

# SLOVENSKI STANDARD

## SIST EN 301 908-7 V2.2.1:2004

01-julij-2004

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Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 7: Harmonized EN for IMT-2000, CDMA TDD (UTRA TDD) (BS) covering essential requirements of article 32 of the R&TTE Directive

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| 33.100.01 | Elektromagnetna združljivost na splošno | Electromagnetic compatibility in general |

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# ETSI EN 301 908-7 V2.2.1 (2003-10)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Base Stations (BS), Repeaters and User Equipment (UE) for  
IMT-2000 Third-Generation cellular networks;  
Part 7: Harmonized EN 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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Sous-Préfecture de Grasse (06) N° 7803/88

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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).

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").

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

- SIST EN 301 908-7 V2.2.1:2004  
<https://standards.iteh.ai/catalog/standards/sist/317c42e1-9b6c-4a54-ade0-ba3da5246598/sist-en-301-908-7-v2-2-1-2004>
- 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 and Repeaters) 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";
  - Part 11: "Harmonized EN for IMT-2000, CDMA Direct Spread (UTRA FDD) (Repeaters) covering essential requirements of article 3.2 of the R&TTE Directive".



Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A in the present document and annex A of EN 301 908-1 [9].

| <b>National transposition dates</b>  |                 |
|--|-----------------|
| Date of adoption of this EN:   | 3 October 2003  |
| Date of latest announcement of this EN (doa):  | 31 January 2004 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 July 2004    |
| Date of withdrawal of any conflicting National Standard (dow):                         | 31 January 2006 |

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<https://standards.iteh.ai/catalog/standards/sist/917e42c9-9b6c-4a54-afd6-ba3dfa524b58/sist-en-301-908-7-v2-2-1-2004>

## 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.

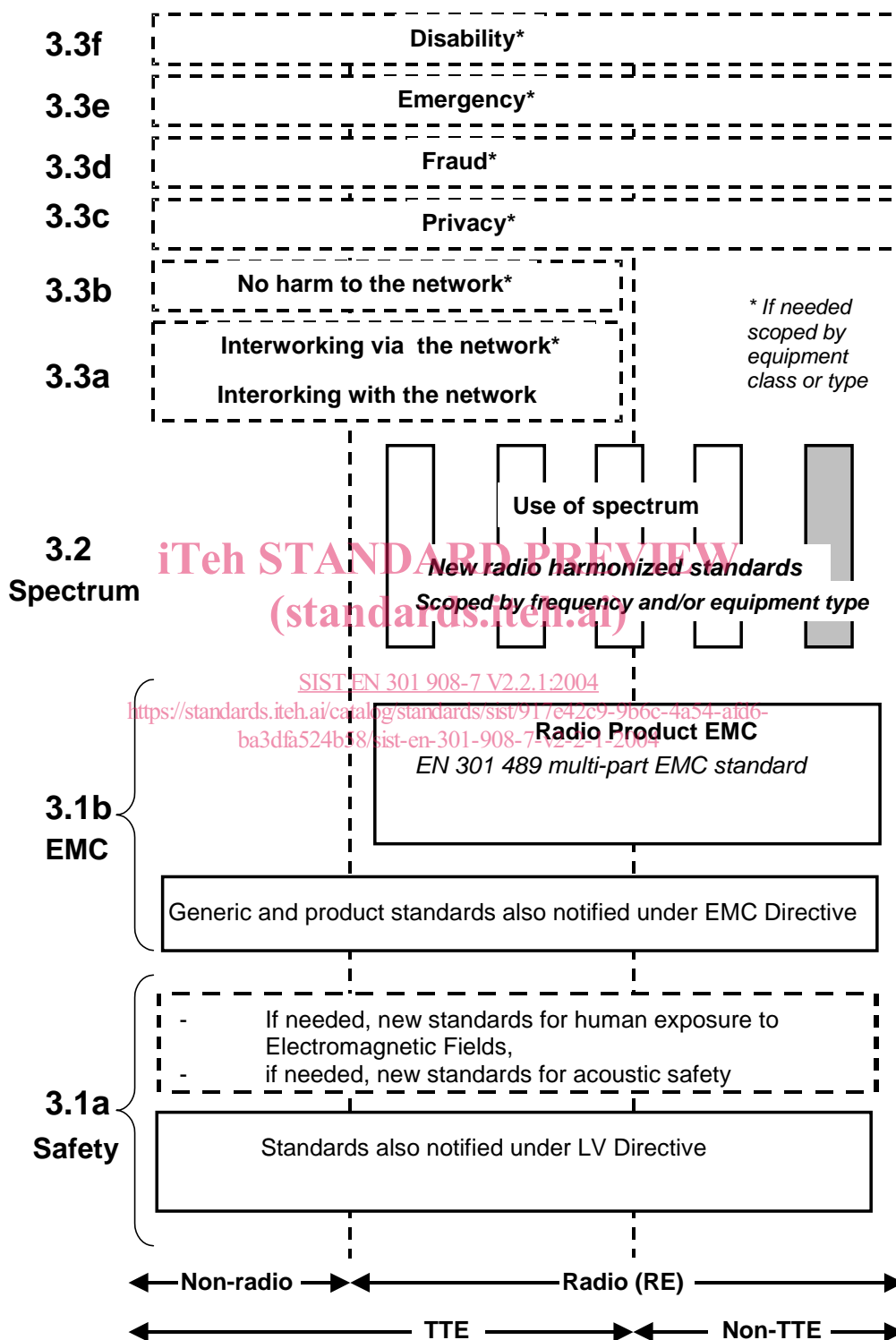


Figure 1: Modular structure for the various standards used under the R&TTE Directive

The left hand edge of 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 [8], the multi-part product EMC standard for radio 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. 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 all parts of EN 301 908 is based, differ in presentation; and this is reflected in the present document.

# 1 Scope

The present document applies to the following radio equipment type:

- Base stations for IMT-2000 CDMA TDD (UTRA TDD).

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

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

| Direction of transmission | CDMA TDD base station frequency bands |
|---------------------------|---------------------------------------|
| Transmit and Receive      | 1 900 MHz to 1 920 MHz                |
| Transmit and Receive      | 2 010 MHz to 2 025 MHz                |

The requirements in the present document apply to both Wide Area base stations and Local Area base stations unless otherwise stated.

IMT-2000 CDMA TDD (UTRA TDD) supports two options of the TDD mode with the chip rates of 3,84 Mchip/s and 1,28 Mchip/s. These two options are called the 3,84 Mcps TDD option and the 1,28 Mchip/s TDD option respectively. The requirements are listed in different subsections only if the parameters deviate.

The present document covers requirements for 3,84 Mcps TDD option base station for Release 99, 4 and 5 and for 1,28 Mcps TDD option base stations for Release 4 and 5.

For general purpose base stations of Release 99 and 4 only the requirements for Wide Area base stations shall apply.

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: 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.

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

- [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 (V1.4.1) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".
- [5] ETSI TS 125 105 (V5.4.0): "Universal Mobile Telecommunications System (UMTS); UTRA (BS) TDD: Radio transmission and reception (3GPP TS 25.105 version 5.4.0 Release 5)".
- [6] ETSI TS 125 142 (V5.5.0): "Universal Mobile Telecommunications System (UMTS); Base station conformance testing (TDD) (3GPP TS 25.142 version 5.5.0 Release 5)".
- [7] ITU-R Recommendation SM.329-10 (2003): "Unwanted emissions in the spurious domain".
- [8] ETSI EN 301 489 (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".
- [9] ETSI EN 301 908-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters 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".

## 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:

**ancillary RF amplifier:** piece of equipment, which when connected by RF coaxial cables to the BS, has the primary function to provide amplification between the transmit and/or receive antenna connector of a BS and an antenna without requiring any control signal to fulfil its amplifying function

**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

**local area base station:** base station, characterized by requirements derived from Pico Cell scenarios with a BS to UE coupling loss equals to 45 dB

**maximum output power (P<sub>max</sub>):** mean power level per carrier of the base station measured at the antenna connector in a specified reference condition

NOTE: The period of measurement shall be a transmit timeslot excluding the guard period.

**mean power:** when applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least  $(1 + \alpha)$  times the chip rate of the radio access mode

NOTE: The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

**output power:** mean power of one carrier of the base station, delivered to a load with resistance equal to the nominal load impedance of the transmitter

**Rated Output Power (PRAT):** mean power level per carrier that the manufacturer has declared to be available at the antenna connector

**RRC filtered mean power:** mean power as measured through a root raised cosine filter with roll-off factor  $\alpha$  and a bandwidth equal to the chip rate of the radio access mode

**wide area base stations:** base station, characterized by requirements derived from macrocell and microcell scenarios with BS to UE coupling losses equal to 70 dB and 53 dB

## 3.2 Symbols

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

|                               |   |
|-------------------------------|---|
| $\alpha$                      | roll-off factor, $\alpha = 0,22$  |
| $\frac{DPCH_o - E_c}{I_{or}}$ | The ratio of the average transmits energy per PN chip for the $DPCH_o$ to the total transmit power spectral density in one time slot. |

## 3.3 Abbreviations

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

|          |  |
|----------|--|
| 16QAM    | 16 - Quadrature Amplitude Modulation   |
| 3GPP     | 3rd Generation Partnership Project   |
| 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   |
| BTS      | Base Transceiver Station   |
| CDMA     | Code Division Multiple Access  |
| 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 |
| EMC      | ElectroMagnetic Compatibility  |
| EUT      | Equipment Under Test   |
| F        | Frequency (of the assigned channel frequency of the wanted signal)   |
| FDD      | Frequency Division Duplexing   |
| $F_{uw}$ | Frequency offset of the unwanted interfering signal from the assigned channel frequency of the wanted signal           |
| HS-PDSCH | High Speed Physical Downlink Shared Channel  |
| IMT-2000 | International Mobile Telecommunications 2000   |
| LV       | Low Voltage  |
| M        | appropriate frequency in the Middle of the operating frequency band of the BS: "RF channel"                            |
| MS       | Mobile station   |
| P        | output Power   |
| Pmax     | Maximum output power of the base station   |
| PRAT     | RATed Output Power of the base station   |
| R&TTE    | Radio equipment and Telecommunications Terminal Equipment  |
| RMS      | Root-Mean Square   |
| RRC      | Root-Raised Cosine   |
| T        | appropriate frequency in the Top of the operating frequency band of the BS: "RF channel"                               |
| TDD      | Time Division Duplexing  |
| TS       | Time Slot  |
| TTE      | Telecommunications Terminals Equipment   |
| UE       | User Equipment   |
| UL       | Up Link (reverse link)   |
| UTRA     | Universal Terrestrial Radio Access   |

## 4 Technical requirements specifications

### 4.1 Environmental profile

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

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

### 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 in addition to those in EN 301 908-1 [9] have been identified. Table 2 provides a cross reference between these seven essential parameters and the corresponding nine technical requirements for equipment within the scope of the present document.

To fulfil 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) |
|   | 4.2.4 Transmitter spurious emissions                          |
| Conducted spurious emissions from the transmitter antenna connector | 4.2.5 Base station maximum output power                       |
| Accuracy of maximum output power                                    | 4.2.6 Transmit intermodulation                                |
| Intermodulation attenuation of the transmitter                      | 4.2.7 Receiver spurious emissions                             |
| Conducted spurious emissions from the receiver antenna connector    | 4.2.8 Receiver blocking characteristics                       |
| Impact of interference on receiver performance                      | 4.2.9 Receiver intermodulation characteristics                |
|   | 4.2.10 Receiver Adjacent Channel Selectivity (ACS)            |

The technical requirements also apply to the BS configurations described in annex B.

#### 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.

##### 4.2.2.1.1 3,84 Mcps TDD option

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.