

Harmonized system of quality
assessment for electronic components

Fixed capacitors for use in electronic equipment — Sectional specification for fixed polypropylene film dielectric metal foil d.c. capacitors

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Components Standards Policy Committee (ECL/-) to Technical Committee ECL/4, upon which the following bodies were represented:

- British Telecommunications plc
- EEA (the Association of Electronics, Telecommunications and Business Equipment Industries)
- Electronic Components Industry Federation
- Ministry of Defence
- National Supervising Inspectorate
- Society of British Aerospace Companies Limited

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National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Policy Committee. It is identical with IEC 384-13:1991 “*Fixed capacitors for use in electronic equipment. Part 13: Sectional specification: Fixed polypropylene film dielectric metal foil d.c. capacitors*” published by the International Electrotechnical Commission (IEC). IEC 384-13, also designated QC 301800, is a harmonized specification in the IECQ system for electronic components of assessed quality.

IEC 384-13 was prepared by IEC Technical Committee No. 40 “*Capacitors and resistors for electronic equipment*” and the United Kingdom participation in the drafting was provided by Technical Committee ECL/4 “*Capacitors and resistors for electronic equipment*”.

Cross-references

International Standard	Corresponding British Standard
ISO 3:1973	BS 2045:1965 <i>Preferred numbers</i> (Technically equivalent)
IEC 62:1974	BS 1852:1975 <i>Specification for marking codes for resistors and capacitors</i> (Identical)
IEC 63:1963	BS 2488:1966 <i>Schedule of preferred numbers for the resistance of resistors and the capacitance of capacitors for telecommunication equipment</i> (Technically equivalent)
IEC 68-1:1988	BS 2011 <i>Environmental testing</i> Part 1.1:1989 <i>General and guidance</i> (Identical)
IEC 384-1:1982	BS 9930 <i>Harmonized system of quality assessment for electronic components. Fixed capacitors for use in electronic equipment</i> Part 0:1983 <i>Generic specification</i> (Identical)
IEC 384-13-1:1991	BS QC 301801:1991 <i>Harmonized system of quality assessment for electronic components. Fixed capacitors for use in electronic equipment. Blank detail specification for fixed polypropylene film dielectric metal foil d.c. capacitors. Assessment level E</i> (Identical)
IEC 384-14:1981	BS 6201 <i>Fixed capacitors for use in electronic equipment</i> Part 3:1982 <i>Specification for fixed capacitors for radio interference suppression. Selection of methods of test and general requirements</i> (Identical)
IEC 410:1973	BS 6001 <i>Sampling procedures for inspection by attributes</i> Part 1:1991 <i>Specification for sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection</i> (Technically equivalent)
QC 001002:1986	BS QC 001002:1991 <i>Rules of Procedure of the IEC Quality Assessment System for Electronic Components (IECQ)</i> (Identical)

The British Standard which implements the IECQ Rules of Procedure is BS 9000 “General requirements for a system for electronic components of assessed quality” Part 3:1991 “Specification for the national implementation of the IECQ System”.

The Technical Committee has reviewed the provisions of QC 001001 to which reference is made in the text and has decided that they are acceptable for use in conjunction with this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 20, an inside back cover 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.

Section 1. General

1.1 Scope

This standard is applicable to fixed direct current capacitors, using as dielectric a polypropylene film with electrodes of thin metal foils. The capacitors covered by this standard are intended for use in electronic equipment.

Capacitors for radio interference suppression are not included, but are covered by IEC Publication 384-14: Fixed Capacitors for Use in Electronic Equipment. Part 14: Sectional Specification: Fixed Capacitors for Radio Interference Suppression.

1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC Publication 384-1 (1982), 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 Related documents

IEC Publications:

Publication 62:(1974)	<i>Marking Codes for Resistors and Capacitors.</i>
Publication 63:(1963)	<i>Preferred Number Series for Resistors and Capacitors.</i>
	Amendment No. 1 (1967)
	Amendment No. 2 (1977)
Publication 68:	<i>Environmental Testing.</i>
Publication 384-1 (1982):	<i>Fixed Capacitors for Use in Electronic Equipment — Part 1: Generic Specification.</i>
	Amendment No. 2 (1987).
Publication 410 (1973):	<i>Sampling Plans and Procedures for Inspection by Attributes.</i>
Publication QC 001001:(1986)	<i>Basic Rules of the IEC Quality Assessment System for Electronic Components (IECQ).</i>
Publication QC 001002:(1986)	<i>Rules of Procedure of the IEC Quality Assessment System for Electronic Components (IECQ).</i>

ISO Publication:

ISO Standard 3 (1973):	<i>Preferred Numbers — Series of Preferred Numbers.</i>
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NOTE The above references apply to the current editions except for IEC 68, for which the referenced edition in the applicable test clauses of the generic specification shall be used.

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 Sub-clause 1.9 of the detail specification and indicated in the test schedules, for example by an asterisk.

NOTE The information given in Sub-clause 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, 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 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 Sub-clause 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 tests.

1.4.4 Marking

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

1.5 Terminology

In addition to the applicable terms and definitions of IEC Publication 384-1 the following definitions apply:

1.5.1 stability class

the stability class is defined by the tolerance on the temperature coefficient together with the permissible change of capacitance after defined tests. The stability class is stated in the detail specification the table in Sub-clause 2.2.4, shows the preferred stability classes

1.5.2 rated voltage (U_R)

the rated voltage is the 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 be not 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

Sub-clause 2.4 of IEC Publication 384-1, 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;
- b) rated voltage (d.c. voltage may be indicated by the symbol — — — or — — —);
- c) tolerance on rated capacitance;
- d) year and month (or week) of manufacture;
- e) manufacturer's name or trade mark;
- f) temperature coefficient and stability class;
- 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 Sub-clause 1.6.1.

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