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ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 34: Specific conditions for External Power Supply (EPS) for mobile phones; Harmonised Standard covering the essential requirements of article 3.1b of the Directive 2014/53/EU and the essential requirements of article 6 of the Directive 2014/30/EU

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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.8] 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.4].

The present document has been prepared to provide one voluntary means of conforming to the essential requirements of 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.1].

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.1] 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 34 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

To demonstrate an adequate level of EMC protection, the present document is to be used together with the appropriate specific radio part of the standard.

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.

Introduction

The present document is part of a set of standards developed by ETSI and is designed to fit in a modular structure to cover all radio and telecommunications terminal equipment within the scope of the RE-Directive [i.4]

Interoperability for the product within the scope of the present document is covered by CENELEC EN 62684 [16] and Safety is covered by CENELEC EN 60950-1 [i.6]. An EPS not intended to support CENELEC EN 62684 [16] may meet the EMC requirements of other standards.

The EPS supplied for test (EUT) should be identified by the supplier as intended to support M/455 regarding Harmonisation of a Charging Capability for Mobile Phones.

1 Scope

The present document contains the Specific ElectroMagnetic Compatibility (EMC) requirements for the common external power supply (EPS) for use with data-enabled mobile telephones as described in CENELEC EN 62684 [16].

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 [i.7].

In case of differences (for instance concerning special conditions, definitions and abbreviations) between the present document and ETSI EN 301 489-1 [1], the provisions of the present document take precedence.

The environment 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.

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] ETSI EN 301 489-1 (V2.1.0) (04-2016): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Harmonised Standard covering the essential requirements of article 3.1(b) of the Directive 2014/53/EU and the essential requirements of article 6 of the Directive 2014/30/EU; Part 1: Common technical requirements".

From [2] to [7] void.

[2] 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.

From [9] to [15] void.

[3] CENELEC EN 62684:2010: "Interoperability specifications of common external power supply (EPS) for use with data-enabled mobile telephones".

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 2014/30/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.2] Void.

[i.3] Void.

[i.4] 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.5] Void.

[i.6] CENELEC EN 60950-1:2006: "Information technology equipment - Safety - Part 1: General requirements".

[i.7] ETSI EN 301 489 (all parts): "ElectroMagnetic Compatibility (EMC) standard for radio equipment and services".

[i.8] 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 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

adaptor: device with a USB Micro-B receptacle/plug connecting to a specific non USB Micro-B connector

NOTE: An Adaptor can also be a cable.

enclosure port: physical boundary of the apparatus through which electromagnetic fields may radiate or impinge

External Power Supply (EPS): common external Power Supply (EPS) with an AC input which meets the requirements of the specifications given in CENELEC EN 62684 [16]

port: particular interface, of the specified equipment (apparatus), with the electromagnetic environment

EXAMPLE: Any connection point on an equipment intended for connection of cables to or from that equipment is considered as a port (see figure 1).

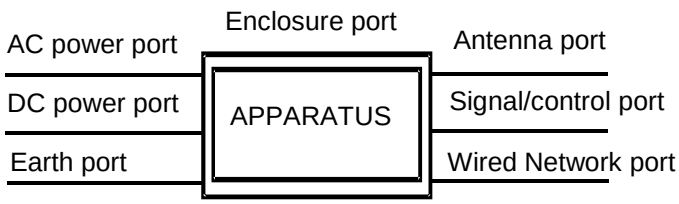

Figure 1: Examples of ports

NOTE: An interface, which uses optical fibre, is not a port for the purposes of testing because it does not interact with the electromagnetic environment within the frequency range, which is applicable for the present document. An optical fibre interface may still be used in the assessment of performance.

representative generic test load: EPS load which fully exercise the EPS and is supplied by the EPS manufacturer

NOTE: E.g. as in clause 4.3.

3.2 Abbreviations

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

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
DCS	Digital Cellular System
EMC	ElectroMagnetic Compatibility
EPS	External Power Supply
ESD	Electro Static Discharge
EUT	Equipment Under Test
PCS	Personal Communications Service
RF	Radio Frequency
rms	root mean square
UE	User Equipment (Mobile station)
UMTS	Universal Mobile Telecommunication System

4 Test conditions

4.1 General

The present document relates to the testing of the EPS, and seeks to ensure that an EPS which is compliant to the provisions of the present document will, when used with a compatible UE which is compliant to the applicable provisions of the ETSI EN 301 489 [i.7], comply with the requirements of ETSI EN 301 489-1 [1].

The present document describes testing the EPS with a Representative generic test load, which is intended to emulate a UE for the purpose of testing the EPS.

Because the choice of UE may have some impact on the EMC performance of the EPS certain criteria and/or limits have been tightened beyond those applied in the case of testing intended to determine the compliance of a specific EPS - UE combination. Such specific combinations may be tested as described in other parts of the ETSI EN 301 489 [i.7], but such testing does not demonstrate compliance to the requirements of an EPS.

The provisions of ETSI EN 301 489-1 [1], clause 4.2 shall apply with the following modifications:

- The EPS shall be connected with a Representative generic test load exercising the DC output port.
- Adequate measures shall be taken to avoid the effect of immunity RF test signals on the measuring equipment.
- Measurements shall be taken with the cable supplied with the EPS at the USB Micro-B port. The type and length of cable used shall be recorded in the test report.

4.2 Arrangements for test signals

Adequate measures shall be taken to avoid the effect of immunity test signals on both the measuring equipment and the signal sources for the wanted signals located outside the test environment.

4.3 RF exclusion band of radio communications equipment

Not applicable.

4.4 Narrow band responses of receivers or receivers which are part of transceivers

Not applicable.

4.5 Normal test modulation

Not applicable.

4.6 Representative generic test load

An EPS Representative generic test load which is representative of a UE shall have the following characteristics:

- A USB Micro-B socket connection.
- An input capacitance of 1μF in parallel with the EPS output.
- An input impedance with switchable range of:
  - 10 k Ω (for 0 % rated current).
  - Selection of resistances to obtain the currents and output voltages of the test procedures.

NOTE: Current range 500 mA to 1 500 mA, see CENELEC EN 62684 [16].

  - A resistance to obtain Maximum rated current.
- A shielded casing/enclosure as given in CENELEC EN 62684 [16].

5 Performance assessment

ETSI EN 301 489-1 [1], clause 5 shall apply with the following modification stated in clause 6.

6 Performance criteria

6.0 General

For the EPS, the performance criteria are based on a UE intended to be used with the EPS. For some specific test cases a different compliance level and/or performance criteria has been defined in order to ensure the compliance at the UE and EPS.

The performance criteria are used to make a decision on whether an EPS passes or fails immunity tests.

For the purpose of the present document two categories of performance criteria apply:

- performance criteria for continuous phenomena applied to EPS;
- performance criteria for transient phenomena applied to EPS.

6.1 Performance criteria for EPS

For an EPS the performance criteria for continuous phenomena shall meet the requirements whilst tested with the representative generic test load as given below.

The EPS shall meet its specification points on voltage ranges as given below, during and after continuous phenomena and after transient phenomena:

- Output Voltage 5 V ± 0,25 V from no load to maximum output current measured at the USB Micro-B plug, while connected to the generic test load defined in clause 4.6.

While the parameters above should be monitored at the USB Micro-B plug, the reference for the output voltage is the USB Micro-B plug for an EPS with captive cable and the Standard-A plug for an EPS with detachable cable.

The above criteria shall also be met after exposure to transient phenomena.

The following criteria shall be met after exposure to all immunity phenomena tests:

- Output Voltage Ripple (Under load conditions from idle to full): 80 mVp-p measured at 20 MHz bandwidth using the test method as defined in CENELEC EN 62684 [16].