigned channel frequencies. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.
3) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
4) Calculate the ratio of the power between the values measured in step 2) and step 3) above.

Details of test method for UEs supporting DC-HSUPA can be found in ETSI TS 134 121-1 [1], clause 5.10C.

5.3.11.1.1C UL OLTD

5.3.11.1.1C.1 Initial conditions for UL OLTD

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.
2) Set up the UL Reference Measurement Channel and parameters, and the Fixed Reference Channels (FRC H-Set 1, QPSK version).
3) An HSDPA call is set up. The RF parameters are set up and settings for the serving cell are defined.
4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting UL OLTD can be found in ETSI TS 134 121-1 [1], clause 5.10AA.

5.3.11.1.1C.2 Procedure for UL OLTD

1) Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.2.4, in ETSI TS 134 121-1 [1], and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.
2) Set and send continuously Up power control commands to the UE.
3) Start transmitting HSDPA Data.
4) When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.
5) Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
6) Calculate the ratio of the power between the values measured in step 4) and step 5).
7) Repeat steps 1-) to 6) for all the different combinations of beta values.

Details of test method for UEs supporting UL OLTD can be found in ETSI TS 134 121-1 [1], clause 5.10AA.

5.3.11.1.1D UL CLTD Activation state 1

5.3.11.1.1D.1 Initial conditions for UL CLTD Activation state 1

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) Connect the SS (node B emulator) to the UE antenna connector.

2) Set up the UL Reference Measurement Channel and parameters, and the Fixed Reference Channels (FRC H-Set 1, QPSK version).

3) An HSDPA call is set up. The RF parameters are set up and settings for the serving cell are defined.

4) Enter the UE into loopback test mode in the presence of HSDPA and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

Details of initial conditions for UEs supporting UL CLTD Activation state 1 can be found in ETSI TS 134 121-1 [1], clause 5.10AB.

5.3.11.1.1D.2 Procedure for UL CLTD Activation state 1

1) ~~1)~~ Send TRANSPORT CHANNEL RECONFIGURATION message to set the beta values according to table C.10.2.4~~,~~ in ETSI TS 134 121-1 [1], and the DPCH frame offset according the HS-DPCCH slot offset required for measurements.

2) ~~2)~~ Set and send continuously Up power control commands to the UE.

3) ~~3)~~ Start transmitting HSDPA Data.

4) ~~4)~~ When UE has reached the maximum power, measure the RRC filtered mean power on the wanted channel. The measurement period shall be inside the HS-DPCCH on-period for the wanted and the adjacent channels.

5) ~~5)~~ Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.

6) ~~6)~~ Calculate the ratio of the power between the values measured in step 4) and step 5).

7) ~~7)~~ Repeat steps 1~~-~~) to 6) for all the different combinations of beta values.

Details of test method for UEs supporting UL CLTD Activation state 1 can be found in ETSI TS 134 121-1 [1], clause 5.10AB.

5.3.11.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.12.2 in order to show compliance.

5.3.12 Receiver Reference Sensitivity level

5.3.12.1 Method of test

5.3.12.1.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH (see annex B).

The frequencies to be tested are low range, mid range, high range as defined in ETSI TS 134 108 [2], clause 5.1:

1) ~~1)~~ Connect the SS to the UE antenna connector.

2) ~~2)~~ A call is set up according to the Generic call setup procedure as per ETSI TS 134 108 [2], and RF parameters are set up according to table 4.2.13.2-1.

3) ~~3)~~ Enter the UE into loopback test mode and start the loopback test using the procedure defined in ETSI TS 134 109 [3], clause 5.3.

NOTE: When reference is made to test set up, call set up and loopback test mode, guidance on the applicability of these can be found in ETSI TS 134 121-1 [1], ETSI TS 134 108 [2] and ETSI TS 134 109 [3].

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.2.

5.3.12.1.2 Procedure

1) ~~1)~~ Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) ~~2)~~ Measure the BER of DCH received from the UE at the SS.

Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.2.

5.3.12.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.13.2 in order to show compliance.

5.3.13 Receiver Total Radiated Sensitivity

5.3.13.1 Method of test

5.3.13.1.1 Initial conditions

Initial conditions are described in ETSI TS 137 544 [9], clause 7.1.3.4.1.

5.3.13.1.2 Procedure

Procedure is described in ETSI TS 137 544 [9], clause 7.1.3.4.2.

In case devices support adaptive features that dynamically tune the RF front end and adjust TX power for optimum performance in its region of operation, the device being measured should be representative of the device configuration used by a consumer in that region. This could include setting the MCC value or other parameter to one used within the region.

5.3.13.1.3 Procedure, reverberation chamber method

Refer to ETSI TS 137 544 [9], clause 7.1.3.4.3.

5.3.13.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.14.2 in order to show compliance.

5.3.14 Total Radiated Power

5.3.14.1 Method of test

5.3.14.1.1 Initial conditions

Initial conditions are described in ETSI TS 137 544 [9], clause 6.1.3.4.1.

5.3.14.1.2 Procedure

Procedure is described in ETSI TS 137 544 [9], clause 6.1.3.4.2.

In case devices support adaptive features that dynamically tune the RF front end and adjust TX power for optimum performance in its region of operation, the device being measured should be representative of the device configuration used by a consumer in that region. This could include setting the MCC value or other parameter to one used within the region.

For devices supporting transmit antenna switching using multiple TX antennas, the TRP should be measured for each transmit antenna individually. The antenna with the greater TRP should be used to determine the pass/fail compliance.

5.3.14.1.3 Procedure, reverberation chamber method

Refer to ETSI TS 137 544 [9], clause 6.1.3.4.3.

5.3.14.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.15.2 in order to show compliance.

Annex A (informative): Relationship between the present document and the essential requirements of Directive 2014/53/EU

The present document has been prepared under the Commission's standardization request C(2015) 5376 final [i.9] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.2].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A-1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table A-1: Relationship between the present document and the essential requirements of Directive 2014/53/EU

Harmonised Standard ETSI EN 301 908-2					
Requirement				Requirement Conditionality	
No	Description	Essential requirements of Directive	~~Reference:~~ Clause ~~No~~(s) of the present document	U/C	Condition
1	Transmitter maximum output power	3.2	4.2.2	U	
2	Transmitter spectrum emission mask	3.2	4.2.3	U	
3	Transmitter spurious emissions	3.2	4.2.4	U	
4	Transmitter minimum output power	3.2	4.2.5	U	
5	Receiver Adjacent Channel Selectivity (ACS)	3.2	4.2.6	U	
6	Receiver blocking characteristics	3.2	4.2.7	U	
7	Receiver spurious response	3.2	4.2.8	U	
8	Receiver ~~intermodulation~~Intermodulation characteristics	3.2	4.2.9	U	
9	Receiver spurious emissions	3.2	4.2.10	U	
10	Out-of-synchronization handling of output power	3.2	4.2.11	U	
11	Transmitter ~~adjacent channel leakage~~Adjacent Channel Leakage power ~~ratio~~Ratio (ACLR)	3.2	4.2.12	U	
12	Receiver Reference Sensitivity level	3.2	4.2.13	U	
13	Receiver Total Radiated Sensitivity (TRS)	3.2	4.2.14	U	
14	Total Radiated Power (TRP)	3.2	4.2.15	U	

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement.

Description A textual reference to the requirement.

Essential requirements of Directive

Identification of article(s) defining the requirement in the Directive.

Clause ~~Number~~(s) of the present document

Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

U/C Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement is or is not applicable for a requirement which is classified "conditional".

Presumption of conformity stays valid only as long as a reference to the present document is maintained in the list published in the Official Journal of the European Union. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.

Other Union legislation may be applicable to the product(s) falling within the scope of the present document.

Annex B (normative): Environmental profile

B.1 General

B.1.1 Introduction

This normative annex specifies the environmental profile of the UE.

B.1.2 Temperature

The UE shall fulfil all the requirements in the full temperature range as given in table B.1.2-1.

Table B.1.2-1: Temperatures

Range	Conditions
+15 °C to +35 °C	For normal conditions (with relative humidity up to 75 %)
-10 °C to +55 °C	For extreme conditions (see IEC 60068-2-1 [5] and IEC 60068-2-2 [6])

The low and high extreme temperature conditions are denoted as TL (temperature low, -10 °C) and TH (temperature high, +55 °C).

B.1.3 Voltage

The UE shall fulfil all the requirements in the full voltage range, i.e. the voltage range between the extreme voltages.

The manufacturer should declare the lower and higher extreme voltages and the approximate shutdown voltage. For the equipment that can be operated from one or more of the power sources listed in table B.1.3-1, the lower extreme voltage should not be higher, and the higher extreme voltage should not be lower than that specified in table B.1.3-1.

Table B.1.3-1: Power sources

Power source	Lower extreme voltage	Higher extreme voltage	Normal conditions voltage
AC mains	0,9 × nominal	1,1 × nominal	~~Nominal~~nominal
Regulated lead acid battery	0,9 × nominal	1,3 × nominal	1,1 × nominal
Non regulated batteries: Leclanché Lithium Mercury/nickel and cadmium	 0,85 × nominal 0,95 ~~x~~× nominal 0,90 × nominal	 nominal 1,1 ~~x~~× nominal nominal	 nominal 1,1 ~~x~~× nominal nominal

B.1.4 Test environment

Where a normal environment is required then the normal conditions shown in clauses B.1.2 and B.1.3 shall be applied.

Where an extreme environment is required then the various combinations of extreme temperatures together with the extreme voltages shown in clauses B.1.2 and B.1.3 shall be applied. The combinations are:

- Low extreme Temperature/Low extreme Voltage (TL/VL);
- Low extreme Temperature/High extreme Voltage (TL/VH);
- High extreme Temperature/Low extreme Voltage (TH/VL);
- High extreme Temperature/High extreme Voltage (TH/VH).

~~Annex C~~Annex C (informative): Recommended maximum measurement uncertainty

For the test methods, according to the present document, the measurement uncertainty figures are calculated using expansion factors as described in clause 5.2. The recommended maximum uncertainty values in table C-1 is based on such expansion factors.

Table C-1: Maximum uncertainty of the test system

Parameter	Conditions	Test system uncertainty
Transmitter maximum output power		±0,7 dB
Transmitter spectrum emissions mask		±1,5 dB
Transmitter spurious emissions	f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz f > 4 GHz Co-existence band (≥ -60 dBm) Co-existence band (< -60 dBm)	±1,5 dB ±2,0 dB ±4,0 dB ±2,0 dB ±3,0 dB
Transmitter Minimum output power		±1,0 dB
Receiver Adjacent Channel Selectivity (ACS)		±1,1 dB
Receiver Blocking characteristics	f < 15 MHz offset: 15 MHz offset ≤ f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz f > 4 GHz	±1,4 dB ±1,0 dB ±1,7 dB ±3,1 dB
Receiver spurious response	f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz f > 4 GHz	±1,0 dB ±1,7 dB ±3,1 dB
Receiver intermodulation characteristics		±1,3 dB
Receiver spurious emissions	For UE receive band (-60 dBm) For UE transmit band (-60 dBm) Outside the UE receive band: f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz f > 4 GHz	±3,0 dB ±3,0 dB ±2,0 dB ±2,0 dB ±4,0 dB
Out of synchronization of handling power	DPCCH E_c/I_{or} Transmit OFF power	±0,4 dB ±1,0 dB
Transmitter adjacent channel leakage power ratio	-	±0,8 dB
Total Receiver Sensitivity	For single measurement	±2,3 dB
Total Radiated Power	For single measurement	±1,9 dB
NOTE: For RF tests it should be noted that the uncertainties in this table apply to the test system operating into a nominal 50 Ω load and do not include system effects due to mismatch between the EUT and the test system.		

Annex D (informative): Bibliography

Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC (EMC Directive).

CEPT/ERC/REC 74-01 (Siófok 1998, Nice 1999, Sesimbra 2002, Hradec Kralove 2005, Cardiff 2011): "Unwanted Emissions in the Spurious Domain".

Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).

Commission Decision 2008/477/EC of 13 June 2008 on the harmonisation of the 2 500-2 690 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community.

Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations.

Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

ETSI TS 125 101 (V12.9.0) (10-2015): "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101 version 12.9.0 Release 12)".

Annex ~~D~~E (informative): Change history

Version	Information about changes
V13.1.1_11.1.3	Updates up to release 13 included
V13.1.1_11.1.5	UMTS UE OTA antenna requirements included
V13.1.1_11.1.6	Minor changes on note 2 in TRP and TRS requirement tables
V13.1.1_11.1.7	Clean-up done by ***editHelp!*** E-mail: mailto:edithelp@etsi.org
V13.1.1_11.1.~~2~~9	~~Editorial corrections after assessments from EC.~~EC early assessment comments incorporated

History

Document history		
V1.1.1	January 2002	Publication
V2.2.1	October 2003	Publication
V3.2.1	May 2007	Publication
V4.2.1	March 2010	Publication
V5.2.1	July 2011	Publication
V5.4.1	December 2012	Publication
V6.2.1	October 2013	Publication
V7.1.1	December 2015	Publication
V11.1.1	July 2016	Publication
V11.1.2	August 2017	Publication
V13.0.1	March 2020	EN Approval Procedure AP 20200609: 2020-03-11 to 2020-06-09
V13.1.1	June 2020	Publication