



## Fabrication Capabilities

(US Standard)

SHOP TOLERANCE	Standard*	Advanced*	Emerging*
Minimum Outer Line Width	0.0035	0.0025	0.002
Minimum Inner Line Width	0.003	0.0025	0.002
Minimum Outer Space Trace/ Trace	0.0035	0.003	0.0025
Minimum Inner Space, Trace / Trace	0.0035	0.003	0.002
Minimum Outer Space, Trace / Pad	0.0025	0.002	.0015
Minimum Inner Space, Trace / Pad	0.0025	0.002	< .0015
Layer-to-Layer Registration	+/- .005	+/- .003	+/- .002
Maximum Finished PCB Thickness	.250	.300	> .330
Board Thickness Tolerance	+/- 8%	5%	4%
Dimensions - Hole Location	+/- .002	+/- .0015	+/- .001
Dimensions - Fab O.D.	+/- .010	+/- .005	+/- .003
Fabrication Radius	+/- 5 Degrees	+/- 5 Degrees	+/- 5 Degrees
Warpage (inch per inch) (flatness of finished board)	0.006	0.003	0.002
Minimum Dielectric Thickness	0.004	0.002	0.001
Maximum Number of Layers	< 50	50 - 58	> 60
Maximum Panel Size	24 x 30" (usable 22.5 x 28.5")		

PAD TO HOLE SIZE	Standard*	Advanced*	Emerging*
Minimum Plated Hole Size * (Finished)	0.004	0.004	0.003
Tolerance - Plated Hole Size	+/- .003	+/- .002	+/- .001
Minimum Inner Layer Pad (1 mil annular ring)	.008 OVER F.H.S	.006 OVER F.H.S.	.004 OVER F.H.S.
Mech. Min. Drill Hole Size	0.005	0.004	.003
Normal Finished Hole Size	0.002	0.002	< .002
Plane Relief Diameter Over Drilled Hole	0.012	0.01	0.006
Minimum Outer Layer Pad	0.008	0.006	0.004
Min. Outer Non-Plated Hole to Metal	0.008	0.006	.005
Min. Inner Non-Plated Hole to Metal	0.008	0.006	< .006
Max. Number holes/sq. in. (average over board)	1000	1500 +	2000 +

<b>DRILLING</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
Maximum Aspect Ratio	20:1	32:1	34:1

<b>TESTING CAPABILITIES</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
Flying Probe Testing	Minimum Pitch: .1.2 (mm) Minimum feature size: .003		
Universal Grid Tester (UGT)	N/A		

<b>SOLDERMASK CRITERIA</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
SMT Minimum Pad Spacing	0.006	0.004	0.003
Line to SMT Minimum Space	0.0035	0.003	0.002
Minimum Soldermask Dam	0.004	0.003	0.002

<b>ELECTRICAL CHARACTERISTICS</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
Impedance Tolerance *	+/- 10%	+/- 5%	+/- 3%

Metric (mm)

<b>SHOP TOLERANCE</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
Minimum Outer Line Width	0.0889	0.0635	0.0508
Minimum Inner Line Width	0.0762	0.0635	0.0508
Minimum Outer Space Trace / Trace	0.0889	0.0762	0.0635
Minimum Inner Space, Trace / Trace	0.0889	0.0762	0.0508
Minimum Outer Space, Trace / Pad	0.0635	0.0508	< .0381
Minimum Inner Space, Trace / Pad	0.0635	0.0508	<.0381
Layer-to-Layer Registration	+/- .127	+/- .0762	+/- .0254
Maximum Finished PCB Thickness	6.35	7.62	> 8.38
Board Thickness Tolerance	+/- 8%	+/- 4%	< 4%
Dimensions - Hole Location	+/- .0508	+/- .0381	+/- .0254
Dimensions - Fab O.D.	+/- .254	+/- .127	+/- .0762
Fabrication Radius	+/- 5 Degrees	+/- 5 Degrees	+/- 5 Degrees
Warpage (inch per inch) (flatness of finished board)	0.1524	0.0762	0.0508
Minimum Dielectric Thickness	0.1016	0.0254	< .0254
Maximum Number of Layers	< 50	50 - 58	> 60
Maximum Panel Size	60.9 x 76.2cm (usable 57.1 x 72.4cm)		

<b>PAD TO HOLE SIZE</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
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Minimum Plated Hole Size * (Finished)	0.0101	0.1016	< .1016
Tolerance - Plated Hole Size	+/- .0762	+/- .0508	+/- .0254
Minimum Inner Layer Pad (1 mil annular ring)	.2032 OVER F.H.S	.1524 OVER F.H.S.	.1016 OVER F.H.S.
Mech. Min. Drill Hole Size	0.1524	0.1016	0.0762
Normal Finished Hole Size	0.0508	0.0508	< .0508
Plane Relief Diameter Over Drilled Hole	0.3048	0.254	0.1524
Minimum Outer Layer Pad (1 mil annular ring)	0.2032 OVER F.H.S.	0.1524 OVER F.H.S.	0.1016 OVER F.H.S.
Min. Outer Non-Plated Hole to Metal	0.2032	0.1524	< .1524
Min. Inner Non-Plated Hole to Metal	0.2032	0.1524	< .1524
Max. Number holes/sq. in. (average over board)	1000	1500 +	2000 +

<b>DRILLING</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
Maximum Aspect Ratio	25:1	34:1	75:1

<b>TESTING CAPABILITIES</b>			
Flying Probe Testing	Minimum Pitch: .005 Minimum feature size: .002		
Universal Grid Tester (UGT)	N/A		

<b>SOLDERMASK CRITERIA</b>	<b>Standard*</b>	<b>Advanced*</b>	<b>Emerging*</b>
SMT Minimum Pad Spacing	0.1524	0.127	0.1016
Line to SMT Minimum Space	0.0889	0.0762	<.0762
Minimum Soldermask Rib	0.127	0.1016	0.0762

<b>ELECTRICAL CHARACTERISTICS</b>			
Impedance Tolerance *	+/- 10%	+/- 5%	+/- 3%

- For 16x18 panel size and 0.5 oz Copper