



IPC-TM-650 TEST METHODS MANUAL

1.0 Scope

1.1 To evaluate the contact resistance of electrical contacts where the applied voltage and current are low.

2.0 Reference Documents

2.1 Information in this section is intended to parallel the test method described in EIA-RS-364/TP-23.

3.0 Test Specimen

3.1 The mated contacts of a connector mounted and, when required, terminated in its normal manner or a mated pair of individual contacts.

NOTE: When mated contact pairs, not requiring housings, are tested, they shall be rigidly mounted in a fixture to provide mechanical stability and to insure proper mating and orientation.

3.2 Voltage connections shall be attached permanently by soldering, crimping, or wire-wrapping as appropriate and shall be positioned as follows:

- A. Wire Hole — On the contact within 1/8 inch of insulator.
- B. WrapPost — On the wrap-post adjacent to the outer turn of wire.
- C. Crimp — Crimped to the contact simultaneously with the current lead.
- D. Solder Tab — On the printed wiring traces as close to the termination as practicable.
- E. Press-Fit — On the pad of the plated-through hole as close to the termination as practicable.

If the pad of the printed wiring board constitutes one-half of the mated contact pair, the voltage connection shall be soldered to the pad immediately adjacent to, but not touching, the mating contact.

NOTE: In case of environment resistant (sealed) connector, the voltage connections shall be attached as close to the sealing grommets as practicable.

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3.3 Unless otherwise specified in the individual contact or connector specification, the test samples shall not be cleaned by any means prior to the test nor shall any lubricants or other coatings be applied.

4.0 Apparatus

4.1 **Microvoltmeter** The meter accuracy shall be such that the voltage value is measured within 2 percent.

4.2 **Milliammeter (optional)** The meter accuracy shall be such that the current value is measured within 2 percent.

4.3 0.001 OHM resistor accurate to ± 1 percent.

4.4 Power supply capable of delivering 1 milliamperes at 1.35 volts DC potential.

5.0 Procedure

CAUTION: THE CONTACTS UNDER TEST SHALL NOT BE SUBJECTED TO A POTENTIAL GREATER THAN 20 MILLIVOLTS DC (OR 20 MILLIVOLTS PEAK AC) EITHER PRIOR TO OR DURING THE TEST.

5.1 The low level test shall be conducted using a circuit comparable to that shown in Figure 1, which will deliver a one (1) milliamperes sample current when the variable resistor is adjusted to provide a 20 millivolt open circuit potential between T1 and T2. The 3-position switch shown in Figure 1 shall be opened before each measurement to zero the voltmeter.

NOTE: The total resistance between points T1 and T2 shall be less than 100 milliohms.

5.2 The voltage drop across each pair of mated contacts with the current successively in both directions through the test specimen shall be measured. The contact resistance shall be calculated, in both the forward and reverse direction, by dividing the voltage drop reading by the current reading. The average of the two resistance values thus obtained for each contact shall not exceed the maximum allowable contact resistance as defined in the individual contact or connector specification.

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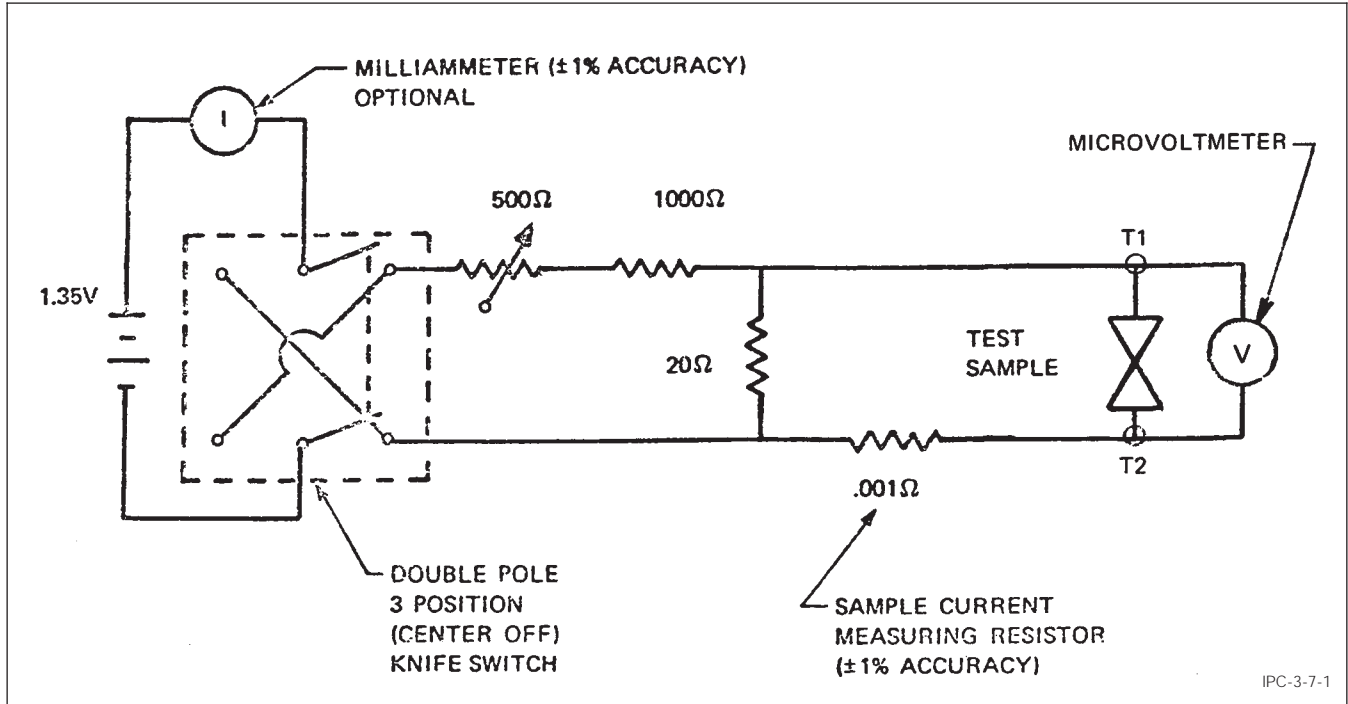


Figure 1

6.0 Notes

6.1 Acceptance criteria shall be established as the maximum level at which stable electrical contact is maintained. This resistance is an inherent characteristic of any given connector contact design and is (when the connector is properly applied) well below that resistance level required for circuit function.