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Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Short Range Devices (SRD);
Radio equipment in the frequency range
9 kHz to 25 MHz and inductive loop systems
in the frequency range 9 kHz to 30 MHz;
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.

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

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 [i.2] 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 [i.2] are given in annex A.

The present document is part 2 of a multi-part deliverable covering Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems, 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

1 Scope

The present document applies to Short Range Devices (SRDs) transmitters and receivers as described in the scope of EN 300 330-1 [1].

The present document covers transmitters intended to operate in the frequency range as defined in the Commission Decision 2006/771/EC [i.4] on harmonisation of the radio spectrum for use by short-range devices as amended by Commission Decision 2008/432/EC and the CEPT/ERC/REC 70-03 [i.5].

The document applies to:

- 1) Generic Short range Devices including transmitters operating in the range from 9 kHz to 25 MHz; and
- 2) inductive loop transmitters operating from 9 kHz to 30 MHz including Radio Frequency Identification (RFID) and EAS equipments;
- 3) receivers operating from 9 kHz to 30 MHz.

These radio equipment types are capable of operating in the permitted frequency bands within the 9 kHz to 30 MHz range as specified in table 1:

- either with a Radio Frequency (RF) output connection and dedicated antenna or with an integral antenna;
- for all types of modulation;
- with or without speech.

Table 1 shows a list of the frequency bands as designated to Short Range Devices by some European Commission Decisions and the CEPT/ERC/REC 70-03 [i.5] as known at the date of publication of the present document.

Table 1: H-field limits at 10 m

Frequency range (MHz)	H-field strength limit (H_f) dB μ A/m at 10 m
$0,009 \leq f < 0,135$	72 descending 3 dB/oct above 0,03 MHz or according to note 1 (note 3, note 5)
$0,135 \leq f < 0,140$	42
$0,140 \leq f < 0,1485$	37,7
$0,1485 \leq f < 30$	-5
$0,315 \leq f < 0,600$	-5
$3,155 \leq f < 3,400$	13,5
4,234	9
4,516	7
$7,400 \leq f < 8,800$	9
$10,2 \leq f < 11,00$	9
$12,5 \leq f \leq 20$	-7
$6,765 \leq f \leq 6,795$ $13,553 \leq f \leq 13,567$ $26,957 \leq f \leq 27,283$	42 (see note 3)
$13,553 \leq f \leq 13,567$	60 (see notes 2 and 3)
27,095	42
NOTE 1: For the frequency ranges 9 kHz to 135 kHz, the following additional restrictions apply to limits above 42 dB μ A/m: <ul style="list-style-type: none"> - for loop coil antennas with an area $\geq 0,16$ m² table 5 applies directly; - for loop coil antennas with an area between 0,05 m² and 0,16 m² table 5 applies with a correction factor. The limit is: table value + $10 \times \log(\text{area}/0,16 \text{ m}^2)$; - for loop coil antennas with an area $< 0,05$ m² the limit is 10 dB below table 5. 	
NOTE 2: For RFID and EAS applications only.	
NOTE 3: Spectrum mask limit, see EN 300 330-1 [1], annex G.	
NOTE 4: For further information see EN 300 330-1 [1], annex H.	
NOTE 5: Limit is 42 dB μ A/m for the following spot frequencies: 60 kHz \pm 250 Hz, 66,6 kHz \pm 750 kHz, 75 kHz \pm 250 Hz, 77,5 kHz \pm 250 Hz, 100 kHz \pm 250 kHz and 129,1 kHz \pm 500 Hz.	

NOTE 1: It should be noted that table 1 represents the most widely implemented position within the European Union and the CEPT countries, but it should not be assumed that all designated bands are available in all countries.

NOTE 2: In addition, it should be noted that other frequency bands may be available in a country within the frequency range 9 kHz to 30 MHz covered by the present document.

NOTE 3: On non-harmonized parameters, national administrations may impose certain conditions such as the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated power, duty cycle, and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an Individual Rights for use of spectrum or General Authorization, or as a condition for use under "licence exemption" as it is in most cases for Short Range Devices.

The present document is intended to cover the provisions of Article 3.2 of Directive 1999/5/EC [i.2] (R&TTE Directive), 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".

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>.

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 300 330-1 (V1.6.2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 1: Technical characteristics and test methods".

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 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 (V2.1.1): "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] Commission Decision 2006/771/EC on harmonisation of the radio spectrum for use by short-range devices as amended by Commission Decision 2008/432/EC.
- [i.5] 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 terms and definitions given in [i.2] and EN 300 330-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 330-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 330-1 [1] apply.

4 Technical requirements specifications

4.1 Environmental conditions

4.1.1 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 provider. 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

4.2.1.1 Permitted range of operating frequencies

The permitted range of operating frequencies shall not exceed the limits specified in clause 7.3.3 of EN 300 330-1 [1].

4.2.1.2 Limits for transmitters in the range from 9 kHz to 30 MHz

The maximum radiated field strength shall not exceed the limits specified in clauses 7.2.1.3 and 7.2.3.3 of EN 300 330-1 [1].

The maximum RF carrier current shall not exceed the limits specified in clause 7.2.2.3 of EN 300 330-1 [1].

4.2.1.3 Limits for the permitted range of modulation bandwidth

The maximum range of modulation bandwidth shall not exceed the limits as specified in clause 7.4.3 of EN 300 330-1 [1].

4.2.1.4 Transmitter spurious and out-of-band emissions

The transmitter unwanted emissions, i.e. spurious and out-of-band emissions, shall not exceed the limits specified in clause 7.5.2.2, 7.5.2.4 or 7.5.3.2 and 7.5.4.2 of EN 300 330-1 [1].

4.2.2 Receiver requirements

4.2.2.1 Adjacent channel selectivity - in band (receiver category 1 only)

The maximum adjacent channel selectivity of the equipment shall not be less than as stated in clause 8.1.3 of EN 300 330-1 [1].

4.2.2.2 Blocking or desensitiation (receiver categories 1 or 2 only)

The maximum blocking limits of the equipment shall not be less than stated in clause 8.2.3 of EN 300 330-1 [1].

4.2.2.3 Receiver spurious emissions

The receiver spurious emissions shall not exceed the limits specified in clauses 8.3.3.1 or 8.3.3.2 of EN 3000 330-1 [1].

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 Essential radio test suites

5.2.1 Transmitter test suites

5.2.1.1 Permitted range of operating frequencies

The test defined in clause 7.3.2 of EN 300 330-1 [1] shall be carried out.

5.2.1.2 Permitted range of the modulation bandwidth

The test defined in clause 7.4.2 of EN 300 330-1 [1] shall be carried out.

5.2.1.3 Emission limits for transmitters in the range from 9 kHz to 30 MHz

The tests defined in clauses 7.2.1.2, 7.2.2.2 or 7.2.3.2 of EN 300 330-1 [1] shall be carried out.

5.2.1.4 Transmitter spurious and out-of-band emissions

The tests defined in clauses 7.5.2.1, 7.5.2.3, 7.5.3.1 or 7.5.4.1 of EN 300 330-1 [1] shall be carried out.

5.2.2 Receiver test suites

5.2.2.1 Adjacent channel selectivity (receiver category 1 only)

The test defined in clause 8.1.2 of EN 300 330-1 [1] shall be carried out.

5.2.2.2 Blocking or desensitisation (receiver categories 1 or 2 only)

The test defined in clause 8.2.2 of EN 300 330-1 [1] shall be carried out.

5.2.2.3 Receiver spurious emissions

The test defined in clause 8.3.2 of EN 300 330-1 [1] shall be carried out.

5.3 Interpretation of results and measurement uncertainty

Clauses 9 and 10 of EN 300 330-1 [1] shall apply.

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