



**ElectroMagnetic Compatibility (EMC)
standard for radio equipment and services;
Part 17: Specific conditions for
Broadband Data Transmission Systems;
Harmonised Standard for ElectroMagnetic Compatibility**

Reference

REN/ERM-EMC-370

Keywords

EMC, harmonised standard, radio

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

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

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

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

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

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2019.

All rights reserved.

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

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M™ logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Contents

| | |
|--|-----------|
| Intellectual Property Rights | 5 |
| Foreword..... | 5 |
| Modal verbs terminology..... | 5 |
| 1 Scope | 6 |
| 2 References | 6 |
| 2.1 Normative references | 6 |
| 2.2 Informative references..... | 6 |
| 3 Definitions of terms, symbols and abbreviations | 7 |
| 3.1 Terms..... | 7 |
| 3.2 Symbols..... | 8 |
| 3.3 Abbreviations | 8 |
| 4 Test conditions | 8 |
| 4.1 General | 8 |
| 4.2 Arrangements for test signals | 8 |
| 4.2.1 Arrangements for test signals at the input of transmitters..... | 8 |
| 4.2.2 Arrangements for test signals at the output of transmitters..... | 9 |
| 4.2.3 Arrangements for test signals at the input of receivers | 9 |
| 4.2.4 Arrangements for test signals at the output of receivers | 9 |
| 4.2.5 Arrangements for testing transmitter and receiver together (as a system) | 9 |
| 4.2.6 Equipment with an external antenna connector | 9 |
| 4.2.7 Equipment without an external antenna connector (integral antenna) | 9 |
| 4.2.8 Equipment with more than one antenna..... | 10 |
| 4.3 Exclusion bands..... | 10 |
| 4.4 Void..... | 10 |
| 4.5 Normal test modulation | 10 |
| 5 Performance assessment..... | 10 |
| 5.1 General | 10 |
| 5.2 Arrangements for the assessment of host dependent equipment and plug-in cards..... | 11 |
| 5.2.0 Introduction..... | 11 |
| 5.2.1 Alternative A: composite equipment | 11 |
| 5.2.2 Alternative B: use of a test jig or host..... | 11 |
| 5.3 Assessment procedures..... | 11 |
| 6 Performance criteria | 12 |
| 6.1 General performance criteria | 12 |
| 6.2 Performance table..... | 12 |
| 6.2.1 Performance criteria overview..... | 12 |
| 6.2.2 Minimum performance level..... | 12 |
| 6.3 Performance criteria for Continuous phenomena applied to Transmitters (CT) | 12 |
| 6.4 Performance criteria for Transient phenomena applied to Transmitters (TT) | 13 |
| 6.5 Performance criteria for Continuous phenomena applied to Receivers (CR)..... | 13 |
| 6.6 Performance criteria for Transient phenomena applied to Receivers (TR) | 13 |
| 7 Requirements..... | 13 |
| 7.1 Emission | 13 |
| 7.1.1 General..... | 13 |
| 7.1.2 Special conditions | 14 |
| 7.2 Immunity | 14 |
| 7.2.1 General..... | 14 |
| 7.2.2 Special conditions..... | 15 |
| Annex A (informative): Relationship between the present document and the essential requirements of Directive 2014/53/EU | 16 |
| Annex B (informative): Examples of radio equipment in the scope of the present document | 18 |

| | | |
|-------------------------------|--|-----------|
| B.1 | Introduction | 18 |
| B.2 | Data transmission systems operating in the 2,4 GHz ISM band and using wide band modulation techniques..... | 18 |
| B.3 | 5 GHz high performance RLAN systems..... | 18 |
| B.4 | Broadband data transmitting systems operating in the band 5 725 MHz to 5 875 MHz..... | 18 |
| B.5 | Broadband data transmitting/BWA Terminal Stations..... | 18 |
| B.6 | Multi-Gigabit Wireless Systems (MGWS) | 18 |
| Annex C (informative): | Change History | 19 |
| History | | 20 |

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables 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 (<https://ipr.etsi.org/>).

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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

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.12] 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.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 17 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

| 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.

1 Scope

The present document, together with ETSI EN 301 489-1 [1], specifies technical characteristics and methods of measurements for Broadband Data Transmission System equipment, as detailed in annex B.

Technical specifications related to the antenna port and emissions from the enclosure port of the radio equipment are not included in the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for wideband data communication systems.

The environmental classification and the emission and immunity requirements used in the present document are as stated in ETSI EN 301 489-1 [1], except for any special conditions included in the present document.

The present document covers the essential requirements of article 3.1(b) of Directive 2014/53/EU [i.1] 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 301 489-1 (V2.2.3) (11-2019): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility".

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] 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.2] Void.
- [i.3] ETSI EN 301 893: "5 GHz RLAN; Harmonised Standard for access to radio spectrum".
- [i.4] ETSI EN 302 502: "Wireless Access Systems (WAS); 5,8 GHz fixed broadband data transmitting systems; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU".

- [i.5] ETSI EN 302 544-2: "Broadband Data Transmission Systems operating in the 2 500 MHz to 2 690 MHz frequency band; Part 2: TDD User Equipment Stations; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.6] ETSI EN 302 567: "Broadband Radio Access Networks (BRAN); 60 GHz Multiple-Gigabit WAS/RLAN Systems; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.7] ETSI EN 302 623: "Broadband Wireless Access Systems (BWA) in the 3 400 MHz to 3 800 MHz frequency band; Mobile Terminal Stations; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive".
- [i.8] ETSI EN 300 328: "Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum".
- [i.9] Void.
- [i.10] ETSI EN 301 908-19: "IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 19: OFDMA TDD WMAN (Mobile WiMAX™) TDD User Equipment (UE)".
- [i.11] ETSI EN 301 908-21: "IMT cellular networks; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 21: OFDMA TDD WMAN (Mobile WiMAX™) FDD User Equipment (UE)".
- [i.12] 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.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 301 489-1 [1] and the following apply:

Equipment Under Test (EUT): equipment subject to the performance requirements of the present document

fixed station: equipment intended for use in a fixed location and fitted with one or more antennas

NOTE: The equipment may be fitted with either antenna socket(s) or integral antenna(s) or both.

hand-portable station: equipment normally used on a stand-alone basis and to be carried by a person

NOTE: The equipment may be fitted with one or more antennas. The equipment may be fitted with either antenna socket(s) or integral antenna(s) or both.

host: any equipment which has complete user functionality when not connected to the radio equipment part and to which the radio equipment part provides additional functionality and to which connection is necessary for the radio equipment part to offer functionality

plug-in radio device: equipment, including slide-in radio cards, intended to be used with or within a variety of host systems, using their control functions and power supply

stand-alone radio equipment: equipment that is intended primarily as communications equipment and that is normally used on a stand-alone basis

3.2 Symbols

For the purposes of the present document, the following symbols apply:

P_{min} minimum power required to establish a communication link

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|------|---|
| AC | Alternating Current |
| ACK | ACKnowledgement |
| ARQ | Automatic Retransmission reQuest |
| BRAN | Broadband Radio Access Networks |
| BWA | Broadband Wireless Access |
| CR | Continuous phenomena applied to Receivers |
| CT | Continuous phenomena applied to Transmitters |
| DC | Direct Current |
| EMC | ElectroMagnetic Compatibility |
| ERM | Electromagnetic compatibility and Radio Matters |
| EUT | Equipment Under Test |
| ISM | Industrial, Scientific and Medical |
| MGWS | Multi-Gigabit Wireless Systems |
| MUS | Maximum Usable Sensitivity |
| NACK | Not ACKnowledgement |
| RF | Radio Frequency |
| RLAN | Radio Local Area Network |
| TR | Transient phenomena applied to Receivers |
| TT | Transient phenomena applied to Transmitters |

4 Test conditions

4.1 General

For the purposes of the present document, the test conditions of ETSI EN 301 489-1 [1], clause 4, shall apply as appropriate. Further product related test conditions for wideband data communications systems are specified in clauses 4.2 to 4.5.

The radio equipment may take forms which may require special software and/or test fixtures. Equipment which requires connection to a host equipment to function shall use a test configuration representative of the EUT's intended use and shall be recorded in the test report.

4.2 Arrangements for test signals

4.2.1 Arrangements for test signals at the input of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.1 shall apply with the following modifications.

The wanted signals and/or controls required to establish a communication link and shall be representative of the EUTs intended use.

The transmitter shall be operated at maximum rated power.

4.2.2 Arrangements for test signals at the output of transmitters

The provisions of ETSI EN 301 489-1 [1], clause 4.2.2 shall apply with the following modifications.

A suitable companion receiver shall be used to receive messages or to set up a communication link.

4.2.3 Arrangements for test signals at the input of receivers

The provisions of ETSI EN 301 489-1 [1], clause 4.2.3 shall apply with the following modifications.

The wanted signals required to establish a communication link shall be representative of the EUTs intended use.

The level of the wanted signal at the input of the receiver shall be not greater than 30 dB above the Pmin for the EUTs.

NOTE: Simple method to establish the required communication link is establish link, reduce power to point of link failure then increase by no more than 30 dB.

4.2.4 Arrangements for test signals at the output of receivers

The measuring equipment for the output signal from the receiver under test shall be located outside the test environment.

It shall be possible to assess the performance of the equipment by appropriately monitoring the receiver output.

If the receiver has an output connector or port providing the wanted output signal, then this port shall be used via a cable, consistent with the standard cable used in normal operation, connected to the external measuring equipment outside the test environment.

Precautions shall be taken to ensure that any effect on the test due to the coupling means is minimized.

A suitable companion transmitter shall be used to transmit messages or to set up a communication link.

4.2.5 Arrangements for testing transmitter and receiver together (as a system)

The provisions of ETSI EN 301 489-1 [1], clause 4.2.0 shall apply.

A suitable companion transceiver or transmitter and receiver shall be used to send and receive messages or to set up a communication link.

Both the EUT and the companion equipment shall transmit the normal test modulation. Further, the output of the radio equipment under test shall be monitored by the test system.

4.2.6 Equipment with an external antenna connector

If access to the antenna connector involves modification or dismantling of the EUT then this clause does not apply.

The EUT may be tested with its antenna removed.

In the case of testing with the antenna removed, the wanted RF input and output signals shall be delivered between the EUT antenna connector and the measuring and/or test equipment by a shielded transmission line, such as a coaxial cable. Adequate measures shall be taken to minimize the effect of common mode currents on the transmission line at the point of entry to the EUT and at the measuring/test equipment.

4.2.7 Equipment without an external antenna connector (integral antenna)

This clause applies to EUT to which clause 4.2.6 does not apply. Such EUT are generally known as integral antenna or dedicated antenna equipment.

The EUT shall be tested with its antenna fitted in a manner typical of intended use.

4.2.8 Equipment with more than one antenna

If the EUT has more than one antenna port, e.g. separate antennas for Tx and Rx or separate antennas for different operating frequencies or diversity antennas, then:

- If clause 4.2.6 applies to all the antenna ports, then the EUT may be tested according to clause 4.2.6, with all antenna ports treated the same.
- Otherwise it shall be tested according to clause 4.2.7.

NOTE: The reason is that replacing one antenna by a transmission line may affect the operation of any other antennas.

4.3 Exclusion bands

The frequencies on which the transmitter part of the EUT is intended to operate shall be excluded from radiated emission measurements when performed in transmit mode of operation.

There shall be no frequency exclusion band applied to emission measurements of the receiver part of transceivers or the stand alone receiver under test, and/or associated ancillary equipment.

The exclusion band for immunity testing of equipment operating in the 2,4 GHz band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -120 MHz, i.e. 2 280 MHz;
- upper limit of exclusion band = highest allocated band edge frequency +120 MHz, i.e. 2 603,5MHz.

The exclusion band for immunity testing of equipment operating in the 5 GHz Wi-Fi band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -270 MHz, i.e. 4 880 MHz;
- upper limit of exclusion band = highest allocated band edge frequency +270 MHz, i.e. 5 995 MHz.

The exclusion band for immunity testing of equipment operating in the 5,8 GHz band shall be:

- lower limit of exclusion band = lowest allocated band edge frequency -270 MHz, i.e. 5 455 MHz;
- as the immunity requirements have an upper frequency range of 6 GHz and any upper edge exclusion band would be greater than this for the 5,8 GHz band. The above frequency shall also be regarded as the upper end of the test range.

NOTE: These receiver exclusion band ranges align with the relevant blocking test ranges.

4.4 Void

4.5 Normal test modulation

The modulated test signal shall represent intended use, and may contain data formatting, error detection and correction information.

5 Performance assessment

5.1 General

The manufacturer should supply at the time of submission of the equipment for test, the information required in ETSI EN 301 489-1 [1], annex C and the following which should be recorded in the test report:

- the operating frequency range(s) of the equipment and, where applicable, band(s) of operation;

- the type of the equipment, for example: stand-alone or plug-in radio device;
- the host equipment to be combined with the radio equipment for testing;
- the minimum performance level under the application of EMC stress (see clause 6.2);
- the normal test modulation, the format, the type of error correction and any control signals e.g. ACKnowledgement (ACK)/Not ACKnowledgement (NACK) or Automatic Retransmission reQuest (ARQ).

5.2 Arrangements for the assessment of host dependent equipment and plug-in cards

5.2.0 Introduction

For equipment parts for which integration with a host equipment is necessary in order to offer functionality, two alternative approaches defined in clauses 5.2.1 and 5.2.2 may be used.

5.2.1 Alternative A: composite equipment

A combination of the radio equipment part and a specific type of host equipment may be used for assessment according to the present document.

Where a specific combination of host equipment and a radio equipment part is tested as a composite system for compliance, repeat testing shall not be required for:

- those other combinations of hosts and radio equipment parts which are based on substantially similar host models in the circumstance that the variations in mechanical and electrical properties between such host models are unlikely to significantly influence the intrinsic immunity and unwanted emissions of the radio equipment part;
- the radio equipment part which cannot be used without mechanical, electrical, or software modification in variations of host equipment different from those represented by the units for which compliance to the present document has been demonstrated.

For all other combinations, each combination shall be tested separately.

5.2.2 Alternative B: use of a test jig or host

Where the radio equipment part is intended for use with a variety of host systems, the manufacturer shall supply a suitable test configuration consisting of either a host system intended for normal use or a test jig that is representative of the range of host systems in which the device may be used. The test jig shall allow the radio equipment part to be powered and stimulated in a way similar to the way it would be powered and stimulated when connected to or inserted into host equipment.

5.3 Assessment procedures

The performance assessment shall be based upon:

- maintenance of function(s);
- the way the eventual loss of function(s) can be recovered;
- unintentional behaviour of the EUT.

The test system shall set up a communications link in the same manner as the Equipment Under Test's (EUT) normal intended use.

Any user defined data fields in the memory or storage of the EUT shall be filled in a way representative of normal intended use.

The assessment procedure shall verify that the communications link is maintained and that there is no loss of user control functions or loss of critical stored data.

6 Performance criteria

6.1 General performance criteria

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

6.2 Performance table

6.2.1 Performance criteria overview

Table 1: Performance criteria

| Criteria | During test | After test (i.e. as a result of the application of the test) |
|--|--|---|
| A | Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions. | Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data. |
| B | May be loss of function. | Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data. |
| C | May be loss of function. | Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data. |
| NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2. | | |

6.2.2 Minimum performance level

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

6.3 Performance criteria for Continuous phenomena applied to Transmitters (CT)

The performance criteria A shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

6.4 Performance criteria for Transient phenomena applied to Transmitters (TT)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

6.5 Performance criteria for Continuous phenomena applied to Receivers (CR)

The performance criteria A shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

6.6 Performance criteria for Transient phenomena applied to Receivers (TR)

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply.

Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

7 Requirements

7.1 Emission

7.1.1 General

Table 2 contains the EMC emission requirements for the relevant ports of radio and ancillary equipment.

Table 2: Emission requirements

| Phenomenon | Port | Applicability | | | Reference clause |
|----------------------------------|----------------------------------|--|--|--------------------------------------|-----------------------------------|
| | | Fixed use (e.g. base station equipment) | Vehicular use (e.g. mobile equipment) | Portable use (portable equipment) | |
| radiated emission | enclosure of ancillary equipment | applicable | applicable | applicable | ETSI EN 301 489-1 [1], clause 8.2 |
| conducted emission | DC power input/output port | applicable | applicable | not applicable | ETSI EN 301 489-1 [1], clause 8.3 |
| conducted emission | AC mains input/output port | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 8.4 |
| harmonic current emissions | AC mains input port | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 8.5 |
| voltage fluctuations and flicker | AC mains input port | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 8.6 |
| conducted emission | wired network port | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 8.7 |

Hand portable equipment, or combinations of equipment, declared as capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular mobile equipment.

Hand portable or mobile equipment, or combinations of equipment, declared as capable of being powered for intended use by ac mains shall additionally be considered as fixed station equipment.

7.1.2 Special conditions

Arrangements for test conditions shall be as specified in clause 4 of the present document.

7.2 Immunity

7.2.1 General

Table 3 contains the EMC immunity requirements for the relevant ports of radio equipment.

Table 3: Immunity requirements

| Phenomenon | Port | Applicability | | | Reference clause |
|--|--|--|--|--------------------------------------|-----------------------------------|
| | | Fixed use (e.g. base station equipment) | Vehicular use (e.g. mobile equipment) | Portable use (portable equipment) | |
| RF electromagnetic field (80 MHz to 6 000 MHz) | enclosure port | applicable | applicable | applicable | ETSI EN 301 489-1 [1], clause 9.2 |
| electrostatic discharge | enclosure | applicable | not applicable | applicable | ETSI EN 301 489-1 [1], clause 9.3 |
| fast transients common mode | signal, wired network and control ports, DC and AC power ports | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 9.4 |
| RF common mode 0,15 MHz to 80 MHz | signal, wired network and control ports, DC and AC power ports | applicable | applicable | not applicable | ETSI EN 301 489-1 [1], clause 9.5 |
| transients and surges | DC power input ports | not applicable | applicable | not applicable | ETSI EN 301 489-1 [1], clause 9.6 |

| Phenomenon | Port | Applicability | | | Reference clause |
|---|---|---|---------------------------------------|-----------------------------------|-----------------------------------|
| | | Fixed use (e.g. base station equipment) | Vehicular use (e.g. mobile equipment) | Portable use (portable equipment) | |
| voltage dips and interruptions | AC mains power input ports | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 9.7 |
| surges, line to line and line to ground | AC mains power input ports, wired network ports | applicable | not applicable | not applicable | ETSI EN 301 489-1 [1], clause 9.8 |

Hand portable equipment, or combinations of equipment, declared as capable of being powered for intended use by the main battery of a vehicle shall additionally be considered as vehicular mobile equipment.

Hand portable or mobile equipment, or combinations of equipment, declared as capable of being powered for intended use by ac mains shall additionally be considered as fixed station equipment.

7.2.2 Special conditions

Arrangements for test conditions shall be as specified in clause 4 of the present document.

Arrangements for performance criteria shall be as specified in clause 6 of the present document.

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.12] 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.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.

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

| Harmonised Standard ETSI EN 301 489-17 | | | | | |
|--|--|-------------------------------------|-----------------------------------|----------------------------|---|
| Requirement | | | | Requirement Conditionality | |
| No | Description | Essential requirements of Directive | Clause(s) of the present document | U/C | Condition |
| 1 | Emissions: Enclosure of ancillary equipment measured on a standalone basis | 3.1b | 7.1 | U | |
| 2 | Emissions: DC power input/output ports | 3.1b | 7.1 | C | Only where equipment has DC power input and/or output ports with a cable length greater than 3 m or from a vehicle power supply |
| 3 | Emissions: AC mains power input/output ports | 3.1b | 7.1 | C | Only where equipment has AC mains power input and/or output ports |
| 4 | Emissions: Harmonic current emission (AC mains input port) | 3.1b | 7.1 | C | Only where equipment has AC mains power input ports |
| 5 | Emissions: Voltage fluctuations and flicker (AC mains input ports) | 3.1b | 7.1 | C | Only where equipment has AC mains power input ports |
| 6 | Emissions: Wired network ports | 3.1b | 7.1 | C | Only where equipment has wired network ports |
| 7 | Immunity: Radio frequency electromagnetic field (80 MHz to 6 000 MHz) | 3.1b | 7.2 | U | |
| 8 | Immunity: Electrostatic discharge | 3.1b | 7.2 | U | |
| 9 | Immunity: Fast transients common mode | 3.1b | 7.2 | C | Only where equipment has AC mains power input ports or DC power ports or wired network ports with cables longer than 3 m |
| 10 | Immunity: Radio frequency common mode | 3.1b | 7.2 | C | Only where equipment has AC mains power input ports or DC power ports or wired network ports with cables longer than 3 m |
| 11 | Immunity: Transients and surges in the vehicular environment | 3.1b | 7.2 | C | Only where equipment is fitted to a vehicle power supply |

| Harmonised Standard ETSI EN 301 489-17 | | | | | |
|--|---|-------------------------------------|-----------------------------------|----------------------------|--|
| Requirement | | | | Requirement Conditionality | |
| No | Description | Essential requirements of Directive | Clause(s) of the present document | U/C | Condition |
| 12 | Immunity: Voltage dips and interruptions | 3.1b | 7.2 | C | Only where equipment has AC mains power input ports |
| 13 | Immunity: Surges, line to line and line to ground | 3.1b | 7.2 | C | Only where equipment has AC mains power input ports and/or wired network ports |

Key to columns:

Requirement:

No A unique identifier for one row of the table which may be used to identify a requirement.

Description A textual reference to the requirement.

Essential requirements of Directive

Identification of article(s) defining the requirement in the Directive.

Clause(s) of the present document

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 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): Examples of radio equipment in the scope of the present document

B.1 Introduction

The present document covers radio wideband transmission systems as set out below.

B.2 Data transmission systems operating in the 2,4 GHz ISM band and using wide band modulation techniques

Wideband transmission systems are defined in ETSI EN 300 328 [i.8].

B.3 5 GHz high performance RLAN systems

5 GHz high performance RLAN systems are those within the scope and compliant with ETSI EN 301 893 [i.3].

B.4 Broadband data transmitting systems operating in the band 5 725 MHz to 5 875 MHz

Broadband Data Transmitting systems are those within the scope and compliant with ETSI EN 302 502 [i.4].

B.5 Broadband data transmitting/BWA Terminal Stations

Examples of such systems are those within the scope of ETSI EN 302 544-2 [i.5] or ETSI EN 302 623 [i.7], ETSI EN 301 908-19 [i.10] or ETSI EN 301 908-21 [i.11].

B.6 Multi-Gigabit Wireless Systems (MGWS)

Examples of such systems are those within the scope of ETSI EN 302 567 [i.6] when operating in the frequency band 57 GHz to 66 GHz.

Annex C (informative): Change History

| Version | Information about changes |
|---------|--|
| 3.1.1 | Radiated immunity testing to a continuous sweep between 80 MHz and 6 000 MHz at 3 V/m, as opposed to the previous frequency range of 80 MHz to 1 000 MHz and 1 400 MHz to 2 700 MHz in earlier editions. New derivations of exclusion bands more closely linked to the operational characteristics of the radio link(s) in the EUT. New test arrangement for systems with multiple antennas. |
| 3.2.1 | Change to definition of performance criteria. Mapping of requirements to ETSI EN 301 489-1. |

History

| Document history | | | |
|-------------------------|----------------|-----------------------|---------------------------------------|
| V1.1.1 | September 2000 | Publication | |
| V1.2.1 | August 2002 | Publication | |
| V1.3.2 | April 2008 | Publication | |
| V2.1.1 | May 2009 | Publication | |
| V2.2.1 | September 2012 | Publication | |
| V3.1.1 | February 2017 | Publication | |
| V3.2.0 | March 2017 | EN Approval Procedure | AP 20170613: 2017-03-15 to 2017-06-13 |
| V3.2.2 | December 2019 | EN Approval Procedure | AP 20200311: 2019-12-12 to 2020-03-11 |