भारतीय मानक

Indian Standard

IS/IEC 60512-2-2 : 2003

विद्युत उपकरणों के लिए संयोजक — परीक्षण और मापन

भाग 2 विद्युत अविच्छिन्नता और संपर्क प्रतिरोध परीक्षण

अनुभाग 2 परीक्षण 2बी संपर्क प्रतिरोध निर्दिष्ट परीक्षण धारा पद्धति

Connectors for Electronic Equipment — Tests and Measurements

Part 2 Electrical Continuity and Contact Resistance Tests

Section 2 Test 2b Contact Resistance Specified Test Current Method

ICS 31.220.10

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Electromechanical Components and Mechanical Structures for Electronic Equipment Sectional Committee, LITD 03

NATIONAL FOREWORD

This Indian Standard which is identical to IEC 60512-2-2 : 2003 ‘Connectors for electronic equipment — Tests and measurements — Part 2: Electrical continuity and contact resistance tests, Section 2: Test 2b Contact resistance — Specified test current method’ issued by the International Electrotechnical Commission (IEC) was adopted the Bureau of Indian Standards on the recommendation of the Electromechanical Components and Mechanical Structures for Electronic Equipment Sectional Committee and approval of the Electronics and Information Technology Division Council.

The other parts in this series are:

Part 1 Generic specification

Part 2 Electrical continuity and contact resistance tests

Part 3 Insulation test

Part 4 Voltage stress tests

The text of IEC standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appears referring to this standard, they should be read as ‘Indian Standard’; and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CONNECTORS FOR ELECTRONIC EQUIPMENT— TESTS AND MEASUREMENTS

PART 2 ELECTRICAL CONTINUITY AND CONTACT RESISTANCE TESTS

SECTION 2 TEST 2B CONTACT RESISTANCE SPECIFIED TEST CURRENT METHOD

1 Scope and object

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

The object of this test is to define a standard test method to measure the electrical resistance across a pair of mated contacts or a contact with a measuring gauge.

2 General measuring requirements

Measurements may be carried out with direct current or alternating current. For a.c. measurements, the frequency shall not exceed 2 kHz. In the case of dispute, the d.c. measurements shall govern.

The uncertainly of the measuring apparatus shall not exceed 1 %.

3 Method of measurement

3.1 Measurement details

The contact resistance shall be derived normally from the voltage drop measured between the zones intended for connection of the wiring to the contacts at the points specified in the detail specification.

The contact shall not be operated while the measuring voltage is applied.

Care must be taken during the measurement to avoid exerting abnormal pressure on the contacts under test and to avoid movement of the test cables.

Where the measuring points specified in the detail specification are not directly accessible, the resistance of the cable or wire used shall be subtracted from the measured value. The corrected value shall be recorded.

The contacts to be measured shall be chosen in accordance with the detail specification.

3.2 Test current and voltage

The contact resistance shall be measured with the alternating current or direct current as specified in the detail specification. The test voltage shall be at least 1 V d.c. or a.c. peak.

Measurements shall be made on individual contacts within the minute following application of the test current.

4 Measuring cycles

4.1 Measurement with direct current

One measuring cycle consists of

a) application of the voltage;
b) measurement with current flowing in one direction;
c) measurement with current flowing in the opposite direction;
d) disconnection of the voltage source.

4.2 Measurement with alternating current

One measuring cycle consists of

a) application of the voltage;
b) making the measurement;
c) disconnection of the voltage source.

NOTE Unless otherwise specified, the made contact(s) should not be disturbed between the end of the preceding test and the application of the voltage in this test.

5 Requirements

The value of the contact resistance shall not exceed, for any measurement, the value specified in the detail specification.

The contact resistance measurement with d.c. shall be the average of the two readings obtained with forward and reverse current.

Use of the following equation will ensure that the calculated resistance is always correct:

$$R = \frac{\left|V_{\mathrm{mf}} - V_{\mathrm{mr}}\right|}{\left|I_{\mathrm{f}}\right| + \left|I_{\mathrm{r}}\right|}$$

where

R is the resistance;
V_{mf} is the measured forward voltage;
V_{mr} is the measured reverse voltage;
I_{f} is the forward current;
I_{r} is the reverse current.

NOTE 1 In the equation the sign of the voltage measurements must be included.

NOTE 2 Any deviation from the standard test procedure should be clearly indicated in the test report.

6 Details to be specified

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

a) the measuring points;
b) the number of contacts to be measured;
c) the measuring current;
d) the permissible limits of contact resistance;
e) any deviation from the standard test method.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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Amendments Issued Since Publication

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