

Fixed capacitors for use in electronic equipment —

**Part 3: Sectional specification: Surface
mount fixed tantalum electrolytic
capacitors with manganese dioxide
solid electrolyte**

ICS 31.060.40

National foreword

This British Standard is the UK implementation of EN 60384-3:2006, incorporating corrigendum April 2009. It is identical with IEC 60384-3:2006. It supersedes BS CECC 30800:1991, BS EN 130800:2001 and BS QC 300800:1991, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/40X, Capacitors and resistors for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Amendments/corrigenda issued since publication

Date	Comments
30 November 2009	Implementation of CENELEC corrigendum April 2009 (changes to EN title page and EN Foreword) and addition to supersession details in National foreword

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English version

Fixed capacitors for use in electronic equipment
Part 3: Sectional specification: Surface mount fixed tantalum
electrolytic capacitors with manganese dioxide solid electrolyte
(IEC 60384-3:2006)

Condensateurs fixes utilisés dans
les équipements électroniques
Partie 3: Spécification intermédiaire:
Condensateurs fixes électrolytiques
au tantale pour montage en surface,
à électrolyte solide au dioxyde
de manganèse
(CEI 60384-3:2006)

Festkondensatoren zur Verwendung
in Geräten der Elektronik
Teil 3: Rahmenspezifikation:
Oberflächenmontierbare
Tantal-Kondensatoren mit festem
Mangandioxid-Elektrolyt
(IEC 60384-3:2006)

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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.

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CENELEC members are the national electrotechnical committees of Austria, Belgium, 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 40/1771/FDIS, future edition 3 of IEC 60384-3, 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 60384-3 on 2006-11-01.

This European Standard supersedes EN 130800:2000 + A1:2003.

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) 2007-08-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-11-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60384-3:2006 was approved by CENELEC as a European Standard without any modification.

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FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

Part 3: Sectional specification: Surface mount fixed tantalum electrolytic capacitors with manganese dioxide solid electrolyte

1 General

1.1 Scope

This specification applies to surface mount tantalum solid electrolyte capacitors. These capacitors are primarily intended to be mounted directly onto substrates for hybrid circuits or onto printed boards.

The following two styles are considered:

- Style 1: protected capacitors;
- Style 2: unprotected capacitors.

1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC 60384-1:1999, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor.

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*

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

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

IEC 60410, *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.

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.

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

The detail specification shall give 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. All dimensions are to be stated in mm.

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

Normally, the numerical values shall be given for the length, width and height of the body. When necessary, for example, when a number of case sizes 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.

1.4.2 Mounting

The detail specification shall give guidance on methods of mounting for normal use. Mounting for test and measurement purposes (if required) shall be in accordance with 4.3.

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 (QPL).".

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 test 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 1.5 of this sectional specification shall be specifically stated.

1.5 Terms and definitions

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

1.5.1

surface mount capacitor

capacitor whose small dimensions and nature or shape of terminations make it suitable for surface mounting in hybrid circuits and on printed boards

1.5.2 rated voltage

U_R

See 2.2.16 of IEC 60384-1

NOTE 1 The sum of the d.c. voltage and the peak a.c. voltage applied to the capacitor should not exceed the rated voltage.

NOTE 2 For short periods, however, the rated voltage may be exceeded (see 2.2.5 and 4.14).

1.5.3 Class 1

capacitor with low dielectric losses and high stability of capacitance; Ta powders with low volumetric capacitance values are used

1.5.4 Class 2

capacitor with a dielectric of medium range volumetric capacitance for applications where low losses and high stability of capacitance are not of major importance

1.5.5 Class 3

capacitor with a dielectric of high volumetric capacitance for applications where small size and high capacitance values are essential, and higher losses and less stability of capacitance can be tolerated

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) polarity of the terminations (unless identified by the construction);
- b) rated capacitance, in clear or coded form;
- c) rated voltage, in clear or coded form, (d.c. voltage may be indicated by the symbol ($\equiv$ or —);
- d) tolerance on rated capacitance;
- e) style (in accordance with 1.1);
- f) year and month (or week) of manufacture;
- g) manufacturer's name or trade mark;
- i) climatic category;
- j) manufacturer's type designation;
- k) reference to the detail specification.

1.6.2 Surface mount capacitors are generally not marked on the body. If some marking can be applied, they shall be clearly marked with as many as possible of the above items as is considered useful. Designation of polarity is a mandatory item. Any duplication of information in the marking on the capacitor should be avoided. Where space does not permit the marking of the capacitor in accordance with IEC 60062 the following code may be used.

a) Capacitance coding

The rated capacitance value in picofarad is given by the following digit and letter code.

Letter	Value
A	1,0
C	1,2
E	1,5
G	1,8
J	2,2
L	2,7
N	3,3
Q	3,9
S	4,7
U	5,6
W	6,8
Y	8,2

Digit	Multiplier
9	10^{-1}
0	10^0
1	10^1
2	10^2
3	10^3
4	10^4
5	10^5
6	10^6
7	10^7
8	10^8

b) Voltage coding

For code letters for marking, see the detail specification.

1.6.3 Any marking shall be legible and not easily smeared or removed by rubbing with the finger.

1.6.4 The package containing the capacitor(s) shall be clearly marked with all the information listed in 1.5.1, except polarity, unless this is applicable to the method of packing.

1.6.5 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.

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

Lower category temperature:	–55 °C.
Upper category temperature:	+85 °C and +125 °C.
Duration of the damp heat, steady state test:	Style 1: 21 and 56 days Style 2: --

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