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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Base Stations (BS) and User Equipment (UE) for  
IMT-2000 Third Generation cellular networks;  
Part 7: Harmonized standard for IMT-2000,  
CDMA TDD (UTRA TDD) (BS)  
covering essential requirements of  
article 3.2 of the R&TTE Directive**

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**Reference**

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## Foreword

This Candidate Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

The present document is part 7 of a multi-part deliverable covering the Base Stations (BS) and User Equipment (UE) for IMT-2000 Third-Generation cellular networks, as identified below:

- Part 1: "Harmonized standard for IMT-2000, Introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 2: "Harmonized standard for IMT-2000, CDMA Direct Spread (UTRA FDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 3: "Harmonized standard for IMT-2000, CDMA Direct Spread (UTRA FDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 4: "Harmonized standard for IMT-2000, CDMA Multi-Carrier (cdma2000) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 5: "Harmonized standard for IMT-2000, CDMA Multi-Carrier (cdma2000) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 6: "Harmonized standard for IMT-2000, CDMA TDD (UTRA TDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 7: "Harmonized standard for IMT-2000, CDMA TDD (UTRA TDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";**
- Part 8: "Harmonized standard for IMT-2000, TDMA Single-Carrier (UWC 136) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 9: "Harmonized standard for IMT-2000, TDMA Single-Carrier (UWC 136) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 10: "Harmonized standard for IMT-2000 FDMA/TDMA (DECT) covering essential requirements of article 3.2 of the R&TTE Directive".

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [1] 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 ("the R&TTE Directive").

<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 designed to fit in a modular structure to cover all radio and telecommunications terminal equipment under the R&TTE Directive [1]. Each standard is a module in the structure. The modular structure is shown in figure 1.

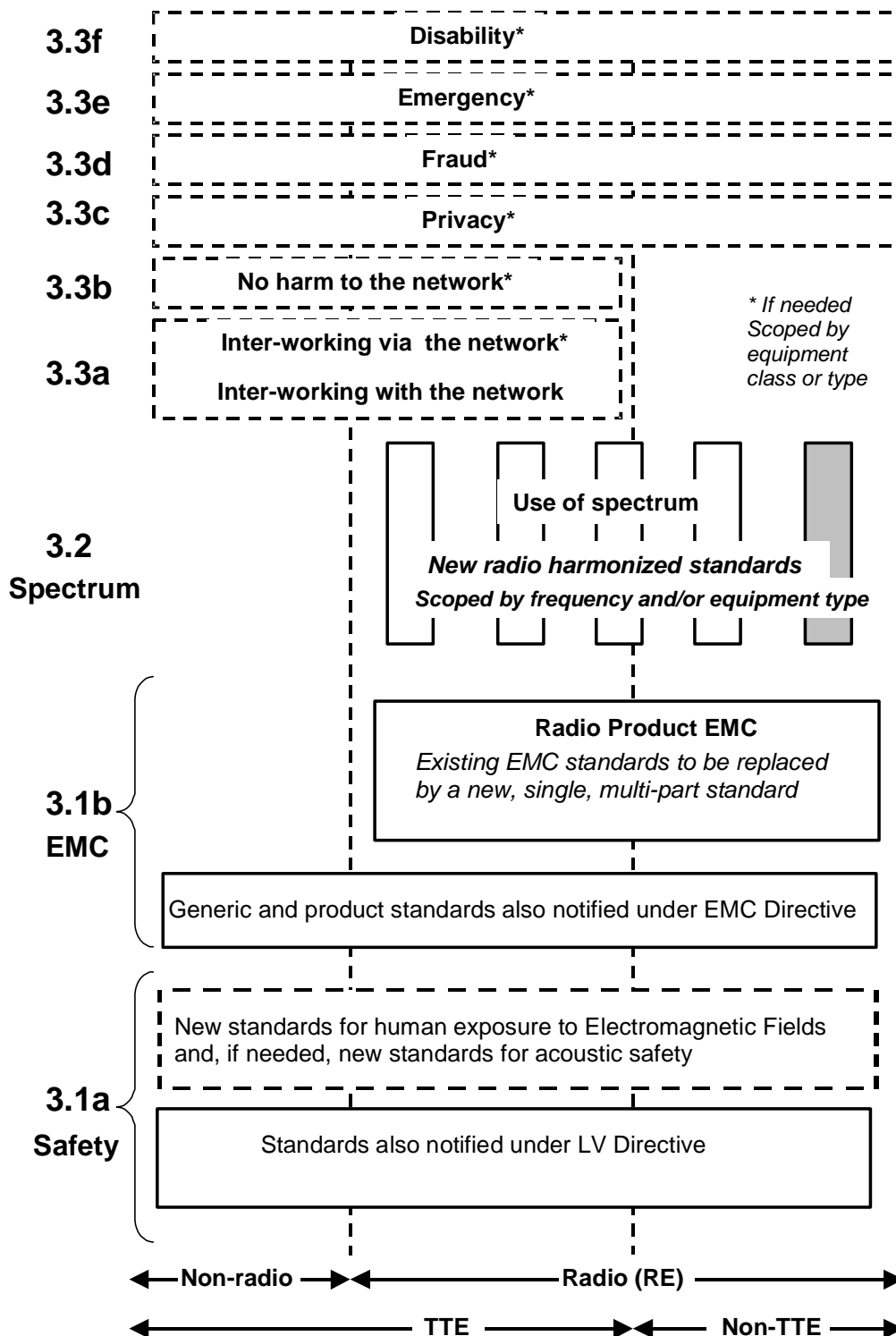


Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]

The left hand edge of the figure 1 shows the different clauses of article 3 of the R&TTE Directive [1].

For article 3.3 various horizontal boxes are shown. Dotted lines indicate that at the time of publication of the present document essential requirements in these areas have to be adopted by the Commission. If such essential requirements are adopted, and as far and as long as they are applicable, they will justify individual standards whose scope is likely to be specified by function or interface type.

The vertical boxes show the standards under article 3.2 for the use of the radio spectrum by radio equipment. The scopes of these standards are specified either by frequency (normally in the case where frequency bands are harmonized) or by radio equipment type.

For article 3.1b the diagram shows EN 301 489 [8], the multi-part product EMC standard for radio, and the existing collection of generic and product standards currently used under the EMC Directive [2].

For article 3.1a the diagram shows the existing safety standards currently used under the LV Directive [3] and new standards covering human exposure to electromagnetic fields. New standards covering acoustic safety may also be required.

The bottom of the figure shows the relationship of the standards to radio equipment and telecommunications terminal equipment. A particular equipment may be radio equipment, telecommunications terminal equipment or both. A radio spectrum standard will apply if it is radio equipment. An article 3.3 standard will apply as well only if the relevant essential requirement under the R&TTE Directive [1] is adopted by the Commission and if the equipment in question is covered by the scope of the corresponding standard. Thus, depending on the nature of the equipment, the essential requirements under the R&TTE Directive [1] may be covered in a set of standards.

The modularity principle has been taken because:

- it minimizes the number of standards needed. Because equipment may, in fact, have multiple interfaces and functions it is not practicable to produce a single standard for each possible combination of functions that may occur in an equipment;
- it provides scope for standards to be added:
  - under article 3.2 when new frequency bands are agreed; or
  - under article 3.3 should the Commission take the necessary decisions;without requiring alteration of standards that are already published,
- it clarifies, simplifies and promotes the usage of Harmonized Standards as the relevant means of conformity assessment.

The product specifications upon which this multi-part deliverable is based, differ in presentation, and this is reflected in the present document.



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# 1 Scope

The present document applies to the following radio equipment type:

- Base stations for IMT-2000 CDMA TDD (UTRA 3,84 Mcps TDD).

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

**Table 1: CDMA TDD base station frequency bands**

Direction of transmission	CDMA TDD base station frequency bands
Transmit and Receive	1 900 MHz to 1920 MHz
Transmit and Receive	2 010 MHz to 2025 MHz

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (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 will 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/>.

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# 2 References

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

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] 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).
- [2] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).
- [3] Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).
- [4] ETSI TR 100 028-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".
- [5] ETS TS 125 105 V3.5.0 (2000-12): "Universal Mobile Telecommunications System (UMTS); UE Radio Transmission and Reception (FDD) (3GPP TS 25.101 version 3.5.0 Release 1999)".
- [6] ETSI TS 125 142 V3.4.0 (2000-12): "Universal Mobile Telecommunications System (UMTS); Base station conformance testing (TDD) (3GPP TS 125 142 version 3.4.0 Release 1999)".
- [7] ITU-R Recommendation SM.329-8: "Spurious emissions".
- [8] ETSI EN 301 489: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1], and the following apply.

**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.

**power setting:** value of the control signal, which determines the desired transmitter, output Power  
Typically, the power setting would be altered in response to power control commands.

**maximum power setting:** highest value of the Power control setting which can be used

**maximum output power:** this refers to the measure of power when averaged over the transmit timeslot at the maximum power setting

**average Power:** average transmitter output power obtained over any specified time interval, including periods with no transmission

**maximum average power:** The average transmitter output power obtained over any specified time interval, including periods with no transmission, when the transmit time slots are at the maximum power setting.

### 3.2 Symbols

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

$\alpha$	roll-off factor
$\frac{DPCH_{o-E_c}}{I_{or}}$	The ratio of the average transmit energy per PN chip for the $DPCH_o$ to the total transmit power

### 3.3 Abbreviations

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

3GPP	3rd Generation Partnership Project
ACIR	Adjacent Channel Interference Ratio
ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
B	appropriate frequency in the Bottom of the operating frequency band of the BS: 'RF channel'
BER	Bit Error Ratio
BS	Base Station
CW	Continuous Wave (unmodulated signal)
dB	decibel
dBm	decibel relative to 1 milliWatt
DL	Down Link (forward link)
$DPCH_o$	A mechanism used to simulate an individual intracell interferer in the cell with one code and a spreading factor of 16 spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
EIRP	Effective Isotropic Radiated Power
EMC	Electro-Magnetic Compatibility
EVM	Error Vector Magnitude
F	Frequency (of the assigned channel frequency of the wanted signal)
FDD	Frequency Division Duplexing
FER	Frame Error Rate
$F_{uw}$	Frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal
IMT-2000	International Mobile Telecommunications 2000

$I_{oc}$	power spectral density of a band limited white noise source (simulating interference form other cells) as measured at the BS antenna connector.
$\hat{I}_{or}$	received power spectral density of all users in the cell in one timeslot as measured at the BS antenna connector
IPR	Intellectual Property Rights
LV	Low Voltage
M	appropriate frequency in the Middle of the operating frequency band of the BS: 'RF channel'
MS	Mobile station
P	Transmit power
Pmax	Maximum output power of the base station; defined as the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition
Pout	Output power of the base station; defined as the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter during one slot
PPM	Parts Per Million
PRAT	Rated output power of the base station; defined as the mean power level per carrier over an active timeslot that the manufacturer has declared to be available at the antenna connector
R&TTE	Radio and Telecommunications Terminal Equipment
RBER	Residual BER
RE	Radio Equipment
REFSENS	REFerence SENSitivity level
RMS	Root-Mean Square
RRC	Root-Raised Cosine
RSSI	Received Signal Strength Indicator
SIR	Signal to Interference Ratio
T	appropriate frequency in the Top of the operating frequency band of the BS: 'RF channel'
$T_C$	Chip duration
TDD	Time Division Duplexing
TPC	Transmit Power Control
TS	Time Slot
TTE	Telecommunications Terminal Equipment
UE	User Equipment
UL	Up Link (reverse link)
UTRA	UMTS Terrestrial Radio Access

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## 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 required operational environmental profile.

For guidance on how a supplier can declare the environmental profile see annex B.

### 4.2 Conformance requirements

#### 4.2.1 Introduction

To meet the essential requirement under article 3.2 of the R&TTE Directive [1] for IMT-2000 base stations (BS) seven essential parameters have been identified. Table 2 provides a cross reference between these essential parameters and the corresponding technical requirements for equipment within the scope of the present document.

To fulfill an essential parameter the compliance with all the corresponding technical requirements in table 2 must be verified.

**Table 2: Cross references**

Essential parameter	Corresponding technical requirements
Spectrum emissions mask	4.2.2 Spectrum emission mask
	4.2.3 Transmitter adjacent channel leakage power ratio (ACLR)
Conducted spurious emissions from the transmitter antenna connector	4.2.4 Transmitter spurious emissions
Accuracy of maximum output power	4.2.5 Base station maximum output power
Intermodulation attenuation of the transmitter	4.2.6 Transmit intermodulation
Conducted spurious emissions from the receiver antenna connector	4.2.7 Receiver spurious emissions
Impact of interference on receiver performance	4.2.8 Receiver blocking characteristics
	4.2.9 Receiver intermodulation characteristics
Receiver adjacent channel selectivity	4.2.10 Receiver adjacent channel selectivity (ACS)

## 4.2.2 Spectrum emission mask

### 4.2.2.1 Definition

Spectrum emission mask defines an out of band emission requirement for the base station transmitter. These out of band emissions are unwanted emissions outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions.

The spectrum emission mask specifies the limit of the transmitter out of band emissions at frequency offsets from the assigned channel frequency of the wanted signal between 2,5 MHz and 12,5 MHz.

### 4.2.2.2 Limits

The requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 3 to 6 in the frequency range of  $f_{\text{offset}}$  from 2,515 MHz to  $f_{\text{offset}_{\text{max}}}$  from the carrier frequency, where:

- $f_{\text{offset}}$  is the separation between the carrier frequency and the centre of the measurement filter;
- $f_{\text{offset}_{\text{max}}}$  is either 12,5 MHz or the offset to the UMTS Tx band edge (UL and DL transmission in the following bands: 1900-1920MHz and 2010-2025MHz), whichever is the greater.

The spectrum emissions measured according to clause 5.3.1.1.2 shall not exceed the maximum level specified in tables 3 to 6 for the appropriate BS rated output power.

**Table 3: Test Requirements for spectrum emission mask values,  
BS rated output power PRAT  $\geq$  43 dBm**

Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2,515 \text{ MHz} \leq f_{\text{offset}} < 2,715 \text{ MHz}$	-12,5 dBm	30 kHz
$2,715 \text{ MHz} \leq f_{\text{offset}} < 3,515 \text{ MHz}$	$-12,5 - 15 \times (f_{\text{offset}} - 2,715)$ dBm	30 kHz
$3,515 \text{ MHz} \leq f_{\text{offset}} < 4,0 \text{ MHz}$	-24,5 dBm	30 kHz
$4,0 \text{ MHz} \leq f_{\text{offset}} < 8,0 \text{ MHz}$	-11,5 dBm	1 MHz
$8,0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$	-11,5 dBm	1 MHz

**Table 4: Test Requirements for spectrum emission mask values,  
BS rated output power  $39 \leq \text{PRAT} < 43$  dBm**

Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2,515 \text{ MHz} \leq f_{\text{offset}} < 2,715 \text{ MHz}$	-12,5 dBm	30 kHz
$2,715 \text{ MHz} \leq f_{\text{offset}} < 3,515 \text{ MHz}$	$-12,5 - 15 \times (f_{\text{offset}} - 2,715) \text{ dBm}$	30 kHz
$3,515 \text{ MHz} \leq f_{\text{offset}} < 4,0 \text{ MHz}$	-24,5 dBm	30 kHz
$4,0 \text{ MHz} \leq f_{\text{offset}} < 8,0 \text{ MHz}$	-11,5 dBm	1 MHz
$8,0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}}_{\text{max}}$	$P - 54,5 \text{ dBm}$	1 MHz

**Table 5: Test Requirements for spectrum emission mask values,  
BS rated output power  $31 \leq \text{PRAT} < 39$  dBm**

Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2,515 \text{ MHz} \leq f_{\text{offset}} < 2,715 \text{ MHz}$	$P - 51,5 \text{ dBm}$	30 kHz
$2,715 \text{ MHz} \leq f_{\text{offset}} < 3,515 \text{ MHz}$	$P - 51,5 - 15 \times (f_{\text{offset}} - 2,715) \text{ dBm}$	30 kHz
$3,515 \text{ MHz} \leq f_{\text{offset}} < 4,0 \text{ MHz}$	$P - 63,5 \text{ dBm}$	30 kHz
$4,0 \text{ MHz} \leq f_{\text{offset}} < 8,0 \text{ MHz}$	$P - 50,5 \text{ dBm}$	1 MHz
$8,0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}}_{\text{max}}$	$P - 54,5 \text{ dBm}$	1 MHz

**Table 6: Test Requirements for spectrum emission mask values,  
BS rated output power  $\text{PRAT} < 31$  dBm**

Frequency offset of measurement filter centre frequency, $f_{\text{offset}}$	Maximum level	Measurement bandwidth
$2,515 \text{ MHz} \leq f_{\text{offset}} < 2,715 \text{ MHz}$	-20,5 dBm	30 kHz
$2,715 \text{ MHz} \leq f_{\text{offset}} < 3,515 \text{ MHz}$	$-20,5 - 15 \times (f_{\text{offset}} - 2,715) \text{ dBm}$	30kHz
$3,515 \text{ MHz} \leq f_{\text{offset}} < 4,0 \text{ MHz}$	-32,5 dBm	30 kHz
$4,0 \text{ MHz} \leq f_{\text{offset}} < 8,0 \text{ MHz}$	-19,5 dBm	1 MHz
$8,0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}}_{\text{max}}$	-23,5 dBm	1 MHz

#### 4.2.2.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

### 4.2.3 Transmitter adjacent channel leakage power ratio

#### 4.2.3.1 Definition

Transmitter adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured in an adjacent channel. ACLR is also an 'out of band emission' requirement, see clause 4.2.2. Both the transmitted and the adjacent channel power are measured through a matched filter (root raised cosine and roll-off 0,22) with a noise power bandwidth equal to the chip rate. The requirements shall apply for all configurations of BS (single carrier or multi-carrier), and for all operating modes foreseen by the manufacturer's specification.

The requirements in this clause shall apply to base stations intended for general-purpose applications.

#### 4.2.3.2 Limits

The ACLR shall be equal to or greater than the limits given in table 7.

**Table 7: BS ACLR limits**

<b>BS adjacent channel offset</b>	<b>ACLR limit</b>
$\pm 5$ MHz	44,2 dB
$\pm 10$ MHz	54,2 dB

### 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

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. This is measured at the base station RF output port.

Unless otherwise stated, all requirements are measured as mean power.

### 4.2.4.2 Limits

The requirements in this clause shall apply to base stations intended for general-purpose applications.

#### 4.2.4.2.1 General requirements

The requirements of clause 4.2.4.2.1.1 shall apply whatever the type of transmitter considered (single carrier or multi-carrier). It applies for all transmission modes foreseen by the manufacturer.

Either requirement applies at frequencies within the specified frequency ranges which are more than 12,5 MHz under the first carrier frequency used or more than 12,5 MHz above the last carrier frequency used.

##### 4.2.4.2.1.1 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [7], are applied.

The power of any spurious emission shall not exceed the maximum levels given in table 8.

**Table 8: BS Mandatory spurious emissions limits, Category B**

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-36 dBm	1 kHz	note 1
150 kHz – 30 MHz	-36 dBm	10 kHz	note 1
30 MHz – 1 GHz	-36 dBm	100 kHz	note 1
1 GHz – Fc1 - 60 MHz or FI - 10 MHz <i>whichever is the higher</i>	-30 dBm	1 MHz	note 1
Fc1 - 60 MHz or FI - 10 MHz <i>whichever is the higher</i> – Fc1 - 50 MHz or FI -10 MHz <i>whichever is the higher</i>	-25 dBm	1 MHz	note 2
Fc1 - 50 MHz or FI -10 MHz <i>whichever is the higher</i> – Fc2 + 50 MHz or Fu +10 MHz <i>whichever is the lower</i>	-15 dBm	1 MHz	note 2
Fc2 + 50 MHz or Fu + 10 MHz <i>whichever is the lower</i> – Fc2 + 60 MHz or Fu + 10 MHz <i>whichever is the lower</i>	-25 dBm	1 MHz	note 2
Fc2 + 60 MHz or Fu + 10 MHz <i>whichever is the lower</i> – 12,5 GHz	-30 dBm	1 MHz	notes 1 and 3
NOTE 1: Bandwidth as in ITU-R SM.329-8 [7], s4.1. NOTE 2: Specification in accordance with ITU-R SM.329-8 [7], s4.1. NOTE 3: Upper frequency as in ITU-R SM.329-8 [7], s2.5 (table 1). Fc1: Center frequency of emission of the first carrier transmitted by the BS. Fc2: Center frequency of emission of the last carrier transmitted by the BS. FI: Lower frequency of the band in which TDD operates. Fu: Upper frequency of the band in which TDD operates.			

#### 4.2.4.2.2 Co-existence with GSM

This requirement shall be applied for the protection of GSM 900 MS. The power of any spurious emission shall not exceed the maximum level given in table 9.

**Table 9: BS Spurious emissions limits for protection of GSM 900 MS receiver**

Band	Maximum level	Measurement bandwidth
921 MHz to 960 MHz	-57 dBm	100 kHz

#### 4.2.4.2.3 Co-existence with DCS 1800

This requirement shall be applied for the protection of DCS 1800 MS. The power of any spurious emission shall not exceed the maximum level given in table 10.

**Table 10: BS Spurious emissions limits for protection of of DCS 1800 MS receiver**

Band	Maximum level	Measurement bandwidth
1805 MHz to 1880 MHz	-47 dBm	100 kHz

#### 4.2.4.2.4 Co-existence with UTRA FDD

This requirement shall be applied for protection of UTRA FDD. The power of any spurious emission shall not exceed the maximum level given in table 11.

**Table 11: BS Spurious emissions limits for protection of UTRA FDD receiver**

Band	Maximum Level	Measurement Bandwidth
1920 MHz to 1980 MHz	-32 dBm	1 MHz
2110 MHz to 2170 MHz	-52 dBm	1 MHz

#### 4.2.4.3 Conformance

Conformance tests described in clause 5.3.3 shall be carried out.

### 4.2.5 Base station maximum output power

#### 4.2.5.1 Definition

Maximum output power,  $P_{max}$ , of the base station is the mean power level per carrier over an active timeslot measured at the antenna connector for a specified reference condition.

The base station maximum output power is determined relative to the 'rated output power':

- Rated output power, PRAT, of the base station is the mean power level per carrier over an active timeslot that the manufacturer has declared to be available at the antenna connector.

#### 4.2.5.2 Limits

The requirements in this clause shall apply to base stations intended for general-purpose applications.

In normal conditions, the measured output power, derived according to clause 5.3.4.1.2, shall remain within +2,7 dB and -2,7 dB of the manufacturer's rated output power.

In extreme conditions, the measured output power, derived according to clause 5.3.4.1.2, shall remain within +3,2 dB and -3,2 dB of the manufacturer's rated output power.

#### 4.2.5.3 Conformance

Conformance tests described in clause 5.3.4 shall be carried out.

### 4.2.6 Transmit intermodulation

#### 4.2.6.1 Definition

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

#### 4.2.6.2 Limits

The transmit intermodulation level is the power of the intermodulation products when a CDMA modulated interference signal is injected into the antenna connector at a level of 30 dB lower than that of the subject signal. The frequency of the interference signal shall be  $\pm 5$  MHz,  $\pm 10$  MHz and  $\pm 15$  MHz offset from the subject signal.

The requirements in this clause shall apply to base stations intended for general-purpose applications.

The transmit intermodulation level shall not exceed the spectrum emission mask or transmitter adjacent channel leakage power ratio or the transmitter spurious emission requirements of clauses 4.2.2.2, 4.2.3.2 and 4.2.4.2, respectively.



### 4.2.6.3 Conformance

Conformance tests described in clause 5.3.5 shall be carried out.

## 4.2.7 Receiver spurious emissions

### 4.2.7.1 Definition

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS antenna connector. The requirements apply to all BS with separate RX and TX antenna port. The test shall be performed when both TX and RX are on with the TX port terminated.

For BS equipped with only a single antenna connector for both transmitter and receiver, the requirements of clause 4.2.4 Transmitter spurious emissions shall apply to this port, and this test need not be performed.

The requirements in this clause shall apply to base stations intended for general-purpose applications.

### 4.2.7.2 Limits

The power of any spurious emission shall not exceed the values given in table 12.

**Table 12: Receiver spurious emission requirements**

Band	Maximum level	Measurement Bandwidth	Note
30 MHz to 1 GHz	-57 dBm	100 kHz	-
1 GHz to 1,9 GHz	-47 dBm	1 MHz	note
1,900 GHz to 1,980 GHz	-78 dBm	3,84 MHz	note
1,980 GHz to 2,010 GHz	-47 dBm	1 MHz	note
2,010 GHz to 2,025 GHz	-78 dBm	3,84 MHz	note
2,025 GHz to 12,75 GHz	-47 dBm	1 MHz	note

NOTE: 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 BS

### 4.2.7.3 Conformance

Conformance tests described in clause 5.3.6 shall be carried out.

## 4.2.8 Receiver blocking characteristics

### 4.2.8.1 Definition

The blocking characteristics 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 adjacent channels.

### 4.2.8.2 Limits

The blocking performance shall apply at all frequencies as specified in table 13 using a 1 MHz step size.

The requirements in this clause shall apply to base stations intended for general-purpose applications.

Using the UL reference measurement channel (12,2 kbps) defined in TS 125 105 annex A [5] the BER shall not exceed 0,001 when the BS is receiving at the reference sensitivity level of  $-109\text{dBm}$  (=REFSENS). This static reference performance shall be met with a wanted and an interfering signal coupled to the BS antenna input using the parameters specified in table 13.

**Table 13: Blocking requirements**

Center frequency of interfering signal	Interfering signal level	Wanted signal level	Minimum offset of interfering signal	Type of interfering signal
1 900 MHz to 1 920 MHz, 2 010 MHz to 2 025 MHz	-40 dBm	REFSENS + 6 dB	10 MHz	WCDMA signal with one code
1 880 MHz to 1 900 MHz, 1 990 MHz to 2 010 MHz, 2 025 MHz to 2 045 MHz	-40 dBm	REFSENS + 6 dB	10 MHz	WCDMA signal with one code
1 920 MHz to 1 980 MHz	-40 dBm	REFSENS + 6 dB	10 MHz	WCDMA signal with one code
1 MHz to 1 880 MHz, 1 980 MHz to 1 990 MHz, 2 045 MHz to 12 750 MHz	-15 dBm	REFSENS + 6 dB	—	CW carrier

### 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 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.

The requirements in this clause shall apply to base stations intended for general-purpose applications.

### 4.2.9.2 Limits

Using the UL reference measurement channel (12,2 kbps) defined in TS 125 105 annex A [5] the BER shall not exceed 0,001 when the BS is receiving at the reference sensitivity level of  $-109\text{dBm}$  (=REFSENS). This static reference performance shall be met when the following signals are coupled to the BS antenna input.

- A wanted signal at the assigned channel frequency, 6 dB above the static reference level.
- Two interfering signals with the parameters specified in table 14.

**Table 14: Parameters of the interfering signals for intermodulation characteristics testing**

Interfering Signal Level	Offset	Type of Interfering Signal
- 48 dBm	10 MHz	CW signal
- 48 dBm	20 MHz	WCDMA signal with one code

The BER shall not exceed 0,001.

### 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 center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

#### 4.2.10.2 Limits

The requirements in this clause shall apply to base stations intended for general-purpose applications.

The BER, measured on the wanted signal in the presence of an interfering signal, shall not exceed 0,001 for the parameters specified in table 15.

**Table 15: Parameters of the wanted signal and the interfering signal for ACS testing**

Parameter	Level	Unit
Data rate	12,2	kbit/s
Wanted signal	Reference sensitivity level + 6 dB	dBm
Interfering signal	-52	dBm
$F_{uw}$ (modulated)	5	MHz
NOTE: $F_{uw}$ is the frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal.		

#### 4.2.10.3 Conformance

Conformance tests described in clause 5.3.9 shall be carried out.

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## 5 Testing for compliance with technical requirements

### 5.1 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 conditions 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 125 142 [6], clause 5.9.

Many tests in TS 125 142 [6] are performed with appropriate frequencies in the bottom, middle and top of the operating frequency band of the BS. These are denoted as RF channels B (bottom), M (middle) and T (top).

### 5.2 Interpretation of the measurement results

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

- the measured value related to the corresponding limit will be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in table 16.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with ETR 028 [4] and shall correspond to an expansion factor (coverage factor)  $k = 1,96$  (which provide a confidence level of 95 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 16 is based on such an expansion factor.

**Table 16: Maximum measurement uncertainty of the test system**

Parameter	Conditions	Uncertainty
5.3.1 Spectrum emission mask	-	$\pm 1,5$ dB
5.3.2 Transmitter adjacent channel leakage power ratio (ACLR)	5 MHz offset 10 MHz offset	$\pm 0,8$ dB $\pm 0,8$ dB
5.3.3 Transmitter spurious emissions	for BS and coexistence bands:  outside above: $f \leq 2.2$ GHz $2.2 \text{ GHz} < f \leq 4 \text{ GHz}$ $4 \text{ GHz} < f$	$\pm 2,0$ dB  $\pm 1,5$ dB $\pm 2,0$ dB $\pm 4,0$ dB
5.3.4 Base station maximum output power	-	$\pm 0,7$ dB
5.3.5 Transmit intermodulation	spectrum emission mask: ACLR: spurious emission (Category B):  Outside above: $f \leq 2,2 \text{ GHz}$ : $2,2 \text{ GHz} < f \leq 4 \text{ GHz}$ : $4 \text{ GHz} < f$ :	$\pm 2,5$ dB $\pm 2,2$ dB $\pm 2,8$ dB  $\pm 2,5$ dB $\pm 2,8$ dB $\pm 4,5$ dB
5.3.6 Receiver spurious emissions	For BS receive band (-78dBm): Outside BS receive band: $f \leq 2,2 \text{ GHz}$ : $2,2 \text{ GHz} < f \leq 4 \text{ GHz}$ : $4 \text{ GHz} < f$ :	$\pm 3,0$ dB  $\pm 2,0$ dB $\pm 2,0$ dB $\pm 4,0$ dB
5.3.7 Receiver blocking characteristics	System error for: foffset < 15 MHz:  foffset $\geq$ 15 MHz: $f \leq 2,2 \text{ GHz}$ : $2,2 \text{ GHz} < f \leq 4 \text{ GHz}$ : $4 \text{ GHz} < f$ :	$\pm 1,4$ dB  $\pm 1,0$ dB $\pm 1,7$ dB $\pm 3,1$ dB
5.3.8 Receiver intermodulation characteristics	-	$\pm 0,75$ dB
5.3.9 Receiver adjacent channel selectivity (ACS)	-	$\pm 1,1$ dB

NOTE 1: For RF tests it should be noted that the uncertainties in table 16 apply to the Test System operating into a nominal 50 ohm load and do not include system effects due to mismatch between the EUT and the Test System.

NOTE 2: Annex G of TR 100 028-2 [9] provides guidance for the calculation of the uncertainty components relating to mismatch.

NOTE 3: If the Test System for a test is known to have a measurement uncertainty greater than that specified in table 16, 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 16 is 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 16 does not increase the probability of passing a EUT that would otherwise have failed a test if a Test System compliant with table 16 had been used.

## 5.3 Essential radio test suites

### 5.3.1 Spectrum emission mask

#### 5.3.1.1 Method of test

##### 5.3.1.1.1 Initial conditions

Test environment: normal; see TS 125 142 clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

- (1) Connect the measuring equipment to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 17.

**Table 17: Parameters of the BS transmitted signal for spectrum emission mask testing**

Parameter	Value/description
TDD Duty Cycle	TS $i$ ; $i = 0, 1, 2, \dots, 14$ : transmit, if $i$ is even; receive, if $i$ is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

##### 5.3.1.1.2 Procedure

Measure the power of the BS spectrum emissions by applying measurement filters with bandwidths as specified in the relevant table in clause 4.2.2.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be stepped in contiguous steps over the ranges of offsets  $f_{\text{offset}}$  as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

For frequency offsets of the measurement filter centre frequency in the range  $4,0 \text{ MHz} \leq f_{\text{offset}} < f_{\text{offset}_{\text{max}}}$ , the measurement shall be performed by applying filters with measurement bandwidth of 50 kHz or less and integrating the measured results over the nominal measurement bandwidth 1 MHz.

##### 5.3.1.2 Test requirements

The spectrum emissions measured according to clause 5.3.1.1.2 shall not exceed the maximum level specified in tables 3 to 6 for the appropriate BS rated output power table of clause 4.2.2.2.

## 5.3.2 Transmitter adjacent channel leakage power ratio

### 5.3.2.1 Method of test

#### 5.3.2.1.1 Initial conditions

Test environment: normal; see TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

- (1) Connect the measuring equipment to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 18.

**Table 18: Parameters of the BS transmitted signal for ACLR testing**

Parameter	Value/description
TDD Duty Cycle	TS $i$ ; $i = 0, 1, 2, \dots, 14$ : transmit, if $i$ is even; receive, if $i$ is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	Real life (sufficient irregular)

### 5.3.2.1.2 Procedure

- (1) Measure transmitted power over the 2464 active chips of the even time slots TS  $i$  (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off  $\alpha = 0,22$  and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken at the decision points. (The global in-channel Tx test described in TS 125 142 annex C [6] may be applied.)
- (2) Average over the number of time slots defined in TS 125 142 [6].
- (3) Measure interference power at the first lower adjacent RF channel (center frequency 5 MHz below the assigned channel frequency of the transmitted signal) over the useful part of the burst within the even time slots TS  $i$  (this excludes the guard period), and with a measurement filter that has a RRC filter response with a roll off  $\alpha = 0,22$  and a bandwidth equal to the chip rate. The power is determined by calculating the RMS value of the signal samples at the measurement filter output taken with adherence to the sampling theorem.
- (4) Average over the number of time slots defined in TS 125 142 [6].
- (5) Calculate the ACLR by the ratio
 
$$\text{ACLR} = \text{transmitted power acc. to (2)} / \text{interference power acc. to (4)}.$$
- (6) Repeat steps (3), (4) and (5) for the second lower adjacent RF channel (center frequency 10 MHz below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (center frequency 5 MHz and 10 MHz above the assigned channel frequency of the transmitted signal, respectively).

### 5.3.2.2 Test requirements

The ACLR calculated in step (5) of clause 5.3.2.1.2 shall be equal or greater than the limits given in table 7.

## 5.3.3 Transmitter spurious emissions

### 5.3.3.1 Method of test

#### 5.3.3.1.1 Initial conditions

Test environment: normal; see TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

- (1) Connect the measuring equipment to the antenna connector of the BS under test.
- (2) Set the parameters of the BS transmitted signal according to table 19.

**Table 19: Parameters of the BS transmitted signal for spurious emissions testing**

Parameter	Value/description
TDD Duty Cycle	TS $i$ ; $i = 0, 1, 2, \dots, 14$ : transmit, if $i$ is even; receive, if $i$ is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

### 5.3.3.1.2 Procedure

Measure the power of the spurious emissions by applying measurement filters with bandwidths as specified in the relevant tables of clause 4.2.4.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be stepped in contiguous steps over the frequency bands as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

### 5.3.3.2 Test requirements

The spurious emissions measured according to clause 5.3.3.1.2 shall not exceed the limits specified in the relevant tables of 4.2.4.2.

## 5.3.4 Base station maximum output power

### 5.3.4.1 Method of test

#### 5.3.4.1.1 Initial conditions

Test environment: normal; see TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

In addition, on one UARFCN only, the test shall be performed under extreme power supply as defined in TS 125 142 [6] clause 5.9 [6].

NOTE: Tests under extreme power supply also test extreme temperature.

- (1) The transmitter under test and all other transmitters of the base station (if any) are switched on.
- (2) The power of the transmitters not under test (if any) are controlled down.
- (3) Connect the power measuring equipment to the BS antenna connector.
- (4) Set the parameters of the transmitted signal according to table 20.

**Table 20: Parameters of the transmitted signal for maximum output power test**

Parameter	Value/description
TDD Duty Cycle	TS $i$ ; $i = 0, 1, 2, \dots, 14$ : transmit, if $i$ is even; receive, if $i$ is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)



### 5.3.4.1.2 Procedure

- (1) Measure thermal power over the 2 464 active chips of an even time slot (this excludes the guard periods), and with a measurement bandwidth of at least 5 MHz.
- (2) Run step (1) for RF channels B/M/T.

### 5.3.4.2 Test requirements

The value of the measured output power, derived according to clause 5.3.4.1.2, shall be within the tolerance defined in clause 4.2.5.2.

## 5.3.5 Transmit intermodulation

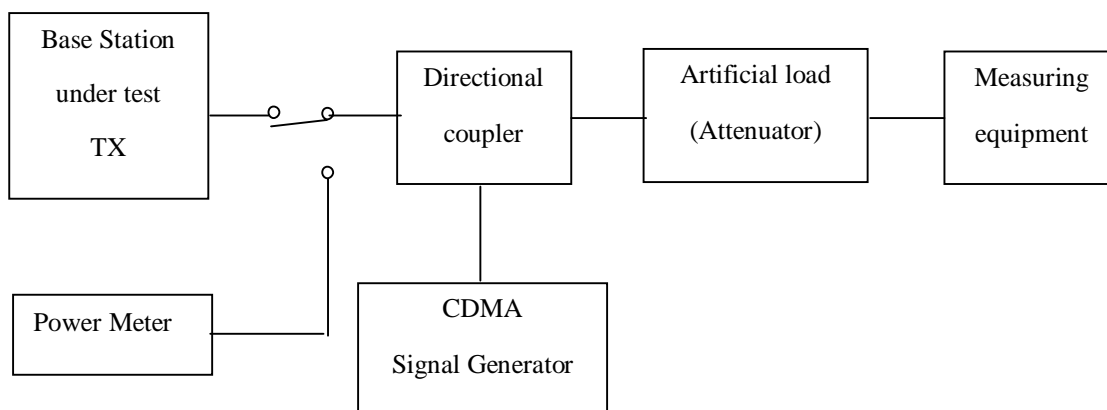
### 5.3.5.1 Method of test

#### 5.3.5.1.1 Initial conditions

Test environment: normal; see TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

- (1) Connect the measuring equipment, the BS under test and the CDMA signal generator as shown in figure 2.



**Figure 2: Measuring setup for Base Station transmit intermodulation testing**

- (2) Set the parameters of the BS transmitted signal according to table 21.

**Table 21: Parameters of the BS transmitted signal for transmit intermodulation testing**

Parameter	Value/description
TDD Duty Cycle	TS $i$ ; $i = 0, 1, 2, \dots, 14$ : transmit, if $i$ is odd; receive, if $i$ is even.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

- (3) Configure the CDMA signal generator to produce an interference signal with a level of 30 dB lower than that of the BS transmitted signal. The interference signal shall be like-modulated as the BS transmitted signal, and the active time slots of both signals shall be synchronized. The frequency of the interference signal shall be  $\pm 5$  MHz,  $\pm 10$  MHz and  $\pm 15$  MHz offset from the BS transmitted signal.

### 5.3.5.1.2 Procedure

Apply the test procedures for out of band described in clauses 5.3.1.1 and 5.3.2.1 and for transmitter spurious emissions as described in clause 5.3.3.1. The frequency band occupied by the interference signal are excluded from the measurements.

### 5.3.5.2 Test requirements

The conformance requirements for out of band as specified in clauses 4.2.2.2 and 4.2.3.2 and for transmitter spurious emissions as specified in clause 4.2.4.2 shall be met.

## 5.3.6 Receiver spurious emissions

### 5.3.6.1 Method of test

#### 5.3.6.1.1 Initial conditions

Test environment: normal; see TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: M; see clause 5.1.

- (1) Connect the measuring equipment to the antenna connector of one BS Rx port.
- (2) Terminate or disable any other BS Rx port not under test.
- (3) Set the BS receiver to operational mode.
- (4) Set the BS to transmit a signal with parameters according to table 22.
- (5) Terminate the Tx port(s).

**Table 22: Parameters of the transmitted signal for Rx spurious emissions test**

Parameter	Value/description
TDD Duty Cycle	TS $i$ ; $i = 0, 1, 2, \dots, 14$ : transmit, if $i$ is even; receive, if $i$ is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

#### 5.3.6.1.2 Procedure

- (1) Measure the power of the spurious emissions by applying the measuring equipment with the settings as specified in table 23. The characteristics of the measurement filter with the bandwidth 3,84 MHz shall be RRC with roll-off  $\alpha = 0,22$ . The characteristics of the measurement filters with bandwidths 100 kHz and 1 MHz shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filters shall be stepped in contiguous steps over the frequency bands as specified in table 23. The time duration of each step shall be sufficiently long to capture one even (transmit) time slot.
- (2) If the BS is equipped with more than one Rx port, interchange the connections of the BS Rx ports and repeat the measurement according to (1).

Table 23: Measurement equipment settings

Stepped frequency range	Measurement bandwidth	Step width	Note	Detection mode
30 MHz to 1 GHz	100 kHz	100 kHz	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 BS	true RMS
1 GHz to 1,900 GHz	1 MHz	1 MHz		
1,900 GHz to 1,980 GHz	3,84 MHz	200 kHz		
1,980 GHz to 2,010 GHz	1 MHz	1 MHz		
2,010 GHz to 2,025 GHz	3,84 MHz	200 kHz		
2,025 GHz to 12,75 GHz	1 MHz	1 MHz		

### 5.3.6.2 Test requirements

The receiver spurious emissions measured according to clause 5.3.6.1.2 shall not exceed the limits specified in clause 4.2.7.2.

## 5.3.7 Receiver blocking characteristics

### 5.3.7.1 Method of test

#### 5.3.7.1.1 Initial conditions

Test environment: normal; see TS 125 142 clause 5.9 [6].

RF channels to be tested: M; see clause 5.1.

The BS shall be configured to operate as close to the centre of the operating band as possible.

- (1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator to the antenna connector of one Rx port.
- (2) Terminate or disable any other Rx port not under test.
- (3) Start transmission from the BS tester to the BS using the UL reference measurement channel (12,2 kbps) defined in TS 125 105 annex A [6]. The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level of -109 dBm.

#### 5.3.7.1.2 Procedure

- (1) Set the signal generator to produce an interfering signal at a frequency offset  $F_{uw}$  from the assigned channel frequency of the wanted signal which is given by

$$F_{uw} = \pm (n \times 1 \text{ MHz}),$$

where  $n$  shall be increased in integer steps from  $n = 10$  up to such a value that the center frequency of the interfering signal covers the range from 1 MHz to 12,75 GHz. The interfering signal level measured at the antenna connector shall be set in dependency of its center frequency, as specified in table 13. The type of the interfering signal is either equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off  $\alpha = 0,22$ , or a CW signal; see table 13.

- (2) Measure the BER of the wanted signal at the BS receiver.
- (3) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) and (2).

NOTE: The test procedure as defined in steps (1) and (2) requests to carry out more than 10000 BER measurements. To reduce the time needed for these measurements, it may be appropriate to conduct the test in two phases: During phase 1, BER measurements are made on all center frequencies of the interfering signal as requested but with a reduced confidence level, with the aim to identify those frequencies which require more detailed investigation. In phase 2, detailed measurements are made only at those critical frequencies identified before, applying the required confidence level.

### 5.3.7.2 Test requirements

In all measurements made according to clause 5.3.7.1.2, the BER shall not exceed 0,001.

## 5.3.8 Receiver intermodulation characteristics

### 5.3.8.1 Method of test

#### 5.3.8.1.1 Initial conditions

Test environment: normal; see TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

- (1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and two signal generators to the antenna connector of one Rx port.
- (2) Terminate or disable any other Rx port not under test.
- (3) Start transmission from the BS tester to the BS using the UL reference measurement channel (12,2 kbps) defined in TS 125 105 annex A [6]. The level of the UE simulator signal measured at the BS antenna connector shall be set to 6 dB above the reference sensitivity level of  $-109$  dBm.
- (4) Set the first signal generator to produce a CW signal with a level measured at the BS antenna connector of  $-48$  dBm.
- (5) Set the second signal generator to produce an interfering signal equivalent to a wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off  $\alpha = 0,22$ . The level of the signal measured at the BS antenna connector shall be set to  $-48$  dBm.

#### 5.3.8.1.2 Procedure

- (1) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, above the assigned channel frequency of the wanted signal.
- (2) Measure the BER of the wanted signal at the BS receiver.
- (3) The frequency of the first and the second signal generator shall be set to 10 MHz and 20 MHz, respectively, below the assigned channel frequency of the wanted signal.
- (4) Measure the BER of the wanted signal at the BS receiver.
- (5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

### 5.3.8.2 Test requirements

The BER measured according clause 5.3.8.1.2 to shall not exceed 0,001.

## 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 TS 125 142 [6] clause 5.9 [6].

RF channels to be tested: B, M and T; see clause 5.1.

- (1) Connect an UE simulator operating at the assigned channel frequency of the wanted signal and a signal generator used to produce the interfering signal in the adjacent channel to the antenna connector of one Rx port.

- (2) Terminate or disable any other Rx port not under test.
- (3) Start transmission from the BS tester to the BS using the UL reference measurement channel (12,2 kbps) defined in TS 125 105 annex A [6]. The level of the UE simulator signal measured at the BS antenna connector shall be adjusted to the value specified in table 15.
- (4) Set the signal generator to produce an interfering signal that is equivalent to a continuous wideband CDMA signal with one code of chip frequency 3,84 Mchip/s, filtered by an RRC transmit pulse-shaping filter with roll-off  $\alpha = 0,22$ . The level of the interfering signal measured at the BS antenna connector shall be adjusted to the value specified in table 15.

#### 5.3.9.1.2 Procedure

- (1) Set the center frequency of the interfering signal to 5 MHz above the assigned channel frequency of the wanted signal.
- (2) Measure the BER of the wanted signal at the BS receiver.
- (3) Set the center frequency of the interfering signal to 5 MHz below the assigned channel frequency of the wanted signal.
- (4) Measure the BER of the wanted signal at the BS receiver.
- (5) Interchange the connections of the BS Rx ports and repeat the measurements according to steps (1) to (4).

#### 5.3.9.1.3 Test requirements

The BER measured according clause 5.3.9.1.2 to shall not exceed 0,001.

## Annex A (normative): The EN Requirements Table (EN-RT)

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the EN-RT proforma in this annex so that it can be used for its intended purposes and may further publish the completed EN-RT.

The EN Requirements Table (EN-RT) serves a number of purposes, as follows:

- it provides a tabular summary of all the requirements;
- it shows the status of each EN-R, whether it is essential to implement in all circumstances (Mandatory), or whether the requirement is dependent on the supplier having chosen to support a particular optional service or functionality (Optional). In particular it enables the EN-Rs associated with a particular optional service or functionality to be grouped and identified;
- when completed in respect of a particular equipment it provides a means to undertake the static assessment of conformity with the EN.

**Table A.1: EN Requirements Table (EN-RT)**

EN Reference		EN <xxx xxx-7>				Comment
No.	Reference	EN-R (note)	Status			
1	4.2.2	Spectrum emission mask	M			
2	4.2.3	Transmitter adjacent channel leakage power ratio	M			
3	4.2.4	Transmitter spurious emissions	M			
4	4.2.5	Base station maximum output power	M			
5	4.2.6	Transmit intermodulation	M			
6	4.2.7	Receiver spurious emissions	M			
7	4.2.8	Receiver blocking characteristics	M			
8	4.2.9	Receiver intermodulation characteristics	M			
9	4.2.10	Receiver adjacent channel selectivity	M			

NOTE: These EN-Rs are justified under article 3.2 of the R&TTE Directive.

### Key to columns:

- No** Table entry number;
- Reference** Clause reference number of conformance requirement within the present document;
- EN-R** Title of conformance requirement within the present document;
- Status** Status of the entry as follows:
- M Mandatory, shall be implemented under all circumstances;
  - O Optional, may be provided, but if provided shall be implemented in accordance with the requirements;
  - O.n this status is used for mutually exclusive or selectable options among a set. The integer "n" shall refer to a unique group of options within the EN-RT. A footnote to the EN-RT shall explicitly state what the requirement is for each numbered group. For example, "It is mandatory to support at least one of these options", or, "It is mandatory to support exactly one of these options".
- Comments** To be completed as required.

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## Annex B (informative): Environmental profile specification

The following environmental conditions may be declared by the supplier:

- barometric pressure: minimum and maximum;
- temperature: minimum and maximum;
- relative humidity: minimum and maximum;
- power supply: lower and upper voltage limit.

When operating outside the boundary limits of the declared operational environmental profile the equipment should not make ineffective use of the radio frequency spectrum so as to cause harmful interference.

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## Annex C (informative): Bibliography

EN 301 908-1 V1.1.1 (2001-01): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 1: Harmonized standard for IMT-2000, Introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive".

3GPP TR 25.942: "3rd Generation Partnership Project; Technical Specification Group Radio Access Networks; RF System scenarios (3G TR 25.942 version 2.1.3. Release 1999)".

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.



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## Annex D (informative): The EN title in the official languages

Language	EN title
Danish	
Dutch	
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 7: Harmonized standard for IMT-2000, CDMA TDD (UTRA TDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive
Finnish	
French	
German	
Greek	
Icelandic	
Italian	
Portuguese	
Spanish	
Swedish	

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## History

<b>Document history</b>			
V1.1.1	April 2001	Public Enquiry	PE 20010824: 2001-04-25 to 2001-08-24