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Harmonized European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

Reference
REN/ERM-TG17WG3-261-2

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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).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) [i.2] 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") [i.1].

Technical specifications relevant to Directive 1999/5/EC [i.1] are given in annex A.

The present document is part 2 of a multi-part deliverable covering cordless audio devices in the range 25 MHz to 2 000 MHz, as identified below:

Part 1: "Technical characteristics and test methods";

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

National transposition dates	
Date of adoption of this EN:	10 November 2008
Date of latest announcement of this EN (doa):	28 February 2009
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2009
Date of withdrawal of any conflicting National Standard (dow):	31 August 2010

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.1]. The modular structure is shown in EG 201 399 [i.3].

If you are planning to use RDS please go to: http://www.rds.org.uk/rds98/rds98.htm for further information.

1 Scope

The present document is intended to specify the minimum performance and the methods of measurement of cordless audio equipment in the range 25 MHz to 2 000 MHz, including:

- cordless headphones;
- cordless loudspeakers;
- consumer radio microphones in the range 863 MHz to 865 MHz;
- in-ear monitoring equipment using either 300 kHz bandwidth analogue modulation or 300 kHz, 600 kHz, 1 200 kHz digital FDMA modulation in the range 863 MHz to 865 MHz;
- in-vehicle cordless;
- personal cordless;
- broadband multi channel audio systems;
- Band II LPD. (low power devices) in the 87,5 MHz to 108 MHz range (Broadcasting Band II) using up to 200 kHz bandwidth and analogue modulation.
- and other devices and frequency bands defined within CEPT/ERC/REC 70-03 [i.4] or European or National regulation.

The frequency bands for this equipment may differ from country to country as specified in their national regulations. All equipment is intended to be used with integral antennas.

The present document is intended to cover the provisions of Directive 1999/5/EC [i.1] (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 1: A list of such ENs is included on the web site http://www.newapproach.org.

NOTE 2: The term cordless is also used to describe infra red and other non-RF "wireless" links, but in the context of the present document it is restricted to RF operating systems only.

2 References

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.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

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

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI EN 301 357-1 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Cordless audio devices in the range 25 MHz to 2 000 MHz; Part 1: Technical characteristics and test methods".

[2] 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".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] 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.2] 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.3] ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".

[i.4] CEPT/ERC/REC 70-03 relating to the use of Short Range Devices (SRD).

3 Definitions, symbols and abbreviations

3.1 Definitions

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

artificial antenna: tuned reduced-radiating dummy load equal to the nominal impedance specified by the applicant

integral antenna: antenna, with or without a connector, designed as, and declared as by the manufacturer, an indispensable part of the equipment

integral antenna for Band II LPD only: permanent fixed antenna, which may be built-in, designed as an indispensable part of the equipment

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

NOTE: However, the necessary bandwidths of most digital modulation formats are presently not referred to ITU-R Recommendations of SM series.

port: any connection point on or within the Equipment Under Test (EUT) intended for the connection of cables to or from that equipment

radiated measurements: measurements that involve the absolute measurement of a radiated electromagnetic field

spurious emission: emission 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

NOTE: Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products.

3.2 Symbols

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

µW	micro Watt
Ω	ohm
dBc	dB relative to the carrier level
E	field strength
GHz	Giga Hertz
kHz	kilo Hertz
MHz	Mega Hertz
mW	milli Watt
nW	nano Watt

3.3 Abbreviations

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

EUT	Equipment Under Test
FDMA	Frequency Division Multiple Access
LPD	Low Power Device

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 Transmitter requirements for Band II LPD

4.2.1.1 Basic requirements for Band II LPB

The Band II LPD shall meet the basic requirements according to EN 301 357-1 [1], clause 8.1.

4.2.1.2 Effective radiated power

The effective radiated power, as defined in EN 301 357-1 [1], clause 8.2.3.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.2.3.3.

4.2.1.3 Occupied bandwidth

The occupied bandwidth, as defined in EN 301 357-1 [1], clause 8.2.4.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.2.4.3.

4.2.1.4 Frequency error

The frequency error, as defined in EN 301 357-1 [1], clause 8.2.5.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.2.5.3.

4.2.1.5 Transmitter timeout

The transmitter timeout, as defined in EN 301 357-1 [1], clause 8.2.6.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.2.6.3.

4.2.1.6 Radiated spurious emissions

The radiated spurious emissions as defined in EN 301 357-1 [1], clause 3.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.2.7.3.

NOTE: For combined equipment such as Band II LPD implemented in cellular phones or in other telecommunication equipment falling under the R&TTE Directive, the ERP measurement of spurious emissions may be made according to the matching EN standards for the main equipment. Refer to EN 301 357-1 [1], clause 8.2.7.3.2.

4.2.2 Frequency error

The frequency error, as defined in EN 301 357-1 [1], clause 8.3.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.3.3, table 3.

This clause does not apply to Band II LPD.

4.2.3 Carrier power

The carrier power, as defined in EN 301 357-1 [1], clause 8.4.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.4.3, table 5.

This clause does not apply to Band II LPD.

4.2.4 Channel bandwidth

The channel bandwidth, as defined in EN 301 357-1 [1], clause 8.5.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.5.4, table 7, figures 3 and 4.

This clause does not apply to Band II LPD.

4.2.5 Spurious emissions and cabinet radiation

The spurious emissions and cabinet radiation, as defined in EN 301 357-1 [1], clause 3.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.6.3, table 9.

This clause does not apply to Band II LPD.

4.2.6 Cordless audio transmitter shutoff

The transmitter shutoff time, as defined in EN 301 357-1 [1], clause 8.7.1, shall not exceed the limits in EN 301 357-1 [1], clause 8.7.3.

This clause does not apply to Band II LPD.

4.2.7 Receiver spurious emissions and cabinet radiation

The spurious emissions and cabinet radiation, as defined in EN 301 357-1 [1], clause 9.1.1, shall not exceed the limits in EN 301 357-1 [1], clause 9.1.5, table 12.

This clause does apply to cordless audio devices with integrated receiver and to combined equipments such as Band II LPD integrated into a receiver.

5 Testing for compliance with technical requirements

5.1 Environmental conditions for testing

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile.

Where technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions (within the boundary limits of the declared operational environmental profile) to give confidence of compliance for the affected technical requirements.

5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit shall be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in table 1.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [2] and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 1 is based on such expansion factors and gives the maximum allowable measurement uncertainties applicable to measured parameters for cordless audio and radio microphones unless otherwise stated in the present document.

Table 1: Maximum allowable measurement uncertainty for cordless audio and radio microphones

Parameter	Uncertainty
RF frequency	< ±1 x 10^{-7}
Audio Output power	< ±0,5 dB
Radiated RF power	< ±6 dB
Conducted RF power variations using a test fixture	< ±0,75 dB
Maximum frequency deviation: - within 300 Hz and 6 kHz of audio frequency - within 6 kHz and 25 kHz of audio frequency	 < ±5 % < ±3 dB
Deviation limitation	< ±5 %
Radiated emission of transmitter, valid up to 12,75 GHz	< ±6 dB
Radiated emission of receiver, valid up to 12,75 GHz	< ±6 dB
Transmitter switch off time	< ±5 %