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I.S. EN 55017:2011

Methods of measurement of the suppression characteristics of passive EMC filtering devices (CISPR 17:2011 (EQV))

I.S. EN 55017:2011

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English version

**Methods of measurement of the suppression characteristics of passive
EMC filtering devices
(CISPR 17:2011)**

Méthodes de mesure des caractéristiques
d'antiparasitage des dispositifs de filtrage
CEM passifs
(CISPR 17:2011)

Verfahren zur Messung der
Entstöreeigenschaften von passiven EMV-
Filtern
(CISPR 17:2011)

This European Standard was approved by CENELEC on 2011-07-15. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

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Foreword

The text of document CISPR/A/941/FDIS, future edition 2 of CISPR 17, prepared by CISPR SC A, "Radio-interference measurements and statistical methods", was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 55017 on 2011-07-15.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2012-04-15
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2014-07-15

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard CISPR 17:2011 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

CISPR 12:2007 NOTE Harmonized as EN 55012:2007 (not modified).

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-161	-	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**METHODS OF MEASUREMENT OF THE SUPPRESSION
CHARACTERISTICS OF PASSIVE EMC FILTERING DEVICES**

FOREWORD

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International Standard CISPR 17 has been prepared by CISPR subcommittee A: Radio interference measurements and statistical methods.

This second edition cancels and replaces the first edition published in 1981. It is a technical revision.

This edition includes the following significant technical change with respect to the previous edition: new measurement methods are added to characterize the more technologically sophisticated EMC filtering devices currently available.

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

FDIS	Report on voting
CISPR/A/941/FDIS	CISPR/A/951/RVD

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

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This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this 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

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

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INTRODUCTION

The suppression characteristics of EMC filters and components used for the suppression of EM disturbances, referred to in this standard as EMC filtering devices, are a function of numerous variables such as impedance of the circuits to which they connect, operating voltage and current, and ambient temperature. This standard specifies uniform test methods that will enable comparison of filtering and suppression characteristics determined by test laboratories or specified by manufacturers.

The first edition of CISPR 17 (1981) prescribed the measurement methods of insertion loss mainly for power-line filters. Today, however, many types of sophisticated EMC filters and suppression components can be found in various electronic devices. Those filters need to be characterized using standardized measurement methods. New methods for measurement of impedance and *S*-parameters for such EMI devices are included in this second edition.

In addition, the following insertion loss measurement methods from the first edition have been deleted because they are no longer in use in the industry:

- measurement method with a bias voltage for insertion loss measurement,
- in situ method, and
- worst-case methods.

METHODS OF MEASUREMENT OF THE SUPPRESSION CHARACTERISTICS OF PASSIVE EMC FILTERING DEVICES

1 Scope

This International standard specifies methods to measure the radio interference suppression characteristics of passive EMC filtering devices used in power and signal lines, and in other circuits.

The defined methods may also be applied to combinations of over-voltage protection devices and EMC filtering devices.

The measurement method covers the frequency range from 9 kHz to several GHz depending on the device and test circuit.

NOTE Measurement methods in this standard may be applied up to 40 GHz.

The standard describes procedures for laboratory tests (type tests) as well as factory tests. Test methods with and without bias conditions are defined.

Measurement procedures are provided for unbiased and bias conditions. Measurements under bias conditions are performed to determine potential non-linear behaviour of the EMC filtering devices such as saturation effects in inductors with magnetic cores. This testing serves to show the usability in a specific application (such as frequency converters that produce high amplitudes of common mode pulse current and thus may drive inductors into saturation). Measurement under bias conditions may be omitted if the non-linear behaviour can be determined by other methods (e.g. separate saturation measurement of the inductors used).

2 Normative references

The following referenced documents are indispensable for the application 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 60050-161, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1

bias current

d.c. or a.c. mains (power) frequency current flowing through the current conductor(s) of the EMC filtering device under test

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