IEC 60352-8

Edition 1.0 2011-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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

Connexions sans soudure –
Partie 8: Connexions par compression – Exigences générales, méthodes d'essai et guide pratique

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX S

ICS 31.220.10

ISBN 978-2-88912-363-6

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SOLDERLESS CONNECTIONS –

Part 8: Compression mount connections – General requirements, test methods and practical guidance

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International Standard IEC 60352-8 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/2223/FDIS	48B/2229/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 the IEC 60352 series, published under the general title *Solderless connections,* can be found on the IEC website.

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INTRODUCTION

This part of IEC 60352 includes requirements, tests and practical guidance information.

Two test schedules are provided:

A basic test schedule applies to compression mount connections which conform to all of the requirements given in Clause 4.

A full test schedule applies to compression mount connections which are part of a new component and have already passed the basic test schedule or to connections of the same kind which do not fully comply with the requirements of Clause 4.

Requirements given in Clause 4 are derived from experience with successful applications of such compression mount connections.

IEC Guide 109 advocates the need to minimize the impact of a product on the natural environment throughout the product life cycle.

It is understood that some of the materials permitted in this standard may have a negative environmental impact.

As technological advances lead to acceptable alternatives for these materials, they will be eliminated from the standard.

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SOLDERLESS CONNECTIONS –

Part 8: Compression mount connections – General requirements, test methods and practical guidance

1 Scope and object

This part of IEC 60352 is applicable to compression mount connections with metallic spring contacts for use in telecommunication equipments and in other electronic devices employing similar techniques.

Information on materials and data from industrial experience are included in addition to the test procedures to provide electrically stable connections under prescribed environmental conditions.

The object of this part of IEC 60352 is to determine the suitability of compression mount connections under specified electrical, mechanical and atmospheric conditions and to provide a means of comparing test results when the tools used to make the connectors are of different designs or manufacture.

2 Normative references

The following referenced documents are indispensable for the application 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 (IEV) – Part 581: Electromechanical components for electronic equipment*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

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

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

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

IEC 61249-2-7:2002, *Materials for printed boards and other interconnecting structures – Part 2-7: Reinforced base materials clad and unclad – Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050(581) and IEC 60512-1 as well as the following (additional) terms and definitions apply.

3.1
compression mount connection
solderless connection between a compression mount contact and a contact pad which is established by a continuous compression force

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3.2
compression mount contact
conductive element in a compression mount connector which makes contact with its corresponding contact pad on a printed wiring board to provide an electrical path

3.3
contact pad (land)
conductive element on a printed wiring board which makes contact with its corresponding compression mount contact of a connector to provide an electrical path

NOTE Usually the contact area on devices such as on semiconductors is called “land”.

3.4
stiffener
component used to provide resistance against warpage of a printed wiring board

3.5
locating pin
guiding element equipped with a connector body or a printed wiring board for accurate positioning of the connector on the printed wiring board by mating with its corresponding locating slot (or hole)

3.6
locating slot (or locating hole)
guiding element equipped with a printed wiring board or a connector body to accommodate a locating pin

4 Requirements

4.1 General

The connections are made in accordance with the connector manufacturer’s instructions.

4.2 Mounting tools

Mounting tools for a compression mount connector on a printed wiring board shall be specified in the detail specification.

When a screw driver is used, torque shall be specified in the detail specification. If any special tools are required, tooling instructions shall be provided by the manufacturer.

4.3 Compression mount contact

4.3.1 Materials

Suitable contact materials satisfying the test and requirements of this standard shall be used.

4.3.2 Design features

Contact force of the compression mount connection shall be such that the connector meets all the relevant requirements of this standard.

4.3.3 Surface finishes

Finishes used on metallic elements of the connector shall be such that the connector meets all the relevant requirements of this standard.

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4.4 Connector body

4.4.1 Materials

Suitable connector body materials satisfying the test and requirements of this standard shall be used.

4.4.2 Design features

A connector body shall be provided with a locating pin(s), slot(s) or hole(s) that allows the connector to be positioned on the printed wiring board accurately. Dimensions and location of pin(s), slot(s) or hole(s) shall be specified in the detail specification.

4.5 Printed wiring board

4.5.1 Materials

The materials of a printed wiring board shall be in accordance with IEC 61249-2-7.

4.5.2 Design features

The thickness of a printed wiring board shall be specified in the detail specification. The dimensions and layout of contact pads (lands) shall be specified in the detail specification. A printed wiring board shall be provided with a locating slot(s), hole(s) or pin(s), and the dimensions of those shall be specified in the detail specification.

4.5.3 Surface finishes

Contact pads (lands) of a printed wiring board shall be plated free from contamination and corrosion visible to the unaided eye.

4.6 Stiffener

If required, stiffener shall be specified in the detail specification.

5 Tests

5.1 General

5.1.1 Standard conditions for testing

Unless otherwise specified, all tests shall be carried out under standard atmospheric conditions for testing, as specified in IEC 60512-1.

The ambient temperature and the relative humidity at which the measurements are made shall be stated in the test report.

In case of dispute about test results, the test shall be repeated at one of the referee conditions of IEC 60068-1.

5.1.1.1 Preconditioning

Where specified, specimens shall be preconditioned under the standard atmospheric conditions for a period of 24 h, as specified in IEC 60512-1.

5.1.1.2 Recovery

Where specified, the specimens shall be allowed to recover under the standard atmospheric conditions for a period of 1 h to 2 h after conditioning.

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5.1.2 Mounting of the specimen

The specimen shall consist of the connector including compression mount connections and a printed wiring board, unless otherwise specified.

When mounting is required in a test, the connector shall be mounted using the normal mounting method.

5.2 Test and measuring methods

5.2.1 General examination

5.2.1.1 Visual examination

The test shall be carried out in accordance with test 1a: Visual examination, IEC 60512-1-1. The visual examination test shall be carried out with magnification approximately five times.

Specimens shall be examined to ensure that the applicable requirements given in 4.3 to 4.6 have been met.

5.2.1.2 Examination of dimension

The test shall be carried out in accordance with test 1b: Examination of dimension and mass, IEC 60512-1-2.

Specimens shall be examined to ensure that the applicable requirements given in 4.3 to 4.6 have been met.

5.2.2 Mechanical tests

5.2.2.1 Mechanical operation

The test is to examine the successful mounting of compression mount contacts against mechanical stress during the mounting process of the compression mount connectors on a printed wiring board.

The test shall be carried out in accordance with test 9a: Mechanical operation, IEC 60512-5. Mounting and un-mounting method shall be specified in the detail specification.

A printed wiring board used for the test shall have contact pads that can make contact with the contacts of a connector under test.

Unless otherwise specified in the detail specification, mechanical operation shall be conducted for three cycles.

The same printed wiring board shall be used throughout the whole test, and the connector shall be always positioned at the same location on the printed wiring board.

NOTE This may be achieved e.g. by means of suitable locating slots or pins on the two mating parts (printed wiring board and connector).

5.2.2.2 Vibration

The test shall be carried out in accordance with test 6d: Vibration, IEC 60512-6-4.

The specimen shall be firmly held on a vibration table.

A suitable test arrangement for testing shall be defined in the detail specification. Unless otherwise specified in the detail specification, test severities given in Table 1 shall be applied.

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Table 1 – Vibration, preferred test severities

Range of frequency	10 Hz to 55 Hz	10 Hz to 500 Hz	10 Hz to 2 000 Hz
Full duration	2,25 h	6 h	7,5 h
Displacement amplitude below the cross-over frequency	0,35 mm	0,35 mm	1,5 mm
Acceleration amplitude above the cross-over frequency	–	50 m/s^2	200 m/s^2
Directions	Three axes	Three axes	Three axes
Number of sweep cycles per direction	10	10	10

During the test, contact disturbances shall be monitored in accordance with test 2e: Contact disturbance, IEC 60512-2-5. Contact disturbance shall not exceed 1 µs, unless otherwise specified in the detail specification.

5.2.2.3 Shock

The test shall be carried out in accordance with test 6c: Shock, IEC 60512-6-3.

The specimen shall be firmly held on a test table.

Unless otherwise specified in the detail specification the following test severities shall apply.

- Shock acceleration: 300 m/s^2
- Duration of impact: 11 ms
- Wave form: Half-sine or saw-tooth
- Number of shocks: Three shocks in two directions along three axes (total 18 shocks)

A suitable test arrangement shall be defined in the detail specification.

During the test, contact disturbances shall be monitored in accordance with test 2e: Contact disturbance, IEC 60512-2-5. Contact disturbance shall not exceed 1 µs, unless otherwise specified in the detail specification.

5.2.3 Electrical tests

5.2.3.1 Contact resistance

The test shall be carried out in accordance with test 2a: Contact resistance - millivolt level method, IEC 60512-2-1.

Contact resistance shall be measured between measuring points as shown in Figure 1.

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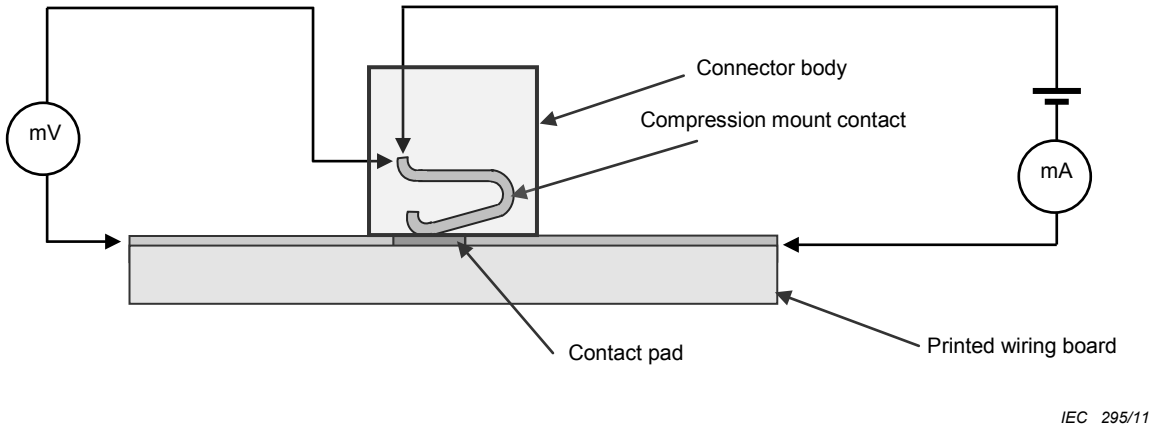

Figure 1 – Wiring arrangement for contact resistance test

5.2.3.2 Current carrying capacity

The test shall be carried out in accordance with test 5b: Current carrying capacity, IEC 60512-5-2.

Test condition shall be specified in the detail specification.

5.2.4 Climatic tests

5.2.4.1 Dry heat

The test shall be carried out in accordance with test 11i: Dry heat, IEC 60512-11-9.

The connectors shall be mounted on the printed wiring board and subjected to the test.

Unless otherwise specified, following conditions shall be applied.

– Dry heat, test temperature: 105 °C
– Duration of exposure: 300 h or 1 000 h

5.2.4.2 Flowing mixed gas corrosion

The test shall be carried out in accordance with test 11g: Flowing mixed gas corrosion test, IEC 60512-11-7.

Unless otherwise specified, following conditions (Method 1) shall be applied.

– Mixed gases: H_2S 100 ± 20 (10^{-9} vol/vol)
SO_2 500 ± 100 (10^{-9} vol/vol)
– Duration of exposure: 10 days

The connectors shall be mounted on the printed wiring board and subjected to the test.

If necessary, intermediate measurements shall be specified in the detail specification.

5.2.4.3 Sand and dust

The test shall be carried out in accordance with test 11h: Sand and dust, IEC 60512-11-8.

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