



**~~Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Short Range Devices;
Road Transport and Traffic Telematics (RTTTT);
Radar equipment operating in the 76 GHz to 77 GHz range;
Part 2: Harmonized EN~~Harmonised Standard covering the
essential requirements
of article 3.2 of the R&TTE Directive 2014/53/EU;
Part 2: Fixed infrastructure radar equipment**

Reference

~~REN/ERM-TG31B-049-2TGSRR-72~~

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Foreword

This ~~Harmonized~~Harmonised European Standard (~~Telecommunications series~~EN) 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~~prepared under Council the Commission's standardisation request C(2015) 5376 final [i.6] to provide one voluntary means of conforming to the essential requirements of Directive 98/34/EC (as amended) laying down a procedure for the provision of information in 2014/53/EU on the field of technical standards and regulations.

The present document is intended to become a ~~Harmonized Standard~~, harmonisation of the reference of which will be published in the Official Journal of the European Communities referencing laws of the Member States relating to the making available on the Directive 1999/5/EC [1] market 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~~ repealing Directive 1999/5/EC [i.2] ~~are given in annex A-1.~~

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 is part_2 of a multi-part deliverable covering ~~Electromagnetic compatibility and Radio spectrum Matters (ERM);~~ Short Range Devices; ~~Road~~ Transport and Traffic Telematics (RTTTT); Radar equipment operating in the 76 GHz to 77 GHz range, as identified below:

Part 1: ~~"Technical characteristics and test methods for~~ Ground based vehicular radar equipment operating in the 76 GHz to 77 GHz range";

Part 2: "Harmonized EN covering Fixed infrastructure radar equipment";

Part 3: "Railway/Road Crossings obstacle detection system applications".

The present document covers the essential requirements of article 3.2 of the ~~R&TTE~~ Directive", 2014/53/EU [i.2].

National transposition dates	
Date of adoption of this EN:	23 January 2017
Date of latest announcement of this EN (doa):	30 April 2017
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 October 2017
Date of withdrawal of any conflicting National Standard (dow):	31 October 2018

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.

1 Scope

The present document ~~applies to Road~~ specifies technical characteristics and methods of measurements for radar equipment for fixed infrastructure Transport and Traffic and Telematics (RTTT) systems:

- ~~with an integral antenna;~~
- ~~for mobile Telematic (TTT) applications only;~~
- ~~operating in the frequency range from 76 GHz to 77 GHz.~~

The applicability of the present document ~~It covers only the 76 GHz to 77 GHz automotive Radar equipment for road vehicles, 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.

~~The present document applies to~~ These radio equipment ~~intended to operate~~ types are capable of operating in all or part of the frequency designation as defined bands given in CEPT/ECC/DEC (02)01 table 1.

Table 1: Permitted range of operation [i.1] and in CEPT/ERC/REC 70-03 [1]

Permitted range of operation	
Transmit	76 GHz to 77 GHz
Receive	76 GHz to 77 GHz

~~The present document covers the essential requirements of article 3.2 of Directive 2014/53/EU [i.2] in all or in part of the service frequency band from 76 GHz to 77 GHz.~~

~~The present document is intended to cover the provisions of Directive 1999/5/EC [1] under the conditions identified in annex A.~~

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

~~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 [1] will apply to equipment within the scope of the present document.~~

~~1. the provisions of the present document take precedence.~~

2 References

~~The following documents contain provisions which, through reference in this text, constitute provisions~~

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 <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 (V1.1.1) (12-2016): "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] 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.2] Directive 1999/5/EC2014/53/EU 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).
- [2] Council Directive 89/336/EEC of 3 May 198916 April 2014 on the approximationharmonisation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive) amended by Directive 91/263/EEC, Directive 92/31/EEC and Directive 93/68/EECthe making available on the market of radio equipment and repealing Directive 1999/5/EC.
- [i.3] 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).
- [f] CEPT/ERC/REC 74-01: "Unwanted emissions in the spurious domain".
- [i.4] ETSI EN 301 091 1 (V1.3.2): "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Radar equipment operating in the 76 GHz to 77 GHz range; Part 1: Technical characteristics and test methods for radar equipment operating in the 76 GHz to 77 GHz range".
- [5] CEPT/ERC Recommendation 70-03 (November 17th, 2005): "Relating to the use of Short Range Devices (SRD)".
- [6] ETSI EN 301 489 part 1 (V1.5.1) and part 3 (V1.4.1):] ETSI EG 203 336: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and servicesGuide 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] CEPT/ECC/DEC(02)01: "ECCVoid.
- [i.6] Commission Implementing Decision C(2015) 5376 final of 15 March 20024.8.2015 on the frequency bandsa standardisation request to be designatedthe European Committee for Electrotechnical Standardisation and to the co-ordinated introductionEuropean Telecommunications Standards Institute as regards radio equipment in support of Road Transport and Traffic Telematic Systems".Directive 2014/53/EU of the European Parliament and of the Council.

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 [1], EN 301 091-1 [4]~~ETSI EN 303 396 [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~~

pulse radars: EUTs, 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 301 091-1~~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 301 091-1~~ETSI EN 303 396 [1] and the following apply:

e.r.p equivalent radiated power

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 ~~provider~~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 ~~Conformance~~ General

4.2.1 General requirements

4.2.1 ~~Transmitter~~

4.2.1.1 ~~Permitted range of operating frequencies~~

~~The permitted range of operating frequencies shall not exceed the limits specified in clause 7.1.3 of EN 301 091-1 [1].~~In this clause all general considerations for the testing of radar equipment for applications in the frequency range from 76 GHz to 77 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 clauses 4.2 and 4.3 of ETSI EN 303 396 [1]).

4.2.1.2 Radiated spatial mean power density (e.i.r.p.)

The radiated spatial mean power density (e.i.r.p.) shall not exceed the limits specified in clause 7.2.3 of EN 301 091 1 [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 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.

4.2.3 Fixed and scanning antennas

The provisions of ETSI EN 303 396 [1].

4.2.1.3 Radiated spatial peak power (e.i.r.p.)

The radiated spatial peak power (e.i.r.p.) shall not exceed the limits specified in clause 7.2.3 of EN 301 091 1 [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].

[1, clause 6.2.2 applies.

4.2.3.1.4 Out-of-band emissions³ Limits

The transmitter out-of-band emissions upper and lower limits of the operating frequency range shall not exceed meet the limits specified following conditions:

- $f_H \leq 77$ GHz.
- $f_L \geq 76$ GHz.

4.3.1.4 Conformance

~~The conformance test suite for operating frequency range shall be as defined in clause 7.3.42 of ETSI EN 301 091-1 303 396 [4], table 4.~~

4.2.1.5 Spurious emissions

~~The transmitter spurious emissions,]~~

~~Conformance shall not exceed the limits specified be established under normal and extreme test conditions defined in clause 7.4.4].~~

~~The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 301 091-1 303 396 [1], table 5.~~

].

4.3.2 Mean Power

4.3.2 Receiver spurious emissions.1 Applicability

~~The receiver spurious emissions shall not exceed the limits specified in clause 8.1.3 of EN 301 091-1 [4].~~

~~NOTE: Not required on receivers co-located with transmitters.~~

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

5.2.1.1 Permitted range of operating frequencies

~~The test defined in clause 7.1.2 of EN 301 091-1 [4] shall be carried out.~~

5.2.1.2 Radiated spatial mean power (e.i.r.p.)

~~The test defined in clause 7.2.2 of EN 301 091-1 [4] shall be carried out.~~

5.2.1.3 Radiated spatial peak power (e.i.r.p.)

~~The test defined in clause 7.2.2 of EN 301 091-1 [4] shall be carried out.~~

5.2.1.4 Out-of-band emissions

~~The test defined in clause 7.3.3 of EN 301 091-1 [4] shall be carried out.~~

~~5.2.1.5~~ — ~~Spurious emissions~~

~~The test defined in clause 7.4.3 of EN 301 091 1 [4] shall be carried out.~~

~~5.2.2~~ — ~~Receiver spurious emissions~~

~~The test defined in clause 8.1.2 of EN 301 091 1 [4] shall be carried out.~~

~~5.3~~ — ~~Interpretation of results and measurement uncertainty~~

~~Clause 4.4 of EN 301 091 1 [4] shall apply.~~

~~Annex A (normative): HS Requirements and conformance Test specifications Table (HS-RTT)~~

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the HS-RTSS proforma in this annex so that it can be used for its intended purposes and may further publish the completed HS-RTSS.

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A1 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 in the present document or to a specific clause in a specific referenced document;~~
- ~~it provides a statement of all the test procedure corresponding to those essential requirements by cross reference to 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~~This requirement applies into all circumstances, ~~or~~EUT.

~~— Conditional: meaning that the requirement is dependent on the supplier 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;~~
- ~~when the schedule is completed in respect of a particular equipment including the testing outcomes, including a completed version of table A.1 it provides a means to assert the "presumption of conformity" with the HS.~~

~~Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)~~

4.3.2.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.5 applies.

4.3.2.3 Limits

The mean power shall not be greater than the limits in table 2.

Table 2: Mean power [i.1]

	<u>EUTs others than pulsed radar</u>	<u>Pulsed radar</u>
<u>mean power (e.i.r.p.)</u>	<u>50 dBm</u>	<u>23,5 dBm</u>
<u>NOTE: For the purposes of this measurement, the averaging time shall be not greater than 100 ms. If the result varies through the EUT cycle time the maximum value shall be taken as the result.</u>		

For constant pattern scanning antennas measured with the scanning inhibited (clause 4.3.5 of ETSI EN 303 396 [1]), the mean power shall be calculated from the measured result P_{MEASURED} as shown in table 3.

Table 3: Mean power calculation (constant pattern scanning antenna)

Illumination time t (see note 1)	EUTs others than pulsed radar		Pulsed radar	
	t ≤ 100 ms	t > 100 ms	t ≤ 100 ms	t > 100 ms
mean power (e.i.r.p) (see note 2)	$P_{\text{MEASURED}} + 10 \log(D)$	P_{MEASURED}	$P_{\text{MEASURED}} + 10 \log(D)$	P_{MEASURED}

NOTE 1: t is the illumination time defined in ETSI EN 303 396 [1].
NOTE 2: D is the antenna scan duty factor defined in ETSI EN 303 396 [1]. As D is smaller than 1 (i.e. 100 %), the log (D) value is negative and leads to a decrease in the result.

4.3.2.4 Conformance

The conformance test suite for mean power shall be as defined in clause 6.3.4 of ETSI EN 303 396 [1].

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

The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 303 396 [1].

4.3.3 Peak Power

4.3.3.1 Applicability

This requirement applies to all EUT.

4.3.3.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.4 applies.

4.3.3.3 Limits

The peak power for EUT with fixed beam or scanning antenna shall not be greater than 55 dBm.

4.3.3.4 Conformance

The conformance test suite for peak power shall be as defined in clause 6.3.3 of ETSI EN 303 396 [1].

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

The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 303 396 [1].

4.3.4 Unwanted emissions in the out-of-band domain

4.3.4.1 Applicability

This requirement applies to all EUT.

4.3.4.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.11 apply.

4.3.4.3 Limits

The RMS mean power spectral density radiated in the calculated out-of-band domain (between E_L to f_L and f_H to E_2 band) shall not be greater than the values given in table 4.

Table 4: Limits for out-of-band radiation [i.3]

Frequency [GHz]	RMS mean power spectral density [dBm/MHz]
$F_1 \leq f < f_L$	0
$f_H < f \leq F_2$	0

The values f_L and f_H are the results of the operating frequency range conformance test, see clause 4.3.1.4.

The values F_1 and F_2 are calculated as in ETSI EN 303 396 [1], clause 6.2.11.

NOTE: The out-of-band domain may be larger or smaller than the maximum permitted range of operation.

4.3.4.4 Conformance

The conformance test suite for unwanted emissions in the out-of-band domain shall be as defined in clause 6.3.10 of ETSI EN 303 396 [1].

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

The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 303 396 [1].

4.3.5 Unwanted emissions in the spurious domain

4.3.5.1 Applicability

This requirement applies to all EUT.

4.3.5.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.11 applies.

4.3.5.3 Limits

The effective radiated power of any radiated spurious emission shall be not greater than the values given in table 5.

Table 5: Limits of radiated spurious emissions [i.3]

Frequency range (MHz)	Limit values for spurious radiation	Detector type
47 to 74	-54 dBm e.r.p.	Quasi-Peak
87,5 to 118	-54 dBm e.r.p.	Quasi-Peak
174 to 230	-54 dBm e.r.p.	Quasi-Peak
470 to 790	-54 dBm e.r.p.	Quasi-Peak
otherwise in band 30 to 1 000	-36 dBm e.r.p.	Quasi-Peak
$f > 1\ 000$ to 300 000 (see note)	-30 dBm e.i.r.p.	RMS

NOTE: Measurement is only required up to the 2nd harmonic of the fundamental frequency (as defined in CEPT/ERC/REC 74-01 [i.3]). In this case, the upper frequency limit up to which measurements are performed is 154 GHz.

4.3.5.4 Conformance

The conformance test suite for unwanted emissions in the spurious domain shall be as defined in clause 6.3.10 of ETSI EN 303 396 [1].

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

The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 303 396 [1].

4.4 Receiver Conformance Requirements

4.4.1 Introduction

ETSI EG 203 336 [i.4] lists candidate technical parameters to be included in a Harmonised Standard aimed at providing a presumption of conformity of radio equipment with the essential requirements in articles 3.1(b) and 3.2 of the Radio Equipment Directive 2014/53/EU [i.2].

Essential requirements are high level objectives described in European Directives. The purpose of the Harmonised Standard is to translate those high level objectives into detailed technical specifications.

The present document applies to radar systems for which the "classical" receiver parameters are not necessarily relevant. Where applicable, suitable alternative technical requirements are included, see clause 4.4.3.

4.4.2 Receiver spurious emissions

4.4.2.1 Applicability

Receiver spurious emission testing shall apply for any mode other than transmit mode.

NOTE: Otherwise receiver spurious emissions are measured as part of the transmitter spurious emissions, see clause 4.3.5.

4.4.2.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.12 applies.

4.4.2.3 Limits

The effective radiated power of any narrowband receiver spurious emission shall be not greater than the values given in table 6.

Table 6: Narrowband spurious emission limits for receivers [i.3]

<u>Frequency range</u>	<u>Limit</u>	<u>Detector type</u>
<u>30 MHz to 1 GHz</u>	<u>-57 dBm (e.r.p.)</u>	<u>Quasi-Peak</u>
<u>above 1 GHz to 300 GHz (see note)</u>	<u>-47 dBm (e.i.r.p.)</u>	<u>RMS</u>
<u>NOTE: Measurement is only required up to the 2nd harmonic of the fundamental frequency (as defined in CEPT/ERC/REC 74-01 [i.3]). In this case, the upper frequency limit up to which measurements are performed is 154 GHz.</u>		

Wideband receiver spurious emissions shall be not greater than the values given in table 7.

Table 7: Wideband spurious emission limits for receivers [i.3]

<u>Frequency range</u>	<u>Limit</u>	<u>Detector type</u>
<u>30 MHz to 1 GHz</u>	<u>-47 dBm/MHz (e.r.p.)</u>	<u>Quasi-Peak</u>
<u>above 1 GHz to 300 GHz (see note)</u>	<u>-37 dBm/MHz (e.i.r.p.)</u>	<u>RMS</u>
<u>NOTE: Measurement is only required up to the 2nd harmonic of the fundamental frequency (as defined in CEPT/ERC/REC 74-01 [i.3]). In this case, the upper frequency limit up to which measurements are performed is 154 GHz.</u>		

4.4.2.4 Conformance

The conformance test suite for unwanted receiver spurious emissions shall be as defined in clause 6.3.11 of ETSI EN 303 396 [1].

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

The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 303 396 [1].

4.4.3 Receiver in-band, out-of-band and remote-band signals handling

4.4.3.1 Applicability

This requirement applies to all EUT.

4.4.3.2 Description

The description in ETSI EN 303 396 [1], clause 6.2.13 applies.

4.4.3.3 Limits

The EUT shall achieve the wanted performance criterion, see clause 4.2.2, in the presence of unwanted signals defined in table 8.

The unwanted signal transmitter shall be able to transmit continuous wave signals at specific frequencies, as described in table 8.

Table 8: Unwanted signal for 76-77 GHz sensors

	In-band signal	OOB signal	Remote-band signal
Frequency	Centre frequency (f_c) of the EUT modulated signal (see clause 4.3.1)	$f = f_c \pm F$	$f = f_c \pm 10 \times F$
Signal level field strength at the EUT	55 mV/m	173 mV/m	173 mV/m
Equivalent EIRP at 10 m	10 dBm	20 dBm	20 dBm
F: permitted frequency bandwidth (1 GHz).			

4.4.3.4 Conformance

The conformance test suite for receiver in-band, out-of-band and remote-band signals handling shall be as defined in clause 6.3.12 of ETSI EN 303 396 [1].

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

The interpretation of the results for the measurements uncertainty shall be as given in clause 4.6 of ETSI EN 303 396 [1].

4.4.4 Receiver sensitivity

Receiver sensitivity is not specified in the present document in order to allow manufacturers the freedom to tailor equipment to specific circumstances.

For instance, equipment covered by the present document may be intended to detect a target at maximum range or may be intended to discriminate features such as size, shape or velocity at shorter range. The level of minimum usable signal would be different in each case.

5 General considerations for performing the tests

The provisions of ETSI EN 303 396 [1], clause 4 shall apply except as varied herein.

6 Test setup and procedures

The provisions of ETSI EN 303 396 [1], clause 5 shall apply except as varied herein.

7 Conformance methods of measurement for transmitter and receiver

The provisions of ETSI EN 303 396 [1], clause 6 shall apply except as varied herein.

All measurement results shall be recorded in a test report, see clause 4.7 in ETSI EN 303 396 [1].

Annex A (informative): Relationship between the present document and the essential requirements of Directive 2014/53/EU

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.6] 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.

Table A.1: Relationship between the present document and the essential requirements of Directive 2014/53/EU

Harmonised Standard ETSI EN 301 091-2				
Requirement			Requirement Conditionality	
No	Description	Reference: Clause No	U/C	Condition
1	Operating Frequency Range	4.3.1	<u>U</u>	
2	Mean Power	4.3.2	<u>U</u>	
3	Peak Power	4.3.3	<u>U</u>	
4	Unwanted emissions in the out-of-band domain	4.3.4	<u>U</u>	
5	Unwanted emissions in the spurious domain	4.3.5	<u>U</u>	
6	Receiver spurious emissions	4.4.2	<u>C</u>	It applies for any mode other than transmit mode.
7	Receiver in-band, out-of-band and remote-band signal handling	4.4.3	<u>U</u>	

Key to columns:

Requirement:

No. — Table entry number;

Reference — Clause reference number of conformance. A unique identifier for one row of the table which may be used to identify a requirement within the.

Description — A textual reference to the requirement.

Clause Number — Identification of clause(s) defining the requirement in the present document;

EN-R — Title of conformance requirement within the present document;

Status — Status of the entry as follows:

M — Mandatory, shall be implemented under all circumstances;

O — Optional, may be provided, but if provided shall be implemented in accordance with the requirements;

O.n — this status unless another document is used for mutually exclusive or selectable options among a set. The integer "n" shall refer to a unique group of options within the EN-RT. A footnote to the EN-RT shall referenced explicitly state what the requirement is for each numbered group. For example, "It is mandatory to support at least one of these options", or, "It is mandatory to support exactly one of these options".

Comments — To be completed as required.

Requirement Conditionality:

U/C Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).

Condition Explains the conditions when the requirement is or is not applicable for a requirement which is classified "conditional".

Presumption of conformity stays valid only as long as a reference to the present document is maintained in the list published in the Official Journal of the European Union. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.

Other Union legislation may be applicable to the product(s) falling within the scope of the present document.

Annex B (informative): The EN title in the official languages Change History

Language	EN title
Czech	Elektromagnetická kompatibilita a rádiové spektrum (ERM) - Zařízení krátkého dosahu - Telematika v silniční dopravě a v silničním provozu (RTTT) - Radarová zařízení pracující v pásmu 76 GHz až 77 GHz - Část 2: Harmonizovaná EN pokrývající základní požadavky článku 3.2 Směrnice R&TTE
Danish	Elektromagnetisk kompatibilitet og radiospektrumanliggønder (ERM); Radioudstyr med kort rækkevidde (SRD); Vejtransport og trafik telematik (RTTT); radarudstyr i 76 GHz til 77 GHz frekvensbåndet - Del 2: Harmoniseret EN, som dækker de væsentlige krav i R&TTE direktivets artikel 3.2
Dutch	Elektromagnetische compatibiliteit en radiospectrum kwesties (ERM); Apparaten voor kort bereik; wegverkeer en vervoer telematica (RTTT); Radar apparatuur werkend in het 76 GHz to 77 GHz gebied; Deel 2: geharmoniseerde EN die de essentiële vereisten dekt uit artikel 3.2 van de R&TTE Directive
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Radar equipment operating in the 76 GHz to 77 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 (SRD); Maanteetranspordi ja liikluse telematika; Raadiosagedusvahemikus 76 GHz kuni 77 GHz töötavad radarseadmed; Osa 2: Harmoniseeritud EN R&TTE direktiivi artikli 3.2 alusel
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); Lyhyen kantaman laitteet; Maantiekuljetusten ja liikenteen telematiikan tutkalaitteet, jotka toimivat 76–77 GHz:n taajuusalueella; Osa 2: Yhdenmukaistettu standardi (EN), joka kattaa R&TTE-direktiivin artiklan 3.2 mukaiset olennaiset vaatimukset
French	Télécommunications - CEM et spectre radioélectrique (ERM) Appareils à courte portée, Télématique pour la circulation et le transport routiers (RTTT) Equipement radar à courte portée opérant dans la bande 76 Ghz à 77 Ghz. Partie 2 : EN harmonisée sous couvert de l'article 3.2 de la Directive R&TTE
German	Elektromagnetische Verträglichkeit und Funkspektrumsangelegenheiten (ERM); Radargeräte für den Betrieb in den Frequenzbereichen von 76 GHz bis 77 GHz; Teil 2: Harmonisierte Europäische Norm (EN) mit wesentlichen Anforderungen nach R&TTE Richtlinie Artikel 3.2
Greek	Ηλεκτρομαγνητική Συμβατότητα και Θέματα Ραδιοφάσματος (ERM) - Συσκευές μικρής εμβέλειας - Τηλεπληροφορική Οδικών Μεταφορών και Οδικής Κυκλοφορίας (RTTT) - Εξοπλισμός ραντάρ που λειτουργεί στην περιοχή συχνοτήτων 76 GHz ως 77 GHz - Μέρος 2: Εναρμονισμένο EN για την κάλυψη των ουσιαστών απαιτήσεων του άρθρου 3.2 της Οδηγίας R&TTE
Hungarian	Elektromágneses összeférhetőségi és rádióspektrumügyek (ERM). Kis hatótávolságú eszközök. Közúti közlekedési és forgalmi telematika (RTTT). A 76 GHz - 77 GHz sávban működő radarberendezések. 2. rész: Az R&TTE-irányelv 3.2. cikkelyének alapvető követelményeit tartalmazó, harmonizált európai szabvány
Icelandic	Þættir sem varða rafsegulviðssamhæfi og fjarskiptatíðni (ERM); Skammdræg tæki; Ratsjárnúnaður til nota við fjarvirkni í landflutningum og umferð (RTTT) sem starfar á tíðnisviðinu 76 – 77 GHz; 2. hluti: Samræmdur Evrópustaðall um grunnkröfur 2. mgr. 3. gr. í tilskipun 1999/5/EC um fjarskiptabúnað og endabúnað til fjarskipta
Italian	Compatibilità elettromagnetica e Questioni relative allo spettro delle radiofrequenze (ERM); Dispositivi a corto raggio; Trasporto stradale e telematica del traffico (RTTT); apparecchiature radar funzionanti nelle gamme da 76 GHz a 77 GHz; Parte 2: Norma Europea armonizzata relativa ai requisiti essenziali dell'articolo 3.2 della direttiva R&TTE
Latvian	Elektromagnētiska saderība un radiofrekvencu spektra jautajumi (ERM). Maza darbības attāluma iekārtas (SRD). Ceļu transporta un satiksmes telematika. Radaru iekārtas, kas strādā frekvencu joslā no 76 GHz līdz 77 GHz. 2.dala: Harmonizots Eiropas standarts (EN), kas atbilst R
Lithuanian	Elektromagnetinio suderinamumo ir radijo dažnių spektro dalykai. Trumpojo nuotolio įtaisai. Informacijos apie kelių transportą ir eismą apdorojimo bei perdavimo priemonės. Radariniai įrenginiai, veikiantys nuo 76 GHz iki 77 GHz dažnių diapazone. 2 dalis. Darnusis Europos standartas, apimantis esminius 1999/5/EC* direktyvos 3.2 straipsnio reikalavimus
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 li jopera fil-medda 76 GHz sa 77 GHz; Parti 2: EN armonizzata taħt l-artiklu 3.2 tad-Direttiva R&TTE
Polish	Kompatybilność elektromagnetyczna i zagadnienia widma radiowego (ERM) - Urządzenia bliskiego zasięgu - Transport drogowy i telematyka transportu drogowego (RTTT) - Urządzenia radarowe pracujące w zakresie 76 GHz do 77 GHz - Część 2: Zharmonizowana EN zapewniająca spełnienie zasadniczych wymagań zgodnie z artykułem 3.2 dyrektywy R&TTE

Language	EN title
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 operando nas faixas de 76 GHz a 77 GHz; Parte 2: EN Harmonizada cobrindo os requisitos essenciais no âmbito do artigo 3.º, n.º 2, da Directiva R&TTE
Slovak	Elektromagnetická kompatibilita a záležitosti rádiového spektra (ERM). Zariadenia s krátkym dosahom. Telematika v cestnej doprave a prevádzke (RTTT). Radarové zariadenia pracujúce v rozsahu od 76 GHz do 77 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) - Radarska oprema, ki deluje v frekvenčnem območju od 76 GHz do 77 GHz - 2. del: Harmonizirani EN, ki zajema bistvene zahteve člona 3.2 direktive R
Spanish	Cuestiones de compatibilidad electromagnética y espectro de radiofrecuencia (ERM); Dispositivos de Corto Alcance; Sistema Telemático de ayuda a la circulación, utilizado en Transporte por Carretera y Tráfico rodado (RTTT); Equipos radar funcionando en la gama de frecuencia de 76 GHz a 77 GHz; Parte 2: Norma Europea (EN) armonizada cubriendo los requisitos esenciales según el artículo 3.2 de la Directiva R&TTE
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Kortdistansutrustningar; Vägtransport och trafiktelematik (RTTT); Radarutrustning som arbetar i området 76 GHz till 77 GHz; Del 2: Harmoniserad EN omfattande väsentliga krav enligt artikel 3.2 i R&TTE-direktivet

Version	Information about changes
1.3.3 (part 1) 1.3.2 (part 2)	Last publication as two-part HS
2.1.1	<ul style="list-style-type: none"> • <u>Revision for compliance with Directive 2014/53/EU</u> • <u>The EN was split into a 3 part document (all parts harmonised)</u> <ul style="list-style-type: none"> - <u>Part 1: ground based vehicle</u> - <u>Part 2: fixed TTT applications</u> - <u>Part 3: railway/road crossing</u> • <u>Out-sourcing of standard measurement procedures into a separate ETSI EN 303 396</u> • <u>More detailed description of receiver spurious emission requirements</u> • <u>New requirement on receiver in-band, out-of-band and remote-band handling and method of measurement</u>

History

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