

**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**

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ETSI EN 302 288-1 V1.6.1 \(2012-03\)](https://standards.iteh.ai/catalog/standards/etsi/c139f8a9-8810-49b1-b289-da5eba4e96be/etsi-en-302-288-1-v1-6-1-2012-03)

<https://standards.iteh.ai/catalog/standards/etsi/c139f8a9-8810-49b1-b289-da5eba4e96be/etsi-en-302-288-1-v1-6-1-2012-03>



Reference

REN/ERM-TGSRR-056-1

Keywords

radar, radio, RTTT, SRD, testing

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

(<https://standards.iteh.ai>)
Document Preview

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

http://portal.etsi.org/chaicor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™**, **TIPHON™**, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

LTE™ is a Trade Mark of ETSI currently being registered

for the benefit of its Members and of the 3GPP Organizational Partners.

GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	6
Foreword.....	6
1 Scope	7
2 References	7
2.1 Normative references	7
2.2 Informative references.....	8
3 Definitions, symbols and abbreviations	8
3.1 Definitions.....	8
3.2 Symbols.....	10
3.3 Abbreviations	10
4 Technical requirements specifications	11
4.1 Presentation of equipment for testing purposes.....	11
4.1.1 Choice of model for testing	12
4.2 Mechanical and electrical design.....	12
4.3 Auxiliary test equipment	12
4.4 Interpretation of the measurement results	12
5 Test conditions, power sources and ambient temperatures	12
5.1 Normal and extreme test conditions	12
5.2 External test power source.....	12
5.3 Normal test conditions.....	13
5.3.1 Normal temperature and humidity	13
5.3.2 Normal test power source	13
5.3.2.1 Mains voltage	13
5.3.2.2 Other power sources	13
5.4 Extreme test conditions	13
5.4.1 Extreme temperatures	13
5.4.1.1 Procedure for tests at extreme temperatures.....	13
5.4.1.2 Extreme temperature ranges.....	13
5.4.2 Extreme test source voltages.....	14
5.4.2.1 Mains voltage	14
5.4.2.2 Other power sources.....	14
6 General conditions.....	14
6.1 Test fixture	14
6.1.1 Requirements	14
6.1.2 Calibration	15
6.1.3 General requirements for RF cables.....	16
6.1.4 Shielded anechoic chamber.....	17
7 Methods of measurement and limits for transmitter parameters	18
7.1 Methods of measurement and limits for transmitters in the 22,000 GHz to 26,65 GHz band.....	18
7.1.1 Permitted range of operating frequencies	18
7.1.1.1 Definition	18
7.1.1.2 Method of measurement.....	18
7.1.1.3 Limits	19
7.1.2 Maximum radiated average power density (e.i.r.p.)	19
7.1.2.1 Definition	19
7.1.2.2 Method of measurement.....	19
7.1.2.3 Limits	21
7.1.3 Maximum radiated peak power density (e.i.r.p.)	21
7.1.3.1 Definition	21
7.1.3.2 Method of measurement.....	22
7.1.3.3 Standard procedure and setup extensions.....	22
7.1.3.4 Limits	23

7.1.4	Methods of measurement and limits for emissions in the 24,05 GHz to 24,25 GHz band	23
7.1.4.1	Equivalent isotropically radiated power (e.i.r.p.)	23
7.1.4.1.1	Definition	23
7.1.4.1.2	Method of measurement	24
7.1.4.1.3	Limits	25
7.1.4.2	Permitted range of operating frequencies	25
7.1.4.2.1	Definition	25
7.1.4.2.2	Method of measurement for equipment not using FH modulation	26
7.1.4.2.3	Method of measurement for equipment using pulsed FH modulation	26
7.1.4.2.4	Limit	27
7.1.5	Vertical plane transmitter emissions in the 23,6 GHz to 24 GHz range	27
7.1.5.1	Definition	27
7.1.5.2	Measurement procedure	27
7.1.5.3	Vertical emission limits in the 23,6 GHz to 24,0 GHz range	28
7.2	Radiated spurious and out-of-band emissions	28
7.2.1	Definition	28
7.2.2	Measuring receiver	28
7.2.3	Method of measurement for radiated spurious or out-of-band emissions	28
7.2.4	Limits	29
8	Methods of measurement and limits for receiver parameters	29
8.1	Receiver spurious emissions	29
8.1.1	Definition	29
8.1.2	Method of measurement - radiated spurious emissions	30
8.1.3	Limit	30
9	Measurement uncertainty	30
Annex A (normative):	Radiated measurements	32
A.1	Test sites and general arrangements for measurements involving the use of radiated fields	32
A.2	Guidance on the use of radiation test sites	32
A.2.1	Substitution antenna	32
A.3	Indoor test site using a fully anechoic RF chamber	32
A.3.1	Example of the construction of a shielded anechoic chamber	32
A.3.2	Influence of parasitic reflections in anechoic chambers	34
A.3.3	Calibration of the shielded RF anechoic chamber	34
Annex B (normative):	General description of measurement methods	35
B.1	Radiated measurements	35
B.2	Performance requirements for preamplifier and horn antenna	36
B.3	Measurement of the residual carrier	36
Annex C (informative):	Example of modulation schemes	37
C.1	Pseudo Noise Pulse Position Modulation (PN PPM)	37
C.1.1	Definition	37
C.1.2	Typical operation parameters	38
C.2	Pulsed FH (Pulsed Frequency Hopping)	38
C.2.1	Definition	38
C.2.2	Typical operation parameters	39
C.2.3	Additional requirements for pulsed FH equipment measurement	39
C.2.3.1	Pulsed FH modulation	39
C.2.3.2	Measurement requirements	39
C.3	PN-2-PSK (Pseudo noise binary coded phase shift keying)	40
C.3.1	Definition	40
C.3.2	Typical operation parameters	41

Annex D (normative):	Installation requirements of 24 GHz Short Range Radar (SRR) systems	42
Annex E (informative):	Conversion of power density to e.i.r.p.....	43
E.1	Assumptions	43
E.2	Example	43
Annex F (informative):	Bibliography	44
History		45

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ETSI EN 302 288-1 V1.6.1 \(2012-03\)](https://standards.iteh.ai/catalog/standards/etsi/c139f8a9-8810-49b1-b289-da5eba4e96be/etsi-en-302-288-1-v1-6-1-2012-03)

<https://standards.iteh.ai/catalog/standards/etsi/c139f8a9-8810-49b1-b289-da5eba4e96be/etsi-en-302-288-1-v1-6-1-2012-03>

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://webapp.etsi.org/IPR/home.asp>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This draft 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.

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

Equipment compliant with the present document is intended for fitment into road vehicles, therefore it is subject to automotive EMC type approval and has to comply with Directive 95/54/EC [4]. For use on vehicles outside the scope of Directive 95/54/EC [4] compliance with an EMC directive/standard appropriate for that use is required.

The present document is part 1 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".

ETSI EN 302 288-1 V1.6.1 (2012-03)

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):	6 months after doa