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**Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) – Standard elektromagnetne združljivosti (EMC) za radijsko opremo in storitve – 26. del: Posebni pogoji za bazne postaje s CDMA 1x, repetitorje (ponavljalnike) in pomožno opremo, ki delujejo z razpršenim spektrom**

Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 26: Specific conditions for CDMA 1x spread spectrum Base Stations, repeaters and ancillary equipment

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# ETSI EN 301 489-26 V2.3.2 (2005-07)

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*Candidate Harmonized European Standard (Telecommunications series)*

**Electromagnetic compatibility  
and Radio spectrum Matters (ERM);  
ElectroMagnetic Compatibility (EMC)  
standard for radio equipment and services;  
Part 26: Specific conditions for CDMA 1x spread spectrum  
Base Stations, repeaters and ancillary equipment**

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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).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under the Council Directive 98/34/EC [4] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulation.

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 Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility ("the EMC Directive") (89/336/EEC [3] as amended) and Directive 1999/5/EC [2] 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 26 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

[SIST EN 301 489-26 V2.3.2:2005](https://standards.iteh.ai/catalog/standards/sist/faa3a5a4-c96a-4fd6-8fa8-96657d412a34/sist-en-301-489-26-v2-3-2-2005)

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### National transposition dates

Date of adoption of this EN:	8 July 2005
Date of latest announcement of this EN (doa):	31 October 2005
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2006
Date of withdrawal of any conflicting National Standard (dow):	30 April 2007

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## 1 Scope

The present document, together with EN 301 489-1 [1], covers the assessment of CDMA 1x spread spectrum base station equipment, repeaters and associated ancillary equipment in respect of ElectroMagnetic Compatibility (EMC).

Technical specifications related to the antenna port and emissions from the enclosure port of radio equipment (Base Station (BS), and repeaters) are not included in the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria of CDMA 1x spread spectrum base station radio equipment, repeaters and associated ancillary equipment.

Examples of base station equipment covered by the present document are given in annex A.

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and EN 301 489-1 [1], the provisions of the present document take precedence.

The environmental classification and the emission and immunity requirements used in the present document are as stated in EN 301 489-1 [1], except for any special conditions included in the present document.

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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.

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

- [1] ETSI EN 301 489-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements".
- [2] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- [3] 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).
- [4] 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.
- [5] TIA/EIA/IS-2000.2-1: "Physical Layer Standard for cdma2000@ Spread Spectrum Systems - Addendum 1".
- [6] TIA-97-E-1: "Base Station Performance Standards for Dual Mode Spread Spectrum Systems".
- [7] ITU-R Recommendation SM.329-10: "Unwanted emissions in the spurious domain".
- [8] TIA/EIA/IS-2000 Series, Release A: "CDMA 2000@ Series, Release A (2000)".



## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 301 489-1 [1] and the following apply:

**CDMA-PAMR:** term used to denote a PAMR system, based on TIA/EIA/IS-2000 [8] Spreading Rate 1 specifications

**CDMA 1x Spread Spectrum:** term used to denote cdma2000 Spread Spectrum Systems and their evolution with spreading rate 1

**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.

**International Mobile Telecommunications-2000 (IMT-2000):** third generation mobile systems which provide access, by means of one or more radio links, to a wide range of telecommunications services supported by the fixed telecommunication networks (e.g. PSTN, ISDN or IP), and to other services which are specific to mobile users

**necessary bandwidth:** as defined in ITU-R Recommendation SM.329-10 [7]

**Radio Configuration (RC):** 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

**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.

**signal and control port:** port which carries information or control signals, except from antenna and telecommunication ports

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

### 3.2 Abbreviations

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

BS	Base Station
CDMA	Code Division Multiple Access
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
FER	Frame Error Rate
ISDN	Integrated Services Digital Network
PAMR	Public Access Mobile Radio
PN	Pseudorandom Number
PSTN	Public Switched Digital Network
RC	Radio Configuration
RF	Radio Frequency

## 4 Test conditions

For the purpose of the present document, the test conditions of EN 301 489-1 [1], clause 4, shall apply as appropriate. Further product related test conditions for base station equipment are specified in the present document.

### 4.1 General

The equipment shall be tested in normal test environment defined in TIA-97-E-1 [6]. The test conditions shall be recorded in the test report.

For emission and immunity tests, the test arrangements, etc., as specified in the present document, clauses 4.2 to 4.5, shall apply.

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

Precautions should be taken to ensure that the cables connecting antenna connectors to test equipment or termination do not influence the test results.

### 4.2 Arrangements for test signals

The provisions of EN 301 489-1 [1], clause 4.2 shall apply with the following modifications.

The wanted RF signal nominal frequency shall be selected by setting the CDMA channel to an appropriate number. A communication link shall be set up with a suitable mobile station simulator (hereafter called "the test system") according to the Radio Configuration (RC) supported by the base station (see clause 1.3 in TIA-97-E-1 [6]) using full data rate only. The test system shall be located outside of the test environment.

When the EUT is required to be in the transmit/receive mode, the following conditions shall be met:

- The transmitter part of the EUT shall be commanded to operate at maximum rated transmit power.

NOTE: This may be achieved by disabling the transmitter RF power control.

- Adequate measures shall be taken to avoid the effect of the immunity test RF signal on the measuring equipment.

#### 4.2.1 Arrangements for test signals at the input of transmitters

The provisions of EN 301 489-1 [1], clause 4.2.1 shall apply.

#### 4.2.2 Arrangements for test signals at the output of transmitters

The provisions of EN 301 489-1 [1], clause 4.2.2 shall apply.

#### 4.2.3 Arrangements for test signals at the input of receivers

The provisions of EN 301 489-1 [1], clause 4.2.3 shall apply with the following modification.

For immunity testing the wanted RF signal level at the input of the EUT shall be set to no more than 40 dB above the reference sensitivity level as defined in TIA-97-E-1 [6], to provide a stable communications link. The input signal level used in the test shall be noted in the test report.

For emission testing the wanted RF signal level at the input of the measuring receiver shall be set to no more than 15 dB above the reference sensitivity level as defined in TIA-97-E-1 [6], to ensure that it operates within its dynamic range. The input signal level used in the test shall be noted in the test report.

## 4.2.4 Arrangements for test signals at the output of receivers

The provisions of EN 301 489-1 [1], clause 4.2.4 shall apply.

## 4.2.5 Arrangements for test signals for repeaters

For immunity tests of repeaters, the wanted RF input signal shall be coupled to one antenna port at a level which will result, when measured, in the maximum rated RF output power per channel, as declared by the manufacturer. The test shall either be repeated with a wanted signal coupled to the other antenna port, or a single test shall be performed with the specified input signals being simultaneously coupled to both antenna ports.

## 4.3 Exclusion bands

### 4.3.1 Transmitter exclusion band

The transmitter frequency bands including in band emissions and out of band emissions are covered by the RF spectral mask specification and need no further consideration.

For the purpose of EMC specifications the transmitter exclusion band shall be the carrier centre frequency  $\pm (2,5 \times \text{necessary bandwidth})$ .

### 4.3.2 Receiver exclusion band

The exclusion band for receivers and receiver sections of transceivers is the band of frequencies over which no immunity tests with radiated RF are made.

The receiver exclusion band for base stations extends from the lower frequency of the relevant receiver band minus 5 % to the upper frequency of the relevant receiver band plus 5 %.

### 4.3.3 Repeater exclusion band

The exclusion band for repeaters is the band of frequencies over which no testing is performed.

The larger of the two definitions of exclusion band above in clauses 4.3.1 and 4.3.2 shall be used when testing repeaters. This shall apply to all ports of a repeater.

## 4.4 Narrow band responses of receivers

Responses on receivers or duplex transceivers occurring during the immunity test at discrete frequencies which are narrow band responses (spurious responses), are identified by the following method:

- If during an immunity test the quantity being monitored goes outside the specified tolerances (see clause 6.1), it is necessary to establish whether the deviation is due to a narrow band response or to a wideband (EMC) phenomenon. Therefore, the test shall be repeated with the unwanted signal frequency increased, and then decreased by 10 MHz.
- If the deviation disappears in either or both of the above 10 MHz offset cases, then the response is considered as a narrow band response.
- If the deviation does not disappear, this may be due to the fact that the offset has made the frequency of the unwanted signal correspond to the frequency of another narrow band response. Under these circumstances the procedure is repeated with the increase and decrease of the frequency of the unwanted signal set to 12,5 MHz.
- If the deviation still does not disappear with the increased and/or decreased frequency, the phenomenon is considered wideband and therefore an EMC problem and the equipment fails the test.

For immunity tests, narrow band responses shall be disregarded.