

# CONSOLIDATED VERSION

# VERSION CONSOLIDÉE



**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  
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**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**

FOREWORD

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**This Consolidated version of IEC 61076-4-116 bears the edition number 1.1. It consists of the first edition (2012-04) [documents 48B/2280/FDIS and 48B/2289/RVD] and its amendment 1 (2015-11) [documents 48B/2452/FDIS and 48B/2465/RVD]. The technical content is identical to the base edition and its amendment.**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**

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.

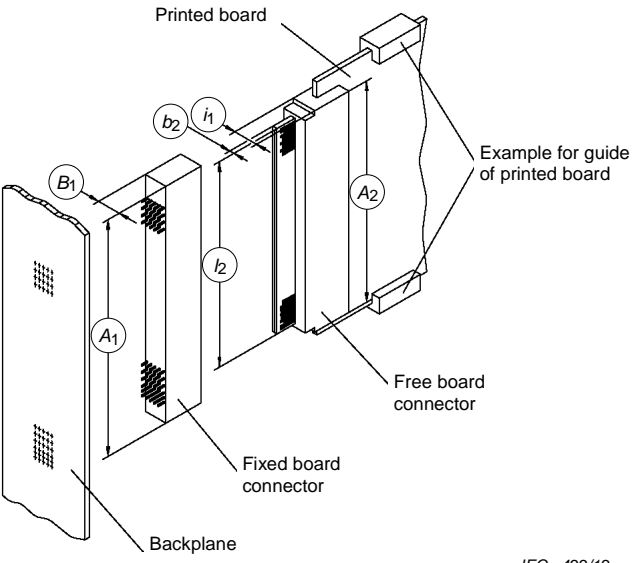
This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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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: right;"><i>IEC 422/12</i></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>

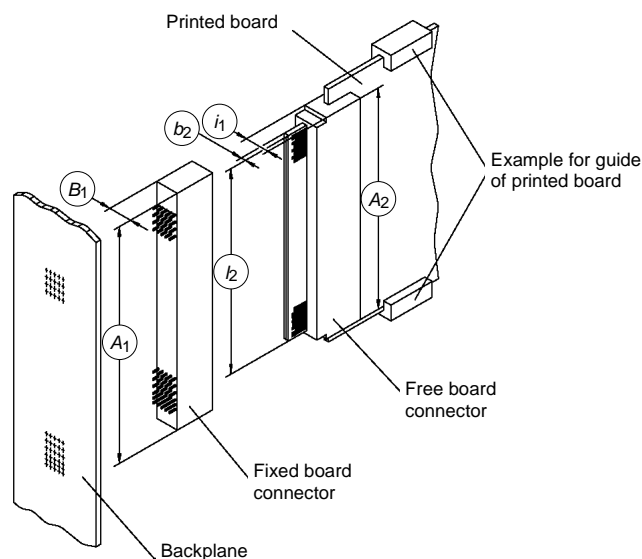
## INTRODUCTION

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](http://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.

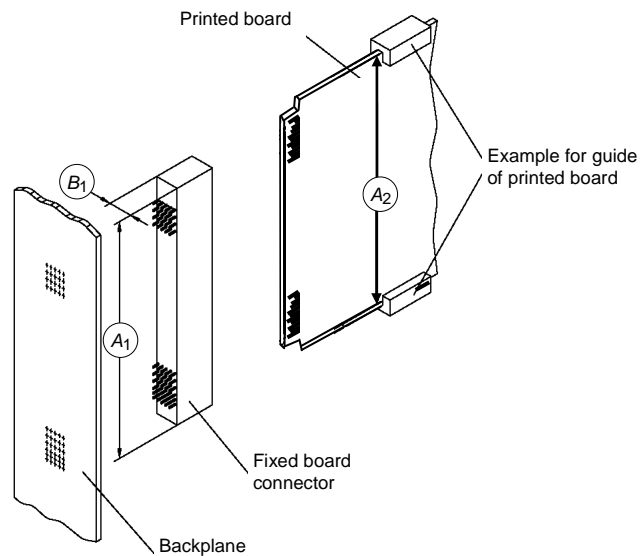
A typical arrangement for such a two-part connector is shown in the following outline sketch (see Figure 1):



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.



IEC 424/12

**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