



IPC-6017

Qualification and Performance Specification for Printed Boards Containing Embedded Passive Devices

Developed by the Embedded Devices Performance Subcommittee (D-53) of the Embedded Devices Committee (D-50) of IPC

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

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Table of Contents

1 SCOPE	1	3.5.2 Spacing	3
1.1 Statement of Scope	1	3.5.3 Conductive Surfaces	3
1.2 Purpose	1	3.5.4 Nicks and Pinholes	3
1.3 Performance Classification	1	3.6 Structural Integrity	3
1.4 Embedded Passive Device Categories	1	3.6.1 Thermal Stress	4
1.5 Documentation Hierarchy	1	3.6.2 Microsection Integrity	4
1.6 Selection for Procurement	1	3.7 Protective Coverage	4
1.7 Selection (Default)	1	3.7.1 Solder Mask Coverage Requirements	4
1.8 Terms and Definitions	1	3.7.2 Other Protective Coatings	4
1.8.1 As Agreed Upon Between User and Supplier (AABUS)	1	3.8 Electrical Requirements	4
2 APPLICABLE DOCUMENTS	1	3.8.1 Electrical Requirements of Embedded Passives Devices in PBs	4
2.1 IPC	1	3.8.2 Dielectric Withstanding Voltage	4
2.2 Underwriters Laboratories	2	3.8.3 Circuitry	5
3 REQUIREMENTS	2	3.8.4 Moisture and Insulation Resistance (MIR)	5
3.1 General	2	3.9 Cleanliness	5
3.2 Materials	2	3.10 Special Requirements	5
3.2.1 Rigid Laminates	2	3.10.1 Heat Dissipation	5
3.2.2 Flexible Films	2	3.10.2 Thermal Shock	5
3.2.3 Microwave High Speed Materials	2	3.11 Repair	5
3.2.4 Bonding Materials	2	4 QUALITY ASSURANCE PROVISIONS	5
3.2.5 Resistor Materials	2	4.1 General	5
3.2.6 Capacitor and Capacitance Materials	3	4.2 Acceptance Tests	5
3.2.7 Metal Foils	3	4.2.1 C=0 Zero Acceptance Number Sampling Plan	5
3.2.8 Metallic Plating and Coatings	3	4.2.2 Referee Tests	5
3.2.9 Solder Mask	3		
3.2.10 Polymer Coatings for Embedded Passive Devices	3		
3.2.11 Marking Inks	3		
3.2.12 Other Materials	3		
3.3 Visual Examination	3		
3.4 PB Dimensional Requirements	3		
3.5 Embedded Passive Pattern Definition	3		
3.5.1 Size Verification	3		

Tables

Table 3-1 Embedded Passive Device Finished PB Tolerance Requirements	4
Table 3-2 Dielectric Withstanding Voltages	4
Table 4-1 C=0 Sampling Plan (Sample Size for Specific Index Value	6
Table 4-2 Acceptance Testing and Frequency	6

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1 SCOPE

1.1 Statement of Scope This specification covers qualification and performance of in-process and finished printed boards (PBs) containing embedded passive circuitry with distributive capacitive planes, capacitive or resistive components.

1.2 Purpose The requirements contained herein are intended to reflect electrical, mechanical, and environmental properties unique to embedded passives. It is not intended to specify overall requirements for the PB which are already documented in the following sectional performance specifications: IPC-6012 (rigid), IPC-6013 (flex/rigid-flex), IPC-6015 (MCM-L) or IPC-6018 (microwave).

1.3 Performance Classification This specification recognizes that in-process and finished PBs containing embedded passive devices will be subject to variations in performance requirements based on end-use. The PBs are classified by one of three general Performance Classes as defined in IPC-6011.

1.4 Embedded Passive Device Categories Embedded resistors and capacitors are supplied in two formats, which are referred to as laminate and nonlaminate like. The laminate like are supplied as sheets of capacitor or resistor materials usually supplied with copper foil and/or an inner-layer support. The final resistors or capacitors designs are imaged/etched in the supplied material. Nonlaminate like capacitors and resistors are supplied as pastes or other materials which are applied in discrete areas to define the capacitors and resistors. Both categories of embedded passives are included in this specification.

1.5 Documentation Hierarchy This document, combined with IPC-6011 and the applicable sectional performance specification(s) (e.g., IPC-6012, IPC-6013, IPC-6018, etc.), constitutes a qualification and performance specification for in-process and finished PBs containing embedded passives.

1.6 Selection for Procurement For procurement purposes, performance class **shall** be specified in the procurement documentation. The documentation **shall** provide sufficient information to the supplier so that one can fabricate

the PB and ensure that the user receives the desired product. Information that should be included in the procurement documentation is shown in IPC-D-325.

1.7 Selection (Default) The procurement documentation should specify the requirements that can be selected within this specification; however, in the event selections are not made in the applicable sectional performance specification(s) (e.g., IPC-6012, IPC-6013, IPC-6018, etc.), then the Class 2 requirements in those specifications **shall** apply.

1.8 Terms and Definitions Terms and definitions **shall** be in accordance with IPC-T-50 and as stated below.

1.8.1 As Agreed Upon Between User and Supplier (AABUS) Indicates additional or alternate requirements to be decided between the user and the supplier in the procurement documentation. Examples include contractual requirements, modifications to purchase documentation and information on the drawing. Agreements can be used to define test methods, conditions, frequencies, categories or acceptance criteria within a test, if not already established.

Note: The user's attention is called to the possibility that utilization of some of the materials described within this design guideline may require use of inventions covered by rights of patents. By publication of this document, no position is taken with respect to the validity of these claims or of any rights of patents in connection therewith. The patent holders have, however, filed a statement of willingness to grant a license under the rights of these patents on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license. Details may be obtained from IPC.

2 APPLICABLE DOCUMENTS

2.1 IPC¹

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

IPC-D-325 Documentation Requirements for Printed Boards, Assemblies, and Support Drawings

IPC-TM-650 Test Methods Manual²

2.1.1 Microsectioning

1. www.ipc.org

2. Current and revised IPC Test Methods are available on the IPC Web site (www.ipc.org/html/testmethods.htm)