

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electronic equipment – Product requirements –
Part 4-116: Printed board connectors – Detail specification for a high-speed
two-part connector with integrated shielding function**

**Connecteurs pour équipements électroniques – Exigences de produit –
Partie 4-116: Connecteurs pour cartes imprimées – Spécification particulière
pour un connecteur haute vitesse en deux parties avec une fonction de
protection intégrée**



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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	8
1 Scope.....	10
2 Normative references	10
3 Terms and definitions	10
4 General data	11
4.1 Recommended method of mounting.....	11
4.2 Number of contacts and contact cavities	11
4.3 Ratings and characteristics	12
5 Technical data.....	12
5.1 Survey of styles and variants.....	12
5.2 Information on application	12
5.2.1 Complete connectors (pairs).....	12
5.2.2 Fixed board connectors	12
5.2.3 Free board connectors.....	12
5.2.4 Accessories.....	12
5.2.5 Shielding and grounding.....	12
5.2.6 Basic type of termination	12
5.3 Contact arrangement.....	13
6 Dimensional information	13
6.1 General.....	13
6.2 Isometric view and common features.....	14
6.2.1 Common features.....	14
6.2.2 Reference system.....	14
6.3 Mating information.....	14
6.3.1 Mating conditions	14
6.3.2 Planarity.....	15
6.4 Fixed board connector.....	16
6.4.1 Dimensions	16
6.4.2 Terminations	17
6.5 Free board connector	18
6.5.1 Dimensions	18
6.5.2 Terminations	20
6.6 Accessories.....	21
6.7 Mounting information for fixed board connectors	21
6.8 Mounting information for connectors.....	22
6.9 Gauges	22
6.9.1 Sizing gauges and retention force gauges	22
6.9.2 Test gauge for first contact point	22
7 Characteristics	22
7.1 Climatical category.....	22
7.2 Electrical characteristics.....	23
7.2.1 Creepage and clearance distances.....	23
7.2.2 Voltage proof.....	23
7.2.3 Current-carrying capacity.....	23

7.2.4	Contact resistance.....	23
7.2.5	Insulation resistance.....	24
7.2.6	Impedance.....	24
7.2.7	Transmission characteristics.....	24
7.3	Mechanical characteristics	26
7.3.1	Mechanical operation	26
7.3.2	Engaging and withdrawal forces	26
7.3.3	Contact retention in insert.....	27
7.3.4	Static load, transverse	27
7.3.5	Gauge retention force	27
7.3.6	Vibration (sinusoidal).....	27
7.3.7	Shock	27
7.3.8	Polarizing method.....	27
7.3.9	Robustness and effectiveness of coding devices	27
8	Test schedule.....	27
8.1	General.....	27
8.2	Arrangement for contact resistance measurement	28
8.3	Arrangement for contact disturbance measurement (shock and vibration test).....	28
8.4	Arrangement for current carrying measurement.....	29
8.5	Arrangement for dynamic stress tests.....	29
8.6	Arrangement for testing static load, transverse	30
8.7	Arrangement for voltage proof and polarization voltage	30
8.8	Arrangement for flammability tests	31
8.9	Test boards for impedance and transmission characteristics	31
8.10	Pre-conditioning	32
8.11	Wiring and mounting of specimens.....	32
8.11.1	Wiring.....	32
8.11.2	Mounting	32
8.12	Test procedures and measuring methods	33
8.13	Test schedule tables	33
8.13.1	Test group P – Preliminary	33
8.13.2	Test group A – Dynamic/climatic.....	34
8.13.3	Test group B – Mechanical endurance	36
8.13.4	Test group C – Moisture	38
8.13.5	Test group D – Electrical load.....	39
8.13.6	Test group E – Mechanical resistivity.....	40
8.13.7	Test group F – Chemical resistivity	40
8.13.8	Test group G – Connections	41
8.13.9	Test group H – Signal integrity tests	41
	Bibliography.....	43
	Figure 1 – Typical arrangement with a two-part connector	8
	Figure 2 – Typical arrangement with a direct edge connector, not covered in this Standard.....	9
	Figure 3 – Fixed board and free board connector.....	14
	Figure 4 – Mating conditions: lateral offset.....	14
	Figure 5 – Mating conditions: misalignment, angular offset	15
	Figure 6 – Mating conditions: end stop.....	15

Figure 7 – Fixed board connector	16
Figure 8 – Free board connector, part 1	18
Figure 9 – Free board connector, part 2	19
Figure 10 – Dimensions of hole pattern in backplane	21
Figure 11 – Reference points	25
Figure 12 – Crosstalk combinations	26
Figure 13 – Arrangement for resistance measurement	28
Figure 14 – Arrangement for measurement of contact disturbance	29
Figure 15 – Wiring arrangement for current-carrying measurement	29
Figure 16 – Test setup for shock and vibration test	30
Figure 17 – Application of static load	30
Figure 18 – Measurement arrangement for voltage proof	31
Figure 19 – Measurement arrangement for flammability tests	31
Figure 20 – Break out area of the connector footprint.....	31
Figure 21 – Example of a test fixture for fixed board connectors	32
Figure 22 – Example of a test fixture for free board connectors.....	32
Table 1 – Contact arrangement.....	13
Table 2 – Dimensions of fixed board connector.....	17
Table 3 – Dimensions of the free board connector.....	20
Table 4 – Dimensions of hole pattern in backplane	22
Table 5 – Climatic category	22
Table 6 – Rated insulation voltages	23
Table 7 – Current rating per pin at ambient of 70°C	23
Table 8 – Maximal permissible contact resistance change	24
Table 9 – Minimal insulation resistance.....	24
Table 10 – Number of specimens for test sequence	28
Table 11 – Test group P	33
Table 12 – Test group A	34
Table 13 – Test group B	36
Table 14 – Test group C	38
Table 15 – Test group D	39
Table 16 – Test group E	40
Table 17 – Test group F.....	40
Table 18 – Test group G	41
Table 19 – Test group H	41



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRONIC EQUIPMENT –
PRODUCT REQUIREMENTS –**
**Part 4-116: Printed board connectors –
Detail specification for a high-speed two-part connector
with integrated shielding function**

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International Standard IEC 61076-4-116 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/2280/FDIS	48B/2289/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.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61076, under the general title *Connectors for electronic equipment – Product requirements*, can be found on the IEC website.

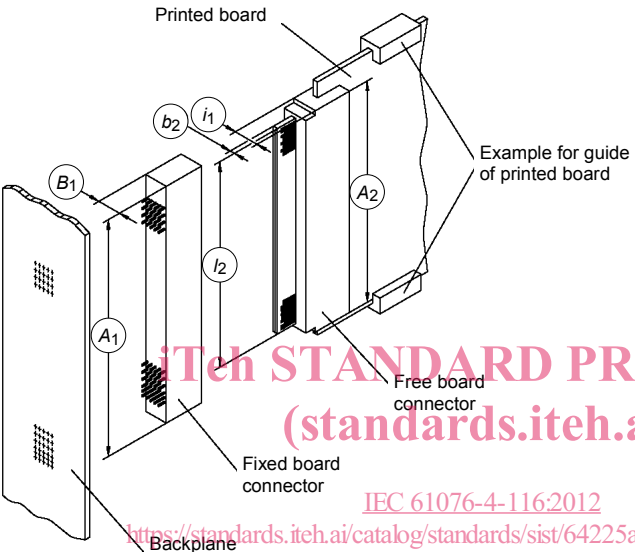
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<p>IEC SC 48B – Connectors Specification available from: IEC General secretariat or from the addresses shown on the inside cover.</p>	<p>Draft IEC 61076-4-116 Ed. 1.0</p>
<p>ELECTRONIC COMPONENTS DETAIL SPECIFICATION in accordance with IEC 61076-1 and IEC 61076-4</p>	<p>Page 6 of 42</p>
<p style="text-align: center;">Outline drawing</p>  <p style="text-align: center;">IEC 61076-4-116:2012 https://standards.iteh.ai/catalog/standards/sist/64225ad6-5fab-4b8f-9a5c-bfd2f841299d/iec-61076-4-116-2012</p>	<p>Two-part connector for printed boards and backplanes</p>
	<p>Fixed and free connectors, for industrial environments</p> <p>Performance level: 1</p>

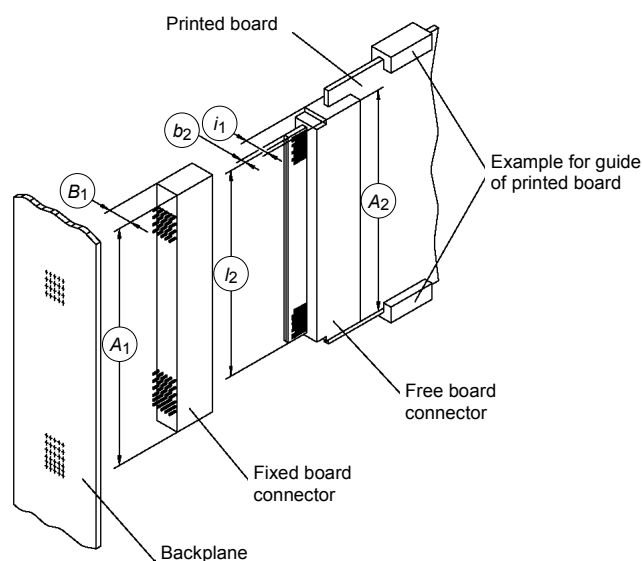
INTRODUCTION

International Standard IEC 61076-4-116 establishes specifications and test requirements for a high-speed two-part connector with integrated shielding function for use as a printed board connector in industrial environments. The connectors have a primary purpose of serving as a platform for telecommunications and enterprise computer network equipment. It is expected that these connectors are going to find applications outside the Telecommunication market, e.g. in the industrial market, as factory automation, process control, industrial communication, medical and others.

The connector type was originally developed in the consortium PCI Industrial Computer Manufacturers Group (whereas PCI is a peripheral component interconnect, which can be used to connect peripheral components to processors via using a bus structure or serially connected fabric based transports). This consortium, referred to in short as PICMG has defined several system specifications describing a backplane connector (fixed connector) in combination with an edge board connector (free connector) as a functional component of a specified Plug-in Unit. These specifications are the AdvancedMC.0 and the MicroTCA.0. The system-description in MicroTCA.0 contains also a test program for the connector. Further information of PICMG and its specifications can be obtained on the following website: www.picmg.org.

Based on the connector type and on PICMG-developments, this International Standard was developed by experts of IEC SC 48B, Connectors. In contrast to the PICMG-standard, the connector described here has two connector halves (a fixed and a free connector, as shown in Figure 1). The fixed connector is based on a $1,6 \text{ mm} \pm 10 \%$ plug-in unit printed board thickness similar to PICMG specifications. In addition, the test program of this IEC Standard differs from that defined in PICMG based on previous existing tests defined in IEC for connectors to suit the needs for use in industry. The resulting test schedule differs from the test-procedures as defined within PICMG to some degree not only in test-severity and conditions but also in test sequence. Experts within IEC SC48B work together with experts from PICMG to reach consensus with regard to similarities and differences in the relevant testprogram. The outcome is intended to be published in separate documents.

A typical arrangement for such a two-part connector is shown in the following outline sketch (see Figure 1):



IEC 423/12

Figure 1 – Typical arrangement with a two-part connector

Not covered in this International Standard are direct edge connector contacts for printed boards. The reason for this is, that in difference to the PICMG-specification this International Standard is intended to define the connector as a component together with test-procedures only and is not intended to detail functions which are not directly related to the connector system. Examples for such details are the characteristics of the printed circuit board. However, based on the information given in 4.5.1 of this Standard contact positioning and mechanical edge board connector details can be derived. Further information may be obtained in PICMG-specification AdvancedMC.0. Such direct edge connector contacts are applied directly to the printed board edge as part of the printed board circuit (free connector) and form the interface to the backplane (fixed connector), as can be seen in Figure 2.

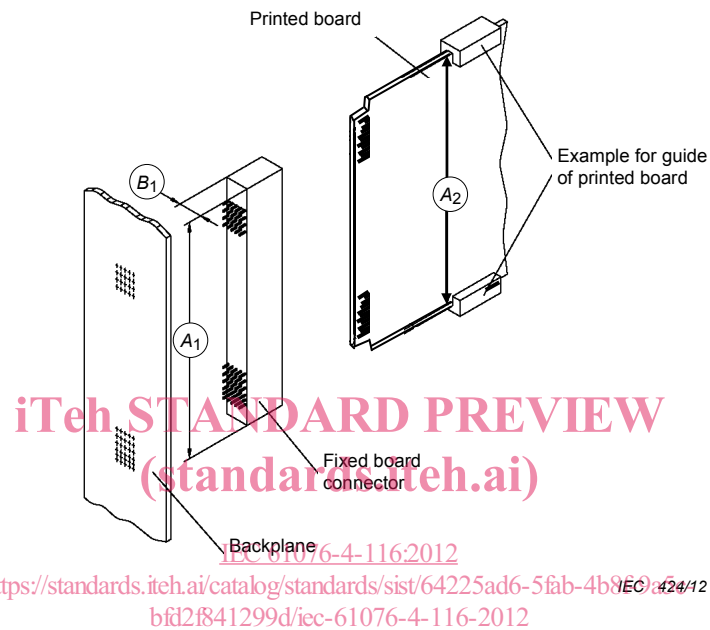


Figure 2 – Typical arrangement with a direct edge connector, not covered in this Standard

The connectors as described in this Standard are referenced in IEC 60297-3-107, which describes dimensions of subracks and plug-in units for their use.

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 4-116: Printed board connectors – Detail specification for a high-speed two-part connector with integrated shielding function

1 Scope

This International Standard establishes specifications and test requirements for a high-speed two-part connector with integrated shielding function for use as a printed board connector in industrial environments.

The connectors connect a backplane to printed boards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-581: 2008, *International Electrotechnical Vocabulary (IEV) – Part 581: Electromechanical components for electronic equipment*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-52: 1996, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)*

IEC 60068-2-54: 2006, *Environmental testing – Part 2-54: Tests – Test Ta: Solderability testing of electronic components by the wetting balance method*

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

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

IEC 60352-8, *Solderless connections – Part 8: Compression mount connections – General requirements, test methods and practical guidance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581 apply as well as the following.

3.1

contact for general purpose

electrical contact, which does not have a predefined function (neither for power, ground nor signal). The function can be defined according to the application

4 General data

NOTE Throughout this specification dimensions are in millimetres.

4.1 Recommended method of mounting

This International Standard specifies free and fixed connectors, suitable for press in connections to the printed boards. Other terminations techniques, as solder or compression mount connections are upon agreement between manufacturer and user.

A complete connector consists of two connector halves, a free board connector and a fixed board connector.

Free board connectors are mounted on the edge of the printed circuit board and have male contacts with angled press-in terminations, solder terminations or compression mount termination.

Fixed board connectors are mounted on the backplane and have female contacts with straight press-in terminations.

The free board connector can be omitted, but then alternatively the printed board used shall have an edge similar to those of the connection zone as defined in 4.5.1. for the free board connector. The board connector then is used as a direct edge connector.

4.2 Number of contacts and contact cavities

The number of contacts and their position is fixed and is 170. The number of contacts in the PCB terminations area might differ when designated ground-pins are combined.

Several contact positions (in total 56) are reserved for ground connections.

The contacts are placed in two different contact rows.

4.3 Ratings and characteristics

Rated voltage:	contact / contact 80 V r.m.s.
Current rating:	Power: 1,52 A at 70 °C Ground: 0,3 A at 70 °C General purpose: 0,4 A at 70 °C Signal: 0,1 A at 70 °C
Insulation resistance:	10 MΩ minimum (100 MΩ minimum at initial condition)
Climatic category:	55/105/56
Printed board:	diameter of plated-through holes: 0,55 ± 0,05 mm drill-hole diameter: 0,64 ± 0,02 mm thickness of backplane: min. 1,4 mm Thickness of printed board: to be defined between manufacturer and customer

5 Technical data

5.1 Survey of styles and variants

Performance level for this connector is 1. One termination method (press-in termination according to IEC 60352-5) is standardized, others are possible upon agreement between manufacturer and customer. Compression mount termination or solder connection are such termination methods.

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5.2 Information on application

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5.2.1 Complete connectors (pairs)

A complete connector consists of both, a free and a fixed connector.

5.2.2 Fixed board connectors

Not applicable.

5.2.3 Free board connectors

Not applicable.

5.2.4 Accessories

Not applicable.

5.2.5 Shielding and grounding

Several contact positions (in total 56) are reserved for ground connections.

5.2.6 Basic type of termination

The fixed board connectors are connected to the backplane via press-in terminations. Suitable tools should be used. These tools should be used in accordance with the manufacturers specification.

5.3 Contact arrangement

For the contact arrangement of the connection, Table 1 applies.

Table 1 – Contact arrangement

Contact type	Pin Number	Mating
Power	2, 9, 18, 27, 42, 57, 72, 84	First
Ground	1, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 85, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 122, 125, 128, 131, 134, 137, 140, 143, 146, 149, 152, 155, 158, 161, 164, 170	First
General purpose	4	First
	5, 6, 8, 17, 26, 41, 56, 71, 165, 166, 167, 168, 169	Second
	3, 83	Last
Differential pairs	11/12, 14/15, 20/21, 23/24, 29/30, 32/33, 35/36, 38/39, 44/45, 47/48, 50/51, 53/54, 59/60, 62/63, 65/66, 68/69, 74/75, 77/78, 80/81, 87/88, 90/91, 93/94, 96/97, 99/100, 102/103, 105/106, 108/109, 111/112, 114/115, 117/118, 120/121, 123/124, 126/127, 129/130, 132/133, 135/136, 138/139, 141/142, 144/145, 147/148, 150/151, 153/154, 156/157, 159/160, 162/163	Third

6 Dimensional information

6.1 General

Dimensions are given in millimetres, drawings are shown in first angle projection. The shape of the connectors may deviate from those given in the following drawings as long as the specified dimensions are not influenced.

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The following requirements apply to the complete connector consisting of both the free and fixed board connectors.

Missing dimensions shall be chosen according to the common characteristics and intended use. The interface dimensions of the free board (male) style shall be chosen according to the common characteristics of the fixed board (female) styles.