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Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) - Oddajniška oprema za prizemno digitalno (televizijsko) videoradiodifuzijsko storitev (DVB-T) - 2. del: Harmonizirani EN, ki zajema bistvene zahteve člena 3.2 direktive R&TTE

Electromagnetic compatibility and Radio spectrum Matters (ERM) - Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T) - Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

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Harmonized European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T); Part 2: Harmonized EN covering the essential requirements 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), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate 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 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 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").

Technical specifications relevant to Directive 1999/5/EC [2] are given in annex A.

The present document is part 2 of a multi-part deliverable covering Transmitting equipment for the digital television broadcast service, Terrestrial (DVB-T), as identified below:

Part 1: "Technical characteristics and test methods";

Part 2: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

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. The modular structure is shown in EG 201 399 [i.2].

Other document directly associated with the present document:

- EN 301 489-14 [4].

1 Scope

The present document applies to transmitting equipment for the terrestrial digital television broadcasting service.

The types of equipment covered by the present document are as follows:

> Transmitting equipment for digital television broadcasting service, with 7 MHz and 8 MHz RF channel bandwidths, operating in the CEPT frequency bands. These frequencies are currently within the television Bands III, IV and V.

The present document is intended to cover the provisions of Directive 1999/5/EC [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 [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.

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] Void.

[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] Void.

[4] ETSI EN 301 489-14 (V1.2.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 14: Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters".

[5] CENELEC EN 55022:2006 + A1:2007: "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement".

[6] CENELEC EN 55011: 2007 + A2:2007: "Industrial, scientific and medical (ISM) radio-frequency equipment - Radio disturbance characteristics - Limits and methods of measurement".

[7] ETSI TR 100 028-1 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1".

[8] ETSI TR 100 028-2 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2".

[9] CENELEC EN 55016-1-1:2007 + A1:2007 + A2:2008: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus".

[10] CISPR 16-2-3 Ed. 2.0 b:2006: "Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements".

[11] CENELEC EN 55016-4-2 (2010): "Specification for radio disturbance and immunity measuring apparatus and methods - Part 4-2: Uncertainties, statistics and limit modelling - Measurement instrumentation uncertainty".

[12] ETSI EN 300 744 (V1.6.1): "Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for digital terrestrial television".

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] ETSI EG 201 399 (V2.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of Harmonized Standards for application under the R&TTE Directive".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

antenna port: port of an apparatus which is designed, in normal operation, to be connected to an antenna using coaxial cable

carrier power: average power supplied to the antenna port by a transmitter during one radio frequency cycle taken under the condition of no modulation

class of emission: set of characteristics of an emission, designated by standard symbols, e.g. type of modulation of the main carrier, modulating signal, type of information to be transmitted, and also, if appropriate, any additional signal characteristics

dBc: decibels relative to the unmodulated carrier power of the emission

NOTE: In the cases which do not have a carrier, for example in some digital modulation schemes where the carrier is not accessible for measurement, the reference level equivalent to dBc is decibels relative to the *mean power P*.

digital signal: discretely timed signal in which information is represented by a finite number of well defined discrete values that its characteristic quantities may take in time

digital television: television in which all information is represented by a digital signal

enclosure port: physical boundary of the apparatus through which electromagnetic fields may radiate or impinge

NOTE: In the case of integral antenna equipment, this port is inseparable from the antenna port.

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

exclusion band: band of radio frequencies where no measurements are made

harmonic: component of order greater than 1 of the Fourier series of a periodic quantity

intermodulation products: unwanted frequencies resulting from intermodulation between carriers or harmonics of emission, or between any oscillations generated to produce the carrier

mean power: average power supplied to the antenna port by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions

necessary bandwidth: for a given class of emission, the width of the frequency band which is sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions

rated output power: power that the transmitter or transposer delivers at its output under specified conditions of operation

reference bandwidth: bandwidth in which the emission level is specified

3.2 Symbols

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

µ	Micro.

3.3 Abbreviations

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

dB	logarithmic ratio (tenths of a "Bel")
dBm	dB relative to one milliwatt
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
FAR	Fully Anechoic Room
GHz	GigaHertz
kHz	kiloHertz
LV	Low Voltage
m	metres
MHz	MegaHertz
OATS	Open Area Test Site
R&TTE	Radio and Telecommunications Terminal Equipment
W	Watt

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.

4.2 Conformance requirements

4.2.1 Introduction

To meet the essential requirement under article 3.2 of the R&TTE Directive [2] two essential parameters have been identified. Table 1 provides a cross reference between these two essential parameters and the corresponding three 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 4.1 must be verified.

Table 4.1: Cross references

Essential parameter	Corresponding technical requirements
Conducted emissions from antenna port	4.2.2 Spurious emissions
	4.2.3 Out-of-band emissions
Radiated emissions from enclosure port	4.2.4 Cabinet radiation

4.2.2 Spurious emissions

4.2.2.1 Definition

Emissions on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. These include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products but exclude out of band emissions.

For the purposes of the present document spurious emissions are emissions at frequencies outside the frequency range $f_0 \pm 14$ MHz for 7 MHz channels, $f_0 \pm 12$ MHz for 8 MHz channels, where f_0 is the centre frequency of the channel, irrespective of the number of carriers employed.

4.2.2.2 Limits

Spurious emissions shall not exceed the values set out in Table 4.2 additionally shown in Figures 4.1 and 4.2, for the frequency range 9 kHz to 4,5 GHz.

In the case of a DVB-T transmitter supplied without an internal bandpass output filter, the manufacturer shall specify the characteristics of the filter necessary to fulfil the spurious emission limits defined in Table 4.2. The manufacturer shall include this information in their test report.

Table 4.2: Spurious emission limits for DVB-T transmitters

Frequency range of the spurious emission	Limits of the spurious emission		Reference bandwidth	Figure
9 kHz to 174 MHz	-36 dBm (250 nW)		100 kHz	4.1
> 174 MHz to 400 MHz	-82 dBm, for -126 dBc, for -66 dBm, for	P ≤ 25 W 25 W < P ≤ 1 000 W 1 000 W < P	4 kHz	4.2
> 400 MHz to 790 MHz	-36 dBm (250 nW)		100 kHz	4.1
> 790 MHz to 862 MHz	-76 dBm, for -120 dBc, for -60 dBm, for	P ≤ 25 W 25 W < P ≤ 1 000 W 1 000 W < P	4 kHz	4.2
> 862 MHz to 1 000 MHz	-36 dBm (250 nW)		100 kHz	4.1
> 1 000 MHz	-30 dBm (1 µW)		100 kHz	4.1
NOTE: P = mean power of the transmitter.				

4.2.2.3 Conformance test

Conformance tests described in Clause 5.3.1 shall be carried out.