ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

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Number	
2.5.7.1 **(Supersedes 2.5.7C for Conformal Coating Test)**	
Subject **Dielectric Withstanding Voltage - Polymeric Conformal Coating**	
Date **07/00**	Revision
Originating Task Group **Conformal Coating Task Group (5-33a)**	

IPC-TM-650
TEST METHODS MANUAL

1 Scope The dielectric withstanding voltage test (also called high-potential, over potential or voltage breakdown test) consists of the application of a voltage higher than rated voltage for a specific time between mutually isolated portions of a PWB or between isolated portions and ground. This is used to prove that the PWB can operate safely at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomena. Although this test is often called a voltage breakdown test, it is not intended that this test cause insulation breakdown or to be used for detecting corona. Rather, it serves to determine whether insulating materials and/or conductor spacings are adequate.

2 Applicable Documents

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

IPC-A-600 Acceptability of Printed Wiring Boards

MIL-STD-202 Method 301

J-STD-004 Requirements for Soldering Fluxes

3 Test Specimens

3.1 Qualification Testing, Classes 1-3 Five IPC-B-25A boards (see Figure 1) using the D comb pattern (one uncoated and four coated) with conformal coating according to the coating suppliers recommendations.

3.2 Conformance Testing Five IPC-B-25A Boards (See Figure 1) containing the C pattern (''Y'' shape 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 conformal coating according to the coating supplier's recommendations.

4 Apparatus

4.1 Soldering Iron

4.2 Flux Water white rosin (R or RMA) with halide content less than 0.5%, i.e., type Symbol A and B or ROL0 and ROL1 according to J-STD-004.

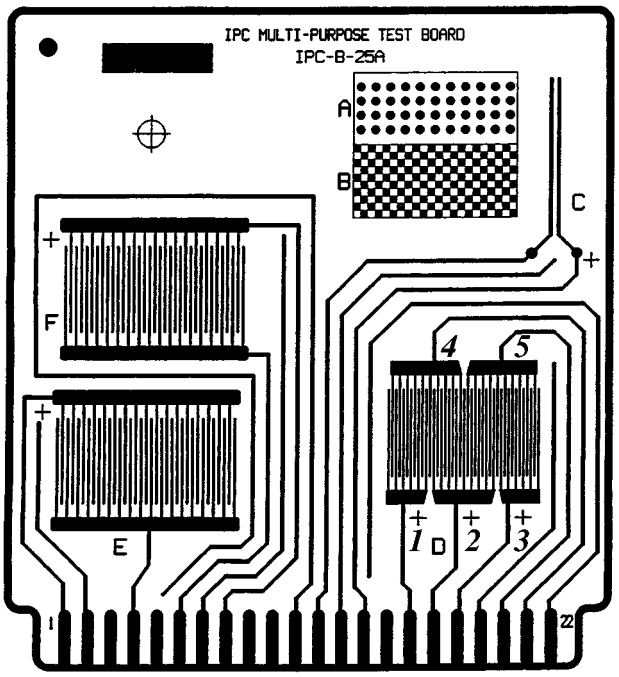

Figure 1 IPC-B-25A Test Board (Leads on D Pattern Are Identified)

4.3 Hi-Pot Tester Capable of supplying a test voltage of 1,500 VAC at 50-60 hertz (Hz) and able to record a leakage rate.

4.4 Timer

4.5 Oven Capable of maintaining 60°C [140°F].

4.6 Desiccator

5 Test Specimens Preparation Prior to Testing

5.1 Solder wires to the finger tabs on the ''D'' comb pattern using R or RMA flux.

5.1.1 Clean the specimens using a soft bristle brush while rinsing with deionized water for 30 seconds.

5.1.2 Immerse and agitate the test specimens in 2-propanol for 30 seconds. Scrub with a soft bristle brush and spray with clean 2-propanol.

5.1.3 Place the cleaned specimens in an oven maintained at 50°C [122°F] for three to five hours to dry.

5.1.4 Remove the specimens from the oven and place in a desiccator to cool.

5.1.5 Conformal coat the test specimens and cure in accordance with the suppliers recommendations. If the specimens are not used immediately, seal the specimens in Kapac® bags.

5.2 Procedure

5.2.1 For each individual specimen, secure all the positive leads (1, 3 and 5) together and the negative (2 and 4) together.

5.2.2 Attach the leads of the Hi-Pot Tester to the wires of the test specimen.

5.2.3 Raise the test voltage from zero to 1,500 VAC at 100 VAC per second.

5.2.4 Apply the test voltage of 1,500 VAC at 50-60 Hz for one minute and record any leakage rate.

5.2.5 After the one-minute duration, turn off the voltage and disconnect the test specimen from the Hi-Pot Tester.

6.0 Evaluate

6.1 Record if the specimen exhibits flashover, sparkover or breakdown.

6.1.1 Record the leakage current of each specimen.