SLOVENSKI STANDARD

SIST EN 61967-4:2005/A1:2006

julij 2006

Integrirana vezja – Meritve elektromagnetnega sevanja od 150 kHz do 1 GHz – 4. del: Meritve prevajanega sevanja – Metoda neposrednega sklopa 1 ohm/150 ohmov (IEC 61967-4:2002)

Integrated circuits – Measurement of electromagnetic emissions, 150 kHz to 1 GHz – Part 4: Measurement of conducted emissions – 1 ohm/150 ohm direct coupling method (IEC 61967-4:2002/A1:2006)

ICS 31.200

Referenčna številka
SIST EN 61967-4:2005/A1:2006(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61967-4/A1

February 2006

ICS 31.200

English version

Integrated circuits - Measurement of electromagnetic emissions, 150 kHz to 1 GHz Part 4: Measurement of conducted emissions - 1 ohm/150 ohm direct coupling method

(IEC 61967-4:2002/A1:2006)

Circuits intégrés -
Mesure des émissions électromagnétiques, 150 kHz à 1 GHz
Partie 4: Mesure des émissions conduites - Méthode par couplage direct 1 ohm/150 ohm
(CEI 61967-4:2002/A1:2006)

Integrierte Schaltungen -
Messung von elektromagnetischen Aussendungen im Frequenzbereich von 150 kHz bis 1 GHz
Teil 4: Messung der leitungsgeführten Aussendungen - Messung mit direkter 1 Ohm/150 Ohm-Kopplung
(IEC 61967-4:2002/A1:2006)

This amendment A1 modifies the European Standard EN 61967-4:2002; it was approved by CENELEC on 2006-02-01. 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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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

Ref. No. EN 61967-4:2002/A1:2006 E

Foreword

The text of document 47A/735/FDIS, future amendment 1 to IEC 61967-4:2002, prepared by SC 47A, Integrated circuits, of IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61967-4:2002 on 2006-02-01.

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)	2006-11-01
– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	2009-02-01

This European Standard makes reference to International Standards. Where the International Standard referred to has been endorsed as a European Standard or a home-grown European Standard exists, this European Standard shall be applied instead. Pertinent information can be found on the CENELEC web site.

Endorsement notice

The text of amendment 1:2006 to the International Standard IEC 61967-4:2002 was approved by CENELEC as an amendment to the European Standard without any modification.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
61967-4

2002

AMENDEMENT 1
AMENDMENT 1
2006-02

Amendement 1

Circuits intégrés – Mesure des émissions électromagnétiques, 150 kHz à 1 GHz –

Partie 4: Mesure des émissions conduites – Méthode par couplage direct 1 Ω/150 Ω

Amendment 1

Integrated circuits – Measurement of electromagnetic emissions, 150 kHz to 1 GHz –

Part 4: Measurement of conducted emissions – 1 Ω/150 Ω direct coupling method

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE G

Pour prix, voir catalogue en vigueur
For price, see current catalogue

FOREWORD

This amendment has been prepared by subcommittee 47A: Integrated circuits, of IEC technical committee 47:Semiconductor devices.

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

FDIS	Report on voting
47A/735/FDIS	47A/743/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 maintenance result 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.

Page 3

CONTENTS

Add the following new annex title:

Page 5

Add the following new figure titles:

Page 11

2 Normative references

Replace the reference to CISPR 16-1 by the following:

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

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

CISPR 16-1-3, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-3: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Disturbance power*

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

CISPR 16-1-5, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-5: Radio disturbance and immunity measuring apparatus – Antenna calibration test sites for 30 MHz to 1 000 MHz*

Page 57

Add, after Annex E, the following new Annex F:

Annex F
(informative)

150 Ω direct coupling networks for common mode emission measurements of differential mode data transfer ICs and similar circuits

F.1 Basic direct coupling network

In Figure F.1 the basic circuit of a coupling network is shown. The resistors R4, R5 and R6 represent termination resistors which may be needed to operate the DUT properly. They also may be incorporated in the coupling network in whole or in part if appropriate. Examples are shown later (see Clauses F.2, F.3 and F.4).

NOTE Other types of coupling networks, e.g. z-transformers and suitable couplers as defined in the CISPR 16-1 series, may be used too.

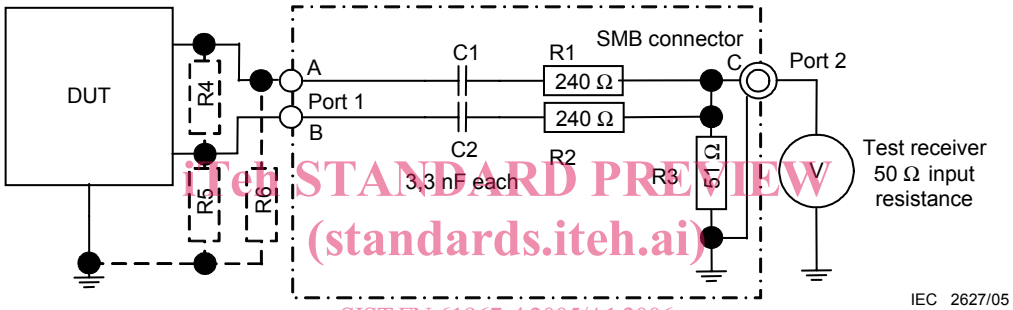

Figure F.1 – Basic direct coupling for common mode EMC measurements

The connections A and B have to be connected to the DUT during the emission or immunity measurement. For the emission measurement a test receiver is connected to connection C.

By default the resistor values R1, R2 will be chosen to represent a common-mode 150 Ω load together with R3 in parallel connection with the test receiver input impedance. The common-mode impedance tolerances from IEC 61000-4-6 shall apply.

R1 and R2 shall closely match. By default the matching tolerance shall be better than 10^{-3}. The value of C1 and C2 is about half of the value of the capacitor value used for a single pin measurement set-up. C1 and C2 shall also closely match. Because the impedance of C1 and C2 shall be small compared respectively to R1and R2, the matching tolerance may be not so tight as with the resistors. By default for C1 and C2 a matching tolerance of better than 10^{-2} is sufficient.

The absolute value of R1 and R2 may be changed if needed for proper function of the IC or other needs. In that case the new values have to be presented in the test report and test specification together with the S21 measurement and S21 calculation.

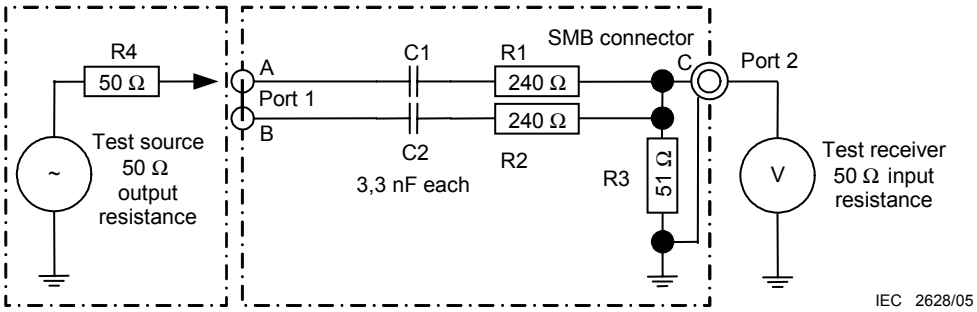

Figure F.2 – Measurement set-up for the S21 measurement of the common-mode coupling

For the measurement of the S21 of the coupling network with respect to emission the IC is replaced by a test source and connection A and B are connected together to form port 1 (see Figure F.2). Due to the simple coupling network the magnitude of S21 can be estimated by the following equation:

$$|S21| = 20 \times \log\left(\frac{2 \times (R3 \,//\, 50)}{R1 // R2 + R3 \,//\, 50 + R4}\right) \text{ (dB)}$$

C1 and C2 are used for DC-blocking. They cause a deviation from the calculated value of S21 towards low frequencies. The corner (–3 dB) frequency can be estimated with the following equation:

$$f_{c\_s21} = \frac{1}{(4 \times \pi \times C1 \times (0{,}5 \times R1) + R3 \,//\, 50) + R4}$$

Taking the values in Figure F.3 as an example, the calculation results in

|S21| = –11,8 dB

f_{c_s21} = 123,5 kHz

F.2 Example of a common-mode coupling network alternative for high speed CAN or LVDS or RS485 or similar systems

In Figure F.3 the RF-coupling network is changed to get an appropriate termination for the high speed CAN-bus (60 Ω). This termination can also be used for the measurement of other communication ICs that operate with such low differential termination impedance.

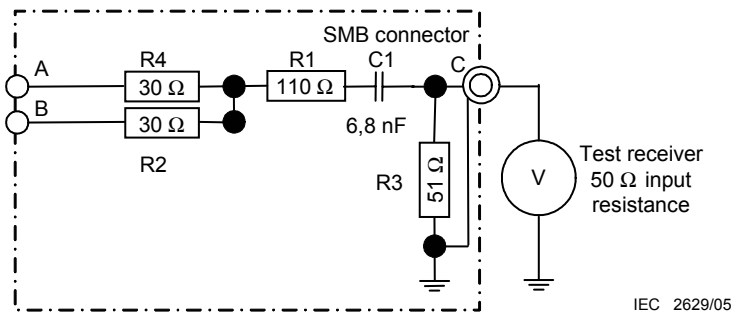

Figure F.3 – Using split load termination as coupling for measuring equipment

NOTE R1, R2 and R4 as a star-network can be substituted by a delta-network instead, which would allow the line-loading resistance to be applied outside this network.