

# PWB PRODUCIBILITY GUIDELINES

FAB

## PCB FABRICATION DRAWING FEATURES - ALL PWB

FEATURE	STANDARD PRODUCIBILITY	REDUCED PRODUCIBILITY	NOTES
Materials	Standard / High Tg FR-4 laminates. High performance laminates. Flexible circuit substrates. Ceramic substrates. Teflon substrates.		Isola, Park, Arlon, NanYa, DuPont, Rogers, Taconic, W.L. Gore, Espanex, Shin-Etsu, Hanwha
Maximum layer count for Flex	10	16	
Maximum layer count for Rigid	22	40 <	
Maximum layer count for Rigid-Flex	16	22	
Allowable Tolerance for Layer to Layer.	0.008	0.005	
IPC Classification	1 & 2	3	
Minimum Trace Width	0.002	0.0015	
Minimum Air Gap	0.003	0.002	
Minimum drill size (mechanical)	0.006	0.004	
Minimum drill size (Laser)	0.004	0.003	
Plated Hole Size Tolerance	Plus or Minus .003	Plus or Minus .002	
Sequential Lamination cycles	4	5	
Copper Weight (Base & plated)	0.25 oz - 2.0 oz	0.125 oz - 6.0 oz	
Maximum panel size	18 x 24	21 x 24	
Maximum Thickness	0.15	0.18	
Thickness Tolerance	Plus or Minus 10 Percent	Plus or Minus 5 Percent	
Maximum Aspect Ratio	10 to 1	14 to 1	
Blind & Buried Vias	Yes	Yes	Filled and Non-Filled.
Stacked Vias	Yes	Yes	Filled and Non-Filled.
Conductive Via Fill	Yes	Yes	DuPont
Non-Conductive via Fill	Yes	Yes	Tayio
Counter sink / Bore	Yes	Yes	
Scoring	Yes	Yes	
Routing	Mechanical	Laser	
Routing Tolerances	Plus or Minus .005	Plus or Minus .003	
Inside Radius	0.015	0.01	
Minimum Slot Width	.030 NPT	.015 NPT	
Minimum Slot Width	.020 plated	.010 plated	

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Drill Positioning	1Plus or Minus .002	Plus or minus .0015	
Plated Edges	Yes	NO	
Surface Finish	Hard and Soft Gold, ENIG, Immersion TinH.A.L. Lead Free, H.A.L. 60/40, Immersion Silver, OSP.	NO	Rohm and Haas, OMG, Enthone.
Plated Radii (Castellation)	Yes	NO	
Plated Milling/Cutouts	Yes	NO	
Controlled Impedance Single Ended	Plus or Minus 10 Percent	Plus or minus 5 percent	
Controlled Impedance Differential	Plus or Minus 10 Percent	Plus or minus 7 percent	If design allows.
Time Delay Reflectometry testing	Yes	No	Polar CIT S500s
Automatic Optical Inspection	Yes	No	Camtek Orion 3G-S Reflective.
Electrical Test	Yes	NO	A.T.G.s
Probe Pitch	.008 / .008	.004 / .004	
Probe Accuracy	Plus or Minus .00059	N/A	
Repetition Accuracy	Plus or Minus .00039	N/A	
Test Current	.01 mA - 30 mA	N/A	
Test Voltage	4v (field measuring) - 500v (high voltage test)	N/A	
Threshold Opens test	1 Ohm - 1 kOhm	N/A	
Threshold Shorts test	500 kOhms -10 MOhms (field measuring)	500 kOhms -100 Mohms (high voltage test)	
Book Binder	N/A	> .75"	Assumes No Bonded Flex Layers.
Crossing Flex Legs	N/A	If Present	
Double Sided Core Cap (1-2) Construction.	N/A	If Present	

## PCB FABRICATION DRAWING FEATURES - FLEX PWB

Book Binder	N/A	> .75"	Assumes No Bonded Flex Layers.
Crossing Flex Legs	N/A	If Present	
Double Sided Core Cap (1-2) Construction.	N/A	If Present	

# PWB PRODUCIBILITY GUIDELINES



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## ARTWORK (GERBER DATA) FEATURES - ALL PWB

FEATURE	STANDARD PRODUCIBILITY	REDUCED PRODUCIBILITY	NOTES
Materials	Standard / High Tg FR-4 laminates. High performance laminates. Flexible circuit substrates. Ceramic substrates. Teflon substrates.		Isola, Park, Arlon, NanYa, DuPont, Rogers, Taconic, W.L. Gore, Espanex, Shin-Etsu, Hanwha
Minimum Trace Width & Air Gap on .25 oz Cu.	.002 / .003	.0015 / .002	Nominal Dimensions before Etch Compensation.
Minimum Trace Width & Air Gap on .5 oz Cu.	.003 / .004	.002 / .003	Nominal Dimensions before Etch Compensation.
Minimum Trace Width & Air Gap on 1.0 oz Cu.	.006 / .006	.005 / .006	Nominal Dimensions before Etch Compensation.
Minimum Trace Width & Air Gap on 2.0 oz Cu.	.005 / .008	.004 / .007	Nominal Dimensions before Etch Compensation.
Trace Tolerance	Plus or Minus .001	Plus or Minus .0008	
Minimum Pad size for Mil-Spec Annular ring [ .005 External / .001 Internal]	Drill Size + .014	Drill Size + .010	Assumes Finished Hole size is drilled minus .005 mils
Minimum Pad size for IPC Annular ring [ .002 External / .001 Internal]	Drill Size + .012	Drill Size + .008	Assumes Finished Hole size is drilled minus .005 mils
Minimum Distance for Conductor to P.T.H.	0.01	0.007	Applies to Padless Holes
Minimum Distance for Ground Plane Clearance	.015 Clearance	.010 Clearance	The Clearance around the Pads.
Minimum Distance for Hole to the Part Edge.	0.03	0.02	The Edge of the Hole to the Edge of the Part.
Minimum Distance for Art Work Feature to the Part Edge.	0.01	0.005	The Edge of the Feature to the Edge of the Part.
Minimum Dams or Webs for L.P.I. Solder Mask	0.005	0.003	
Minimum Solder Mask Clearance around Features.	.005 per side	.002 per side	Nominal Dimensions before Etch Compensation

## ARTWORK (GERBER DATA) FEATURES - FLEX PWB

Minimum Distance from Plated Hole to R/F Interface.	< .075	< .050	Edge of the Hole to the Edge of the RigidBoard.
Minimum Clearance around Cover Coated Pads.	Clearance Diameter < .020 over Pad Diameter.	Clearance Diameter < .010 over Pad Diameter.	For Up to .003 mils Adhesive; To Allow for Adhesive Squeeze Out & Cover Coat registration.