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Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Short range devices;
Radio equipment to be used
in the 1 GHz to 40 GHz frequency range;
Part 2: Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**



Reference

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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 (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 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; Radio equipment to be used in the 1 GHz to 40 GHz frequency range, 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. The modular structure is shown in EG 201 399.

1 Scope

The present document applies to the following Short Range Device major equipment types:

- 1) Generic Short Range Devices, including alarms, identification systems, radio-determination, telecommand, telemetry etc.;
- 2) Radio Frequency IDentification (RFID);
- 3) Detecting and movement and alert applications.

These radio equipment types are capable of operating in the permitted frequency bands within the 1 GHz to 40 GHz 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 by the European Commission Decision on Short Range Devices and the CEPT ERC Recommendation 70-03 as known at the date of publication of the present document.

Table 1: Short Range Devices within the 1 GHz – 40 GHz frequency band

	Frequency Bands	Applications	Notes
Transmit and Receive	2 400 MHz to 2 483,5 MHz	Generic use	
Transmit and Receive	2 400 MHz to 2 483,5 MHz	Detecting and movement and alert applications	
Transmit and Receive	(a) 2 446 MHz to 2 454 MHz	RFID	See annex C of EN 300 440-1 [1]
Transmit and Receive	(b) 2 446 MHz to 2 454 MHz	RFID	See annex C of EN 300 440-1 [1]
Transmit and Receive	5 725 MHz to 5 875 MHz	Generic use	
Transmit and Receive	9 200 MHz to 9 500 MHz	Detecting and movement and alert applications	
Transmit and Receive	9 500 MHz to 9 975 MHz	Detecting and movement and alert applications	
Transmit and Receive	10,5 GHz to 10,6 GHz	For detecting and movement and alert applications	
Transmit and Receive	13,4 GHz to 14,0 GHz	Detecting and movement and alert applications	
Transmit and Receive	17,1 GHz to 17,3 GHz	GBSAR detecting and movement and alert applications	See annex E of EN 300 440-1 [1]
Transmit and Receive	24,00 GHz to 24,25 GHz	Generic use and for detecting and movement and alert applications	

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.

In addition, it should be noted that other frequency bands may be available in a country within the frequency range 1 GHz to 40 GHz covered by the present document.

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 or general licence, or as a condition for use under licence exemption

The present document covers fixed stations, mobile stations and portable stations. If a system includes transponders, these are measured together with the transmitter.

When selecting parameters for new SRDs, which may have inherent safety of human life implications, manufacturers and users should pay particular attention to the potential for interference from other systems operating in the same or adjacent bands.

Applications using Ultra Wide Band (UWB) technology are not covered by the present document.

The present document does not require measurements for radiated emissions below 25 MHz.

The present document is intended to cover the provisions of article 3.2 of Directive 1999/5/EC (R&TTE Directive), see annex E of EN 300 440-1 [1].

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

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- 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.
- For a non-specific reference, the latest version 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.

- [1] ETSI EN 300 440-1 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 1: Technical characteristics and test methods".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive and EN 300 440-1 [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 440-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 300 440-1 [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 Transmitter requirements

4.2.1.1 Equivalent isotropically radiated power

The equivalent isotropically radiated power, as defined in EN 300 440-1 [1], clause 7.1.1, shall not exceed the limits in EN 300 440-1 [1], clause 7.1.3, table 4.

This requirement applies to transmitters with an integral or dedicated antenna.

4.2.1.2 Permitted range of operating frequencies

The permitted range of operation frequencies, as defined in EN 300 440-1 [1], clause 7.2.1, shall not exceed the limits in EN 300 440-1 [1], clause 7.2.4.

4.2.1.3 Unwanted emissions in the spurious domain

The unwanted emissions in the spurious domain, as defined in EN 300 440-1 [1], clause 7.3.1, shall not exceed the limits in EN 300 440-1 [1], clause 7.3.7, table 6.

This requirement applies to all transmitters.

4.2.1.4 Duty cycle

The duty cycle, as defined in EN 300 440-1 [1], clause 7.4.1, shall not exceed the limits in EN 300 440-1 [1], clause 7.4.3, table 7.

This requirement applies to all transmitters.

4.2.2 Receiver requirements

4.2.2.1 Adjacent channel selectivity

The adjacent channel selectivity, as defined in EN 300 440-1 [1], clauses 8.1 and 8.1.1, shall not be less than the limits in EN 300 440-1 [1], clause 8.1.3, table 8.

This requirement applies to Equipment Category1 receivers, when invoked, as defined in EN 300 440-1 [1], clause 4.1.1.

4.2.2.2 Blocking or desensitization

The blocking or desensitization, as defined in EN 300 440-1 [1], clause 8.2.1, shall not be less than the limits in EN 300 440-1 [1], clause 8.2.3, table 10.

This requirement applies to Equipment Category1 and Category 2 receivers, when invoked, as defined in EN 300 440-1 [1], clause 4.1.1.

4.2.2.3 Spurious radiations

The spurious radiations, as defined in EN 300 440-1 [1], clause 8.3.1, shall not exceed the limits in EN 300 440-1 [1], clause 8.3.5.

This requirement applies to all receivers.

4.2.3 2,45 GHz RFID systems

2,45 GHz RFID systems as defined in EN 300 440-1 [1], annex C, shall not exceed the limits as defined in EN 300 440-1 [1], clauses C.1, C.1.1 and C.1.2.

4.2.4 GBSAR systems

GBSAR systems as defined in EN 300 440-1 [1], annex E, shall not exceed the limits as defined in EN 300 440-1 [1], clauses E.2.1, E.4.3.1, E.4.4.1.1, E.4.5.1, E.4.6.1 and E.4.7.1 shall not exceed the limits EN 300 440-1 [1], clauses E.2.3, E.4.3.3, E.4.4.1.3, E.4.5.3, E.4.6.3 and E.4.7.3.

5 Testing for compliance with technical requirements

5.1 Description of testing for compliance with technical requirements

5.1.1 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.

5.1.1.1 Normal and extreme test-conditions

The test procedures shall be as specified in EN 300 440-1 [1], clauses 5.3, and 5.4.

5.1.1.2 Test power source

The test power source shall meet the requirements of EN 300 440-1 [1], clause 5.2.

5.1.2 Choice of samples for test suites

Measurement shall be performed, according to the present document, on samples of equipment defined in EN 300 440-1 [1], clauses 4.2.1 to 4.2.3.2.

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 will 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 values in clause 10, table 11 of EN 300 440-1 [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 (see bibliography) 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)).

The particular expansion factor used for the evaluation of the measurement uncertainty shall be stated.

5.3 Essential transmitter test suites

5.3.1 Equivalent isotropically radiated power

Either:

- the test specified in EN 300 440-1 [1], clauses 7.1.2 and 7.1.2.1 shall be carried out; or
- the test specified in EN 300 440-1 [1], clauses 7.1.2 and 7.1.2.2 shall be carried out.

This test suite applies to transmitters with an integral or dedicated antenna.

5.3.2 Permitted range of operation frequencies

Either:

- the test specified in EN 300 440-1 [1], clause 7.2.2 shall be carried out; or
- the test specified in EN 300 440-1 [1], clause 7.2.3 as appropriate shall be carried out.

This test suite applies to all transmitters.

5.3.3 Unwanted emissions in the spurious domain

Either:

- the tests specified in EN 300 440-1 [1], clause 7.3.3 and EN 300 440-1 [1], clause 7.3.4 shall be carried out; or
- the test specified in EN 300 440-1 [1], clause 7.3.5 shall be carried out.

This test suite applies to all transmitters.

5.4 Essential receiver test suites

5.4.1 Adjacent channel selectivity

- the test specified in EN 300 440-1 [1], clause 8.1.2 shall be carried out.

This test suite applies to Category 1 and Category 2 receivers when invoked, as defined in EN 300 440-1 [1], clause 4.1.1.

5.4.2 Blocking or desensitization

- the test specified in EN 300 440-1 [1], clause 8.2.2 shall be carried out.

This test suite applies to Category 1 and Category 2 receivers when invoked, as defined in EN 300 440-1 [1], clause 4.1.1.

5.4.3 Spurious radiations

Either:

- the tests specified in EN 300 440-1 [1], clause 8.3.2 and EN 300 440-1 [1], clause 8.3.3 shall be carried out; or
- the test specified in EN 300 440-1 [1], clause 8.3.4 shall be carried out.

This test suite applies to all receivers.

5.5 Tests for RFID systems at 2,45 GHz

- the test specified in clauses 5.3.1 and 5.3.2 shall be carried out.
- the test specified in EN 300 440-1 [1], clause 7.2 shall be carried out.

5.6 Tests for GBSAR systems

- the test specified in clauses 5.3.1 and 5.3.2 shall be carried out;
- the test specified in EN 300 440-1 [1], clause 7.2 shall be carried out;
- the test specified in EN 300 440-1 [1], clauses E.4.3.2, E.4.4.1.2, E.4.5.2, E.4.6.2 and E.4.7.2 shall be carried out.

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 essential 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 essential 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 300 440-2						
The following essential requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the R&TTE Directive						
Essential Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	Equivalent isotropically radiated power	4.2.1.1	U		E	5.3.1
2	Permitted range of operating frequencies	4.2.1.2	U		E	5.3.2
3	Unwanted emissions in the spurious domain	4.2.1.3	U		E	5.3.3
4	Duty cycle	4.2.1.4	C	Does apply for RFID in 1 446 MHz to 1 454 MHz only	X	
5	Adjacent channel selectivity	4.2.2.1	C	Applies to Category 1 receivers only	E	5.4.1
6	Blocking or desensitization	4.2.2.2	C	Applies to Category 1 and Category 2 receivers	E	5.4.2
7	Spurious radiations	4.2.2.3	U		E	5.4.3
8	2,45 GHz RFID systems	4.2.3	C	Applies to 2,45 GHz RFID systems only	E	5.5
9	GBSAR systems	4.2.4	C	Applies to GBSAR systems only	E	5.6

Key to columns:**Essential 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

Language	EN title
Bulgarian	
Czech	
Danish	
Dutch	
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices; Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Norwegian	
Polish	
Portuguese	
Romanian	
Slovak	
Slovenian	
Spanish	
Swedish	

Annex C (informative): Bibliography

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".

ETSI TR 100 028 (V1.4.1) (2001-12) (all parts): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

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).

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.

CEPT/ERC Recommendation 70-03 (2007): "Relating to the use of Short Range Devices (SRD)".

History

Document history		
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