



# IPC-TM-650 TEST METHODS MANUAL

**1 Scope** This test method is used to determine the effects of exposure to elevated ambient temperature on the electrical and mechanical characteristics of a connector.

**2 Applicable Documents** None

### 3 Test Specimen

**3.1** A mated connector (plug and receptacle) complete with all applicable guide, keying, and engaging hardware shall be terminated and mounted in its normal manner during this test.

**3.2** The card-edge receptacle and an applicable PCB of minimum thickness shall be mated during this test, except as otherwise specified.

### 4 Equipment/Apparatus

**4.1** A suitable chamber capable of maintaining the applicable temperatures within  $\pm 20^{\circ}\text{C}$  at the geometric center under no load conditions. Thermal distribution shall not exceed  $\pm 50^{\circ}\text{C}$  of the temperature at the geometric center.

**4.2** A thermocouple bridge, potentiometer, or resistance bridge of suitable range for the specified test conditions

### 5 Procedure

**5.1** The chamber shall be adjusted to, and maintained at, the temperature specified in the individual connector specification. Thermal equilibrium shall be attained prior to the start of the test (see 6.3).

**5.2** The mated test specimen shall be suspended within the test chamber and subjected to the specified temperature for the required time duration called out in the individual specification.

**Note:** Table 1 and Table 2 may be used as a reference for test temperatures and test times, however, the individual connector specification shall take precedence.

**5.3** If groups of samples are tested, they shall be mounted in a manner, such that the normal heat dissipation, absorption, conduction, or reflection characteristics inherent in the connector are not infringed.

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Subject <b>High Temperature Life, Connectors</b>	
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**Table 1 Test Temperatures**

Test Condition	Chamber Temperature ( $^{\circ}\text{C}$ )
1	55
2	70
3	85
4	105
5	125
6	150
7	200

**Table 2 Length of Test**

Test Time Condition	Hours
A	96
B	300
C	500
D	1000
E	1500
F	2000
G	3000
H	5000

**5.4** The connector test potentials, duty cycle load, and other operating conditions during exposure shall be specified in the applicable connector specifications

**5.5** At the completion of the specified exposure time, the conductors shall be stabilized at ambient temperature and checked for low level circuit and insulation resistance, unless otherwise specified in the individual connector specification.

**5.6** Visual examination shall be for evidence of the following:

- A. Permanent dimensional changes or distortion
- B. Cracking or delamination of finishes or dielectric materials
- C. Opening of seals or seams
- D. Hardening or softening of dielectric materials
- E. Fusing or seizure of mating connectors or components

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## 6 Notes

**6.1** Acceptance criteria shall be established in terms of one or any combination of the following:

- A. Visible evidence of damage or significant material change
- B. Deterioration of low level circuit or insulation resistance beyond allowable specified limits, or other requirements called out in an individual specification

**6.2** The test chambers shall be of the forced- (circulating) air type to ensure temperature distribution.

**6.3** Thermal equilibrium shall be assumed, when three successive thermocouple readings taken at five-minute intervals indicate variations of 30°C or less.

**6.4** Information in this test method is intended to parallel the test method described in EIA-RS-364/TP-17.