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ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility

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Foreword

This Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document has been prepared under the Commission's standardisation request C(2015) 5376 final [i.16] 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 1 of a multi-part EMC standard for radio equipment which is structured in the following way:

- All common technical requirements for EMC emission and immunity have been placed in the common part, which is the present document.
- Separate parts have been developed to cover specific product related radio equipment test conditions, test arrangements, performance assessment, performance criteria, etc.
- A clause is included in each of the specific radio parts, entitled "special conditions", which is used as appropriate to cover any deviations or additions to the common requirements set out in the present document.

The present document is part 1 of a multi-part deliverable covering ElectroMagnetic Compatibility (EMC) standard for radio equipment and services, as identified below:

Part 1: "Common technical requirements";

Part 2: "Specific conditions for radio paging equipment";

Part 3: "Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz";

Part 4: "Specific conditions for fixed radio links and ancillary equipment";

Part 5: "Specific conditions for Private land Mobile Radio (PMR) and ancillary equipment (speech and non-speech) and Terrestrial Trunked Radio (TETRA)";

Part 6: "Specific conditions for Digital Enhanced Cordless Telecommunications (DECT) equipment";

Part 9: "Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices";

Part 12: "Specific conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4 GHz and 30 GHz in the Fixed Satellite Service (FSS)";

Part 13: "Specific conditions for Citizens' Band (CB) radio and ancillary equipment (speech and non-speech)";

Part 15: "Specific conditions for commercially available amateur radio equipment";

Part 17: "Specific conditions for Broadband Data Transmission Systems";

Part 19: "Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band (ROGNSS) providing positioning, navigation, and timing data";

Part 20: "Specific conditions for Mobile Earth Stations (MES) used in the Mobile Satellite Services (MSS)";

Part 22: "Specific conditions for ground based VHF aeronautical mobile and fixed radio equipment";

Part 27: "Specific conditions for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P) operating in the 402 MHz to 405 MHz bands";

Part 28: "Specific conditions for wireless digital video links";

Part 29: "Specific conditions for Medical Data Service Devices (MEDS) operating in the 401 MHz to 402 MHz and 405 MHz to 406 MHz bands";

Part 31: "Specific conditions for equipment in the 9 kHz to 315 kHz band for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P)";

Part 33: "Specific conditions for Ultra-WideBand (UWB) devices";

Part 34: "Specific conditions for External Power Supply (EPS) for mobile phones";

Part 35: "Specific requirements for Low Power Active Medical Implants (LP-AMI) operating in the 2 483,5 MHz to 2 500 MHz bands";

Part 50: "Specific conditions for Cellular Communication Base Station (BS), repeater and ancillary equipment";

Part 51: "Specific conditions for Automotive, Ground based Vehicles and Surveillance Radar Devices using 24,05 GHz to 24,25 GHz, 24,05 GHz to 24,5 GHz, 76 GHz to 77 GHz and 77 GHz to 81 GHz";

Part 52: "Specific conditions for Cellular Communication Mobile and portable radio and ancillary equipment";

Part 53: "Specific conditions for terrestrial sound broadcasting and digital TV broadcasting service transmitters and associated ancillary equipment";

Part 54: "Specific conditions for ground based aeronautical and meteorological radars".

NOTE: Parts 7, 8, 10, 11, 14, 16, 18, 23, 24, 25, 26 and 32 of this multi-part deliverable have been removed from this listing as they do not cover the new Directives in force, Directive 2014/53/EU [i.1] and Directive 2014/30/EU [i.2].

National transposition dates	
Date of adoption of this EN:	18 November 2019
Date of latest announcement of this EN (doa):	29 February 2020
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2020
Date of withdrawal of any conflicting National Standard (dow):	31 August 2021

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.

Introduction

Product dependent arrangements necessary to perform the EMC tests on dedicated types of radio communications equipment, and the assessment of test results, are detailed in the appropriate relevant radio technology parts of ETSI EN 301 489 series [i.13] details of which can be found in annex C of the present document.

The environment classification used in the present document refers to the environment classification used in:

- CENELEC EN 61000-6-3 [i.4] and CENELEC EN 61000-6-1 [i.5] for the residential, commercial and light industrial environment; or
- CENELEC EN 61000-6-2 [i.15] and CENELEC EN 61000-6-4 [i.14] for the industrial environment; or
- ETSI TR 101 651 [i.6] for the telecommunication centre environment; or
- ISO 7637-2 [8] for the vehicular environment.

The immunity requirements within the present document are derived from the generic immunity standard for the residential, commercial and light industrial environment.

When it is required to evaluate the EMC performance of "combined radio and non-radio equipment", ETSI EG 203 367 [i.3] provides guidance upon the application of the various harmonised standards, including the present document, that could potentially apply to such equipment.

1 Scope

The present document specifies methods of measurements and technical characteristics for radio equipment and associated ancillary equipment, excluding broadcast receivers, in respect of ElectroMagnetic Compatibility (EMC).

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

NOTE 1: The relationship between the present document and essential requirements of article 3.1(b) of Directive 2014/53/EU [i.1] is given in annex A.

NOTE 2: Other standards may apply in place of the present document, e.g. product specific standards in the ETSI EN 301 489 [i.13] series.

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] CENELEC EN 55032 (2015): "Electromagnetic compatibility of multimedia equipment - Emission Requirements".

[2] CENELEC EN 61000-4-2 (2009): "Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test".

[3] CENELEC EN 61000-4-3 (2006), A1 (2008) and A2 (2010): "Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test".

[4] CENELEC EN 61000-4-4 (2012): "Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test".

[5] CENELEC EN 61000-4-5 (2014): + A1 (2017): "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test".

[6] CENELEC EN 61000-4-6 (2014): "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".

[7] CENELEC EN 61000-4-11 (2004): "Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests".

[8] ISO 7637-2 (2004): "Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only".

NOTE: The dated reference of ISO 7637-2 has not been updated to the latest version in order to maintain alignment with the requirements of UNECE Reg 10 [i.10].

[9] CENELEC EN 61000-3-3 (2013): "Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection".

[10] CISPR 25 (2nd Edition 2002) and COR1 (2004): "Radio disturbance characteristics for the protection of receivers used on board vehicles, boats, and on devices - Limits and methods of measurement".

NOTE: The dated reference of CISPR 25 has not been updated to the latest version in order to maintain alignment with the requirements of UNECE Reg 10 [i.10].

[11] CENELEC EN 61000-3-12 (2011): "Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase".

[12] CENELEC EN 61000-3-11 (2000): "Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection".

[13] CENELEC EN 50561-3 (2016): "Power line communication apparatus used in low-voltage installations - Radio disturbance characteristics - Limits and methods of measurement - Part 3: Apparatus operating above 30 MHz".

[14] CENELEC EN 50561-1 (2013)/AC (2015): "Power line communication apparatus used in low-voltage installations - Radio disturbance characteristics - Limits and methods of measurement - Part 1: Apparatus for in-home use".

[15] CENELEC EN 61000-3-2 (2014): "Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)".

[16] CENELEC EN 61000-4-34 (2007), A1 (2009): "Electromagnetic compatibility (EMC) - Part 4-34: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with mains current more than 16 A per phase".

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] Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast).

[i.3] ETSI EG 203 367: "Guide to the application of harmonised standards covering articles 3.1b and 3.2 of the Directive 2014/53/EU (RED) to multi-radio and combined radio and non-radio equipment".

[i.4] CENELEC EN 61000-6-3 (2007) + A1(2011): "Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments".

[i.5] CENELEC EN 61000-6-1 (2007): "Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments".

[i.6] ETSI TR 101 651 (V2.1.1): "Classification of the electromagnetic environment conditions for equipment in telecommunication networks".

[i.7] IEC 60050-161: "International Electrotechnical Vocabulary. Chapter 161: Electromagnetic compatibility".

[i.8] ITU Radio Regulations (Article 1, Section VI).

[i.9] Void.

[i.10] UNECE Regulation No. 10: "Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility".

[i.11] Void.

[i.12] Void.

[i.13] ETSI EN 301 489 series: "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".

[i.14] CENELEC EN 61000-6-4 (2007) + A1 (2011): "Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments".

[i.15] CENELEC EN 61000-6-2 (2005): "Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments".

[i.16] Commission Implementing Decision C(2015) 5376 final of 4.8.2015 on a standardisation request to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards radio equipment in support of Directive 2014/53/EU of the European Parliament and of the Council.

[i.17] Void.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in article 2 of Directive 2014/53/EU [i.1] and the following apply:

ancillary equipment: electrical or electronic equipment, that is intended to be used with a receiver or transmitter

NOTE 1: It is considered as an ancillary equipment if:

- the equipment is intended for use with a receiver or transmitter to provide additional operational and/or control features to the radio equipment, (e.g. to extend control to another position or location); and
- the ancillary equipment cannot be used without being connected to radio equipment to provide user functions independently of a receiver or transmitter; and
- the receiver or transmitter, to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

NOTE 2: An example of ancillary equipment would be a docking station for radio equipment whose interface is dedicated to a particular product or range of products.

antenna port: port, for connection of an antenna used for intentional transmission and/or reception of radiated RF energy

associated equipment: equipment needed to exercise and/or monitor the operation of the EUT