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Full standard:
<https://standards.iteh.ai/catalog/standards/sist/ec470a17-10eb-4112-a1c6-a7c9216c655c/etsi-en-301-489-1-v2.1.1-2017-02>

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Foreword

This draft Harmonised European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

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

The present document has been prepared to provide one voluntary means of conforming to the essential requirements of Directive 2014/30/EU [i.2] 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).

NOTE: The corresponding Commission's standardisation request to provide one voluntary means of conforming to the essential requirements Directive 2014/30/EU on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast) [i.2] is expected shortly.

Once the present document is cited in the Official Journal of the European Union under the Directives, compliance with the normative clauses of the present document given in tables A.1 and A.2 confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding essential requirements of the corresponding Directives 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:

- One EMC standard for all radio equipment made up of several parts.
- 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 Terrestrial Trunked Radio (TETRA) equipment and ancillary equipment (speech and non-speech)";
- Part 6: "Specific conditions for Digital Enhanced Cordless Telecommunications (DECT) equipment";
- Part 7: "Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)";
- Part 8: "Specific conditions for GSM base stations";
- Part 9: "Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices";
- Part 10: "Specific conditions for First (CT1 and CT1+) and Second Generation Cordless Telephone (CT2) equipment";
- Part 11: "Specific conditions for terrestrial sound broadcasting service transmitters";
- 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 14: "Specific conditions for analogue and digital terrestrial TV broadcasting service transmitters";
- Part 15: "Specific conditions for commercially available amateur radio equipment";
- Part 16: "Specific conditions for analogue cellular radio communications equipment, mobile and portable";
- Part 17: "Specific conditions for Broadband Data Transmission Systems";
- Part 18: "Specific conditions for Terrestrial Trunked Radio (TETRA) equipment";
- Part 19: "Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications";
- 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 23: "Specific conditions for IMT-2000 CDMA, Direct Spread (UTRA and E-UTRA) Base Station (BS) radio, repeater and ancillary equipment";
- Part 24: "Specific conditions for IMT-2000 CDMA Direct Spread (UTRA and E-UTRA) for Mobile and portable (UE) radio and ancillary equipment";
- Part 25: "Specific conditions for CDMA 1x spread spectrum Mobile Stations and ancillary equipment";
- Part 26: "Specific conditions for CDMA 1x spread spectrum Base Stations, repeaters and ancillary equipment";
- Part 27: "Specific conditions for Ultra Low Power Active Medical Implants (ULP-AMI) and related peripheral devices (ULP-AMI-P)";
- 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 32: "Specific conditions for Ground and Wall Probing Radar applications";
- Part 33: "Specific conditions for Ultra Wide Band (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 and Surveillance Radar Devices using 24,05 GHz to 24,5 GHz or 76 GHz to 81 GHz";
- Part 52: "Specific conditions for mobile and portable (UE) radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS), IMT-2000 CDMA Direct Spread (UTRA and E-UTRA) and CDMA 1x spread spectrum".

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 contains the common requirements for radio equipment and associated ancillary equipment, excluding broadcast receivers, in respect of ElectroMagnetic Compatibility (EMC).

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 product related parts of ETSI EN 301 489 series [i.13].

The present document, together with the product related part, where required, specifies the applicable EMC tests, the methods of measurement, the limits and the performance criteria for radio equipment and associated ancillary equipment. In case of differences (for instance concerning special conditions, definitions, abbreviations) between part 1 of ETSI EN 301 489 series [i.13] and the relevant product related part of ETSI EN 301 489 series [i.13], the product related part takes precedence.

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 associated 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.

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 EMC requirements have been selected to ensure an adequate level of compatibility for equipment intended to be used in the environments mentioned above. The levels, however, do not cover extreme cases which may occur in any location but with low probability of occurrence.

The present document may not cover those cases where a potential source of interference which is producing individually repeated transient phenomena or a continuous phenomenon is permanently present, e.g. a radar or broadcast site in the near vicinity. In such a case it may be necessary to use special protection applied to either the source of interference or the interfered part or both.

Where none of the existing specific product related radio parts covers the required conditions for a particular radio equipment/service e.g. in case of the initial introduction of a new radio service or a special application, the present document can be used for the purposes of testing to the EMC requirements set out in the present document.

In all cases where a radio product falls within the scope of a specific product related radio part of the standard, the product related part takes precedence.

Compliance of radio equipment to the requirements of the present document does not signify compliance to any requirements related to spectrum management or to the use of the equipment (licensing requirements).

Compliance to the requirements of the present document does not signify compliance to any safety requirements. However, it is the responsibility of the assessor of the equipment to record in the test report any observations regarding the test sample becoming dangerous or unsafe as a result of the application of the tests called for in the present document.

NOTE 1: Requirements for Harmonics and flicker and voltage fluctuations are to be found in other harmonised standards.

NOTE 2: The present document does not yet fully address the industrial environment and industrial equipment, including ISM equipment. These will be addressed in a future edition.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <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 (2006): "Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test".

NOTE: The dated reference of CENELEC EN 61000-4-5 has not been updated to the latest version because of the significant technical changes in comparison with the referenced revision. For some test laboratories, updating equipment will be a significant additional cost hence more time is required for implementation.

- [6] CENELEC EN 61000-4-6 (2009): "Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields".

NOTE: The dated reference of CENELEC EN 61000-4-6 has not been updated to the latest version because of the significant technical changes in comparison with the referenced revision. For some test laboratories, updating equipment will be a significant additional cost hence more time is required for implementation.

- [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".
- [9] CENELEC EN 61000-3-3 (2008): "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".
- [11] CENELEC EN 61000-3-12 (2005): "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): "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 (2006), A1 (2009) and A2 (2009): "Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 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] Void.
- [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 (V1.1.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); 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] Void.
- [i.9] Void.
- [i.10] Void.
- [i.11] Void.
- [i.12] Void.
- [i.13] ETSI EN 301 489 series: "Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".
- [i.14] CENELEC EN 61000-6-4 (2007) + A1(2011): "Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments".