



IPC-TM-650 TEST METHODS MANUAL

1.0 Scope

1.1 To determine the effects of exposing connectors to extremes of high and low temperature and of the mechanical stresses created by rapid transition between the temperature extremes.

2.0 Reference Documents

2.1 Information in this section is intended to parallel the test method described in EIA-RS-364/TP-32.

3.0 Test Specimen

3.1 A connector (plug and receptacle) complete with all applicable guide, keying and engaging hardware or a card-edge receptacle.

3.2 The plug and receptacle shall be tested in a configuration normal to its functional capacity including mounting, termination, and mating.

3.3 The plug and receptacle or the card-edge receptacle and a nominal thickness printed circuit board shall be mated during this test, except as otherwise specified.

4.0 Apparatus

4.1 A dual chamber (or two separate chambers) capable of maintaining the applicable temperature within $\pm 2^\circ\text{C}$ at the geometric center under no load conditions, and a thermal distribution not greater than $\pm 5^\circ\text{C}$ of the temperature at the geometrical center.

5.0 Procedure

5.1 The chamber(s) shall be adjusted to, and maintained at, the high and low extremes 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 low temperature chamber and subjected to the number of

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continuous thermal shock cycles specified in the individual connector specification. One complete cycle of thermal shock is defined by Table 1. (See 6.4)

Table 1 Thermal Shock Test Conditions (One Cycle)

Step	Temperature, °C	Time
1	Low extreme (+0, -5°C)	30 min. (min.)
2	25°C (+10, -5°C)	2 min. (max.)
3	High extreme (+5, -0°C)	30 Min. (min.)
4	25°C (+10, -5°C)	2 min. (max.)

WARNING: BOTH THE HIGH AND LOW TEMPERATURE EXTREMES USED DURING THIS TEST WILL CAUSE SEVERE BURNS. USE INSULATED GLOVES WHEN HANDLING THE TEST SPECIMEN.

5.3 After completion of the specified number of cycles and attaining room ambient temperature, the sample shall be visually examined for evidence of the following:

- A. Excessive permanent dimensional changes (distortion).
- B. Cracking or delamination of finishes or dielectric materials.
- C. Opening of seals or seams.
- D. Hardening or softening of dielectric materials.

5.4 Unless otherwise specified in the individual connector specification, the test specimen shall be subjected to the withstanding voltage test, (3.13).

6.0 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. A deterioration in withstanding voltage occasioned by internal fissures in the dielectric with or without the accompanying entrapment, of moisture.

6.2 The test chambers shall be of the forced (circulating) air type to insure even temperature distribution.

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6.3 Thermal equilibrium shall be assumed to have been attained when three successive temperature readings taken at five-minute intervals show a variation not greater than 3°C.

6.4 The exposure and transfer times specified in Table 1 are based on an assumed sample weight less than 0.5 pound (226 GMS). Appropriate increases in these periods shall be made for larger samples to ensure that the designated test temperature is attained.