

ETSI EN 302 288-2 V1.2.2 (2008-02)

Harmonized European Standard (Telecommunications series)

**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

REN/ERM-TG31B-004-2

Keywords

radar, radio, regulation, RTTT, SRD, testing

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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).

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").

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:

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**".

National transposition dates	
Date of adoption of this EN:	10 August 2007
Date of latest announcement of this EN (doa):	30 November 2007
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2008
Date of withdrawal of any conflicting National Standard (dow):	31 May 2009

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 [1]. The modular structure is shown in EG 201 399 (see bibliography).

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 [2]:

- with an integral antenna;
- for ultra low power motion and distance monitoring radars for mobile applications only;
- operating in the 22 GHz to 26,65 GHz frequency range.

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 required to prohibit the taking into service of equipment covered by the present document after a date defined in Commission Decision 2005/50/EC (see bibliography).

The present document covers transmitters intended to operate in a temporary frequency designation under the 24 GHz ECC decision ECC/DEC/(04)10 (see bibliography). The application is also subject to the EU Commission decision on 24 GHz SRR EC 2005/50/EC (see bibliography).

The present document is intended to cover the provisions of Directive 1999/5/EC (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 for Harmonized Standards covering Ultrawide band (UWB) applications.

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] Void.
- [2] ETSI EN 302 288-1 (V1.2.2): "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".
- [3] Void.
- [4] Void.
- [5] 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".

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, EN 302 288-1 [2] 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 [2] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in EN 302 288-1 [2] 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 22,0 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 [2].

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 [2].

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 [2].

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 [2].

4.2.1.2.2 Equivalent isotropically radiated power (e.i.r.p.)

The equivalent isotropically radiated power (e.i.r.p.) shall not exceed the limits specified in clause 7.1.4.1.3 of EN 302 288-1 [2], 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 [2].

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 [2], 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 [2].

4.2.3 Installation requirements

The installation requirements as defined in EN 302 288-1 [2], 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 22,0 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 [2] 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 [2] 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 [2] 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 [2] shall be carried out.

5.2.1.2.2 Equivalent isotropically radiated power (e.i.r.p.)

The test defined in clause 7.1.4.1.2 of EN 302 288-1 [2].

5.2.1.3 Vertical plane transmitter emissions

The test defined in clause 7.1.5.2 of EN 302 288-1 [2] 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 [2] 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 [2].

5.2.3 Installation requirements

The installation requirements as defined in EN 302 288-1 [2], annex D, shall be applied.

5.3 Interpretation of results and measurement uncertainty

Clause 4.4 of EN 302 288-1 [2] 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 [5] 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 [5] 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;
- 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 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 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 rated average power density	4.2.1.1.2	U		E	5.2.1.1.2
3	Maximum rated 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	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:**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	Elektromagnetická kompatibilita a rádiové spektrum (ERM) - Zařízení krátkého dosahu - Telematika v silniční dopravě a provozu (RTTT) - Radarová zařízení krátkého dosahu pracující v pásmu 24 GHz - Část 2: Harmonizovaná EN pokrývající základní požadavky článku 3.2 Směrnice R&TTE
Danish	
Dutch	Elektromagnetische compatibiliteit en radiospectrumkwesties (ERM); Kort bereik apparatuur; Telematica voor wegvervoer en -verkeer (RTTT); Kort bereik radar apparatuur, werkend in de 24 GHz band; Deel 2: Geharmoniseerde EN onder artikel 3.2 van de R&TTE richtlijn
English	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 essential requirements of article 3.2 of the R&TTE Directive
Estonian	Elektromagnetilise ühilduvuse ja raadiospektri küsimused (ERM); Lähitoimeseadmed; Maanteetranspordi ja liikluse telematikaseadmed; Sagedusalas 24 GHz töötavad lähitoime radarseadmed; Osa 2: Harmoneeritud EN R&TTE direktiivi artikli 3.2 põhinõuete alusel
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); Lyhyen kantaman laitteet; Maantiekuljetusten ja liikenteen telematiikka (RTTT); 24 GHz taajuusalueella toimivat lyhyen kantaman tutkalaitteet; Osa 2: R&TTE-direktiivin artiklaan 3.2 perustuva yhdenmukaistettu standardi (EN)
French	Compatibilité électromagnétique et gestion du spectre radioélectrique; Equipement compte partée, Transport routier et gestion télématique du trafic, Radar courte portée fonctionnant dans la bande 24 GHz ; Partie 2: Norme Européenne harmonisée suivant l'article 3.2 de la directive RTTE
German	Elektromagnetische Verträglichkeit und Funkspektrumsangelegenheiten (ERM); Funkanlagen geringer Reichweite; Strassentransport und Verkehrstelematik (RTTT), Radargeräte mit geringer Reichweite, die im 24 GHz Frequenzbereich arbeiten Teil 2: Harmonisierte EN, die wesentliche Anforderungen nach Art. 3.2 der R&TTE-Richtlinie enthält
Greek	Ηλεκτρομαγνητική Συμβατότητα και Θέματα Ραδιοφάσματος (ERM) – Διατάξεις μικρής εμβέλειας – Τηλεπληροφορική οδικών μεταφορών και οδικής κυκλοφορίας (RTTT) – Εξοπλισμός ραντάρ μικρής εμβέλειας που λειτουργεί στην περιοχή 24 GHz – Μέρος 2: Εναρμονισμένο EN για την κάλυψη του άρθρου 3.2 της Οδηγίας R&TTE
Hungarian	Elektromágneses összeférhetőségi és rádióspektrumügyek (ERM). kis hatótávolságú eszközök. Közúti szállítási és forgalmi telematika (RTTT). 24 GHz-es sávban működő kis hatótávolságú radarberendezés. 2. rész: Az R&TTE-irányelv 3.2. cikkelyének lényegi követelményeit tartalmazó harmonizált európai szabvány
Icelandic	
Italian	Compatibilità elettromagnetica e Questioni relative allo spettro delle radiofrequenze (ERM); Dispositivi a breve portata (SRD); Dispositivi a breve portata (SRD); Sistemi per trasporto stradale e telematica del traffico; Apparecchiatura radar a breve portata da utilizzare nella gamma di frequenza 24 GHz. Parte 2: Norma armonizzata relativa ai requisiti essenziali dell'articolo 3.2 della direttiva R&TTE
Latvian	
Lithuanian	Elektromagnetinio suderinamumo ir radijo dažnių spektro dalykai. Trumpojo nuotolio įrenginiai. Informacijos apie kelių transportą ir eismą apdorojimo bei perdavimo priemonės. Trumpojo nuotolio radariniai įrenginiai, veikiantys 24 GHz dažnio srityje. 2 dalis Darnasis Europos standartas pagal 1999/5/EC* direktyvos 3.2 straipsnį
Maltese	Kompatibilità elettromanjetika u materji relatati ma' spettru radjofoniku (ERM); Apparati ta' medda qasira; Telematika tat-Transport u Traffiku bl-Art (RTTT); Tagħmir tar-radar ta' medda qasira li jopera fil-medda 24 GHz; Parti 2: EN armonizzati taħt l-artiklu 3.2 tad-Direttiva R&TTE
Norwegian	Elektromagnetisk kompatibilitet og Radiospektrum spørsmål (ERM); Kortdistansenhet; Vei transport og trafikk telemattikk (RTTT); Kortdistanse radarutstyr som opererer i 24 GHz området; Del 2: Harmonisert EN under R&TTE- direktivets artikkel 3.2
Polish	Kompatybilność elektromagnetyczna i zagadnienia widma radiowego (ERM) – Urządzenia bliskiego zasięgu – Telematyka transportu i ruchu drogowego (RTTT) – Urządzenia radarowe bliskiego zasięgu pracujące w zakresie 24 GHz – Część 2: Zharmonizowana EN zapewniająca spełnienie zasadniczych wymagań zgodnie z artykułem 3.2 dyrektywy R&TTE
Portuguese	Assuntos de Espectro Radioelétrico e Compatibilidade Electromagnética (ERM); Equipamentos de curto alcance; Sistemas de Telemática para Transporte e Tráfego Rodoviário (RTTT); Equipamentos de radar de curto alcance operando na faixa dos 24 GHz ; Parte 2: EN Harmonizada no âmbito do artigo 3.º, n.º 2, da Directiva R&TTE
Romanian	

Language	EN title
Slovak	Elektromagnetická kompatibilita a závislosti rádiového spektra (ERM). Zariadenia s krátkym dosahom. Telematika v cestnej doprave a prevádzke (RTTT). Radarové zariadenia s krátkym dosahom pracujúce v pásme 24 GHz. Časť 2: Harmonizovaná EN vzťahujúca sa na základné požiadavky podľa článku 3.2 smernice R&TTE
Slovenian	Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) - Naprave kratkega dosega - Cestna transportna in prometna telematika (RTTT) - Oprema za radarje kratkega dosega, ki delujejo v frekvenčnem območju 24 GHz - 2. del: Harmonizirani EN v skladu s členom 3.2 direktive R&TTE
Spanish	
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Kortdistansutrustning; Vägtransport och trafiktelematik (RTTT); Radarutrustning för korta avstånd som arbetar i 24 GHz-området Del 2: Harmoniserad EN omfattande väsentliga krav enligt artikel 3.2 i R & TTE-direktivet

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).
- Commission Decision 2005/50/EC of 17 January 2005 on the harmonization of the 24 GHz range radio spectrum for the time-limited use by automotive short-range radar equipment in the Community.
- CEPT/ECC/DEC(04)10: "ECC Decision of 1 July 2005 on the frequency bands to be designated for the temporary introduction of Automotive Short Range Radars (SRR)", amended by Annex 1, July 2005.
- CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".
- 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.
- 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".
- 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).
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NOTE: <http://europa.eu.int/comm/enterprise/rtte/harstand.htm>.

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