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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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Contents

Intellectual Property Rights	4
Foreword.....	4
Introduction	4
1 Scope	5
2 References	5
2.1 Normative references	6
2.2 Informative references.....	6
3 Definitions, symbols and abbreviations	6
3.1 Definitions.....	6
3.2 Symbols.....	7
3.3 Abbreviations	7
4 Technical requirements specifications	7
4.1 Environmental profile.....	7
4.2 Conformance requirements	7
4.2.1 Transmitter requirements for Band II LPD.....	7
4.2.1.1 Basic requirements for Band II LPB	7
4.2.1.2 Effective radiated power	7
4.2.1.3 Occupied bandwidth.....	8
4.2.1.4 Frequency error	8
4.2.1.5 Transmitter timeout.....	8
4.2.1.6 Radiated spurious emissions	8
4.2.2 Frequency error.....	8
4.2.3 Carrier power	8
4.2.4 Channel bandwidth	8
4.2.5 Spurious emissions and cabinet radiation	8
4.2.6 Cordless audio transmitter shutoff	8
4.2.7 Receiver spurious emissions and cabinet radiation.....	9
5 Testing for compliance with technical requirements.....	9
5.1 Environmental conditions for testing	9
5.2 Interpretation of the measurement results	9
5.3 Essential radio test suites.....	10
5.3.1 Transmitter test suites for Band II LPD	10
5.3.2 Frequency error.....	10
5.3.3 Carrier power	10
5.3.4 Channel bandwidth	10
5.3.5 Radiated spurious emissions and cabinet radiation.....	10
5.3.6 Cordless audio transmitter shutoff.....	10
5.3.7 Receiver spurious emissions and cabinet radiation.....	10
Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT).....	11
Annex B (informative): The EN title in the official languages	13
Annex C (informative): Bibliography.....	14
History	15

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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 Vote 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 (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".

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

Table 2 gives the maximum allowable measurement uncertainties applicable to measured parameters for Band II LPD unless otherwise stated in the present document.

Table 2: Maximum allowable measurement uncertainty for Band II LPD

Parameter	Uncertainty
Effective Radiated Power	< ± 6 dB
Occupied Bandwidth	< ± 6 dB
Frequency Error	< ± 100 Hz
Transmitter Timeout	< ± 10 seconds
Radiated Spurious Emissions	< ± 6 dB

5.3 Essential radio test suites

5.3.1 Transmitter test suites for Band II LPD

All tests specified in EN 301 357-1 [1], clause 8.2 shall be carried out for Band II LPD.

These tests cover the following transmitter test suites for Band II LPD: effective radiated power; occupied bandwidth; frequency error; transmitter timeout and radiated spurious emissions.

5.3.2 Frequency error

The test specified in EN 301 357-1 [1], clause 8.3 shall be carried out for general cordless audio devices.

5.3.3 Carrier power

The test specified in EN 301 357-1 [1], clause 8.4 shall be carried out for general cordless audio devices.

5.3.4 Channel bandwidth

The test specified in EN 301 357-1 [1], clause 8.5 shall be carried out for general cordless audio devices.

5.3.5 Radiated spurious emissions and cabinet radiation

The test specified in EN 301 357-1 [1], clause 8.6 shall be carried out for general cordless audio devices.

5.3.6 Cordless audio transmitter shutoff

The test specified in EN 301 357-1 [1], clause 8.7 shall be carried out for general cordless audio devices.

5.3.7 Receiver spurious emissions and cabinet radiation

The test specified in EN 301 357-1 [1], clause 9.1 shall be carried out for general cordless audio devices.

Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it provides a statement of all the test procedures corresponding to those requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
 - Unconditional: meaning that the requirement applies in all circumstances; or
 - Conditional: meaning that the requirement is dependent on the manufacturer having chosen to support optional functionality defined within the schedule;
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
 - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
 - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 301 357-2						
The following requirements and test specifications are relevant to the presumption of conformity under the Article 3.2 of the R&TTE Directive						
Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	Transmitter requirements for Band II LPD	4.2.1	C	For Band II LPD and combined devices	E	5.3.1
2	Frequency error	4.2.2	C	For cordless audio devices in the range 25 MHz to 2 000 MHz	E	5.3.2
3	Carrier power	4.2.3	C	For cordless audio devices in the range 25 MHz to 2 000 MHz	E	5.3.3
4	Channel bandwidth	4.2.4	C	For cordless audio devices in the range 25 MHz to 2 000 MHz	E	5.3.4
5	Spurious emissions and cabinet radiation	4.2.5	C	For cordless audio devices in the range 25 MHz to 2 000 MHz	E	5.3.5
6	Cordless audio transmitter shutoff	4.2.6	C	For cordless audio devices in the range 25 MHz to 2 000 MHz	E	5.3.6
7	Receiver spurious emissions and cabinet radiation	4.2.7	C	For cordless audio devices in the range 25 MHz to 2 000 MHz	E	5.3.7

Key to columns:**Requirement:**

- No** A unique identifier for one row of the table which may be used to identify a requirement or its test specification.
- Description** A textual reference to the requirement.
- Clause Number** Identification of clause(s) defining the requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

- U/C** Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the manufacturers claimed functionality of the equipment (C).
- Condition** Explains the conditions when the requirement shall or shall not be applicable for a technical requirement which is classified "conditional".

Test Specification:

- E/O** Indicates whether the test specification forms part of the Essential Radio Test Suite (E) or whether it is one of the Other Test Suite (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement. The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

- Clause Number** Identification of clause(s) defining the test specification in the present document unless another document is referenced explicitly Where no test is specified (that is, where the previous field is "X") this field remains blank.

Annex B (informative): The EN title in the official languages

The enlargement of the European Union (EU) resulted in a requirement from the EU for a larger number of languages for the translation of the titles of Harmonized Standards and mandated ENs that are to be listed in the Official Journal to support the implementation of this legislation.

For this reason the title translation concerning the present document can be consulted via the [e-approval](#) application.

Annex C (informative): Bibliography

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (LV Directive).

History

Document history			
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