

INTERNATIONAL STANDARD



**Connectors for electrical and electronic equipment –
Part 01: Rectangular connectors – Detail specification for 8-way, shielded, free
and fixed high density connectors for data transmission with frequencies up to
100 MHz and with current carrying capacity up to 1 A**

<https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92f468c78e/iec-62946-01-2018>



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2018 IEC, Geneva, Switzerland

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 either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 21 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC STANDARD PREVIEW
(standards.iteh.ai)
IEC 62946-11:2018
<https://standards.iteh.ai/catalog/standards/iec-62946-11-2018>
8d92468c78e/iec-62946-11-2018

INTERNATIONAL STANDARD



**Connectors for electrical and electronic equipment –
Part 01: Rectangular connectors – Detail specification for 8-way, shielded, free
and fixed high density connectors for data transmission with frequencies up to
100 MHz and with current carrying capacity up to 1 A**

<https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92f468c78e/iec-62946-01-2018>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 31.220.10

ISBN 978-2-8322-5724-1

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	9
4 Mating information	10
4.1 General.....	10
4.2 Contacts – mating conditions	10
4.3 Fixed female connector.....	10
4.4 Free male connector	13
5 Characteristics	15
5.1 General.....	15
5.2 Pin and pair grouping assignment	15
5.3 Classification into climatic category	16
5.4 Electrical characteristics	16
5.4.1 Voltage proof.....	16
5.4.2 Current-temperature derating.....	16
5.4.3 Initial insulation resistance	17
5.5 Transmission characteristics	17
5.5.1 General	17
5.5.2 Insertion loss	18
5.5.3 Return loss	18
5.5.4 Near end cross talk	18
5.5.5 Far end cross talk	18
5.5.6 Transverse conversion loss	18
5.5.7 Transfer conversion transfer loss.....	18
5.6 Mechanical characteristics	19
5.6.1 Mechanical operation.....	19
5.6.2 Insertion and withdrawal forces	19
6 Tests and test schedule.....	19
6.1 General.....	19
6.2 Arrangement for contact resistance measurement.....	20
6.2.1 General	20
6.2.2 Contact resistance calculation method.....	20
6.3 Arrangement for vibration test (test phase EP5)(see Figure 8)	21
6.4 Test procedures and measuring methods.....	21
6.5 Preconditioning.....	21
6.6 Test schedules.....	22
6.6.1 General	22
6.6.2 Basic (minimum) test schedule	22
6.6.3 Full test schedule	22
Figure 1 – Contact interface dimensions with terminated free connector	10
Figure 2 – Fixed female connector, view of contact zone	11
Figure 3 – View of contact zone section A-A	12
Figure 4 – Free male connector, view of contact zone.....	14

Figure 5 – Fixed female connector pin and pair grouping assignment, front view of connector (and conversely for the free male connector)	16
Figure 6 – Connector de-rating curve	17
Figure 7 – Arrangement for contact resistance measurement	20
Figure 8 – Arrangement for vibration test	21
Table 1 – Dimensions for Figure 1	10
Table 2 – Dimensions for Figures 2 and 3	13
Table 3 – Dimensions for Figure 4	15
Table 4 – Climatic categories – selected values	16
Table 5 – Test group P	22
Table 6 – Test group AP	23
Table 7 – Test group BP	24
Table 8 – Test group CP	25
Table 9 – Test group DP	26
Table 10 – Test group EP	27
Table 11 – Test group FP	28
Table 12 – Test group GP	29

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 62946-01:2018](https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92f468c78e/iec-62946-01-2018)

<https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92f468c78e/iec-62946-01-2018>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –

Part 01: Rectangular connectors – Detail specification for 8-way, shielded, free and fixed high density connectors for data transmission with frequencies up to 100 MHz and with current carrying capacity up to 1 A

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62946-01 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
48B/2626/FDIS	48B/2654/RVD

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

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

A list of all parts in the IEC 62946 series, published under the general title *Connectors for electrical and electronic equipment*, can be found on the IEC website.

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

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

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

iTeh STANDARD PREVIEW

The contents of the corrigendum of March 2020 have been included in this copy.

[IEC 62946-01:2018](https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92f468c78e/iec-62946-01-2018)

<https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92f468c78e/iec-62946-01-2018>

INTRODUCTION

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning connectors given in this specification.

The IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he is willing to grant licenses with applicants throughout the world on a non-discriminatory basis and on reasonable terms and conditions. In this respect, the statement of the holder of this patent is registered with the IEC.

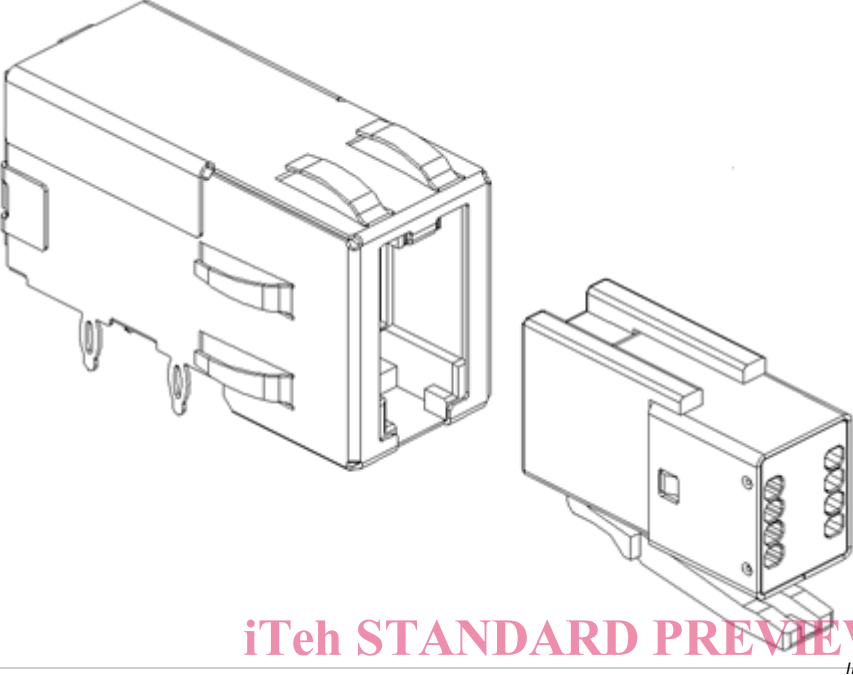
Information may be obtained from:

TE Connectivity Ltd.,
Shanghai HQ,
No 1528 Gumei Road,
Caohejing, 200233,
Shanghai, China.
Telephone +86-21-33980276.
E-mail: bowen.yu@te.com

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

ISO (www.iso.org/patents) and IEC (<http://patents.iec.ch>) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

<https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-8d92468c78e/iec-62946-01-2018>

	IEC 62946-01:2018
Subcommittee 48B: Electrical connectors	
 <p data-bbox="464 987 1118 1099" style="text-align: center;">iTeh STANDARD PREVIEW (standards.iteh.ai)</p>	<p data-bbox="1139 324 1374 517">8-way, shielded, free and fixed high density connectors for data transmission for frequencies up to 100 MHz and with current carrying capacity up to 1 A.</p>
<p data-bbox="432 1137 1145 1227" style="text-align: center;">https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-969c-8d92f468c78e/iec-62946-01-2018</p>	<p data-bbox="1139 1137 1374 1256">Fixed connectors are mounted on printed circuit board, the free connector is attached to wires.</p>

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –

Part 01: Rectangular connectors – Detail specification for 8-way, shielded, free and fixed high density connectors for data transmission with frequencies up to 100 MHz and with current carrying capacity up to 1 A

1 Scope

This part of IEC 62946 covers 8-way shielded connectors, and is intended to specify the common dimensions, mechanical, electrical and environmental characteristics and tests for the family of IEC 62946-01 connectors.

These connectors are intermateable and interoperable with other IEC 62946 series connectors.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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, *International Electrotechnical Vocabulary – Part 581: Electromechanical components for electronic equipment*

IEC 60068-2-38, *Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

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

IEC 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-3-1, *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

IEC 60512-4-1, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-5-2, *Connectors for electronic equipment – Tests and measurements – Part 5-2: Current-carrying capacity tests – Test 5b: Current-temperature derating*

IEC 60512-6-3, *Connectors for electronic equipment – Tests and measurements – Part 6-3: Dynamic stress tests – Test 6c: Shock*

IEC 60512-6-5, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 6: Dynamic stress tests – Section 5: Test 6e: Random vibration*

IEC 60512-9-1, *Connectors for electronic equipment – Tests and measurements – Part 9-1: Endurance tests – Test 9a: Mechanical operation*

IEC 60512-9-3, *Connectors for electronic equipment – Tests and measurements – Part 9-3: Endurance tests – Test 9c: Mechanical operation (engaging and separating) with electrical load*

IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-12, *Connectors for electronic equipment – Tests and measurements – Part 11-12: Climatic tests – Test 11m: Damp heat, cyclic*

IEC 60512-13-1, *Connectors for electronic equipment – Tests and measurements – Part 13-1: Mechanical operation tests – Test 13a: Engaging and separating forces*

<https://standards.iteh.ai/catalog/standards/sist/d967a26e-487f-442c-966e-ec0294012018>

IEC 60512-13-2, *Connectors for electronic equipment – Tests and measurements – Part 13-2: Mechanical operation tests – Test 13b: Insertion and withdrawal forces*

IEC 60512-26-100, *Connectors for electronic equipment – Tests and measurements – Part 26-100: Measurement setup, test and reference arrangements and measurements for connectors according to IEC 60603-7 – Tests 26a to 26g*

IEC 61076-1, *Connectors for electronic equipment – Product requirements – Part 1: Generic specification*

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581, IEC 61076-1 and IEC 60512-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

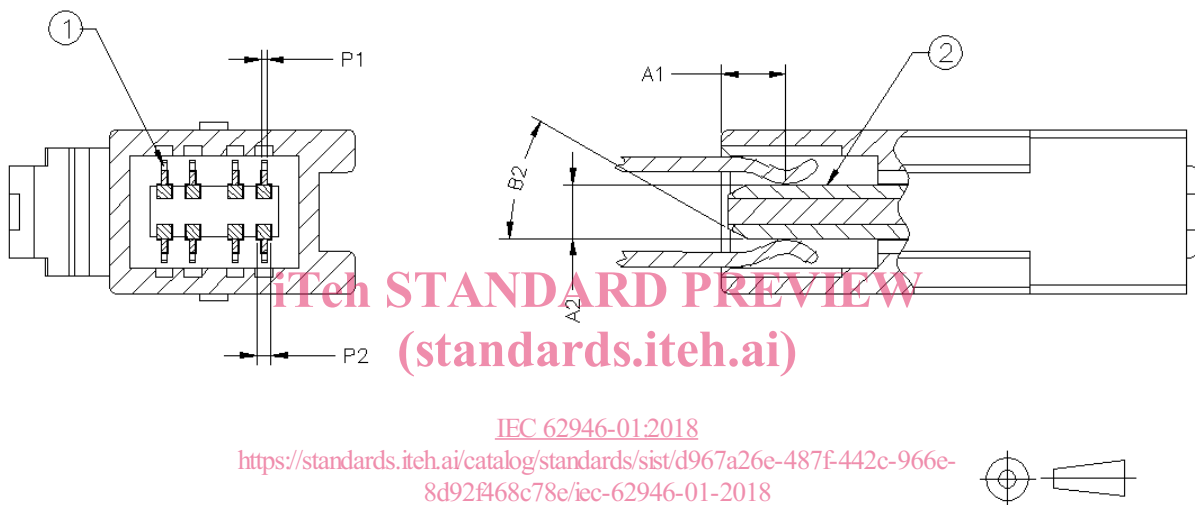
4 Mating information

4.1 General

Dimensions are given in millimetres. Drawings are shown in third-angle projection. The shape of connectors may deviate from those given in Figures 1 to 4 but the dimensions specified shall not be changed.

4.2 Contacts – mating conditions

Figure 1 shows on the right a side view of a free male connector, partially sectioned in the contact area, and only the mating female contact portion of the corresponding fixed female connector. On the left it shows a cross-section of said free male connector in the same contact area, and the cross-section of the mating female contacts (key 1). It identifies only those dimensions which are relevant for the correct contact interfacing, provided in Table 1.



Key

- 1 Female contact of fixed connector. The mating information shown can only be achieved with a free connector with a cable attached.
- 2 Burrs shall not project above the top of the contact in this area, since it may be a contact area.

Figure 1 – Contact interface dimensions with terminated free connector

Table 1 – Dimensions for Figure 1

(Dimensions in millimetres)

Letter	Minimum	Nominal (ref.)	Maximum
A1	2,00		2,50
A2	1,82		1,98
B2		30°	
P1	0,19		0,21
P2	0,38		0,51

4.3 Fixed female connector

Figure 2 provides two front views of the fixed female connector. The first view (Figure 2a)) shows its main part (i.e. without shield), for better addressing of all relevant dimensions provided in Table 2. The second view (Figure 2b)) shows the same as Figure 2a) dressed with the shielding, in order to provide the shielding relevant dimensions also provided in Table 2.