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

Supersedes IPC-6018C
July 2016

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

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

Contact:

IPC
3000 Lakeside Drive, Suite 105 N
Bannockburn, Illinois
60015-1249
Tel 847 615.7100
Fax 847 615.7105

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High Speed/High Frequency Committee	High Speed/High Frequency Board Performance Subcommittee	Technical Liaison of the IPC Board of Directors
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Timothy Glaze Hughes Circuits, Inc.	Gerry Partida Summit Interconnect - Anaheim	Crystal Vanderpan UL LLC
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Jonathan Herbert Northrop Grumman Corporation	Randy Reed R. Reed Consultancy LLC	

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Table of Contents

1 SCOPE	1	3.2.6	Base Metallic Plating Depositions and Conductive Coatings	8
1.1 Scope	1	3.2.7	Final Finish Depositions and Coatings - Metallic and Non-Metallic	8
1.2 Purpose	1	3.2.8	Polymer Coating (Solder Mask)	11
1.3 Performance Classification and Types	1	3.2.9	Fusing Fluids and Fluxes	12
1.3.1 Classifications	1	3.2.10	Marking Inks	12
1.3.2 Printed Board Type	1	3.2.11	Hole Fill Insulation Material	12
1.3.3 Selection for Procurement	1	3.2.12	Metal and/or Composite, External	12
1.3.4 Material, Plating Process and Final Finish	3	3.2.13	Via Protection	12
1.4 Terms and Definitions	4	3.2.14	Embedded Passive Materials	12
1.4.1 White Spots	4	3.3	Visual	12
1.4.2 Hybrid (Composite) Printed Board	4	3.3.1	Edges of Microwave Printed Boards	12
1.4.3 As Agreed Between User and Supplier (AABUS)	4	3.3.2	Laminate Imperfections	12
1.4.4 High Density Interconnects (HDI)	4	3.3.3	Plating and Coating Voids in the Hole	13
1.4.5 Back-Drilling	4	3.3.4	Lifted Lands	13
1.5 Interpretation	4	3.3.5	Marking	13
1.6 Presentation	4	3.3.6	Solderability	14
1.7 Design Data Protection	4	3.3.7	Plating Adhesion	14
1.8 Revision Level Changes	5	3.3.8	Edge Printed Board Contact, Junction of Gold Plate to Solder Finish	15
1.9 Master Drawing	5	3.3.9	Back-Drilled Holes	15
2 APPLICABLE DOCUMENTS	5	3.3.10	Workmanship	15
2.1 IPC	5	3.4	Printed Board Dimensional Requirements	15
2.2 Joint Industry Standards	6	3.4.1	Hole Size, Hole Pattern Accuracy, Pattern Feature Accuracy and Slots	15
2.3 Federal	6	3.4.2	Annular Ring and Breakout (External)	16
2.4 ASTM International ⁴	6	3.4.3	Bow and Twist	18
2.5 Underwriters Lab.	7	3.5	Conductor Definition	18
2.6 National Electrical Manufacturers Association	7	3.5.1	Conductor Widths and Thicknesses and Spacing	18
2.7 American Society for Quality	7	3.5.2	Conductive Surfaces	19
2.8 AMS	7	3.6	Structural Integrity	21
2.9 American Society of Mechanical Engineers ⁸	7	3.6.1	Thermal Stress Testing	22
3 REQUIREMENTS	7	3.6.2	Requirements for Microsectioned Coupons or Printed Boards	23
3.1 General	7	3.7	Solder Mask Requirements on non PTFE laminates	36
3.2 Materials Used in this Specification	7	3.7.1	Solder Mask Coverage	36
3.2.1 Laminates and Bonding Material for Multilayer or Mixed Dielectric Printed Boards	7	3.7.2	Solder Mask Cure and Adhesion	37
3.2.2 External Bonding Materials	7	3.7.3	Solder Mask	37
3.2.3 Other Dielectric Materials	7			
3.2.4 Metal Foils	7			
3.2.5 Metal Core/Backed	8			

		Tables			
Figure 3-26	Surface Copper Wrap Measurement for Filled Holes (Over Laminate).....	29	Table 1-2	Technology Adder Examples	2
Figure 3-27	Wrap Copper (Acceptable)	29	Table 3-1	Metal Core Substrate	8
Figure 3-28	Wrap Copper Removed by Excessive Processing, e.g., Sanding/Planarization/Etching (Not Acceptable).....	29	Table 3-2	Maximum Limits of SnPb Solder Bath Contaminant	9
Figure 3-29	Copper Cap Thickness	30	Table 3-3	Final Finish, Plating and Coating Requirements	10
Figure 3-30	Copper Cap Filled Via Height (Bump).....	30	Table 3-4	Surface5 and Hole Copper Plating Minimum Requirements for Buried Vias > 2 Layers, Through-Holes, and Blind Vias1	11
Figure 3-31	Copper Cap Depression (Dimple)	30	Table 3-5	Surface and Hole Copper Plating Minimum Requirements for Microvias (Blind and Buried)1	11
Figure 3-32	Copper Cap Plating Voids	30	Table 3-6	Hole Copper Plating Minimum Requirements for Buried Via Cores (2 layers)	11
Figure 3-33	Nonconforming Via fill Between Copper Cap Plating Layers	31	Table 3-7	Plating and Coating Voids Visual Examination	13
Figure 3-34	Acceptable Via Fill Between Copper Cap Plating Layers	31	Table 3-8	Edge Board Contact Gap	15
Figure 3-35	Example of Acceptable Voiding in a Cap Plated, Copper Filled Via	31	Table 3-9	Minimum Annular Ring	16
Figure 3-36	Example of Acceptable Voiding in a Copper Filled Microvia without Cap Plating	31	Table 3-10	Maximum Percent of Allowable Conductor Width Deviations	18
Figure 3-37	Example of Nonconforming Void in a Cap Plated, Copper Filled Microvia	32	Table 3-11	Percent of Allowable Conductor Space Deviations	19
Figure 3-38	Example of Nonconforming Void in a Copper Filled Microvia	32	Table 3-12	Percent of Allowable Conductor Width Reduction Caused By Pin Holes	19
Figure 3-39	Microvia Contact Dimension	32	Table 3-13	Percent of Reduction In Dielectric Material Thickness	19
Figure 3-40	Exclusion of Separations in Microvia Target Land Contact Dimension	32	Table 3-14	Plated Hole Integrity After Stress	23
Figure 3-41	Unintended Piercing of Microvia Target Land (Laser Drilled)	33	Table 3-15	Cap Plating Requirements for Filled Holes	30
Figure 3-42	Intentional Piercing of Microvia Target Land (Mechanically Drilled)	33	Table 3-16	Microvia Contact Dimension (Laser Drilled)	32
Figure 3-43	Metal Core to PTH Spacing	34	Table 3-17	Microvia Contact Dimension (Mechanically Drilled)	32
Figure 3-44	Measurement of Minimum Dielectric Spacing	35	Table 3-18	Internal Layer Foil Thickness after Processing	33
Figure 3-45	Fill Material in Blind/Through Vias When Cap Plating Not Specified	35	Table 3-19	Thickness of External Conductor of the Finished Printed Board after Plating	34
Figure 3-46	Void in Fill Material at Hole Wall Interface	35	Table 3-20	Solder Mask Adhesion	37
Figure 3-47	Overhang	36	Table 3-21	Dielectric Withstanding Voltages	37
			Table 3-22	Insulation Resistance	38
			Table 4-1	Qualification Test Coupons	41
			Table 4-2	C=0 Sampling Plan per Lot Size	42
			Table 4-3	Acceptance Testing and Frequency	43
			Table 4-4	Quality Conformance Testing1	47

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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.

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 Requirement Deviations

Space and military avionics performance classification deviations are provided in the IPC-6018DS Addendum and are applicable when the addendum is specified within the procurement documentation.

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 to be in accordance with IPC-2611 and IPC-2614.

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, 3.6.1.1.1, 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 and 3.6.1.1.1)
- Conventional SnPb reflow processes (see 3.6.1.2)
- Lead-free reflow processes (see 3.6.1.3)

IPC-6016, a sectional performance specification for HDI printed boards, was canceled by the IPC. Relevant HDI conformance and acceptance criteria has been transferred to this revision of this specification.

The addition of IPC-2221 Appendix A conformance coupons (beginning with Revision B of the design standard) by the printed board manufacturer to the manufacturing panel **shall** be AABUS.