

Abbreviated Printed Circuit Board Capability

For full capability information please consult Merlin Manufacturing Capabilities document QA-03-45 Latest Edition

Parameter						
	IMPERIAL		METRIC			
Panel Sizes	24 " x 18 "		610mm x 457mm (preferred)			
	18 " x 16 "		457mm x 406mm (preferred)			
Active Board Area	22.5 " x 16.5 "		570mm x 417mm (preferred)			
	16.5 " x 14.5 "		417mm x 366mm (preferred)			
Number of Layers	32 Layers maximum					
Parameter	Standard		Advanced		Development	
Parameter	Imperial	Metric	Imperial	Metric	Imperial	Metric
General						
Minimum Board Thickness	0.016 "	0.40mm	0.016 "	0.40mm	0.016 "	0.40mm
Maximum Board Thickness	0.197 "	5.00mm	0.197 "	5.00mm	0.197 "	5.00mm
Material Tolerance +/-	10%	10%	10%	10%	5%	5%
Minimum Core Thickness	0.004 "	0.100mm	0.003 "	0.075mm	0.002 "	0.050mm
Inner Layers						
Min Line (0.5oz start Copper)	0.003 "	0.075mm	0.003 "	0.075mm	0.002 "	0.050mm
Min Space (0.5oz start Copper)	0.004 "	0.100mm	0.003 "	0.075mm	0.003 "	0.075mm
Outer Layers						
Min Line (12µm start Copper)	0.003 "	0.075mm	0.0025 "	0.064mm	0.002 "	0.050mm
Min Space (12µm start Cu)	0.003 "	0.075mm	0.0030 "	0.075mm	0.003 "	0.075mm
Holes						
Minimum Hole Size (drilled)	0.008 "	0.200mm	0.006 "	0.150mm	0.004 "	0.100mm
Min Annular Ring Radial Inner*	0.005 "	0.125mm	0.004 "	0.100mm	0.003 "	0.075mm
Min Ann - Ring Radial Outer*	0.004 "	0.100mm	0.003 "	0.075mm	0.003 "	0.075mm
NPTH Hole Size Tolerance +/-	0.001 "	0.025mm	0.001 "	25µm	0.001 "	0.025mm
PTH Hole Size Tolerance +/-	0.002 "	0.050mm	0.002 "	50µm	0.002 "	0.100mm
Positional Tolerance ≥ 1.00 +/-	0.003 "	0.075mm	0.003 "	0.075mm	0.003 "	0.075mm
Positional Tolerance ≤ 0.95 +/-	0.004 "	0.100mm	0.004 "	0.100mm	0.004 "	0.100mm
Maximum Aspect Ratio	8.5 : 1 (1.60mm thick laminate)					
Side to Side Alignment						
Laser Direct Imaging	0.001 "	0.025mm	0.0008 "	0.020mm	0.0008 "	0.020mm
UV Expose with Phototools	0.0016 "	0.040mm	0.0016 "	0.040mm	0.0016 "	0.020mm
Core to Core Alignment						
Laser Direct Imaging	0.0026 "	0.065mm	0.0026 "	0.065mm	0.0026 "	0.065mm
UV Expose with Phototools	0.0031 "	0.080mm	0.0031 "	0.080mm	0.0031 "	0.080mm
HDI (High Density Interconnect)						
Number of Layers (maximum)	16		24		32	
Minimum Microvia Hole Drilled	0.005 "	0.120mm	0.004 "	0.100mm	0.004 "	0.100mm
Minimum Land to Drilled Hole	0.005 "	0.125mm	0.004 "	0.100mm	0.003 "	0.075mm

*Depends on IPC Class requirement Class 3 may require more land – See technical or QA.

Parameter	Standard		Advanced		Development	
	Imperial	Metric	Imperial	Metric	Imperial	Metric
Solder Resist (Photoimageable)						
Min Dam (Green mask only)	0.003 "	0.075mm	0.003 "	0.075mm	0.003 "	0.075mm
Min Dam (Red & Blue mask)	0.004 "	0.100mm	0.004 "	0.100mm	0.004 "	0.100mm
Min Dam (Black & White mask)	0.005 "	0.125mm	0.005 "	0.125mm	0.005 "	0.125mm
Minimum designed clearance	0.002 "	0.050mm	0.002 "	0.050mm	0.002 "	0.050mm
Notation Inkjet (White only)						
Minimum Gap to features	0.004 "	0.100mm	0.004 "	0.100mm	0.004 "	0.100mm
Minimum Line Width	0.005 "	0.125mm	0.005 "	0.125mm	0.005 "	0.125mm
Notation P/I (various colours)						
Minimum Gap to features	0.004 "	0.100mm	0.0035 "	0.089mm	0.003 "	0.075mm
Minimum Line Width	0.005 "	0.125mm	0.005 "	0.125mm	0.005 "	0.125mm
Peelable Resist						
Maximum Tentable Hole Size	0.071 "	1.80mm	0.071 "	1.80mm	0.071 "	1.80mm
Via Hole Plugging						
Maximum Hole Diameter(finished)	0.018 "	0.450mm	0.018 "	0.450mm	0.018 "	0.450mm
Via Hole Filling						
Maximum Board Thickness	0.063 "	1.600mm	0.094 "	2.400mm	0.126 "	3.200mm
Maximum Hole Diameter(finished)	0.040 "	1.00mm	0.040 "	1.00mm	0.040 "	1.00mm
Minimum Hole Diameter(finished)	0.008 "	0.200mm	0.012 "	0.300mm	0.018 "	0.450mm
Microvia Hole Diameter Min(drilled)	0.006"	0.150mm	0.006"	0.150mm	0.006"	0.150mm
Copper filled Vias						
% Via filled with copper* see full capability manual	To meet the requirements of IPC 6012D		To meet the requirements of IPC 6012D		To meet the requirements of IPC 6012D	

Parameter	Standard		Advanced		Development	
	Imperial	Metric	Imperial	Metric	Imperial	Metric
Routing						
Minimum Cutter Diameter	0.020 "	0.500mm	0.020 "	0.500mm	0.020 "	0.500mm
Profile Tolerance +/-	0.005 "	0.125mm	0.004 "	0.100mm	0.004 "	0.100mm
Edge to Hole Tolerance +/-	0.005 "	0.125mm	0.004 "	0.100mm	0.003 "	0.075mm
Copper to Edge	0.008 "	0.200mm	0.008 "	0.200mm	0.006 "	0.150mm
Copper Feature (fiducial) to Edge	0.008 "	0.200mm	0.006 "	0.150mm	0.006 "	0.150mm
"Z" Axis Routing Tolerance +/-	0.008 "	0.200mm	0.006 "	0.150mm	0.004 "	0.100mm
V Scoring						
Minimum Board Thickness	0.031 "	0.800mm	0.031 "	0.800mm	0.031 "	0.800mm
Maximum Board Thickness	0.094 "	2.400mm	0.094 "	2.400mm	0.094 "	2.400mm
AOI						
Minimum track & gap * Thin start Cu	0.003 "	0.075mm	0.0025 "	0.062mm	0.002 "	0.050mm
Electrical Test (Flying Probe)						
Min Board Thickness Horizontal	0.031 "	0.800mm	0.024 "	0.600mm	0.024 "	0.600mm
Min Board Thickness Vertical	0.010 "	0.250mm	0.010 "	0.250mm	0.010 "	0.250mm
Maximum Board Size	24" x 18"	610x457	24" x 18"	610x457	24" x 18"	610x457
Maximum Test Voltage	500 V	500 V	500 V	500 V	500 V	500 V
Minimum Value Ohms	1 Ohms	1 Ohms	1 Ohms	1 Ohms	1 Ohms	1 Ohms
Maximum Value Ohms	10M Ohm	10M Ohm	10M Ohm	10M Ohm	10M Ohm	10M Ohm
Impedance						
Tolerance	10%		5%		2%	
Flatness						
Percentage Bow and Twist	0.5%		0.5%		0.5%	

Any boards using development tolerances must have prior agreement of the Technical department.