



IPC-TM-650 TEST METHODS MANUAL

1.0 Scope This is a nondestructive test that may be used at any time during the preproduction phase of printed wiring board manufacturing.

2.0 Applicable Documents

2.1 IPC-A-600 Acceptability of Printed Wiring Boards

2.2 IPC-D-325 End Product Documentation Specification for Printed Boards

3.0 Test Specimen Any preproduction or production single-sided, double-sided, multilayer printed wiring board or test coupon. This may also be a discrete wiring board with pads on one or more layers.

4.0 Apparatus Any optical, opto-mechanical, or mechanical measuring device capable of measuring to 0.001 in. or less. X-ray photographs may be used. All measurements should be made perpendicular to the specimen.

5.0 Procedure

5.1 General Initially the determination of hole locations is made with respect to the master drawing, then the accuracy of the conductor placement is made as a secondary size control.

Number 2.2.10	
Subject Hole Location and Conductor Location	
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Originating Task Group N/A	

5.2 Hole Location A test specimen is placed on the measuring device. All holes are measured for location accuracy. (Register to master drawing requirements.)

5.3 Double-Sided Boards and Multilayer Surface Layers—Conductor Locations After locating hole center (paragraph 5.2), center of lands are located and compared to the centers of the respective holes. For variation of the pattern on one side compared to that on the other side, all measurements shall be made to the holes and compared.

5.4 Multilayer Boards-Internal Conductor Location Multilayer internal registration may be determined using X-ray photography. One shot is taken with the test specimen laying flat. Two additional shots are taken with the specimen positioned at a 30° angle in both the X and the Y.

Proceed to measure the X-ray negatives or photographs using from 10 to 30 power.

6.0 Note Set up and operating parameters, i.e., Kv, Ma, distance and time, will depend on the board thickness and type of equipment.