SLOVENSKI STANDARD
SIST EN 62333-2:2006/A1:2016

01-marec-2016

Protišumni list za digitalne naprave in opremo - 2. del: Merilne metode

Noise suppression sheet for digital devices and equipment - Part 2: Measuring method

Rauschunterdrückungsschicht für digitale Geräte und Einrichtungen - Teil 2: Messverfahren

Plaque réduisant le bruit des dispositifs et appareils numériques - Partie 2: Méthode de mesure

Ta slovenski standard je istoveten z: EN 62333-2:2006/A1:2015

ICS:

33.160.01	Avdio, video in avdiovizualni sistemi na splošno	Audio, video and audiovisual systems in general

SIST EN 62333-2:2006/A1:2016 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62333-2:2006/A1

December 2015

ICS 29.100.10

English Version

Noise suppression sheet for digital devices and equipment – Part 2: Measuring method (IEC 62333-2:2006/A1:2015)

Plaque réduisant le bruit des dispositifs et appareils numériques - Partie 2: Méthodes de mesure (IEC 62333-2:2006/A1:2015)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 62333-2:2006/A1:2015 E

European foreword

The text of document 51/1068/CDV, future IEC 62333-2:2006/A1, prepared by IEC/TC 51 "Magnetic components and ferrite materials" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62333-2:2006/A1:2015.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-06-09
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-09-09

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IEC 62333-2

Edition 1.0 2015-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Noise suppression sheet for digital devices and equipment – Part 2: Measuring methods

Plaque réduisant le bruit des dispositifs et appareils numériques – Partie 2: Méthodes de mesure

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.100.10

ISBN 978-2-8322-2802-9

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FOREWORD

This amendment has been prepared by IEC technical committee 51: Magnetic components and ferrite materials.

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

CDV	Report on voting
51/1068/CDV	51/1088/RVC

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 website 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.

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4 Measuring methods

Add, after 4.4, the following new subclause, new tables and new figures:

4.5 Line-decoupling ratio: R_{dl}

4.5.1 General

This standard has provided for the measuring method of

① the intra-decoupling ratio (R_{da}),

② the inter-decoupling ratio (R_{de}),

③ the transmission attenuation power ratio (R_{tp}) and

④ the radiation suppression ratio (R_{rs}) in 4.1 to 4.4.

Subclause 4.5 provides

⑤ the line-decoupling ratio (R_{dl}).

The diagrammatic illustration of each noise suppression effect is shown in the following Table 9 and Figure 17.

Table 9 – Noise suppression effect classified as noise path and NSS position

Victim / Agressor	Near field coupling			Conduction	Radiation
	Part (component)		Line	Line plane	Far field
	Same side	Opposite side	Line in vicinity		
Part (component)	① Intra-decoupling	② Inter-decoupling	⑤ Line decoupling	③ Transmission attenuation	④ Radiation suppression
Line	⑥	⑤ Line decoupling	⑦		

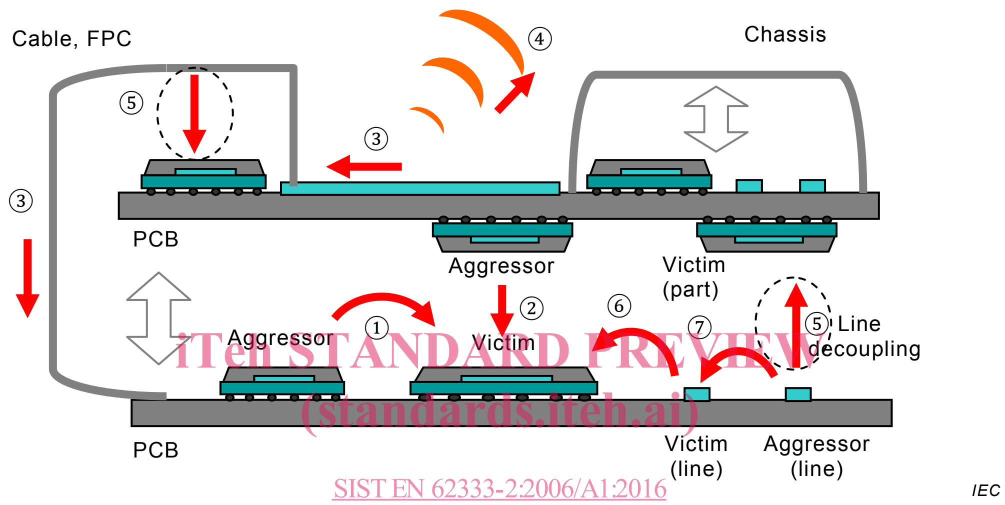


Figure 17 – Noise path

4.5.2 Principle

The following method is applied to evaluate the reduction of coupling between a line and (a) part(s) on both sides of the NSS, from 100 MHz to 6 GHz.

A test fixture for this evaluation is constructed with a micro-strip line (MSL) and a magnetic loop antenna as shown in Figure 18. The test fixture is aimed to simulate an electromagnetic interference observed frequently in electronic equipments. The MSL and the antenna correspond to a noise source, the aggressor, and a receiver, the victim, respectively.

The antenna and the NSS are set up at the centre of the MSL as shown in Figure 19. Two coupling factors of the loop antenna to the MSL with the NSS and without the NSS are measured in dB. The line-decoupling ratio R_{dl} is given in terms of dB as the difference of the two factors.

Permeability of the NSS modifies the magnetic field in its vicinity which can be applied to reduce noise coupling between the MSL and the antenna. At the high frequency range where the imaginary part of the permeability is dominant, the noise can be effectively absorbed due to the magnetic loss of the NSS.

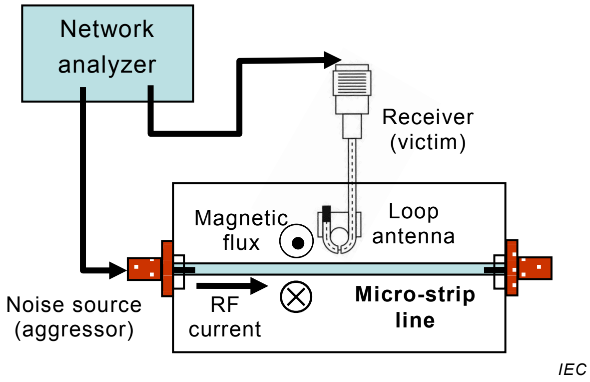
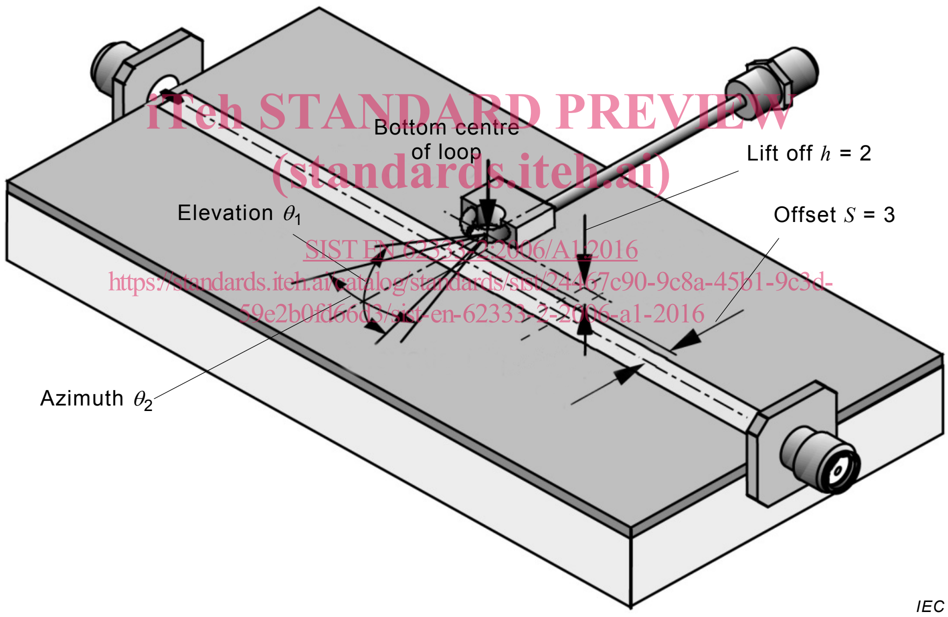


Figure 18 – A test fixture for line decoupling measurement

4.5.3 Apparatus

Figure 19 shows the schematic diagram of the measurement set-up for the line-decoupling ratio.



Key

h is the lift off between the lower edge of the loop antenna and the surface of the MSL substrate,

θ_1 is the elevation angle of the loop antenna surface from the horizontal plane,

θ_2 is the azimuth angle of the loop antenna and transverse direction of the MSL,

S is the centre offset of the loop antenna and the MSL.

Figure 19 – Schematic diagram of MSL and loop antenna set-up

4.5.3.1 Loop antenna

A small loop antenna defined in 4.1.2.1 shall be used.

4.5.3.2 Micro-strip line

The dimensions of the micro-strip line are shown in Table 10. One end of the MSL shall be connected to the network analyzer via an SMA type connector, and the other end of the MSL shall be connected to termination load of 50 Ω via an SMA type connector. The VSWR of the MSL terminated with the other end shall be smaller than 1,2.

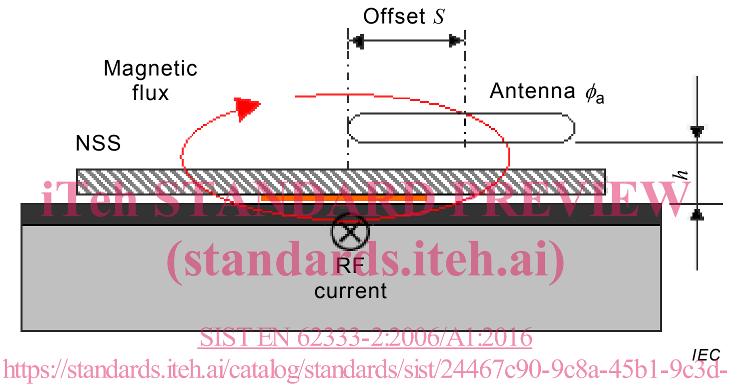
Table 10 – Dimensions of the MSL

	Length mm	**Width** mm	**Thickness** mm	**Material**
Substrate	100 ± 0,8	50 ± 0,8	1,6	PTFE/Glass[b]
Strip conductor	100 ± 0,15	4,4 ± 0,05	0,018[a]	Cu

[a] Typically, but in any case < 21 µm.

[b] ε_r = 2,2 to 2,6.

The antenna MSL and NSS configuration are shown in Figure 20. The dimensions of the loop antenna are specified as shown in Table 11.



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ϕ_a is the average diameter of the loop antenna.

Figure 20 – NSS, loop antenna and magnetic flux configuration

Table 11 – Dimensions of loop antenna

Lift off *h* mm	Diameter ϕ_a mm	Angle θ_1 radian	Angle θ_2 radian	Offset *S* mm
2,0 ± 0,2	3,0 ± 0,2	≤ π/18[a]	≤ π/2[b]	3,0±0,2

[a] ≤ 10°

[b] ≤ 90°

The frequency response required between the loop antenna and the MSL shall be in accordance with 4.1.2.1, however, the antenna and the MSL are within a fixed position as shown in Figure 18.

4.5.3.3 Network analyzer

A vector network analyzer shall be operated in accordance with 4.1.2.2.

4.5.4 Test sample

4.5.4.1 Dimension

The dimensions of the test sample for measuring R_{dl} are shown in Table 12.