Draft ETSI EN 302 288 V1.1.0 (2017-01)

Short Range Devices;
Transport and Traffic Telematics (TTT);
Ultra-wideband radar equipment operating
in the 24,25 GHz to 26,65 GHz range;
Harmonised Standard covering the essential requirements
of article 3.2 of Directive 2014/53/EU

Reference

REN/ERM-TGSRR-78

Keywords

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Contents

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.8] to provide one voluntary means of conforming to the essential requirements of Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC [i.3].

Once the present document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of the present document given in table A.1 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document specifies the technical characteristics and test methods for automotive ultra-wideband (UWB) radar equipment fitted with integral antennas operating in the frequency range from 24,25 GHz to 26,65 GHz working as broadband devices with at least 500 MHz bandwidth and references CEPT/ERC Recommendation 70-03 [i.1] and EC Decision 2013/752/EU [i.2].

This equipment is intended for Transport and Traffic Telematics (TTT) applications according to ERC Recommendation 70-03 [i.1], annex 5, such as obstacle detection, stop and go, blind spot detection, parking aid, backup aid, precrash and other automotive applications.

Table 1 shows the frequency bands as designated to ultra-wideband (UWB) radar.

Table 1: Frequency of operation

	Frequency bands / frequencies	Frequency bands / frequencies
Transmit 1	24,25 GHz to 26,65 GHz	UWB mode
Receive 1	24,25 GHz to 26,65 GHz	UWB mode
Transmit 2	24,05 GHz to 24,25 GHz (see note)	Single carrier emissions (see note)
Receive 2	24,05 GHz to 24,25 GHz (see note)	Single carrier emissions (see note)
NOTE: Single carrier emissions in the SRD band from 24,05 GHz to 24,25 GHz according to the present document may not be used on its own, but only in conjunction with UWB emissions in the 24,25 GHz to 26,65 GHz range. For 24,05 GHz to 24,25 GHz devices the present document does not apply and the correct standard is ETSI EN 302 858 [i.11].		

In case of differences (for instance concerning special conditions, definitions, abbreviations) between the present document and ETSI EN 303 396 [1], the provisions of the present document take precedence.

The present document covers transmitters intended to operate in a temporary frequency designation under the ECC decision CEPT/ECC/DEC/(04)10 [i.6], the EU Commission decision 2005/50/EC [i.7] and the amendment as presented in RSCOM11-07 [i.9].

- The operating frequency range for intentional UWB emissions has been determined from 21,65 GHz to 26,65 GHz until 30th June 2013. This is no longer covered by the present document.

- Since 30th June 2013 the operating frequency range for intentional UWB has reduced frequency band from 24,25 GHz to 26,65 GHz until 1st January 2018, with an extension for car models which have received type approval before 1st January 2018 and which can continue to be put on the market until 1st January 2022 [i.6]. This equipment is covered by the present document.

The present document covers the essential requirements of article 3.2 of Directive 2014/53/EU [i.3] under the conditions identified in annex A.

2 References

2.1 Normative references

References are specific, identified by date of publication and/or edition number or version number. Only the cited version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://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.

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

[1] ETSI EN 303 396 (V1.1.1) (12-2016): "Short Range Devices; Measurement Techniques for Automotive and Surveillance Radar Equipment".

[2] ETSI EN 303 883 (V1.1.1) (09-2016): "Short Range Devices (SRD) using Ultra Wide Band (UWB); Measurement Techniques".

2.2 Informative 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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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] CEPT/ERC Recommendation 70-03: "Relating to the use of Short Range Devices (SRD)". Tromsø 1997, subsequent amendments 27 May 2016.

[i.2] EC Decision 2013/752/EU: "Commission implementing Decision of 11 December 2013 amending Decision 2006/771/EC on harmonisation of the radio spectrum for use by short-range devices and repealing Decision 2005/928/EC".

[i.3] Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

[i.4] CEPT/ERC/REC 74-01E: "Unwanted emissions in the spurious domain", Recommendation adopted by the Working Group "Spectrum Engineering" (WGSE).

[i.5] ETSI EG 203 336: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide for the selection of technical parameters for the production of Harmonised Standards covering article 3.1(b) and article 3.2 of Directive 2014/53/EU".

[i.6] ECC decision CEPT/ECC/DEC/(04)10: "The frequency bands to be designated for the temporary introduction of Automotive Short Range Radars (SRR)", approved 12 November 2004, amended 1 June 2012, corrected 6 March 2015.

[i.7] EC 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.8] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.9] 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 (Update with published EC Decision).

[i.10] ECC Report 158: "The impact of 26 GHz SRR applications using Ultra-WideBand (UWB) technology on radio services", Cardiff, January 2011.

[i.11] ETSI EN 302 858: "Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 24,05 GHz to 24,25 GHz or 24,05 GHz to 24,50 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI EN 303 396 [1], clause 3.1 apply.

3.2 Symbols

For the purposes of the present document, the symbols given in ETSI EN 303 396 [1], clause 3.2 apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI EN 303 396 [1] and the following apply:

e.r.p	equivalent radiated power
PDCF	Pulse Duration Correction Factor

4 Technical requirements specification

4.1 Environmental conditions

The technical requirements of the present document apply under the environmental profile for operation of the equipment, which shall be declared by the manufacturer. The equipment shall comply with all the technical requirements of the present document which are identified as applicable in annex A at all times when operating within the boundary limits of the declared operational environmental profile.

The normal and extreme test conditions are defined in clauses 4.4.3 and 4.4.4 of ETSI EN 303 396 [1].

4.2 General

4.2.0 Multiple operating bandwidths

All operating bandwidths of the equipment (see clause 4.3.1) shall be declared by the equipment manufacturer (see clauses 4.2 and 4.3 of ETSI EN 303 396 [1]).

Where equipment has more than one operating bandwidth, a sufficient number of operating bandwidths shall be chosen for testing so as to encompass the lower and higher limits of the operating frequency and the minimum and maximum bandwidth.

The EUT modulation during testing should be representative of normal use of the equipment. The manufacturer shall employ the mode of operation of the equipment which results in the highest transmitter activity consistent with the requirement to measure the highest power transmission which would be available in operation, and should ensure that:

- transmissions occur regularly in time;
- sequences of transmissions can be repeated accurately.

For transmitters that have multi-modulation schemes incorporated, it may be necessary to test each scheme.

4.2.1 Wanted performance criteria

The wanted performance criterion is that the EUT shall indicate the properties of a given target at a given distance.

Since EUTs considered here typically are tailored to very specific applications, no single wanted performance criterion can be defined here.

Therefore:

- the relevant properties (e.g. presence, range, relative speed, azimuth angle) shall be declared by the manufacturer;
- the type and RCS of the target and the distance shall be declared by the manufacturer.

4.2.2 Fixed and scanning antennas

The provisions of ETSI EN 303 396 [1], clause 4.3.5 apply.

4.3 Transmitter Conformance Requirements

4.3.1 Operating Frequency Range

4.3.1.1 Applicability

This requirement applies to all EUT.

4.3.1.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.2 applies (99 % OBW).

Alternatively to the 99 % OBW definition, the procedure from clause 4.3.2.2 may be used:

- The frequency, f_C, at which the amplitude of the radiated spectrum is maximum is determined from the spectrum analyser curve. The lower frequency, f_L, and the higher frequency, f_H, where the radiated spectrum density is 20 dB below maximum are recorded.

The method used to determine "operating frequency range" should be indicated in the test report.

4.3.1.3 Limits

For ultra-wideband radar equipment, the upper and lower limits of the operating frequency range shall meet the following conditions:

- $f_H \leq 26{,}65$ GHz.
- $f_L \geq 24{,}25$ GHz.

In case that emissions in an ultra-wideband mode between 24,25 GHz and 26,65 GHz are present, optional single carrier emissions are allowed with the following upper and lower limits of the operating frequency range:

- $f_H \leq 24{,}25$ GHz.
- $f_L \geq 24{,}05$ GHz.

4.3.1.4 Conformance

The conformance test suite for operating frequency range shall be as defined in clause 6.3.2 of ETSI EN 303 396 [1].

Conformance shall be established under normal and extreme test conditions defined in clause 4.1.