

SLOVENSKI STANDARD
SIST EN 61000-4-3:2003/A1:2003
01-december-2003

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Electromagnetic compatibility (EMC) -- Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test

Elektromagnetische Verträglichkeit (EMV) -- Teil 4-3: Prüf- und Messverfahren - Prüfung der Störfestigkeit gegen hochfrequente elektromagnetische Felder
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Compatibilité électromagnétique (CEM) -- Partie 4-3: Techniques d'essai et de mesure - Essai d'immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques
92d15abe0bad/sist-en-61000-4-3-2003-a1-2003

Ta slovenski standard je istoveten z: EN 61000-4-3:2002/A1:2002

ICS:

33.100.20 Imunost Immunity

SIST EN 61000-4-3:2003/A1:2003 en

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EUROPEAN STANDARD

EN 61000-4-3/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2002

ICS 33.100.20

English version

Electromagnetic compatibility (EMC)
Part 4-3: Testing and measurement techniques -
Radiated, radio-frequency, electromagnetic field immunity test
(IEC 61000-4-3:2002/A1:2002)

Compatibilité électromagnétique (CEM)
Partie 4-3: Techniques d'essai
et de mesure -
Essai d'immunité aux champs
électromagnétiques rayonnés
aux fréquences radioélectriques
(CEI 61000-4-3:2002/A1:2002)

Elektromagnetische Verträglichkeit (EMV)
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hochfrequente elektromagnetische Felder
(IEC 61000-4-3:2002/A1:2002)

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This amendment A1 modifies the European Standard EN 61000-4-3:2002; it was approved by CENELEC on 2002-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 77B/352/FDIS, future amendment 1 to IEC 61000-4-3:2002, prepared by SC 77B, High frequency phenomena, of IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61000-4-3:2002 on 2002-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2003-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2005-10-01

Annexes designated "informative" are given for information only. In this standard, annex K is informative.

Endorsement notice

The text of amendment 1:2002 to the International Standard IEC 61000-4-3:2002 was approved by CENELEC as an amendment to the European Standard without any modification.

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

61000-4-3

2002

AMENDEMENT 1
AMENDMENT 1
2002-08

Amendement 1

Compatibilité électromagnétique (CEM) –

Partie 4-3:

Techniques d'essai et de mesure –

**Essai d'immunité aux champs électromagnétiques
rayonnés aux fréquences radioélectriques**

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Amendment 1

Electromagnetic compatibility (EMC) –

Part 4-3:

Testing and measurement techniques –

**Radiated, radio-frequency, electromagnetic field
immunity test**

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Международная Электротехническая Комиссия

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FOREWORD

This amendment has been prepared by subcommittee 77B: High frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

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

FDIS	Report on voting
77B/352/FDIS	77B/359/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 the base publication and its amendments will remain unchanged until 2005. At this date, the publication will be

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

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Add the title of the following new annex K:

Annex K (informative) Amplifier non-linearity and example for the calibration procedure according to 6.2

Add the title of the following new figure 7:

Figure 7 – Measuring set-up

Page 7

FOREWORD

Replace the paragraph dealing with the informative annexes as follows:

Annexes A to I as well as annex K are for information only.

6.2 Calibration of field

Replace, on page 29, the sixteenth and seventeenth paragraphs, including items a) to h) regarding the calibration method: "The procedure for carrying out the calibration, based on constant power, is as follows: The principles outlined in a), d), e), f) and h) shall be respected.", with the following text:

Generally the calibration of the field in anechoic and semi-anechoic chambers has to be performed using the test set up shown in figure 7. The calibration shall always be performed with an unmodulated carrier for both horizontal and vertical polarisations in accordance with the steps given below. Calibration shall be carried out with a field strength at least 1,8 times as high as the field strength to be applied to the EUT to ensure that the amplifiers can handle the modulated signal and are not saturated. Denote this calibration field strength by E_c . E_c is the value which is applicable only to field calibration. The test field strength E_t shall not exceed $E_c/1,8$.

NOTE 1 Other methods to ensure avoiding saturation may be used.

Two different calibration methods are described below. These methods are considered to give the same field uniformity if they are applied in the right way.

NOTE 2 The field calibration requirements are fulfilled if a maximum of 3 % of the frequencies does not meet the 6 dB criterion but are at least within the tolerance of -0 dB to +10 dB.

6.2.1 Constant field strength calibration method

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The constant field strength of the uniform field shall be established and measured via a calibrated field sensor at each particular frequency and at each of the 16 points one after the other (see figure 4) using the step size given in clause 8, by adjusting the forward power accordingly.

The forward power necessary to establish the field strength chosen shall be measured in accordance with figure 7 and is to be recorded in dBm for the 16 points.

Procedure to be followed

- Position the sensor at one of the 16 points in the grid (see figure 4), and set the frequency of the signal generator output to the lowest frequency in the range of the test (for example 80 MHz).
- Adjust the forward power to the field-generating antenna so that the field strength obtained is equal to the required test field strength E_c . Record the forward power reading.
- Increase the frequency by a maximum of 1 % of the present frequency.
- Repeat steps b) and c) until the next frequency in the sequence would exceed the highest frequency in the range of the test. Finally, repeat step b) at this highest frequency (for example 1 GHz).
- Repeat steps a) to d) for each point in the grid.

At each frequency:

- f) Sort the 16 forward power readings into ascending order.
- g) Start at the highest value and check if at least the 11 readings below this value are within the tolerance of -6 dB to $+0$ dB of that value.
- h) If they are not within this tolerance of -6 dB to $+0$ dB, go back to the same procedure, starting by the reading immediately below and so on (notice that there are only five possibilities for each frequency).
- i) Stop the procedure if at least 12 numbers are within 6 dB and note the maximum forward power out of the numbers.

NOTE 1 If at a specific frequency, the ratio between E_c and E_t is R (dB), where $R = 20 \log(E_c/E_t)$, then the test power $P_t = P_c - R$ (dB). The subscripts c and t refer to calibration and test respectively. The field is modulated in accordance with clause 8.

A description of an example for the calibration is given in K.4.1.

NOTE 2 At each frequency it has to be ensured that the amplifier used is not saturated. This can best be done by checking the 1 dB compression of the system. The amplifier saturation can be checked by using spot frequencies, and with frequency steps recommended as follows:

- 20 MHz from 80 MHz to 200 MHz;
- 50 MHz from 250 MHz to 1 000 MHz;
- 100 MHz from 1 400 MHz to 2 000 MHz.

6.2.2 Constant power calibration method

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The field strength of the uniform field shall be established and measured via a calibrated field sensor at each particular frequency and at each of the 16 points one after the other (see figure 4) using the step size given in clause 8, by adjusting the forward power accordingly.

The forward power necessary to establish the field strength at the starting position shall be measured in accordance with figure 7 and noted. The same forward power shall be applied for all 16 positions. The field strength created by this forward power is to be recorded at each of the 16 points.

Procedure to be followed

- a) Position the sensor at one of the 16 points in the grid (see figure 4), and set the frequency of the signal generator output to the lowest frequency in the range of the test (for example 80 MHz).
- b) Apply a forward power to the field-generating antenna so that the field strength obtained equals E_c (taking into account that the test field will be modulated). Record the forward power and field strength readings.
- c) Increase the frequency by a maximum of 1% of the present frequency.
- d) Repeat steps b) and c) until the next frequency in the sequence would exceed the highest frequency in the range of the test. Finally, repeat step b) at this highest frequency (for example 1 GHz).
- e) Move the sensor to another position in the grid. At each of the frequencies used in steps a) to d), apply the forward power recorded in step b) for that frequency, and record the field strength reading.
- f) Repeat step e) for each point in the grid.

At each frequency:

- g) Sort the 16 field strength readings into ascending order.
- h) Select one field strength as the reference and calculate the deviation from this reference for all other positions in decibels.
- i) Start at the lowest value of the field strength and check if at least 11 readings above this value are within the tolerance of -0 dB to $+6$ dB of that lowest value.
- j) If they are not within the tolerance of -0 dB to $+6$ dB, go back to the same procedure, starting by the reading immediately above and so on (notice that there are only five possibilities for each frequency).
- k) Stop the procedure if at least 12 numbers are within 6 dB and take from these numbers the position where the minimum field strength was obtained as the reference.
- l) Calculate the forward power necessary to create the required field strength in the reference position.

NOTE 1 If at a specific frequency, the ratio between E_c and E_t is R (dB), where $R = 20 \log(E_c/E_t)$, then the test power $P_t = P_c - R$ (dB). The subscripts c and t refer to calibration and test respectively. The field is modulated in accordance with clause 8.

A description of an example for the calibration is given in K.4.2.

NOTE 2 At each frequency it has to be ensured that the amplifier used is not saturated. This can best be done by checking the 1 dB compression of the system. The amplifier saturation can be checked by using spot frequencies, and with frequency steps recommended as follows:

- 20 MHz from 80 MHz to 200 MHz;
- 50 MHz from 250 MHz to 1 000 MHz;
- 100 MHz from 1 400 MHz to 2 000 MHz.

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8 Test procedures

Delete, in the sixth paragraph, the second sentence.

Replace the first sentence of the seventh paragraph by the following new text:

The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0,5 s.

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Add, after figure 6, the following new figure 7: