



Fabrication Capabilities

(Metric)

Units in millimeters unless otherwise noted

PCB ATTRIBUTES	STANDARD	ADVANCED*
Layer Count	<50	50-60
Max. Finished PCB Thickness	6.35	0.3258
Min. Finished PCB Thickness	0.508	0.2032
Min. Core Thickness (HK4)	0.0254	-
Board Thickness Tolerance	± 8%	5%
Max. Panel Size	609.6 x 762 (usable 571.5 x 723.9)	
Min. Dielectric Thickness	0.1016	0.0508
Layer-to-Layer Registration	± .127	± .178
Dimensions - Hole Location	± .0508	± .0381
Dimensions - Fab O.D.	± .254	± .127
Fabrication Radius	± 5 Degrees	± 5 Degrees
Warpage (inch per inch) (flatness of finished board)	0.152	0.076
Min. Prepreg Fill	0.0635	0.0508
Min. Copper Foil - External	¼ oz	-
Max. Copper Foil - External	3 oz	-
Min. Copper Clad - Internal	¼ oz	-
Max. Copper Foil - Internal	4 oz	-
Impedance: 40-60 (Single ended)	± 10%	± 5%
Impedance: 80-120 (Differential)	± 10%	± 5%

ETCH TOLERANCES	STANDARD	ADVANCED*
Min. Outer Line Width (½ oz)	0.0889	0.0635
Min. Outer Line Width (1 oz)	0.1524	0.1778
Min. Inner Line Width (½ oz)	0.0762	0.0635
Min. Inner Line Width (1 oz)	0.1016	0.0889
Min. Outer Space Trace/Trace (½ oz)	0.0889	0.0762
Min. Outer Space Trace/Trace (1 oz)	0.1524	0.1778
Min. Inner Space, Trace / Trace (½ oz)	0.0889	0.0762
Min. Inner Space, Trace / Trace (1 oz)	0.1143	0.1016
Min. Outer Space, Trace / Pad (½ oz)	0.0635	0.0508
Min. Outer Space, Trace / Pad (1 oz)	0.127	0.1143
Min. Inner Space, Trace/ Pad (½ oz)	0.0635	0.0508
Min. Inner Space, Trace/ Pad (1 oz)	0.1016	0.0889



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PAD TO HOLE SIZE	STANDARD	ADVANCED*
Min. Plated Hole Size * (Finished)	0.1016	0.0762
Tolerance - Plated Hole Size	± .0762	± .0254
Min. Inner Layer Pad	0.2032	0.102
(1 mil annular ring)	OVER F.H.S	OVER F.H.S.
Mech. Min. Drill Hole Size	0.127	0.0762
Normal Finished Hole Size	0.0508	< .0508
Plane Relief Diameter Over Drilled Hole	0.3048	0.1524
Min. Outer Layer Pad	0.2032	0.1016
Min. Outer Non-Plated Hole to Metal	0.2032	0.127
Min. Inner Non-Plated Hole to Metal	0.2032	< .1524
Max. Number holes/sq. in. (average over board)	1000	2000 +

DRILLING CAPABILITIES	STANDARD	ADVANCED*
Aspect Ratio (.1524mm drill)	32:1	-
Aspect Ratio (.254mm drill)	25:1	-
Drill to metal	0.2032	0.0889
Min Mechanical Drill	0.2032	0.1016
BBV Mechanical Drill	0.2032	0.1016
Control Depth Drill Tolerance (Mechanical MV)	-	± .0254
Control Depth Drill Tolerance (Backdrill)	-	± .127
Backdrill Pitch	0.5	0.35
Min. Backdrill Via	0.2032	0.1016
Min Drill Laser Via	-	0.0635
HDI 4+ Layer Build Up	Yes	-
Microvia Capture Pad / Hole	0.3048 / 0.127	0.2032 / 0.1016
Microvia Aspect Ratio	0.7:1	1:1

TESTING CAPABILITIES	Advanced*	
Flying Probe Testing	Min. Pitch: 1.2	Min. feature size: .0762
Universal Grid Tester (UGT)	N/A	

SOLDERMASK CRITERIA	STANDARD	ADVANCED*
SMT Minimum Pad Spacing	0.1524	0.1016
Line to SMT Minimum Space	0.0889	0.0762
Minimum Soldermask Dam	0.1016	0.0762

ELECTRICAL CHARACTERISTICS	STANDARD	ADVANCED*
Impedance Tolerance	± 10%	± 5%



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SURFACE FINISHES

HASL

OSP

ENIG

ENEPIG

Hard Ni/Au

Soft Bondable Au

Tab Au Connectors

Immersion Ag

Combination Finishes

MATERIALS

Nelco	Isola	Panasonic	Rogers	Nanya	Hitachi
N4000-13EP	FR408HR	Meg 7N	4003	NP170	EMC-370
N4000-13EP-SI	370HR	Meg 7	4350	NP175	MCL-HE 679G
N4000-13	P95	Meg 6	3003		
N4000-13SI	ASTRA MT	Meg 4			
N4000-6	Tachyon-100G	Meg 2			
N4000-11	Terra Green	R1755V			
N4000-29	I-Tera				
N4800-20	I-Speed				
Meteorwave 2000					
Meteorwave 25000					

Omega Ply/ Ticer	Arlon	Dupont	Farad Flex	ITEQ
Buried Resistors:	85N	HK04 1mil	MCXX Series	IT180A
25 ohm	CuCLAD 552	Polyimide cores		
50 ohm				
100 ohm				

HYBRIDS*

FR4 + Any Nelco listed above

FR4 + Any Isola listed above

FR4 + RO 4000

FR4 + RO 3000

FR4 + Meg 6

FR4 + Meg 7

*For reference only, please reach out to our Sales team for our DFM guidelines

**Contact GC Engineering for other hybrid options available