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Celična omrežja IMT - Harmonizirani standard, ki zajema bistvene zahteve člena 3.2 direktive 2014/53/EU - 12. del: Ponavljalniki s CDMA z več nosilnimi frekvencami ("Multi-Carrier") (CDMA2000)

IMT cellular networks - Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU - Part 12: CDMA Multi-Carrier (cdma2000) Repeaters

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Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.4] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.1].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A-1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

The present document is part 12 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.3].

National transposition dates	
Date of adoption of this EN:	20 April 2016
Date of latest announcement of this EN (doa):	31 July 2016
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2017
Date of withdrawal of any conflicting National Standard (dow):	31 January 2018

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Introduction

The present document is part of a set of standards developed by ETSI that are designed to fit in a modular structure to cover radio equipment within the scope of the Radio Equipment Directive [i.1]. The present document is produced following the guidance in ETSI EG 203 336 [i.2] as applicable.

1 Scope

The present document applies to the following equipment types:

1) Repeaters for IMT-2000 CDMA multi-carrier (cdma2000)

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

Table 1-1: CDMA multi-carrier Repeater operating bands

Band Class (BC)	Direction of transmission	CDMA multi-carrier Repeater operating bands
6	Forward link (DL)	2 110 MHz to 2 170 MHz
	Reverse link (UL)	1 920 MHz to 1 980 MHz
8	Forward link (DL)	1 805 MHz to 1 880 MHz
	Reverse link (UL)	1 710 MHz to 1 785 MHz
9	Forward link (DL)	925 MHz to 960 MHz
	Reverse link (UL)	880 MHz to 915 MHz
13	Forward link (DL)	2 620 MHz to 2 690 MHz
	Reverse link (UL)	2 500 MHz to 2 570 MHz

Repeaters for IMT-2000 CDMA multi-carrier (cdma2000) may support:

1) operation in cdma2000 spread spectrum systems as defined in 3GPP2 C.S0002-F [i.5], referred to herein as operation in Type 1 cdma2000 systems; or

2) operation in cdma2000 High Rate Packet Data Systems as defined in TIA-856 [i.6], referred to herein in Type 2 cdma2000 systems.

The present document contains requirements to demonstrate that Radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] TIA-1037-A (May 2012): "Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Repeaters".

[2] TIA-1030-F (September 2015): "Band Class Specification for cdma2000 Spread Spectrum Systems".

[3] 3GPP2 C.S0032-D (March 2014): "Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Network".

NOTE: Available at http://www.3gpp2.org/Public_html/specs/C.S0032-D_v2.0_20140321.pdf.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] Directive 2014/53/EU of the European parliament and of the council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

[i.2] ETSI EG 203 336 (V1.1.1) (06-2015): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

[i.3] ETSI EN 301 908-1 (V11.1.1): "IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements".

[i.4] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.5] 3GPP2 C.S0002-F V2.0 (05-2014): "Physical Layer Standard for cdma2000 Spread Spectrum Systems Revision F".

NOTE: Available at http://www.3gpp2.org/Public_html/specs/C.S0002-F%20v2.0_20140519.pdf.

[i.6] TIA-856-B-2 (July 2012): "cdma2000 High Rate Packet Data Air Interface Specification".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Band Class (BC): set of frequency channels and a numbering scheme for these channels

Base Station (BS): fixed station used for communicating with mobile stations

NOTE: Base stations for IMT-2000 CDMA multi-carrier (cdma2000) may support, operation in cdma2000 spread spectrum systems as defined in 3GPP2 C.S0002-F [i.5], referred to herein as operation in Type 1 cdma2000 system, or operation in cdma2000 High Rate Packet Data Systems as defined in TIA-856 [i.6], referred to herein as operation in Type 2 cdma2000 systems. 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. See also MSC.

CDMA channel: set of channels transmitted from the Base Station and the mobile stations on a given frequency

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 6, 8 and 9, the channel is centred on one of the 50 kHz channels.

chip rate: rate of "chips" (modulated symbols after spreading) per second

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

donor coupling loss: coupling loss between the Repeater and the donor Base Station

DownLink (DL): signal path where Base Station or Repeater transmits and the mobile receives

NOTE: Also referred to as the forward link.

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

forward CDMA channel: CDMA channel from a Base Station or Repeater 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.

High Rate Packet Data (HRPD): CDMA technique optimized for data communications in Type 2 cdma2000 systems

maximum output power (Pmax): mean power level per carrier measured at the antenna connector of the Repeater in specified reference condition

mean power: total calorimetric power measured in a specified bandwidth at the antenna connector

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.

pass band: frequency range that the Repeater operates in with operational configuration

NOTE: This frequency range can correspond to one or several consecutive nominal channels. If they are not consecutive each subset of channels is considered as an individual pass band. The Repeater can have one or several pass bands.

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 3GPP2 C.S0002-F [i.5], clauses 2.1.3 and 3.1.3.

repeater: device that receives, amplifies and transmits the radiated or conducted RF carrier both in the down-link direction (from the Base Station to the mobile area) and in the up-link direction (from the mobile to the Base Station)

NOTE: A repeater can be a device that receives, amplifies and transmits one or more radiated or conducted CDMA channel(s) both in the down-link direction (from the Base Station to the mobile area) and in the up-link direction (from the mobile to the Base Station).

Resolution BandWidth (RBW): measured in Hz and represents the frequency over which power is integrated in a spectrum analyser to display the amplitude at the centre of the integration frequency range

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.

RF carrier: direct-sequence spread RF channel

NOTE: For the forward CDMA channel, the number of RF carriers is 1 for spreading rate 1 and 3 for spreading rate 3; for the reverse CDMA channel, there is one RF carrier.

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: often referred to as "1X"

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

spreading rate 3: often referred to as "3X"

NOTE: A spreading rate 3 forward CDMA channel uses three direct-sequence spread carriers (see multiple-carrier forward channel) each with a chip rate of 1,2288 Mcps.
A spreading rate 3 reverse CDMA channel uses a single direct-sequence spread carrier with a chip rate of 3,6864 Mcps.

UpLink (UL): signal path where the mobile or Repeater transmits and the Base Station receives

NOTE: Also referred to as the reverse link.

User Equipment (UE): mobile station supporting operation in cdma2000 spread spectrum systems

NOTE: See 3GPP2 C.S0002-F [i.5], referred to herein as operation in Type 1 cdma2000 system; access terminal supporting operation in cdma2000 High Rate Packet Data Systems as defined in TIA-856 [i.6], referred to herein as operation in Type 2 cdma2000 system; and mobile station supporting operation in Type 1 and Type 2 cdma2000 systems.

3.2 Symbols

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

Δf	frequency offset from the centre frequency
Ω	Ohm
dBc	ratio (in dB) of the sideband power of a signal, measured in a given bandwidth at a given frequency offset from the centre frequency of the same signal, to the total inband power of the signal

NOTE: For CDMA, the total inband power of the signal is measured in a 1,23 MHz bandwidth around the centre frequency of the CDMA signal for a spreading rate 1 CDMA signal and in 3,69 MHz bandwidth around the centre frequency of the CDMA signal for a spreading rate 3 CDMA signal.

dBm	measure of power expressed in terms of its ratio (in dB) to 1 mW
dBm/Hz	measure of power spectral density

NOTE: The ratio, dBm/Hz, is the power in 1 Hz of bandwidth, where power is expressed in units of dBm.

GHz	GigaHertz (10^9 Hertz)
kHz	kiloHertz (10^3 Hertz)
MHz	MegaHertz (10^6 Hertz)
Pout	transmitter RF output power

3.3 Abbreviations

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

BC	Band Class
BS	Base Station
CDMA	Code Division Multiple Access
CW	Continuous Wave (unmodulated signal)
DCS	Digital Cellular System
DL	DownLink
EFTA	European Free Trade Association
EMC	ElectroMagnetic Compatibility
FDD	Frequency Division Duplex
GSM	Global System for Mobile communications
HRPD	High Rate Packet Data