IEC 61000-6-3

Edition 4.0 2026-04

INTERNATIONAL STANDARD

REDLINE VERSION

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

HORIZONTAL PUBLICATION

GENERIC EMC STANDARD

Electromagnetic compatibility (EMC) -
Part 6-3: Generic standards - Emission standard for equipment in residential ~~environments~~ locations

ICS 33.100.10

ISBN 978-2-8327-1196-5

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CONTENTS

FOREWORD 5
INTRODUCTION 7
1 Scope 8
2 Normative references 8
3 Terms, definitions and abbreviated terms 10
3.1 Terms and definitions 10
3.2 Abbreviated terms 10
4 Classification of equipment 15
5 Measurements and conditions during testing 17
6 Documentation for the user 18
7 Applicability 19
8 Requirements 19
9 Measurement uncertainty 19
10 Compliance with this document 19
11 Emission test details 20
11.1 General 20
11.2 Setting test frequency ranges 26
11.3 Additional requirements for devices with a radio function 27
Annex A (informative) Classification of equipment and mapping to the immunity standards 29
Annex B (normative) Testing of DC powered systems 30
Annex C (informative) Rationale for alternative ~~test levels~~ requirements at the DC power port 32
C.1 General 32
C.2 Necessity of alternative test methods in generic standards 32
C.3 Limit justification in table clause 5.2 32
C.3.1 Proportional relation approach 32
C.3.2 Current-to-voltage conversion approach 33
C.3.3 Setting the final limit 34
Annex D (informative) Alternative average detectors 35
D.1 General 35
D.2 Changes implemented in CISPR 16-1-1:2019 35
D.3 Conclusion 36
Annex E (informative) Background information on the normative limits in the frequency range 9 kHz to 150 kHz 37
E.1 Derivation of the normative limits 37
E.2 Radio protection analysis 39
E.2.1 General 39
E.2.2 Radio protection analysis for common mode disturbance injections 39
E.2.3 Radio protection analysis for differential mode disturbance injections 46
Annex F (informative) Spectral density of non-intentional emissions (NIE) in the frequency range 9 kHz to 150 kHz 53
F.1 Introduction of Integral Voltage Levels (IVL) for the limitation of the spectral density of NIE 53
F.2 Recommended maximum IVL for NIE 54

F.3 Rationale for the recommendation of additional limitations on the spectral density of non-intentional emissions 54
F.3.1 Rationale 54
F.3.2 Relationship between MCE performances and Integral Voltage Levels 55
Annex G (informative) Rationale for radiated magnetic field emissions requirements 60
Annex H (informative) Possible limits for radiated magnetic field emissions for EUT with the potential to produce disturbing electromagnetic fields 61
Annex I (informative) The conversion factor for magnetic emissions limits below 30 MHz 63
I.1 General 63
I.2 Considerations 65
I.3 Summary 68
Annex J (informative) Magnetic field emission limit correction based upon power 70
J.1 General 70
J.2 Limits 70
Bibliography 71

Figure 1 – Example of ports 13
Figure 2 – Basic WPT configuration 15
Figure 3 – Illustration of F_{TX} and F_X 28
Figure 4 – Excluded band 28
Figure C.1 – Equivalent circuit of test set up for measurement of disturbance voltages 33
Figure D.1 – Typical filter responses 35
Figure E.1 – Example of a V-AMN 38
Figure E.2 – Worst case common mode radiator for residential locations 39
Figure E.3 – Simulation results for the coupling factor for both field types 41
Figure E.4 – Worst case disturbance field strength at 10 m distance 42
Figure E.5 – Proposed field strengths limits compared to protection needs of radio applications 46
Figure E.6 – Worst-case differential mode radiator for residential locations 47
Figure E.7 – Simulation results for the coupling factor for differently sized loops 48
Figure E.8 – Properties of a V-AMN 49
Figure E.9 – Proposed field strengths limits compared to protection needs of radio applications 52
Figure F.1 – Example of a multi-carrier MCE spectrum 55
Figure F.2 – Laboratory test setup for the evaluation of the relationship between MCE performances and Integral Voltage Levels 56
Figure F.3 – Example of broadband noise produced by the NIE source used in the test 57
Figure F.4 – Spectral noise from device A, lower disturbing effect 58
Figure F.5 – Spectral noise from device B, higher disturbing effect 58
Figure I.1 – Example measurement of a real EUT at measurement distances (d) of 3 m and 10 m 64
Figure I.2 – Qualitative magnetic field lines in xz-plane of a horizontal loop and vertical dipole over infinite perfectly conducting ground 64
Figure I.3 – The six fundamental field source configurations 65
Figure I.4 – Absolute field strengths generated by 60 cm loops in all orientations at different distances 66

Figure I.5 – Absolute field strengths generated by 80 cm dipoles in all orientations at different distances 66
Figure I.6 – Conversion factors for dominant coupling 67
Figure I.7 – Derivation of the final conversion factor using dominant coupling for EUTs described in I.1 68
Figure I.8 – Conversion factor from a distance of 3 m to 10 m, in the frequency range 150 kHz to 30 MHz ($CF_{3\ m\ to\ 10\ m}$) 69

Table 1 – Test arrangements of EUT 18
~~Table 2 – Required highest frequency for radiated measurement .....~~
Table ~~3~~2 – Requirements for radiated electric field emissions, enclosure port 22
Table 3 – Requirements for radiated magnetic field emissions, enclosure port 23
Table 4 – Requirements for conducted emissions, low-voltage AC mains port 24
Table 5 – Requirements for conducted emissions, DC power port 25
Table 6 – Requirements for conducted emissions, other wired ports 26
Table 7 – Required highest frequency for radiated electric field emission measurements for EUT containing at least one active radio transmitter that is transmitting 27
Table 8 – Required highest frequency for radiated electric field emission measurements for EUT not containing at least one active radio transmitter that is transmitting 27
Table A.1 – Examples of emission and immunity requirements against product type and intended use 29
Table B.1 – Conducted emission requirements of DC powered equipment 30
Table B.2 – Conditional requirements for the start frequency of test at DC power ports for tests defined in table clause B1.4 to B1.7 31
Table C.1 – DC power port, terminal disturbance voltage limits for class B GCPCs, measured on a test site, proportion relation approach 33
Table C.2 – DC power port, terminal disturbance voltage limits for class B GCPCs, measured on a test site, current-to-voltage conversion approach 34
Table D.1 – Updated tolerances 35
Table E.1 – Simulation results for the coupling factor for both field types 40
Table E.2 – Worst case disturbance field strength at 10 m distance 42
Table E.3 – Probability factors and respective rationales 43
Table E.4 – Calculations of the required field strength limit 45
Table E.5 – Calculations of the required field strength limit 48
Table E.6 – Conversion from voltage limit to current limit for injection 49
Table E.7 – Disturbance field strength calculation for 20 cm and 50 cm loops 50
Table E.8 – Disturbance field strength calculation for 100 cm loop 51
Table F.1 – Recommended maximum Integral Voltage Levels 54
Table F.2 – Recommended maximum Integral Voltage Levels for equipment covered by footnote [a] to Table 4 54
Table F.3 – Correlation between MCE's noise assessment and Integral Voltage Levels computed in the MCE's operating frequency ranges 57
Table F.4 – Correlation between IVLs and MCE communication performance 58
Table H.1 – Proposed limits for radiated magnetic field emissions, enclosure port 62

Table I.1 – Conversion factor from a distance of 3 m to 10 m in the frequency range 150 kHz to 30 MHz ($CF_{3\ m\ to\ 10\ m}$) 69

Table J.1 – Proposed reduction to the limits 70

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Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential ~~environments~~ locations

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IEC 61000-6-3 has been prepared by CISPR subcommittee H: Limits for the protection of radio services. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2020. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) the addition of magnetic field emission requirements, including the measurement of WPT function;
b) the extension of low-voltage AC mains power requirements to cover the range 9 kHz to 150 kHz;
c) products with a radio function have been added to the scope;
d) limits in a FAR for rack mounted equipment have been added.

The text of this document is based on the following documents:

Draft	Report on voting
CIS/H/547/FDIS	CIS/H/557/RVD

Full information on the voting for the approval of this document can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61000 series, published under the general title *Electromagnetic compatibility (EMC)*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

IEC 61000 is published in separate parts according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)

Definitions, terminology

Part 2: Environment

Description of the environment

Classification of the environment

Compatibility levels

Part 3: Limits

Emission limits

Immunity limits (insofar as they do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques

Measurement techniques

Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines

Mitigation methods and devices

Part 6: Generic standards

Part 9: Miscellaneous

Each part is further subdivided into several parts published either as International Standards, technical reports or technical ~~reports/~~specifications~~, some of which have already been~~. These are published as sections. Others will be published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

1 Scope

This generic EMC emission standard is applicable only if no relevant dedicated product or product family EMC emission standard has been published.

This part of IEC 61000 for emission requirements applies to electrical and electronic equipment intended for use at residential (see 3.1.21) locations. This part of IEC 61000 also applies to electrical and electronic equipment intended for use at other locations that do not fall within the scope of IEC 61000-6-8 or IEC 61000-6-4.

The intention is that all equipment used in the residential, commercial and light-industrial ~~environments~~ locations are covered by IEC 61000-6-3 or IEC 61000-6-8. If there is any doubt the requirements in IEC 61000-6-3 apply.

~~The conducted and radiated emission requirements in the frequency range up to 400 GHz are considered essential and have been selected to provide an adequate level of protection of radio reception in the defined electromagnetic environment.~~ Equipment that have a radio function (3.1.20) are included in the scope of this document. However, the emission requirements in this document are not intended to be applicable to the intentional transmissions from these radio transmitters, their harmonics and their out of band emissions.

Not all disturbance phenomena have been included for testing purposes but only those considered relevant for the equipment intended to operate within the locations included within this document.

~~The emission requirements in this document are not intended to be applicable to the intentional transmissions and their harmonics from a radio transmitter as defined by the ITU.~~

The objectives of this document are:

a) to establish requirements that provide an adequate level of protection of radio reception in the frequency range 9 kHz to 400 GHz;

b) to establish requirements that provide an adequate level of protection against conducted and radiated electromagnetic disturbances emitted by equipment in the scope of this document;

c) to support the reproducibility of measurement and the repeatability of results.

~~NOTE 1 Safety considerations are not covered by this document.~~

NOTE ~~2~~ 1 In special cases, situations will arise where the levels specified in this document will not offer adequate protection; for example, where a sensitive receiver is used in close proximity to an equipment. In these instances, special mitigation measures can be employed.

NOTE ~~3~~2 Disturbances generated in fault conditions of equipment are not covered by this document.

NOTE ~~4~~3 ~~As~~ The requirements in this document are more stringent or equivalent to the requirements specified in IEC 61000-6-4 and IEC 61000-6-8~~, equipment fulfilling the requirements of this document comply with the requirements of IEC 61000-6-4 and IEC 61000-6-8~~.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61000-3-2:2018, *Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*
IEC 61000-3-2:2018/AMD1:2020
IEC 61000-3-2:2018/AMD2:2024

IEC 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*
IEC 61000-3-3:2013/AMD1:2017
IEC 61000-3-3:2013/AMD2:2021

IEC 61000-3-11:2017, *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*

IEC 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*
IEC 61000-3-12:2011/AMD1:2021

IEC 61000-4-20:~~2010~~2022, *Electromagnetic compatibility (EMC) - Part 4-20: Testing and measurement techniques - Emission and immunity testing in transverse electromagnetic (TEM) waveguides*

CISPR 14-1:~~2016~~2020, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*

CISPR 16-1-1:2019, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus*

CISPR 16-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus*[1]
CISPR 16-1-1:2010/AMD1:2010
CISPR 16-1-1:2010/AMD2:2014

CISPR 16-1-2:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Coupling devices for conducted disturbance measurements*
CISPR 16-1-2:2014/AMD1:2017

CISPR 16-1-4:2019, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements*
CISPR 16-1-4:2019/AMD1:2020
CISPR 16-1-4:2019/AMD2:2023

CISPR 16-1-5:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-5: Radio disturbance and immunity measuring apparatus - Antenna calibration sites and reference test sites for 5 MHz to 18 GHz*
CISPR 16-1-5:2014/AMD1:2016

CISPR 16-1-6:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-6: Radio disturbance and immunity measuring apparatus - EMC antenna calibration*
CISPR 16-1-6:2014/AMD1:2017
CISPR 16-1-6:2014/AMD2:2022

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1 This version has been superseded.

CISPR 16-2-1:2014, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements*
CISPR 16-2-1:2014/AMD1:2017

CISPR 16-2-3:2016, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements*
CISPR 16-2-3:2016/AMD1:2019
CISPR 16-2-3:2016/AMD2:2023

CISPR 16-4-2:2011, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 4-2: Uncertainties, statistics and limit modelling - Measurement instrumentation uncertainty*
CISPR 16-4-2:2011/AMD1:2014
CISPR 16-4-2:2011/AMD2:2018

CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment - Emission requirements*
CISPR 32:2015/AMD1:2019

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

– IEC Electropedia: available at http://www.electropedia.org/
– ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
adjustable speed electric power drive function
power drive system function that provides adjustable speed AC or DC motor drives and can convert input voltages (line-to-line) to other voltages

3.1.2
antenna port
port, other than a broadcast receiver tuner port (3.1.4), for connection of an antenna used for intentional transmission ~~and/or~~, reception of radiated RF energy

3.1.3
associated equipment
AE
equipment needed to exercise, monitor or to exercise and~~/or~~ monitor the operation of the EUT

Note 1 to entry: The AE can be either local (within the measurement or test area) or remote.

3.1.4
broadcast receiver tuner port
port intended for the reception of a modulated RF signal carrying terrestrial, satellite ~~and/~~or cable transmissions of audio ~~and/or~~broadcast, video broadcast and similar services

Note 1 to entry: This port ~~may~~ can be connected to an antenna, a cable distribution system, a VCR or similar device.

3.1.5
DC distribution network
local supply network in the infrastructure of a site or building intended for use by one or more different types of equipment and providing power independent of the public mains network

Note 1 to entry: Connection to a remote local battery is not regarded as a DC distribution network, if such a link comprises only power supply for a single piece of equipment.

3.1.6
DC power port
port used to connect to a low-voltage DC power generating system, energy storage or DC distribution network to power the equipment

Note 1 to entry: See Annex B.

3.1.7
enclosure port
physical boundary of the equipment which electromagnetic fields ~~may~~ can radiate through or impinge on

3.1.8
highest internal frequency
F_x
highest fundamental frequency generated or used within the EUT, or the highest frequency at which it operates, whichever is the greater

Note 1 to entry: This includes fundamental frequencies which are solely used within an integrated circuit.

Note 2 to entry: This excludes the frequencies generated or used intentionally by a radio function (3.1.20).

3.1.9
low-voltage
~~**LV**~~
voltage having a value below a conventionally adopted limit

Note 1 to entry: For the distribution of AC electric power, the upper limit is generally accepted to be 1 000 V. For the distribution of DC electric power, the upper limit is generally accepted to be 1 500 V.

3.1.10
low-voltage AC mains port
port used to connect to the low-voltage (3.1.9) AC mains supply network to power the equipment

Note 1 to entry: Equipment with a DC power port is considered low-voltage AC mains powered if it is powered from an AC/DC power converter.

Note 2 to entry: The low-voltage AC mains supply could be public or non-public.

3.1.11
necessary bandwidth
for a given class of emission, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions

[SOURCE: ITU Radio Regulations (2020), 1.152]

3.1.12
optical fibre port
port at which an optical fibre is connected to an equipment

3.1.13
out-of-band emission
emission on a frequency or frequencies immediately outside the necessary bandwidth which results from the modulation process, but excluding spurious emissions

Note 1 to entry: In terms of this definition, “immediately outside” means “adjacent to”.

[SOURCE: ITU Radio Regulations (2020), 1.144, modified – Addition of Note 1 to entry.]

3.1.14
plasma screen
display that uses small cells containing plasma, an ionized gas that responds to electric fields to create light

3.1.15
port
physical interface of the specified equipment with the external electromagnetic environment

Note 1 to entry: See Figure 1.

Note 2 to entry: Examples of ‘Other wired port’ shown in Figure 1 are specified in Table 6.

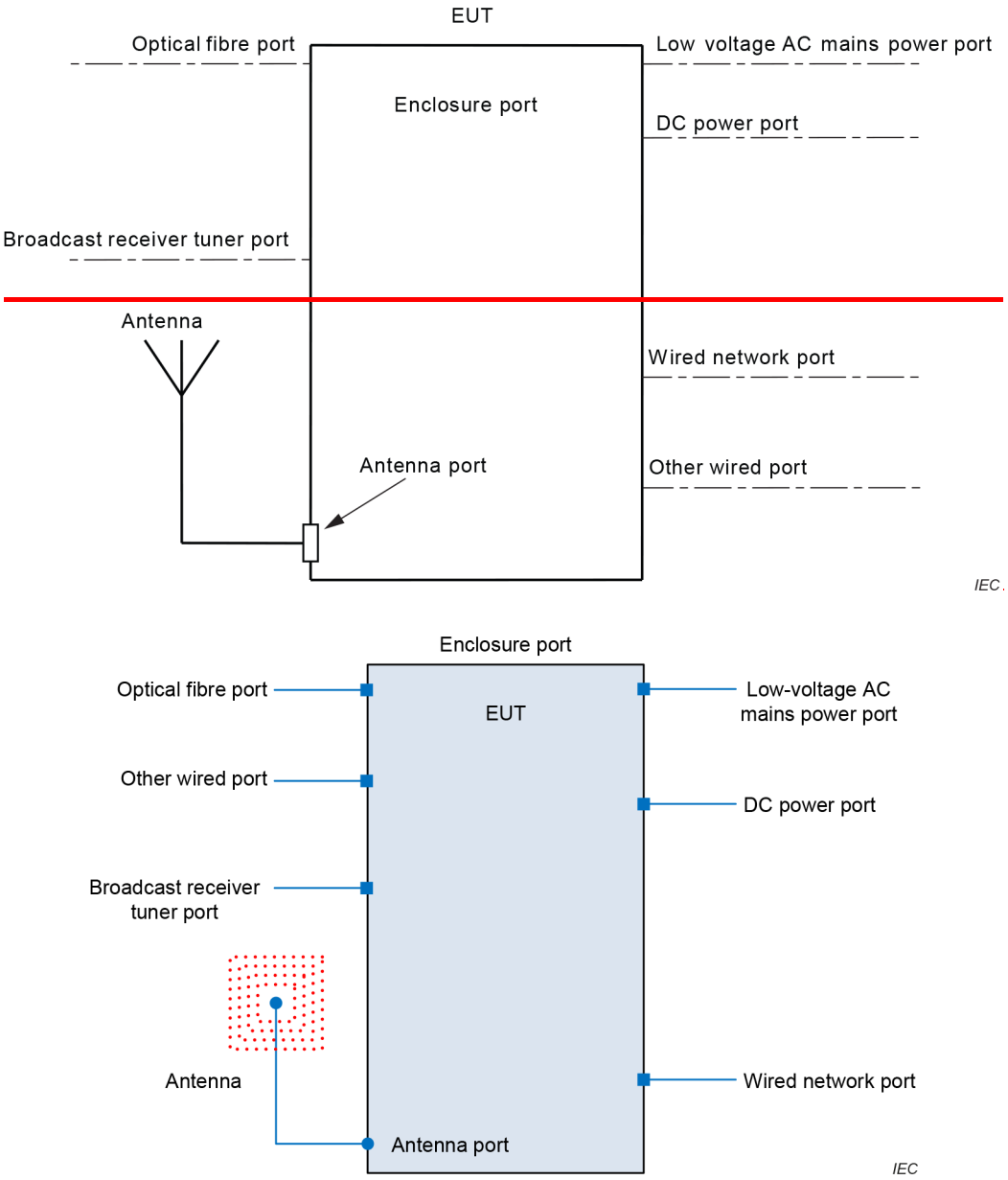


Figure 1 – Example of ports

3.1.16
power port
port for the connection of the equipment to its primary electrical power supply

3.1.17
primary function
any function of an EUT considered essential for the user or for the majority of users

Note 1 to entry: An EUT can have more than one primary function. For example, the primary functions of a basic television set include broadcast reception, audio reproduction and display.

3.1.18
primary WPT port
port through which power is transferred wirelessly to equipment with one or more secondary WPT ports

3.1.19
public mains network
electricity lines to which all categories of consumers have access and which are operated by a supply or distribution undertaking for the purpose of supplying electrical energy

3.1.20
radio function
function that includes radio reception or radio transmission or both

3.1.21
residential location
area of land designated for domestic dwellings where the mains power within these locations is directly connected to the low-voltage public mains network

Note 1 to entry: Examples of residential locations are: houses, apartments, farm buildings housing people.

Note 2 to entry: A dwelling can be a single building, separate building or a separate section of a larger building.

Note 3 to entry: Within these locations, it is expected to operate a radio receiver within a distance of 10 m from the equipment.

Note 4 to entry: Domestic dwellings are places for one or more people to live.

~~**3.1.15**~~
~~**small equipment**~~
~~equipment, either positioned on a table top or standing on the floor which, including its cables fits in a cylindrical test volume of 1,2 m in diameter and 1,5 m above the ground plane~~

~~Note 1 to entry: These dimensions are currently under discussion in CISPR.~~

3.1.22
secondary WPT port
port through which power is received from another equipment with a primary WPT port

Note 1 to entry: The secondary device can either store or directly use the received energy, or both.

3.1.23
spurious emission
emission on a frequency or frequencies which are outside the necessary bandwidth and the level of which can be reduced without affecting the corresponding transmission of information

Note 1 to entry: Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

[SOURCE: ITU Radio Regulations (2020), 1.145, modified – The second sentence was formatted as a note to entry.]

3.1.24
UPS function
Uninterruptible Power Systems function
power supply function, that provides power during unintentional AC mains power supply interruptions

3.1.25
wired network port
port for the connection of communication intended to interconnect widely dispersed systems by direct connection to a single-user or multi-user network

Note 1 to entry: Examples of communication through the network include voice, data and signalling transfers.

Note 2 to entry: Examples of these networks include CATV, PSTN, ISDN, xDSL, LAN and similar.

Note 3 to entry: These ports ~~may~~ can support screened or unscreened cables and ~~may~~ can also carry AC or DC power where this is an integral part of the telecommunication specification.

Note 4 to entry: A port generally intended for interconnection of components of a system under test (e.g. RS-232 (defined in ITU-T V.28), RS-485 (defined in ITU-T V.11), field buses in the scope of IEC 61158-1, IEEE Standard 1284 (parallel printer), Universal Serial Bus (USB), IEEE Standard 1394 (“Fire Wire”), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a wired network port.

Note 5 to entry: In previous editions of this document and many product standards, this port was defined as a telecommunications or network port.

3.1.26
wireless power transfer
WPT

transfer of electrical energy between equipment, not galvanically connected, through a primary WPT port (3.1.18) to a secondary WPT port (3.1.22)

Note 1 to entry: WPT can use a variety of coupling methods including inductive, capacitive, and electromagnetic coupling technologies. The method of energy transfer uses any combination of electric fields, magnetic fields or electromagnetic fields.

Note 2 to entry: Equipment with a primary WPT port (3.1.18) can be able to provide power to more than one equipment with a secondary WPT port (3.1.22).

Note 3 to entry: See Figure 2.

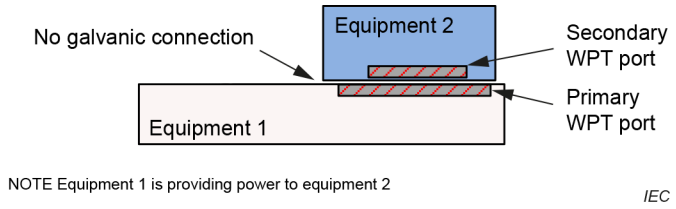


Figure 2 – Basic WPT configuration

3.2 Abbreviated terms

AAN	Asymmetric Artificial Network
AC	Alternating Current
ACEC	Advisory Committee on Electromagnetic Compatibility
AE	Associated Equipment
V-AMN	Artificial Mains V-Network
V-AN	Artificial V-Network
AP	Allowance Probability
AV	Average
BPSK	Binary Phase-Shift Keying
CATV	Cable TV network
CALTS	Calibration Test Site
CF	Coupling Factor
CF(E)	Electric field Coupling Factor
CF(H)	Magnetic field Coupling Factor
CM	Common Mode
CMAD	Common Mode Absorption Device (including those defined in CISPR 16-1-4)
DC	Direct Current
DC-AN	Direct Current-Artificial Network
DM	Differential Mode