



**Short Range Devices;  
Transport and Traffic Telematics (TTT);  
Short Range Radar equipment operating in  
the 77 GHz to 81 GHz band;  
Harmonised Standard covering the essential requirements  
of article 3.2 of the Directive 2014/53/EU**

*Public Review*  
*ETSI EN 302 264 V2.1.0 (2016-07)*  
*https://standards.10000.org/standards/etsi-en-302-264-v2-1-0-2016-07-05*

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Reference

REN/ERM-TGSRR-76

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Keywords

radar, radio, RTTT, SRD, testing, UWB

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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.7] 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.2].

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.

The present document covers short range radar equipment operating in the 77 GHz to 81 GHz range.

The present document covers the essential requirements of article 3.2 of the RE-D [i.2].

### 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

## 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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

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## Introduction

The present document, together with ETSI EN 303 396 [1], covers the assessment of certain types of equipment as defined herein.

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.

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# 1 Scope

The present document specifies the technical requirements and methods of measurement for Short Range Devices (SRD) working as broadband devices with at least 50 MHz occupied bandwidth in the 77 GHz to 81 GHz frequency range, hereinafter referred to as the 79 GHz band, intended for Transport and Traffic Telematics (TTT) applications. Applications include but are not limited to e.g. Short Range Radar (SRR) for obstacle detection, stop&go, blind spot detection, parking aid, backup aid and precrash.

The present document covers transmitters intended to operate in the frequency range as defined in the EC Decision 2004/545/EC [i.5] and the ECC Decision ECC/DEC/(04)03 [i.6].

The present document applies to:

- a) transmitters in the 79 GHz range operating as broadband devices;
- b) receivers operating in the 79 GHz range;
- c) integrated transceivers in the 79 GHz range.

The present document:

- a) contains the technical characteristics and test methods for short range radar equipment fitted with integral antennas operating in the 79 GHz range;
- b) covers short range radar vehicle applications in the 79 GHz range. It covers integrated transceivers and separate transmit/receive modules.

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.

These radio equipment types are capable of operating in all or part of the frequency bands given in table 1.

**Table 1: Permitted ranges of operation**

Permitted ranges of operation	
Transmit	77 GHz to 81 GHz
Receive	77 GHz to 81 GHz

The present document contains requirements to demonstrate that radio equipment both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

## 2 References

### 2.1 Normative 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.

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

- [1] ETSI EN 303 396 (V1.1.0) (04-2016): "Short Range Devices; Measurement Techniques for automotive and surveillance radar equipment" . .

## 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)".
- [i.2] 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.3] CEPT/ERC/REC 74-01: "Unwanted emissions in the spurious domain".
- [i.4] 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.5] Commission Decision 2004/545/EC on the harmonisation of radio spectrum in the 79 GHz range for the use of automotive short-range radar equipment in the Community.
- [i.6] ECC Decision (04)/03: "The frequency band 77-81 GHz to be designated for the use of Automotive Short Range Radars".
- [i.7] 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.

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## 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] and the following apply:

**ground based vehicles:** vehicles using wheels or rails for movement

EXAMPLE: Includes but is not limited to passenger cars, busses, trucks, rail engines, trams, ships, constricted vehicle and aircraft while taxiing

NOTE: For details see CEPT/ERC Recommendation 70-03 [i.1].

**Pulse radars:** radar system providing information on the distance of a target

NOTE: Which determine distance (range) by the time-of-flight of short radar pulses, which are not frequency modulated.

### 3.2 Symbols

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

D antenna scan duty factor



### 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

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## 4 Technical requirements specifications

### 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 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

#### 4.2.1 Background information

In this clause all general considerations for the testing of radar applications for automotive vehicular applications in the frequency range from 77 GHz to 81 GHz are given. The tests cover integrated transceivers and separate transmit/receive modules.

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

Where equipment has more than one operating bandwidths, 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.

The meaning of EUT with scanning/steerable antenna is that the EUT TX antenna pattern is electronically or mechanically adjustable.

#### 4.2.2 Wanted performance criteria

The wanted performance criterion is that the EUT shall indicate the properties of a given target at a given distance. Since EUT considered here typically are tailored to 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.