

INTERNATIONAL STANDARD

IEC
61076-4-108

QC 480301XX0009

First edition
2002-02

Connectors for electronic equipment –

Part 4-108:

**Printed board connectors with assessed quality –
Detail specification for cable-to-board connectors,
with a modular pitch of 25 mm and integrated
shielding function, applicable for transverse
packing density of 15 mm, having a basic grid
of 2,5 mm in accordance with IEC 60917-1**

[IEC 61076-4-108:2002](https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002)

[https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-
2368bfa31de1/iec-61076-4-108-2002](https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002)



Reference number
IEC 61076-4-108:2002(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** (www.iec.ch)

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site (www.iec.ch/catlg-e.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications (www.iec.ch/JP.htm) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: custserv@iec.ch
Tel: +41 22 919 02 11
Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

IEC 61076-4-108

QC 480301XX0009

First edition
2002-02

Connectors for electronic equipment –

Part 4-108:

**Printed board connectors with assessed quality –
Detail specification for cable-to-board connectors,
with a modular pitch of 25 mm and integrated
shielding function, applicable for transverse
packing density of 15 mm, having a basic grid
of 2,5 mm in accordance with IEC 60917-1**

<https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002>

© IEC 2002 — Copyright - all rights reserved

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.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

XB

For price, see current catalogue

CONTENTS

FOREWORD.....	5
1 General data.....	8
1.1 Recommended method of mounting	8
1.1.1 Maximum number of contacts	9
1.2 Ratings and characteristics	11
1.3 Normative references	11
1.4 Marking	12
1.5 IEC type designation.....	13
1.6 Ordering information.....	13
2 Technical information.....	14
2.1 Definitions	14
2.1.1 Mechanical features.....	14
2.1.2 Contacts and terminations.....	14
2.1.3 Engagement sequence	14
2.1.4 Mechanical coding, locking	15
2.2 Surveys of styles and variants.....	15
2.2.1 Styles of connectors.....	15
2.2.2 Survey of termination variants.....	20
2.3 Information on application.....	21
2.3.1 Connector pairs	21
2.3.2 Fixed board connectors.....	22
2.3.3 Free cable connectors.....	23
2.3.4 Accessories	23
2.3.5 Shielding and grounding.....	24
2.3.6 Basic styles of the connections	25
2.4 Survey of contact arrangements.....	25
3 Dimensional information	26
3.1 General	26
3.2 Isometric view and common features	27
3.2.1 Common features	28
3.2.2 Reference system	28
3.2.3 Height dimensions	29
3.2.4 Width dimensions	30
3.2.5 Depth dimensions	31
3.3 Mating information	31
3.3.1 Engaging direction	31
3.3.2 Perpendicular to engaging direction	31
3.3.3 Inclination	31
3.4 Fixed board connectors	32
3.4.1 Dimensions of board connectors	32
3.4.2 Dimensions of male contacts	39

3.5	Free cable connectors	41
3.5.1	Dimensions of cable connectors	41
3.5.2	Dimensions of female contacts	45
3.6	Accessories	46
3.6.1	Coding devices	46
3.6.2	Shielding / ground contact	47
3.7	Mounting information for fixed board connectors	48
3.7.1	Hole pattern on backplane	48
3.7.2	Hole pattern on printed board (front)	49
3.8	Mounting information for free cable connectors	49
3.9	Gauges	50
3.9.1	Sizing and retention force gauges	50
3.9.2	Test gauge for shield / ground contact	50
4	Characteristics	51
4.1	Climatic categories	51
4.2	Electrical	51
4.2.1	Creepage and clearance distances	51
4.2.2	Voltage proof	51
4.2.3	Current carrying capacity	52
4.2.4	Initial contact resistance	52
4.2.5	Initial insulation resistance	52
4.3	Mechanical	53
4.3.1	Mechanical operation	53
4.3.2	Engaging and separating forces	53
4.3.3	Contact retention in insert	53
4.3.4	Static load, transverse	53
4.3.5	Withdrawal force with gauge	53
4.3.6	Vibration (sinusoidal)	54
4.3.7	Shock	54
4.3.8	Polarizing method	54
4.3.9	Mechanical coding	54
4.3.10	Latching force in male connector body	55
4.3.11	Cable clamp resistance to cable rotation	55
4.3.12	Cable connector drop test	55
4.4	Electromagnetic compatibility (EMC)	55
4.4.1	Shielding effectiveness	55
5	Test schedule	56
5.1	General	56
5.1.1	Arrangement for contact resistance measurement	57
5.1.2	Arrangement for dynamic stress tests	57
5.1.3	Arrangement for testing static load, transverse	58
5.1.4	Arrangement for testing insulation resistance, voltage proof and polarization voltage	59
5.1.5	Arrangement for flammability test	59
5.2	Test schedule tables	60
5.2.1	Group P – Preliminary	60
5.2.2	Group AP – Dynamic / Climatic	61
5.2.3	Group BP – Mechanical endurance	64

5.2.4	Group CP – Moisture	65
5.2.5	Group DP – Electrical load	65
5.2.6	Group EP – Mechanical resistivity	66
5.2.7	Group FP – Chemical resistivity	67
5.2.8	Group GP – Connections	67
5.2.9	Group HP – Electromagnetic compatibility	67
6	Quality assessment procedures	67
6.1	Qualification approval testing	67
6.1.1	Method 1	67
6.1.2	Method 2	67
6.2	Quality conformance inspection	68
6.2.1	Lot-by-lot tests	68
6.2.2	Periodic tests	69
6.3	Delayed delivery, re-inspection	69

Annex A (informative) Shielding effectiveness

iTeh STANDARD PREVIEW (standards.iteh.ai)

IEC 61076-4-108:2002

<https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRONIC EQUIPMENT –

**Part 4-108: Printed board connectors with assessed quality –
Detail specification for cable-to-board connectors, with a modular pitch
of 25 mm and integrated shielding function, applicable for transverse
packing density of 15 mm, having a basic grid of 2,5 mm
in accordance with IEC 60917-1**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61076-4-108 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

The text of this standard is based on the following documents:

FDIS	Report on voting
48B/1122/FDIS	48B/1170/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated when a new edition is prepared.

The QC number that appears on the front cover of this publication is the specification number in the IEC Quality Assessment System for Electronic Components (IECQ).

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

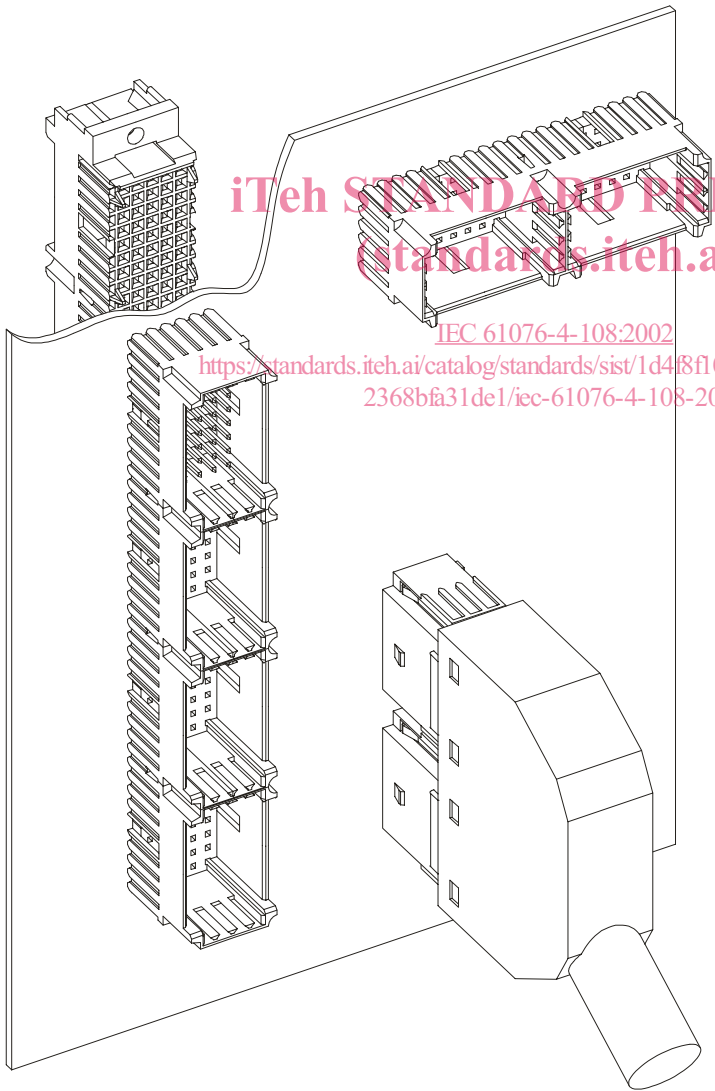
iTeh STANDARD PREVIEW **(standards.iteh.ai)**

IEC 61076-4-108:2002

<https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002>

CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 4-108: Printed board connectors with assessed quality –
Detail specification for cable-to-board connectors, with a modular pitch
of 25 mm and integrated shielding function, applicable for transverse
packing density of 15 mm, having a basic grid of 2,5 mm
in accordance with IEC 60917-1

<p>IEC SC 48B – Connectors</p> <p>Specification available from: IEC Central Office or from the addresses shown on the inside cover.</p> <p>ELECTRONIC COMPONENTS OF ASSESSED QUALITY</p> <p>DETAIL SPECIFICATION in accordance with IEC 61076-1:1995.</p>	<p>IEC 61076-4-108 QC 480301XX0009</p>
 <p>IEC 61076-4-108:2002</p> <p>https://standards.iteh.ai/catalog/standards/sist/1d48f10-a304-4c8b-908c-2368bfa31de1/iec-61076-4-108-2002</p> <p>IEC 395/02</p>	<p>Cable connector system, – 15 mm mounting pitch –, for printed boards and backplanes, grid of 2,5 mm in accordance with IEC 60917-1, integrated shielding function.</p> <p>Modular, five row connector, with shielding, ground contacts and coding features. Fixed board connectors 50 mm to 250 mm length Free cable connectors, 25 mm to 100 mm length.</p> <p>Performance levels (PL): 1, 2 Assessment level: G</p>

Information on the availability of components qualified to this detail specification is given in the qualified products list.

1 General data

This specification describes adapter connectors of modular metric construction in conformance with IEC 60917-1.

Interface connectors and cable connectors are used to make the electrical connection between a closed functional unit, for example a subrack, and its environment. The modular construction and the various connector styles enable a suitable connector to be used in equipment practices for electronic equipment such as data systems, communications technology, telecommunications engineering and safety and security systems, power engineering and automation technology.

Throughout this specification all dimensions are in millimetres.

1.1 Recommended method of mounting

The connectors are used for connecting a printed board to a cable (see also figure 1).

The connectors are matched to the 2,5 mm contact grid. They can be mounted in an existing grid coordinate system horizontally or vertically or overlapping from module to module or from subrack to subrack. Care shall be taken to ensure that the contact areas of the male contacts match the position of the female contacts. The engaging areas of the male contacts on the rear of a backplane correspond to the male contact dimensions according to IEC 61076-4-100.

NOTE In view of the large number of different mounting and application options, the contact quality between male and female contacts must be guaranteed.

In the case of a subrack, for example, there are three mounting options:

- a) Rear of the backplane [IEC 61076-4-108:2002](https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002)
- b) Module side of the backplane
- c) Front of the module

Fixed connectors:

For application on the rear of a backplane, a male connector body (preferably of flanged construction) is pushed over the rear plug-in connections of male contacts which have already been pressed in, for example over the terminals of a male connector according to IEC 61076-4-100, and secured in position.

For use on the module side of a backplane, a male connector body can be mounted in the same way over press-in male contacts.

Apart from flange mounting, the male connector body can also be fixed unsupported or directly to the male contacts.

For application on the side of a module or at the rear of a backplane, an interface male connector (preferably without flange) can be pressed into metal-plated holes in the backplane.

For application at the front of a module, a male connector body shall be equipped with male contacts which are mounted, for example pressed in, on the module printed board with terminals bent at right angles.

Free connectors:

The female connector equipped with female contacts is secured in a connector housing at which the cable is mounted with strain relief. The shielding braid of a cable shall be conductively connected to the connector housing consisting of shielded metal caps. The individual wires of a cable shall be connected at the female contacts directly by means of crimped or insulation displacement connections.

1.1.1 Maximum number of contacts*Fixed board connector***Table 1 – Maximum number of contacts – fixed connector**

System units (Height = Coordination dimension)	1 SU (25)	2 SU (50)	4 SU (100)	9 SU (225)	10 SU (250)
Styles (see 2.2.1.1)	J	B;P;K	D;L;R	G;U	H;V
Signal contacts	41	82	164	369	410
Ground contacts	4	8	16	36	40

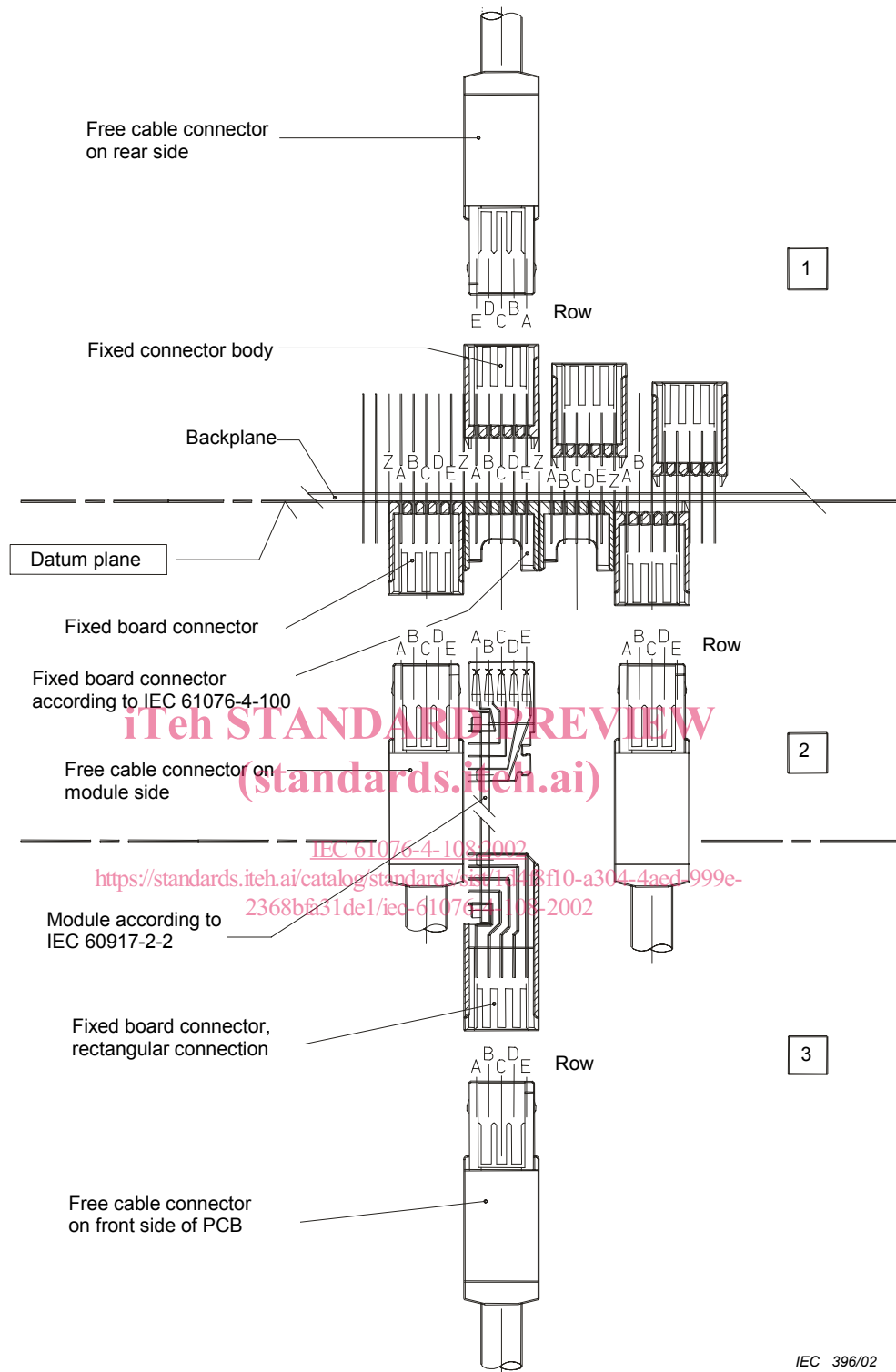
*Free cable connector***Table 2 – Maximum number of contacts – free cable connector**

System units (Height = Coordination dimension)	1 SU (25)	2 SU (50)	4 SU (100)
Styles (see 2.2.1.1)	A	B	D
Signal contacts	41	82	164
Ground contacts	4	8	16

iTeh STANDARD PREVIEW
(standards.iteh.ai)

IEC 61076-4-108:2002

<https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-2368bfa31de1/iec-61076-4-108-2002>



Installation options:

- 1 Rear of the backplane
- 2 Module side of the backplane
- 3 Front of the module

Figure 1 – Recommended installation

1.2 Ratings and characteristics

Proof voltage:	contact/ground > 750 V r.m.s. (according to table 15)		
Current rating: (at 70 °C)	2,1 A (grid 2,5 mm × 2,5 mm)		
	2,2 A (grid 2,5 mm × 5 mm “chess”)		
	2,7 A (grid 5 mm × 5 mm)		
Insulation resistance:	10 ⁴ MΩ		
Climatic category:	PL1: 40/100/56		
	PL2: 40/100/21		
Printed board thickness:	Backplane 1,6 mm to 4,5 mm		
	Plug-in unit 1,6 mm to 3,2 mm		
Metal-plated hole:	0,94 mm – 1,09 mm		
Contact gap:	2,5 mm × 2,5 mm		
Shielding effectiveness:	4 contacts/25 mm	Style: A (1 SU) : 10 dB	(at 300 MHz)
	(arrangement 4, table 7)	B (2 SU) : 14 dB	(at 300 MHz)
		D (4 SU) : 20 dB	(at 300 MHz)

1.3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61076. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61076 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

<https://standards.iteh.ai/catalog/standards/sist/1d4f8f10-a304-4aed-999e-42509c1e18b1/iec-61076-4-108-2002>
IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-21:1999, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60326-3:1991, *Printed boards – Part 3: Design and use of printed boards*

IEC 60352-1:1997, *Solderless connections – Part 1: Wrapped connections – General requirements, test methods and practical guidance*

IEC 60352-2:1990, *Solderless connections – Part 2: Solderless crimped connections – General requirements, test methods and practical guidance*
Amendment 1:1996

IEC 60352-3:1993, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-5:1995, *Solderless connections – Part 5: Solderless press-in connections – General requirements, test methods and practical guidance*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

IEC 60512 (all parts), *Connectors for electronic equipment – Tests and measurements*

IEC 60512-1-100:2001, *Connectors for electronic equipment – Tests and measurements – Part 1-100: General – Applicable publications*

IEC 60917-1:1998, *Modular order for the development of mechanical structures for electronic equipment practices – Part 1: Generic standard*

IEC 60917-2-2:1994, *Modular order for the development of mechanical structures for electronic equipment practices – Part 2: Sectional specification – Interface co-ordination dimensions for the 25 mm equipment practice – Section 2: Detail specification – Dimensions for subracks, chassis, backplanes, front panels and plug-in units*

IEC 61076-1:1995, *Connectors with assessed quality for use in d.c., low-frequency analogue and digital high-speed data applications – Part 1: Generic specification*

IEC 61076-4:1995, *Connectors with assessed quality for use in d.c., low-frequency analogue and digital high-speed data applications – Part 4: Sectional specification – Printed board connectors*

IEC 61076-4-001:1996, *Connectors with assessed quality for use in d.c., low-frequency analogue and digital high-speed data applications – Part 4: Printed board connectors – Section 001: Blank detail specification*

IEC 61076-4-100:2001, *Connectors for electronic equipment – Part 4-100: Printed board connectors with assessed quality – Detail specification for two-part connector modules having a grid of 2,5 mm for printed boards and backplanes*

ISO 1302:1992, *Technical drawings – Method of indicating surface texture*

1.4 Marking

The marking of the connector and the package shall be in accordance with 2.6 of IEC 61076-4.

Marking examples (according to 1.5)

Fixed board connector

Style 4 SU male connector, male contacts equipped in “chess” pattern, press-in termination with rear plug-up cable connection, with ground contacts, surface of the signal and ground contacts gold-plated, meeting performance level 1 and assessment level G:

IEC 61076-4-108 – R088M – 24 – R1 – 1 – 1G

Free cable connector

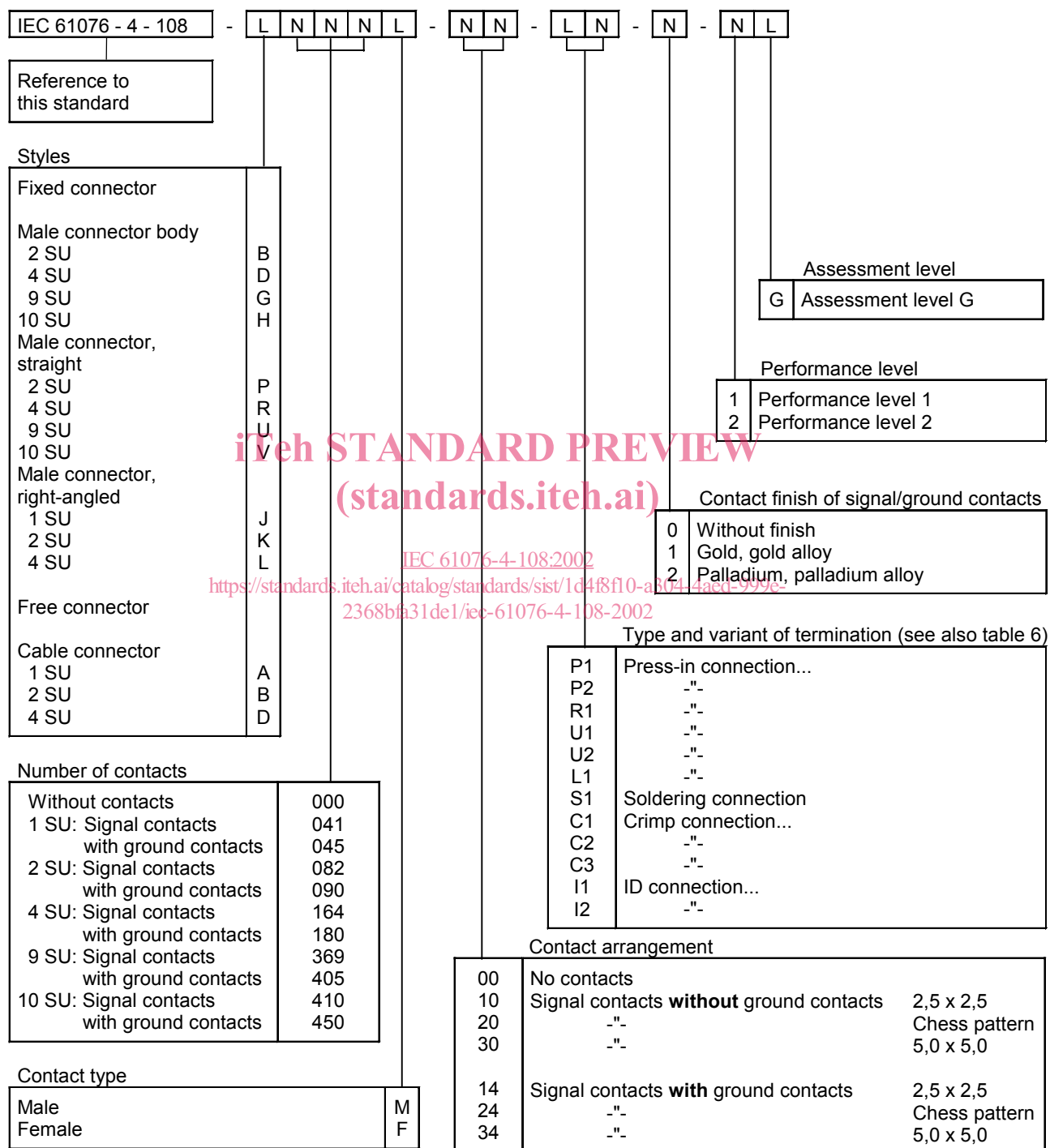
Style 1 SU, female contacts equipped in 2,5 mm × 2,5 mm grid pattern, without ground contacts, surface of the signal contacts palladium alloy, cable with solid conductors, with crimp termination (AWG 30 – 24), meeting performance level 2 and assessment level G:

IEC 61076-4-108 – A041F – 10 – C3 – 2 – 2G

1.5 IEC type designation

The designation of plug-in connectors shall be defined as follows in accordance with this standard:

L stands for letter, N stands for number.



1.6 Ordering information

For ordering connectors according to this detail specification, the IEC type designation described in 1.5 shall be used.