



Fabrication Capabilities

(US Standard)

Units in inches unless otherwise noted

PCB ATTRIBUTES	STANDARD	ADVANCED*
Layer Count	<50	50-60
Max. Finished PCB Thickness	0.25	0.325
Min. Finished PCB Thickness	0.02	0.008
Min. Core Thickness (HK4)	0.001	-
Board Thickness Tolerance	± 8%	5%
Max. Panel Size	24 x 30" (usable 22.5 x 28.5")	
Min. Dielectric Thickness	0.004	0.002
Layer-to-Layer Registration	± .005	± .003
Dimensions - Hole Location	± .002	± .0015
Dimensions - Fab O.D.	± .010	± .005
Fabrication Radius	± 5 Degrees	± 5 Degrees
Warpage (inch per inch) (flatness of finished board)	0.006	0.003
Min. Prepreg Fill	0.0025	0.002
Min. Copper Foil - External	¼ oz	-
Max. Copper Foil - External	4 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)	0.0035	0.0025
Min. Outer Line Width (1 oz)	0.006	0.007
Min. Inner Line Width (½ oz)	0.003	0.0025
Min. Inner Line Width (1 oz)	0.004	0.0035
Min. Outer Space Trace/Trace (½ oz)	0.0035	0.003
Min. Outer Space Trace/Trace (1 oz)	0.006	0.007
Min. Inner Space, Trace / Trace (½ oz)	0.0035	0.003
Min. Inner Space, Trace / Trace (1 oz)	0.0045	0.004
Min. Outer Space, Trace / Pad (½ oz)	0.0025	0.002
Min. Outer Space, Trace / Pad (1 oz)	0.005	0.0045
Min. Inner Space, Trace/ Pad (½ oz)	0.0025	0.002
Min. Inner Space, Trace/ Pad (1 oz)	0.004	0.0035



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PAD TO HOLE SIZE	STANDARD	ADVANCED*
Min. Plated Hole Size * (Finished)	0.004	0.003
Tolerance - Plated Hole Size	± .003	± .001
Min. Inner Layer Pad	0.008	0.004
(1 mil annular ring)	OVER F.H.S	OVER F.H.S.
Mech. Min. Drill Hole Size	0.005	0.003
Normal Finished Hole Size	0.002	< .002
Plane Relief Diameter Over Drilled Hole	0.012	0.006
Min. Outer Layer Pad	0.008	0.004
Min. Outer Non-Plated Hole to Metal	0.008	0.005
Min. Inner Non-Plated Hole to Metal	0.008	< .006
Max. Number holes/sq. in. (average over board)	1000	2000 +

DRILLING CAPABILITIES	STANDARD	ADVANCED*
Aspect Ratio (6 mil drill)	32:1	-
Aspect Ratio (10 mil drill)	25:1	-
Drill to metal	0.008	0.0035
Min Mechanical Drill	0.008	0.004
BBV Mechanical Drill	0.008	0.004
Control Depth Drill Tolerance (Mechanical MV)	-	± .001
Control Depth Drill Tolerance (Backdrill)	-	± .005
Backdrill Pitch	0.5 mm	0.35 mm
Min. Backdrill Via	0.008	0.004
Min Drill Laser Via	-	0.0025
HDI 4+ Layer Build Up	Yes	-
Microvia Capture Pad / Hole	0.012 / 0.005	0.008 / 0.004
Microvia Aspect Ratio	0.7:1	1:1

TESTING CAPABILITIES	Advanced*
Flying Probe Testing	Min. Pitch: 1.2 (mm) / Min. feature size: .003
Universal Grid Tester (UGT)	N/A

SOLDERMASK CRITERIA	STANDARD	ADVANCED*
SMT Minimum Pad Spacing	0.006	0.004
Line to SMT Minimum Space	0.0035	0.003
Minimum Soldermask Dam	0.004	0.003

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 ask our Sales team for our DFM guidelines

**Contact GC Engineering for other hybrid options available