ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

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Number	
2.6.7.3 **(Supersedes 2.6.7.1 for Solder Mask Test)**	
Subject **Thermal Shock - Solder Mask**	
Date **07/00**	Revision
Originating Task Group **Solder Mask Performance Task Group (5-33b)**	

IPC-TM-650
TEST METHODS MANUAL

1 Scope This test method is to determine the physical endurance of applied polymer solder mask to sudden changes of high and low temperature excursions to cause physical fatigue.

2 Applicable Documents

IPC-CC-830 Qualification and Performance of Electrical Insulating Compounds for Printed Board Assemblies

IPC-SM-840 Qualification and Performance of Permanent Coating (Solder Mask) for Printed Boards

3 Test Specimens

3.1 Qualification Testing Six IPC-B-25A test boards (see Figure 1) coated with solder mask and cured in accordance with solder mask supplier's recommendations.

3.2 Conformance Testing Six IPC-B-25A boards (see Figure 1) containing the C pattern (''Y'' pattern) with 0.635 mm lines/0.635 mm spacing [25.00 mil lines/25.00 mil spacing] or minimum spacing on the production board, whichever is smaller, coated with solder mask according to the coating supplier's recommendations.

4 Apparatus

4.1 Chamber Automatically controlled dual temperature environmental test equipment or two separate chambers capable of maintaining -65° ± 5°C [-85° ± 9°F] and +125° ± 5°C [+257° ± 9°F].

5 Procedure

5.1 Specimen Preparation In order to test the compatibility of solder mask with conformal coating, conformal coat three of the above test specimens with a coating in accordance with IPC-CC-830 and cure in accordance with the coating supplier's recommendations

5.2 Test

5.2.1 Place the test specimens into the test chamber, so that they do not touch one another, and set the parameters as follows:

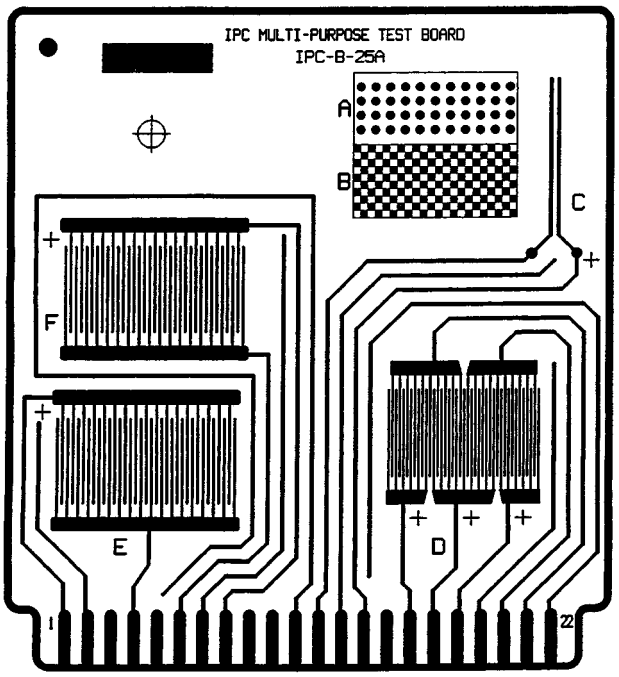

Figure 1 IPC-B-25A Test Board

a. Temperature Extremes: as specified in IPC-SM-840 ± 5°C [± 9°F].
b. Dwell Time at Temperature Extremes: 15 minutes
c. Transfer Time: Less than two minutes
d. Number of Cycles: 100

5.2.2 Activate the test chamber and begin testing.

5.2.3 One thermal cycle consists of the following:

a. Expose the specimens to the high temperature for 15 minutes.
b. Transfer the specimens to the low temperature in less than two minutes.
c. Expose the specimens to the low temperature for 15 minutes.
d. Transfer the specimens to the high temperature in less than two minutes.

5.2.4 Repeat the above cycle to 100 cycles without interruption.

5.2.5 Remove the specimens and allow them to reach laboratory conditions as specified in IPC-SM-840.

5.2.6 Evaluation Examine the specimens, on both sides, for all visual requirements of IPC-SM-840 using 10X magnifications (Referee of 30X magnifications).

Note: The presence of cracks in solder mask is not a sufficient reason for rejection unless the conformal coating has also cracked. Report findings and support results with the photographs, if appropriate.