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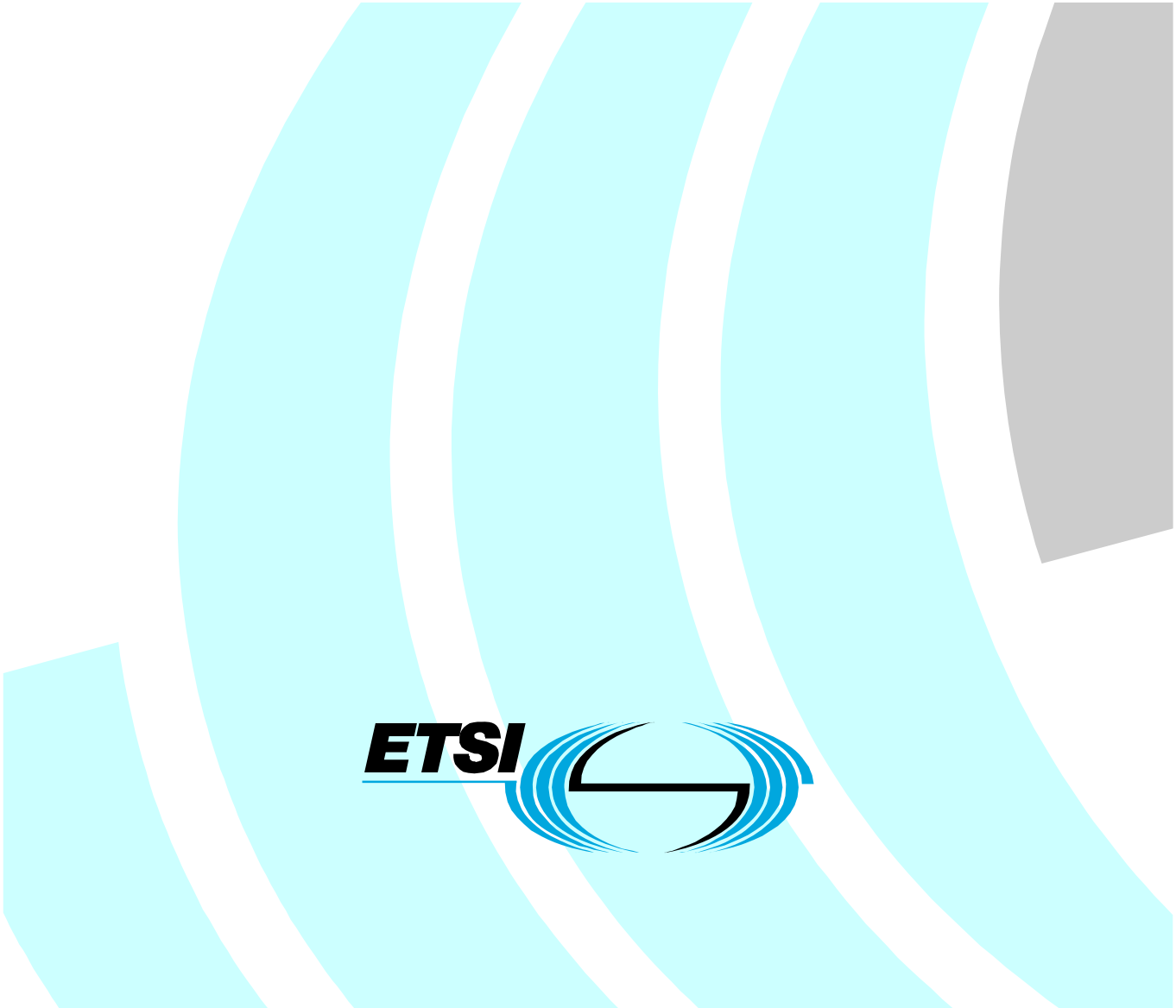
Harmonized European Standard

IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 6: CDMA TDD (UTRA TDD) User Equipment (UE)



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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
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Contents

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Foreword

This final draft Harmonized European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG), and is now submitted for the Vote phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to mandate M/284 from the European Commission issued under Council Directive 98/34/EC [i.1] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The title and reference to the present document are intended to included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.2].

See article 5.1 of Directive 1999/5/EC [i.2] for information on presumption of conformity and Harmonised Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.2] are summarised in annex A.

The present document is part 6 of a multi-part deliverable covering the essential requirements under article 3.2 of Directive 1999/5/EC [i.2] (R&TTE Directive) for Base Stations (BS), Repeaters and User Equipment (UE) for IMT cellular networks, as identified below:

Part 1: "Introduction and common requirements";

Part 2: "CDMA Direct Spread (UTRA FDD) User Equipment (UE)";

Part 3: "CDMA Direct Spread (UTRA FDD) Base Stations (BS)";

Part 4: "CDMA Multi-Carrier (cdma2000) User Equipment (UE)";

Part 5: "CDMA Multi-Carrier (cdma2000) Base Stations (BS)";

Part 6: "CDMA TDD (UTRA TDD) User Equipment (UE)";

Part 7: "CDMA TDD (UTRA TDD) Base Stations (BS)";

Part 8: "Harmonized EN for IMT-2000, TDMA Single-Carrier (UWC 136) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 9: "Harmonized EN for IMT-2000, TDMA Single-Carrier (UWC 136) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 10: "Harmonized EN for IMT-2000, FDMA/TDMA (DECT) covering essential requirements of article 3.2 of the R&TTE Directive";

Part 11: "CDMA Direct Spread (UTRA FDD) (Repeaters)";

Part 12: "Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) (Repeaters) covering the essential requirements of article 3.2 of the R&TTE Directive";

Part 13: "Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)";

Part 14: "Evolved Universal Terrestrial Radio Access (E-UTRA) Base Stations (BS)";

Part 15: "Evolved Universal Terrestrial Radio Access (E-UTRA FDD) (Repeaters)";

Part 16: "Harmonized EN for IMT-2000, Evolved CDMA Multi-Carrier Ultra Mobile Broadband (UMB) (UE) covering the essential requirements of article 3.2 of the R&TTE Directive";

Part 17: "Harmonized EN for IMT-2000, Evolved CDMA Multi-Carrier Ultra Mobile Broadband (UMB) (BS) covering the essential requirements of article 3.2 of the R&TTE Directive";

Part 18: "E-UTRA, UTRA and GSM/EDGE Multi-Standard Radio (MSR) Base Station (BS)";

Part 19: "OFDMA TDD WMAN (Mobile WiMAX) TDD User Equipment (UE)";

Part 20: "OFDMA TDD WMAN (Mobile WiMAX) TDD Base Stations (BS)";

Part 21: "OFDMA TDD WMAN (Mobile WiMAX) FDD User Equipment (UE)";

Part 22: "OFDMA TDD WMAN (Mobile WiMAX) FDD Base Stations (BS)".

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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 R&TTE Directive [i.2]. The modular structure is shown in EG 201 399 [i.3].

1 Scope

The present document applies to the following radio equipment type:

- User equipment for IMT-2000 CDMA TDD (UTRA TDD).

This radio equipment type is capable of operating in all or any part of the frequency bands given in table 1-1.

Table 1-1: IMT-2000 CDMA TDD service frequency bands

UTRA TDD Band	Direction of transmission	IMT-2000 CDMA TDD service operating bands
a	Transmit and Receive	1 900 MHz to 1 920 MHz
	Transmit and Receive	2 010 MHz to 2 025 MHz
d	Transmit and Receive	2 570 MHz to 2 620 MHz

The UTRA TDD component of IMT-2000 CDMA TDD supports three options of the TDD mode with the chip rates of 3,84 Mcps, 7,68 Mcps and 1,28 Mcps. These three options are called the 3,84 Mcps TDD option, the 1,28 Mcps TDD option and the 7,68 Mcps TDD option respectively. The requirements are listed in different clauses only if the parameters deviate. The present document covers requirements for:

- 3,84 Mcps UTRA TDD option user equipment for Releases 99, 4, 5, 6, 7, 8 and 9;
- 1,28 Mcps UTRA TDD option user equipment for Releases 4, 5, 6, 7, 8 and 9;
- 7,68 Mcps UTRA TDD option user equipment for Releases 7, 8 and 9.

For the case of IMB, only the 3,84 Mcps UTRA TDD option applies.

The present document covers the provisions of Directive 1999/5/EC [i.2] (R&TTE Directive) article 3.2, which states that "… radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of article 3 of the R&TTE Directive [i.2] may apply to equipment within the scope of the present document.

NOTE: A list of such ENs is included on the web site: http://www.newapproach.org/.

2 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 reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://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.

2.1 Normative references

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

[1] Void.

[2] ETSI TS 125 102 (V9.4.0): "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (TDD) (3GPP TS 25.102 version 9.4.0 Release 9)".

[3] ETSI TS 134 108 (V9.2.0): "Universal Mobile Telecommunications System (UMTS); LTE; Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108 version 9.2.0 Release 9)".

[4] ETSI TS 134 109 (V9.2.0): "Universal Mobile Telecommunications System (UMTS); LTE; Terminal logical test interface; Special conformance testing functions (3GPP TS 34.109 version 9.2.0 Release 9)".

[5] ETSI TS 134 122 (V9.2.0): "Universal Mobile Telecommunications System (UMTS); Terminal conformance specification; Radio transmission and reception (TDD) (3GPP TS 34.122 version 9.2.0 Release 9)".

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

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

[8] ETSI EN 301 908-1 (V5.2.1): "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive Part 1: Introduction and common requirements".

2.2 Informative references

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] 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.

[i.2] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[i.3] ETSI EG 201 399 (V2.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".

[i.4] ETSI TR 100 028 (V1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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

EXAMPLE: Output rate of the voice codec.

environmental profile: range of environmental conditions under which the 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 supported by the UE (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, where the period of measurement is a transmit timeslot excluding the guard period unless otherwise stated

MBSFN-only UE: UE operable in receive mode only (for the purpose of MBSFN reception)

mean power: when applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least (1 + α) times the chip rate of the radio access mode, where the period of measurement is a transmit timeslot excluding the guard period 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 TDD operates

NOTE: The operating band(s) for a UTRA TDD UE is declared by the manufacturer according to the designations in table 1-1. Operating bands for UTRA are designated with Roman numerals, while the corresponding operating bands for E-UTRA are designated with Arabic numerals.

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

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
Δf	separation between the carrier frequency and the centre of the measuring filter
DPCH_Ec	average energy per PN chip for DPCH
$\frac{DPCH\_Ec}{I_{or}}$	ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the downlink at the BS antenna connector
$\frac{\Sigma\ DPCH\_Ec}{I_{or}}$	ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector

NOTE: For UEs supporting only MBSFN reception, the DL reference measurement channel specified in clause A.2.9 [2] is used. For the purposes of clause 4, the term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the DL reference measurement channel in use, irrespective of its particular physical channel type (DPCH or not).

F_{uw}	Frequency of unwanted signal

NOTE: This is specified in bracket in terms of an absolute frequency(s) or frequency offset from the assigned channel frequency.

I_{oac}	the power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of the adjacent frequency channel as measured at the UE antenna connector
I_{oc}	the 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}	the total transmit power spectral density (integrated in a bandwidth of (1 + α) times the chip rate and normalized to the chip rate) of the downlink signal at the BS antenna connector
$\hat{I}_{or}$	the received power spectral density of the downlink signal as measured at the UE antenna connector
I_{ouw}	mean power (modulated)
Q_{out}	quality level threshold

3.3 Abbreviations

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

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BER	Bit Error Ratio
BS	Base Station
CDMA	Code Division Multiple Access
CRC	Cyclic Redundancy Check
CW	Continuous Wave (unmodulated signal)
DCH	Dedicated CHannel
DL	Down Link (forward link)
DPCH	Dedicated Physical CHannel
EMC	Electro-Magnetic Compatibility
ERM	Electro-Magnetic Compatibility and Radio Spectrum Matters
EUT	Equipment Under Test
E-UTRA	Evolved Universal Terrestrial Radio Access
FDD	Frequency Division Duplexing
IMB	Integrated Mobile Broadcast
MBMS	Multimedia Broadcast and Multicast Service
MBSFN	MBMS over a Single Frequency Network
MSG	Mobile Standards Group
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
RRC	Root-Raised Cosine
SS	System Simulator
TDD	Time Division Duplexing
TFCI	Transport Format Combination Indicator
TFES	Task Force for European Standards for IMT
TH	Temperature High
TL	Temperature Low
TS	Time Slot
TTE	Telecommunications Terminal Equipment
TX	Transmitter
UARFCN	UTRA Absolute Radio Frequency Channel Number
UE	User Equipment
UL	Uplink (reverse link)
UTRA	Universal Terrestrial Radio Access
VH	Voltage High
VL	Voltage Low

4 Technical requirements specifications

4.1 Environmental profile

The technical requirements of the present document apply under the environmental profile for operation of the user equipment, which shall be declared by the supplier. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the declared operational environmental profile.

For details on how a supplier declares the environmental profile see annex B.

4.2 Conformance requirements

The requirements in the present document are based on the assumption that the operating band, band (a) and (d), are shared between systems of the IMT family or systems having compatible characteristics.

4.2.1 Introduction

To meet the essential requirement under article 3.2 of the R&TTE Directive for IMT User Equipment eight essential parameters in addition to those in EN 301 908-1 [8] have been identified. Table 4.2.1-1 provides a cross reference between these eight essential parameters and the corresponding eleven technical requirements within the scope of the present document.

To fulfil an essential parameter the compliance with all the corresponding technical requirements in table 4.2.1-1 must be verified. For the case of an MBSFN-only UE the technical requirements in clauses 4.2.6, 4.2.7, 4.2.8, 4.2.9 and 4.2.10 shall apply.

Table 4.2.1-1: Cross reference

Essential parameter	Corresponding technical requirement	
Spectrum emissions mask	4.2.2	Spectrum emissions mask
	4.2.12	Transmitter adjacent channel leakage power ratio
Conducted spurious emissions in active mode	4.2.3	Transmitter spurious emissions
Accuracy of maximum output power	4.2.4	Maximum output power
Prevention of harmful interference through control of power	4.2.5	Minimum transmit output power
Conducted spurious emissions in idle mode	4.2.6	Receiver spurious emissions
Impact of interference on receiver performance	4.2.7	Receiver blocking characteristics
	4.2.8	Receiver intermodulation characteristics
	4.2.9	Receiver spurious response
Receiver adjacent channel selectivity	4.2.10	Receiver adjacent channel selectivity
Control and Monitoring functions	4.2.11	Out-of-synchronization handling of output power

The technical requirements in the present document apply for UEs supporting UTRA TDD in declared operating bands.

4.2.2 Spectrum emission mask

4.2.2.1 Definition

The spectrum emission mask establishes out-of-band emission power limits of the user equipment transmitter. Out-of-band emissions are emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions.

4.2.2.1.1 3,84 Mcps TDD option

The spectrum emission mask of the UE applies to frequency offsets between 2,5 MHz and 12,5 MHz on both sides of the UE centre carrier frequency. The out-of-channel emission is specified as a power level relative to the RRC-filtered mean power of the UE carrier.

4.2.2.1.2 1,28 Mcps TDD option

The spectrum emission mask of the UE applies to frequency offsets between 0,8 MHz and 4 MHz on both sides of the UE centre carrier frequency. The out-of-channel emission is specified as a power level relative to the RRC-filtered mean power of the UE carrier.

4.2.2.1.3 7,68 Mcps TDD option

The spectrum emission mask of the UE applies to frequency offsets between 5 MHz and 25 MHz on both sides of the UE centre carrier frequency. The out-of-channel emission is specified as a power level relative to the RRC-filtered mean power of the UE carrier.

4.2.2.2 Limits

4.2.2.2.1 3,84 Mcps TDD option

The power of any UE emission shall not exceed the levels specified in table 4.2.2.2.1-1.

Table 4.2.2.2.1-1: Spectrum emission mask requirement (3,84 Mcps TDD option)

Frequency offset Δf	Minimum requirement	Measurement bandwidth
2,5 MHz to 3,5 MHz	$\left\{-33,5-15\times\left(\frac{\Delta f}{MHz}-2,5\right)\right\}$dBc	30 kHz
3,5 MHz to 7,5 MHz	$\left\{-33,5-1\times\left(\frac{\Delta f}{MHz}-3,5\right)\right\}$dBc	1 MHz
7,5 MHz to 8,5 MHz	$\left\{-37,5-10\times\left(\frac{\Delta f}{MHz}-7,5\right)\right\}$dBc	1 MHz
8,5 MHz to 12,5 MHz	-47,5 dBc	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz; the last is at Δf equals to 3,485 MHz. NOTE 3: The first measurement position with a 1 MHz filter is at Δf equals to 4 MHz; the last is at Δf equals to 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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. NOTE 4: The lower limit shall be -48,5 dBm/3,84 MHz or the minimum requirement presented in this table whichever is the higher.		

4.2.2.2.2 1,28 Mcps TDD option

The power of any UE emission shall not exceed the levels specified in table 4.2.2.2.2-1.

Table 4.2.2.2.2-1: Spectrum emission mask requirement (1,28 Mcps TDD option)

Frequency offset Δf	Minimum requirement	Measurement bandwidth
0,8 MHz	-33,5 dBc	30 kHz
0,8 MHz to 1,8 MHz	$\left\{-33,5-14\times\left(\frac{\Delta f}{MHz}-0,8\right)\right\}$dBc	30 kHz
1,8 MHz to 2,4 MHz	$\left\{-47,5-25\times\left(\frac{\Delta f}{MHz}-1,8\right)\right\}$dBc	30 kHz
2,4 MHz to 4,0 MHz	-47,5 dBc	1 MHz
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first measurement position with a 30 kHz filter is at Δf equals to 0,815 MHz; the last is at Δf equals to 2,385 MHz. NOTE 3: The first measurement position with a 1 MHz filter is at Δf equals to 2,9 MHz; the last is at Δf equals to 3,5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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. NOTE 4: The lower limit shall be -53,5 dBm/1,28 MHz or the minimum requirement presented in this table whichever is the higher.		

4.2.2.2.3 7,68 Mcps TDD option

The power of any UE emission shall not exceed the levels specified in table 4.2.2.2.3-1.

Table 4.2.2.2.3-1: Spectrum emission mask requirement (7,68 Mcps TDD option)

Δf in MHz	Minimum requirement	Measurement bandwidth
5,0 to 5,75	$\left\{-36{,}5-10{,}67\cdot\left(\frac{\Delta f}{MHz}-5{,}0\right)\right\}dBc$	30 kHz
5,75 to 7,0	$\left\{-44{,}5-5{,}6\cdot\left(\frac{\Delta f}{MHz}-5{,}75\right)\right\}dBc$	30 kHz
7,0 to 15	$\left\{-36{,}5-0{,}5\cdot\left(\frac{\Delta f}{MHz}-7{,}0\right)\right\}dBc$	1 MHz
15,0 to 17,0	$\left\{-40{,}5-5{,}0\cdot\left(\frac{\Delta f}{MHz}-15{,}0\right)\right\}dBc$	1 MHz
17,0 to 25,0	-51,5 dBc	1 MHz

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 5,015 MHz and 6,985 MHz.
NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 7,5 MHz and 24,5 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from 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.
NOTE 4: The lower limit shall be -45,5 dBm/7,68 MHz or the minimum requirement presented in this table whichever is the higher.

4.2.2.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

4.2.3 Transmitter spurious emissions

4.2.3.1 Definition

Transmitter 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.

4.2.3.2 Limits

4.2.3.2.1 3,84 Mcps TDD option

The following requirements are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

Table 4.2.3.2.1-1: General spurious emissions requirements (3,84 Mcps TDD option)

Frequency band	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

Table 4.2.3.2.1-2: Additional spurious emissions requirements (3,84 Mcps TDD option)

Frequency band	Measurement bandwidth	Minimum requirement
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm
1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm
2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-37 dBm
NOTE: The measurements shall be 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 4.2.3.2.1-1 are permitted for each UARFCN used in the measurement.		

4.2.3.2.2 1,28 Mcps TDD option

The following requirements are only applicable for frequencies, which are greater than 4 MHz away from the UE centre carrier frequency.

Table 4.2.3.2.2-1: General spurious emissions requirements (1,28 Mcps TDD option)

Frequency band	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

Table 4.2.3.2.2-2: Additional spurious emissions requirements (1,28 Mcps TDD option)

Frequency band	Measurement bandwidth	Minimum requirement
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm
1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm
2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-37 dBm
NOTE: The measurements shall be 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 4.2.3.2.2-1 are permitted for each UARFCN used in the measurement.		

4.2.3.2.3 7,68 Mcps TDD option

The following requirements are only applicable for frequencies, which are greater than 25 MHz away from the UE centre carrier frequency.

Table 4.2.3.2.3-1: General spurious emissions requirements (7,68 Mcps TDD option)

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

Table 4.2.3.2.3-2: Additional spurious emissions requirements (7,68 Mcps TDD option)

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
925 MHz ≤ f ≤ 935 MHz	100 kHz	-67 dBm
935 MHz < f ≤ 960 MHz	100 kHz	-79 dBm
1 805 MHz ≤ f ≤ 1 880 MHz	100 kHz	-71 dBm
2 620 MHz ≤ f ≤ 2 690 MHz	3,84 MHz	-37 dBm
NOTE: 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 4.2.3.2.3-1 are permitted for each UARFCN used in the measurement.		

4.2.3.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

4.2.4 Maximum output power

4.2.4.1 Definition

The following power classes define the nominal maximum output power. Maximum output power and nominal maximum output power are defined in clause 3.1.

4.2.4.2 Limits

The error of the UE maximum output power shall not exceed the tolerance shown in table 4.2.4.2-1 for single code.

Table 4.2.4.2-1: Power classes

Power Class	Nominal maximum output power	Tolerance
2	+24 dBm	+1,7 dB to -3,7 dB
3	+21 dBm	+2,7 dB to -2,7 dB

4.2.4.3 Conformance

Conformance tests described in clause 5.3.3 shall be carried out.

4.2.5 Minimum transmit output power

4.2.5.1 Definition

The minimum controlled output power of the UE is when the power is set to a minimum value. The minimum transmit output power is defined as the mean power in one time slot excluding the guard period.

4.2.5.2 Limits

4.2.5.2.1 3,84 Mcps TDD option

The minimum transmit output power shall be lower or equal to -43 dBm.

4.2.5.2.2 1,28 Mcps TDD option

The minimum transmit output power shall be lower or equal to -48 dBm.

4.2.5.2.3 7,68 Mcps TDD option

The minimum transmit output power shall be lower or equal than -41 dBm.

4.2.5.3 Conformance

Conformance tests described in clause 5.3.4 shall be carried out.

4.2.6 Receiver spurious emissions

4.2.6.1 Definition

The spurious emissions power is the power of emissions generated or amplified in a receiver that appears at the UE antenna connector.

4.2.6.2 Limits

4.2.6.2.1 3,84 Mcps TDD option

The power of any spurious emissions shall not exceed the limits given in table 4.2.6.2.1-1.

Table 4.2.6.2.1-1: Receiver spurious emission requirements (3,84 Mcps TDD option)

Band	Maximum level	Measurement bandwidth	Note
30 MHz to 1 GHz	-57 dBm	100 kHz	
1 GHz to 1,9 GHz and 1,92 GHz to 2,01 GHz and 2,025 GHz to 2,11 GHz and 2,17 GHz to 2,57 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the UE
1,9 GHz to 1,92 GHz and 2,01 GHz to 2,025 GHz and 2,11 GHz to 2,170 GHz and 2,57 GHz to 2,69 GHz	-60 dBm	3,84 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the UE
2,69 GHz to 12,75 GHz	-47 dBm	1 MHz	

4.2.6.2.2 1,28 Mcps TDD option

The power of any spurious emissions shall not exceed the limits given in table 4.2.6.2.2-1.

Table 4.2.6.2.2-1: Receiver spurious emission requirements (1,28 Mcps TDD option)

Band	Maximum level	Measurement Bandwidth	Note
30 MHz to 1 GHz	-57 dBm	100 kHz	
1 GHz to 1,9 GHz and 1,92 GHz to 2,01 GHz and 2,025 GHz to 2,11 GHz and 2,17 GHz to 2,57 GHz	-47 dBm	1 MHz	With the exception of frequencies between 4 MHz below the first carrier frequency and 4 MHz above the last carrier frequency used by the UE
1,9 GHz to 1,92 GHz and 2,01 GHz to 2,025 GHz and 2,11 GHz to 2,170 GHz and 2,57 GHz to 2,69 GHz	-64 dBm	1,28 MHz	With the exception of frequencies between 4 MHz below the first carrier frequency and 4 MHz above the last carrier frequency used by the UE
2,69 GHz to 12,75 GHz	-47 dBm	1 MHz	

4.2.6.2.3 7,68 Mcps TDD option

The power of any spurious emissions shall not exceed the limits given in table 4.2.6.2.3-1.

Table 4.2.6.2.3-1: Receiver spurious emission requirements (7,68 Mcps TDD option)

Band	Maximum level	Measurement Bandwidth	Note
30 MHz to 1 GHz	-57 dBm	100 kHz	
1 GHz to 1,9 GHz and 1,92 GHz to 2,01 GHz and 2,025 GHz to 2,11 GHz	-47 dBm	1 MHz	With the exception of frequencies between 25 MHz below the first carrier frequency and 25 MHz above the last carrier frequency used by the UE.
1,9 GHz to 1,92 GHz and 2,01 GHz to 2,025 GHz and 2,11 GHz to 2,170 GHz	-57 dBm	7,68 MHz	With the exception of frequencies between 25 MHz below the first carrier frequency and 25 MHz above the last carrier frequency used by the UE.
2,170 GHz to 12,75 GHz	-47 dBm	1 MHz	

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 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 occurs.

4.2.7.2 Limits

4.2.7.2.1 3,84 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in tables 4.2.7.2.1-1 and 4.2.7.2.1-2.

For table 4.2.7.2.1-2, up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size for the interference signal.

Table 4.2.7.2.1-1: In-band blocking (3,84 Mcps TDD option)

Parameter	Level		Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0 (see note)		dB
$\hat{I}_{or}$	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for $F_{uwoffset} \pm 10$ MHz)	-44 (for $F_{uwoffset} \pm 15$ MHz)	dBm
NOTE: Subtract 0,77 dB when using the IMB DL reference measurement channel as specified in clause A.2.9, TS 125 102 [2]. For IMB the term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.			

Table 4.2.7.2.1-2: Out-of-band blocking (3,84 Mcps TDD option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0 (see note 3)	0 (see note 3)	0 (see note 3)	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} (absolute frequency) for operation in band (a)	1 840 < f < 1 885 1 935 < f < 1 995 2 040 < f < 2 085	1 815 < f < 1 840 2 085 < f < 2 110	1 < f < 1 815 2 110 < f < 12 750	MHz
F_{uw} (absolute frequency) for operation in band (d)	2 510 < f < 2 555 2 635 < f < 2 680	2 485 < f < 2 510 2 680 < f < 2 705	1 < f < 2 485 2 705 < f < 12 750	MHz

NOTE 1: For operation in band (a), F_{uw} (absolute frequency) in bands, from 1 885 MHz < f < 1 900 MHz, 1 920 MHz < f < 1 935 MHz, 1 995 MHz < f < 2 010 MHz and 2 025 MHz < f < 2 040 MHz, the appropriate in-band blocking in table 4.2.7.2.1-1 or adjacent channel selectivity in table 4.2.10.2.1-1 shall be applied.

NOTE 2: For operation in band (d), F_{uw} (absolute frequency) in bands, from 2 555 MHz < f < 2 570 MHz and 2 620 MHz < f < 2 635 MHz, the appropriate in-band blocking in table 4.2.7.2.1-1 or adjacent channel selectivity in table 4.2.10.2.1-1 shall be applied.

NOTE 3: Subtract 0,77 dB when using the IMB DL reference measurement channel as specified in clause A.2.9, TS 125 102 [2]. For IMB the term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.

4.2.7.2.2 1,28 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in tables 4.2.7.2.2-1 and 4.2.7.2.2-2.

For table 4.2.7.2.2-2 up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size for the interference signal.

Table 4.2.7.2.2-1: In-band blocking (1,28 Mcps TDD option)

Parameter	Level		Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0		dB
$\hat{I}_{or}$	-105		dBm/1,28 MHz
I_{ouw} mean power (modulated)	-61 (for $F_{uwoffset} \pm 3,2$ MHz)	-49 (for $F_{uwoffset} \pm 4,8$ MHz)	dBm

Table 4.2.7.2.2-2: Out-of-band blocking (1,28 Mcps TDD option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-105	-105	-105	dBm/1,28 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} (absolute frequency) for operation in band (a)	1 840 < f < 1 895,2 1 924,8 < f < 2 005,2 2 029,8 < f < 2 085	1 815 < f < 1 840 2 085 < f < 2 110	1 < f < 1 815 2 110 < f < 12 750	MHz
F_{uw} (absolute frequency) for operation in band (d)	2 510 < f < 2 565,2 2 624,8 < f < 2 680	2 485 < f < 2 510 2 680 < f < 2 705	1 < f < 2 485 2 705 < f < 12 750	MHz

NOTE 1: For operation in band (a), F_{uw} (absolute frequency) in bands, from 1 895,2 MHz < f < 1 900 MHz, 1 920 MHz < f < 1 924,8 MHz, 2 005,2 MHz < f < 2 010 MHz and 2 025 MHz < f < 2 029,8 MHz, the appropriate in-band blocking in table 4.2.7.2.2-1 or adjacent channel selectivity in table 4.2.10.2.2-1 shall be applied.

NOTE 2: For operation in band (d), F_{uw} (absolute frequency) in bands, from 2 565,2 MHz < f < 2 570 MHz and 2 620 MHz < f < 2 624,8 MHz, the appropriate in-band blocking in table 4.2.7.2.2-1 or adjacent channel selectivity in table 4.2.10.2.2-1 shall be applied.

4.2.7.2.3 7,68 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in tables 4.2.7.2.3-1 and 4.2.7.2.3-2.

For table 4.2.7.2.3-2, up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size for the interference signal.

Table 4.2.7.2.3-1: In-band blocking (7,68 Mcps TDD option)

Parameter	Level		Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0		dB
$\hat{I}_{or}$	-102		dBm/7,68 MHz
I_{ouw} mean power (modulated)	-53 (for F_{uw} offset ± 20 MHz)	-41 (for F_{uw} offset ± 30 MHz)	dBm

Table 4.2.7.2.3-2: Out-of-band blocking (7,68 Mcps TDD option)

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	0	0	0	dB
$\hat{I}_{or}$	-102	-102	-102	dBm/7,68 MHz
I_{ouw} (CW)	-44	-30	-15	dBm
F_{uw} (absolute frequency) for operation in band (a)	1 840 < f < 1 870 1 950 < f < 1 980 2 055 < f < 2 085	1 815 < f < 1 840 2 085 < f < 2 110	1 < f < 1 815 2 110 < f < 12 750	MHz

NOTE 1: For operation in band (a), F_{uw} (absolute frequency) in bands, from 1 870 MHz < f < 1 900 MHz, 1 920 MHz < f < 1 950 MHz, 1 980 MHz < f < 2 010 MHz and 2 025 MHz < f < 2 055 MHz, the appropriate in-band blocking in table 4.2.7.2.3-1 or adjacent channel selectivity in table 4.2.10.2.3-1 shall be applied.

NOTE 2: For operation in band (d), F_{uw} (absolute frequency) in bands, from 2 540 MHz < f < 2 570 MHz and 2 620 MHz < f < 2 650 MHz, the appropriate in-band blocking in table 4.2.7.2.3-1 or adjacent channel selectivity in table 4.2.10.2.3-1 shall be applied.

4.2.7.3 Conformance

Conformance tests described in clause 5.3.6 shall be carried out.

4.2.8 Receiver intermodulation characteristics

4.2.8.1 Definition and applicability

Third and higher order mixing of 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 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.

4.2.8.2 Limits

4.2.8.2.1 3,84 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2.1-1.

Table 4.2.8.2.1-1: Receiver intermodulation characteristics (3,84 Mcps TDD option)

Parameter	Value	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0 (see note)	dB
$\hat{I}_{or}$	-102	dBm/3,84 MHz
I_{ouw1}(CW)	-46	dBm
I_{ouw2}(modulated)	-46	dBm/3,84 MHz
F_{uw1}(CW)	±10	MHz
F_{uw2}(modulated)	±20	MHz
NOTE: Subtract 0,77 dB when using the IMB DL reference measurement channel as specified in clause A.2.9, TS 125 102 [2]. For IMB the term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

4.2.8.2.2 1,28 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2.2-1.

Table 4.2.8.2.2-1: Receiver intermodulation characteristics (1,28 Mcps TDD option)

Parameter	Value	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/1,28 MHz
I_{ouw1}(CW)	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm
F_{uw1}(CW)	±3,2	MHz
F_{uw2}(modulated)	±6,4	MHz

4.2.8.2.3 7,68 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2.3-1.

Table 4.2.8.2.3-1: Receiver intermodulation characteristics (7,68 Mcps TDD option)

Parameter	Value	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-102	dBm/7,68 MHz
I_{ouw1}(CW)	-46	dBm
I_{ouw2}(modulated)	-46	dBm/7,68 MHz
F_{uw1}(CW)	±20	MHz
F_{uw2}(modulated)	±40	MHz

4.2.8.3 Conformance

Conformance tests described in clause 5.3.7 shall be carried out.

4.2.9 Receiver spurious response

4.2.9.1 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 blocking limit is not met.

4.2.9.2 Limits

4.2.9.2.1 3,84 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2.1-1.

Table 4.2.9.2.1-1: Spurious response (3,84 Mcps TDD option)

Parameter	Value	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0 (see note)	dB
$\hat{I}_{or}$	-102	dBm/3,84 MHz
I_{ouw} (CW)	-44	dBm
NOTE: Subtract 0,77 dB when using the IMB DL reference measurement channel as specified in clause A.2.9, TS 125 102 [2]. For IMB the term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

4.2.9.2.2 1,28 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2.2-1.

Table 4.2.9.2.2-1: Spurious response (1,28 Mcps TDD option)

Parameter	Value	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-105	dBm/1,28 MHz
I_{ouw} (CW)	-44	dBm

4.2.9.2.3 7,68 Mcps TDD option

The BER shall not exceed 0,001 for the parameters specified in table 4.2.9.2.3-1.

Table 4.2.9.2.3-1: Spurious response (7,68 Mcps TDD option)

Parameter	Value	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-102	dBm/7,68 MHz
I_{ouw} (CW)	-44	dBm

4.2.9.3 Conformance

Conformance tests described in clause 5.3.8 shall be carried out.

4.2.10 Receiver adjacent channel selectivity

4.2.10.1 Definition

Adjacent Channel Selectivity (ACS) is a measure of the receiver ability to receive a wanted 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 receiver filter attenuation on the adjacent channel(s).

4.2.10.2 Limits

4.2.10.2.1 3,84 Mcps TDD option

For UE of power classes 2 and 3 and parameters specified in table 4.2.10.2.1-1 the BER shall not exceed 0,001. This test condition is equivalent to the ACS value 33 dB.

Table 4.2.10.2.1-1: Test parameters for Adjacent Channel Selectivity (3,84 Mcps TDD option)

Parameter	Level	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0 (see note)	dB
$\hat{I}_{or}$	-91	dBm/3,84 MHz
I_{oac} mean power (modulated)	-52	dBm
F_{uw} offset	+5 or -5	MHz
NOTE: Subtract 0,77 dB when using the IMB DL reference measurement channel as specified in clause A.2.9, TS 125 102 [2]. For IMB the term ΣDPCH_Ec refers to the sum of the energy of the physical channels comprising the IMB DL reference measurement channel.		

4.2.10.2.2 1,28 Mcps TDD option

For UE of power classes 2 and 3 and parameters specified in table 4.2.10.2.2-1 the BER shall not exceed 0,001. This test condition is equivalent to the ACS value 33 dB.

Table 4.2.10.2.2-1: Test parameters for Adjacent Channel Selectivity (1,28 Mcps TDD option)

Parameter	Level	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-91	dBm/1,28 MHz
I_{oac} mean power (modulated)	-52	dBm
F_{uw} offset	+1,6 or -1,6	MHz

4.2.10.2.3 7,68 Mcps TDD option

For UE of power classes 2 and 3 and parameters specified in table 4.2.10.2.3-1 the BER shall not exceed 0,001. This test condition is equivalent to the ACS value 33 dB.

Table 4.2.10.2.3-1: Test parameters for Adjacent Channel Selectivity (7,68 Mcps TDD option)

Parameter	Level	Unit
$\frac{\Sigma \text{ DPCH\_Ec}}{I_{or}}$	0	dB
$\hat{I}_{or}$	-91	dBm/7,68 MHz
I_{oac} mean power (modulated)	-52	dBm
F_{uw} offset	+10 or -10	MHz

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 DPCH quality in order to detect a loss of the signal on layer 1. The threshold Q_{out} specifies at what DPCH quality levels the UE shall shut its power off. The threshold is defined by the condition under which the UE shall shut its transmitter off as stated in this clause.

The OFF power is defined as the RRC filtered mean power measured over one chip when the transmitter is off.

4.2.11.2 Limit

4.2.11.2.1 3,84 Mcps TDD option

The handover triggering level shall be set very high to ensure that the beacon channel power never exceeds the value of 10 dB above it. Therefore the averaging time for signal quality will always be 160 ms.

When the UE estimates the DPCH 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 signal level depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2.1-1 a signal with the quality at the level Q_{out} can be generated by a $\Sigma DPCH\_Ec/I_{or}$ ratio of -13 dB. In this test, the DL reference measurement channel 12,2 kbit/s specified in TS 125 102 [2], where the CRC bits are replaced by data bits, and with static propagation conditions is used. For the parameters in table 4.2.11.2.1-1, figure 4.2.11.2.1-1 shows a scenario where the $\frac{\Sigma\ DPCH\_Ec}{I_{or}}$ ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level where the UE shall shut its power off.

Table 4.2.11.2.1-1: DCH parameters for test of out-of-synchronization handling (3,84 Mcps TDD option)

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	1,1
I_{oc}	dBm/3,84 MHz	-60
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	See figure 4.2.11.2.1-1
Information Data Rate	kbit/s	13
TFCI	-	On

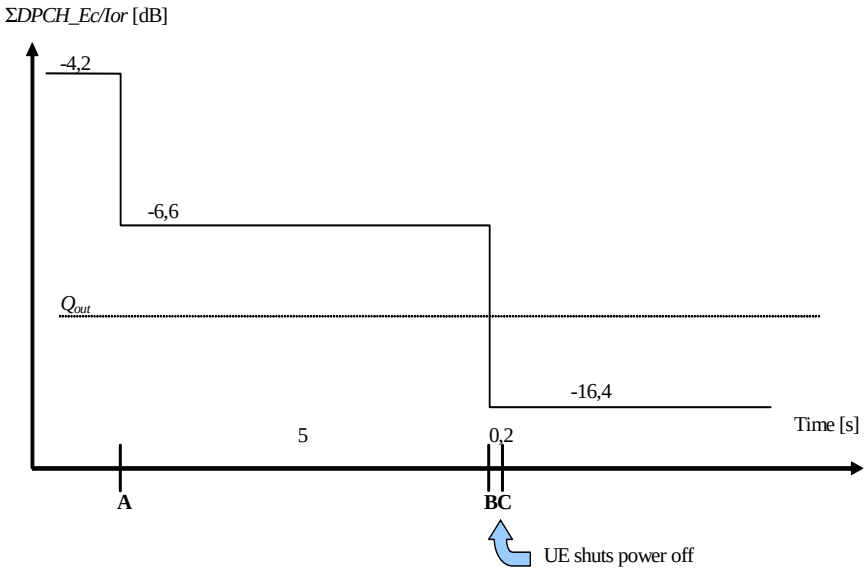

Figure 4.2.11.2.1-1: Test case for out-of-synchronization handling in the UE (3,84 Mcps TDD option)

The UE transmitter is considered to be off if the transmitter power is less than -63,5 dBm.

4.2.11.2.2 1,28 Mcps TDD option

The handover triggering level shall be set very high to ensure that the beacon channel power never exceeds the value of 10 dB above it. Therefore the averaging time for signal quality will always be 160 ms.

When the UE estimates the DPCH 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 signal level depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2.2-1 a signal with the quality at the level Q_{out} can be generated by a $\Sigma DPCH\_Ec/I_{or}$ ratio of -15 dB. In this test, the DL reference measurement channel 12,2 kbit/s specified in TS 125 102 [2], where the CRC bits are replaced by data bits, and with static propagation conditions is used. For the parameters in table 4.2.11.2.2-1, figure 4.2.11.2.2-1 shows a scenario where the $\frac{\Sigma\ DPCH\_Ec}{I_{or}}$ ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level where the UE shall shut its power off.

Table 4.2.11.2.2-1: DCH parameters for test of out-of-synchronization handling (1,28 Mcps TDD option)

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	-1
I_{oc}	dBm/1,28 MHz	-60
$\frac{\Sigma\ DPCH\_Ec}{I_{or}}$	dB	See figure 4.2.11.2.2-1
Information Data Rate	kbit/s	12,2
TFCI	-	On

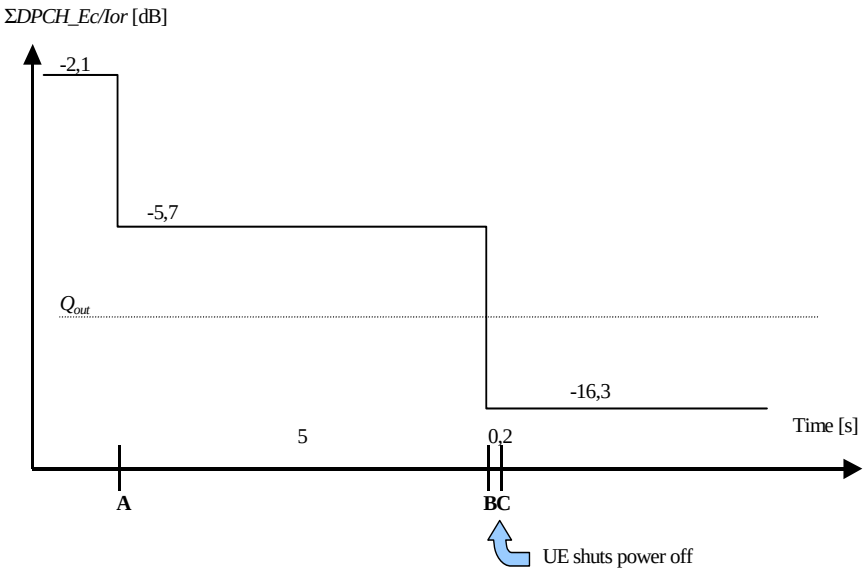

Figure 4.2.11.2.2-1: Test case for out-of-synchronization handling in the UE (1,28 Mcps TDD option)

The UE transmitter is considered to be off if the transmitter power is less than -63,5 dBm.

4.2.11.2.3 7,68 Mcps TDD option

The handover triggering level shall be set very high to ensure that the beacon channel power never exceeds the value of 10 dB above it. Therefore the averaging time for signal quality will always be 160 ms.

When the UE estimates the DPCH 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 signal level depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2.3-1 a signal with the quality at the level Q_{out} can be generated by a $\Sigma DPCH\_Ec/I_{or}$ ratio of -16 dB. In this test, the DL reference measurement channel 12,2 kbit/s specified in TS 125 102 [2], where the CRC bits are replaced by data bits, and with static propagation conditions is used. For the parameters in table 4.2.11.2.3-1, figure 4.2.11.2.3-1 shows a scenario where the $\frac{\Sigma DPCH\_Ec}{I_{or}}$ ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level where the UE shall shut its power off.

Table 4.2.11.2.3-1: DCH parameters for test of out-of-synchronization handling (7,68 Mcps TDD option)

Parameter	Unit	Value
$\hat{I}_{or}/I_{oc}$	dB	1,1
I_{oc}	dBm/7,68 MHz	-60
$\frac{\Sigma DPCH\_Ec}{I_{or}}$	dB	See figure 4.2.11.2.3-1
Information Data Rate	kbit/s	13
TFCI	-	On

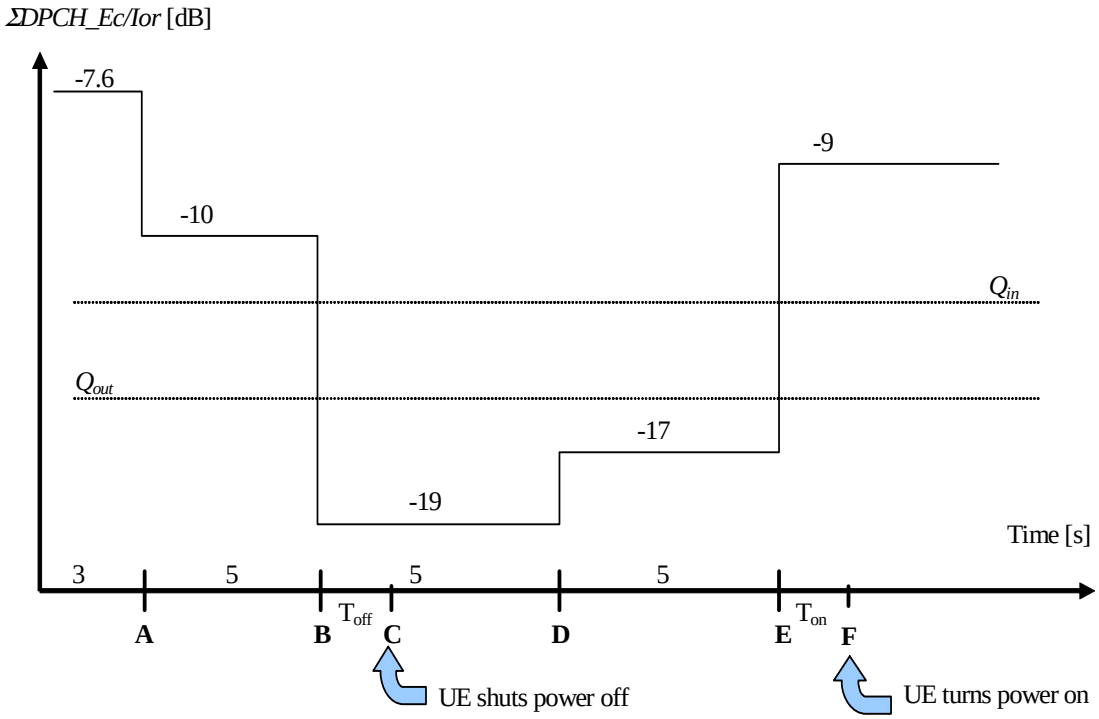

Figure 4.2.11.2.3-1: Test case for out-of-synchronization handling in the UE (7,68 Mcps TDD option)

The UE transmitter is considered to be off if the transmitter power is less than -63,5 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

4.2.12.1 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.

4.2.12.2 Limits

4.2.12.2.1 3,84 Mcps TDD option

If the adjacent channel RRC filtered mean power is greater than -50 dBm then the ACLR shall be equal to or greater than the limits specified in table 4.2.12.2.1-1.

Table 4.2.12.2.1-1: UE ACLR limits (3,84 Mcps TDD option)

adjacent channel	ACLR limit
UE channel ±5 MHz	32,2 dB
UE channel ±10 MHz	42,2 dB

4.2.12.2.2 1,28 Mcps TDD option

If the adjacent channel RRC filtered mean power is greater than -55 dBm then the ACLR shall be equal to or greater than the limits specified in table 4.2.12.2.2-1.

Table 4.2.12.2.2-1: UE ACLR limits (1,28 Mcps TDD option)

adjacent channel	ACLR limit
UE channel ±1,6 MHz	32,2 dB
UE channel ±3,2 MHz	42,2 dB

4.2.12.2.3 7,68 Mcps TDD option

If the adjacent channel RRC filtered mean power is greater than -50 dBm then the ACLR shall be equal to or greater than the limits specified in table 4.2.12.2.3-1.

Table 4.2.12.2.3-1: UE ACLR limits (7,68 Mcps TDD option)

adjacent channel	ACLR limit
UE channel ±10 MHz	32,2 dB
UE channel ±20 MHz	42,2 dB

4.2.12.3 Conformance

Conformance tests described in clause 5.3.11 shall be carried out.

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 required 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 required 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 condition except where otherwise stated. For guidance on the use of other test conditions to be used in order to show compliance reference can be made to TS 134 122 [5].

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 shall be used to decide whether the user equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be documented in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in table 5.2-1.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [i.4] and shall correspond to an expansion factor (coverage factor) k = 1,96 (which provides a confidence level of 95 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). For guidance on other measurement conditions reference can be made to the annexes of TS 134 122 [5].

Table 5.2-1 is based on this expansion factor.

Table 5.2-1: Maximum measurement uncertainty of the test system

Parameter	Conditions	Uncertainty
5.3.1 Spectrum emission mask		±1,5 dB
5.3.2 Transmitter spurious emissions	For UE and coexistence bands: for results < -60 dBm for results > -60 dBm	 ±3,0 dB ±2,0 dB
	Outside above: f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz 4 GHz < f	 ±1,5 dB ±2,0 dB ±4,0 dB
5.3.3 Maximum output power	–	±0,7 dB
5.3.4 Minimum transmit output power	–	±1,0 dB
5.3.5 Receiver spurious emissions	UE receive band	±3,0 dB
	Outside UE receive band f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz 4 GHz < f	 ±2,0 dB ±2,0 dB ±4,0 dB
5.3.6 Receiver blocking characteristics (3,84 Mcps TDD option)	Foffset < 15 MHz	±1,4 dB
	Foffset ≥ 15 MHz and f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz 4 GHz < f	 ±1,0 dB ±1,7 dB ±3,1 dB

Parameter	Conditions	Uncertainty
5.3.6 Receiver blocking characteristics (1,28 Mpcs TDD option)	Foffset < 4,8 MHz	±1,4 dB
	Foffset ≥ 4,8 MHz and f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz 4 GHz < f	±1,0 dB ±1,7 dB ±3,1 dB
5.3.6 Receiver blocking characteristics (7,68 Mpcs TDD option)	Foffset < 30 MHz	±1,4 dB
	Foffset ≥ 30 MHz and f ≤ 2,2 GHz 2,2 GHz < f ≤ 4 GHz 4 GHz < f	±1,0 dB ±1,7 dB ±3,1 dB
5.3.7 Receiver intermodulation characteristics	-	±1,3 dB with Formula = $\sqrt{(2 \cdot CW\_level\_error)^2 + (\mathrm{mod}\_level\_error)^2 + (wanted\_signal\_level\_error)^2}$ (Using CW interferer ±0,5 dB, modulated interferer ±0,5 dB, wanted signal ±0,7 dB)
5.3.8 Receiver spurious response	f ≤ 2,2 GHz	±1,0 dB
	2,2 GHz < f ≤ 4 GHz	±1,7 dB
	4 GHz < f	±3,1 dB
5.3.9 Receiver Adjacent Channel Selectivity (ACS)	-	±1,1 dB
5.3.10 Out-of-synchronization handling of output power	$\frac{\Sigma DPCH\_E_c}{I_{or}}$	±0,4 dB
	Measurement of transmit OFF power	±1,5 dB
5.3.11 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 follows:

- any additional uncertainty in the test system over and above that specified in table 5.2-1 is used to tighten the test requirements thus 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

This clause describes the test suites for UTRA TDD.

5.3.1 Spectrum emission mask

5.3.1.1 Method of test

5.3.1.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are low range and high range as defined in TS 134 108 [3].

1) Connect the System Simulator (SS) to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the generic call setup procedure using parameters as specified in table 5.3.1.1.1-1.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

Table 5.3.1.1.1-1: Common transmitter test parameters

Parameter	Value/description
UL Reference measurement channel	12,2 kbit/s (see TS 125 102 [2])
Uplink power control	Set the SS level and signalling parameter values such that MS under test will transmit maximum power
Data content	real life (sufficiently irregular pattern)

5.3.1.1.2 Procedure

1) Measure the power of the transmitted signal using a measurement filter bandwidth according to table 4.2.2.2.1-1 for the 3,84 Mcps TDD option, table 4.2.2.2.2-1 for the 1,28 Mcps TDD option and table 4.2.2.2.3-1 for the 7,68 Mcps TDD option respectively. The characteristics 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 4.2.2.2.1-1 for the 3,84 Mcps TDD option, table 4.2.2.2.2-1 for the 1,28 Mcps TDD option and table 4.2.2.2.3-1 for the 7,68 Mcps TDD option respectively. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.

2) Measure the RRC filtered mean power centred on the assigned channel frequency according to annex B in TS 134 122 [5].

3) Display the results of step 1 in dBc with respect to 2).

5.3.1.2 Test requirements

The result of the measurement according to clause 5.3.1.1.2 step 3) shall fulfil the test requirements of table 4.2.2.2.1-1 for the 3,84 Mcps TDD option, table 4.2.2.2.2-1 for the 1,28 Mcps TDD option and table 4.2.2.2.3-1 for the 7,68 Mcps TDD option respectively.

5.3.2 Transmitter spurious emissions

5.3.2.1 Method of test

5.3.2.1.1 Initial conditions

Test environment: normal (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in TS 134 108 [3].

1) Connect the SS to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the generic call setup procedure using parameters as specified in table 5.3.1.1.1-1.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.2.1.2 Procedure

Measure the power of the spurious emissions applying measurement filters bandwidths as specified in the relevant tables 4.2.3.2.1-1 and 4.2.3.2.1-2 for the 3,84 Mcps TDD option, tables 4.2.3.2.2-1 and 4.2.3.2.2-2 for the 1,28 Mcps TDD option and tables 4.2.3.2.3-1 and 4.2.3.2.3-2 for the 7,68 Mcps TDD option respectively. The characteristics of the filters shall be approximately Gaussian (typical spectrum analyser filters). The centre frequency of the filter shall be swept over the frequency bands as given in the tables. The sweep time shall be sufficiently low to capture the active time slots.

5.3.2.2 Test requirements

The spurious emissions measured according to clause 5.3.2.1.2 shall not exceed the limits specified in the relevant tables 4.2.3.2.1-1 and 4.2.3.2.1-2 for the 3,84 Mcps TDD option, tables 4.2.3.2.2-1 and 4.2.3.2.2-2 for the 1,28 Mcps TDD option and tables 4.2.3.2.3-1 and 4.2.3.2.3-2 for the 7,68 Mcps TDD option respectively.

5.3.3 Maximum output power

5.3.3.1 Method of test

5.3.3.1.1 Initial conditions

Test environment: normal and extreme (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in TS 134 108 [3].

1) Connect the System Simulator (SS) to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the Generic call setup procedure using parameters as specified in table 5.3.3.1.1-1.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

Table 5.3.3.1.1-1: Test parameters for maximum output power single code

Parameter	Value/description
UL Reference measurement channel	Single code 12,2 kbit/s (see TS 125 102 [2])
Uplink Power Control	SS level and signalling values such that UE will transmit maximum power
Data content	real life (sufficiently irregular)

5.3.3.1.2 Procedure

1) Measure the mean power of the UE output signal.

2) Run step 1 for RF channels Low/Mid/High.

5.3.3.2 Test requirements

The output power error, measured in step 1) of clause 5.3.3.1.2, shall not exceed the prescribed tolerance in table 4.2.4.2-1.

5.3.4 Minimum transmit output power

5.3.4.1 Method of test

5.3.4.1.1 Initial conditions

Test environment: normal and extreme (see annex B).

The frequency to be tested is mid range as defined in TS 134 108 [3].

1) Connect the System Simulator (SS) to the UE antenna connector (see TS 134 122 [5]).

2) A call is set up according to the Generic call setup procedure using parameters as specified in table 5.3.4.1.1-1.

Table 5.3.4.1.1-1: Common TX test parameters

Parameter	Value/description
UL Reference measurement channel	12,2 kbit/s (see TS 125 102 [2])
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	Real life (sufficiently irregular)

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.4.1.2 Procedure

1) Configure the UE transmitter to enable power control steps of size 1 dB.

2) Set and send Down power control commands to the UE. The sequence shall be sufficiently long so that the UE output signal reached its minimum power.

3) Measure the mean power of the UE output signal according to annex B of TS 134 122 [5].

4) Configure the UE transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat steps 2) and 3).

5) Run steps 2) to 4) for RF channels Low, Mid and High.

5.3.4.2 Test requirements

For all measurements, the minimum transmit power derived in steps 3), 4) and 5) of 5.3.4.1.2 shall be below the limit in clause 4.2.5.2.1 for the 3,84 Mcps TDD option, clause 4.2.5.2.2 for the 1,28 Mcps TDD option and clause 4.2.5.2.3 for the 7,68 Mcps TDD option respectively.

5.3.5 Receiver spurious emissions

5.3.5.1 Method of test

5.3.5.1.1 Initial conditions

Test environment: normal (see annex B).

The frequency to be tested is mid range as defined in TS 134 108 [3].

1) Connect the measurement equipment to the UE antenna connector (see TS 134 122 [5]).

2) Set up RF parameters according to table 5.3.5.1.1-1 for the 3,84 Mcps TDD option, table 5.3.5.1.1-2 for the 1,28 Mcps TDD option and table 5.3.5.1.1-3 for the 7,68 Mcps TDD option respectively.

Table 5.3.5.1.1-1: RF parameters for receiver spurious emissions test (3,84 Mcps TDD Option)

Parameter	Unit	Level
PCCPCH_Ec/I_{or}	dB	-3
SCH_Ec/I_{or}	dB	-9
$\hat{I}_{or}/I_{oc}$	dB	9
PCCPCH RSCP	dBm	-64

Table 5.3.5.1.1-2: RF parameters for receiver spurious emissions test (1,28 Mcps TDD Option)

Parameter	Unit	Level
PCCPCH_Ec/I_{or}	dB	-3
DwPCH_Ec/I_{or}	dB	0
$\hat{I}_{or}/I_{oc}$	dB	9
PCCPCH RSCP	dBm	-64

Table 5.3.5.1.1-3: RF parameters for receiver spurious emissions test (7,68Mcps TDD Option)

Parameter	Unit	Level
PCCPCH_Ec/I_{or}	dB	-3
SCH_Ec/I_{or}	dB	-9
$\hat{I}_{or}/I_{oc}$	dB	9
PCCPCH RSCP	dBm	-64

3) A call is set up according to the setup procedure specified in TS 134 108 [3] with the following exceptions for information elements in System Information Block type3.

Table 5.3.5.1.1-4: Call setup exceptions for information elements in System Information Block type3

Information Element	Value/remark
Cell selection and re-selection info	
CHOICE mode	TDD
Sintrasearch	0 dB
Sintersearch	0 dB
RAT List	This parameter is configurable
Ssearch,RAT	0 dB
Maximum allowed UL TX power	Power level where Pcompensation=0

NOTE 1: The setup procedure (3) sets the UE into CELL_FACH state. With this state and the SS level (2) it is ensured that UE continuously monitors the S-CCPCH and no cell reselections are performed. No transmission of the UE will interfere with the measurement.

NOTE 2: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.5.1.2 Procedure

Measure the power of spurious emissions by covering the frequency ranges of table 4.2.6.2.1-1 for the 3,84 Mcps TDD option, table 4.2.6.2.2-1 for the 1,28 Mcps TDD option and table 4.2.6.2.3-1 for the 7,68 Mcps TDD option respectively. Cover the UTRA/TDD and UTRA/FDD UE receive band in contiguous steps of 200 kHz. Cover the other frequency ranges in contiguous steps of 100 kHz. Apply the corresponding filters of table 4.2.6.2.1-1 for the 3,84 Mcps TDD option, table 4.2.6.2.2-1 for the 1,28 Mcps TDD option and table 4.2.6.2.3-1 for the 7,68 Mcps TDD option respectively. The step duration shall be sufficiently long to capture intermittent spurious emissions.

5.3.5.2 Test requirements

The power level of any spurious emissions shall not exceed the values of table 4.2.6.2.1-1 for the 3,84 Mcps TDD option, table 4.2.6.2.2-1 for the 1,28 Mcps TDD option and table 4.2.6.2.3-1 for the 7,68 Mcps TDD option respectively.

5.3.6 Receiver blocking characteristics

5.3.6.1 Method of test

5.3.6.1.1 Initial conditions

Test environment: normal (see annex B).

The frequency to be tested is mid range as defined in TS 134 108 [3].

1) Connect the System Simulator (SS) and the interfering signal generator to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.6.1.2 Procedure

1) Set the wanted signal frequency channel to mid range frequency using the parameters in table 4.2.7.2.1-1 for the 3,84 Mcps TDD option, table 4.2.7.2.2-1 for the 1,28 Mcps TDD option and table 4.2.7.2.3-1 for the 7,68 Mcps TDD option respectively.

2) Step the interfering signal generator frequency through the frequency range indicated in table 4.2.7.2.1-1 for the 3,84 Mcps TDD option, table 4.2.7.2.2-1 for the 1,28 Mcps TDD option and table 4.2.7.2.3-1 for the 7,68 Mcps TDD option respectively with a step size of 1 MHz. The interfering signal level shall be set according to table 4.2.7.2.1-1 for the 3,84 Mcps TDD option, table 4.2.7.2.2-1 for the 1,28 Mcps TDD option and table 4.2.7.2.3-1 for the 7,68 Mcps TDD option respectively.

3) The interference signal modulation shall be equivalent to a continuously running wideband CDMA signal with one code and a chip frequency of 3,84 Mcps for the 3,84 Mcps TDD option, 1,28 Mcps for the 1,28 Mcps TDD option and 7,68 Mcps for the 7,68 Mcps TDD option respectively and a roll off factor of 0,22.

4) Measure the BER of the wanted signal received from the UE at the SS for each step of the interfering frequency.

5) Set the wanted signal frequency channel to an arbitrary frequency chosen from the low, mid or high range using the parameters in table 4.2.7.2.1-2 for the 3,84 Mcps TDD option, table 4.2.7.2.2-2 for the 1,28 Mcps TDD option and table 4.2.7.2.3-1 for the 7,68 Mcps TDD option respectively.

6) Step the interfering signal generator through the frequency range indicated in table 4.2.7.2.1-2 for the 3,84 Mcps TDD option, table 4.2.7.2.2-2 for the 1,28 Mcps TDD option and table 4.2.7.2.3-2 for the 7,68 Mcps TDD option respectively with a step size of 1 MHz. The interfering signal level shall be set according to table 4.2.7.2.1-2 for the 3,84 Mcps TDD option, table 4.2.7.2.2-2 for the 1,28 Mcps TDD option and table 4.2.7.2.3-2 for the 7,68 Mcps TDD option respectively.

7) Apply an interfering CW signal.

8) Measure the BER of the wanted signal received from the UE at the SS for each interfering frequency.

9) Record the frequencies for which BER exceed the test requirements in clause 4.2.7.2.1 for the 3,84 Mcps TDD option, clause 4.2.7.2.2 for the 1,28 Mcps TDD option and clause 4.2.7.2.3 for the 7,68 Mcps TDD option. These frequencies are further processed in clause 5.3.8 "Receiver spurious response".

5.3.6.2 Test requirements

The measured BER from step 4) shall not exceed the limit stated in clause 4.2.7.2.1 for the 3,84 Mcps TDD option, clause 4.2.7.2.2 for the 1,28 Mcps TDD option and clause 4.2.7.2.3 for the 7,68 Mcps TDD option respectively.

The measured BER from step 8) shall not exceed the limit stated in clause 4.2.7.2.1 for the 3,84 Mcps TDD option, clause 4.2.7.2.2 for the 1,28 Mcps TDD option and clause 4.2.7.2.3 for the 7,68 Mcps TDD option respectively except for up to 24 different interfering frequencies. These frequencies are further processed in clause 5.3.8 "Receiver spurious response".

5.3.7 Receiver intermodulation characteristics

5.3.7.1 Method of test

5.3.7.1.1 Initial conditions

Test environment: normal (see annex B).

The frequency to be tested is mid range as defined in TS 134 108 [3].

1) Connect the System Simulator (SS) and the generators of unwanted signals to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.7.1.2 Procedure

1) Set the wanted and interfering signals as indicated in table 4.2.8.2.1-1 for the 3,84 Mcps TDD option, table 4.2.8.2.2-1 for the 1,28 Mcps TDD option and table 4.2.8.2.3-1 for the 7,68 Mcps TDD option respectively with positive offset with respect to the wanted signal.

2) Measure the BER of DCH that the UE at the System Simulator (SS) receives.

3) Set the interfering signals according to table 4.2.8.2.1-1 for the 3,84 Mcps TDD option, table 4.2.8.2.2-1 for the 1,28 Mcps TDD option and table 4.2.8.2.3-1 for the 7,68 Mcps TDD option respectively with negative offsets with respect to the wanted signal and repeat step 2).

5.3.7.2 Test requirements

The measured BER, derived in step 2) and 3) shall not exceed the limit in clause 4.2.8.2.1 for the 3,84 Mcps TDD option, clause 4.2.8.2.2 for the 1,28 Mcps TDD option and clause 4.2.8.2.3 for the 7,68 Mcps TDD option respectively.

5.3.8 Receiver spurious response

5.3.8.1 Method of test

5.3.8.1.1 Initial conditions

Test environment: normal (see annex B).

The frequency to be tested is mid range as defined in TS 134 108 [3].

1) Connect the SS and the unwanted signal to the UE antenna connector (see TS 134 122 [5]).

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.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.8.1.2 Procedure

1) Set the wanted signal frequency to the frequency used for the out-of-band blocking test. Set the power level of the wanted signal according to table 4.2.9.2.1-1 for the 3,84 Mcps TDD option, table 4.2.9.2.2-1 for the 1,28 Mcps TDD and table 4.2.9.2.3-1 for the 7,68 Mcps TDD option respectively.

2) Set the frequency of the interferer signal according the recorded spurious response frequency values obtained from the out-of-band blocking test as described in clause 5.3.6.1.2, at which the blocking test failed. Set the power level of the interferer according to table 4.2.9.2.1-1 for the 3,84 Mcps TDD option, table 4.2.9.2.2-1 for the 1,28 Mcps TDD option and table 4.2.9.2.3-1 for the 7,68 Mcps TDD option respectively.

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

5.3.8.2 Test requirements

The measured BER, derived in step 3), shall not exceed the limit in clause 4.2.9.2.1 for the 3,84 Mcps TDD option, clause 4.2.9.2.2 for the 1,28 Mcps TDD option and clause 4.2.9.2.3 for the 7,68 Mcps TDD option respectively.

5.3.9 Receiver adjacent channel selectivity

5.3.9.1 Method of test

5.3.9.1.1 Initial conditions

Test environment: normal (see annex B).

The frequency to be tested is mid range as defined in TS 134 108 [3].

1) Connect the system simulator (SS) and the interferer to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

4) Set the signal generators to produce wanted and interference signals according to table 4.2.10.2.1-1 for the 3,84 Mcps TDD option, table 4.2.10.2.2-1 for the 1,28 Mcps TDD option and table 4.2.10.2.3-1 for the 7,68 Mcps TDD option respectively. The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mcps for the 3,84 Mcps TDD option, 1,28 Mcps for the 1,28 Mcps TDD option respectively and 7,68 Mcps for the 7,68 Mcps TDD option and roll off factor of 0,22.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.9.1.2 Procedure

1) Set the interference signal 5 MHz for the 3,84 Mcps TDD option, 1,6 MHz for the 1,28 Mcps TDD option and 10 MHz for the 7,68 Mcps TDD option respectively above the assigned channel frequency of the wanted signal.

2) Measure the BER of the wanted signal received from the UE at the SS.

3) Set the interference signal 5 MHz for the 3,84 Mcps TDD option, 1,6 MHz for the 1,28 Mcps TDD option and 10 MHz for the 7,68 Mcps TDD option respectively below the assigned channel frequency of the wanted signal and repeat 2).

5.3.9.2 Test requirements

The measured BER, derived in step 2), shall not exceed the limit in clause 4.2.9.2.1 for the 3,84 Mcps TDD option, clause 4.2.9.2.2 for the 1,28 Mcps TDD option and clause 4.2.9.2.3 for the 7,68 Mcps TDD option respectively.

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 is mid range as defined in TS 134 108 [3].

1) Connect the SS to the UE antenna connector (see TS 134 122 [5]).

2) Calls are set up according to the Generic call setup procedure using parameters as specified in table 4.2.11.2.1-1 for the 3,84 Mcps TDD option, table 4.2.11.2.2-1 for the 1,28 Mcps TDD option and table 4.2.11.2.3-1 for the 7,68 Mcps TDD option respectively.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.10.1.2 Procedure

5.3.10.1.2.1 3,84 Mcps TDD option

1) SS level and signalling values are set such that the UE transmits maximum power (see TS 134 122 [5], clause E.3.1).

2) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -4,2 dB.

3) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -6,6 dB.

4) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -16,4 dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

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

5.3.10.1.2.2 1,28 Mcps TDD option

1) SS level and signalling values are set such that the UE transmits maximum power (see TS 134 122 [5], clause E.3.1).

2) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -2,1 dB.

3) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -5,7 dB.

4) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -16,3 dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

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

5.3.10.1.2.3 7,68 Mcps TDD option

1) SS level and signalling values are set such that the UE transmits maximum power (see TS 134 122 [5], clause E.3.1).

2) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -7,2 dB.

3) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -9,6 dB.

4) Set the SS TX signal quality to $\frac{\Sigma DPCH\_E_c}{I_{or}}$ = -19,4 dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

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

5.3.10.2 Test requirements

The results obtained shall be compared to the limits in clause 4.2.11.2.1 for the 3,84 Mcps TDD option, clause 4.2.11.2.2 for the 1,28 Mcps TDD option and clause 4.2.11.2.3 for the 7,68 Mcps TDD option respectively in order to prove compliance.

5.3.11 Transmitter adjacent channel leakage power ratio

5.3.11.1 Method of test

5.3.11.1.1 Initial conditions

Test environment: normal and extreme (see annex B).

The frequencies to be tested are low range, mid range and high range as defined in TS 134 108 [3].

1) Connect the System Simulator (SS) to the UE antenna connector (see TS 134 122 [5]).

2) Set up a call according to the generic call setup procedure using parameters as specified in table 5.3.1.1.1-1.

3) Enter the UE into loopback test mode and start the loopback test.

NOTE: When reference is made to test setup, call-setup and loopback test mode, guidance on the applicability of these can be found in TS 134 122 [5], annexes A to E, TS 134 108 [3] and TS 134 109 [4], respectively.

5.3.11.1.2 Procedure

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

2) Average over the number of time slots defined in TS 134 122 [5].

3) Measure the RRC filtered mean power centred on the first lower adjacent channel frequency.

4) Average over the number of time slots defined in TS 134 122 [5].

5) Calculate the ACLR from the ratio of the power measured in 2) and the power measured in 4).

6) Repeat steps 3), 4) and 5) for the second lower adjacent RF channel (centre frequency 10 MHz for the 3,84 Mcps TDD Option, 3,2 MHz for the 1,28 Mcps TDD Option and 20 MHz for the 7,68 Mcps TDD Option respectively, below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (centre frequency 5 MHz for the 3,84 Mcps TDD Option, 1,6 MHz for the 1,28 Mcps TDD Option and 10 MHz for the 7,68 Mcps TDD Option respectively, above the assigned channel frequency of the transmitted signal, and 10 MHz, for the 3,84 Mcps TDD Option, 3,2 MHz for the 1,28 Mcps TDD Option and 20 MHz for the 7,68 Mcps TDD Option respectively above the assigned channel frequency of the transmitted signal).

7) Run steps 1) to 6) for RF channels Low/Mid/High.

5.3.11.2 Test requirements

The ACLR calculated in steps 3) to 5) of clause 5.3.11.1.2 shall be equal or greater than the limits given in table 4.2.12.2.1-1 for the 3,84 Mcps TDD option, table 4.2.12.2.2-1 for the 1,28 Mcps TDD option respectively and table 4.2.12.2.3-1 for the 7,68 Mcps TDD option.

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A-1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
  - Unconditional: meaning that the requirement applies in all circumstances; or
  - Conditional: meaning that the requirement is dependent on the manufacturer having chosen to support optional functionality defined within the schedule.
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
  - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
  - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A-1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 301 908-6 The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive						
Requirement			**Requirement Conditionality**		**Test Specification**	
No	**Description**	**Reference: Clause No**	**U/C**	**Condition**	**E/O**	**Reference: Clause No**
1	Spectrum emission mask	4.2.2	C	Does not apply for the case of MBSFN-only UE	E	5.3.1
2	Transmitter spurious emissions	4.2.3	C	Does not apply for the case of MBSFN-only UE	E	5.3.2
3	Maximum output power	4.2.4	C	Does not apply for the case of MBSFN-only UE	E	5.3.3
4	Minimum transmit output power	4.2.5	C	Does not apply for the case of MBSFN-only UE	E	5.3.4
5	Receiver spurious emissions	4.2.6	U		E	5.3.5
6	Receiver blocking characteristics	4.2.7	U		E	5.3.6
7	Receiver intermodulation characteristics	4.2.8	U		E	5.3.7
8	Receiver spurious response	4.2.9	U		E	5.3.8
9	Receiver adjacent channel selectivity	4.2.10	U		E	5.3.9
10	Out-of-synchronization handling of output power	4.2.11	C	Does not apply for the case of MBSFN-only UE	E	5.3.10
11	Transmitter adjacent channel leakage power ratio	4.2.12	C	Does not apply for the case of MBSFN-only UE	E	5.3.11

Key to columns:

Requirement:

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

Description A textual reference to the requirement.

Clause Number 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 to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).

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

Test Specification:

E/O Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement. The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

Clause Number Identification of clause(s) defining the test specification in the present document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.

Annex B (normative): Environmental profile

B.1 General

B.1.1 Introduction

This normative annex defines the environmental profile of the UE.

B.1.2 Temperature

The UE should fulfil all the test 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 of 25 % to 75 %)
-10 °C to +55 °C	For extreme conditions (see IEC 60068-2-1 [6] and IEC 60068-2-2 [7])

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 should fulfil all test requirements stated in the present document in the full voltage range between the extreme supply voltages.

The manufacturer should declare a lower and a higher extreme supply voltage and an approximate shutdown voltage. For equipment that can be operated from one or more of the power sources listed below, 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: Supply voltages

Power source	Lower extreme voltage	Higher extreme voltage	Normal conditions voltage
AC mains	0,9 × nominal	1,1 × nominal	nominal
Regulated lead acid battery	0,9 × nominal	1,3 × nominal	1,1 × nominal
Non regulated batteries:			
Leclanché/lithium	0,85 × nominal	Nominal	Nominal
Mercury/nickel cadmium	0,90 × nominal	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 should 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 should 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 (informative): The EN title in the official languages

The enlargement of the European Union (EU) resulted in a requirement from the EU for a larger number of languages for the translation of the titles of Harmonized Standards and mandated ENs that are to be listed in the Official Journal to support the implementation of this legislation.

For this reason the title translation concerning the present document can be consulted via the e-approval application.

Annex D (informative): Bibliography

- IEC 60068-3-1 (1974-01): "Environmental testing - Part 3: Background information - Section One: Cold and dry heat tests".
- ETSI TS 125 102 (V5.5.0): "Universal Mobile Telecommunications System (UMTS); UTRA (UE) TDD; Radio transmission and reception (3GPP TS 25.102 version 5.5.0 Release 5)".
- 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).
- 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).
- CEPT/ERC/REC 74-01E (Siófok 1998, Nice 1999, Sesimbra 2002, Hradec Kralove 2005, Cardiff 2011): "Unwanted Emissions in the Spurious Domain".
- ETSI TS 125 346 (V9.1.0): "Universal Mobile Telecommunications System (UMTS); Introduction of the Multimedia Broadcast/Multicast Service (MBMS) in the Radio Access Network (RAN); Stage 2 (3GPP TS 25.346 version 9.1.0 Release 9)".
- 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.

History

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