

Connectors for frequencies below 3 MHz for use with printed boards —

Part 1: Generic specification — General requirements and guide for the preparation of detail specifications, with assessed quality

The European Standard EN 60603-1:1998 has the status of a
British Standard

ICS 31.220.10

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/21, upon which the following bodies were represented:

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

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA Ltd.)
- British Telecommunications plc
- Society of British Aerospace Companies Limited

This British Standard, having been prepared under the direction of the Electronic Components Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 July 1993

© BSI 03-2000

The following BSI references relate to the work on this standard:
Committee reference ECL/21
Special announcement in *BSI News* January 1993

ISBN 0 580 21872 4

Amendments issued since publication

Amd. No.	Date	Comments
10432	March 2000	Renumbers BS QC 010000:1993 as BS EN 60603-1:2000

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Section 1. Scope and object	
1 Scope and object	1
Section 2. General	
2 Related documents	1
Section 3. Quality assessment procedures	
3 Quality assessment procedures	3
Section 4. General requirements, tests and test schedules	
4 Testing	11
Section 5. Preparation of detail specifications	
5 Title of detail specifications	15
Appendix A Common lettering system to be used in drawings	19
Appendix B Recommended termination lengths for printed board connectors having terminals intended to be flow soldered	20
Annex ZA (normative) Normative references to international publications with their corresponding European publications	21
Figure B.1	20
Table I — Qualification approval test schedule for connectors	7
Table IIa — Quality conformance inspection, lot-by-lot tests	10
Table IIb — Quality conformance inspection, periodicity tests	11

National foreword

This British Standard is the English language version of EN 60603-1:1998, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 60603-1:1991 (QC010000), *Connectors for frequencies below 3 MHz for use with printed boards — Part 1: Generic specification — General requirements and guide for the preparation of detail specifications, with assessed quality*, including Amendment 1:1992, published by the International Electrotechnical Commission (IEC), and is a harmonized specification in the IECQ system of quality assessment for electronic components. IEC 60603-1 was prepared by IEC Subcommittee 48B, Connectors, of IEC Technical Committee No. 48, Electromechanical components for electronic equipment, and the United Kingdom participation in the drafting was provided by Subcommittee ECL/21/2, Connectors for electronic equipment, of Technical Committee ECL/21, Electromechanical components for electronic equipment.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index” or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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 and ii, the EN title page, the EN foreword page, pages 1 to 22, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

ICS 31.220.10

Descriptors: electronic components, electric connections, printed-circuit cards, characteristics, general conditions, detail specifications, quality assurance, technical wiring, instructions

English version

Connectors for frequencies below 3 MHz for use with printed boards — Part 1: Generic specification — General requirements and guide for the preparation of detail specifications, with assessed quality

(IEC 60603-1:1991 + A1:1992)

Connecteurs pour fréquences inférieures à 3 MHz pour utilisation avec cartes imprimées —
Partie 1: Spécification générique —
Prescriptions générales et guide de rédaction des spécifications particulières, avec assurance de la qualité
(CEI 60603-1:1991 + A1:1992)

Steckverbinder für gedruckte Schaltungen für Frequenzen unter 3 MHz —
Teil 1: Fachgrundspezifikation Allgemeine — Anforderungen und Leitfaden für die Erstellung von Bauartspezifikationen mit Qualitätsbewertung
(IEC 60603-1:1991 + A1:1992)

This European Standard was approved by CENELEC on 1998-01-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and 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 the International Standard IEC 60603-1:1991 and its amendment 1:1992, prepared by SC 48B, Connectors, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the formal vote and was approved by CENELEC as EN 60603-1 on 1998-01-01 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) 1998-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-12-01

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

Annexes designated “informative” are given for information only.

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

Annex ZA has been added by CENELEC.

Section 1. Scope and object

1 Scope and object

This part of IEC 603 is applicable to printed board connectors designed for use in equipment for telecommunication and electronic data processing and in electronic equipment or devices employing similar techniques. This generic specification shall be used in conjunction with the relevant detail specification(s).

Connectors essentially for applications at frequencies exceeding 3 MHz are not covered by this generic specification.

The object of this part of IEC 603 is to establish uniform specifications, type test requirements and quality assessment procedures for connectors for use with printed boards and to establish rules for the preparation of detail specifications for connectors of assessed quality.

In the event of conflict between this generic specification and the detail specification, the requirements of the detail specification shall prevail.

Section 2. General

2 Related documents

This generic specification shall be used in conjunction with the following publications. Units, graphic symbols and letter symbols shall be used whenever possible in accordance with the requirements of the publications listed below.

IEC 27, *Letter symbols to be used in electrical technology*.

IEC 50(581):1978, *IEV — Chapter 581: Electromechanical components for electronic equipment*.

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

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

IEC 512-1:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 1: General*.

IEC 512-2:1985, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 2: General examination, electrical continuity*.

IEC 512-3:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 3: Current-carrying capacity tests*.

IEC 512-4:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 4: Dynamic stress tests*.

IEC 512-5:1977, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests*.

IEC 512-6:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 6: Climatic tests and soldering tests*.

IEC 512-7:1988, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 7: Mechanical operating tests and sealing tests*.

IEC 512-8:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*.

IEC 617, *Graphical symbols for diagrams*.

QC 001002:1986, *Rules of procedure of the IEC quality assessment system for electronic components (IECQ)*.

ISO 129:1985, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications*.

ISO 286-1:1988, *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits*.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*.

ISO 1000:1981, *SI units and recommendations for use of their multiples and of certain other units*.

2.1 Terminology

The terminology used in and applicable to this part of IEC 603 is included in IEC 50(581).

For the purpose of this standard, the following additional terms and definitions shall apply:

2.1.1 type
connectors within a particular sub-family, such as one-part connectors (edge-socket connectors), two-part connectors

2.1.2 style
a particular connector within a type

2.1.3 variant
variations within a type and style, or within a group of related connectors

2.1.4 Examples

- Family: connector.
- Sub-family: connector for printed boards.
- Type: two-part connector for printed boards.
- Style: a particular external mounting configuration, e.g. rectangular flange mounting.
- Variant: number of contacts, polarization, terminations, etc.

2.2 Classification into climatic categories

The connectors are classified into climatic categories in accordance with the general rules given in IEC 68-1.

The following preferred temperature ranges and severities of the damp heat, steady state tests have been selected:

Category	Temperature range	Damp heat, steady state	Climatic category
10/070/04	– 10 °C to + 70 °C	4 days	Each performance level of a designated connector has only one climatic category and shall be specified in Sub-clause 6.1 of the detail specification
25/070/10	– 25 °C to + 70 °C	10 days	
40/085/21	– 40 °C to + 85 °C	21 days	
40/085/56	– 40 °C to + 85 °C	56 days	
55/100/21	– 55 °C to + 100 °C	21 days	
55/125/21	– 55 °C to + 125 °C	21 days	
55/125/56	– 55 °C to + 125 °C	56 days	
65/155/56	– 65 °C to + 155 °C	56 days	

2.3 Creepage and clearance distances

Permissible operating voltages depend on the application and on the applicable or specified safety requirements. Therefore, creepage and clearance distances as well as proof voltages under specified air pressure shall be specified in the detail specification.

2.4 Currents

For each connector, the current-carrying capacity shall be specified in the detail specification, preferably by the current-temperature derating curve evaluated in accordance with Test 5b of IEC 512-3 or by at least one value of current and the associated temperature on this derating curve as well as the maximum operating temperature.

2.5 Marking

2.5.1 On the connector

Each connector shall have the following information marked upon it:

- a) Identification of the contact position as indicated in the detail specification.

If space does not permit full marking, as much as possible of the following in the order shown shall be included:

- b) IEC type designation.
- c) Mark of origin (manufacturer's name or trade mark).
- d) Date code.

2.5.2 On the package

The information b), c) and d) shall also be marked on the package.

2.6 IEC type designation

Connectors to which this standard applies shall be designated by the following indications and in the order given:

- a) The number of the detail specification.
- b) The letters "IEC".
- c) A letter denoting the style of the connector. (The system shall be specified in the detail specification.)
- d) The number of contacts of connectors or of contact cavities of connector bodies.
- e) A letter denoting the type of the contact of two-part connectors or the number of electrically independent rows of edge-socket connectors.

The following letters shall be used:

- M = male contact
- F = female contact
- H = hermaphroditic contact

- f) A letter denoting the basic type of the termination.

The following letters shall be used:

- A = screw terminations
- S = solder terminations
- C = crimp terminations
- W = wrap terminations
- T = tab terminations.

If necessary and explicitly specified in the detail specification, the IEC type designation may optionally be extended to cover further information, for example climatic category, termination information, etc.

For connectors of assessed quality to a specified performance level, a digit shall be used to denote performance level and a letter shall be used to denote assessment level. The digit and letter shall be included in this order as final characters of the type designation.

Section 3. Quality assessment procedures

3 Quality assessment procedures

3.1 Primary stage of manufacture

The primary stage of manufacture as defined in the Rules of Procedure (QC 001002, Sub-clause 8.5.2), is the first process subsequent to the manufacture of finished component parts and sub-assemblies. A sub-assembly is defined as the permanent assembly of two or more component parts.

This primary stage of manufacture and all subsequent processes shall be carried out under the direct surveillance of the manufacturer's approved Chief Inspector. They may be carried out by sub-contractors providing that equivalent disciplines apply.

3.2 Structurally similar styles

Connectors having the same basic design, common contact sizes, and the same contact surface finish, are considered to be structurally similar components as defined in the Rules of Procedure (QC 001002, Sub-clause 8.5.3). They may be different in other features, such as number of contacts, overall size, mounting, termination technique, etc., but shall be produced by the same manufacturing processes and methods.