IEC 61000-6-3

Edition 2.0 2010-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

AMENDMENT 1
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Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments

Compatibilité électromagnétique (CEM) – Partie 6-3: Normes génériques – Norme sur l'émission pour les environnements résidentiels, commerciaux et de l'industrie légère

CISPR 61000-6-3:2006/A1:2010

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ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments

INTERPRETATION SHEET

This interpretation sheet has been prepared by CISPR subcommittee H: Limits for the protection of radio services, of IEC technical committee CISPR: International special committee on radio interference.

The text of this interpretation sheet is based on the following documents:

FDIS	Report on voting
CISPR/H/217/FDIS	CISPR/H/222/RVD

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

Interpretation

The requirement in Clause 8 "Measurement uncertainty" of IEC 61000-6-3 Amend. 1 ed. 2.0:

> ***8 Measurement uncertainty***
>
> *The measurement instrumentation uncertainty shall be determined according to CISPR 16-4-2, where applicable.*
>
> NOTE For a given test method, the actual value of U_{lab} has only to be recorded in the test report if the value is greater than U_{CISPR}.

shall be interpreted as follows:

The measurement instrumentation uncertainty shall be calculated and compared with the budgets defined in CISPR 16-4-2. For each applicable test method, whose instrumentation uncertainty budgets are higher than those defined in CISPR 16-4-2, compliance with the limits has to be determined according to CISPR 16-4-2 methodology. This requirement is only applicable for tests where an uncertainty budget is defined in CISPR 16-4-2.

The additional note was further clarification that there is no need to state in the test report the laboratory uncertainty budget U_{lab} if this is less than or equal to the U_{CISPR} defined in CISPR 16-4-2. However, it has to be mentioned in the test report that the instrumentation measurement uncertainty is determined according to CISPR16-4-2.

FOREWORD

This amendment has been prepared by CISPR subcommittee H: Limits for the protection of radio services.

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

FDIS	Report on voting
CISPR/H/206/FDIS	CISPR/H/210/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the interpretation sheet 1 of July 2011 have been included in this copy.

Contents

Replace the title of Clause 3 by the following new title:

3 Terms, definitions and abbreviations

Replace the title of Clause 8 by the following new title:

8 Measurement uncertainty

Replace the title of Clause 9 by the following new title:

9 Application of limits in tests for conformity of equipment in series production

Add the following new Clauses 10 and 11:

10 Compliance with this standard

11 Emission test requirements

Replace the title of Table 1 by the following new title:

Table 1 – Emission – Enclosure port

Add the following new Tables:

Table 2 – Emission – Low voltage AC mains port

Table 3 – Emission – DC power port

2 Normative references

Add the following new references to the existing list:

IEC 60050-161, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

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

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*

CISPR 16-1-4:2007, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances*
Amendment 1:2007

Replace the existing references by the following new references:

IEC 61000-3-2:2005 *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*
Amendment 1:2008
Amendment 2:2009

IEC 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*

IEC 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*

IEC 61000-3-12:2004, *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*

CISPR 14-1:2005, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission*
Amendment 1:2008

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*
Amendment 1:2004
Amendment 2:2006

CISPR 16-2-1:2008, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements*

CISPR 16-2-3:2006, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*

CISPR 16-4-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements*

CISPR 22:2008, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*

3 Terms and definitions

Replace the title, first paragraph and Note of this clause by the following:

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-161, as well as the following apply.

Renumber the existing definitions 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 as 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.1.8 respectively.

Figure 1 – Examples of port

Replace the existing figure and title by the following new figure and title:

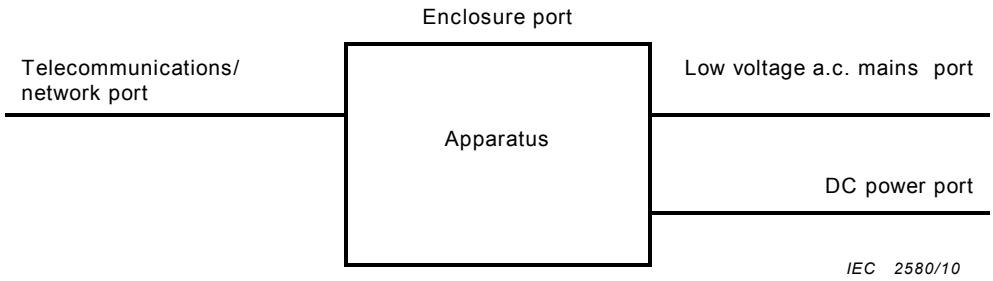

Figure 1 – Ports covered by Tables 1 to 4

Add, after definition 3.1.8, the following new definitions 3.1.9 and 3.1.10:

3.1.9
low voltage AC mains port
port used to connect to the low voltage AC mains supply network to power the equipment

NOTE Equipment with a DC power port is considered low voltage AC mains powered if it is powered from an AC/DC power converter.

3.1.10
highest internal frequency
highest fundamental frequency generated or used within the EUT, or the highest frequency at which it operates

After definition 3.1.10, add the following new subclause:

3.2 Abbreviations

AC	Alternating Current
DC	Direct Current
EUT	Equipment Under Test
FAR	Fully Anechoic Room
ISN	Impedance Stabilization Network
OATS	Open Area Test Site
SAC	Semi Anechoic Chamber
TEM	Transverse Electromagnetic Mode

4 Conditions during testing

At the end of Clause 4 add the following paragraph:

Where applicable, additional information on EUT configuration can be found in the CISPR 16-2 series and CISPR 22.

6 Applicability

Replace the second paragraph of this clause by the following new paragraph:

Measurements shall be applied to the relevant ports of the apparatus according to Tables 1 to 4. Measurements shall only be carried out where the relevant ports exist.

7 Emission requirements

Replace the first paragraph of this clause by the following new paragraph:

The emission requirements for apparatus covered by this standard are given on a port by port basis. The requirements are stated in Tables 1 to 4.

Replace the fourth paragraph of this clause by the following new paragraph:

The description of the measurement, the measurement instrumentation, the measurement methods and the measurement set-up to be used are given in the standards, which are referred to in Tables 1 to 4.

8 Application of limits in tests for conformity of equipment in series production

Replace the existing title and text of this clause by the following new title and text:

8 Measurement uncertainty

The measurement instrumentation uncertainty shall be determined according to CISPR 16-4-2, where applicable.

NOTE For a given test method, the actual value of U_{lab} has only to be recorded in the test report if the value is greater than U_{CISPR}.

9 Measurement uncertainty

Replace the existing title and text of this clause by the following new title and text:

9 Application of limits in tests for conformity of equipment in series production

9.1 Tests shall be made:

– either on a sample of equipment of the type using the statistical method of evaluation set out in 9.2,

– or, for simplicity's sake, on one equipment only.

9.2 Statistically assessed compliance with limits shall be made as follows.

This test shall be performed on a sample of not less than five and not more than 12 items of the type. If, in exceptional circumstances, five items are not available, a sample of four or three shall be used. Compliance is judged from the following relationship:

$$\bar{x} + kS_n \leq L$$

where

$\bar{x}$ is the arithmetic mean of the measured value of n items in the sample

$$S_n^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$$

x_n is the value of the individual item

L is the appropriate limit

k is the factor derived from tables of the non-central t-distribution which assures with 80 % confidence that 80 % of the type is below the limit; the value of k depends on the sample size n and is stated below.

The quantities x_n, $\bar{x}$, S_n and L are expressed logarithmically: dB(μV), dB(μV/m) or dB(pW).

n	3	4	5	6	7	8	9	10	11	12
k	2,04	1,69	1,52	1,42	1,35	1,30	1,27	1,24	1,21	1,20

Delete the existing Table 1, and add the following new Clause 10:

10 Compliance with this standard

Where this standard gives options for testing particular requirements with a choice of test methods, compliance can be shown against any of the test methods, using the specified limits with the restrictions provided in the relevant tables.

In any situation where it is necessary to retest the equipment the test method original chosen should be used in order to ensure consistency of the results.

Equipment which fulfills the requirements across the frequency ranges specified in Clause 11 Tables 1 to 4 in this standard is deemed to fulfill the requirements in the entire frequency range from 9 kHz to 400 GHz.

Measurements do not need to be performed at frequencies where no limits are specified.

Add the following new Clause 11:

11 Emission test requirements

Table 1 – Emission – Enclosure port

Table clause	Port	Frequency range	Limits	Basic standard	Applicability note	Remarks
1.1	Enclosure Test facility: OATS or SAC	30 MHz to 230 MHz 230 MHz to 1 000 MHz	30 dB(μV/m) quasi-peak at 10 m 37 dB(μV/m) quasi-peak at 10 m	The measurement instrumentation shall be as defined in 4 of CISPR 16-1-1. The measuring antennas shall be as defined in 4.4 of CISPR 16-1-4. The measuring site shall be as described in Clause 5 of CISPR 16-1-4. The measurement method shall be as specified in 7.2 of CISPR 16-2-3.	See [a, b and e]	May be measured at 3 m distance using the limits increased by 10 dB. As stated in CISPR 16-2-3 the antenna height shall be varied between 1 m to 4 m. Additional guidance on the test method can be found in CISPR 16-2-3 clause 7.3 and clause 8.
1.2	Enclosure Test facility: FAR	30 MHz to 230 MHz	42 to 35 dB(μV/m) quasi-peak at 3 m Limit reducing linearly with the logarithm of the frequency.	The measurement instrumentation shall be as defined in 4 of CISPR 16-1-1. The measuring antennas shall be as defined in 4.4 of CISPR 16-1-4. The measuring site shall be as described in Clause 5.8 of CISPR 16-1-4. The measurement method shall be as specified in 7.2.9.2 of CISPR 16-2-3.	See [a, b and e] Only applicable to table top equipment.	May be measured at greater distances with the limits decreased by 20 dB/decade (relative to distance). The limitations on EUT size in CISPR 16-1-4 apply.
		230 MHz to 1 000 MHz	42 dB(μV/m) quasi-peak at 3 m			
1.3	Enclosure Test facility: TEM Waveguide	30 MHz to 230 MHz 230 MHz to 1 000 MHz	30 dB(μV/m) quasi-peak 37 dB(μV/m) quasi-peak The small-EUT correction factor given in A.4.3 of IEC 61000-4-20 shall be used. The limit relates to the OATS measurement distance of 10m	IEC 61000-4-20	Only applicable to battery powered equipment not intended to have external cables attached. Restricted to equipment complying with the definition 6.2 in IEC 61000-4-20. See [a, b and e]	

Table clause	Port	Frequency range	Limits	Basic standard	Applicability note	Remarks
1.4	Enclosure Test facility: OATS, SAC or FAR	1 GHz to 3 GHz	70 dB(μV/m) peak at 3 m 50 dB(μV/m) average at 3 m	The measurement instrumentation shall be as defined in 5 and 6 of CISPR 16-1-1. The measuring antennas shall be as defined in 4.5 of CISPR 16-1-4. The measuring site shall be as described in Clause 8 of CISPR 16-1-4. The measurement method shall be as specified in 7.3 of CISPR 16-2-3.	See [a, c, d and e]	May be measured at greater distances with the limits decreased by 20 dB/decade (relative to distance). For SAC and OATS facilities absorber may be required to achieve free space conditions as defined in CISPR 16-1-4.
		3 GHz to 6 GHz	74 dB(μV/m) peak at 3 m 54 dB(μV/m) average at 3 m			

[a] For apparatus containing devices operating at frequencies less than 9 kHz measurements only need to be performed up to 230 MHz.

[b] The apparatus is deemed to comply with the enclosure port requirement below 1 GHz if it meets the requirements defined in one or more of the table clauses 1.1, 1.2 or 1.3.

[c] If the highest internal frequency of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.
If the highest internal frequency of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.
If the highest internal frequency of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.
If the highest internal frequency of the EUT is above 1 GHz, the measurement shall be made up to 6 GHz.

Where the highest internal frequency is not known, tests shall be performed up to 6 GHz.

[d] The peak detector limits shall not be applied to disturbances produced by arcs or sparks that are high voltage breakdown events. Such disturbances arise when devices contain or control mechanical switches that control current in inductors, or when devices contain or control subsystems that create static electricity (such as paper handling devices). The average limits apply to disturbances from arcs or sparks, and both peak and average limits apply to other disturbances from such devices.

[e] At transitional frequencies the lower limit applies.