



BSI Standards Publication

Connectors for electrical and electronic equipment — Product requirements

Part 3-123: Rectangular connectors — Detail specification for hybrid connectors for industrial environments, for power supply and fibre optic data transmission, with push-pull locking

National foreword

This British Standard is the UK implementation of EN IEC 61076-3-123:2019. It is identical to IEC 61076-3-123:2019.

The UK participation in its preparation was entrusted to Technical Committee EPL/48, Electromechanical components and mechanical structures for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Connectors for electrical and electronic equipment - Product requirements - Part 3-123: Rectangular connectors - Detail specification for hybrid connectors for industrial environments, for power supply and fibre optic data transmission, with push-pull locking
(IEC 61076-3-123:2019)

Connecteurs pour équipements électriques et électroniques
- Exigences de produit - Partie 3-123: Connecteurs rectangulaires - Spécification particulière relative aux connecteurs hybrides dans des environnements industriels pour l'alimentation et la transmission de données fibronique, avec verrouillage de type pousser-tirer
(IEC 61076-3-123:2019)

Steckverbinder für elektronische Einrichtungen - Produktanforderungen - Teil 3-123: Rechteckige Steckverbinder - Bauartspezifikation für hybride Steckverbinder für industrielle Umgebungen, zur Stromversorgung und LWL-Datenübertragung, mit Push-Pull-Verriegelung
(IEC 61076-3-123:2019)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 48B/2742/FDIS, future edition 1 of IEC 61076-3-123, prepared by SC 48B "Electrical connectors" of IEC/TC 48 "Electrical connectors and mechanical structures for electrical and electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61076-3-123:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-07-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-10-18

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The text of the International Standard IEC 61076-3-123:2019 was approved by CENELEC as a European Standard without any modification.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-581	2008	International Electrotechnical Vocabulary - Part 581: Electromechanical components for electronic equipment	-	-
IEC 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-
IEC 60068-2-30	-	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	-
IEC 60352-1	1997	Solderless connections - Part 1: Wrapped connections - General requirements, test methods and practical guidance	EN 60352-1	1997
IEC 60352-2	2006	Solderless connections - Part 2: Crimped connections - General requirements, test methods and practical guidance	EN 60352-2	2006
IEC 60352-3	1993	Solderless connections - Part 3: Solderless accessible insulation displacement connections - General requirements, test methods and practical guidance	EN 60352-3	1994
IEC 60352-4	1994	Solderless connections - Part 4: Solderless non-accessible insulation displacement connections - General requirements, test methods and practical guidance	EN 60352-4	1994
IEC 60352-5	2012	Solderless connections - Part 5: Press-in connections - General requirements, test methods and practical guidance	EN 60352-5	2012
IEC 60352-6	1997	Solderless connections - Part 6: Insulation piercing connections - General requirements, test methods and practical guidance	EN 60352-6	1997
IEC 60352-7	2002	Solderless connections - Part 7: Spring clamp connections - General requirements, test methods and practical guidance	EN 60352-7	2002
IEC 60352-8	2011	Solderless connections - Part 8: Compression mount connections - General requirements, test methods and practical guidance	EN 60352-8	2011
IEC 60512-1-1	-	Connectors for electronic equipment - Tests and measurements - Part 1-1: General examination - Test 1a: Visual examination	EN 60512-1-1	-
IEC 60512-1-2	2002	Connectors for electronic equipment - Tests and measurements - Part 1-2: General examination - Test 1b: Examination of dimension and mass	EN 60512-1-2	2002

IEC 60512-2-1	2002	Connectors for electronic equipment - Tests and measurements - Part 2-1: Electrical continuity and contact resistance tests - Test 2a: Contact resistance - Millivolt level method	EN 60512-2-1	2002
IEC 60512-2-2	-	Connectors for electronic equipment - Tests and measurements - Part 2-2: Electrical continuity and contact resistance tests - Test 2b: Contact resistance - Specified test current method	EN 60512-2-2	-
IEC 60512-2-5	-	Connectors for electronic equipment - Tests and measurements - Part 2-5: Electrical continuity and contact resistance tests - Test 2e: Contact disturbance	EN 60512-2-5	-
IEC 60512-3-1	2002	Connectors for electronic equipment - Tests and measurements - Part 3-1: Insulation tests - Test 3a: Insulation resistance	EN 60512-3-1	2002
IEC 60512-4-1	2003	Connectors for electronic equipment - Tests and measurements - Part 4-1: Voltage stress tests - Test 4a: Voltage proof	EN 60512-4-1	2003
IEC 60512-5-2	2002	Connectors for electronic equipment - Tests and measurements - Part 5-2: Current-carrying capacity tests - Test 5b: Current-temperature derating	EN 60512-5-2	2002
IEC 60512-6-3	2002	Connectors for electronic equipment - Tests and measurements - Part 6-3: Dynamic stress tests - Test 6c: Shock	EN 60512-6-3	2002
IEC 60512-6-4	2002	Connectors for electronic equipment - Tests and measurements - Part 6-4: Dynamic stress tests - Test 6d: Vibration (sinusoidal)	EN 60512-6-4	2002
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	EN 60512-6-5	-
IEC 60512-8-1	2010	Connectors for electronic equipment - Tests and measurements - Part 8-1: Static load tests (fixed connectors) - Test 8a: Static load, transverse	EN 60512-8-1	2010
IEC 60512-8-2	2011	Connectors for electronic equipment - Tests and measurements - Part 8-2: Static load tests (fixed connectors) - Test 8b: Static load, axial	EN 60512-8-2	2011
IEC 60512-9-1	2010	Connectors for electronic equipment - Tests and measurements - Part 9-1: Endurance tests - Test 9a: Mechanical operation	EN 60512-9-1	2010
IEC 60512-9-2	-	Connectors for electronic equipment - Tests and measurements - Part 9-2: Endurance tests - Test 9b: Electrical load and temperature	EN 60512-9-2	-
IEC 60512-11-1	-	Connectors for electrical and electronic equipment - Tests and measurements - Part 11-1: Climatic tests - Test 11a - Climatic sequence	EN IEC 60512-11-1	-
IEC 60512-11-3	-	Connectors for electronic equipment - Tests and measurements - Part 11-3: Climatic tests - Test 11c: Damp heat, steady state	EN 60512-11-3	-
IEC 60512-11-4	-	Connectors for electronic equipment - Tests and measurements - Part 11-4: Climatic tests - Test 11d: Rapid change of temperature	EN 60512-11-4	-
IEC 60512-11-9	-	Connectors for electronic equipment - Tests and measurements - Part 11-9: Climatic tests - Test 11i: Dry heat	EN 60512-11-9	-
IEC 60512-11-10	-	Connectors for electronic equipment - Tests and measurements - Part 11-10: Climatic tests - Test 11j: Cold	EN 60512-11-10	-

IEC 60512-11-12 -	Connectors for electronic equipment - Tests and measurements - Part 11-12: Climatic tests - Test 11m: Damp heat, cyclic	EN 60512-11-12 -
IEC 60512-12-4 -	Connectors for electronic equipment - Tests and measurements - Part 12-4: Soldering tests - Test 12d: Resistance to soldering heat, solder bath method	EN 60512-12-4 -
IEC 60512-12-5 -	Connectors for electronic equipment - Tests and measurements - Part 12-5: Soldering tests - Test 12e: Resistance to soldering heat, soldering iron method	EN 60512-12-5 -
IEC 60512-13-1 2006	Connectors for electronic equipment - Tests and measurements - Part 13-1: Mechanical operation tests - Test 13a: Engaging and separating forces	EN 60512-13-1 2006
-	-	+ corrigendum2006 Dec.
IEC 60512-13-2 -	Connectors for electronic equipment - Tests and measurements - Part 13-2: Mechanical operation tests - Test 13b: Insertion and withdrawal forces	EN 60512-13-2 -
IEC 60512-13-5 2006	Connectors for electronic equipment - Tests and measurements - Part 13-5: Mechanical operation tests - Test 13e: Polarizing and keying method	EN 60512-13-5 2006
-	-	+ corrigendum2006 Dec.
IEC 60512-14-7 -	Electromechanical components for electronic equipment - Basic testing procedures and measuring methods - Part 14: Sealing tests - Section 7: Test 14g: Impacting water	EN 60512-14-7 -
IEC 60512-15-1 -	Connectors for electronic equipment - Tests and measurements - Part 15-1: Connector tests (mechanical) - Test 15a: Contact retention in insert	EN 60512-15-1 -
IEC 60512-15-6 2008	Connectors for electronic equipment - Tests and measurements - Part 15-6: Connector tests (mechanical) - Test 15f: Effectiveness of connector coupling devices	EN 60512-15-6 2008
IEC 60512-16-5 -	Connectors for electronic equipment - Tests and measurements - Part 16-5: Mechanical tests on contacts and terminations - Test 16e: Gauge retention force (resilient contacts)	EN 60512-16-5 -
IEC 60512-17-3 -	Connectors for electronic equipment - Tests and measurements - Part 17-3: Cable clamping tests - Test 17c: Cable clamp resistance to cable pull (tensile)	EN 60512-17-3 -
IEC 60512-17-4 -	Connectors for electronic equipment - Tests and measurements - Part 17-4: Cable clamping tests - Test 17d: Cable clamp resistance to cable torsion	EN 60512-17-4 -
IEC 60512-19-3 -	Electromechanical components for electronic equipment - Basic testing procedures and measuring methods - Part 19: Chemical resistance tests - Section 3: Test 19c - Fluid resistance	EN 60512-19-3 -
IEC 60529 1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 1991
IEC 60603-7 -	Connectors for electronic equipment - Part 7: Detail specification for 8-way, unshielded, free and fixed connectors	EN 60603-7 -
IEC 60664-1 2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1 2007
IEC 60793-2-10 -	Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres	EN IEC 60793-2-10

IEC 60793-2-50	-	Optical fibres - Part 2-50: Product specifications -	EN IEC 60793-2--	
		Sectional specification for class B single-mode fibres	50	
IEC 60999-1	-	Connecting devices - Electrical copper conductors -	EN 60999-1	-
		Safety requirements for screw-type and screwless-		
		type clamping units - Part 1: General requirements		
		and particular requirements for clamping units for		
		conductors from 0,2 mm ² up to 35 mm ² (included)		
IEC 60999-2	-	Connecting devices - Electrical copper conductors -	EN 60999-2	-
		Safety requirements for screw-type and screwless-		
		type clamping units - Part 2: Particular requirements		
		for clamping units for conductors above 35 mm ² up to		
		300 mm ² (included)		
IEC 61076-1	2006	Connectors for electronic equipment - Product	EN 61076-1	2006
		requirements - Part 1: Generic specification		
IEC 61076-3	2008	Connectors for electronic equipment - Product	EN 61076-3	2008
		requirements - Part 3: Rectangular connectors -		
		Sectional specification		
IEC 61076-3-117	2009	Connectors for electronic equipment - Product	EN 61076-3-117	2009
		requirements - Part 3-117: Rectangular connectors -		
		Detail specification for protective housings for use with		
		8-way shielded and unshielded connectors for		
		industrial environments incorporating the IEC 60603-7		
		series interface - Variant 14 related to IEC 61076-3-		
		106 - Push-pull coupling		
IEC 61076-7-100	-	Connectors for electronic equipment - Product	EN 61076-7-100	-
		requirements - Part 7-100: Cable outlet accessories -		
		Detail specification for a metric cable sealing		
		consisting of an integrated part of heavy-duty		
		rectangular or circular connector hoods and a sealing		
		system		
IEC 61156-1	2007	Multicore and symmetrical pair/quad cables for digital	-	-
		communications - Part 1: Generic specification		
IEC 61300-3-1	2005	Fibre optic interconnecting devices and passive	EN 61300-3-1	2005
		components - Basic test and measurement		
		procedures - Part 3-1: Examinations and		
		measurements - Visual examination		
IEC 61300-3-4	2012	Fibre optic interconnecting devices and passive	EN 61300-3-4	2013
		components - Basic test and measurement		
		procedures - Part 3-4: Examinations and		
		measurements - Attenuation		
IEC 61300-3-6	2008	Fibre optic interconnecting devices and passive	EN 61300-3-6	2009
		components - Basic test and measurement		
		procedures - Part 3-6: Examinations and		
		measurements - Return loss		
IEC 61300-3-11	1995	Fibre optic interconnecting devices and passive	EN 61300-3-11	1997
		components - Basic test and measurement		
		procedures - Part 3-11: Examinations and		
		measurements - Engagement and separation forces		
IEC 61300-3-35	2015	Fibre optic interconnecting devices and passive	EN 61300-3-35	2015
		components - Basic test and measurement		
		procedures - Part 3-35: Examinations and		
		measurements - Visual inspection of fibre optic		
		connectors and fibre-stub transceivers		
IEC 61300-3-47	2014	Fibre optic interconnecting devices and passive	EN 61300-3-47	2014
		components - Basic test and measurement		
		procedures - Part 3-47: Examinations and		
		measurements - End face geometry of PC/APC		
		spherically polished ferrules using interferometry		

IEC 61753-1-3	2014	Fibre optic interconnecting devices and passive components - Performance standard - Part 1-3: General and guidance for single-mode fibre optic connector and cable assembly for industrial environment, Category I	EN 61753-1-3	2014
IEC 61754-20	2012	Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 20: Type LC connector family	EN 61754-20	2012
IEC 61755-3-12006 (mod)		Fibre optic connector optical interfaces - Part 3-1: Optical interface, 2,5 mm and 1,25 mm diameter cylindrical full zirconia PC ferrule, single mode fibre	EN 61755-3-1	2009
IEC 61984	2008	Connectors - Safety requirements and tests	EN 61984	2009
IEC 62430	2009	Environmentally conscious design for electrical and electronic products	EN 62430	2009
IEC 62664-1-1	2013	Fibre optic interconnecting devices and passive components - Fibre optic connector product specifications - Part 1-1: LC-PC duplex multimode connectors terminated on IEC 60793-2-10 category A1a fibre	EN 62664-1-1	2013
IEC 62664-1-3	2013	Fibre optic interconnecting devices and passive components - Fibre optic connector product specifications - Part 1-3: LC-PC duplex singlemode connectors terminated on IEC 60793-2-50 category B1.1 and B1.3 fibre	-	-
IEC Guide 109	-	Environmental aspects - Inclusion in electrotechnical product standards	-	-
ISO 128-30	2001	Technical drawings - General principles of presentation - Part 30: Basic conventions for views	-	-
ISO 1302	2002	Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation	EN ISO 1302	2002
ISO 11469	2016	Plastics - Generic identification and marking of plastics products	EN ISO 11469	2016

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –
PRODUCT REQUIREMENTS –****Part 3-123: Rectangular connectors – Detail specification for hybrid
connectors for industrial environments, for power supply and fibre optic
data transmission, with push-pull locking**

FOREWORD

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International Standard IEC 61076-3-123 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 standard is based on the following documents:

FDIS	Report on voting
48B/2742/FDIS	48B/2753/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.

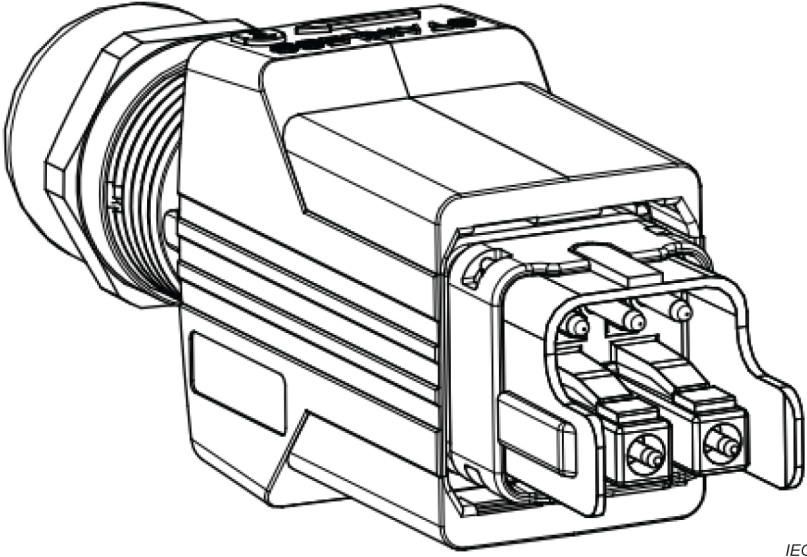
A list of all parts in the IEC 61076 series, published under the general title *Connectors for electrical and electronic equipment – Product requirements*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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.

INTRODUCTION

<p>IEC SC 48B – Electrical connectors</p> <p>Specification available from:</p> <p>IEC General secretariat</p> <p>or from the addresses shown on the inside cover.</p>	IEC 61076-3-123 Ed.1
DETAIL SPECIFICATION in accordance with IEC 61076-1	
	<p>Rectangular connectors</p> <p>Detail specification for hybrid connectors for industrial environments, for power supply and fibre optic data transmission, with push-pull locking</p> <p>Male and female connectors</p> <p>Male and female contacts</p> <p>Optical ferrules and adaptors</p> <p>Rewirable –</p> <p>Non-rewirable</p>
	<p>Free cable connectors</p> <p>Straight and right angle connectors</p> <p>Fixed connectors</p> <p>Flange mounting</p> <p>Single hole mounting</p>

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-123: Rectangular connectors – Detail specification for hybrid connectors for industrial environments, for power supply and fibre optic data transmission, with push-pull locking

1 Scope

This part of IEC 61076 covers hybrid rectangular connectors with a 3 poles 16 A electric portion for power supply and a duplex fibre optic connector type LC portion for data transmission. These connectors consist of fixed and free connectors, either rewirable or non-rewirable (for both portions) and use the rectangular push-pull housing described in IEC 61076-3-117 with IP65/IP67 degree of protection, for harsh applications. The mating dimensions of such housings allow fulfilling the performance class Category I according to IEC 61753-1-3 in regards to the fibre optic portion of the connector with the exception of the operating temperature range which is –25 °C/+70 °C.

The electric portion may have different rated insulation voltages. Male connectors have 3 electric round contacts Ø1,6 mm, with 16 A rated current.

NOTE Only the phase/neutral contacts are loaded upon current-carrying capacity test of 4.4 and 6.4.3 and electrical load and temperature test in 7.2.2.6 (DP2) and 7.2.2.12 (KP5)

The fibre optic portion provides data transmission by using the common mating configurations for all variants of the type LC duplex fibre optic connectors as defined in IEC 61754-20, for dedicated fibre types and fibre termination technology covered therein.

The different codings provided by this document prevent the mating of accordingly coded male or female connectors to any other similarly sized interfaces covered by other standards and the cross-mating between the different codings provided by this document.

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 60050-581:2008, *International Electrotechnical Vocabulary – Chapter 581: Electro-mechanical components for electronic equipment*

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

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

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

IEC 60352-2:2006, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

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

IEC 60352-4:1994, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-5:2012, *Solderless connections – Part 5: Press-in connections – General requirements, test methods and practical guidance*

IEC 60352-6:1997, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60352-7:2002, *Solderless connections – Part 7: Spring clamp connections – General requirements, test methods and practical guidance*

IEC 60352-8:2011, *Solderless connections – Part 8: Compression mount connections – General requirements, test methods and practical guidance*

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

IEC 60512-1-2:2002, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-2-2, *Connectors for electronic equipment – Tests and measurements – Part 2-2: Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test current method*

IEC 60512-2-5, *Connectors for electronic equipment – Tests and measurements – Part 2-5: Electrical continuity and contact resistance tests – Test 2e: Contact disturbance*

IEC 60512-3-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

IEC 60512-4-1:2003, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-5-2:2002, *Connectors for electronic equipment – Tests and measurements – Part 5-2: Current-carrying capacity tests – Test 5b: Current-temperature derating*

IEC 60512-6-3:2002, *Connectors for electronic equipment – Tests and measurements – Part 6-3: Dynamic stress tests – Test 6c: Shock*

IEC 60512-6-4:2002, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

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 60512-8-1:2010, *Connectors for electronic equipment – Tests and measurements – Part 8-1: Static load tests (fixed connectors) – Test 8a: Static load, transverse*