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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)

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

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Table of Contents

1 SCOPE 1
1.1 Scope 1
1.2 Purpose 1
1.3 Performance Classification and Types 1
1.3.1 Classifications 1
1.3.2 Printed Board Type 1
1.3.3 Selection for Procurement 1
1.3.4 Material, Plating Process and Final Finish 3
1.4 Terms and Definitions 3
1.4.1 White Spots 3
1.4.2 Hybrid (Composite) Printed Board 3
1.4.3 As Agreed Between User and Supplier (AABUS) 4
1.5 Interpretation “Shall,” 4
1.6 Presentation 4
1.7 Revision Level Changes 4
1.8 Master Drawing 4

2 APPLICABLE DOCUMENTS 4
2.1 IPC 4
2.2 Joint Industry Standards 5
2.3 Federal 6
2.4 American Society for Testing and Materials 6
2.5 Underwriters Lab 6
2.6 National Electrical Manufacturers Association 6
2.7 American Society for Quality 6
2.8 AMS 6
2.9 American Society of Mechanical Engineers 6

3 REQUIREMENTS 6
3.1 General 6
3.2 Materials Used in this Specification 6
3.2.1 Laminates and Bonding Material for Multilayer or Mixed Dielectric Printed Boards 6
3.2.2 External Bonding Materials 7
3.2.3 Other Dielectric Materials 7
3.2.4 Metal Foils 7
3.2.5 Metal Core/Backed 7
3.2.6 Base Metallic Plating Depositions and Conductive Coatings 7
3.2.7 Final Finish Depositions and Coatings — Metallic and Non-Metallic 8
3.2.8 Polymer Coating (Solder Mask) 10
3.2.9 Fusing Fluids and Fluxes 10
3.2.10 Marking Inks 10
3.2.11 Hole Fill Insulation Material 10
3.2.12 Metal and/or Composite, External 10
3.2.13 Via Protection 10
3.2.14 Embedded Passive Materials 11
3.3 Visual 11
3.3.1 Edges of Microwave Printed Boards 11
3.3.2 Laminate Imperfections 11
3.3.3 Plating and Coating Voids in the Hole 11
3.3.4 Lifted Lands 11
3.3.5 Marking 12
3.3.6 Solderability 12
3.3.7 Plating Adhesion 12
3.3.8 Edge Printed Board Contact, Junction of Gold Plate to Solder Finish 12
3.3.9 Workmanship 12
3.4 Printed Board Dimensional Requirements 13
3.4.1 Hole Size, Hole Pattern Accuracy, Pattern Feature Accuracy and Slots 13
3.4.2 Annular Ring and Breakout (External) 13
3.4.3 Bow and Twist 14
3.5 Conductor Definition 15
3.5.1 Undercutting 15
3.5.2 Conductor Widths and Thicknesses and Spacing 15
3.5.3 Conductive Surfaces 16

3.6 Structural Integrity 18
3.6.1 Thermal Stress Testing 18
3.6.2 Requirements for Microsectioned Coupons or Printed Boards 18
3.7 Solder Mask Requirements on non PTFE Laminates 27
3.7.1 Solder Mask Coverage 27
3.7.2 Solder Mask Cure and Adhesion 28
3.7.3 Solder Mask Thickness 28
3.8 Electrical Requirements 28
3.8.1 Dielectric Withstanding Voltage 29
3.8.2 Electrical Continuity and Isolation Resistance 29
3.8.3 Circuit Shorts 29
3.8.4 Circuit/PTH Shorts to Metal Substrate 29
3.8.5 Moisture and Insulation Resistance (MIR) 29
3.8.6 Dielectric Withstanding Voltage After MIR 29
3.9 Cleanliness 29
3.9.1 Cleanliness Prior to Solder Mask Application 29
3.9.2 Cleanliness After Solder Mask, Solder, or Alternative Surface Coating Application 30
3.9.3 Cleanliness of Inner Layers After Oxide Treatment Prior to Lamination 30
3.10 Special Requirements 30
3.10.1 Outgassing 30
3.10.2 Organic Contamination 30
3.10.3 Fungus Resistance 30
3.10.4 Vibration 30
3.10.5 Mechanical Shock 30
3.10.6 Impedance Testing 30
3.10.7 Coefficient of Thermal Expansion (CTE) 30
3.10.8 Thermal Shock 30
3.10.9 Surface Insulation Resistance (As Received) 31
3.10.10 Wire Bond Adhesion 31
3.10.11 Die Bond Adhesion 31
3.10.12 Rework Simulation 31
3.10.13 Metal Core (Horizontal Microsection) 31
3.10.14 Destructive Physical Analysis 31
3.11 Repair 31
3.11.1 Circuit Repairs 31
3.12 Rework 31

4 QUALITY ASSURANCE PROVISIONS 31
4.1 General 31
4.1.1 Qualification 31
4.1.2 Sample Test Coupons 32
4.2 Acceptance Tests 32
4.2.1 C=0 Zero Acceptance Number Sampling Plan 32
4.2.2 Referee Tests 33
4.3 Quality Conformance Testing 33
4.3.1 Coupon Selection 33

5 PACKAGING 37

6 NOTES 37
6.1 Ordering Data 37

APPENDIX A 38

Figures

Figure 3-1 Microvia Definition 7
Figure 3-2 Adhesive Band Near Exposed Conductor 12
Figure 3-3 Annular Ring Measurement (External) 13
Figure 3-4 Breakout of 90º and 180º 14
Figure 3-5 Usage of Modified Land Shapes on Breakout Conditions 14
Figure 3-6 Conductor Edge Definitions 15
Figure 3-7 Undercut and Growth 15
Figure 3-8 Rectangular Surface Mount Lands 17
Figure 3-9 Round Surface Mount Lands 17
Figure 3-10 Separations at External Foil 20
Figure 3-11 Crack Definition 20
Figure 3-12 Plating Folds/Inclusions – Minimum Measurement Points 20
Figure 3-13 Typical Microsection Evaluation Specimen 21
Figure 3-14 Etchback in Contact with PTFE Layer 21

Figure 3-15 Measurement Locations for PTFE Resin Smear 22
Figure 3-16 Negative Etchback 22
Figure 3-17 Annular Ring Measurement (Internal) 23
Figure 3-18 Microsection Rotations for Breakout Detection . . 23
Figure 3-19 Comparison of Microsection Rotations 23
Figure 3-20 Surface Copper Wrap measurement 24
Figure 3-21 Wrap Copper in Type 4 Printed Board (Acceptable) 24
Figure 3-22 Wrap Copper Removed by Excessive Sanding/Planarization (Not Acceptable). 24
Figure 3-23 Copper Cap Thickness 25
Figure 3-24 Copper Cap Filled Via Height (Bump) 25
Figure 3-25 Copper Cap Depression (Dimple). 25
Figure 3-26 Copper Cap Plating Voids 25
Figure 3-27 Metal Core to PTH Spacing 27
Figure 3-28 Measurement of Minimum Dielectric Spacing. . . 27

Tables

Table 1-1 Default Requirements 2
Table 1-2 Technology Adder Examples. 2
Table 3-1 Metal Core Substrate 7
Table 3-2 Final Finish and Coating Requirements 9
Table 3-3 Sufrace and Hole Copper Plating Minimum Requirements for Buried Vias > 2 Layers, Through-Holes, and Blind Vias 10
Table 3-4 Surface and Hole Copper Plating Minimum Requirements for Microvias (Blind and Buried). . .10
Table 3-5 Surface and Holde Copper Plating Minimum Requirements for Buried via cores (2 layers) 10
Table 3-6 Plating and Coating Voids Visual Examination. . . .11
Table 3-7 Edge Board Contact Gap. .12
Table 3-8 Minimum Annular Ring 14
Table 3-9 Maximum Percent of Allowable Conductor Width Deviations. 15
Table 3-10 Percent of Allowable Conductor Space Deviations 16
Table 3-11 Percent of Allowable Conductor Width Reduction Caused By Pin Holes 16
Table 3-12 Percent of Reduction In Dielectric Material Thickness. 16
Table 3-13 Plated-Through Hole Integrity After Stress. 19
Table 3-14 Cap Plating Requirements .25
Table 3-15 Internal Layer Foil Thickness after Processing 26
Table 3-16 External Conductor Thickness after Plating 26
Table 3-17 Solder Mask Adhesion. 28
Table 3-18 Dielectric Withstanding Voltages 29
Table 3-19 Insulation Resistance. 29
Table 4-1 Qualification Test Coupons 32
Table 4-2 C=0 Sampling Plan(Sample Size for Specific Index Value). 33
Table 4-3 Acceptance Testing and Frequency 33
Table 4-4 Quality Conformance Testing 37
Table A.1 Class 3/A Supplemental Requirements 38

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.