SLOVENSKI STANDARD
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Celična omrežja IMT - Harmonizirani EN, ki zajema bistvene zahteve člena 3.2 direktive R&TTE - 3. del: CDMA z neposrednim razprševanjem ("Direct Spread") (UTRA FDD) bazne postaje (BS)

IMT cellular networks - Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive - Part 3: CDMA Direct Spread (UTRA FDD) Base Stations (BS)

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ICS:

33.060.99	Druga oprema za radijske komunikacije	Other equipment for radiocommunications
33.070.99	Druge mobilne storitve	Other mobile services

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IMT cellular networks;
Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive;
Part 3: CDMA Direct Spread (UTRA FDD) Base Stations (BS)

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Foreword

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

The present document has been produced by ETSI in response to mandates M/284 and M/406 issued from the European Commission under Directive 98/34/EC [i.1] as amended by Directive 98/48/EC [i.7].

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.2].

See article 5.1 of Directive 1999/5/EC [i.2] for information on presumption of conformity and Harmonized Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

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The requirements relevant to Directive 1999/5/EC [i.2] are summarized in annex A.

The present document is part 3 of a multi-part deliverable. Full details of the entire series can be found in part 1 [5].

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Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the R&TTE Directive [i.2]. The modular structure is shown in EG 201 399 [i.3].

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1 Scope

The present document applies to the following {radio}{telecommunications terminal} equipment types:

1) Stations for IMT 2000 CDMA Direct Spread (UTRA FDD).

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: UTRA FDD Base Station operating bands

UTRA FDD band	Direction of transmission	UTRA FDD Base Station operating bands
I	Transmit	2 110 MHz to 2 170 MHz
	Receive	1 920 MHz to 1 980 MHz
III	Transmit	1 805 MHz to 1 880 MHz
	Receive	1 710 MHz to 1 785 MHz
VII	Transmit	2 620 MHz to 2 690 MHz
	Receive	2 500 MHz to 2 570 MHz
VIII	Transmit	925 MHz to 960 MHz
	Receive	880 MHz to 915 MHz
XV	Transmit	2 600 MHz to 2 620 MHz
	Receive	1 900 MHz to 1 920 MHz
XVI	Transmit	2 585 MHz to 2 600 MHz
	Receive	2 010 MHz to 2 025 MHz
XX	Transmit	791 MHz to 821 MHz
	Receive	832 MHz to 862 MHz
XXII	Transmit	3 510 MHz to 3 590 MHz
	Receive	3 410 MHz to 3 490 MHz

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The present document covers requirements for UTRA FDD Base Stations for 3GPP Releases 99, 4, 5, 6, 7, 8, 9 and 10. In addition, the present document covers requirements for UTRA FDD Base Stations in the operating bands specified in TS 102 735 [i.4].

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The present document is intended to cover the provisions of Directive 1999/5/EC [i.2] (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 may 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.

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2 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.

2.1 Normative references

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

[1] Void.

[2] ETSI TS 125 141 (V10.8.0) (02-2013): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) conformance testing (FDD) (3GPP TS 25.141 version 10.8.0 Release 10)".

[3] Recommendation ITU-R SM.329-12 (09-2012): "Unwanted emissions in the spurious domain".

[4] Recommendation ITU-T O.153 (10-1992): "Basic parameters for the measurement of error performance at bit rates below the primary rate".

[5] ETSI EN 301 908-1 (V6.2.1) (04-2013): "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements".

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[6] ETSI TS 145 004 (V10.0.0) (04-2011): "Digital cellular telecommunications system (Phase 2+); Modulation (3GPP TS 45.004 version 10.0.0 Release 10)".

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[7] Void.

[8] ETSI EN 301 908-18 (V6.2.1) (11-2012): "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 18: E-UTRA, UTRA and GSM/EDGE Multi-Standard Radio (MSR) Base Station (BS)".

[9] ETSI TS 125 104 (V10.8.0) (02-2013): "Universal Mobile Telecommunications System (UMTS); Base Station (BS) radio transmission and reception (FDD) (3GPP TS 25.104 version 10.8.0 Release 10)".

2.2 Informative references

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 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.

[i.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).

[i.3] ETSI EG 201 399 (V2.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".

[i.4] ETSI TS 102 735 (V7.1.0): "Universal Mobile Telecommunications System (UMTS); Band-specific requirements for UMTS Frequency Division Duplex (FDD) operation in the bands 1 900 MHz to 1 920 MHz paired with 2 600 MHz to 2 620 MHz and 2 010 MHz to 2 025 MHz paired with 2 585 MHz to 2 600 MHz".

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[i.5] Void.

[i.6] ETSI TR 100 028 (all parts) (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

[i.7] Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 amending Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations.

3 Definitions, symbols and abbreviations

3.1 Definitions

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

ancillary equipment: equipment (apparatus) used in connection with a Base Station

NOTE: This is considered as an ancillary equipment (apparatus) if:

- the equipment is intended for use in conjunction with a BS to provide additional operational and/or control features to the radio equipment, (e.g. to extend control to another position or location);
- the equipment cannot be used on a standalone basis to provide user functions independently of a BS; and
- the 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).

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Base Station class: wide area Base Station, medium range Base Station, local area Base Station or home Base Station, as declared by the manufacturer

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

NOTE: The UTRA FDD chip rate is 3,84 Mchip/s.

downlink operating band: part of the operating band designated for downlink (BS transmit)

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

home Base Station: Base Stations characterized by requirements derived from femtocell scenarios

local area Base Station: Base Stations characterized by requirements derived from picocell scenarios with a BS to UE minimum coupling loss equal to 45 dB

maximum output power: mean power level per carrier of the Base Station measured at the antenna connector in a specified reference condition

mean power: power (transmitted or received) in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mod, when applied to a WCDMA-modulated signal. The period of measurement is at least one timeslot unless otherwise stated

NOTE: $\alpha = 0,22$ is the roll-off factor of the WCDMA signal.

medium range Base Station: Base Stations characterized by requirements derived from microcell scenarios with a BS to UE minimum coupling loss equal to 53 dB

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operating band: frequency range that is defined with a specific set of technical requirements, in which UTRA FDD operates

NOTE: The operating band(s) for a UTRA FDD BS is declared by the manufacturer according to the designations in table 1-1. Operating bands for UTRA are designated with Roman numerals, while the corresponding operating bands for E-UTRA are designated with Arabic numerals.

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: rated output power of the Base Station is the 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 α and a bandwidth equal to the chip rate of the radio access mode

NOTE: The RRC filtered mean power of a perfectly modulated WCDMA signal is 0,246 dB lower than the mean power of the same signal.

uplink operating band: part of the operating band designated for uplink (BS receive)

wide area Base Station: Base Station characterized by requirements derived from Macro Cell scenarios with a BS to UE minimum coupling loss equal to 70 dB

NOTE: This Base Station class has the same requirements as the general purpose Base Station in Releases 99, 4 and 5.

3.2 Symbols

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

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Δf	Separation between the carrier centre frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency
Δf_{max}	The largest value of Δf used for defining the requirement
CPICH Êc	Common Pilot Channel code power (on the adjacent channel)
F_{filter}	Filter centre frequency
F_{high}	The highest BS transmit frequency of the downlink operating band
F_{low}	The lowest BS transmit frequency of the downlink operating band
F_{uw}	Frequency of unwanted signal
Ioh	Total received power density excluding own Home BS signal
$P_{EM,N}$	Declared emission level for channel N
P_{max}	Maximum output power

3.3 Abbreviations

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

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
AWGN	Additive White Gaussian Noise
B	appropriate frequency in the Bottom of the operating band of the BS
BER	Bit Error Ratio
BS	Base Station
BSS	Base Station Subsystem
BTS	Base Transceiver Station
CDMA	Code Division Multiple Access
CPICH	Common Pilot Channel
CW	Continuous Wave
DC	Direct Current
DL	Down link (forward link)

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DTT	Digital Terrestrial Television
DUT	Device Under Test
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
FDD	Frequency Division Duplexing
GMSK	Gaussian Minimum Shift Keying
GSM	Global System for Mobile communications
HSDPA	High Speed Downlink Packet Access
IMT	International Mobile Telecommunications
M	appropriate frequency in the Middle of the operating band of the BS
MIMO	Multiple Input Multiple Output
MS	Mobile Station
MSR	Multi-Standard Radio
PCCPCH	Primary Common Control Physical CHannel
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
RMS	Root Mean Square
RRC	Root-Raised Cosine
Rx	Receiver
SCCPCH	Secondary Common Control Physical CHannel
T	appropriate frequency in the Top of the operating band of the BS
TDD	Time Division Duplexing
Tx	Transmitter
UARFCN	UTRA Absolute Radio Frequency Channel Number
UE	User Equipment
UL	Up Link (reverse link)
UMTS	Universal Mobile Telecommunications System
UTRA	Universal Terrestrial Radio Access
WCDMA	Wideband Code Division Multiple Access

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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 declared operational environmental profile.

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

4.2 Conformance requirements

The requirements in the present document are based on the assumption that the operating band (see table 1-1) is shared between systems of the IMT family (for band III and VIII also GSM) or systems having compatible characteristics.

4.2.1 Introduction

To meet the essential requirement under article 3.2 of Directive 1999/5/EC [i.2] (R&TTE Directive) for IMT Base Stations (BS), seven essential parameters in addition to those in EN 301 908-1 [5] have been identified. Table 4.2.1-1 provides a cross reference between these seven essential parameters and the corresponding ten technical requirements for equipment within the scope of the present document.

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Table 4.2.1-1: Cross references

Essential parameter	Corresponding technical requirements
Spectrum emissions mask	4.2.2 Spectrum emissions mask
	4.2.3 Adjacent Channel Leakage power Ratio (ACLR)
	4.2.11 Home BS output power for adjacent channel protection
Conducted spurious emissions from the transmitter antenna connector	4.2.4 Transmitter spurious emissions
Accuracy of maximum output power	4.2.5 Base Station maximum output power
Intermodulation attenuation of the transmitter	4.2.6 Transmit intermodulation
Conducted spurious emissions from the receiver antenna connector	4.2.7 Receiver spurious emissions
Impact of interference on receiver performance	4.2.8 Blocking characteristics
	4.2.9 Receiver intermodulation characteristics
Receiver adjacent channel selectivity	4.2.10 Receiver Adjacent Channel Selectivity (ACS)

The supplier shall declare the Base Station class and operating band(s) for the Base Station. The technical requirements in the present document apply for Base Stations supporting UTRA FDD, for the declared Base Station class and operating band(s) as outlined for each requirement. For a Base Station supporting more than one operating band, conformance testing for each technical requirement in clause 5 shall be performed for each operating band.

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

For an UTRA FDD Wide Area BS additionally conforming to EN 301 908-18 [8], conformance with the technical requirements listed in table 4.2.1-1 can equally be demonstrated through the corresponding technical requirements and test suites in EN 301 908-18 [8], as listed in table 4.2.1-2.

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When conformance is demonstrated through the test suites in EN 301 908-18 [8] for these technical requirements, the corresponding test suites in the present document need not be performed.

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Table 4.2.1-2: Alternative technical requirements and test suites in EN 301 908-18 [8] that can equally be used for demonstrating conformance for UTRA FDD Wide Area BS

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Technical requirement in the present document	Corresponding technical requirements in EN 301 908-18 [8]	Corresponding test suites in EN 301 908-18 [8]
4.2.2 Spectrum emissions mask	4.2.2 Operating band unwanted emissions	5.3.1 Operating band unwanted emissions
4.2.3 Adjacent Channel Leakage power Ratio (ACLR)	See note	See note
4.2.4 Transmitter spurious emissions	4.2.4 Transmitter spurious emissions	5.3.3 Transmitter spurious emissions
4.2.5 Base Station maximum output power	4.2.5 Base station maximum output power	5.3.4 Base station maximum output power
4.2.6 Transmit intermodulation	4.2.6 Transmit intermodulation	5.3.5 Transmit intermodulation
4.2.7 Receiver spurious emissions	4.2.7 Receiver spurious emissions	5.3.6 Receiver spurious emissions
4.2.8 Blocking characteristics	4.2.8 In-band blocking	5.3.7 In-band blocking
	4.2.9 Out-of-band blocking	5.3.8 Out-of-band blocking
4.2.9 Receiver intermodulation characteristics	4.2.10 Receiver intermodulation characteristics	5.3.9 Receiver intermodulation characteristics
4.2.10 Receiver adjacent channel selectivity	4.2.11 Narrowband blocking	5.3.10 Narrowband blocking
NOTE: Conformance with the UTRA ACLR requirement is for an MSR BS demonstrated through the requirement in clause 4.2.3 of the present document and the corresponding test suite in clause 5.3.2.		

NOTE: There are EC and ECC Decisions for the harmonisation of certain frequency bands for terrestrial systems capable of providing electronic communications services, including technical conditions and parameters related to spectrum usage of the bands. These are related to the deployment and installation of the equipment, but are not related to the conformity of the equipment with the present document.

For ACS, blocking and intermodulation characteristics, the negative offsets of the interfering signal apply relative to the assigned channel frequency of the lowest carrier frequency received and positive offsets of the interfering signal apply relative to the assigned channel frequency of the highest carrier frequency received.

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For a BS declared to support Band XX, the manufacturer shall additionally declare the following quantities associated with the applicable test conditions of table 4.2.2.2-7 and information in annex D of TS 125 104 [9]:

$P_{EM,N}$ Declared emission level for channel N.

P_{10MHz} Maximum output Power in 10 MHz.

4.2.2 Spectrum emissions mask

For a UTRA FDD Wide Area BS additionally conforming to EN 301 908-18 [8], either the requirement of the present clause or the Operating band unwanted emissions requirement in clause 4.2.2 of EN 301 908-18 [8] can be equally applied, as listed in table 4.2.1-2.

4.2.2.1 Definition

Out-of-band emissions are unwanted emissions immediately outside the channel bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out-of-band emission limit is specified in terms of a spectrum emission mask and adjacent channel leakage power ratio for the transmitter.

4.2.2.2 Limit

The requirement shall be met by a Base Station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified in tables 4.2.2.2-1 to 4.2.2.2-4 for the appropriate BS maximum output power, in the frequency range from $\Delta f = 2,5$ MHz to Δf_{max} from the carrier frequency, where:

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- Δf is the separation between the carrier frequency and the nominal -3 dB point of the measuring filter closest to the carrier frequency;
- f_offset is the separation between the carrier frequency and the centre of the measurement filter;
- f_offset_{max} is either 12,5 MHz or the offset to the UMTS Tx band edge as defined in clause 1, whichever is the greater;
- Δf_{max} is equal to f_offset_{max} minus half of the bandwidth of the measuring filter.

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**Table 4.2.2.2-1: Spectrum emission mask values,
BS maximum output power P ≥ 43 dBm for UTRA FDD bands ≤ 3 GHz**

Frequency offset of measurement filter - 3 dB point, Δf	Frequency offset of measurement filter centre frequency, f_offset	Maximum level	Measurement bandwidth
2,5 MHz ≤ Δf < 2,7 MHz	2,515 MHz ≤ f_offset < 2,715 MHz	-12,5 dBm	30 kHz
2,7 MHz ≤ Δf < 3,5 MHz	2,715 MHz ≤ f_offset < 3,515 MHz	$-12,5\ \text{dBm} - 15 \times (\frac{f\_offset}{MHz} - 2,715)$ dB	30 kHz
	3,515 MHz ≤ f_offset < 4,0 MHz	-24,5 dBm	30 kHz
3,5 MHz ≤ Δf ≤ Δf_{max}	4,0 MHz ≤ f_offset < f_offset_{max}	-11,5 dBm	1 MHz