



IPC-9252B

Requirements for Electrical Testing of Unpopulated Printed Boards

Developed by the Electrical Continuity Testing Task Group (7-32c)
of the Product Assurance Committee (7-30) of IPC

Supersedes:

IPC-9252A - November 2008

IPC-9252 - February 2001

IPC-ET-652A - October 1990

Users of this publication are encouraged to participate in the
development of future revisions.

Contact:

IPC

Table of Contents

1 SCOPE	1	4.1.2 Indirect Continuity Testing by Signature Comparison.....	6
1.1 Purpose	1	4.2 Isolation Testing	7
1.2 Introduction.....	1	4.2.1 Resistive Isolation Testing	7
1.3 Selection of the Proper Test Level	2	4.2.2 Indirect Isolation Testing by Signature Comparison.....	7
1.4 Revision Level Changes.....	2	4.3 Test Parameter Matrix	7
2 APPLICABLE DOCUMENTS	2	4.4 Tests Other than Continuity and Isolation.....	7
2.1 IPC	2	4.5 Verification (Re-Testing)	7
2.2 International Organization for Standardization (ISO)	2	4.6 Test Records, Traceability and Marking.....	7
2.3 American National Standards Institute (ANSI)	2	4.6.1 Retention.....	7
3 TERMS AND DEFINITIONS	2	4.6.2 Traceability	8
3.1 AABUS (As Agreed Between User and Supplier)	2	4.6.3 Marking.....	8
3.2 Adjacency Terms	2	5 TEST PROGRAM GENERATION	8
3.2.1 Adjacency	3	5.1 Source Data	8
3.2.2 Adjacency Distance	3	5.1.1 CAM Data Test.....	8
3.2.3 Horizontal Adjacency Distance.....	3	5.1.2 CAD Data Test	8
3.2.4 Vertical Layer Adjacency	4	6 ELECTRICAL TEST CERTIFICATION AND TRACEABILITY	8
3.3 Analyzer.....	5	6.1 Certificate of Conformance (C of C).....	8
3.4 Computer Automated Design/Manufacturing (CAD/CAM) Net List	5	6.1.1 Example of a Test Certificate of Conformance (C of C)	8
3.5 Contamination.....	5	6.2 Traceability	9
3.6 End Points/Midpoints	5	APPENDIX A Other Tests and Considerations	10
3.7 Moving (Flying) Probe.....	5	Figures	
3.8 Guide Plate Fixture	5	Figure 1-1 Automatic Test Equipment (ATE) Selection Criteria	1
3.9 Impedance Testing	5	Figure 3-1 Adjacency	3
3.10 Indirect Test by Signature Comparison	5	Figure 3-2 Adjacency Distance Example	3
3.11 Isolation Resistance	5	Figure 3-3 Horizontal Layer Adjacency	3
3.12 Leakage.....	5	Figure 3-4 Line of Sight Adjacency	4
3.13 Plated Hole	5	Figure 3-5 Vertical Layer Adjacency	4
3.14 Populated Board	5	Figure 3-6 Test for Midpoint Classification	5
3.15 Resistance Measuring Method	5	Figure 4-1 Resistive Continuity Test.....	6
3.16 Time Domain Reflectometer (TDR).....	5	Figure 4-2 Resistive Continuity Test.....	7
4 TEST METHODOLOGIES	6	Tables	
4.1 Continuity Test	6	Table 4-1 Requirements by Test Level.....	6
4.1.1 Resistive Continuity Testing	6		

Requirements for Electrical Testing of Unpopulated Printed Boards

1 SCOPE

This document is intended to assist in selecting the test analyzer, test parameters, test data, and fixturing required to perform electrical test(s) on all unpopulated printed boards.

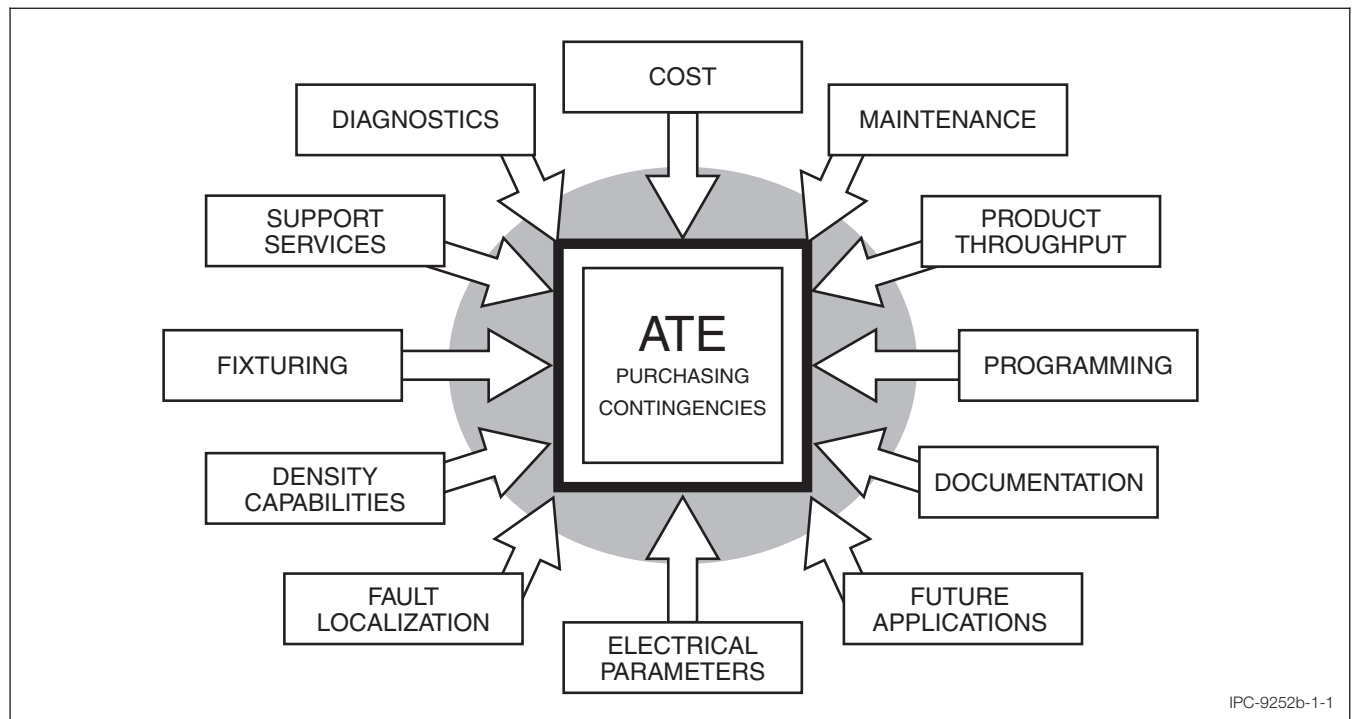
The testing of printed boards with embedded components (e.g., resistors, capacitors, etc.) is not addressed in this document revision.

1.1 Purpose Electrical testing verifies that the conductive networks on the printed boards are interconnected according to the design requirements.

Electrical test does not ensure that the printed board can be assembled or that the printed board meets all of the customer’s requirements. Many physical characteristics of the conductors (dimensional accuracy, solder mask, conductor geometry and nomenclature registration, presence of holes, etc.) can’t be determined by electrical test. Other checks should be employed to confirm these characteristics.

1.2 Introduction Electrical testing of printed boards ensures that the printed board conforms to the electrical design requirements. This document defines different levels of testing available in order to achieve this purpose. In selecting the appropriate test level, technology, equipment, and associated fixturing, a suitable compromise between productivity, features, and costs can be found.

The costs associated with electrical testing can vary dramatically. Costs alone, however, should never be the only criteria for selecting the appropriate test level and equipment. As shown in Figure 1-1, many other important areas require consideration. For example, spacing and density of a printed board design may be of paramount importance to one user, while another may be concerned with testing parameters and service reliability. A careful examination of all areas of concern and how they may affect each other, not just how they perform individually, is therefore significant. Whatever the selection criteria may be, qualifying “benchmarks” should be performed on known product.



IPC-9252b-1-1

Figure 1-1 Automatic Test Equipment (ATE) Selection Criteria