NEEInternational

Technology Roadmap

Fabrication of advanced printed circuits for RF and microwave applications requires extensive knowledge of the specialized materials and the processes required to achieve your design goals. Our technology roadmap is specific to the materials we normally process and should not be used in outright comparisons with those from suppliers that only process standard low frequency materials. Additionally, achievable design parameters will vary depending on material selection and construction specifics. We would encourage you to contact us for a design specific manufacturability review for the best look at what can be built.

Circuit Feature	Production	Advanced	Future
Through Via Size(As Drilled Diameter)	300	250	200
Pad over drill size – inner layer	250	200	150
Pad over drill size – Outer Layer	250	200	150
Maximum Aspect Ratio	5:1	7 :1	8:1
Plated via Diameter Tolerance	+/- 75	+/- 50	+/- 50
Soldermask Registration Tolerance (per side)	125	100	75
Layer to Layer Registration Tolerance	+/- 125	+/- 100	+/- 75
Layer Count Maximum	12	14	16
Panel Size Maximum	457 x 609	457 x 609	457 x 1219
Inner Layer L/S minimum (.5 oz copper)	100	100	75
Inner Layer L/S tolerance (.5 oz copper)	+/- 25	+/- 19	+/- 13
Inner Layer L/S minimum (1 oz copper)	125	100	75
Inner Layer L/S tolerance (1 oz copper)	+/- 25	+/- 19	+/- 13
Outer Layer L/S minimum (.5 oz copper, std plating)	125	100	75
Outer Layer L/S tolerance (.5 oz copper, std plating)	+/- 25	+/- 19	+/- 13
Outer Layer L/S minimum (1 oz copper, std plating)	125	100	75
Outer Layer L/S tolerance (1 oz copper, std plating)	+/- 25	+/- 19	+/- 13
Depth Drill (Counterbore) tolerance	+/- 200	+/- 150	+/- 125
Routed feature tolerance (profile tolerance)	+/- 125	+/- 100	+/- 75
Board Thickness Minimum (w/o heatsink)	254	200	150
Board Thickness Maximum (w/o heatsink)	2540	3175	3175
Impedance Control	+/- 10%	+/- 8%	+/- 7%

Laminate Materials			
Rogers RO4000 Series	Y	Y	Y
Rogers RO3000 Series	Y	Y	Y
Rogers TMM Series	Y	Y	Y
Taconic TLX, TLY, TLT, TLP Series	Y	Y	Y
Taconic RF, CER Series	Y	Y	Y
Arlon 25N, 25FR, 45N, CLTE	Y	Y	Y
Nelco N4000 Series	Y	Y	Y
Nelco N9000 Series	Y	Y	Y
Isola Getek	Y	Y	Y
BT Epoxy	Y	Y	Y
Cyanate Ester	Y	Y	Y
Polyimide (Rigid)	Y	Y	Y
FR-4 (FR406, FR408)	Y	Y	Y

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Bond Films/Prepregs	Production	Advanced	Future
Rogers RO4000 Series Thermoset	Y	Y	Y
WL Gore Speedboard C Thermoset	Y	Y	Y
Arlon 25N/25FR Thermoset	Y	Y	Y
Arlon CLTE-P Thermoplastic	Y	Y	Y
Arlon 6700/Rogers 3001 Thermoplastic	Y	Y	Y
Isola Getek Thermoset	Y	Y	Y
Dupont FEP Thermoplastic	Y	Y	Y
Taconic Tacpreg Hybrid	Y	Y	Y
Nelco N4000 Thermoset	Y	Y	Y
FR-4 (FR406, FR408) Thermoset	Y	Y	Y
Technology			
Mixed Dielectric Constructions	Y	Y	Y
Heat Sink Attach – Post bonded, Sweat soldered	Y	Y	Y
Heat Sink Attach – Post bonded, Adhesive bonded	Y	Y	Y
Blind/Buried Vias – Sequential Lamination	Y	Y	Y
Filled Vias (Conductive)	N	Y	Y
Microvias	N	N	Y
Buried Resistors	N	N	Y
Plated Edges	Y	Y	Y
Thermal Management			
Thermagon	Y	Y	Y
Bergquist	Y	Y	Y
Emerson-Cuming (Ablestik) CF3350	Y	Y	Y
Solder Heat Sink Attach (95% Sn – 5% Pb)	Y	Y	Y
Solder Heat Sink Attach (95% Sn – 5% Ag)	Y	Y	Y
Plating Finishes			
HASL	Y	Y	Y
Electroless Nickel/Immersion Gold (ENIG)	Y	Y	Y
Electroplated Ni-Au	Y	Y	Y
Tin-Lead Reflow	Y	Y	Y
Immersion Silver	Y	Y	Y
Immersion Tin	Y	Y	Y
OSP	Y	Y	Y
Combination Finishes	Y	Y	Y

RoHS/WEEE Compliance: NEE can comply with requirements for RoHS/WEEE printed circuits. In general, care must be taken to specify a non-lead bearing plating finish and take into account the higher solder temperatures by selecting a laminate system that is able to provide acceptable reliability and performance. Please identify if RoHS/WEEE compliance is required at the time you request a quotation. If you need assistance in specifying a suitable plating finish or laminate, please feel free to contact us. For further information, please review the NEE International RoHs Compliance Guide.

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