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Edition 3.0 2008-02

INTERNATIONAL STANDARD

QC 300100

Fixed capacitors for use in electronic equipment –
Part 11: Sectional specification – Fixed polyethylene-terephthalate film dielectric metal foil d.c. capacitors

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FOREWORD

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International Standard IEC 60384-11 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This third edition cancels and replaces the second edition published in 1988 and constitutes a minor revision related to tables, figures and references.

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

CDV	Report on voting
40/1839/CDV	40/1864/RVC

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.

The list of all parts of the IEC 60384 series, under the (new) general title *Fixed capacitors for use in electronic equipment*, can be found on the IEC web site.

The QC number that appears on the front cover of this publication is the specification number in the IEC Quality Assessment System for Electronic Components (IECQ).

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- withdrawn,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.

FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 11: Sectional specification – Fixed polyethylene-terephthalate film dielectric metal foil d.c. capacitors

1 General

1.1 Scope

This part of IEC 60384 applies to fixed direct current capacitors, for rated voltages not exceeding 6 300 V, using as dielectric a polyethylene-terephthalate film and electrodes of thin metal foils. For capacitors with rated voltages exceeding 1 000 V, additional tests and requirements may be specified in the detail specification.

The capacitors covered by this standard are intended for use in electronic equipment.

NOTE Capacitors for radio interference suppression are not included, but are covered by IEC 60384-14 (see bibliography).

1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC 60384-1, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements prescribed in detail specifications referring to this sectional specification shall be of equal or higher performance level, because lower performance levels are not permitted.

1.3 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 60062, *Marking codes for resistors and capacitors*

IEC 60063, *Preferred number series for resistors and capacitors*[1)]

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

IEC 60384-1:1999, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

ISO 3: *Preferred numbers – Series of preferred numbers.*

1.4 Information to be given in a detail specification

Detail specifications shall be derived from the relevant blank detail specification.

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1) Second edition (1963) incorporating Amendments 1 (1967) and 2 (1977).

Detail specifications shall not specify requirements inferior to those of the generic, sectional or blank detail specification. When more severe requirements are included, they shall be listed in 1.9 of the detail specification and indicated in the test schedules, for example by an asterisk.

NOTE The information given in 1.4.1 may, for convenience, be presented in tabular form.

The following information shall be given in each detail specification and the values quoted shall preferably be selected from those given in the appropriate clause of this sectional specification.

1.4.1 Outline drawing and dimensions

There shall be an illustration of the capacitor as an aid to easy recognition and for comparison of the capacitor with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions shall preferably be stated in millimetres, however, when the original dimensions are given in inches, the converted metric dimensions in millimetres shall be added.

Normally the numerical values shall be given for the length of the body, the width and height of the body and the wire spacing, or for cylindrical types, the body diameter, and the length and diameter of the terminations. When necessary, for example when a number of items (capacitance values/voltage ranges) are covered by a detail specification, the dimensions and their associated tolerances shall be placed in a table below the drawing.

When the configuration is other than described above, the detail specification shall state such dimensional information as will adequately describe the capacitor. When the capacitor is not designed for use on printed boards, this shall be clearly stated in the detail specification.

1.4.2 Mounting

The detail specification shall specify the method of mounting to be applied for normal use and for the application of the vibration and the bump or shock tests. The capacitors shall be mounted by their normal means. The design of the capacitor may be such that special mounting fixtures are required in its use. In this case the detail specification shall describe the mounting fixtures and they shall be used in the application of the vibration and bump or shock tests.

1.4.3 Ratings and characteristics

The ratings and characteristics shall be in accordance with the relevant clauses of this specification, together with the following:

1.4.3.1 Rated capacitance range

See 2.2.1.

NOTE When products approved to the detail specification have different ranges, the following statement should be added: "The range of values available in each voltage range is given in the qualified products list".

1.4.3.2 Particular characteristics

Additional characteristics may be listed, when they are considered necessary to specify adequately the component for design and application purposes.

1.4.3.3 Soldering

The detail specification shall prescribe the test methods, severities and requirements applicable for the solderability and the resistance to soldering heat test.

1.4.4 Marking

The detail specification shall specify the content of the marking on the capacitor and on the package. Deviations from 1.6 of this sectional specification, shall be specifically stated.

1.5 Terms and definitions

For the purposes of this document the terms and definitions of IEC 60384-1, as well as the following apply.

1.5.1
rated voltage (U_R)
maximum d.c. voltage which may be applied continuously to a capacitor at the rated temperature

NOTE The sum of the d.c. voltage and the peak a.c. voltage applied to the capacitor shall not exceed the rated voltage. The value of the peak a.c. voltage shall not exceed the following percentages of the rated voltage at the frequencies stated and shall not be greater than 280 V,

50 Hz 20 %

100 Hz 15 %

1 000 Hz 3 %

10 000 Hz 1 %

unless otherwise specified in the detail specification.

1.6 Marking

See 2.4 of IEC 60384-1, with the following details.

1.6.1 The information given in the marking is normally selected from the following list. The relative importance of each item is indicated by its position in the list:

a) rated capacitance (in clear or code according to IEC 60062);
b) rated voltage (d.c. voltage may be indicated by the symbol ⎓ or ⎓);
c) tolerance on rated capacitance;
d) category voltage;
e) year and month (or week) of manufacture;
f) manufacturer's name or trade mark;
g) climatic category;
h) manufacturer's type designation;
i) reference to the detail specification.

1.6.2 The capacitor shall be clearly marked with a), b) and c) above and with as many as possible of the remaining items as is considered necessary. Any duplication of information in the marking on the capacitor should be avoided.

1.6.3 The package containing the capacitor(s) shall be clearly marked with all the information listed in 1.6.1.

1.6.4 Any additional marking shall be so applied that no confusion can arise.

2 Preferred ratings and characteristics

2.1 Preferred characteristics

The values given in detail specifications shall preferably be selected from the following:

2.1.1 Preferred climatic categories

The capacitors covered by this specification are classified into climatic categories according to the general rules given in IEC 60068-1.

NOTE For the tests in the IEC 60068 series of publications, the editions referenced in the applicable test clauses of the generic specification are used.

The lower and upper category temperatures and the duration of the damp heat, steady state test shall be chosen from the following.

Lower category temperature: –55 °C, –40 °C and –25 °C.

Upper category temperature: +85 °C, +100 °C, +105 °C and +125 °C.

Duration of the damp heat, steady state test: 4, 10, 21 and 56 days.

The severities for the cold and dry heat tests are the lower and upper category temperatures respectively.

2.2 Preferred values of ratings

2.2.1 Rated capacitance (C_R)

Preferred values of rated capacitance are:

1 µF, 1,5 µF, 2,2 µF, 3,3 µF, 4,7 µF and 6,8 µF and their decimal multiples.

These values conform to the E6 series of preferred values given in IEC 60063.

If other values are required they shall preferably be chosen from the E12 series.

2.2.2 Tolerance on rated capacitance

The preferred tolerances on the rated capacitance are ±5 %, ±10 % and ±20 %.

2.2.3 Rated voltage (U_R)

The preferred values of rated voltage are: 40 V, 63 V, 100 V, 160 V and 250 V and their decimal multiples. These values conform to the basic series of preferred values R5 and R10 given in ISO 3.

2.2.4 Category voltage (U_C)

The category voltage is:

0,8 U_R for upper category temperature 100 °C and

0,75 U_R for upper category temperature 105 °C and

0,5 U_R for upper category temperature 125 °C.