

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Short Range Devices;
Road Transport and Traffic Telematics (RTTT);
Short range radar equipment operating in the 24 GHz range;
Part 2: Harmonized EN covering the essential requirements
of article 3.2 of the R&TTE Directive**



Reference

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Foreword

This draft Harmonized European Standard (EN) 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 [i.1] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The title and reference to the present document are intended to be included in the publication in the Official Journal of the European Union of titles and references of Harmonized Standard under the Directive 1999/5/EC [i.2].

See article 5.1 of Directive 1999/5/EC [i.2] for information on presumption of conformity and Harmonised Standards or parts thereof the references of which have been published in the Official Journal of the European Union.

The requirements relevant to Directive 1999/5/EC [i.2] are summarised in annex A.

Part 1: "Technical requirements and methods of measurement";

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

The present document is part 2 of a multi-part deliverable covering Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices, Road Transport and Traffic Telematics (RTTT); Short range radar equipment operating in the 24 GHz range, as identified below:

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

1 Scope

The present document applies to Short Range Devices (SRDs) in Road Transport and Traffic Telematics (RTTT) systems as described in the scope of EN 302 288-1 [1]:

- with an integral antenna;
- for ultra low power motion and distance monitoring radars for mobile applications only;
- the operating frequency range for intentional UWB emissions has been determined for the range of 22,000 GHz to 26,65 GHz until 30th June 2013 and from 2,25 GHz to 26,65 GHz until 1st January 2022.

The applicability of the present document covers only the 24 GHz Short Range Radar (SRR) for road vehicles. The present document does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable.

NOTE: Member States of the European Union are requested to prohibit the taking into service of equipment covered by the present document after a date defined in Commission Decision 2005/50/EC [i.7].

The present document covers transmitters intended to operate in a temporary frequency designation under the EU Commission decision on 24 GHz SRR EC 2005/50/EC [i.7] and the amendment as presented in RSCOM11-7 [i.7].

The present document is intended to cover the provisions of Directive 1999/5/EC [i.2] (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".

The present document responds to the EC mandate M/329 [i.6] for Harmonized Standards covering UltraWide Band (UWB) applications.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) 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.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 302 288-1 (V1.5.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short range radar equipment operating in the 24 GHz range; Part 1: Technical requirements and methods of measurement".
- [2] ETSI TR 100 028 (V1.4.1) (all parts): "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 necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [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 2005/50/EC of 17 January 2005 on the harmonization of the 24 GHz range radio spectrum band for the time-limited use by automotive short-range radar equipment in the Community.
- [i.5] Void.
- [i.6] M/329: "Harmonized standards covering Ultrawide band (UWB) applications".

NOTE: See <http://europa.eu.int/comm/enterprise/rtte/harstand.htm>.

- [i.7] RSCOM11-07: Amending Decision 2005/50/EC on the harmonisation of the 24 GHz range radio spectrum band for the time-limited use by automotive short-range radar equipment in the Community.

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 [i.2], EN 302 288-1 [1] and the following apply:

environmental profile: range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

3.2 Symbols

For the purposes of the present document, the symbols given in EN 302 288-1 [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 302 288-1 [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 Limits for transmitters in the range from 22 GHz to 26,65 GHz

4.2.1.1.1 Permitted range of operating frequencies

The permitted range of operating frequencies shall not exceed the limits specified in clause 7.1.1.3 of EN 302 288-1 [1].

4.2.1.1.2 Maximum radiated average power density (e.i.r.p.)

The maximum radiated average power density (e.i.r.p.) shall not exceed the limits specified in clause 7.1.2.3 of EN 302 288-1 [1].

4.2.1.1.3 Maximum radiated peak power density (e.i.r.p.)

The maximum radiated peak power density (e.i.r.p.) shall not exceed the limits specified in clause 7.1.3.4 of EN 302 288-1 [1].

4.2.1.2 Limits for transmitters in the range from 24,050 GHz to 24,250 GHz

4.2.1.2.1 Permitted range of operating frequencies

The permitted range of operating frequencies shall not exceed the limits specified in clause 7.1.4.2.4 of EN 302 288-1 [1].

4.2.1.2.2 Limit for transmitted peak power (e.i.r.p.) in the 24,05 GHz to 24,25 GHz SRD band

The peak power (e.i.r.p.) shall not exceed the limits specified in clause 7.1.4.1.3 of EN 302 288-1 [1], table 3.

4.2.1.3 Vertical plane emission limits in the range from 23,6 GHz to 24,0 GHz

The vertical emission limits shall not exceed the limits specified in clause 7.1.5.3 of EN 302 288-1 [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 7.2.4 of EN 302 288-1 [1], tables 5 and 6.

4.2.2 Receiver requirements

4.2.2.1 Receiver spurious emissions

The receiver spurious emissions shall not exceed the limits specified in clause 8.1.3 of EN 302 288-1 [1].

4.2.3 Installation requirements

The installation requirements as defined in EN 302 288-1 [1], annex D, shall be applied.

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 Transmitters operating in the 22 GHz to 26,65 GHz band

5.2.1.1.1 Permitted range of frequencies

The test defined in clause 7.1.1.2 of EN 302 288-1 [1] shall be carried out.

5.2.1.1.2 Maximum radiated average power density (e.i.r.p.)

The test defined in clause 7.1.2.2 of EN 302 288-1 [1] shall be carried out.

5.2.1.1.3 Maximum radiated peak power density (e.i.r.p.)

The test defined in clause 7.1.3.2 of EN 302 288-1 [1] shall be carried out.

5.2.1.2 Transmitters operating in the 24,050 GHz to 24,250 GHz band

5.2.1.2.1 Permitted range of frequencies

The test defined in clause 7.1.4.2.2 or 7.1.4.2.3 respectively of EN 302 288-1 [1] shall be carried out.

5.2.1.2.2 transmitted peak power (e.i.r.p.)

The test defined in clause 7.1.4.1.2 of EN 302 288-1 [1].

5.2.1.3 Vertical plane transmitter emissions

The test defined in clause 7.1.5.2 of EN 302 288-1 [1] shall be carried out.

5.2.1.4 Transmitter spurious and out-of-band emissions

The tests defined in the clause 7.2.3 of EN 302 288-1 [1] shall be carried out.

5.2.2 Receiver test suites

5.2.2.1 Receiver spurious emissions

The receiver spurious emissions shall not exceed the limits specified in clause 8.1.3 of EN 302 288-1 [1].

5.2.3 Installation requirements

The installation requirements as defined in EN 302 288-1 [1], annex D, shall be applied.

5.3 Interpretation of results and measurement uncertainty

Clause 4.4 of EN 302 288-1 [1] shall apply.

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 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.

Table 1: Maximum Measurement uncertainty

Parameter	Uncertainty
Radio Frequency (out-of-band)	$\pm 1 \times 10^{-7}$
Radiated Emission (valid to 100 GHz)	± 6 dB
Temperature	± 1 K
Humidity	± 10 %

For the test methods, according to the present document the uncertainty figures shall be calculated according to the methods described in the 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 case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 1 is based on such expansion factors.

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

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 302 288-2						
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	Permitted range of operating frequencies	4.2.1.1.1	U		E	5.2.1.1.1
2	Maximum radiated average power density	4.2.1.1.2	U		E	5.2.1.1.2
3	Maximum radiated peak power density	4.2.1.1.3	U		E	5.2.1.1.3
4	Permitted range of operating frequencies	4.2.1.2.1	U		E	5.2.1.2.1
5	Limit for peak power (e.i.r.p.)	4.2.1.2.2	U		E	5.2.1.2.2
6	Vertical plane transmitter emissions	4.2.1.3	U		E	5.2.1.3
7	Transmitter spurious and out-of-band emissions	4.2.1.4	U		E	5.2.1.4
8	Receiver spurious emissions	4.2.2.1	U		E	5.2.2.1
9	Installation requirements	4.2.3	U		O	5.2.3

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

- Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.
- Directive 2006/95/EC of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.
- CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".
- CEPT/ECC/DEC(04)10: "ECC Decision of 12 November 2004 on the frequency bands to be designated for the temporary introduction of Automotive Short Range Radars", amended by Annex 1, July 2005.

History

Document history		
V1.1.1	January 2005	Publication
V1.2.1	May 2006	Publication
V1.2.2	February 2008	Publication
V1.3.2	January 2009	Publication
V1.4.2	May 2011	Public Enquiry PE 20110903: 2011-05-06 to 2011-09-05