

Final draft **ETSI EN 301 908-1** V1.1.1 (2001-11)

---

*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 1: Harmonized EN for IMT-2000, introduction and  
common requirements, covering essential requirements  
of article 3.2 of the R&TTE Directive**

---



---

Reference

DEN/ERM-TFES-001-1

---

Keywords

3G, cellular, digital, IMT-2000, mobile, radio,  
regulation, UMTS

**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, send your comment to:

[editor@etsi.fr](mailto:editor@etsi.fr)

---

**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 2001.  
All rights reserved.

# Contents

Intellectual Property Rights .....	4
Foreword.....	4
Introduction .....	6
1 Scope .....	8
2 References .....	8
3 Definitions and abbreviations.....	9
3.1 Definitions .....	9
3.2 Abbreviations .....	10
4 Technical requirements specifications .....	10
4.1 Environmental profile.....	10
4.2 Conformance requirements .....	10
4.2.1 Introduction.....	10
4.2.2 Radiated emissions (UE) .....	11
4.2.2.1 Definition .....	11
4.2.2.2 Limits .....	11
4.2.2.3 Conformance.....	11
4.2.3 Radiated emissions (BS).....	11
4.2.3.1 Definition .....	11
4.2.3.2 Limits .....	11
4.2.3.3 Conformance.....	12
4.2.4 Control and monitoring functions (UE).....	12
4.2.4.1 Definition .....	12
4.2.4.2 Limits .....	12
4.2.4.3 Conformance.....	12
5 Testing for compliance with technical requirements.....	12
5.1 Environmental conditions for testing .....	12
5.2 Interpretation of the measurement results .....	13
5.3 Essential radio test suites.....	13
5.3.1 Radiated emissions (UE) .....	13
5.3.1.1 Test method.....	13
5.3.1.2 Test configurations.....	14
5.3.2 Radiated emissions (BS).....	14
5.3.2.1 Test method.....	14
5.3.2.2 Test configurations.....	15
5.3.3 Control and monitoring functions (UE).....	15
5.3.3.1 Test method.....	15
<b>Annex A (normative): The EN Requirements Table (EN-RT) .....</b>	<b>16</b>
<b>Annex B (informative): Receiver sensitivity and correct operation of the equipment.....</b>	<b>17</b>
B.1 Receiver sensitivity .....	17
B.2 Correct functioning of the equipment.....	17
<b>Annex C (informative): Bibliography.....</b>	<b>18</b>
<b>Annex D (informative): The EN title in the official languages .....</b>	<b>19</b>
History .....	20

---

# 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://www.etsi.org/legal/home.htm>).

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 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 Vote phase of the ETSI standards Two-step Approval Procedure.

The present document is part 1 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 EN for IMT-2000, introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive";**
- Part 2: "Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 3: "Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 4: "Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 5: "Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 6: "Harmonized EN for IMT-2000, CDMA TDD (UTRA TDD) (UE) covering essential requirements of article 3.2 of the R&TTE Directive";
- Part 7: "Harmonized EN for IMT-2000, CDMA TDD (UTRA TDD) (BS) covering essential requirements of article 3.2 of the R&TTE Directive";
- 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".

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) 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").

Technical specifications relevant to Directive 1999/5/EC are given in annex A.

<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.

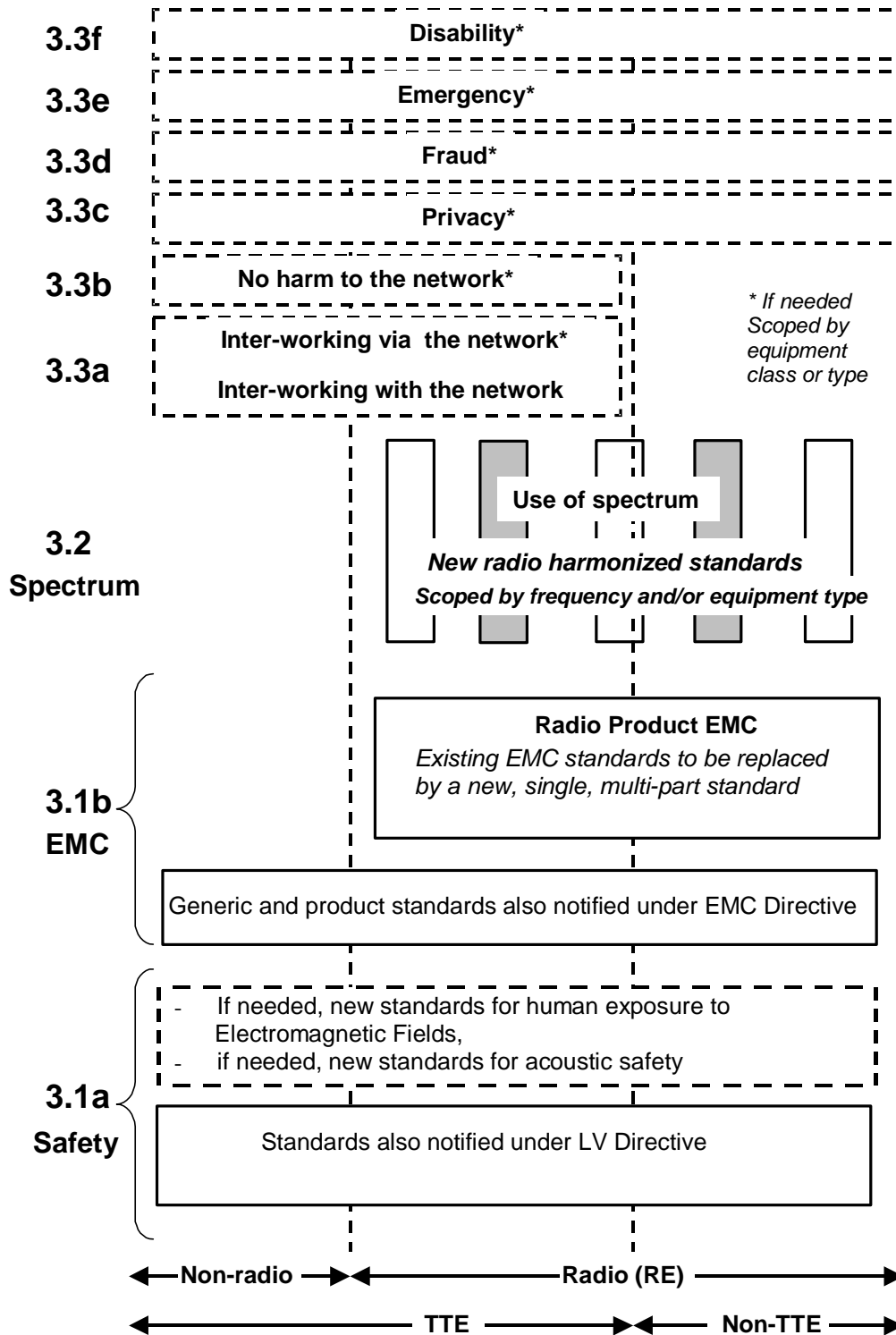


Figure 1: Modular structure for the various standards used under the R&TTE Directive

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, figure 1 shows EN 301 489 [7], 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, figure 1 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 figure 1 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 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 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 decisionswithout 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 all parts of EN 301 908 are based differ in presentation, and this is reflected in the present document.

---

# 1 Scope

The present document applies to the following radio equipment types:

User equipment and base stations for IMT-2000, except for IMT-2000 FDMA/TDMA (DECT), falling within the scope of one of the following parts of EN 301 908, and ancillary equipment which is intended to be used together with it.

NOTE 1: EN 301 908-10 contains requirements for radiated spurious emissions and control and monitoring functions applicable to IMT-2000 FDMA/TDMA (DECT) equipment.

The present document includes technical requirements which are common to equipment falling within the scope of several of the following parts.

NOTE 2: The following parts of EN 301 908, which are listed in the foreword of the present document, specify technical requirements in respect of a particular class of IMT-2000 equipment.

NOTE 3: ITU-R Recommendation M.1457 [4] defines the characteristics of the members of the IMT-2000 family by means of references to technical specifications developed by Standards Development organizations. The present document applies to equipment designed to meet any version of the specifications referenced in ITU-R Recommendation M.1457 [4].

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 [1] will apply to equipment within the scope of the present document.

NOTE 4: A list of such ENs is included on the web site <http://www.newapproach.org>.

---

# 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] ITU-R Recommendation M.1457 (2000): "Detailed specifications of the radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)".

[5] ETSI TR 100 028 (V1.3.1): "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".



- [6] ITU-R Recommendation SM.329-8 (2000): "Spurious emissions".
- [7] ETSI EN 301 489: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".

## 3 Definitions 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:

**ancillary equipment:** equipment (apparatus), used in connection with a User Equipment (UE) or Base Station (BS) is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a user equipment UE or BS to provide additional operational and/or control features to the radio equipment, (e.g. to extend control to another position or location); and
- the equipment cannot be used on a stand alone basis to provide user functions independently of a UE or BS; and
- the UE or BS to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

**applicable part:** part of the multi-part deliverable, of which the present document is the first part, for which the scope of that document includes the equipment to be tested

**enclosure port:** physical boundary of the apparatus through which electromagnetic fields may radiate or impinge  
In the case of integral antenna equipment, this port is inseparable from the antenna port

**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

**IMT-2000:** IMT-2000s are third generation mobile systems which are scheduled to start service around the year 2000 subject to market considerations

NOTE 1: ITU-R Recommendation M.1457 [4] identifies the detailed specifications for the IMT-2000 radio interfaces.

**idle mode:** state of User Equipment (UE) when switched on but with no Radio Resource Control (RRC) connection

**maximum average power:** 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

**port:** particular interface, of the specified equipment (apparatus), with the electromagnetic environment

NOTE 2: For example, any connection point on an equipment intended for connection of cables to or from that equipment is considered as a port (see figure 2).

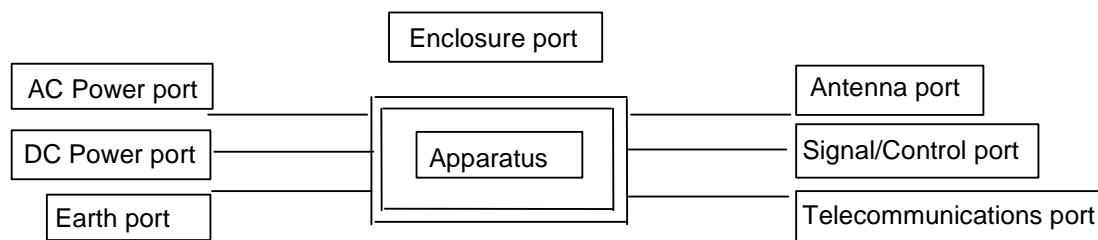


Figure 2: Examples of ports

**radio communications equipment:** telecommunications equipment which includes one or more transmitters and/or receivers and/or parts thereof for use in a fixed, mobile or portable application

NOTE 3: It can be operated with ancillary equipment but if so, is not dependent on it for basic functionality.

**signal and control port:** port which carries information or control signals, excluding antenna ports

**telecommunication port:** port which is intended to be connected to telecommunication networks (e.g. public switched telecommunication networks, integrated services digital networks), local area networks (e.g. Ethernet, Token Ring) and similar networks

**traffic mode:** state of user equipment (UE) when switched on and with Radio Resource Control (RRC) connection established

## 3.2 Abbreviations

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

BS	Base Station
E.I.R.P	Equivalent Isotropically Radiated Power
EMC	Electro-Magnetic Compatibility
E.R.P	Effective Radiated Power
EUT	Equipment Under Test
FDD	Frequency Division Duplex
LV	Low Voltage
R&TTE	Radio Equipment and Telecommunications Terminals Equipment
RF	Radio Frequency
TDD	Time Division Duplex
UE	User Equipment

---

## 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, as defined in the applicable part. The equipment shall comply with all the technical requirements of the present document at all times when operating within the boundary limits of the operational environmental profile.

### 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 equipment three essential parameters have been identified. Tables 1 and 2 provide cross-references, for UE and BS respectively, between these essential parameters and the corresponding technical requirements for equipment within the scope of the present document.

**Table 1: Cross references for user equipment (UE)**

Essential parameter	Corresponding technical requirements
Radiated emissions	4.2.2 Radiated emissions (UE)
Control and monitoring functions	4.2.4 Control and monitoring functions (UE)

**Table 2: Cross references for base stations (BS)**

Essential parameter	Corresponding technical requirements
Radiated emissions	4.2.3 Radiated emissions (BS)

NOTE: Receiver sensitivity, use of correct timing and use of correct code are covered in clauses B.1 and B.2 respectively.

## 4.2.2 Radiated emissions (UE)

### 4.2.2.1 Definition

This test assesses the ability of radio communications equipment and ancillary equipment to limit unwanted emissions from the enclosure port.

This test is applicable to radio communications equipment and ancillary equipment.

This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

### 4.2.2.2 Limits

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out of band emissions and spurious emissions are based on ITU-R Recommendation SM.329-8 [6].

The requirements shown in table 3 are only applicable for frequencies, which are greater than 12,5 MHz away from the UE centre carrier frequency ( $f_c$ ).

**Table 3: Radiated spurious emissions requirements (UE)**

Frequency	Minimum requirement (E.R.P)/ Reference Bandwidth Idle mode	Minimum requirement (E.R.P)/ Reference Bandwidth Traffic mode
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-57 dBm/100 kHz	-36 dBm/100 kHz
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$ $f_c - 12,5 \text{ MHz} < f < f_c + 12,5 \text{ MHz}$	-47 dBm/1 MHz Not defined	-30 dBm/1 MHz Not defined

### 4.2.2.3 Conformance

Conformance tests described in clause 5.3.1 shall be carried out.

## 4.2.3 Radiated emissions (BS)

### 4.2.3.1 Definition

This test assesses the ability of BS to limit unwanted emission from the enclosure port.

This test is applicable to base stations. This test shall be performed on a representative configuration of the base station.

### 4.2.3.2 Limits

The frequency boundary and reference bandwidths for the detailed transitions of the limits between the requirements for out of band emissions and spurious emissions are based on ITU-R Recommendation SM.329-8 [6].

The requirements, shown in table 4, are applicable for the frequency range 30 MHz to 12,75 GHz, excluding 12,5 MHz below the first carrier frequency to 12,5 MHz above the last carrier frequency used.

The BS shall meet the limits given in table 4.

**Table 4: Radiated spurious emissions requirements (BS)**

Frequency	Minimum requirement (E.R.P)/ Reference Bandwidth
$30 \text{ MHz} \leq f < 1\,000 \text{ MHz}$	-36 dBm/100 kHz
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	-30 dBm/1 MHz
$F_{c1} - 12,5 \text{ MHz} < f < F_{c2} + 12,5 \text{ MHz}$	Not defined
Key:	
Fc1:	Centre frequency of first carrier frequency used by the BS.
Fc2:	Centre frequency of last carrier frequency used by the BS.

#### 4.2.3.3 Conformance

Conformance tests described in clause 5.3.2 shall be carried out.

### 4.2.4 Control and monitoring functions (UE)

#### 4.2.4.1 Definition

This requirement, together with other control and monitoring technical requirements identified in the table of cross references in the applicable part, verifies that the control and monitoring functions of the UE prevent it from transmitting when it is not receiving a signal from a valid network.

This test is applicable to radio communications equipment and ancillary equipment.

This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

#### 4.2.4.2 Limits

The maximum measured power during the duration of the test shall not exceed -30 dBm.

#### 4.2.4.3 Conformance

Conformance tests described in clause 5.3.3 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 operational environmental profile, as defined in clause 4.1.

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.

## 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 5.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [5] and shall correspond to an expansion factor (coverage factor)  $k = 1,96$  or  $k = 2$  (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 5 is based on such expansion factors.

**Table 5: Maximum measurement uncertainty**

Parameter	Uncertainty
Effective radiated RF power up to 12,75 GHz	$\pm 6$ dB
Conducted RF power	$\pm 1$ dB

NOTE: If the Test System for a test is known to have a measurement uncertainty greater than that specified in table 5, this equipment can still be used, provided that an adjustment is made follows:

Any additional uncertainty in the Test System over and above that specified in table 5 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 6 does not increase the probability of passing an EUT that would otherwise have failed a test if a Test System compliant with table 5 had been used.

## 5.3 Essential radio test suites

### 5.3.1 Radiated emissions (UE)

#### 5.3.1.1 Test method

Whenever possible the test site should be a fully anechoic chamber simulating the free-space conditions. EUT shall be placed on a non-conducting support. Maximum average power of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyser).

At each frequency at which a component is detected, the EUT shall be rotated to obtain maximum response, and the Effective Radiated Power (E.R.P) of that component determined by a substitution measurement, which shall be the reference method. The measurement shall be repeated with the test antenna in the orthogonal polarization plane.

NOTE: Effective Radiated Power (E.R.P) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between E.I.R.P and E.R.P.

$$\text{E.R.P (dBm)} = \text{E.I.R.P (dBm)} - 2,15 \quad \text{Ref: ITU-R Recommendation SM.329-8, annex 1 [6].}$$

Measurements are made with a tuned dipole antenna or a reference antenna with a known gain referenced to an isotropic antenna.

If a different test site or method is used, this shall be stated in the test report. The results shall be converted to the reference method values and the validity of the conversion shall be demonstrated.

### 5.3.1.2 Test configurations

This clause defines the configurations for emission tests as follows:

- the equipment shall be tested under normal test conditions;
- the test configuration shall be as close to normal intended use as possible;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested;
- the test conditions, test configuration and mode of operation shall be recorded in the test report;
- ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the input/output characteristics of the ancillary equipment, RF input/output ports shall be correctly terminated;
- ports that are not connected to cables during normal operation, e.g. service connectors, programming connectors; temporary connectors etc. shall not be connected to any cables for the purpose of this test. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables;
  - emission tests shall be performed in two modes of operation:
    - with a communication link established (traffic mode); and
    - in the idle mode.

Ancillary equipment shall be tested with it connected to a UE in which case compliance shall be demonstrated to the appropriate clauses of the present document.

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

## 5.3.2 Radiated emissions (BS)

### 5.3.2.1 Test method

- a) A test site fulfilling the requirements of ITU-R Recommendation SM.329-8 [6] shall be used. The EUT shall be placed on a non-conducting support and shall be operated from a power source via a RF filter to avoid radiation from the power leads.

Average power of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyser). At each frequency at which a component is detected, the EUT shall be rotated and the height of the test antenna adjusted to obtain maximum response, and the Effective Radiated Power (E.R.P) of that component determined by a substitution measurement. The measurement shall be repeated with the test antenna in the orthogonal polarization plane.

NOTE: Effective Radiated Power (E.R.P) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between E.I.R.P and E.R.P.

$$E.R.P \text{ (dBm)} = E.I.R.P \text{ (dBm)} - 2,15 \quad \text{Ref: ITU-R Recommendation SM.329-8, annex 1 [6].}$$

- b) The BS shall transmit with maximum power declared by the manufacturer with all transmitters active. Set the base station to transmit a signal as defined in the applicable part for measurement of spurious emissions.
- c) The video bandwidth shall be approximately three times the resolution bandwidth. If this video bandwidth is not available on the measuring receiver, it shall be the maximum available and at least 1 MHz.

### 5.3.2.2 Test configurations

This clause defines the configurations for emission tests as follows:

- the equipment shall be tested under normal test conditions as specified in the functional standards;
- the test configuration shall be as close to normal intended use as possible;
- if the equipment is part of a system, or can be connected to ancillary equipment, then it shall be acceptable to test the equipment while connected to the minimum configuration of ancillary equipment necessary to exercise the ports;
- if the equipment has a large number of ports, then a sufficient number shall be selected to simulate actual operation conditions and to ensure that all the different types of termination are tested;
- the test conditions, test configuration and mode of operation shall be recorded in the test report;
- ports which in normal operation are connected shall be connected to an ancillary equipment or to a representative piece of cable correctly terminated to simulate the input/output characteristics of the ancillary equipment, Radio Frequency (RF) input/output ports shall be correctly terminated;
- ports which are not connected to cables during normal operation, e.g. service connectors, programming connectors, temporary connectors etc. shall not be connected to any cables for the purpose of this test. Where cables have to be connected to these ports, or interconnecting cables have to be extended in length in order to exercise the EUT, precautions shall be taken to ensure that the evaluation of the EUT is not affected by the addition or extension of these cables.

For an EUT which contains more than one BS, it is sufficient to perform tests relating to connectors of each representative type of the BS forming part of the EUT.

At the manufacturer's discretion the test may be performed on the ancillary equipment separately or a representative configuration of the combination of radio and ancillary equipment. In each case the EUT is tested against all applicable emission clauses of the present document and in each case, compliance enables the ancillary equipment to be used with different radio equipment.

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

### 5.3.3 Control and monitoring functions (UE)

#### 5.3.3.1 Test method

- a) At the start of the test, the UE shall be switched off. The UE antenna connector shall be connected to a power measuring equipment, with the following characteristics:
  - The RF bandwidth shall exceed the total operating transmit frequency range of the UE for operation with an applicable part;
  - The response time of the power meter shall be such that the measured power has reached within 1 dB of its steady state value within 100  $\mu$ s of a CW signal being applied;
  - It shall record the maximum power measured.

NOTE: The equipment may include a video low pass filter to minimize its response to transients or Gaussian noise peaks.

- b) The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.
- c) The EUT shall remain switched off for a period of at least thirty seconds, and shall then be switched on for a period of approximately one minute.
- d) Step b) shall be repeated four times.
- e) The maximum power emitted from the UE throughout the duration of the test shall be recorded.

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

## 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 301 908-1				Comment
No.	Reference	EN-R (note)	Status			
1	4.2.2	Radiated emissions (UE)	M			Applicable to UE only
2	4.2.3	Radiated emissions (BS)	M			Applicable to BS only
3	4.2.4	Control and monitoring functions (UE)	M			Applicable to UE only
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.



---

## Annex B (informative): Receiver sensitivity and correct operation of the equipment

### B.1 Receiver sensitivity

In the cellular radiocommunications systems using IMT-2000 standards within the scope of the present document, the power of transmissions is usually controlled so that the power of the transmitted signal intended to be received by a particular receiver is reduced to the minimum level consistent with proper reception. This is accomplished by a closed-loop employing messages reporting received power and/or signal quality between the BS and UE.

If a receiver has inadequate receiver sensitivity, the power of the transmitted signal intended for that receiver will need to be much higher than would otherwise be needed. If the transmitted power is increased excessively, this will cause harmful interference to other receivers using the same frequency in the neighbouring geographic area. Therefore, receiver sensitivity is justified as an essential requirement under article 3.2 of the R&TTE Directive [1].

The product specifications for IMT-2000 UE and BS (falling within the scope of applicable parts) include requirements relating to receiver sensitivity. The level of these requirements has been based on consideration of the performance of that receiver, and not harmful interference indirectly caused to other receivers. As a consequence, these requirements are too stringent to be justified as essential requirements under article 3.2 of the R&TTE Directive [1]. However, the applicable parts under article 3.2 of the R&TTE Directive [1] for IMT-2000 UE and BS (see the foreword of the present document) include an essential requirement for strong interfering signal handling of the receiver. This requirement implicitly requires a certain level of receiver performance, which is less stringent than that required by the product requirements relating directly to receiver sensitivity.

It is considered that the level of receiver performance needed by an IMT-2000 UE or BS to meet the essential requirement for receiver strong interfering signal handling is an appropriate level for an essential requirement under article 3.2 of the R&TTE Directive [1].

Therefore, no separate conformance requirement is defined in the present document or in the applicable parts relating to receiver sensitivity.

---

### B.2 Correct functioning of the equipment

In a radiocommunications system, it is essential that certain functions of equipment operate correctly, in order to prevent harmful interference to other users of the radio spectrum. These functions can include transmission on the correct frequency, at the correct time and/or using the correct code (for equipment using CDMA). For the BS, the parameters of these functions are commanded by the network, and for the UE they are commanded by the BS.

Several of the tests in the applicable parts implicitly require a connection to be established between the equipment under test (EUT) and the test apparatus. This implicitly requires the EUT to respond correctly to the commands it receives.

It is considered that the establishment of a connection demonstrates that the equipment meets most aspects of correct functioning to meet the essential requirements under article 3.2 of the R&TTE Directive [1]. Tests for certain specific functions are defined in applicable parts, where these functions are critical to the prevention of harmful interference.

Therefore, the explicit tests for correct functioning of the equipment, together with the implicit testing through the ability to establish a connection, are sufficient to meet the essential requirement for correct functioning of the equipment so as to prevent harmful interference, under article 3.2 of the R&TTE Directive [1].

---

## Annex C (informative): Bibliography

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.

## 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 1: Harmonized EN for IMT-2000, Introduction and common requirements, covering essential requirements of article 3.2 of the R&TTE Directive
Finnish	
French	Compatibilité électromagnétique et Radioélectrique (ERM); Stations de Base (BS) et Equipement Utilisateur (UE) pour les réseaux cellulaires de troisième génération IMT-2000; Partie 1: Norme harmonisée pour l'IMT-2000, Introduction et exigences communes, couvrant les exigences essentielles de l'article 3.2 de la Directive R&TTE
German	Feststationen (BS) und Einrichtungen für den Nutzer (UE) für digitale zellulare IMT-2000 Funknetze der 3. Generation, Teil 1: Harmonisierte Europäische Norm (EN) für IMT-2000, Einführung und allgemein geltende Bestimmungen mit wesentlichen Anforderungen nach R&TTE-Richtlinie Artikel 3.2
Greek	
Italian	Compatibilità elettromagnetica e problematiche di Spettro Radio (ERM); Stazioni Base (BS) e Terminali Mobili (UE) per le reti cellulari di terza generazione IMT-2000; Parte 1: Norma armonizzata per IMT-2000, Introduzione e requisiti comuni, relativi ai requisiti essenziali dell'articolo 3.2 della Direttiva R&TTE
Portuguese	
Spanish	Compatibilidad electromagnética y espectro radio (ERM); estaciones base (BS) y equipos de usuario (UE) de redes móviles de tercera generación IMT-2000; Parte 1: EN armonizada que cubre los requisitos mínimos del artículo 3.2 de la directiva de R&TTE (1999/5/EC); Introducción y requisitos comunes
Swedish	Elektromagnetisk kompatibilitet och radio-spektrumfrågor (ERM); Basstationer (BS) och Mobilstationer (UE) för tredje generationens mobilnät IMT-2000; Del 1: Harmoniserad EN för IMT-2000, Introduktion och gemensamma krav, omfattande väsentliga krav enligt artikel 3.2 i R&TTE-direktivet

---

## History

<b>Document history</b>				
V1.1.1	April 2001	Public Enquiry	PE 20010824:	2001-04-25 to 2001-08-24
V1.1.1	November 2001	Vote	V 20020104:	2001-11-05 to 2002-01-04