

Harmonized system of quality
assessment for electronic components

Rectangular connectors for frequencies below 3 MHz —

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

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

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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 21873 2

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
1 General	1
1.1 Scope and object	1
1.2 Normative references	1
2 Technical characteristics	2
3 Quality assessment procedures	4
4 General requirements, tests and test schedules	14
5 Preparation of detail specifications	20
Annex A (normative) Common lettering system (to be used in drawings)	23
Table 1a — Qualification approval test schedule for connectors	7
Table 1b — Qualification approval test schedule for connectors mounted on cable adaptors	9
Table 2a — Quality conformance inspection, lot-by-lot tests	12
Table 2b — Quality conformance insertion, periodic tests	13
List of references	Inside back cover

National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Policy Committee. It is identical with IEC 807-1:1991 (QC 030000) *Rectangular connectors for frequencies below 3 MHz — Part 1: Generic specification — General requirements and guide for the preparation of detail specifications for connectors with assessed quality*, published by the International Electrotechnical Commission (IEC), and is a harmonized specification in the IECQ system of quality assessment for electronic components.

IEC 807-1 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

International Standard	Corresponding British Standard
	BS 2011 <i>Environmental testing</i>
IEC 68-1:1988	Part 1.1:1989 <i>General and guidance</i> (Identical)
	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>
IEC 410:1973	(Technically equivalent)
	BS 5772 <i>Basic testing procedures and measuring methods for electromechanical components for electronic equipment</i>
IEC 512-3:1976	Part 3:1979 <i>Current-carrying capacity tests</i> (Identical)
IEC 512-4:1976	Part 4:1979 <i>Dynamic stress tests</i> (Identical)
IEC 512-6:1984	Part 6:1984 <i>Climatic tests and soldering tests</i> (Identical)
IEC 512-8:1984	Part 8:1985 <i>Connector tests (mechanical) and mechanical tests on contacts and terminations</i> (Identical)
QC 001002:1986	BS QC 001002:1991 <i>Rules of Procedure of the IEC Quality Assessment System for Electronic Components (IECQ)</i> (Identical)
	BS 308 <i>Engineering drawing practice</i>
ISO 129:1985	Part 2:1985: <i>Recommendations for dimensioning and tolerancing of size</i> (Technically equivalent)
	BS 4500 <i>ISO limits and fits</i>
ISO 286-1:1988	Section 1.1:1990 <i>Specification for bases of tolerances, deviations and fits</i> (Identical)
ISO 286-2:1988	Section 1.2:1990 <i>Tables of commonly used tolerance and grades and limits deviations for holes and shafts</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 ISO 1101:1983, IEC 512-2:1985 and IEC 512-7:1985 to which normative reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

NOTE Textual error. In the title of Table 2b, “insertion” should read “inspection”.

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 24, 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 and object

This part of IEC 807 is applicable to rectangular connectors designed for use in equipment for telecommunication, 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 designated especially for applications at frequencies exceeding 3 MHz are not covered in this generic specification.

The object of this part of IEC 807 is to establish uniform specifications, test type requirements and quality assessment procedures for rectangular connectors 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 specifications shall prevail.

1.2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of IEC 807. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of IEC 807 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

IEC 50(581):1978, *International electrotechnical vocabulary (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, *Electromechanical components for electronic equipment, basic testing procedures and measuring methods*.

IEC 512-2:1985, *Electromechanical components for electronic equipment, basic testing procedures and measuring methods. Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*.

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 512-5A:1980, *First supplement*.

IEC 512-5B:1981, *Second supplement*.

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*.

Amendment No. 1 (1985).

IEC 512-9:1977, *Electromechanical components for electronic equipment, basic testing procedures and measuring methods. Part 9: Cable-clamping tests, explosion hazard tests, chemical resistance tests, fire hazard tests, r.f. resistance tests, capacitance tests, shielding and filtering tests and magnetic interference tests*.

Amendment No. 1 (1982).

IEC 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*.

ISO 1101:1983, *Technical drawing — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*.

Section 2. Technical characteristics

2.1 Definitions

For the purpose of this part of IEC 807, the following definitions apply.

2.1.1

connector type

connectors within a particular subfamily. [IEV 581-08-05]

2.1.2

connector style

a particular connector within a type. [IEV 581-08-04]

2.1.3

connector variant

variations within a type and style, or within a group of related connectors. [IEV 581-08-06]

2.1.4

examples

- family: connector;
- subfamily: rectangular connectors;
- type: rectangular connectors with polarized guides or jackscrews;
- style: a particular external mounting configuration, e.g. rectangular flange mounting;
- variant: number of contacts, polarization, terminal, 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 test have been selected.

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

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 established in accordance with test 5b: current temperature derating 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 positions as indicated in the detail specification;

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

- 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.

The following letters shall be used:

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

- f) a letter denoting the basic type of the terminations.

The following letters shall be used:

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

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

Section 3. Quality assessment procedures

3.1 Primary stage of manufacture

The primary stage of manufacture as defined in 8.5.2 of IEC QC 001002 is the first process subsequent to the manufacture of finished piece parts and sub-assemblies. A sub-assembly is defined as the permanent assembly of two or more 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 rectangular connectors

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 8.5.3 of IEC QC 001002. They may have differences in other features, such as number of contacts, overall size, mounting, termination technique, etc., but they all shall be produced by the same manufacturing processes and methods.

Structurally similar connectors may be covered by one common or by several detail specifications. Connectors covered by one common detail specification are considered to be structurally similar. Additional details may be given in the detail specification.

For the purpose of quality conformance inspection and of sampling, all structurally similar connectors may be aggregated into one inspection lot.

3.3 System of levels

The term "level" may have several differing meanings which should be clearly defined. A detail specification may contain more than one performance level and assessment level combinations. All details of these levels and their combinations shall be specified in the detail specification. The performance level and its assessment level shall be clearly described in the detail specification.

3.3.1 Performance level

The performance level is based on four factors:

- the climatic category;
- the test schedule;
- the severities of the test conditions;
- the requirements.

Variations of one or more of these factors, i.e. climatic category, extent of test schedule and/or severity and/or requirements will result in different performance levels each having its own assessment level.

This part of IEC 807 contains a "basic test schedule" and a "full test schedule". Both schedules are explicitly given while an "intermediate test schedule" is mentioned together with the instruction how to specify an intermediate test schedule. These test schedules together with the severities to be applied and the requirements to be fulfilled as specified in the detail specification define the performance levels of the components.

A given component with its type designation has one performance level only. If two components differ in their performance levels, they shall be considered as two different components and they shall have two different type designations.

In the type designation, the performance level shall be designated by the digit 1, 2 or 3 and shall be specified in the detail specification.

3.3.2 Assessment level

The assessment level is the combination of sample size and number of defectives permitted. Each performance level of a structurally similar connector shall have only one assessment level.

For *fixed sample size*, the assessment level is defined by the number of specimens to be tested and the number of defectives permitted. Fixed sample sizes are usually used for qualification approval testing and for periodic tests within quality conformance inspection.