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Harmonized European Standard (Telecommunications series)

Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

Reference
REN/ERM-TG17WG3-008-2

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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), 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 [3] (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") [2].

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. Full details of the entire series can be found in part 1 EN 300 422-1 [1].

National regulations on maximum power output will apply.

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 [4].

1 Scope

The present document applies to equipment operating on radio frequencies between 25 MHz and 3 GHz, using analogue, digital and hybrid (using both analogue and digital modulation) modulation. The present document does not apply to radio microphones or in ear monitoring equipment employing Time Division Multiple Access (TDMA) modulation.

The present document applies to the following radio equipment types:

1) professional hand held radio microphones;
2) professional body worn radio microphones;
3) in ear monitoring systems, etc.;
4) consumer radio microphones;
5) tour guide systems;
6) Assistive Listening Devices (Aids for the handicapped).

The maximum power recommended for equipment covered by the present document is 250 mW (erp below 1 GHz and eirp above 1 GHz).

The present document is intended to cover the provisions of Directive 1999/5/EC (R&TTE Directive) [2],

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.

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 300 422-1 (V1.3.2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement".

2.2 Informative references

[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] 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.

[4] 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".

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

[6] ETSI TR 102 215: "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".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 422-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 422-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 422-1 [1] apply.

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 Frequency stability

4.2.1.1 Definition

This shall be as defined in EN 300 422-1 [1], clause 3.1.

4.2.1.2 Limit

The transmitter frequency error limit shall be as stated in EN 300 422-1 [1], clause 8.1.3.

4.2.1.3 Conformance

Conformance tests as defined in clause 5.3.1.1 shall be carried out.

4.2.2 Rated Output Power

4.2.2.1 Definition

This shall be as defined in EN 300 422-1 [1], clause 3.1.

4.2.2.2 Limit

The rated output power shall be as stated in EN 300 422-1 [1], clause 8.2.3.

4.2.2.3 Conformance

Conformance tests as defined in clause 5.3.1.2 shall be carried out.

4.2.3 Necessary bandwidth

4.2.3.1 Definition

This shall be as defined in EN 300 422-1 [1], clause 3.1.

4.2.3.2 Limit

The necessary bandwidth limit shall be as stated in EN 300 422-1 [1], clause 8.3.1.2 for analogue systems and clause 8.3.2.2 for digital systems.

4.2.3.3 Conformance

Conformance tests as defined in clause 5.3.1.3 shall be carried out.

4.2.4 Spurious emissions

4.2.4.1 Definition

This shall be as defined in EN 300 422-1 [1], clause 3.1.

4.2.4.2 Limit

The spurious emissions limit shall be as stated in EN 300 422-1 [1], clause 8.4.3.

4.2.4.3 Conformance

Conformance tests as defined in clause 5.3.1.4 shall be carried out.

4.3 Receiver requirements

4.3.1 Spurious emissions

4.3.1.1 Definition

This shall be as defined in EN 300 422-1 [1], clause 9.1.1.

4.3.1.2 Limit

The spurious emissions limit shall be as stated in EN 300 422-1 [1], clause 9.1.5.

4.3.1.3 Conformance

Conformance tests as defined in clause 5.3.2.1 shall be carried out.

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 the principles contained within TR 100 028 [5] or TR 102 215 [6] as appropriate 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.

Table 1: Maximum measurement uncertainty

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

5.3 Essential radio test suites

5.3.1 Transmitter test suites

5.3.1.1 Frequency stability

The test specified in EN 300 422-1 [1], clause 8.1.1 shall be carried out for analogue systems and clause 8.1.2 for digital systems. The results obtained shall be compared to the limits in clause 4.2.1.2 in order to prove compliance with the requirement.

5.3.1.2 Rated Output Power

The test specified in EN 300 422-1 [1], clauses 8.2.1 and 8.2.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.2.2 in order to prove compliance with the requirement.

5.3.1.3 Necessary bandwidth

The test specified in EN 300 422-1 [1], clause 8.3.1 shall be carried out for analogue systems and clause 8.3.2 for digital systems. The results obtained shall be compared to the limits in clause 4.2.3.2 in order to prove compliance with the requirement.

5.3.1.4 Spurious emissions

The test specified in EN 300 422-1 [1], clause 8.4.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance with the requirement.

5.3.2 Receiver test suites

5.3.2.1 Spurious emissions

The test specified in EN 300 422-1 [1], clauses 9.1.2, 9.1.3 and 9.1.4 shall be carried out. The results obtained shall be compared to the limits in clause 4.3.1.2 in order to prove compliance with the requirement.