

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electronic equipment – Tests and measurements –
Part 9-2: Endurance tests – Test 9b: Electrical load and temperature**

**Connecteurs pour équipements électroniques – Essais et mesures –
Partie 9-2: Essais d'endurance – Essai 9b: Charge électrique et température**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRONIC EQUIPMENT –
TESTS AND MEASUREMENTS –****Part 9-2: Endurance tests –
Test 9b: Electrical load and temperature**

FOREWORD

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International Standard IEC 60512-9-2 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This standard cancels and replaces Test 9b of IEC 60512-5, issued in 1992. The structure of the test documents in the IEC 60512 series is explained in IEC 60512-1-100.

The text of this standard is based on the following documents:

FDIS	Report on voting
48B/2243/FDIS	48B/2255/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 60512 series, under the general title *Connectors for electronic equipment – Tests and measurements*, can be found on the IEC website.

The committee has decided that the contents of this publication 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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- replaced by a revised edition, or
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CONNECTORS FOR ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 9-2: Endurance tests – Test 9b: Electrical load and temperature

1 Scope and object

This part of IEC 60512, when required by the detail specification, is used for testing connectors within the scope of technical committee 48. It may also be used for similar devices when specified in a detail specification.

The object of this standard is to detail a standard test method to assess the ability of a connector to withstand elevated temperatures with electrical loading.

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.

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

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

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 60512-2-6, *Connectors for electronic equipment – Tests and measurements – Part 2-6: Electrical continuity and contact resistance tests – Test 2f: Housing (shell) electrical continuity*

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*

3 Preparation

3.1 Preparation of the specimen

The specimen shall be suitably fitted with temperature-sensing device(s) with dimensions as laid down in the detail specification, and be wired and mounted according to the detail specification.

NOTE 1 Heat transfer by a measuring probe will influence the measurement. Care should be taken to limit this influence, e.g. by using a non-intrusive measuring method.

NOTE 2 Attention is drawn to the fact that reproducibility is frequently improved by arranging the wiring horizontally.

3.2 Equipment

A suitable climatic chamber. Influence of the air circulation to the specimen shall be avoided.

4 Test method

- The specimen shall be subjected to a temperature endurance test with electrical load in accordance with the requirements of the detail specification.
- Initially (see note) and again at the end of the test, the insulation resistance at high temperature shall be measured according to IEC 60512-3-1, test 3a and shall be not less than the value specified by the detail specification.

NOTE Due to the fact that specimen may be wired in series, an insulation resistance measurement after e.g. 10 h of exposure can be unpractical. In cases where such a measurement is possible, early failures will be detected, so that time-consuming testing can be avoided.

- The prepared specimen shall be placed in a chamber, the temperature of which shall be maintained at $70\% \pm 5\%$ of the specified maximum operating temperature of the specimen under test.
- Current shall be applied to the specimen and slowly increased until the specified maximum operating temperature (= ambient + temperature-rise due to current) is approached. There shall be no further increase of current before thermal stability is attained. In no case during the adjustment shall the specified maximum operating temperature or the specified current of the specimen be exceeded. When the maximum operating temperature is reached, the current required to achieve this shall be maintained throughout the test.
- If the temperature rise due to the specified maximum current through the specimen does not cause it to reach its specified maximum operating temperature, the chamber temperature shall be increased until the specified maximum operating temperature of the specimen is reached.
- The test shall be carried out at the specified maximum operating temperature and the duration of the test shall be as specified in the detail specification. Preferred durations are 250 h, 500 h, 1 000 h and 2 000 h.
- At the end of the exposure period, the specimen shall be allowed to cool under standard atmospheric conditions for a time as stated in the detail specification.

If the maximum operating temperature of the specimen is exceeded by 5 % under normal test conditions, the test shall be abandoned and the test shall be regarded as "failed".

5 Final measurements

- a) Contact resistance (IEC 60512-2-1, test 2a, or IEC 60512-2-2, test 2b).
- b) Housing (shell) electrical continuity (IEC 60512-2-6, test 2f), where applicable.
- c) Insulation resistance (IEC 60512-3-1, test 3a).
- d) Voltage proof (IEC 60512-4-1, test 4a).
- e) Visual examination (IEC 60512-1-1, test 1a).
- f) Operational tests as required in the detail specification.

NOTE If applicable, the detail specification may require a sealing test from the IEC 60512-14 series or an ingress protection test according IEC 60529.

6 Details to be specified

When this test is required by the detail specification, the following details shall be given:

- a) maximum operating temperature;
- b) duration;
- c) maximum load current;
- d) insulation resistance (in hot condition);
- e) recovery time prior to final measurements;
- f) requirements for final measurements;
- g) any deviation from the standard test method.

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