

IPC-6018B

2011-November

**Qualification and Performance
Specification for High Frequency
(Microwave) Printed Boards**

A standard developed by IPC

Association Connecting Electronics Industries



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IPC-6018B

Qualification and Performance Specification for High Frequency (Microwave) Printed Board

Developed by the IPC High Speed/High Frequency Board Performance
Subcommittee (D-22) of the High Speed/High Frequency Committee (D-20)

Supersedes:

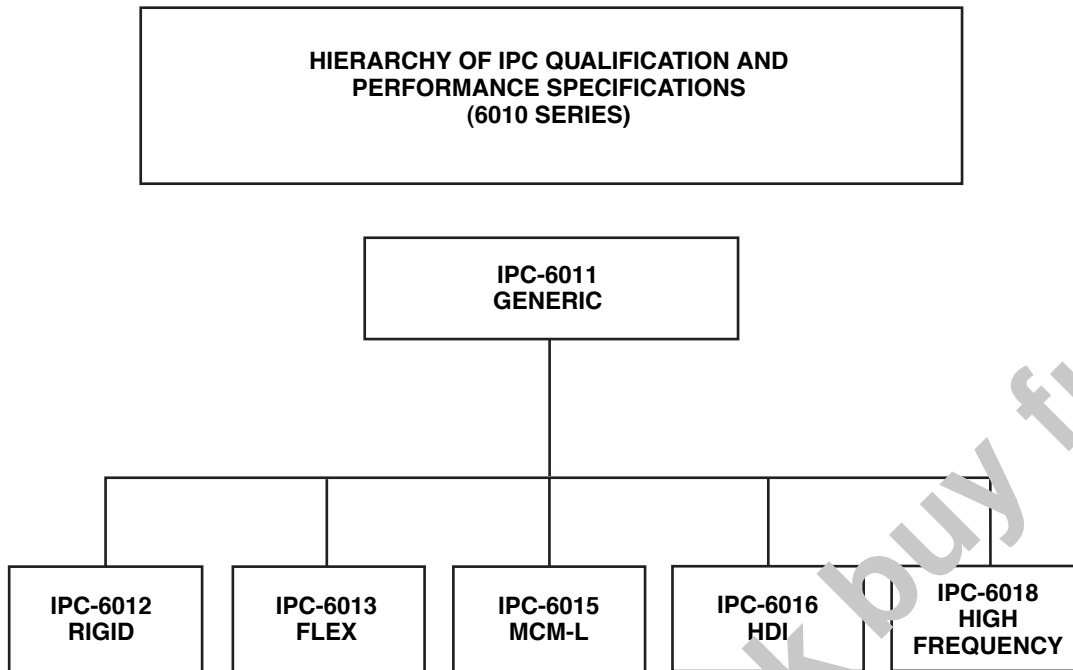
IPC 6018A – January 2002

IPC-6018 – January 1998

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development of future revisions.

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FOREWORD

This specification is intended to provide information on the detailed performance criteria of rigid printed boards. It supersedes IPC-6012B and was developed as a revision to those documents. The information contained herein is also intended to supplement the generic requirements identified in IPC-6011. When used together, these documents should lead both manufacturer and customer to consistent terms of acceptability.

IPC's documentation strategy is to provide distinct documents that focus on specific aspects of electronic packaging issues. In this regard, document sets are used to provide the best information related to a particular electronic packaging topic. A document set is identified by a four digit number that ends in zero (0) (i.e., IPC-6010).

Included in the set is the generic information, which is contained in the first document of the set. The generic specification is supplemented by one or multiple performance documents, each of which provide a specific focus on one aspect of the topic or the technology selected.

Failure to have all information available prior to building a board may result in a conflict in terms of acceptability.

As technology changes, a performance specification will be updated, or new focus specifications will be added to the document set. The IPC invites input on the effectiveness of the documentation and encourages user response through completion of "Suggestions for Improvement" forms located at the end of each document.

Acknowledgment

Any document involving a complex technology draws material from a vast number of sources. While the principal members of the High Speed/High Frequency Board Performance Subcommittee (D-22) of the High Speed/High Frequency Committee (D-20) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of the IPC extend their gratitude.

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Table of Contents

1	SCOPE	1	3.2.3	Other Dielectric Materials	7
1.1	Scope	1	3.2.4	Metal Foils	7
1.2	Purpose	1	3.2.5	Metal Core/Backed	7
1.3	Performance Classification and Types	1	3.2.6	Base Metallic Plating Depositions and Conductive Coatings	7
1.3.1	Classifications	1	3.2.7	Final Finish Depositions and Coatings – Metallic and Non-Metallic	8
1.3.2	Printed Board Type	1	3.2.8	Polymer Coating (Solder Mask)	10
1.3.3	Selection for Procurement	1	3.2.9	Fusing Fluids and Fluxes	10
1.3.4	Material, Plating Process and Final Finish	3	3.2.10	Marking Inks	10
1.4	Terms and Definitions	3	3.2.11	Hole Fill Insulating Material	10
1.4.1	White Spots	3	3.2.12	Metal and/or Composite, External	10
1.4.2	Hybrid (Composite) Printed Board	3	3.2.13	Via Protection	10
1.4.3	As Agreed Between User and Supplier (AABUS)	4	3.2.14	Embedded Passive Materials	11
1.5	Interpretation “Shall,”	4	3.3	Plating and Coating Defects	11
1.6	Presentation	4	3.3.1	Edges of Microwave Printed Boards	11
1.7	Revision Level Changes	4	3.3.2	Laminate Imperfections	11
1.8	Master Drawing	4	3.3.3	Plating and Coating Voids in the Hole	11
2	APPLICABLE DOCUMENTS	4	3.3.4	Lifted Lands	11
2.1	IPC	4	3.3.5	Marking	12
2.2	Joint Industry Standards	5	3.3.6	Solderability	12
2.3	Federal	6	3.3.7	Plating Adhesion	12
2.4	American Society for Testing and Materials	6	3.3.8	Edge Printed Board Contact, Junction of Gold Plate to Solder Finish	12
2.5	Underwriters Lab	6	3.3.9	Workmanship	12
2.6	National Electrical Manufacturers Association	6	3.4	Printed Board Dimensional Requirements	13
2.7	American Society for Quality	6	3.4.1	Hole Size, Hole Pattern Accuracy, Pattern Feature Accuracy and Slots	13
2.8	AMS	6	3.4.2	Annular Ring and Breakout (External)	13
2.9	American Society of Mechanical Engineers	6	3.4.3	Bow and Twist	14
3	REQUIREMENTS	6	3.5	Conductor Definition	15
3.1	General	6	3.5.1	Undercutting	15
3.2	Materials Used in this Specification	6	3.5.2	Conductor Widths and Thicknesses and Spacing	15
3.2.1	Laminates and Bonding Material for Multilayer or Mixed Dielectric Printed Boards	6	3.5.3	Conductive Surfaces	16
3.2.2	External Bonding Materials	7			

Figure 3-15	Measurement Locations for PTFE Resin Smear	22	Table 3-5	Surface and Hole Copper Plating Minimum Requirements for Buried via cores (2 layers)	10
Figure 3-16	Negative Etchback	22	Table 3-6	Plating and Coating Voids Visual Examination.	11
Figure 3-17	Annular Ring Measurement (Internal)	23	Table 3-7	Edge Board Contact Gap.	12
Figure 3-18	Microsection Rotations for Breakout Detection.	23	Table 3-8	Minimum Annular Ring	11
Figure 3-19	Comparison of Microsection Rotations	23	Table 3-9	Maximum Percent of Allowable Conductor Width Deviations.	15
Figure 3-20	Surface Copper Wrap measurement	24	Table 3-10	Percent of Allowable Conductor Spacing Deviations	16
Figure 3-21	Wrap Copper in Type 4 Printed Board (Acceptable)	24	Table 3-11	Percent of Allowable Conductor Width Reduction Caused By Plating Holes	16
Figure 3-22	Wrap Copper Removed by Excessive Sanding/Planarization (Not Acceptable).	24	Table 3-12	Percent of Reduction In Dielectric Material Thickness.	16
Figure 3-23	Copper Cap Thickness	25	Table 3-13	Plated-Through Hole Integrity After Stress.	19
Figure 3-24	Copper Cap Filled Via Height (Bump)	25	Table 3-14	Cap Plating Requirements	25
Figure 3-25	Copper Cap Depression (Dimple).	25	Table 3-15	Internal Layer Foil Thickness after Processing.	26
Figure 3-26	Copper Cap Plating Voids.	25	Table 3-16	External Conductor Thickness after Plating	26
Figure 3-27	Metal Core to PTH Spacing	27	Table 3-17	Solder Mask Adhesion.	28
Figure 3-28	Measurement of Minimum Dielectric Spacing.	27	Table 3-18	Dielectric Withstanding Voltages	29
Tables					
Table 1-1	Default Requirements	2	Table 3-19	Insulation Resistance	29
Table 1-2	Technology Adder Examples.	2	Table 4-1	Qualification Test Coupons	32
Table 3-1	Metal Core Substrate.	7	Table 4-2	C=0 Sampling Plan(Sample Size for Specific Index Value).	33
Table 3-2	Final Finish and Coating Requirements	9	Table 4-3	Acceptance Testing and Frequency	33
Table 3-3	Surface and Hole Copper Plating Minimum Requirements for Buried Vias > 2 Layers, Through-Holes, and Blind Vias.	10	Table 4-4	Quality Conformance Testing	37
Table 3-4	Surface and Hole Copper Plating Minimum Requirements for Microvias (Blind and Buried).	10	Table A.1	Class 3/A Supplemental Requirements	38

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Qualification and Performance Specification for High Frequency (Microwave) Printed Boards

1 SCOPE

1.1 Scope This specification covers end product inspection and test of high frequency (microwave) printed boards for microstrip, stripline, mixed dielectric and multilayer stripline applications with or without buried/blind vias, and metal cores.

The printed board may contain embedded active or passive circuitry with distributive capacitive planes, capacitive or resistive components conforming to IPC-6017. The printed board may contain build up High Density Interconnect (HDI) layers conforming to IPC-6016.

1.2 Purpose The purpose of this specification is to provide requirements for qualification and performance of high frequency (Microwave) printed boards.

1.3 Performance Classification and Types

1.3.1 Classifications This specification establishes acceptance criteria for the performance classification of high frequency printed boards based on customer and/or end-use requirements. Printed boards are classified by one of three general Performance Classes as defined in IPC-6011.

1.3.1.1 Requirement Deviations Requirements deviating from these heritage classifications **shall** be as agreed between user and supplier (AABUS).

1.3.1.2 Space and Military Avionics Deviations Space and Military Avionics performance classification deviations are defined and listed in Appendix A of this specification. These are commonly referred to as Class 3/A.

1.3.2 Printed Board Type This specification will define eight types of high frequency (microwave) printed boards.

Type 1 — Single Sided

Type 2 — Double Sided

Type 3 — Homogeneous Dielectric Multilayer Construction

Type 4 — Mixed Dielectric Multilayer

Type 5 — Homogeneous Dielectric Multilayer with blind and/or buried vias

Type 6 — Mixed Dielectric Multilayer with blind and/or buried vias

Type 7 — Metal and/or composite backed printed boards, single sided or double sided

Type 8 — Multilayer metal and/or composite backed or core printed boards with or without blind and/or buried vias

1.3.3 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 he can fabricate the printed board and ensure that the user receives the desired product. Information that should be included in the procurement documentation is shown in IPC-D-325.

The procurement documentation should specify the thermal stress test method to be used to meet the requirement of 3.6.1. Selection **shall** be from those depicted in 3.6.1.1, 3.6.1.2 and 3.6.1.3. If not specified (see 6.1), the default **shall** be per Table 1-1.

During the selection process, the user should take into consideration the following when determining the appropriate thermal stress test method:

- Wave solder, selective solder, hand solder assembly processes (see 3.6.1.1)
- Conventional (eutectic) reflow processes (see 3.6.1.2)
- Lead-free reflow processes (see 3.6.1.3)

1.3.3.1 Selection (Default) The procurement documentation should specify the requirements that can be selected within this specification. Refer to Table 1-1 for a listing of default requirements.