

**IMT cellular networks;  
Harmonized EN covering the essential requirements  
of article 3.2 of the R&TTE Directive;  
Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)**

---



---

Reference

REN/MSG-TFES-006-2

---

Keywords

3G, 3GPP, cellular, digital, IMT, IMT-2000, 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

---

**Important notice**

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

[http://portal.etsi.org/chaicor/ETSI\\_support.asp](http://portal.etsi.org/chaicor/ETSI_support.asp)

---

**Copyright Notification**

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.  
All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™**, **TIPHON™**, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

**3GPP™** is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**LTE™** is a Trade Mark of ETSI currently being registered

for the benefit of its Members and of the 3GPP Organizational Partners.

**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	6
Foreword.....	6
Introduction .....	7
1 Scope .....	8
2 References .....	9
2.1 Normative references .....	9
2.2 Informative references.....	9
3 Definitions, symbols and abbreviations .....	10
3.1 Definitions .....	10
3.2 Symbols.....	11
3.3 Abbreviations .....	11
4 Technical requirements specifications .....	12
4.1 Environmental profile.....	12
4.2 Conformance requirements .....	13
4.2.1 Introduction.....	13
4.2.2 Transmitter maximum output power.....	13
4.2.2.1 Definition .....	13
4.2.2.2 Limits .....	14
4.2.3 Transmitter spectrum emission mask.....	14
4.2.3.1 Definition .....	14
4.2.3.2 Limits .....	15
4.2.3.3 Conformance.....	15
4.2.4 Transmitter spurious emissions.....	15
4.2.4.1 Definition .....	15
4.2.4.2 Limits .....	15
4.2.4.3 Conformance.....	17
4.2.5 Transmitter minimum output power .....	17
4.2.5.1 Definition .....	17
4.2.5.2 Limits .....	17
4.2.5.3 Conformance.....	17
4.2.6 Receiver Adjacent Channel Selectivity (ACS) .....	17
4.2.6.1 Definition .....	17
4.2.6.2 Limits .....	18
4.2.6.3 Conformance.....	18
4.2.7 Receiver blocking characteristics .....	18
4.2.7.1 Definition .....	18
4.2.7.2 Limits .....	18
4.2.7.3 Conformance.....	20
4.2.8 Receiver spurious response.....	20
4.2.8.1 Definition .....	20
4.2.8.2 Limits .....	20
4.2.8.3 Conformance.....	20
4.2.9 Receiver intermodulation characteristics .....	20
4.2.9.1 Definition .....	20
4.2.9.2 Limits .....	21
4.2.9.3 Conformance.....	21
4.2.10 Receiver spurious emissions .....	21
4.2.10.1 Definition .....	21
4.2.10.2 Limits .....	21
4.2.10.3 Conformance.....	23
4.2.11 Out-of-synchronization handling of output power.....	23
4.2.11.1 Definition .....	23
4.2.11.2 Limits .....	23

4.2.11.3	Conformance .....	24
4.2.12	Transmitter Adjacent Channel Leakage power Ratio (ACLR) .....	24
4.2.12.1	Definition .....	24
4.2.12.2	Limits .....	24
4.2.12.3	Conformance .....	25
5	Testing for compliance with technical requirements.....	25
5.1	Environmental conditions for testing .....	25
5.2	Interpretation of the measurement results .....	25
5.3	Essential radio test suites.....	26
5.3.1	Transmitter maximum output power.....	26
5.3.1.1	Method of test .....	26
5.3.1.1.1	Initial conditions .....	26
5.3.1.1.2	Procedure.....	27
5.3.1.2	Test requirements .....	27
5.3.2	Transmitter spectrum emission mask.....	27
5.3.2.1	Method of test .....	27
5.3.2.1.1	Initial conditions for UEs not supporting HSDPA and/or E-DCH .....	27
5.3.2.1.1A	Initial conditions for UEs supporting HSDPA and/or E-DCH .....	27
5.3.2.1.2	Procedure for UEs not supporting HSDPA and/or E-DCH .....	27
5.3.2.1.2A	Procedure for UEs supporting HSDPA and/or E-DCH .....	27
5.3.2.2	Test requirements .....	28
5.3.3	Transmitter spurious emissions.....	28
5.3.3.1	Method of test .....	28
5.3.3.1.1	Initial conditions .....	28
5.3.3.1.2	Procedure.....	28
5.3.3.2	Test requirements .....	28
5.3.4	Transmitter minimum output power .....	28
5.3.4.1	Method of test .....	28
5.3.4.1.1	Initial conditions .....	28
5.3.4.1.2	Procedure.....	28
5.3.4.2	Test requirements .....	29
5.3.5	Receiver Adjacent Channel Selectivity (ACS) .....	29
5.3.5.1	Method of test .....	29
5.3.5.1.1	Initial conditions .....	29
5.3.5.1.2	Procedure.....	29
5.3.5.2	Test requirements .....	29
5.3.6	Receiver blocking characteristics .....	29
5.3.6.1	Method of test .....	29
5.3.6.1.1	Initial requirements.....	29
5.3.6.1.2	Procedure.....	30
5.3.6.2	Test requirements.....	30
5.3.7	Receiver spurious response.....	30
5.3.7.1	Method of test .....	30
5.3.7.1.1	Initial conditions .....	30
5.3.7.1.2	Procedure.....	30
5.3.7.2	Test requirements .....	30
5.3.8	Receiver Intermodulation characteristics .....	31
5.3.8.1	Method of test .....	31
5.3.8.1.1	Initial conditions .....	31
5.3.8.1.2	Procedure.....	31
5.3.8.2	Test requirements.....	31
5.3.9	Receiver spurious emissions .....	31
5.3.9.1	Method of test .....	31
5.3.9.1.1	Initial conditions .....	31
5.3.9.1.2	Procedure.....	31
5.3.9.2	Test requirements .....	31
5.3.10	Out-of-synchronization handling of output power.....	32
5.3.10.1	Method of test .....	32
5.3.10.1.1	Initial conditions .....	32
5.3.10.1.2	Procedure.....	32
5.3.10.2	Test requirements .....	32

5.3.11	Transmitter adjacent channel leakage power ratio .....	32
5.3.11.1	Method of test .....	32
5.3.11.1.1	Initial conditions for UEs not supporting HSDPA and/or E-DCH .....	32
5.3.11.1.1A	Initial conditions for UEs supporting HSDPA and/or E-DCH .....	33
5.3.11.1.2	Procedure for UEs not supporting HSDPA and/or E-DCH .....	33
5.3.11.1.2A	Procedure for UEs supporting HSDPA and/or E-DCH .....	33
5.3.11.2	Test requirements .....	33
<b>Annex A (normative):</b>	<b>HS Requirements and conformance Test specifications Table (HS-RTT) .....</b>	<b>34</b>
<b>Annex B (normative):</b>	<b>Environmental profile .....</b>	<b>36</b>
B.1	General .....	36
B.1.1	Introduction .....	36
B.1.2	Temperature .....	36
B.1.3	Voltage .....	36
B.1.4	Test environment .....	37
<b>Annex C (informative):</b>	<b>The EN title in the official languages .....</b>	<b>38</b>
<b>Annex D (informative):</b>	<b>Bibliography .....</b>	<b>39</b>
History .....		40

---

# Intellectual Property Rights

IPRs essential or potentially essential to the present document 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 (<http://webapp.etsi.org/IPR/home.asp>).

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.

---

## 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 be 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 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 2 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)".

<b>Proposed national transposition dates</b>	
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 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

The present document covers requirements for UTRA FDD User Equipment from 3GPP Releases 99, 4, 5, 6, 7 and 8. In addition, the present document covers requirements for UTRA FDD User Equipment in the operating bands specified in TS 102 735 [i.4].

NOTE 1: 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.7], ECC Decision (09)03 [i.8] and CEPT Report 30 [i.9];
- 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.7], ECC Decision (09)03 [i.8] and CEPT Report 30 [i.9].

The present document is intended to cover 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 2: 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 134 121-1 (V9.3.0): "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 9.3.0 Release 9)".
- [3] ETSI TS 134 108 (V9.3.0): "Universal Mobile Telecommunications System (UMTS); Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108 version 9.3.0 Release 9)".
- [4] ETSI TS 134 109 (V9.1.0): "Universal Mobile Telecommunications System (UMTS); LTE; Terminal logical test interface; Special conformance testing functions (3GPP TS 34.109 version 9.1.0 Release 9)".
- [5] ETSI TS 125 101 (V8.14.0): "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101 version 8.14.0 Release 8)".
- [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 TS 125 214 (V9.4.0): "Universal Mobile Telecommunications System (UMTS); Physical layer procedures (FDD) (3GPP TS 25.214 version 9.4.0 Release 9)".
- [9] ETSI TS 145 004 (V9.1.0): "Digital cellular telecommunications system (Phase 2+); Modulation (3GPP TS 45.004 version 9.1.0 Release 9)".
- [10] 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: "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 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 102 215 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Recommended approach, and possible limits for measurement uncertainty for the measurement of radiated electromagnetic fields above 1 GHz".
- [i.6] 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.7] Commission Decision 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 (2010/267/EU).
- [i.8] ECC Decision of 30 October 2009 on harmonised conditions for mobile/fixed communications networks (MFCN) operating in the band 790 - 862 MHz (ECC/DEC/(09)03).
- [i.9] 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".

---

## 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

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.

**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  $(1 + \alpha)$  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  $(1 + \alpha)$  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\_Ec/ $I_{or}$ , Ec/ $I_{or}$ , 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  $\alpha$  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:

$\alpha$	Roll-off factor of the root raised cosine filter, $\alpha = 0,22$
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 an absolute frequency(s) or a frequency offset from the assigned channel frequency.

$I_o$	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
$\beta_c$	Gain factor for DPCCCH
$\beta_d$	Gain factor for DPDCH
$\beta_{hs}$	Gain factor for HS-DPCCH
$\beta_{ec}$	Gain factor for E-DPCCH
$\beta_{ed}$	Gain factor for E-DPDCH

## 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

CW Continuous Wave

NOTE: Unmodulated signal.

DCH Dedicated Channel

NOTE: Which is mapped into Dedicated Physical Channel.

DL Downlink

DPCCH Dedicated Physical Control CHannel

DPDCH Dedicated Physical Data CHannel

E-DCH Enhanced Dedicated CHannel

EMC ElectroMagnetic Compatibility

ERM Electromagnetic compatibility and Radio spectrum Matters

FDD Frequency Division Duplex

GMSK Gaussian Minimum Shift Keying

GSM Global System for Mobile

HSDPA High Speed Downlink Packet Access

IMT International Mobile Telecommunications

LTE Long Term Evolution

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.

PN PseudoNoise

PSD Power Spectral Density

<REFSENS> Reference sensitivity

RF Radio Frequency

RRC Root Raised Cosine

R&TTE Radio and Telecommunications Terminal Equipment

SS System Simulator

NOTE: See TS 134 121-1 [2].

TFES Task Force for European Standards for IMT

TH Temperature High

TL Temperature Low

TPC Transmit Power Control

UARFCN UTRA Absolute Radio Frequency Channel Number

UE User Equipment

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 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 guidance on how a supplier can declare 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 (i.e. band I, III, VII, VIII, XV, XVI and XX) 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 1999/5/EC [i.2] (R&TTE Directive) for IMT User Equipment (UE) eight essential parameters in addition to those in EN 301 908-1 [10] have been identified.

Table 4.2.1-1 provides a cross reference between these eight essential parameters and the corresponding eleven technical requirements for equipment within the scope of the present document.

**Table 4.2.1-1: Cross references**

Essential parameter	Corresponding technical requirements
Spectrum emissions mask	4.2.3 Transmitter Spectrum emissions mask
	4.2.12 Transmitter adjacent channel leakage power ratio
Conducted spurious emissions in active mode	4.2.4 Transmitter spurious emissions
Accuracy of maximum output power	4.2.2 Transmitter maximum output power
Prevention of harmful interference through control of power	4.2.5 Transmitter minimum output power
Conducted spurious emission in idle mode	4.2.10 Receiver spurious emissions
Impact of interference on receiver performance	4.2.7 Receiver Blocking characteristics
	4.2.8 Receiver spurious response
	4.2.9 Receiver Intermodulation characteristics
Receiver adjacent channel selectivity	4.2.6 Receiver Adjacent Channel Selectivity (ACS)
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 FDD in declared operating bands. The technical requirements for HSDPA and E-DCH apply only to UEs supporting these features.

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.

### 4.2.2 Transmitter maximum output power

#### 4.2.2.1 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.

## 4.2.2.2 Limits

The UE maximum output power shall be within the shown value in table 4.2.2.2-1 even for the multi-code DPDCH transmission mode.

**Table 4.2.2.2-1: 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/-1,7

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 TS 125 101 [5].

NOTE 2: The range of UE maximum output power for the various power classes are specified in TS 125 101 [5], clause 6.2.1. The values in table 4.2.2.2-1 correspond to the measurement limits taking into account the measurement uncertainty of measurement equipment (see clause 5.2).4.2.2.3 Conformance.

Conformance tests described in clause 5.3.1 shall be carried out.

## 4.2.3 Transmitter spectrum emission mask

### 4.2.3.1 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.

### 4.2.3.2 Limits

The power of any UE emission shall not exceed the levels specified in table 4.2.3.2-1. The requirements are applicable for all for the values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$ ,  $\beta_{ec}$  and  $\beta_{ed}$  defined in TS 125 214 [8].

**Table 4.2.3.2-1: Spectrum emission mask requirement**

$\Delta f$ 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:  $\Delta f$  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  $\Delta f$  equals to 2,515 MHz and 3,485 MHz.  
NOTE 4: The first and last measurement position with a 1 MHz filter is at  $\Delta f$  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.

### 4.2.3.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

## 4.2.4 Transmitter spurious emissions

### 4.2.4.1 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.

### 4.2.4.2 Limits

The power of spurious emissions shall not exceed the limits defined in tables 4.2.4.2-1 and 4.2.4.2-2. The limits shown in tables 4.2.4.2-1 and 4.2.4.2-2 are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency.

**Table 4.2.4.2-1: General spurious emissions requirements**

Frequency bandwidth	Measurement bandwidth	Minimum requirement
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36 dBm
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36 dBm
$30 \text{ MHz} \leq f < 1 \text{ 000 MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	1 MHz	-30 dBm

Table 4.2.4.2-2: Additional spurious emissions requirements

Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
I	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f $\leq$ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
III	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f $\leq$ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	3,84 MHz	-60 dBm
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
VII	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (note 1)
	935 MHz < f $\leq$ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 620 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
	2 590 MHz $\leq$ f $\leq$ 2 620 MHz	3,84 MHz	-50 dBm
VIII	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz < f $\leq$ 960 MHz	100 kHz 3,84 MHz	-79 dBm (note 1) -60 dBm
	1 805 MHz < f $\leq$ 1 830 MHz	100 kHz 3,84 MHz	-71 dBm (notes 1 and 2) -60 dBm (note 2)
	1 830 MHz < f $\leq$ 1 880 MHz	100 kHz 3,84 MHz	-71 dBm (note 1) -60 dBm
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 640 MHz	3,84 MHz	-60 dBm
	2 640 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm (note 2)
XV	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f $\leq$ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz $\leq$ f $\leq$ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
XVI	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f $\leq$ 925 MHz	100 kHz	-60 dBm (note 1)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz 3,84 MHz	-67 dBm (note 1) -60 dBm
	935 MHz $\leq$ f $\leq$ 960 MHz	100 kHz	-79 dBm (note 1)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (note 1)
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 620 MHz	3,84 MHz	-50 dBm
	2 620 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm



Operating band	Frequency bandwidth	Measurement bandwidth	Minimum requirement
XX	$782 \text{ MHz} \leq f \leq 790 \text{ MHz}$	8 MHz	-65 dBm
	$791 \text{ MHz} \leq f \leq 821 \text{ MHz}$	3,84 MHz	-60 dBm
	$921 \text{ MHz} \leq f \leq 925 \text{ MHz}$	100 kHz	-60 dBm (note 1)
	$925 \text{ MHz} \leq f \leq 935 \text{ MHz}$	100 kHz	-67 dBm (note 1)
		3,84 MHz	-60 dBm
	$935 \text{ MHz} \leq f \leq 960 \text{ MHz}$	100 kHz	-79 dBm (note 1)
	$1\ 805 \text{ MHz} \leq f \leq 1\ 880 \text{ MHz}$	100 kHz	-71 dBm (note 1)
	$2\ 110 \text{ MHz} \leq f \leq 2\ 170 \text{ MHz}$	3,84 MHz	-60 dBm
	$2\ 585 \text{ MHz} \leq f \leq 2\ 620 \text{ MHz}$	3,84 MHz	-50 dBm
	3,84 MHz	-60 dBm	

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 4.2.4.2-1 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 4.2.4.2-1 are permitted for each UARFCN used in the measurement due to 2<sup>nd</sup> or 3<sup>rd</sup> harmonic spurious emissions.

#### 4.2.4.3 Conformance

Conformance tests described in clause 5.3.3 shall be carried out.

### 4.2.5 Transmitter minimum output power

#### 4.2.5.1 Definition

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

#### 4.2.5.2 Limits

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

#### 4.2.5.3 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
$I_{or}$	dBm/3,84 MHz	<REF $I_{or}$ > + 14 dB	<REF $I_{or}$ > + 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 $I_{or}$ > as specified in TS 134 121-1 [2].			
NOTE 2: The $I_{oac}$ (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [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	
$I_{or}$	dBm/3,84 MHz	<REF $I_{or}$ > + 3 dB	
$I_{blocking}$ mean power (modulated)	dBm	-56 (for $F_{uw}$ offset $\pm 10$ MHz)	-44 (for $F_{uw}$ offset $\pm 15$ MHz)
$F_{uw}$ (Band I operation)	MHz	$2\ 102,4 \leq f \leq 2\ 177,6$	$2\ 095 \leq f \leq 2\ 185$
$F_{uw}$ (Band III operation)	MHz	$1\ 797,4 \leq f \leq 1\ 887,6$	$1\ 790 \leq f \leq 1\ 895$
$F_{uw}$ (Band VII operation)	MHz	$2\ 612,4 \leq f \leq 2\ 697,6$	$2\ 605 \leq f \leq 2\ 705$
$F_{uw}$ (Band VIII operation)	MHz	$917,4 \leq f \leq 967,6$	$910 \leq f \leq 975$

Parameter	Unit	Level	
$F_{uw}$ (Band XX operation)	MHz	$783,4 \leq f \leq 828,6$	$776 \leq f \leq 836$
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)	
NOTE 1: <REFSENS> and <REF <sub>or</sub> > as specified in TS 134 121-1 [2].			
NOTE 2: The $I_{blocking}$ (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5].			

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
$I_{or}$	dBm/3,84 MHz	<REF <sub>or</sub> > + 3 dB	<REF <sub>or</sub> > + 3 dB	<REF <sub>or</sub> > + 3 dB
$I_{blocking}$ (CW)	dBm	-44	-30	-15
$F_{uw}$ (Band I operation)	MHz	$2\ 050 < f < 2\ 095$ $2\ 185 < f < 2\ 230$	$2\ 025 < f \leq 2\ 050$ $2\ 230 \leq f < 2\ 255$	$1 < f \leq 2\ 025$ $2\ 255 \leq f < 12\ 750$
$F_{uw}$ (Band III operation)	MHz	$1\ 745 < f < 1\ 790$ $1\ 895 < f < 1\ 940$	$1\ 720 < f \leq 1\ 745$ $1\ 940 \leq f < 1\ 965$	$1 < f \leq 1\ 720$ $1\ 965 \leq f < 12\ 750$
$F_{uw}$ (Band VII operation)	MHz	$2\ 570 < f < 2\ 605$ $2\ 705 < f < 2\ 750$	Na $2\ 750 \leq f < 2\ 775$	$1 < f \leq 2\ 570$ $2\ 775 \leq f < 12\ 750$
$F_{uw}$ (Band VIII operation)	MHz	$865 < f < 910$ $975 < f < 1\ 020$	$840 < f < 865$ $1\ 020 \leq f < 1\ 045$	$1 < f \leq 840$ $1\ 045 \leq f < 12\ 750$
$F_{uw}$ (Band XV operation)	MHz	$2\ 570 < f < 2\ 585$ $2\ 705 < f < 2\ 750$	Na $2\ 750 \leq f < 2\ 775$	$1 < f \leq 2\ 570$ $2\ 775 \leq f < 12\ 750$
$F_{uw}$ (Band XVI operation)	MHz	Na $2\ 705 < f < 2\ 750$	$2\ 500 < f \leq 2\ 570$ $2\ 750 \leq f < 2\ 775$	$1 < f \leq 2\ 500$ $2\ 775 \leq f < 12\ 750$
$F_{uw}$ (Band XX operation)	MHz	$731 < f < 776$ $836 < f < 881$	$706 < f \leq 731$ $881 \leq f < 906$	$1 < f \leq 706$ $906 \leq f < 12\ 750$
UE transmitted mean power	dBm	20 (for Power class 3) 18 (for Power class 4)		
Band I operation	For $2\ 095\ \text{MHz} \leq f \leq 2\ 185\ \text{MHz}$ , 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 $1\ 790\ \text{MHz} \leq f \leq 1\ 895\ \text{MHz}$ , 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 $2\ 605\ \text{MHz} \leq f \leq 2\ 705\ \text{MHz}$ , 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 $910\ \text{MHz} \leq f \leq 975\ \text{MHz}$ , 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 $2\ 585\ \text{MHz} \leq f \leq 2\ 705\ \text{MHz}$ , 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 $2\ 570\ \text{MHz} \leq f \leq 2\ 705\ \text{MHz}$ , 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 $776\ \text{MHz} \leq f \leq 836\ \text{MHz}$ , the appropriate in-band blocking or adjacent channel selectivity in clauses 4.2.6 and table 4.2.7.2-1 shall be applied.			
NOTE: <REFSENS> and <REF <sub>or</sub> > as specified in TS 134 121-1 [2].				

**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
$I_{or}$	dBm/3,84 MHz	<REF $I_{or}$ > + 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 $I_{or}$ > as specified in TS 134 121-1 [2].		
NOTE 2: $I_{blocking}$ (GMSK) is an interfering signal as defined in TS 145 004 [9]. 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
$I_{or}$	<REF $I_{or}$ > + 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)	dBm
NOTE: <REFSENS> and <REF $I_{or}$ > as specified in TS 134 121-1 [2].		

### 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 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
$I_{or}$	<REF $I_{or}$ > + 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)		dBm
NOTE 1: $I_{ouw2}$ (modulated) consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5].			
NOTE 2: <REFSENS> and <REF $I_{or}$ > as specified in TS 134 121-1 [2].			

**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	
$I_{or}$	dBm/3,84 MHz	<REF $I_{or}$ > + 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 $I_{or}$ > as specified in TS 134 121-1 [2].			
NOTE 2: $I_{ouw2}$ (GMSK) is an interfering signal as defined in TS 145 004 [9]. 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
$30 \text{ MHz} \leq f < 1 \text{ GHz}$	100 kHz	-57 dBm
$1 \text{ GHz} \leq f \leq 12,75 \text{ GHz}$	1 MHz	-47 dBm

Table 4.2.10.2-2: Additional receiver spurious emission requirements

Band	Frequency Range	Measurement Bandwidth	Maximum level
I	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz < f $\leq$ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 920 MHz $\leq$ f $\leq$ 1 980 MHz	3,84 MHz	-60 dBm
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
III	2 585 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz < f $\leq$ 960 MHz	100 kHz	-79 dBm (see note)
	1 710 MHz $\leq$ f $\leq$ 1 785 MHz	3,84 MHz	-60 dBm
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	3,84 MHz	-60 dBm
VII	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 500 MHz $\leq$ f $\leq$ 2 570 MHz	3,84 MHz	-60 dBm
	2 620 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
	791 MHz $\leq$ f $\leq$ 821 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz < f $\leq$ 960 MHz	100 kHz	-79 dBm (see note)
VIII	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 900 MHz $\leq$ f $\leq$ 1 920 MHz	3,84 MHz	-60 dBm
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
	791 MHz $\leq$ f < 821 MHz	3,84 MHz	-60 dBm
	880 MHz $\leq$ f $\leq$ 915 MHz	3,84 MHz	-60 dBm
	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (see note)
XV	925 MHz $\leq$ f $\leq$ 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz $\leq$ f $\leq$ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (see note)
	1 900 MHz $\leq$ f $\leq$ 1 920 MHz	3,84 MHz	-60 dBm
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm
	791 MHz $\leq$ f < 821 MHz	3,84 MHz	-60 dBm
XVI	921 MHz $\leq$ f < 925 MHz	100 kHz	-60 dBm (see note)
	925 MHz $\leq$ f < 935 MHz	100 kHz	-67 dBm (see note)
	935 MHz $\leq$ f $\leq$ 960 MHz	100 kHz	-79 dBm (see note)
	1 805 MHz $\leq$ f $\leq$ 1 880 MHz	100 kHz	-71 dBm (see note)
	2 010 MHz $\leq$ f $\leq$ 2 025 MHz	3,84 MHz	-60 dBm
	2 110 MHz $\leq$ f $\leq$ 2 170 MHz	3,84 MHz	-60 dBm
	2 585 MHz $\leq$ f $\leq$ 2 690 MHz	3,84 MHz	-60 dBm

Band	Frequency Range	Measurement Bandwidth	Maximum level
XX	$791 \text{ MHz} \leq f < 821 \text{ MHz}$	3,84 MHz	-60 dBm
	$832 \text{ MHz} \leq f \leq 862 \text{ MHz}$	3,84 MHz	-60 dBm
	$921 \text{ MHz} \leq f < 925 \text{ MHz}$	100 kHz	-60 dBm (see note)
	$925 \text{ MHz} \leq f \leq 935 \text{ MHz}$	100 kHz	-67 dBm (see note)
	$935 \text{ MHz} < f \leq 960 \text{ MHz}$	3,84 MHz	-60 dBm
	$1\ 805 \text{ MHz} \leq f \leq 1\ 880 \text{ MHz}$	100 kHz	-79 dBm (see note)
	$2\ 110 \text{ MHz} \leq f \leq 2\ 170 \text{ MHz}$	3,84 MHz	-60 dBm
	$2\ 585 \text{ MHz} \leq f \leq 2\ 690 \text{ MHz}$	3,84 MHz	-60 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 4.2.10.2-1 are permitted for each UARFCN used in the measurement.		

### 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  $Q_{\text{out}}$  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  $Q_{\text{out}}$  for the purpose of monitoring synchronization. The threshold  $Q_{\text{out}}$  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

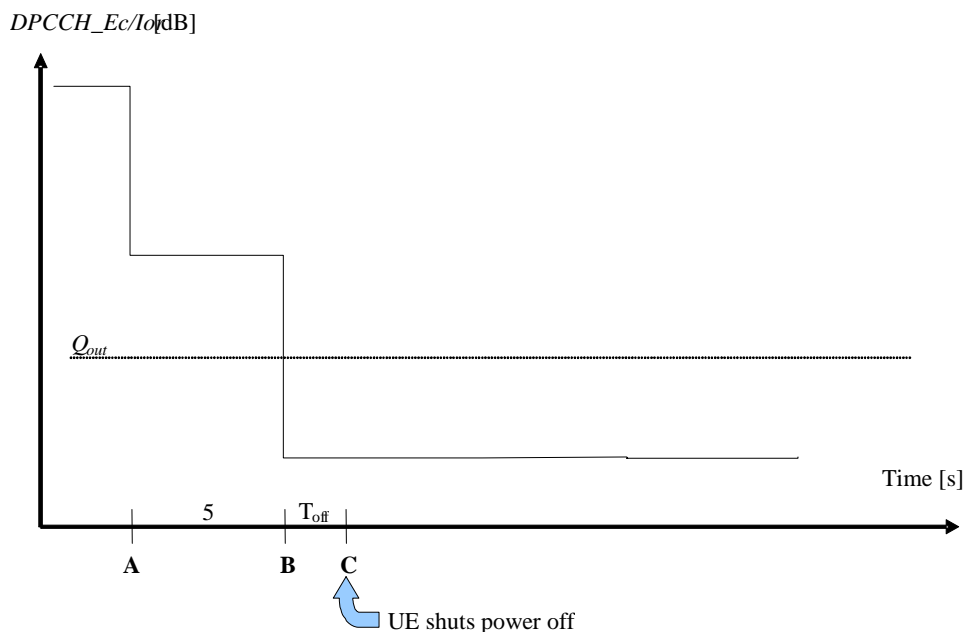
When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold  $Q_{\text{out}}$ , the UE shall shut its transmitter off within 40 ms.

The quality level at the thresholds  $Q_{\text{out}}$  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  $Q_{\text{out}}$  can be generated by a  $\text{DPCCH}_E/\text{I}_{\text{or}}$  ratio of -25 dB. The DL reference measurement channel 12,2 kbit/s is specified in TS 134 121-1 [2] and with static propagation conditions. The downlink physical channels, other than those specified in table 4.2.11.2-1, are as specified in TS 134 121-1 [2].

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

Parameter	Value	Unit
$\hat{I}_{\text{or}}/I_{\text{OC}}$	-1	dB
$I_{\text{OC}}$	-60	dBm/3,84 MHz
$\frac{\text{DPDCH}_E}{I_{\text{or}}}$	See figure 4.2.11.2-1: Before point A: -16,6 for UEs not supporting enhanced performance type 1 for DCH -19,6 for UEs supporting enhanced performance type 1 for DCH After point A not defined	dB
$\frac{\text{DPCCH}_E}{I_{\text{or}}}$	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\_Ec/I<sub>or</sub> 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_Ec/I <sub>or</sub> (UE, not supporting enhanced performance requirements type 1 for DCH)	DPCCH_Ec/I <sub>or</sub> (UE, supporting enhanced 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 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

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.2-1. The requirements are applicable for all for the values of  $\beta_c$ ,  $\beta_d$ ,  $\beta_{hs}$ ,  $\beta_{ec}$  and  $\beta_{ed}$  defined in TS 125 214 [8].



Table 4.2.12.2-1: 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 1: The requirement shall still be met in the presence of switching transients.  
NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.  
NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses.

### 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 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 TS 134 121-1 [2].

Many tests in the present document are performed with appropriate frequencies in the low, middle and high range of the operating frequency band of the UE. These frequencies are defined in TS 134 108 [3].

### 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 an 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 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)). Principles for the calculation of measurement uncertainty are contained in TR 100 028 [i.6] or TR 102 215 [i.5]. For guidance on other measurement conditions reference can be made to annex (s) of TS 134 121-1 [2].

Table 5.2-1 is based on this expansion factor.

**Table 5.2-1: Maximum measurement 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	$f \leq 2,2$ GHz	±1,5 dB
	$2,2$ GHz < $f \leq 4$ GHz	±2,0 dB
	$f > 4$ GHz	±4,0 dB
	Co-existence band ( $\geq -60$ dBm)	±2,0 dB
	Co-existence band (< -60 dBm)	±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:	±1,4 dB
	15 MHz offset $\leq f \leq 2,2$ GHz	±1,0 dB
	$2,2$ GHz < $f \leq 4$ GHz	±1,7 dB
	$f > 4$ GHz	±3,1 dB
Receiver spurious response	$f \leq 2,2$ GHz	±1,0 dB
	$2,2$ GHz < $f \leq 4$ GHz	±1,7 dB
	$f > 4$ GHz	±3,1 dB
Receiver intermodulation characteristics		±1,3 dB
Receiver spurious emissions	For UE receive band (-60 dBm)	±3,0 dB
	For UE transmit band (-60 dBm)	±3,0 dB
	Outside the UE receive band: $f \leq 2,2$ GHz	±2,0 dB
	$2,2$ GHz < $f \leq 4$ GHz	±2,0 dB
	$f > 4$ GHz	±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 $\Omega$ 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

This clause describes the test suites for UTRA FDD.

### 5.3.1 Transmitter maximum output power

#### 5.3.1.1 Method of test

##### 5.3.1.1.1 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 TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

#### 5.3.1.1.2 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.

#### 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 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 TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

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

Details of initial conditions for UEs supporting HSDPA can be found in TS 134 121-1 [2], clause 5.9A. Details of test method for UEs supporting E-DCH can be found in TS 134 121-1 [2], clause 5.9B.

##### 5.3.2.1.2 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 4.2.3.2-1. 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 analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2-1. 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.

##### 5.3.2.1.2A Procedure for UEs supporting HSDPA and/or E-DCH

Details of procedure for UEs supporting HSDPA can be found in TS 134 121-1 [2], clause 5.9A. Details of test method for UEs supporting E-DCH can be found in TS 134 121-1 [2], clause 5.9B.

### 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 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.
- 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 set up, call set up and loopback test mode, guidance on the applicability of these can be found in TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

#### 5.3.3.1.2 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.

### 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 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 TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4].

#### 5.3.4.1.2 Procedure

- 1) Set and send continuously Down power control commands to the UE.
- 2) Measure the mean power of the UE.

### 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 TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

#### 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  $\pm 1$  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  $\pm 1$  dB tolerance.
- 6) Measure the BER of DCH received from the UE at the SS.

### 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 TS 134 108 [3]. For out-of-band case, frequencies to be tested are mid range as defined in TS 134 108 [3].

For narrow band case, frequencies to be tested are mid range as defined in TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

#### 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  $\pm 1$  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.

#### 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 TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

##### 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  $\pm 1$  dB tolerance.
- 3) Measure the BER of DCH received from the UE at the SS.

#### 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 TS 134 108 [3]:

- 1) Connect the SS to the UE antenna connector.
- 2) A call is set up according to the Generic call setup procedure as per TS 134 108 [3], 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 TS 134 109 [4].

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4].

#### 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  $\pm 1$  dB tolerance.
- 3) Measure the BER of DCH received from the UE at the SS.

### 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 TS 134 108 [3]:

- 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 TS 134 121-1 [2]).

#### 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.

### 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 TS 134 108 [3]:

- 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 TS 134 108 [3].

**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\_Ec/Ior 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

#### 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\_Ec/Ior ratio level according to table 4.2.11.2-2, 'A to B'.
- 3) The SS controls the DPCCH\_Ec/Ior 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.

### 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 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 TS 134 108 [3]:

- 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.

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 TS 134 121-1 [2], TS 134 108 [3] and TS 134 109 [4] respectively.

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

Details of initial conditions for UEs supporting HSDPA can be found in TS 134 121-1 [2], clause 5.10A. Details of test method for UEs supporting E-DCH can be found in TS 134 121-1 [2], clause 5.10B.

#### 5.3.11.1.2 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.

#### 5.3.11.1.2A Procedure for UEs supporting HSDPA and/or E-DCH

Details of procedure for UEs supporting HSDPA can be found in TS 134 121-1 [2], clause 5.10A. Details of test method for UEs supporting E-DCH can be found in TS 134 121-1 [2], clause 5.10B.

#### 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.

## 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)**

<b>Harmonized Standard EN 301 908-2</b>						
The following requirements and test specifications are relevant to the presumption of conformity under the article 3.2 of the R&TTE Directive						
<b>Requirement</b>			<b>Requirement Conditionality</b>		<b>Test Specification</b>	
<b>No</b>	<b>Description</b>	<b>Reference: Clause No</b>	<b>U/C</b>	<b>Condition</b>	<b>E/O</b>	<b>Reference: Clause No</b>
1	Transmitter maximum output power	4.2.2	U		E	5.3.1
2	Transmitter spectrum emission mask	4.2.3	U		E	5.3.2
3	Transmitter spurious emissions	4.2.4	U		E	5.3.3
4	Transmitter minimum output power	4.2.5	U		E	5.3.4
5	Receiver Adjacent Channel Selectivity (ACS)	4.2.6	U		E	5.3.5
6	Receiver blocking characteristics	4.2.7	U		E	5.3.6
7	Receiver spurious response	4.2.8	U		E	5.3.7
8	Receiver Intermodulation characteristics	4.2.9	U		E	5.3.8
9	Receiver spurious emissions	4.2.10	U		E	5.3.9

Harmonized Standard EN 301 908-2						
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
10	Out-of-synchronization handling of output power	4.2.11	U		E	5.3.10
11	Transmitter adjacent channel leakage power ratio	4.2.12	U		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 specifies the environmental profile of the UE.

#### B.1.2 Temperature

The UE should 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 [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 the requirements in the full voltage range, i.e. the voltage range between the extreme voltages.

The supplier 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
Regulated lead acid battery	0,9 × nominal	1,3 × nominal	1,1 × nominal
Non regulated batteries:			
Leclanché	0,85 × nominal	nominal	nominal
Lithium	0,95 × nominal	1,1 × nominal	1,1 × nominal
Mercury/nickel and 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

- 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.
- 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.

---

## History

<b>Document history</b>			
V1.1.1	January 2002	Publication	
V2.2.1	October 2003	Publication	
V3.2.1	May 2007	Publication	
V4.2.1	March 2010	Publication	
V5.1.1	October 2010	Public Enquiry	PE 20110224: 2010-10-27 to 2011-02-24
V5.2.1	May 2011	Vote	V 20110702: 2011-05-03 to 2011-07-04