

Transformers and inductors for use in electronic and telecommunication equipment —

Part 1: Generic specification

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/51, Transformers, inductors, magnetic components and ferrite materials, which has the responsibility to:

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 25 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.

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Descriptors: Transformers and inductors, generic specification, tests, capability approval

English version

Transformers and inductors for use in electronic and
telecommunication equipment
Part 1: Generic specification

(IEC 61248-1:1996)

Transformateurs et inductances destinés aux
équipements électroniques et de
télécommunications
Partie 1: Spécification générique
(CEI 61248-1:1996)

Transformatoren und Drosseln für
elektronische und nachrichtentechnische
Einrichtungen
Teil 1: Fachgrundspezifikation
(IEC 61248-1:1996)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

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Foreword

The text of the International Standard IEC 61248-1:1996, prepared by IEC TC 51, Magnetic components and ferrite materials, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 61248-1 on 1997-07-01 without any modification.

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) 1998-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-06-01

Annexes designated “normative” are part of the body of the standard.

Annexes designated “informative” are given for information only.

In this standard, Annex ZA is normative and Annex A and Annex B are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61248-1:1996 was approved by CENELEC as a European Standard without any modification.

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1 General

1.1 Scope

This part of IEC 1248 is a generic specification which prescribes the compliance requirements for manufacturers of transformers and inductors for use in electronic equipment in order to obtain capability approval in accordance with **11.7** of QC 001002, and the component test schedules to be used for the assessment of that capability. It applies to components, including polyphase types, that are primarily intended for use in electronic and telecommunication equipment.

This specification also prescribes requirements for marking, delayed delivery and ordering, and lists standard ratings and characteristics. In addition, it specifies how quality conformance testing should be carried out on ordered components.

NOTE The transformers and inductors that are the subject of this specification may include other components essential to the operation of the device, e.g. capacitors associated with constant voltage transformers and resonated windings.

1.2 Normative references

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this part of IEC 1248. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 1248 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC Guide 102:1989, *Electronic components. Specification structures for quality assessment (Qualification approval and capability approval)*.

IEC QC 001001:1986, *Basic rules of the IEC Quality Assessment System for Electronic Components (IECQ)*. Amendment 2 (1994)

IEC QC 001002:1986, *Rules of procedure of the IEC Quality Assessment System for Electronic Components (IECQ)*. Amendment 2 (1994)

IEC QC 001004, *Specifications list*.

IEC QC 001005, *Register of firms, products and services approved under the IECQ System, including ISO 9000*.

IEC 50, *International Electrotechnical Vocabulary (IEV)*.

IEC 68-1:1988, *Environmental testing — Part 1: General and guidance*. Amendment 1 (1992)

IEC 68-2, *Environmental testing — Part 2: Tests*.

IEC 68-2-1:1990, *Environmental testing — Part 2: Tests — Tests A: Cold*. Amendment 1 (1993), Amendment 2 (1994)

IEC 68-2-2:1974, *Environmental testing — Part 2: Tests — Tests B: Dry heat*. Amendment 1 (1993), Amendment 2 (1994)

IEC 68-2-3:1969, *Environmental testing — Part 2: Tests — Test Ca: Damp heat, steady state*.

IEC 68-2-6:1982, *Environmental testing — Part 2: Tests — Test Fc and guidance: Vibration (sinusoidal)*.

IEC 68-2-7:1983, *Environmental testing — Part 2: Tests — Test Ga and guidance: Acceleration, steady state*.

Amendment 1 (1986)

IEC 68-2-13:1983, *Environmental testing — Part 2: Tests — Test M: Low air pressure*.

IEC 68-2-14:1984, *Environmental testing — Part 2: Tests — Test N: Change of temperature*. Amendment 1 (1986)

IEC 68-2-17:1994, *Environmental testing — Part 2: Tests — Test Q: Sealing*.

IEC 68-2-20:1979, *Environmental testing — Part 2: Tests — Test T: Soldering*. Amendment 2 (1987)

IEC 68-2-21:1983, *Environmental testing — Part 2: Tests — Test U: Robustness of terminations and integral mounting devices*.

Amendment 2 (1991), Amendment 3 (1992)

IEC 68-2-27:1987, *Environmental testing — Part 2: Tests — Test Ea and guidance: Shock*.

IEC 68-2-29:1987, *Environmental testing — Part 2: Tests — Test Eb and guidance: Bump*.

IEC 68-2-58:1989, *Environmental testing — Part 2: Tests — Test Td: Solderability, resistance to dissolution of metallization and to soldering heat of Surface Mounting Devices (SMD)*.

IEC 76-1:1993, *Power transformers — Part 1: General*.

IEC 367-1:1982, *Cores for inductors and transformers for telecommunications — Part 1: Measuring methods*.

Amendment 1 (1984), Amendment 2 (1992)

IEC 410:1973, *Sampling plans and procedures for inspection by attributes*.

IEC 617, *Graphical symbols for diagrams*.

IEC 651:1979, *Sound level meters*.

Amendment 1 (1993)

IEC 695, *Fire hazard testing*.

IEC 723, *Inductor and transformer cores for telecommunication*.

IEC 852-5:1994, *Outline dimensions of transformers and inductors for use in telecommunication and electronic equipment — Part 5: Transformers and inductors using the series Q of C-cores*.

IEC 1007:1994, *Transformers and inductors for use in electronic and telecommunication equipment — Measuring methods and test procedures*.

ISO 31, *Quantities and units*.

1.3 General considerations

For convenience, the following outline of the sequence of events in the capability approval procedure is given.

- a) A manufacturer wishing to obtain capability approval writes a capability manual which clearly defines the scope of his design capability, manufacturing processes and quality control, to the satisfaction of the National Supervising Inspectorate (NSI).
- b) The manufacturer, in collaboration with the NSI, selects sample components to demonstrate the limits of this scope, and the sample is assessed.
- c) These components are submitted to a test programme in accordance with clause 3 of this generic specification.
- d) When testing is successfully completed and the manufacturer's systems approved against the capability manual, capability approval is granted and the fact is published in QC 001005. The capability approval is maintained by periodic testing of sample components at the limits of the scope of the capability.
- e) A potential customer makes an enquiry to the manufacturer for components within the scope of capability published in QC 001005 (or by CODUS).
- f) The specification will be decided by the following two methods:
 - 1) the specification is negotiated between the manufacturer and the customer until an agreed detail specification is finalized;
 - 2) the detail specification is prepared by the manufacturer for his series of catalogue products. The customer will check the detail specification which will be modified by the customer's request if necessary.

NOTE The detail specification is preferably based on one of the blanks included in the appropriate sectional specification.

- g) The manufacturer allocates a reference number to the resulting detail specification which is filed and is available for scrutiny by the NSI. The component is inspected and released in accordance with this specification.

1.4 Terminology

For the purposes of this specification, the definitions of IEC 1007 apply, together with those given in IEC 50 and IEC 410.

1.5 AQLs for particular parameter and for the whole sample of components

1.5.1 AQL for particular parameter (PAQL)

The AQLs ratings designated for particular parameters listed in the inspection requirements of the detail specifications are the maximum numbers of defects per hundred units.

1.5.2 AQL for the whole sample of components (SAQL)

The AQLs can be designated as the maximum percent defective for the whole sample of components, as defined in 3.4.1.1, or for a selected group (or groups) of parameters specified in the CQC schedules and listed in 3.4.2 (e.g. for the group or groups of parameters which are for the customer of fundamental importance for the component operation).

AQLs ratings for the whole sample are decided by the method 1 described in 1.3 f).

1.6 Letter symbols, signs and abbreviations

Letter symbols, signs and abbreviations shall comply with ISO 31.

1.7 Graphical symbols

Graphical symbols shall comply with IEC 617.

1.8 Marking of the component and package

Unless otherwise specified in the detail specification, each component shall be marked as far as it is practical with the items given below, in the order of precedence stated:

- a) type designation¹⁾;
- b) manufacturer's name or trade mark;
- c) production lot number or date code²⁾.

All the above information shall appear also on the primary package.

NOTE 1 If a transparent package is used, the information may be marked on a label that can be read without opening the package.

NOTE 2 For polyphase components it is desirable to give a connection symbol as defined in IEC 76-1.

1.9 Structurally similar components

The requirements relating to structural similarity are superseded by the details of the capability approval procedure included in clause 3.

1.10 Delayed delivery

Components held for a period exceeding one year after acceptance testing shall be re-examined prior to despatch and shall satisfy the inspection requirements specified below, unless otherwise specified in the detail specification.

Solderability

Test Ta of IEC 68-2-20 or

Test Td of IEC 68-2-58, as specified in the detail specification

Minimum: two terminations

Maximum: 10 %

1.11 Certified test records

Certified test records (CTRs) shall be provided only when specifically required by the detail specification.

When so provided, CTRs shall be printed on size A4 paper in the format, for example, illustrated in Annex A.

¹⁾ For components supplied against the detail specification, the type designation will be that required by the customer. For components supplied against the detail specification for standard catalogue items, the type designation will be the manufacturer's type designation.

²⁾ Where the date also serves as lot identification, only the date code need appear on the component and package.