

MANUFACTURING PROCESS CAPABILITIES

Specification	Standard Production	Advanced or Proto-type
General		
Panel Sizes (inches)	All Industry Panel Sizes Available. Custom sized panels and large foot-print applications. Custom design and special tooling available. Call ASC to match your special tooling to design requirements.	
Number of Copper Layers	22	24+
Workmanship Specification	Per IPC 6012 (Rigid Products) / 6018 (Microwave Products) Class 2 (default), Class 3, MIL-PRF-31032 /1, /2 and MIL-PRF-55110, Appendix B	
Materials:		
Materials Rigid / Thermoset	Standard FR4 / Epoxy, High-Temp FR-4 / Epoxy RoHS Compliant FR-4 / Epoxy Polyimide, High Temperature, Extreme Environment GETEK, BT, Cynate Ester, Bergquist, Thermagon, Isola FR408	
Materials – Microwave & High Frequency Materials	Arlon, Nelco, Rogers, Taconic – See Laminate Selector Guide FEP, Arlon 6700, Rogers 3001, FastRise Pre-bonded Assemblies (Rogers, Arlon, Taconic) Custom Order Pre-bonded	
Foil Weight: (inner layer)	1/4, 1/2, 1 oz, 2 oz, 3 oz, 4 oz	>4oz
Foil Weight: (outer layer)	1/4, 1/2, 1 oz, 2 oz, 3 oz, 4 oz	>4oz
Dielectric & PWB thickness:		
Overall board thickness:		
double sided	.005" - .280"	Call for Specifics
multilayer	Upto .280"	Call for Specifics
Thickness Tolerance	+/- 10%	Call for Specifics
Warp and Twist	0.7% std - dependant on material	
Line Width and Space :		
1 oz. Min. line width / spacing	0.004" / 0.004"	
½ oz. Min. line width / spacing	0.004" / 0.004"	0.003" / 0.003"
Etch Tolerance	1/2 oz. copper	+/- .0005" (Design Specified)
(Base Copper)	1 oz. copper	+/- .001" (Design Specified)
	2 oz. copper	+/- .002" (Design Specified)
Drilling:		
Min. drilled hole diameter	0.0091"	0.008"
Max. drilled hole diameter	0.250"	
Max. Aspect Ratio	8:1	12:1
PTH diameter tolerance	+/- 0.003"	+/- 0.002" (after OSP/NiAu/Tin/Silver)
NPTH diameter tolerance	+/- 0.002"	+/- 0.001"
Hole location tolerance	+/- 0.003" Hole to Edge	

MANUFACTURING PROCESS CAPABILITIES

Specification	Standard Production	Advanced or Proto-type
Routing:		
Edge-to-edge tolerance	+/- 0.005"	
Edge-to-datum hole tolerance	+/- 0.005"	+/- 0.003"
Min. internal radius	0.015"	0.010"
Scoring:		
Jump score capability	Yes	Yes
Available scoring angles	30°, 45°	20°
Edge beveling:		
Available angles	30° - 45° +/- 5°	Call for specifics
Multilayer lamination:		
Technique	Hi-Temp Vacuum Assisted Hydraulic Pressing Capabilities	
Layer-to-Layer Registration	+/- 0.005	Call for Specifics
Front to Back Registration	+/- .002	+/- .0005"
Soldermask:		
Type	LPI, Screened Epoxy	
Colors	All	
Min. soldermask clearance	0.003" (per side)	0.002" (per side)
Min. soldemask web thickness	0.0035"	
Legend:		
Type	U.V. / Thermal	Ink Jet Printer
Colors	All	White
Smallest line width:	0.006"	.003"
Hole Plugging		
Conductive silver via plugging	DuPont CB100, Tatsuta AE3030 Max. Hole size 0.018", A.R.=6:1	
Non-conductive via plugging	Taiyo THP, SanEi IR10F, Peters PP2795 Max. Hole size 0.018", A.R.=6:1	
Surface Finishes:		
Type	Hot Air Solder Level, RoHS Compliant Hot Air Level (SN100CL), OSP Entek 106A, Electroless Nickel / Immersion Gold, Electrolytic Nickel, Electrolytic Hard Gold, Electrolytic Soft Gold, Immersion Silver, Immersion Tin, Electrolytic Matte Tin, Plated Tin Lead, Hot Oil Reflow	
Electrical Test:		
Pitch	0.0197"	0.012"
Fixture types	Universal Grid, dedicated	
Test voltages available	100 volts	

MANUFACTURING PROCESS CAPABILITIES

Specification	Standard Production	Advanced or Proto-type
Resistivity testing:		
Open resistance	10 Ω	50 Ω max.
Short resistance	10 MΩ min.	100 MΩ max.
Netlist capability	Yes (IPC-D-356A or IPC-D-356)	Gerber netlist extraction
Flying Probe	Yes	
Test voltages available	100 volts	30 -500 volts
Controlled Impedance	+/- 10%	+/- 5%
Resistivity testing:		
Open resistance	50 Ω	5 – 80 Ω
Short resistance	17 MΩ min.	5.3 – 19.4 MΩ
Heat Sink Bonding		
Bonding processes	Thermally & Electrically Conductive Silicone Adhesive, Sweat Solder All available prepregs Emerson & Cumming CF3350, Ablestick 5025E & 0563ECF	
Sweat Solder Pastes	63% Tin 37% Lead 95% Tin 5% Antimony	Call for Other
Board to Carrier Registration	+/-0.007	+/-0.003

MANUFACTURING PROCESS CAPABILITIES

Specification	Standard Production	Advanced or Proto-type
---------------	---------------------	------------------------

Metal Carrier Finishes over Aluminum		
Electroless Ni (per MIL-C-26074E, Class 1, Grade A)	100 – 300 μ in Nickel	Nickel – Range Specified
Electrolytic Silver (per QQ-S-365D, Type I, Grade B)	200 μ in. min. Silver	Silver – Range Specified
Electroless Ni (per MIL-C-26074E, Class 1, Grade A)	100 – 300 μ in Nickel	Nickel – Range Specified
Electrolytic Matt Tin	200 μ in. min Tin	Tin – Range Specified
Electroless Ni (per MIL-C-26074E, Class 1, Grade A)	50 – 100 μ in Nickel	Nickel – Range Specified Gold – Range Specified
Electrolytic Ni (per MIL-S-QQN-290A, Class I, SD)	100 – 300 μ in Nickel	
Electrolytic Soft Au (per MIL-G-45204C, Type III, Grade A)	3 μ in. min. Gold	
Electroless Ni (per MIL-C-26074E, Class 1, Grade A)	50 – 100 μ in Nickel	Nickel – Range Specified Gold – Range Specified
Electrolytic Ni (per MIL-S-QQN-290A, Class I, SD)	100 – 300 μ in Nickel	
Electrolytic Hard Au (per MIL-G-45204C, Type II, Grade C)	3 μ in. min. Gold	
Chromate conversion coating (per MIL-C-5541E, Class 3)	Coverage	
Metal Carrier Finishes over Copper		
Electrolytic Silver (per QQ-S-365D, Type I, Grade B)	75 – 150 μ in Silver	
Electrolytic Matt Tin	75 – 150 μ in Tin	
Electrolytic Ni (per MIL-S-QQN-290A, Class I, SD)	100 – 300 μ in Nickel	Nickel – Range Specified
Electrolytic Soft Au (per MIL-G-45204C, Type III, Grade A)	3 μ in. min. Gold	Gold – Range Specified
Electrolytic Ni (per MIL-S-QQN-290A, Class I, SD)	100 – 300 μ in Nickel	Nickel – Range Specified
Electrolytic Hard Au (per MIL-G-45204C, Type II, Grade C)	3 μ in. min. Gold	Gold – Range Specified
Electroless Ni (per MIL-C-26074E, Class 1, Grade A)	100 – 300 μ in Nickel	Nickel – Range Specified
Immersion Au (per MIL-G-45204)	3 – 8 μ in Gold	