

Harmonized system of quality assessment for electronic components

Generic specification: Fixed capacitors

Système harmonisé d'assurance de la qualité
des composants électroniques
Spécification générique: Condensateurs fixes

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik
Fachgrundspezifikation: Festkondensatoren

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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:

EEA (The Association of the Electronics, Telecommunications and Business Equipment Industries)
Electronic Components Industry Federation
Ministry of Defence
National Supervising Inspectorate

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National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Policy Committee (ECL/-). It is identical with CECC 30000 : 1983 *Harmonized system of quality assessment for electronic components: Generic specification: Fixed capacitors*, Issue 3 including amendments 1 to 8, published by the European Committee for Electrotechnical Standardization (CENELEC) Electronic Components Committee (CECC).

CECC 30000 was prepared by CECC WG3 'Capacitors' and the United Kingdom participation in the drafting was provided by Technical Committee ECL/4 'Capacitors and resistors for electronic equipment'.

This standard is a new edition. It supersedes BS CECC 30000 : 1984 which is withdrawn. This new edition incorporates amendments 3 to 8 inclusive of CECC 30000 : 1983, but it does not reflect a full review of the standard.

BS CECC 30000 : 1992 prescribes the standard terms, inspection procedures and methods of test of capacitors for use in sectional and detail specifications within the CECC system for electronic components.

Cross-references

International standard	Corresponding British Standard
CECC 00014 : 1986	BS CECC 00014 : 1988 <i>Harmonized system of quality assessment for electronic components. Basic specification: CECC assessed process average procedure (60% confidence limit)</i> (Identical)
ISO 3 : 1973	BS 2045 : 1965 <i>Preferred numbers</i>
ISO 497 : 1973	(Technically equivalent to both ISO 3 and ISO 497)
IS 1000 : 1973 ¹⁾	BS 5555 : 1976 <i>Specification for SI units and recommendations for the use of their multiples and of certain other units</i> (Identical)
IEC 62 : 1974 ²⁾	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	BS 2011 <i>Environmental testing</i>
IEC 68-1 : 1982 ³⁾	BS 2011 : Part 1.1 : 1989 <i>General and guidance</i> (Identical)
IEC 68-2-1 : 1974 ⁴⁾	BS 2011 : Part 2.1A : 1977 <i>Tests A. Cold</i> (Identical) BS 2011 : Part 2.1B : 1977 <i>Tests B. Dry heat</i> (Identical)
IEC 68-2-1A : 1976	
IEC 68-2-2 : 1974	
IEC 68-2-2A : 1976	

¹⁾ ISO 1000 : 1973 has been superseded by ISO 1000 : 1981 which is identical with BS 5555 : 1981 *Specification for SI units and recommendations for the use of their multiples and of certain other units*.

²⁾ IEC 62 : 1974 has been superseded by IEC 62 : 1992. An identical revision of BS 1852 is in preparation.

³⁾ IEC 68-1 : 1982 has been superseded by IEC 68-1 : 1988, which is identical with BS 2011 : Part 1.1 : 1989 *General and guidance*.

⁴⁾ IEC 68-2-1 : 1974 has been superseded by IEC 68-2-1 : 1990 which incorporates IEC 68-2-1A : 1983 and Amendment No. 1 : 1983, and is identical with BS 2011 : Part 2.1A : 1990 *Tests A. Cold*.

International standard	Corresponding British Standard
IEC 68-2-3 : 1969	BS 2011 : Part 2.1Ca : 1977 <i>Test Ca. Damp heat, steady state</i> (Identical)
IEC 68-2-6 : 1982 Amendment 1 : 1983	BS 2011 : Part 2.1Fc : 1983 <i>Test Fc. Vibration (sinusoidal)</i> (Identical)
IEC 68-2-13 : 1983	BS 2011 : Part 2.1M : 1984 <i>Test M. Low air pressure</i> (Identical)
IEC 68-2-14 : 1974 Amendment 1 : 1978	BS 2011 : Part 2.1N : 1985 <i>Test N. Change of temperature</i> (Identical)
IEC 68-2-17 : 1978	BS 2011 : Part 2.1Q : 1981 <i>Test Q. Sealing</i> (Identical)
IEC 68-2-20 : 1979	BS 2011 : Part 2.1T : 1981 <i>Test T. Soldering</i> (Identical)
IEC 68-2-21 : 1983	BS 2011 : Part 2.1U : 1984 <i>Test U. Robustness of terminations and integral mounting devices</i> (Identical)
IEC 68-2-27 : 1972 ⁵⁾ Amendment 1 : 1982 Amendment 2 : 1983	BS 2011 : Part 2.1Ea : 1988 <i>Test Ea. Shock</i> (Identical)
IEC 68-2-29 : 1968 ⁶⁾ Amendment 1 : 1982 Amendment 2 : 1983	BS 2011 : Part 2.1Eb : 1987 <i>Test Eb. Bump</i> (Identical)
IEC 68-2-30 : 1980	BS 2011 : 2.1Db : 1981 <i>Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle)</i> (Identical)
IEC 68-2-45 : 1980	BS 2011 : Part 2.1XA : 1981 <i>Test XA and guidance. Immersion in cleaning solvents</i> (Identical)
IEC 68-2-47 : 1982	BS 2011 : Section 4.1 : 1983 <i>Specification for mounting of components, equipment and other articles for dynamic tests</i> (Identical)
IEC 294 : 1969	BS 5692 : 1979 <i>Method for measurement of the dimensions of a cylindrical electronic component having two axial terminations</i> (Identical)
IEC 410 : 1973	BS 6001 <i>Sampling procedures for inspection by attributes</i> BS 6001 : Part 1 : 1991 <i>Specification for sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection</i> (Technically equivalent)

The Technical Committee has reviewed the provisions of CECC 00100, IEC 27-1 (1971) and IEC 117, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard. IEC 117 has been superseded by IEC 617 *Graphical symbols for diagrams*, to which the corresponding British Standard is BS 3939 *Graphical symbols for electrical power, telecommunications and electronic diagrams*. The relevant Parts of BS 3939 are Part 1 : 1986 *General information, general index* and Part 4 : 1985 *Passive components*.

⁵⁾ IEC 68-2-27 : 1972, with Amendments 1 and 2, has been superseded by IEC 68-2-27 : 1987 which is identical with BS 2011 : Part 2.1Ea : 1988 *Test Ea. Shock*.

⁶⁾ IEC 68-2-29 : 1968, with Amendments 1 and 2, has been superseded by IEC 68-2-29 : 1987 which is identical with BS 2011 : Part 2.1Eb : 1987 *Test Eb. Bump*.

This British Standard which implements the CECC rules of procedure is BS 9000
General requirements for a system for electronic components of assessed quality
Part 2 : 1991 *Specification for the national implementation of the CECC system.*

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

European Committee for Electrotechnical Standardization (CENELEC)
Cenelec Electronic Components Committee

CECC

English version

Harmonized System of Quality Assessment for
Electronic Components

GENERIC SPECIFICATION: FIXED CAPACITORS

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION GNERIQUE: CONDENSATEURS FIXES

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

FACHGRUNDSPEZIFIKATION: FESTKONDENSATOREN



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Ausgabe

CECC 30000

1983



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FOREWORD

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby accepted by all member countries without further testing.

This specification has been formally approved by the CECC, and has been prepared for those countries taking part in the System who wish to issue national harmonized specifications for FIXED CAPACITORS. It should be read in conjunction with document CECC 00 100: Basic Rules (1974).

At the date of printing of this specification the member countries of the CECC are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom, and copies of it can be obtained from the addresses shown on the inside cover.

PREFACE

This generic specification was prepared by CECC Working Group 3: "Capacitors", and it is an editorially revised version of CECC 30 000 Issue 2.

In accordance with the requirements of document CECC 00 100 it is based, wherever possible, on the requirements of the Publications of the International Electrotechnical Commission and in particular on IEC Publication 384-1: Fixed capacitors for use in electronic equipment: Part 1: Terminology and methods of test.

Sectional specifications shall refer to the equivalent IEC Publications and shall select from the relevant documents the terms and methods of test and specify test conditions and the possible requirements applicable to a particular sub-family.

The text of this generic specification was circulated to the CECC for voting in the documents listed below and was ratified by the President of the CECC for publication as a CECC Specification.

<u>Document</u>	<u>Voting date</u>	<u>Report on the voting</u>
CECC(Secretariat)1218	July 1982	CECC(Secretariat)1281
CECC(Secretariat)1175	April 1982	CECC(Secretariat)1283
CECC(Secretariat)1286	January 1983	CECC(Secretariat)1374
CECC(Secretariat)1489	May 1984	CECC(Secretariat)1581

This third issue of CECC 30 000 shall become effective for all new qualification approvals on 1 January 1984. Issue 2 will continue to remain effective to cover all past approvals.

SECTION 1 - SCOPE**1. Scope**

This specification is applicable to fixed capacitors for use in electronic equipment.

It establishes standard terms, inspection procedures and methods of test for use in sectional and detail specifications within the CECC System for electronic components.

SECTION 2 - GENERAL**2.1 Related documents**

CECC 00 100 (1974)	Basic Rules
CECC 00 014 (1986)	CECC Assessed Process Average Procedure (APA)
ISO 3 (1973)	Preferred numbers - Series of preferred numbers
ISO 497 (1973)	Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers
ISO 1000 (1973)	SI units and recommendations for the use of their multiples and of certain other units
IEC 27-1	Letter symbols to be used in electrical technology: Part 1: General
IEC 50	International Electrotechnical Vocabulary
IEC 62 (1974)	Marking codes for resistors and capacitors
IEC 63 (1963) Amendment No. 1 (1967) Amendment No. 2 (1977)	Preferred number series for resistors and capacitors
IEC 68	Basic environmental testing procedures
IEC 68-1 (1982)	General
IEC 68-2-1 (1974) IEC 68-2-1A(1983) Amendment No. 1 (1983)	Test A: Cold First supplement

IEC 68-2-2 (1974) 68-2-2A (1976)	Test B: Dry heat First supplement
IEC 68-2-3 (1969)	Test Ca: Damp heat, steady state
IEC 68-2-6 (1982) Amendment No. 1 (1983)	Test Fc: Vibration (sinusoidal)
IEC 68-2-13 (1983)	Test M: Low air pressure
IEC 68-2-14 (1974) Amendment No. 1 (1978)	Test N: Change of temperature
IEC 68-2-17 (1978)	Test Q: Sealing
IEC 68-2-20 (1979)	Test T: Soldering
IEC 68-2-21 (1983)	Test U: Robustness of terminations and integral mounting devices
IEC 68-2-27 (1972) Amendment No. 1 (1982) Amendment No. 2 (1983)	Test Ea: Shock
IEC 68-2-29 (1968) Amendment No. 1 (1982) Amendment No. 2 (1983)	Test Eb: Bump
IEC 68-2-30 (1980)	Test Db: Damp heat, cyclic (12 + 12 hour cycle)
IEC 68-2-45 (1980)	Test XA and guidance: Immersion in cleaning solvents
IEC 68-2-47 (1982)	Mounting of components, equipment and other articles for dynamic tests, including shock (Ea), bump (Eb), vibration (Fc and Fd) and steady-state acceleration (Ga) and guidance
IEC 117	Recommended graphical symbols
IEC 294	Measurement of the dimensions of a cylindrical component having two axial terminations
IEC 410	Sampling plans and procedures for inspection by attributes

Note: The above references apply to the current editions, except for IEC 68 for which the referenced edition shall be used.

2.2 Units, symbols and terminology

- 2.2.1 Units, graphical symbols, letter symbols and terminology shall, whenever possible, be taken from the following publications:

ISO 1000
IEC 27
IEC 50
IEC 117

When further items are required they shall be derived in accordance with the principles of the documents listed above.

2.2.2 Type

A group of components having similar design features and the similarity of whose manufacturing techniques enables them to be grouped together either for qualification approval or for quality conformance inspection.

They are generally covered by a single detail specification.

Note: Components described in several detail specifications, may, in some cases, be considered as belonging to the same type and may therefore be grouped together for qualification approval and quality conformance inspection.

2.2.3 Style

A sub-division of a type, generally based on dimensional factors.

A style may include several variants, generally of a mechanical order.

2.2.4 Grade

A term to indicate additional general characteristics concerning the intended application, for example long life application.

The term "Grade" may only be used in combination with one or more words (for example long life grade) and not by a single letter or number.

Figures to be added after the term "Grade" should be arabic numerals.

2.2.5 Family (of electronic components)

A group of electronic components which predominantly displays a particular physical attribute and/or fulfils a defined function.

2.2.6 Sub-family (of electronic components)

A group of components within a family manufactured by similar technological methods.

2.2.7 D.C. capacitor

A capacitor designed essentially for application with direct voltage.

Note: A d.c. capacitor may not be suitable for use on a.c. supplies. For other applications, e.g. pulse or a.c., the operating voltage shall be prescribed in the relevant specification.

2.2.8 Polar capacitor (for electrolytic capacitors)

A capacitor intended for use with a unidirectional voltage connected according to the polarity indication.

2.2.9 Bipolar capacitor (for electrolytic capacitors)

An electrolytic capacitor designed to withstand an alternating voltage and/or reversal of the applied direct voltage.

2.2.10 A.C. capacitor

A capacitor designed essentially for application with alternating voltages.

2.2.11 Pulse capacitor

A capacitor for use with pulses of current or voltage.

2.2.12 Rated capacitance (C_R)

The capacitance value for which the capacitor has been designed and which is usually indicated upon it.

2.2.13 Category temperature range

The range of ambient temperatures for which the capacitor has been designed to operate continuously; this is defined by the temperature limits of the appropriate category.

2.2.14 Upper category temperature

The maximum ambient temperature for which a capacitor has been designed to operate continuously.

2.2.15 Lower category temperature

The minimum ambient temperature for which a capacitor has been designed to operate continuously.

2.2.16 Rated temperature

The maximum ambient temperature at which the rated voltage may be continuously applied.

2.2.17 Rated voltage (U_R)

The maximum direct voltage or the maximum r.m.s. alternating voltage or peak value of pulse voltage which may be applied continuously to a capacitor at any temperature between the lower category temperature and the rated temperature (see 2.2.16).

2.2.18 Category voltage (U_C)

The maximum voltage which may be applied continuously to a capacitor at its upper category temperature (see 2.2.14).

2.2.19 Temperature derated voltage

For any temperature between the rated temperature and the upper category temperature, the temperature derated voltage is the maximum voltage that may be applied continuously to a capacitor.

Note: Information on the voltage/temperature dependence at temperatures between the rated temperature and the upper category temperature should, if applicable, be given in the sectional or the detail specification.

2.2.20 Surge voltage ratio

The quotient of the maximum instantaneous voltage which may be applied to the terminations of the capacitor for a specified time at any temperature within the category temperature range and the rated voltage or the temperature derated voltage as appropriate. The number of times per hour that this voltage may be applied shall be specified.

2.2.21 Rated ripple voltage

The r.m.s. value of the maximum allowable alternating voltage of a specified frequency superimposed on the d.c. voltage at which the capacitor may be operated continuously at a specified temperature. The sum of the direct voltage and the peak value of the alternating voltage applied to the capacitor shall not exceed the rated voltage or temperature derated voltage as applicable.

2.2.22 Reverse voltage (for polar capacitors only)

A voltage applied to the capacitor terminations in the reverse polarity direction.

2.2.23 Rated ripple current

The r.m.s. value of the maximum allowable alternating current of a specified frequency, at which the capacitor may be operated continuously at a specified temperature.

2.2.24 Time constant

The product of the insulation resistance and the capacitance. It is normally expressed in seconds.