

Printed boards —

Part 1: Generic specification

National foreword

This British Standard is the English language version of EN 62326-1:1997. It is identical with IEC 2326-1:1996.

This Part 1 forms the generic specification in the IEC quality assessment system for electronic components (IECQ) for printed boards. In the IECQ system, this specification is numbered QC 230000.

The UK participation in its preparation was entrusted to Technical Committee EPL/52, Printed circuits, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

Cross-references

Attention is drawn to the fact that Annex ZA lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or using the “Find” facility of the BSI Standards Electronic Catalogue.

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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 18, 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.

Amendments issued since publication

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English version

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(IEC 2326-1:1996)

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European Committee for Electrotechnical Standardization
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Foreword

The text of document 52/654/FDIS, future edition 1 of IEC 2326-1, prepared by IEC TC 52, Printed circuits, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62326-1 on 1996-12-09.

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) 1997-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) —

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 to Annex E are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 2326-1:1996 was approved by CENELEC as a European Standard without any modification.

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1 Scope

This part of IEC 2326 is a Generic Specification (GS) applying to printed boards within the IEC quality assessment system for electronic components (IECQ). It relates to printed boards irrespective of their method of manufacture, when they are ready for mounting of components. This standard specifies the system and procedure for approval of manufacturers and products, and provides rules for the preparation of specifications for printed boards.

NOTE Plated-through holes. Conductive holes may be achieved by plating-through, by other metallization techniques or by deposition of conductive polymeric materials. Requirements for non-plated-through conductive holes are under consideration

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 2326. 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 2326 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/FDIS 1189-3, *Test methods for electrical materials, interconnection structures and assemblies — Part 3: Test methods for interconnection structures*¹⁾.

IEC 1182-1:1994, *Printed boards — Electronic data description and transfer — Part 1: Printed board description in digital form*.

QC 001002:1986, *Rules of procedure of the IEC Quality Assessment System for electronic components (IECQ)*.

QC 001005:1994, *Register of Firms, Products and Services approved under the IECQ system, including ISO 9000*.

ISO 9000, *Quality management and quality assurance standards*.

ISO 9001:1994, *Quality systems — Model for quality assurance in design development, production, installation and servicing*.

ISO 9002:1994, *Quality systems — Model for quality assurance in production, installation and servicing*.

3 General

3.1 General considerations

Printed boards differ from most other electronic components in important factors, such as:

- there are no standard boards with standard patterns and dimensions but an infinite variety of shapes and circuit configurations;
- they are “custom tailored”, i.e. all details for a particular board are agreed between manufacturer and customer;
- although they are made in considerable total quantities, the production quantity of a particular printed board may be small.

The qualification approval procedure as detailed in 11.1 to 11.6 of QC 001002 cannot therefore be applied. Instead, it is necessary to use the capability approval procedure as laid down in 11.7 of QC 001002. In addition, ISO 9000 assessment of the quality system is required.

In the case of printed boards, capability approval is based on the use of Capability Test Board (CTB) or suitable Production Printed Board (PPB) as capability qualifying components with an appropriate selection of test methods and requirements for each type of printed board, for example:

- rigid single and double-sided printed boards without interlayer connections;
- rigid single and double-sided printed boards with interlayer connections;
- rigid multilayer printed boards with interlayer connections;
- flexible multilayer printed boards with interlayer connections.

NOTE This list is not intended to be exhaustive.

An important requirement of capability approval is that a manufacturer shall demonstrate the claimed capability to manufacture a given product. This capability approval system is described in clause 5.

In the case of printed boards, product and process capability are differentiated (see also 5.1, 5.5.2 and 5.5.3) and are defined in an IEC Capability Detail Specification (Cap DS).

Only a Cap DS prepared by IEC is registered by IECQ. If a National Committee wishes to have a National Cap DS registered by IECQ, this National Committee shall ask IEC/TC52 to prepare a Cap DS.

¹⁾ At present at the stage of Final Draft International Standard.

Product capability is the capability to manufacture a product of defined characteristics.

Examples of product characteristics are:

- maximum size of printed boards that can be processed;
- minimum diameter of plated-through holes relative to board thickness;
- minimum conductor width and/or spacing;
- maximum number of layers.

Process capability is the capability to use processes for the manufacture of printed boards as defined in the Cap DS.

Examples are:

- processing of Computer Aided Design (CAD) data;
- electrolytic copper plating;
- tin lead plating;
- solder resist application.

Capability approval shall be verified through satisfactory compliance with ISO 9000, ISO 9001 or ISO 9002, which addresses the manufacturer's quality system. In addition, capability approval is required as stated in 10.2.4 to 10.2.6 of QC 001002, to determine compliance with the capability claimed by the manufacturer as defined in the appropriate Capability Detail Specification.

It is recommended that ISO certification and IEC capability approval be accomplished concurrently.

Materials used to produce printed boards are specific to the product type and have an influence on printed board performance. Appropriate materials are described in the Cap DS.

Examples of base materials are:

- IEC 1249-2-7: *Materials for interconnexion structures — Part 2: Sectional specification set for reinforced base materials, clad and unclad — Section 7: Epoxide woven glass laminate (under consideration);*
- IEC 1249-2-1: *Materials for interconnexion structures — Part 2: Sectional specification set for reinforced base materials, clad and unclad — Section 1: Phenolic cellulose paper laminate;*
- IEC 1249-3-2: *Materials for interconnexion structures — Part 3: Sectional specification set for unreinforced base materials, clad and unclad — Section 2: Flexible polyimide film;*
- IEC 1249-4-1: *Materials for interconnexion structures — Part 4: Sectional specification set for prepreg materials, unclad (for the manufacture of multilayer boards) — Section 1: Epoxide woven glass prepreps.*

3.2 Structure of the specification series

Although printed boards differ from other electronic components, the specifications as described in the Rules of Procedure for components under the qualification approval procedure will be used as far as practicable.

All levels of specifications have essentially the same significance for both components under qualification approval and printed boards under capability approval.

These are:

- Basic Specifications;
- Generic Specification;
- Sectional Specifications;
- Blank Detail Specifications;
- Detail Specifications.

Basic Specifications (BS) are applicable to all electronic components, for example, basic environmental tests, SI units, etc.

The *Generic Specification (GS)* for printed boards is this standard.

Each *Sectional Specification (SS)* covers one type of printed board, for example rigid single and double-sided printed boards with interlayer connections, rigid multilayer printed boards with interlayer connections, etc.

The *Sectional Specification* gives the requirements, test specimens and test sequence which are applicable for a Performance Level (PL).

A performance level is a level of requirements of a characteristic.

The combination of test schedule (e.g. number and type of tests), performance level and sample size selection is called assessment criteria. Applicable assessment criteria are specified in Table 1 of the relevant SS.

A *Blank Detail Specification* is not applicable to printed boards. For printed boards two different types of Detail Specifications are in use:

- Capability Detail Specification (Cap DS);
- Customer Detail Specification (CDS).

The *Capability Detail Specification (Cap DS)* fully describes the Capability Qualifying Component (CQC) and applies one of the performance levels of the SS to that CQC, for example:

- performance level A;
- performance level B;
- performance level C.