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EIA STANDARD

TP-06C

CONTACT RESISTANCE TEST PROCEDURE FOR ELECTRICAL CONNECTORS

EIA/ECA-364-06C

(Revision of EIA-364-06B)

MARCH 2006

Electronic Components, Assemblies & Materials Association

ELECTRONIC COMPONENTS, ASSEMBLIES & MATERIALS ASSOCIATION
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(From Standards Proposal No. 5106 formulated under the cognizance of the CE-2.0 National Connectors Standards Committee.

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TEST PROCEDURE No. 06C

CONTACT RESISTANCE TEST PROCEDURE FOR ELECTRICAL CONNECTORS

(From EIA Standards Proposal No. 5106, formulated under the cognizance EIA CE-2.0 Committee on National Connector Standards, and previously published in EIA-364-06B.)

1 Introduction

1.1 Scope

This standard establishes test methods to determine the resistance of mated connector contacts attached to lengths of wire by measuring the voltage drop across the contacts while they are carrying a specified current.

2 Test resources

2.1 Equipment

2.1.1 An ammeter capable of measuring the applied current to an accuracy of ± 2%.

2.1.2 A high-impedance voltmeter (in the order of 10,000 ohms per volt). The meter accuracy shall be such that the value being measured is accurate to ± 2%.

NOTE — For greater ease of measuring forward and reverse readings, a zero-center or digital voltmeter with automatic polarity reversal is recommended.

2.1.3 A suitable current source having a controlled output as required for test currents specified in the referencing document. Either ac or dc may be used for this contact resistance test. For ac measurements, the frequency shall not exceed 2 kHz. In the event of a discrepancy between ac and dc measurements, the dc method shall be employed.

2.1.4 An example of a test circuit is shown in figure 1 for the test method described in 4.2 through 4.5.

3 Test specimen

3.1 Description

A test specimen shall consist of a mated connector, a pair of contacts such as a pin and a socket, mating hermaphroditic contacts, or a printed pad and its mating contacts.

3.2 Preparation

3.2.1 All specimens shall be prepared as they would be for normal applications. Care shall be taken to assure that the wire is properly stripped so that all strands are intact and the wire - to - contact joint is free of inclusions such as marking thread or frayed insulation.

3.2.2 Cleaning may be performed to remove solder fluxes associated with specimen preparation. However, unless otherwise specified in the referencing document there shall not be any additional cleaning. There shall not be additional lubricants or other coatings be applied, unless otherwise specified in the referencing document.

3.2.3 The test specimens may be installed in a suitable connector and engaged as in normal service. Specimens not installed in a connector shall not be rigidly fixed by any method that might possibly influence the forces acting on the interface between the mating contacts.

3.2.4 Voltmeter probe points may be prepared prior to starting the test. It is recommended to permanently attach the voltmeter leads by soldering, spot welding, or crimping with a suitable device when required by the environmental conditions existing at the time the test shall be made.

3.2.5 Voltage probes for crimp contacts shall be placed on the conductors a distance of 152.4 millimeters ± 3.0 millimeters (6.00 inch ± 0.12 inch) from each other, with the mated contacts in the center of that distance unless otherwise specified in the referencing document.

4 Test procedure

4.1 With the current OFF, connect the specimen into the test circuit.

4.2 Energize the circuit and increase the current until the required test current is achieved. The lowest voltage shall be used that allows the specified test current to be achieved. Unless otherwise specified in the referencing document the output voltage of the current source shall not exceed the rated working voltage of the specimen.

4.3 Allow the test specimen to stabilize at the test current.

4.4 Connect the voltmeter probes (leads) to the specimen (if not permanently attached) and measure and record the voltage drop. Assure that the test current has remained at the correct value.

4.5 When readings are one millivolt or less on small dc measurements, reverse current readings shall be taken. The two measurements shall be averaged to cancel the effects of thermal potentials.

4.5.1 If necessary, adjust power supply to make reverse current equal to forward current.

4.5.2 Measure and record the reverse voltage drop.

4.5.3 Calculate the specimen voltage drop as follows:

$$\text{Specimen voltage drop} = \frac{\text{forward voltage drop} + \text{reverse voltage drop}}{2}$$

4.5.4 Deenergize circuit and disconnect specimen.

4.5.5 Calculate resistance, if required.

5 Details to be specified

The following details shall be specified in the referencing document:

5.1 Test specimen preparation, if other than specified herein.

5.2 Specimen description including fixturing

5.3 Test current

5.4 Maximum voltage of the current source

5.5 Parameters to be measured, voltage drop or resistance

5.6 Number of specimens to be tested

5.7 Location of voltage drop measurement points and dimension X in figure 1

6 Documentation

Documentation shall contain the details specified in clause 5, with any exceptions, and the following:

6.1 Title of test

6.2 Specimen description, including fixturing if applicable (photographs may be used)

6.3 Test equipment used, and date of last and next calibration

6.4 Test current and applied voltage

6.5 Test procedure

6.6 Values and observations

6.7 Name of operator and date of test

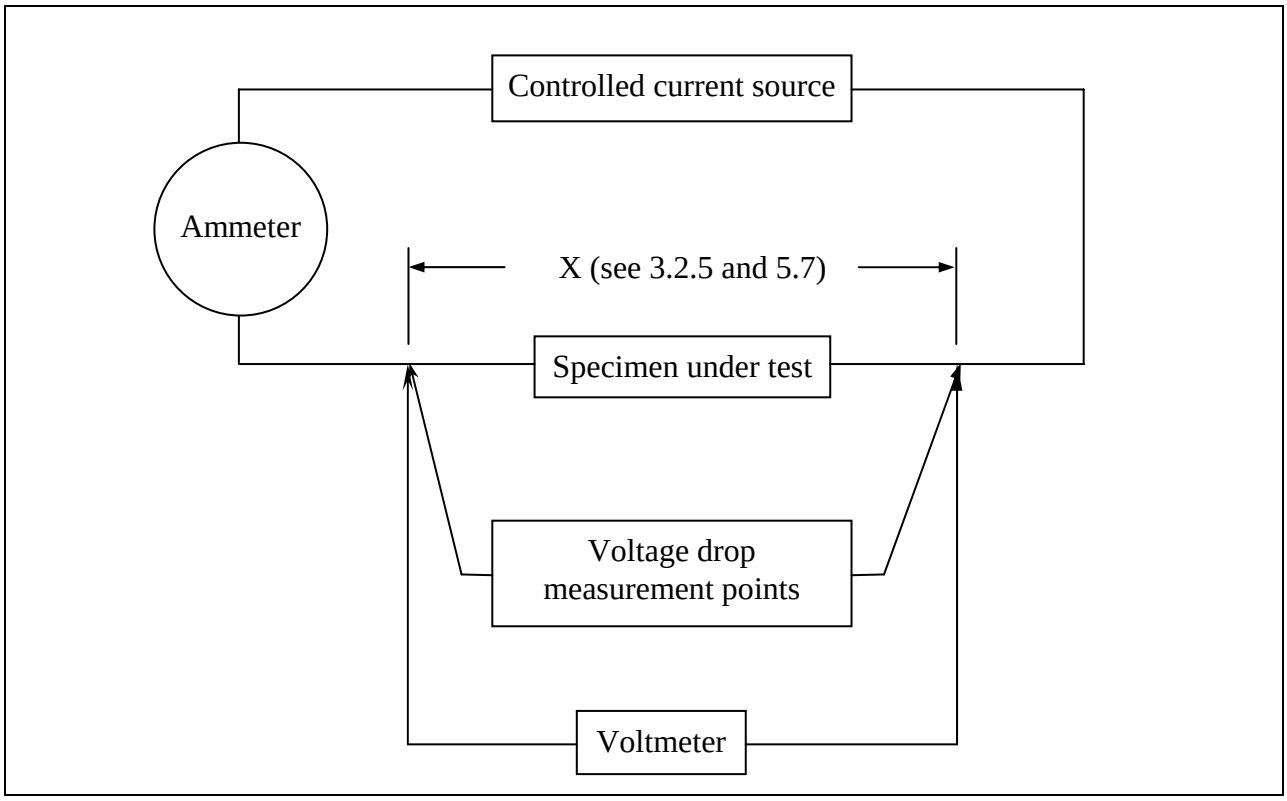

Figure 1 - Test circuit

EIA Document Improvement Proposal

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