



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS C 5401-1 : 2005

(IEC 61076-1 : 1995)

(JEITA)

**Connectors for electronic equipment —
Part 1: Generic specification**

ICS 31.220.10

Reference number : JIS C 5401-1 : 2005 (E)

PROTECTED BY COPYRIGHT

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal of establishing a Japanese Industrial Standard from Japan Electronics and Information Technology Industries Association (JEITA), with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

This Standard has been made based on **IEC 61076-1:1995** *Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high speed data applications — Part 1: Generic specification* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

JIS C 5401 series consists of the following 7 parts under the general title “Connectors for electronic equipment”:

Part 1: Generic specification

Part 2: Circular connectors with assessed quality — Sectional specification

*Part 2-001: Circular connectors with assessed quality — Sectional specification
Blank Detail Specification*

Part 3: Rectangular connectors with assessed quality — Sectional specification

*Part 3-001: Rectangular connectors with assessed quality — Blank Detail
Specification*

*Part 4: Printed board connectors with assessed quality — Sectional
specification*

*Part 4-001: Printed Board Connectors with assessed quality — Blank Detail
Specification*

Date of Establishment: 2005-03-20

Date of Public Notice in Official Gazette: 2005-03-22

Investigated by: Japanese Industrial Standards Committee
Standards Board
Technical Committee on Electronics
Technology

JIS C 5401-1 :2005, First English edition published in 2005-07

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

Contents

	Page
Introduction	1
1 General information	1
1.1 Scope	1
1.2 General considerations relating to specifications	1
1.3 Normative references	3
2 Technical information	5
2.1 Terminology	5
2.2 Classification into climatic categories	5
2.3 Creepage and clearance distances	6
2.4 Current-carrying capacity	6
2.5 JIS type designation	6
2.6 Marking	6
2.7 Dimensional information	7
3 Quality assessment procedures	8
3.1 Quality assessment definitions	8
3.2 Approval of manufacturers, independent test laboratories, and distributors	11
3.3 Qualification approval (QA)	12
3.4 Capability approval (CA)	13
3.5 Quality conformance inspection	20
3.6 Qualification approval / quality assessment systems	23
4 Tests and test schedules	23
4.1 General aspects	23
4.2 Test schedules	24
4.3 Grouping tests	24
4.4 Delayed delivery	25
4.5 Release for delivery, before completion of “Group B” tests	25
4.6 Delivery of tested connectors	25
Annex A (normative) Common lettering system to be used in drawing	26

Connectors for electronic equipment — Part 1: Generic specification

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **IEC 61076-1** *Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high speed data applications — Part 1: Generic specification* published in 1995 and Amendment 1 (1996) and Amendment 2 (2001) without modifying the technical contents of the original International Standard. In this case edition 1:1995 is consolidated with amendments 1:1996 and 2:2001.

The portion given dotted underlines is the matter not stated in the original International Standard.

1 General information

1.1 Scope This part of **JIS C 5401** establishes uniform specifications, testing requirements and quality assessment procedures for connectors.

This generic specification is applicable to a family of connectors for use in electronic and electrical equipment. Connectors designed for use at radio frequencies are not covered.

The quality assessment procedures are divided into qualification approval (QA) and capability approval (CA) procedures, of which quality conformance inspection forms a part.

NOTE : The International Standard(s) corresponding to this Standard is/are as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

IEC 61076-1:1995 *Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high speed data applications — Part 1: Generic specification* and Amendment 1 (1996) and Amendment 2 (2001) (IDT)

1.2 General considerations relating to specifications This generic specification contains, or gives reference to, the terms, definitions, symbols, test methods and information relating to the inspection peculiar to connectors, and it also includes test sequences for quality assessment.

It shall be used in conjunction with relevant levels of specifications:

- sectional specifications;
- detail specifications, including one blank detail specification per sectional specification.

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

1.2.1 Sectional specifications Details appropriate to a particular subfamily of connectors are contained in the relevant sectional specification, e.g. printed board, circular, rectangular connectors and other connecting devices.

It shall contain a choice of all test methods and sequences, severities and preferred values for dimensions and characteristics which could be applicable to that subfamily.

The contents shall be derived from the generic specification.

In the event of conflict between a sectional specification and the detail specification, the requirements of the detail specification shall prevail.

The following sectional specifications are under consideration or in preparation:

JIS C 5401-2: *Circular connectors*

JIS C 5401-3: *Rectangular connectors*

JIS C 5401-4: *Printed board connectors*

1.2.2 Blank detail specifications Guidance to prepare the appropriate detail specifications shall be given in a blank detail specification, prescribing the layout to be adopted, and the information to be given, thus ensuring a uniform presentation.

Its contents shall be derived from the generic or sectional specification and shall list a selection of the technical criteria necessary and sufficient to assess quality of the subject connector subfamily.

The following blank detail specifications are under consideration:

JIS C 5401-2: *Circular connectors*

JIS C 5401-3: *Rectangular connectors*

JIS C 5401-4: *Printed board connectors*

1.2.3 Detail specifications Detail specifications shall give directly, or by making reference to other normative documents, all information necessary to describe a given connector or range of connectors completely, and to ensure conformance thereof with the requirements for quality assessment under the **IECQ**.

Their contents shall be derived from the generic or sectional specification, and shall list a selection of the technical criteria necessary and sufficient to assess quality of the subject connector type, and shall be considered complete and sufficient for inspection purposes.

1.2.4 Conformance to different levels of compatibility As a function of the standardization degree, four levels characterize the compatibility of connectors from different sources. These levels are defined in **1.2.4.1** to **1.2.4.4** and shall, when appropriate, be indicated in the detail specification of the connector.

NOTE : If connectors of differing compatibility levels are mated, the lower level prevails.

1.2.4.1 Level 1 – Intermountable This level standardizes only overall dimensions and mounting dimensions on printed board or panel cut-out and cable termination assembly. Connectors from different sources are not necessarily intermateable.

Information required in a detail specification in order to satisfy this level are: printed board layout, board distances and orientation (parallel or perpendicular) and/or panel cut-out and location. For free-cable connectors, cable termination assembly characteristics shall be specified.

1.2.4.2 Level 2 – Intermateable This level standardizes only dimensions of electrical and mechanical interfaces.

Electrical, mechanical and climatic performances of connectors from different sources, when mated, are not fully guaranteed.

1.2.4.3 Level 3 – Intermateable and intermountable This level standardizes mounting dimensions, electrical and mechanical interface and overall dimensions.

Electrical, mechanical and climatic performances of connectors, from different sources, when mated, are not fully guaranteed.

1.2.4.4 Level 4 – Interchangeable This level standardizes all the elements guaranteeing compliance of the electrical, mechanical and climatic performances of mated connectors when individual connector halves are from different sources.

NOTE : The complexity of demonstrating interchangeability at level 4 may be substantial and therefore should be evaluated prior to the level being specified.

1.3 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. If the indication of the year of publication is given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter do not apply. The normative references without the indication of the year of coming into effect/publication apply only to the most recent editions (including amendments).

JIS B 0021 *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out*

NOTE : **ISO 1101:1983** *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings* is identical with the said standard.

JIS B 0031 *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

NOTE : **ISO 1302:2002** *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation* is identical with the said standard.

JIS B 0401-1 *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits*

NOTE : **ISO 286-1:1988** *ISO system of limits and fits — Part 1: Bases of tolerances, deviations and fits* is identical with the said standard.

JIS B 0401-2 *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*

NOTE : **ISO 286-2:1988** *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts* is identical with the said standard.

JIS C 0704 *Insulation test for control gear*

NOTE : **IEC 60664-1:2002** *Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests* is equivalent to the said standard.

JIS C 5402-1 *Connectors for electronic equipment — Tests and measurements — Part 1: General*

NOTE : **IEC 60512-1:2001** *Connectors for electronic equipment — Tests and measurements — Part 1: General* is identical with the said standard.

JIS C 5402-5-2 *Connectors for electronic equipment — Tests and measurements — Part 5-2: Current-carrying capacity tests — Test 5b: Current-temperature derating*

NOTE : **IEC 60512-5-2:2002** *Connectors for electronic equipment — Tests and measurements — Part 5-2: Current-carrying capacity tests — Test 5b: Current-temperature derating* is identical with the said standard.

JIS C 60068-1 *Environmental testing Part 1: General and guidance*

NOTE : **IEC 60068-1:1988** *Environmental testing. Part 1: General and guidance* is identical with the said standard.

JIS Q 9001 *Quality management systems — Requirements*

NOTE : **ISO 9001:2000** *Quality managements systems — Requirements* is identical with the said standard.

JIS Z 8203 *SI units and recommendations for the use of their multiples and of certain other units*

NOTE : **ISO 1000:1992** *SI units and recommendations for the use of their multiples and of certain other units* is identical with the said standard.

JIS Z 8317 *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications*

NOTE : **ISO 129:1985** *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications* is equivalent to the said standard.

JIS Z 9015-1 *Sampling procedures for inspection by attributes — Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection*

NOTE : **ISO/DIS 2859-1-2** *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptable quality level (AQL) for lot-by-lot inspection* is equivalent to the said standard.

IEC 60050-581 *International Electrotechnical Vocabulary: Electromechanical components for electronic equipment*

IEC Guide 102:1996 *Electronic components — Specification structures for quality assessment (Qualification approval and capability approval)*

IECQ 001002-2:1998 *IEC Quality Assessment System for Electronic Components (IECQ) — Rules of Procedure Part 2: Documentation*

IECQ 001002-3:1998 *IEC Quality Assessment System for Electronic Components (IECQ) — Rules of Procedure Part 3: Approval procedures*

2 Technical information

2.1 Terminology The terminology used in and applicable to this specification is included in **IEC 60050-581**.

For the purpose of this specification, the following (additional) terms and definitions shall apply.

2.1.1 Family: connector.

2.1.2 Sub-family: a group of connectors recognizable by their basic shape or intended application, i.e.:

- circular connectors;
- rectangular connectors;
- printed board connectors;
- sockets for plug-in devices.

2.1.3 Type: connectors within a particular sub-family, such as edge-socket connectors for printed boards, or two-part connectors for printed boards.

2.1.4 Style: a particular connector within a type.

2.1.5 Variant: variations within a type and style, or within a group of related connectors.

Examples: Family: connectors.

Sub-family: connectors for printed boards.

Type: two-part connector for printed boards.

Style: a particular configuration, e.g. flange mounting.

Variant: number of contacts, polarization, termination, etc.

For the following definitions, reference is made to **JIS C 0704**.

- clearance;
- creepage distance;
- rated voltage;
- working voltage.

2.2 Classification into climatic categories Connectors are classified into climatic categories in accordance with the general rules given in **IEC 60068-1**.

Preferred temperature ranges and severities of the damp heat, steady state tests have been selected, see table 1.

Any combination of these elements may be used, and should be written in the format: e.g. 55/125/21, in the applicable sectional and detail specifications.

Table 1 Climatic categories – selected values

Lower temperature °C	Upper temperature °C	Damp heat, steady state (days)
–10	70	4
–25	85	10
–40	100	21
–55	125	56
–65	155	
	175	
	200	
	260	

2.3 Creepage and clearance distances Permissible working or rated 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.

Guidance is provided in **JIS C 0704**.

2.4 Current-carrying capacity For each connector, the current-carrying capacity shall be specified in the detail specification, preferably by the derating curve determined in accordance with Test 5b of **JIS C 5402-5-2**.

2.5 JIS type designation Connectors to which this Standard applies shall be designated as specified in the relevant sectional specification.

2.6 Marking

2.6.1 On the connector Each connector shall have the identification of the contact positions marked upon it as indicated in the detail specification. It shall include:

- a) mark of origin (manufacturer's name or trade mark);
- b) year and month (or week) of manufacture, if explicitly required by the detail specification;
- c) **JIS** type designation, in accordance with **2.5**.

However, since the number of characters this requires may exceed the limitations imposed by computer processing systems, the manufacturer may use his own part number, providing that a cross-reference list is made available.

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

NOTE : The “dashes” which are part of the **JIS** standard numbering system may be omitted to save additional space, e.g. JISC54014101, etc.

2.6.2 On the package The information specified in items **a)**, **b)** and **c)** shall always be marked on the package.