
:]_gb]_cbXYbnUrcf]nUi dcfUwc]`YY_fcbg_]cdfYa]È("XY.`DcXfc bU
gdYWZ_UMU!`5`i a]b]g_]YY_fcb]hg_]_cbXYbnUrcf]g]fX]a `fA bC&L]b`bYfX]a
YY_fcb]fca `f97`*\$` , (!(.&\$+\$L

Fixed capacitors for use in electronic equipment - Part 4: Sectional specification - Aluminium electrolytic capacitors with solid (MnO₂) and non-solid electrolyte (IEC 60384-4:2007)

Festkondensatoren zur Verwendung in Geräten der Elektronik - Teil 4: Rahmenspezifikation - Aluminium-Elektrolyt-Kondensatoren mit festen (MnO₂) und flüssigen Elektrolyten (IEC 60384-4:2007)

Condensateurs fixes utilisés dans les équipements électroniques - Partie 4: Spécification intermédiaire - Condensateurs électrolytiques en aluminium à électrolyte solide (MnO₂) et non solide (IEC 60384-4:2007)

Ta slovenski standard je istoveten z: EN 60384-4:2007

ICS:

31.060.50	Aluminijski elektrolitni kondenzatorji	Aluminium electrolytic capacitors
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SIST EN 60384-4:2008**en,de**

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English version

**Fixed capacitors for use in electronic equipment -
Part 4: Sectional specification -
Aluminium electrolytic capacitors
with solid (MnO₂) and non-solid electrolyte
(IEC 60384-4:2007)**

Condensateurs fixes utilisés
dans les équipements électroniques -
Partie 4: Spécification intermédiaire -
Condensateurs électrolytiques
en aluminium à électrolyte solide (MnO₂)
et non solide
(CEI 60384-4:2007)

Festkondensatoren zur Verwendung
in Geräten der Elektronik -
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Aluminium-Elektrolyt-Kondensatoren
mit festen (MnO₂) und
flüssigen Elektrolyten
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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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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 40/1759/CDV, future edition 4 of IEC 60384-4, prepared by IEC TC 40, Capacitors and resistors for electronic equipment, was submitted to the IEC-CENELEC parallel Unique Acceptance Procedure and was approved by CENELEC as EN 60384-4 on 2007-04-01.

This European Standard supersedes EN 130300:1998.

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) 2008-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60384-4:2007 was approved by CENELEC as a European Standard without any modification.

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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 60063	- ¹⁾	Preferred number series for resistors and capacitors	-	-
IEC 60068-1	- ¹⁾	Environmental testing - Part 1: General and guidance	EN 60068-1	1994 ²⁾
IEC 60068-2-17	- ¹⁾	Environmental testing - Part 2-17: Tests - Test Q: Sealing	EN 60068-2-17	1994 ²⁾
IEC 60068-2-54	- ¹⁾	Environmental testing - Part 2-54: Tests - Test Ta: Solderability testing of electronic components by the wetting balance method	EN 60068-2-54	2006 ²⁾
IEC 60384-1 (mod)	1999	Fixed capacitors for use in electronic equipment - Part 1: Generic specification	EN 60384-1 + corr. October	2001 2001
IEC 60384-4-1	- ¹⁾	Fixed capacitors for use in electronic equipment - Part 4-1: Blank detail specification - Fixed aluminium electrolytic capacitors with non-solid electrolyte - Assessment level EZ	EN 60384-4-1	2007 ²⁾
IEC 60384-4-2	- ¹⁾	Fixed capacitors for use in electronic equipment - Part 4-2: Blank detail specification - Fixed aluminium electrolytic capacitors with solid (MnO ₂) electrolyte - Assessment level EZ	EN 60384-4-2	2007 ²⁾
ISO 3	- ¹⁾	Preferred numbers - Series of preferred numbers	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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INTERNATIONAL STANDARD

IEC 60384-4

QC 300300

Fourth edition
2007-03

Fixed capacitors for use in electronic equipment –

Part 4:

Sectional specification –

Aluminium electrolytic capacitors with solid (MnO₂) and non-solid electrolyte

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

**Part 4: Sectional specification –
Aluminium electrolytic capacitors with solid (MnO₂)
and non-solid electrolyte**

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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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60384-4 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This fourth edition cancels and replaces the third edition published in 1998 and its amendment 1 (2000). This edition 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
40/1759/CDV	40/1819/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 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 list of all parts of the IEC 60384 series, under the general title *Fixed capacitors for use in electronic equipment*, can be found on the IEC website.

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.

The contents of the corrigendum of June 2007 have been included in this copy.

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FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 4: Sectional specification – Aluminium electrolytic capacitors with solid (MnO₂) and non-solid electrolyte

1 General

1.1 Scope

This part of IEC 60384 applies to aluminium electrolytic capacitors with solid (MnO₂) and non-solid electrolyte primarily intended for d.c. applications for use in electronic equipment. It covers capacitors for long-life applications and capacitors for general-purpose applications.

Capacitors for special-purpose applications may need additional requirements.

Capacitors for fixed surface mount aluminium electrolytic capacitors are not included but they are covered by IEC 60384-18.

1.2 Object

The principal 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 60063, *Preferred number series for resistors and capacitors*

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

IEC 60068-2-17, *Environmental testing – Part 2-17: Tests – Test Q: Sealing*

IEC 60068-2-54, *Environmental testing – Part 2-54: Tests – Test Ta: Solderability testing of electronic components by the wetting balance method*

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

IEC 60384-4-1, *Fixed capacitors for use in electronic equipment – Part 4-1: Blank detail specification – Fixed aluminium electrolyte capacitors with non-solid electrolyte – Assessment level EZ*

IEC 60384-4-2, *Fixed capacitors for use in electronic equipment – Part 4-2: Blank detail specification – Fixed aluminium electrolyte capacitors with solid (MnO₂) electrolyte – Assessment level EZ*

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.

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 millimeters; 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 IEC QC 001005."