



# SLOVENSKI STANDARD

## SIST EN 301 449 V1.1.1:2006

01-oktober-2006

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Electromagnetic compatibility and Radio spectrum Matters (ERM); Harmonized EN for CDMA spread spectrum base stations operating in the 450 MHz cellular band (CDMA 450) and 410, 450 and 870 MHz PAMR bands (CDMA-PAMR) covering essential requirements of article 3.2 of the R&TTE Directive

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# ETSI EN 301 449 V1.1.1 (2006-07)

*Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
Harmonized EN for CDMA spread spectrum base stations  
operating in the 450 MHz cellular band (CDMA 450) and  
410, 450 and 870 MHz PAMR bands (CDMA-PAMR)  
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of article 3.2 of the R&TTE Directive**

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## Foreword

This 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") [1].

Technical specifications relevant to Directive 1999/5/EC [1] are given in annex A.

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### National transposition dates

Date of adoption of this EN:	14 July 2006
Date of latest announcement of this EN (doa):	31 October 2006
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2007
Date of withdrawal of any conflicting National Standard (dow):	30 April 2008

## 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.

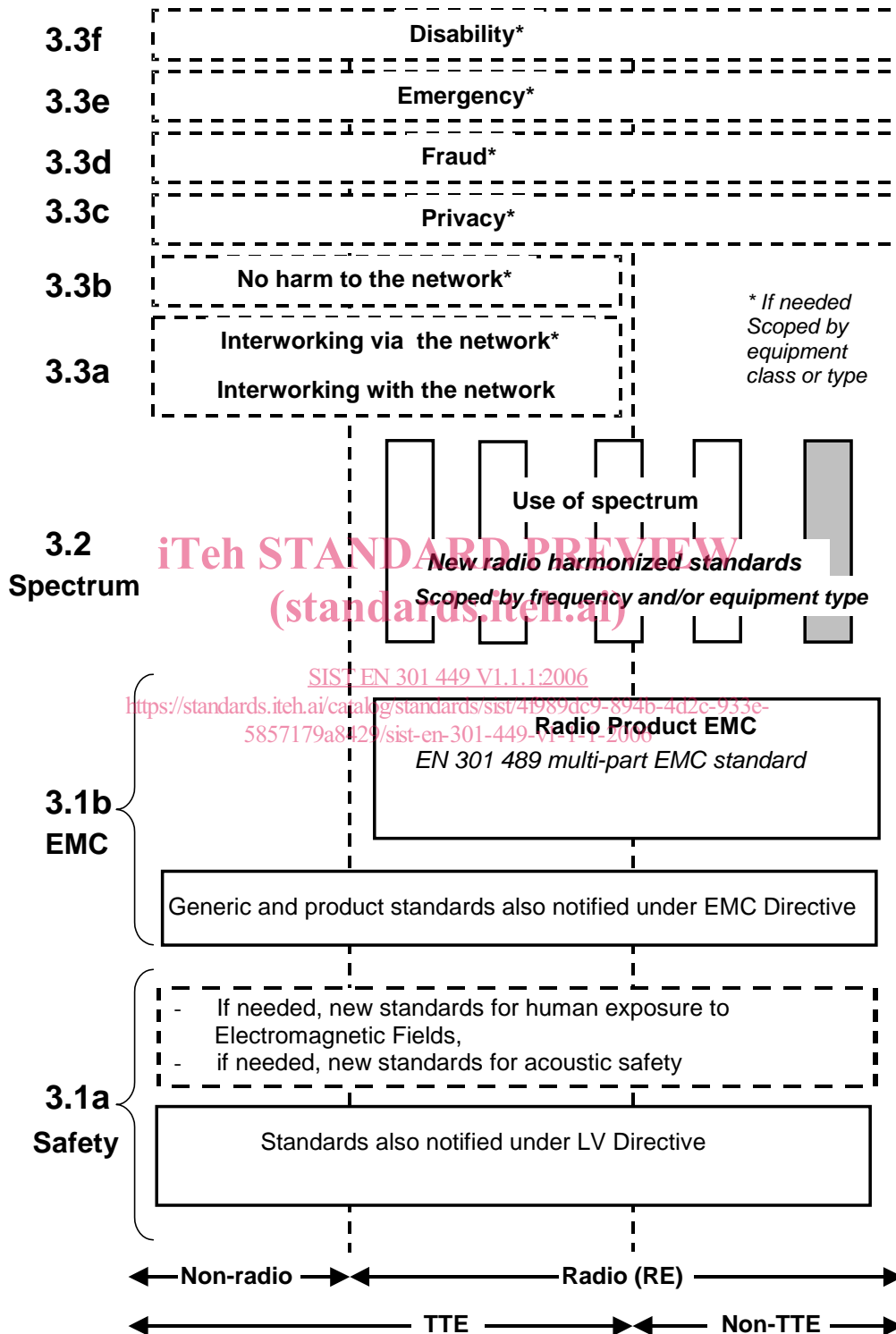


Figure 1: Modular structure for the various standards used under the R&TTE Directive [1]



The left hand edge of 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 [6], 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. 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 the present document is based differ in presentation, and this is reflected in the present document.

# 1 Scope

The present document applies to cdma450 base stations using CDMA 1x spread spectrum technology, i.e. Band Class 5 or Band Class 11 equipment capable of operating in the frequency bands defined in footnote EU34 from the European Common Allocation table, ERC report 25 [10].

- EU34 states "Parts of the bands 450 MHz to 457,5 MHz / 460 MHz to 467,5 MHz may also be used for existing and evolving public cellular networks on a National basis".

The present document also applies to CDMA-PAMR base stations covering, in accordance with ECC decision ECC/DEC/(04)06 [11], the frequency bands:

- Band Class 11: Operating within the bands 410 MHz to 430 MHz and 450 MHz to 470 MHz with 10 MHz duplex spacing between the transmit frequencies of mobile stations (410 MHz to 420 MHz and 450 MHz to 460 MHz) and the transmit frequencies of base stations (420 MHz to 430 MHz and 460 MHz to 470 MHz).
- Band Class 12: Operating within the band 870 MHz to 876 MHz paired with 915 MHz to 921 MHz with 45 MHz duplex spacing between the transmit frequencies of mobile stations (870 MHz to 876 MHz) and the transmit frequencies of base stations (915 MHz to 921 MHz).

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [1] 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] ANSI/TIA-97-F (2005): "Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Base Stations".
- [5] TIA/EIA/IS-2000.2-B (2002): "Physical Layer Standard for cdma2000® Spread Spectrum Systems - Release B".

- [6] ETSI EN 301 489 (all parts) (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".
- [7] TIA-864 (2003): "Recommended Minimum Performance Standards for cdma2000® High Rate Packet Data Access Network Equipment".
- [8] TIA/EIA/IS-890 (2001): "Test Application Specification (TAS) for High Rate Packet Data Air Interface".
- [9] ITU-R Recommendation SM.329-10 (2003): "Unwanted emissions in the spurious domain".
- [10] ERC Report 25, Copenhagen 2004: "The European table of frequency allocations and utilisations covering the frequency range 9 kHz to 275 GHz".
- [11] ECC/DEC/(04)06: "ECC Decision of 19 March 2004 on the availability of frequency bands for the introduction of Wide Band Digital Land Mobile PMR/PAMR in the 400 MHz and 800/900 MHz bands".
- [12] ECC Report 39, Granada February 2004: "Technical impact of introducing CDMA-PAMR on 12.5/25 kHz PMR/PAMR technologies in the 410-430 and 450-470 MHz bands".
- [13] ECC Report 41, Granada February 2004: "Adjacent band compatibility between GSM and CDMA-PAMR at 915 MHz".
- [14] ETSI TR 100 028 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1".
- [15] CEPT/ERC/REC 74-01E, Hradec Kralove 2005: "Unwanted emissions in the spurious domain".
- [16] TIA 1030 (2004): "Band Class Specification for cdma2000® Spread Spectrum Systems".

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## 3 Definitions, symbols and abbreviations

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### 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:

**1X:** mode of operation of a base station or access network using spreading rate 1

**access network:** network equipment providing data connectivity between a packet switched data network (typically the Internet) and the access terminals in HRPD systems

NOTE: Connectivity is typically provided at the link layer (PPP). As used in the present document it is synonymous with base station except that HRPD access network always use spreading rate 1.

**access terminal:** mobile station providing data connectivity to a user in HRPD systems

NOTE: An access terminal may be connected to a computing device such as a laptop personal computer or may be a self-contained data device such as a personal digital assistant or may be a mobile station. Also referred to as HRPD access terminal using spreading rate 1 or a mobile station operating in a HRPD system.

**band class:** set of frequency channels, transmission mask and a numbering scheme for these channels

NOTE: Band classes are defined in TIA 1030 [16], clause 3.1.

**base station:** fixed station used for communicating with mobile stations

NOTE: Depending upon the context, the term base station may refer to a cell, a sector within a cell, an MSC, and access network or other part of the wireless system.

**CDMA channel number:** 11-bit number corresponding to the centre of the CDMA frequency assignment

**CDMA frequency assignment:** 1,23 MHz segment of spectrum

NOTE: For band classes 11 and 12, the channel is centred on one of the 25 kHz channels.  
For band class 5, the channel is centred on one of the 20 kHz or 25 kHz channels.

**code channel:** subchannel of a forward CDMA channel or reverse CDMA channel

NOTE: Each subchannel uses an orthogonal Walsh function or quasi-orthogonal function

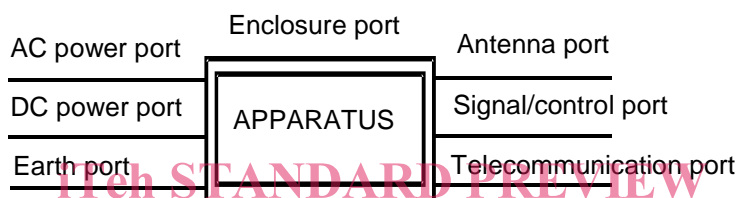
**Code Division Multiple Access (CDMA):** technique for spread-spectrum multiple-access digital communications that creates channels through the use of unique code sequences

**DRCLock Channel:** portion of the Forward MAC Channel that indicates to the access terminal whether the access network can decode the DRC sent by the access terminal or not

NOTE: The DRCLock Channel and the RPC Channel are time-division multiplexed and transmitted on the same MAC Channel.

**effective radiated power:** product of the power supplied to the antenna and the antenna gain in a direction relative to a half-wave dipole

**enclosure port:** also known as cabinet radiation



**forward CDMA channel:** CDMA channel from a base station to mobile stations

NOTE: The forward CDMA channel contains one or more code channels that are transmitted on a CDMA frequency assignment using a particular pilot PN offset.

**forward MAC channel:** forward channel used for medium access control in HRPD systems

NOTE: Forward MAC channel consists of the reverse power control channels, the DRCLock channel and the reverse activity channel.

**forward traffic channel:** one or more code channels used to transport user and signalling traffic from the base station to the mobile station

**Frame Error Rate (FER):** Frame Error Rate of forward traffic channel

NOTE: The value of Frame Error Rate may be estimated by using Service Option 2, 9, 32, 54, or 55 (see ANSI/TIA-97-F [4], clause 1.3).

**handoff:** act of transferring communication with a mobile station from one base station to another

**High Rate Packet Data (HRPD):** CDMA technique optimized for data communications

**MAC channel:** See forward MAC channel.

**mean output power:** total transmitted calorimetric power measured in a specified bandwidth at the antenna connector when the transmitter is active

**mobile station:** station intended to be used while in motion or during halts at unspecified points

NOTE: Mobile stations include portable units (e.g. hand-held personal units) and units installed in vehicles and HRPD access terminals.

**mobile station simulator:** piece of test equipment used to replicate the functions of a mobile station

**multiple carrier:** system set to operate with 2 or more contiguous carriers

**packet:** physical layer protocol data unit

**packet error:** packet error event occurs when a decoded packet's FCS does not check

**physical layer:** part of the communication protocol between the mobile station and the base station that is responsible for the transmission and reception of data

NOTE: The physical layer in the transmitting station is presented a frame and transforms it into an over-the-air waveform. The physical layer in the receiving station transforms the waveform back into a frame.

**pilot channel:** unmodulated, direct-sequence spread spectrum signal transmitted by a CDMA base station or mobile station

NOTE: A pilot channel provides a phase reference for coherent demodulation and may provide a means for signal strength comparisons between base stations for determining when to handoff.

**Provider:** the entity responsible for placing the equipment on the market

**radio configuration:** set of forward traffic channel and reverse traffic channel transmission formats that are characterized by physical layer parameters such as transmission rates, modulation characteristics, and spreading rate

NOTE: Radio configurations are defined in TIA/EIA/IS-2000.2-B [5], clauses 2.1.3 and 3.1.3.

**representative configuration:** the equipment is set up in a manner which is typical for normal operation, where practical

**reverse CDMA channel:** CDMA channel from the mobile station to the base station

NOTE: From the base station's perspective, the reverse CDMA channel is the sum of all mobile station transmissions on a CDMA frequency assignment.

**reverse test application protocol:** test application protocol allowing reverse link performance characterizations in HRPD systems

NOTE: See TIA/EIA/IS-890 [8]. [SIST EN 301 449 V1.1.1:2006  
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**RF carrier:** direct-sequence spread RF channel

NOTE: For the forward CDMA channel, the number of RF carriers is equal to the spreading rate; for the reverse CDMA channel, there is one RF carrier.

**slot:** duration of time specified by 1,6 ms

**spreading rate:** PN chip rate of the forward CDMA channel or the reverse CDMA channel, defined as a multiple of 1,2288 Mcps

**spreading rate 1:** spreading rate 1 forward CDMA channel uses a single direct-sequence spread carrier with a chip rate of 1,2288 Mcps, and a spreading rate 1 reverse CDMA channel uses a single direct-sequence spread carrier with a chip rate of 1,2288 Mcps

NOTE: Spreading rate 1 is often referred to as "1X".

**spurious emissions:** as defined by ITU-R Recommendation SM.329-10 [9]

**traffic channel:** communication path between a mobile station and a base station used for user and signalling traffic

NOTE: The term traffic channel implies a forward traffic channel and reverse traffic channel pair. See also forward traffic channel and reverse traffic channel.

**Walsh function:** one of  $2^N$  time orthogonal binary functions

NOTE: The functions are orthogonal after mapping "0" to 1 and "1" to -1.