

Harmonized system of quality assessment for electronic components — Generic specification: Passive filter units for electromagnetic interference suppression

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British Standard

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National foreword

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The UK participation in its preparation was entrusted by Technical Committee EPL/40, Capacitors and resistors for electronic equipment, to Subcommittee EPL/40/1, Capacitors and EMI suppression components for electronic equipment, which has the responsibility to:

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 23 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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Descriptors: Quality, electronic components, capacitors

English version

Generic Specification:
**Passive filter units for electromagnetic interference
suppression**

Spécification générique:
Filtres passifs d'antiparasitage

Fachgrundspezifikation:
Passive Filter für die Unterdrückung
von elektromagnetischen Störungen

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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Foreword

This European Standard was prepared by CLC/TC CECC/SC 40XA (former WG3), Capacitors.

The text of Specification CECC 33000 was submitted to the formal vote; together with the voting report, circulated as CECC (Secretariat) 3628 it was approved as EN 133000 on 1994-12-28.

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) 1997-10-24
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-10-24

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1 Scope

This standard 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 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 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 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. Separate sectional specifications cover the requirements for these two general application classes.

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

2 General

2.1 Related documents

EN 130000	<i>Generic Specification: Fixed Capacitors</i>
EN 140000	<i>Generic Specification: Fixed Resistors</i>
EN 100114-1	<i>Rules of Procedure 14: Quality Assessment Procedures Part 1: Approval of manufacturers and other organizations</i>
prEN 100114-2:1996	<i>Rules of Procedure 14: Quality Assessment Procedures Part 2: CECC requirements for the qualification approval, the release for delivery and the validity of release of electronic components</i>
CECC 00114-3:1993	<i>Rules of Procedure 14: Quality Assessment Procedures Part 3: Capability approval of an electronic component manufacturing activity (with amendments 1, 2 and erratum)</i>
EN 60335-1	<i>Safety of household and similar electrical appliances Part 1: General requirements (IEC 335-1, modified)</i>
ECQAC 1220:1992	<i>ECQAC Policy on Uncertainty of Measurement</i>
ISO 497	<i>Guide of the choice of series of preferred numbers and of series containing more rounded values of preferred numbers</i>
ISO 1000	<i>SI units and recommendations for the use of their multiples and of certain other units</i>
IEC 27-1	<i>Letter symbols to be used in electrical technology Part 1: General</i>
IEC 50	<i>International Electrotechnical Vocabulary (IEV)</i>
IEC 60-2	<i>High-voltage test techniques Part 1: General definitions and test requirements</i>
IEC 62	<i>Marking codes for resistors and capacitors</i>
IEC 63	<i>Preferred number series for resistors and capacitors</i>
Amendment 1 (1967)	
Amendment 2 (1977)	
IEC 68	<i>Environmental testing</i>
IEC 68-1:1988	<i>Part 1: General</i>
Amendment 1 (1992)	

IEC 68-2-1:1990 Amendment 1 (1993) Amendment 2 (1994)	Part 2: <i>Tests — Tests A: Cold</i>
IEC 68-2-2:1974 Amendment 1 (1993) Amendment 2 (1994)	Part 2: <i>Tests — Tests B: Dry heat</i>
IEC 68-2-3:1985	Part 2: <i>Tests — Test Ca: Damp heat, steady state</i>
IEC 68-2-6:1995	Part 2: <i>Tests — Test Fc: Vibration (Sinusoidal)</i>
IEC 68-2-13:1983	Part 2: <i>Tests — Test M: Low air pressure</i>
IEC 68-2-14:1984 Amendment 1 (1986)	Part 2: <i>Tests — Test N: Change of temperature</i>
IEC 68-2-17:1994	Part 2: <i>Tests — Test Q: Sealing</i>
IEC 68-2-20:1979 Amendment 1 (1986) Amendment 2 (1987)	Part 2: <i>Tests — Test T: Soldering</i>
IEC 68-2-21:1983 Amendment 1 (1985) Amendment 2 (1991) Amendment 3 (1993)	Part 2: <i>Tests — Test U: Robustness of terminations and integral mounting devices</i>
IEC 68-2-27:1987	Part 2: <i>Tests — Test Ea: Shock</i>
IEC 68-2-29:1987	Part 2: <i>Tests — Test Eb: Bump</i>
IEC 68-2-30:1980 Amendment 1 (1985)	Part 2: <i>Tests — Test Db: Damp heat, cyclic (12 + 12 hour cycle)</i>
IEC 68-2-45:1980 Amendment 1 (1993)	Part 2: <i>Tests — Test XA and guidance — Immersion in cleaning solvents</i>
IEC 68-2-47:1982	Part 2: <i>Tests — Mounting of components, equipment and other articles for dynamic tests, including shock (Ea), bump (Eb), vibration (Fc and Fd) and steady-state acceleration (Ga) and guidance)</i>
IEC 85	<i>Thermal evaluation and classification of electrical insulation</i>
IEC 294	<i>Measurement of the dimensions of a cylindrical component having two axial terminations</i>
IEC 410	<i>Sampling plans and procedures for inspection by attributes</i>
IEC 695-2-2	<i>Fire hazard testing — Part 2: Test methods, Needle flame test</i>
CISPR 17:1981	<i>Methods of measurement of the suppression characteristics of passive radio interference filters and suppression components</i>

NOTE The above references apply to the current editions, except for IEC 68, for which the referenced edition must be used.

2.2 Units, symbols and terminology

2.2.1 General

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

ISO Standard 1000

IEC 27

IEC 50

When further items are required they shall be derived in accordance with the principles of the documents listed above.

2.2.2 Type

A group of components having similar design features and the similarity of whose manufacturing techniques enables them to be grouped together either for qualification approval or for quality conformance inspection.

They are generally covered by a single detail specification.

NOTE Components described in several detail specifications may, in some cases, be considered as belonging to the same type and may therefore be grouped together for approval and quality conformance inspection.

2.2.3 Style

A sub-division of a type, generally based on dimensional factors.

A style may include several variants, generally of a mechanical order.

2.2.4 *Electromagnetic interference suppression filter unit (filter) Radio interference suppression filter unit*

An assembly of piece-parts and inductive, capacitive and resistive elements to be used for the reduction of electromagnetic interference caused by electrical or electronic equipment, or other sources.

2.2.5

rated voltage (U_R)

the rated voltage is either the maximum r.m.s. operating voltage at rated frequency or the maximum d.c. operating voltage which may be applied continuously to the terminations of the filter unit at any temperature between the lower category temperature and the rated temperature

2.2.6

category voltage (U_C)

the maximum voltage which may be applied to a filter at its upper category temperature

2.2.7

lower category temperature

the minimum ambient temperature for which the filter has been designed to operate continuously

2.2.8

upper category temperature

the maximum ambient temperature for which the filter unit has been designed to operate continuously

2.2.9

rated temperature

the maximum ambient temperature at which a filter can carry its rated current

2.2.10

rated current

the maximum r.m.s. operating current at rated frequency or maximum d.c. operating current which allows continuous operation of the filter at the rated temperature. It is assigned by the manufacturer for one or both of the following conditions:

- a) free air (I_{RO})
- b) with a specified heat sink (I_{RH})

2.2.11

rated capacitance (C_R)

the capacitance value for which a capacitor has been designed and which may be indicated upon it

2.2.12

rated inductance (L_R)

the inductance value for which the inductor has been designed and which may be indicated upon it

2.2.13 Insertion loss

The ratio of the voltage before and after the insertion of the filter in the circuit as measured at the terminations. The insertion loss can be measured either with a symmetrical or an asymmetrical test circuit.

NOTE It is normally expressed in decibels, when the insertion loss is 20 times the logarithm to base 10 of this ratio.