



**SLOVENSKI STANDARD**  
**SIST EN 301 908-22 V5.2.1:2011**  
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**Celična omrežja IMT - Harmonizirani EN, ki zajema bistvene zahteve člena 3.2  
direktive R&TTE - 22. del: Bazne postaje FDD OFDMA TDD WMAN (mobilni WiMAX)**

IMT cellular networks - Harmonized EN covering the essential requirements of article 3.2  
of the R&TTE Directive - Part 22: OFDMA TDD WMAN (Mobile WiMAX) FDD Base  
Stations (BS)

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# ETSI EN 301 908-22 V5.2.1 (2011-09)



Harmonized European Standard

**IMT cellular networks;**  
**Harmonized EN covering the essential requirements**  
**of article 3.2 of the R&TTE Directive;**  
**Part 22: OFDMA TDD WMAN (Mobile WiMAX)**  
**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 mandate M/284 from the European Commission issued under Council Directive 98/34/EC [i.1] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

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 Harmonised Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

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

The present document is part 22 of a multi-part deliverable covering the essential requirements under article 3.2 of Directive 1999/5/EC [i.2] (R&TTE Directive) for Base Stations (BS), Repeaters and User Equipment (UE) for IMT cellular networks, as identified below:

- Part 1: "Introduction and common requirements";
- Part 2: "CDMA Direct Spread (UTRA FDD) User Equipment (UE)";
- Part 3: "CDMA Direct Spread (UTRA FDD) Base Stations (BS)";
- Part 4: "CDMA Multi-Carrier (cdma2000) User Equipment (UE)";
- Part 5: "CDMA Multi-Carrier (cdma2000) Base Stations (BS)";
- Part 6: "CDMA TDD (UTRA TDD) User Equipment (UE)";
- Part 7: "CDMA TDD (UTRA TDD) Base Stations (BS)";
- 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: "CDMA Direct Spread (UTRA FDD) (Repeaters)";
- Part 12: "Harmonized EN for IMT-2000, CDMA Multi-Carrier (cdma2000) (Repeaters) covering the essential requirements of article 3.2 of the R&TTE Directive";
- Part 13: "Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)";

- Part 14: "Evolved Universal Terrestrial Radio Access (E-UTRA) Base Stations (BS)";
- Part 15: "Evolved Universal Terrestrial Radio Access (E-UTRA) (FDD Repeaters)";
- Part 16: "Harmonized EN for IMT-2000, Evolved CDMA Multi-Carrier Ultra Mobile Broadband (UMB) (UE) covering the essential requirements of article 3.2 of the R&TTE Directive";
- Part 17: "Harmonized EN for IMT-2000, Evolved CDMA Multi-Carrier Ultra Mobile Broadband (UMB) (BS) 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)";
- Part 19: "OFDMA TDD WMAN (Mobile WiMAX) TDD User Equipment (UE)";
- Part 20: "OFDMA TDD WMAN (Mobile WiMAX) TDD Base Stations (BS)";
- Part 21: "OFDMA TDD WMAN (Mobile WiMAX) FDD User Equipment (UE)";
- Part 22: "OFDMA TDD WMAN (Mobile WiMAX) FDD Base Stations (BS)".**

<b>National transposition dates</b>	
Date of adoption of this EN:	12 September 2011
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## Introduction

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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].

# 1 Scope

The present document applies to the following radio equipment type:

- Mobile WiMAX FDD Base Stations for IMT-OFDMA TDD WMAN 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: Base Station WiMAX FDD Operating frequency bands**

Mobile WiMAX Band Class Index	Direction of transmission	Mobile WiMAX FDD frequency bands
7G	Transmit	925 MHz to 960 MHz
	Receive	880 MHz to 915 MHz
6C	Transmit	1 805 MHz to 1 880 MHz
	Receive	1 710 MHz to 1 785 MHz

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 [i.2] 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-](http://www.newapproach.org-standards.iteh.ai/)

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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 reference 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] ETSI EN 301 908-1 (V5.2.1): "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements".
- [2] CEPT/ERC/Recommendation 74-01E (Siófok 98, Nice 99, Sesimbra 02, Hradec Kralove 05): "Unwanted emissions in the spurious domain".

### 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: "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 TR 102 215 (V1.3.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Recommended approach, and possible limits for measurement uncertainty for the measurement of radiated electromagnetic fields above 1 GHz".
- [i.5] ETSI EN 300 019-1-0: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-0: Classification of environmental conditions; Introduction".
- [i.6] 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".
- [i.7] ITU-R Recommendation SM.329-10 (2003): "Unwanted emissions in the spurious domain".

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## 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 [i.2] and the following apply:

**burst:** period during which radio waves are intentionally transmitted, preceded and succeeded by periods during which no intentional transmission is made

**environmental profile:** declared range of environmental conditions under which equipment within the scope of the present document is required to be compliant

**Eval\_BW1:** test condition where the pass band of a rectangular filter with a bandwidth of 4,75 MHz for 5 MHz equipment and 9,5 MHz for 10 MHz equipment is used for measurement centred on an operating channel or a victim channel

**integral antenna:** antenna which is declared to be part of the radio equipment by the supplier

NOTE: Even when equipment with an integral antenna is concerned, it might still be possible to separate the antenna from the equipment using a special tool. In such cases the assessment of the radio equipment and of the antenna against requirements of this multi-part deliverable may be done separately.

**maximum output power:** mean power level per carrier of the base station or user equipment measured at the antenna connector in a specified reference condition

**mean power:** when applied to a modulated signal, this is the power (transmitted or received) in a bandwidth

NOTE: The term "mean" here is used to exclude the amplitude fluctuation related to those theoretical variations present in signal for example due to amplitude modulation, pulse shaping, pre-equalization, etc. Time averaging should be applied to estimate mean power with the affect of the theoretical variations. The duty cycle corresponding to burst activity within a frame should be also incorporated for "mean" power estimation.

**nominal maximum output power:** maximum nominal mean power level measured over total allocated channel bandwidth of the Base Station available at the antenna connector declared by the manufacturer; for equipment implementing dynamic change of modulation format, it is intended as the maximum nominal mean power associated to the modulation format delivering the highest power

**receiver thermal noise power:** equal to  $k \times T \times BW \times F$

**WiMAX:** trademarked name for the OFDMA TDD WMAN IMT technology

## 3.2 Symbols

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

$A_{BS}$	Base Station Interface A
$A_{MS}$	Mobile Station Interface A
$A_{UUT}$	Unit Under Test Interface A
BW	Assigned channel bandwidth
dB	decibel
dBc	decibel relative to P <sub>nom</sub> carrier power measured in Eval_BW1
dBm	decibel relative to 1 milliwatt
f	Frequency of measurement
$F_c$	centre frequency of the assigned channel
F	Receiver noise figure
$F_{UL\_low}$	The lowest frequency of the uplink operating band

NOTE: See table 4.2.2.2.2-1.

$F_{UL\_high}$	The highest frequency of the uplink operating band
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NOTE: See table 4.2.2.2.2-1.

k	Boltzmann's constant
$M_{BS}$	Base Station Interface M
$M_{MS}$	Mobile Station Interface M
N	Maximum number of antennas in a multiple antenna configuration
$N_{th}$	Receiver thermal noise power expressed in dBm
$P_{SENS}$	Receiver sensitivity level at BER = $10^{-6}$ (or equivalent PER) performance for an AWGN channel, corresponding to the most robust modulation and coding rate supported by the technology
P <sub>nom</sub>	declared nominal maximum output Power
$P_{SENS5}$	sensitivity levels at BER $\leq 10^{-6}$ for a 5 MHz channel, corresponding to the most robust modulation and coding rate supported by the technology
$P_{SENS10}$	sensitivity levels at BER $\leq 10^{-6}$ , for a 10 MHz channel, corresponding to the most robust modulation and coding rate supported by the technology
T	Ambient temperature in Kelvin

## 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
BER	Bit Error Ratio
BS	Base Station
BW	BandWidth
CW	Continuous Wave
ERM	Electromagnetic compatibility and Radio spectrum Matters
FDD	Frequency Division Duplexing
GHz	GigaHertz
MHz	MegaHertz
MSG	Mobile Standards Group
OFDMA	Orthogonal Frequency Division Multiple Access
PER	Packet Error Ratio
R&TTE	Radio equipment and Telecommunications Terminal Equipment
RF	Radio Frequency
RMS	Root Mean Square
TFES	Task Force for European Standards for IMT
TPC	Transmit Power Control

UE User Equipment  
UUT Unit Under Test

## 4 Essential requirements specification

With reference to article 3.2 of Directive 1999/5/EC [i.2] the phenomena in this clause have been identified as relevant to the essential requirements.

### 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.

### 4.2 Conformance requirements

#### 4.2.1 Introduction

To meet the essential requirement under article 3.2 of the R&TTE Directive [i.2] for IMT Base Stations (BS) six essential parameters in addition to those in EN 301 908-1 [1] have been identified. Table 4.2.1-1 provides a cross reference between these six 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 4.2.1-1 must be verified.

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Table 4.2.1-1: Cross references

Essential parameter	Corresponding technical requirements
Spectrum emission mask	4.2.2 Transmitter Spectrum emission mask
	4.2.3 Transmitter adjacent channel leakage power ratio
	4.2.6 Transmit Intermodulation characteristics
Conducted spurious emissions from the transmitter antenna connector	4.2.4 Transmitter spurious emissions
Accuracy of maximum output power	4.2.5 Transmitter maximum output power
Conducted spurious emissions from the receiver antenna connector	4.2.7 Receiver spurious emissions
Impact of interference on receiver performance	4.2.9 Receiver blocking characteristics
	4.2.10 Receiver intermodulation characteristics
Receiver adjacent channel selectivity	4.2.8 Receiver adjacent channel selectivity (ACS)

#### 4.2.2 Spectrum emission mask

##### 4.2.2.1 Definition

Spectrum emission mask defines an out of band emission requirement for the 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.

##### 4.2.2.2 Limits

A Base Station device transmitting on a single RF carrier configured in accordance with the manufacturer's specification shall meet the requirement. Emissions shall not exceed the maximum level specified in tables 4.2.2.2.1-1 and 4.2.2.2.2-1 for the appropriate BS maximum output power and nominal channel bandwidths of 5 MHz and 10 MHz.