

Passive filter units for electromagnetic interference suppression Part 1: Generic specification

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60939-1:2005 sisaldab Euroopa standardi EN 60939-1:2005 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 13.06.2005 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 08.04.2005.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 60939-1:2005 consists of the English text of the European standard EN 60939-1:2005.

This standard is ratified with the order of Estonian Centre for Standardisation dated 13.06.2005 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 08.04.2005.

The standard is available from Estonian standardisation organisation.

ICS 31.160

Võtmesõnad: capacitors, electronic components, quality

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

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Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
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English version

Passive filter units for electromagnetic interference suppression
Part 1: Generic specification
(IEC 60939-1:2005)

Filtres passifs d'antiparasitage
Partie 1: Spécification générique
(CEI 60939-1:2005)

Passive Filter für die Unterdrückung
von elektromagnetischen Störungen
Teil 1: Fachgrundspezifikation
(IEC 60939-1:2005)

This European Standard was approved by CENELEC on 2005-03-01. 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.

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 European Standard 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.

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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 40/1509/FDIS, future edition 2 of IEC 60939-1, prepared by IEC TC 40, Capacitors and resistors for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60939-1 on 2005-03-01.

This European Standard supersedes EN 133000:1997.

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) | 2005-12-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2008-03-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60939-1:2005 was approved by CENELEC as a European Standard without any modification.

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 Where 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 60027	Series	Letter symbols to be used in electrical technology	HD 60027 HD 245 S1	Series 1997
IEC 60050	Series	International Electrotechnical Vocabulary	-	-
IEC 60062	- ¹⁾	Marking codes for resistors and capacitors	EN 60062	2005 ²⁾
IEC 60068-1	- ¹⁾	Environmental testing Part 1: General and guidance	EN 60068-1	1994 ²⁾
IEC 60068-2-1	- ¹⁾	Part 2: Tests - Tests A: Cold	EN 60068-2-1	1993 ²⁾
IEC 60068-2-2	- ¹⁾	Part 2: Tests - Tests B: Dry heat	EN 60068-2-2	1993 ²⁾
IEC 60068-2-6	- ¹⁾	Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995 ²⁾
IEC 60068-2-13	- ¹⁾	Part 2: Tests - Test M: Low air pressure	EN 60068-2-13	1999 ²⁾
IEC 60068-2-14	- ¹⁾	Part 2: Tests - Test N: Change of temperature	EN 60068-2-14	1999 ²⁾
IEC 60068-2-17	- ¹⁾	Part 2: Tests - Test Q: Sealing	EN 60068-2-17	1994 ²⁾
IEC 60068-2-20	- ¹⁾	Part 2: Tests - Test T: Soldering	HD 323.2.20 S3	1988 ²⁾
IEC 60068-2-21	- ¹⁾	Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices	EN 60068-2-21	1999 ²⁾
IEC 60068-2-27	- ¹⁾	Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993 ²⁾
IEC 60068-2-29	- ¹⁾	Part 2: Tests - Test Eb and guidance: Bump	EN 60068-2-29	1993 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-30	- ¹⁾	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)	EN 60068-2-30	1999 ²⁾
IEC 60068-2-45	- ¹⁾	Part 2: Tests - Test Xa and guidance: Immersion in cleaning solvents	EN 60068-2-45	1992 ²⁾
IEC 60068-2-78	- ¹⁾	Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2001 ²⁾
IEC 60085	- ¹⁾	Electrical insulation - Thermal classification	EN 60085	2004 ²⁾
IEC 60294	- ¹⁾	Measurement of the dimensions of a cylindrical component having two axial terminations	-	-
IEC 60384-14	1993	Fixed capacitors for use in electronic equipment Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains	-	-
IEC 60410	- ¹⁾	Sampling plans and procedures for inspection by attributes	-	-
IEC 60695-2-2	- ¹⁾	Fire hazard testing Part 2: Test methods - Section 2: Needle-flame test	EN 60695-2-2	1994 ²⁾
IEC QC 001002-3	- ¹⁾	IEC Quality Assessment System for Electronic Components (IEC QS) - Rules of Procedure Part 3: Approval procedures	-	-
CISPR 17	1981	Methods of measurement of the suppression characteristics of passive radio interference filters and suppression components	-	-
ISO 1000	1992	SI units and recommendations for the use of their multiples and of certain other units	-	-

INTERNATIONAL STANDARD

IEC
60939-1

Second edition
2005-02

**Passive filter units for electromagnetic
interference suppression –**

**Part 1:
Generic specification**



Reference number
IEC 60939-1:2005(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

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The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** (www.iec.ch)

- **Catalogue of IEC publications**

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- **IEC Just Published**

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INTERNATIONAL STANDARD

IEC
60939-1

Second edition
2005-02

Passive filter units for electromagnetic interference suppression –

Part 1: Generic specification

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PRICE CODE

V

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PASSIVE FILTER UNITS FOR ELECTROMAGNETIC
INTERFERENCE SUPPRESSION –****Part 1: Generic specification**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60939-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This second edition cancels and replaces the first edition published in 1988. This second edition constitutes a technical revision.

The major changes that have been made between the first and the second edition are:

- Clause 3 has been updated in accordance with the usual practice in IEC TC 40 documents.
- Discharge resistance, current overload, passive flammability, active flammability, solvent resistance of marking and component solvent resistance have been added to Clause 4, test and measurement procedures.

NOTE Corrigendum 1 (2005-11) has been included in this copy. It constitutes a revision of the structure of subclause 4.5, as well as an addition to subclause 4.10.3.

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

FDIS	Report on voting
40/1509/FDIS	40/1536/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.

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

IEC 60939 consists of the following parts, under the general title *Passive filter units for electromagnetic interference suppression*

- Part 1: Generic specification
- Part 2: Sectional specification: Test methods and general requirements
- Part 2-1: Blank detail specification – Passive filter units for electromagnetic interference suppression – Filters for which safety tests are required (Assessment level D/DZ)
- Part 2-2: Blank detail specification – Passive filter units for electromagnetic interference suppression – Filters for which safety tests are required (Safety tests only)

The committee has decided that the contents of this 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.

A bilingual version of this publication may be issued at a later date.

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PASSIVE FILTER UNITS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION –

Part 1: Generic specification

1 General

1.1 Scope

This generic specification relates to passive filter units for electromagnetic interference suppression for use within, or associated with, electronic or electrical equipment and machines.

Both single- and multi-channel filters within one enclosure are included within the scope of this generic specification.

Filters constructed of capacitive elements where the inductance is inherent in the construction of the filter are within the scope of this specification. Similarly, filters constructed of inductive elements where the capacitance is inherent in the construction of the filter are also within the scope of this generic specification. The manufacturer shall state whether a given component is to be designed as a capacitor, an inductor or a filter.

The filter units within the scope of this generic specification are further distinguished as those for which safety tests are appropriate (e.g. those connected to mains supplies) and those for which such tests are not appropriate. A separate sectional specification covers the passive filter units for which safety tests are appropriate.

This generic specification establishes standard terms, inspection procedures and methods of test for use in sectional and detail specifications within the IECQ-CECC system for electronic components.

1.2 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.

NOTE Components other than inductors and capacitors in the filter unit should fulfil requirements in the relevant IEC Standard.

IEC 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050 (all parts), *International Electrotechnical Vocabulary (IEV)*

IEC 60062, *Marking codes for resistors and capacitors*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2: Tests – Tests A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2: Tests – Tests B: Dry Heat*

IEC 60068-2-6, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-13, *Environmental testing – Part 2: Tests – Test M: Low air pressure*

IEC 60068-2-14, *Environmental testing – Part 2: Tests – Test N: Change of temperature*

IEC 60068-2-17, *Basic environmental testing procedures – Part 2: Tests – Test Q: Sealing*

IEC 60068-2-20, *Environmental testing – Part 2: Tests – Test T: Soldering*

IEC 60068-2-21, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60068-2-29, *Environmental testing – Part 2: Tests – Test Eb and guidance: Bump*

IEC 60068-2-30, *Environmental testing – Part 2: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)*

IEC 60068-2-45, *Environmental testing – Part 2: Tests – Test XA and guidance: Immersion in cleaning solvents*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60085, *Thermal evaluation and classification of electrical insulation*

IEC 60294, *Measurement of the dimensions of a cylindrical component having two axial terminations.*

IEC 60384-14: *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 60695-2-2, *Fire hazard testing – Part 2: Test methods – Section 2: Needle flame test*

IEC QC 001002-3, *IEC Quality assessment system for electronic components (IECQ) – Rules of procedure – Part 3: Approval procedures*

CISPR 17:1981, *Methods of measurement of the suppression characteristics of passive radio interference filters and suppression components*

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units*

2 Technical data

2.1 Units, symbols and terminology

Units, graphical symbols, letter symbols and terminology shall, whenever possible, be taken from the following publications:

- IEC 60027
- IEC 60050
- ISO 1000