

INTERNATIONAL STANDARD

IEC
60939-2-1

First edition
2004-11

**Complete filter units for radio
interference suppression –**

Part 2-1:

Blank detail specification –

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

**Filters for which safety tests are required
(assessment level D/DZ)**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMPLETE FILTER UNITS FOR RADIO INTERFERENCE SUPPRESSION –

Part 2-1: Blank detail specification – Passive filter units for electromagnetic interference suppression – Filters for which safety tests are required (assessment level D/DZ)

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International Standard IEC 60939-2-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

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

| | |
|--------------|------------------|
| FDIS | Report on voting |
| 40/1466/FDIS | 40/1487/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 *Complete filter units for radio interference suppression*:

Part 1: Generic specification

Part 2: Sectional specification

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- withdrawn;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 standard may be issued at a later date.

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INTRODUCTION

Blank detail specification

A blank detail specification is a supplementary document to the sectional specification and contains requirements for style and layout and minimum content of detail specifications. In the preparation of detail specifications, the content of 1.4 of the sectional specification shall be taken into account.

The use of IEC 60939-2-2 may be more appropriate for components where approval and requalification tests contribute considerably to the cost of the product, whereas the employment of this specification may be necessary for components manufactured in mass production. This specification offers the assessment levels D and DZ (Zero defect).

Identification of the detail specification and of the component

The first page of the detail specification should have the layout recommended on the next page of this blank detail specification. The numbers between square brackets correspond to the following information which shall be inserted at the position indicated:

- [1] The name of the National Standards Organization under whose authority the detail specification is published and, if applicable, the organization from which the detail specification is available.
- [2] The IECQ symbol and the number allotted to the detail specification by the IECQ General Secretariat.
- [3] The number and issue number of the IECQ generic or sectional specification as relevant; also national reference if different.
- [4] If different from the IECQ number, the national number of the detail specification, date of issue and any further information required by the national system, together with any amendment numbers.
- [5] A brief description of the component or range of components.
- [6] Information on typical construction (when applicable).

For [5] and [6] the text to be given in the detail specification should be suitable for an entry in the IECQ Register of Approvals.

- [7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the appropriate national or international documents for outlines. Alternatively the drawing may be given in an annex to the detail specification, but [7] should always contain an illustration of the general outer appearance of the component.
- [8] The level(s) of quality assessment covered by the detail specification, as appropriate.
- [9] Reference data giving information on the most important properties of the component which allow comparison between the various component types intended for the same or similar applications.

| | | |
|---|---|--------------------------------|
| [1] | IEC 60939-2-1-XXX QC XXXXXXXXX | [2] |
| ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH: IEC 60939-1 IEC 60939-2 [3] | | [4] |
| Outline and dimensions: (... angle projection) [7] | PASSIVE FILTER UNITS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION AND FOR CONNECTION TO THE SUPPLY MAINS – FILTERS FOR WHICH SAFETY TESTS ARE REQUIRED | [5] |
| | TYPICAL CONSTRUCTION: cylindrical/rectangular non-metallic/metallic case insulated/non-insulated axial/radial/screwed terminations contains capacitors of subclasses X and Y | [6] |
| | (Other shapes are permitted within the dimensions given, see Table 1) | Assessment level D / DZ [8] |
| NOTE For [1] to [9], see preceding page. | | |
| REFERENCE DATA: Rated voltages, current range, climatic category, frequency range, insertion loss range, functional circuit diagram. | | [9] |

Information on the availability of components qualified to this detail specification
is given in the IEC QC 001005.

COMPLETE FILTER UNITS FOR RADIO INTERFERENCE SUPPRESSION –

Part 2-1: Blank detail specification – Passive filter units for electromagnetic interference suppression – Filters for which safety tests are required (assessment level D/DZ)

1 General data

1.1 Method of mounting for vibration, bump and shock tests

See 1.3.2 of IEC 60939-2.

1.2 Dimensions

Table 1 – Dimensions related to case size

| Case size reference | Dimensions | | | | | | | | |
|---------------------|------------|----------|----------|-----|-----|-----|-----|-----|--|
| | mm | | | | | | | | |
| | <i>L</i> | <i>W</i> | <i>H</i> | ... | ... | ... | ... | ... | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

When there is no case size reference, Table 1 may be omitted and the dimensions shall be given in Table 2, which then becomes Table 1.

The dimensions shall be given as maximum dimensions or as nominal dimensions with a tolerance.

1.3 Ratings and characteristics

Rated voltages (see Table 2a)

Category voltage (if applicable) (see Table 2a)

Rated current (see Table 2b)

DC line resistance or d.c. voltage drop at rated current

Maximum current at upper category temperature and derating curve (if applicable)

Maximum internal and external temperatures for temperature rise test (if applicable)

Climatic category

Rated temperature

Insertion loss, no load/room temperature (see Table 2a)

Insertion loss, load/temperature (see Table 2b)

Insulation resistance

Discharge resistance (if applicable)

Category of passive flammability (if applicable)

Table 2a – Insertion loss at no load

| Case size or type designation | Rated voltage | Category voltage | Minimum insertion loss dB | | | | | | |
|-------------------------------|---------------|------------------|------------------------------|-----|-----|-----|-----|-----|-----|
| | | | kHz | kHz | MHz | MHz | MHz | GHz | GHz |
| | | | | | | | | | |

Table 2b – Insertion loss at specified current and temperature

| Case size or type designation | Rated current | Test current | Test temp. °C | Minimum insertion loss dB | | | | | | |
|-------------------------------|---------------|--------------|------------------|------------------------------|-----|-----|-----|-----|-----|-----|
| | | | | kHz | kHz | MHz | MHz | MHz | GHz | GHz |
| | | | | | | | | | | |

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1.4 Normative references

IEC 60384-1, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

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

IEC 60939-1, *Complete filter units for radio interference suppression – Part 1: Generic specification*¹

IEC 60939-2, *Complete filter units for radio interference suppression – Part 2: Sectional specification*²

1.5 Marking

The marking of the filter, if any, and the packing shall be in accordance with 1.5 of IEC 60939-2.

The details of the marking of the filter and the packing shall be given in full in the detail specification.

¹ To be published.

1.6 Ordering information

Orders for filters covered by this specification shall contain, in clear or in coded form, the following information:

- (a) type designation;
- (b) rated voltage;
- (c) number and issue reference of this detail specification.

1.7 Certified test records

Required/not required.

1.8 Additional information (not for inspection purposes)

1.9 Additional or increased severities or requirements to those specified in the generic and/or sectional specification

NOTE Additional or increased requirements should be specified only when essential.

Table 3 – Other characteristics

| |
|---|
| <p>This table is to be used for defining characteristics which are additional to or more severe than those given in the sectional specification</p> |
|---|

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2 Inspection requirements [IEC 60939-2-1:2004](#)

[https://standards.iteh.ai/catalog/standards/sist/f87084d5-a5b9-49f5-820b-](https://standards.iteh.ai/catalog/standards/sist/f87084d5-a5b9-49f5-820b-417d532593c8/iec-60939-2-1-2004)

2.1 Procedures [417d532593c8/iec-60939-2-1-2004](#)

2.1.1 For Qualification Approval the procedures shall be in accordance with 3.4.2 of IEC 60939-2.

2.1.2 For Quality Conformance inspection the test schedule (Table 4) includes sampling, periodicity, severities and requirements. The formation of inspection lots is covered by 3.5.1 of IEC 60939-2.

Table 4a – Test schedule for lot-by-lot tests (Group A and Group B inspection) – Assessment level D / DZ

| Assessment level D | | | | |
|---|--|----------|-------|--|
| Clause number and test ¹⁾ | Conditions of test ¹⁾ | IL 2) | AQL | Performance requirements ¹⁾ |
| Group A1 4.2 Visual examination 4.2 Marking 4.2 Dimensions (gauging) | Non-destructive | S-4 | 2,5 % | As in 4.2 Any marking on the filter shall be legible and correct See Table 1 of this specification |
| Group A2 4.5 DC line resistance or voltage drop 4.6 Insertion loss 4.3 Voltage proof (Test A only) 4.4 Insulation resistance (Test A only) 4.7 Discharge resistance ⁴⁾ | Non-destructive See Annex A of this specification Method: ... ⁶⁾ Method: ... ⁶⁾ | II | 1,0 % | See 1.3 of this specification See Table 2 of this specification No breakdown or flashover See 4.4.2 See Table 2a of this specification |
| Group B1 4.10 Solderability ⁴⁾ 4.10.2 Requirements | Non destructive⁵⁾ Method: ... ⁶⁾ Specify ageing if none or other than 4 h at 155 °C dry heat. ⁸⁾ Visual examination Wetting time | S-3 | 2,5 % | Methods 1 and 2: good tinning Method 3: < 3 s |