

Manufacturing Capabilities

Combined Representation of All Facilities

Product Types: Rigid, Flex, Rigid-Flex, RF/microwave, Thermal Management

Attribute	Standard	Advanced	Emerging
Lamination			
Layer count	2 - 30	32 +	>48
Minimum panel size	12x18		
Maximum panel size	18x24	21"x24"	24"x30"
HDI layers	2-3	4	8+ as permitted by laminate type
Sequential laminations	2-3	4	8+ as permitted by laminate type
Layer-to-layer registration	+/- .002"		
Minimum board thickness, single/double sided	.005"		.002"
Maximum board thickness	.250"		.300"
Minimum core thickness	.001"		.0005"
Minimum core thickness (BC, Kapton)	.002"	.001"	.0005"
Minimum prepreg fill	.003"	.002"	<.002"
Drill			
Minimum drill diameter, mechanical drill	.006"	.005"	.004"
Mechanical drill aspect ratio, unfilled	12:1	15:1	30:1
Mechanical drill aspect ratio, filled	10:1	11:1	> 11:1
Drill to metal (rigid)	.008"	.007"	.00525"
Drill to metal (flex)	.012"	.007"	.00525"
Drill Edge to Rigid Flex Transition	.100"	.075"	< .050"
Antipad diameter over drill size	.020"+	.016"	< .016"
Minimum class 2 annular ring, mechanical drill	.005"	.004"	< .004"
Minimum class 3 annular ring, mechanical drill	.007"	.006"	< .006"
Minimum drill diameter, laser micro via	.004"	.003"	< .003"
Microvia aspect ratio	0.6:1	0.7:1	>0.7:1
Microvia capture pad / hole	+.007"	+.005"	+.004"
Control depth drill tolerance	Keep back .010" +/- .005"	Keep back .005" +/- .002"	Keep back .004 +/- .0015"
Back drill, diameter over primary drill	.008"	.007"	<.007"
Back drill anti-pad, diameter over primary drill	.016"	.014"	<.014"
Etch Features			
Min copper foil - Internal	1/2 oz	1/4 oz	1/4 oz
Max copper foil - Internal	2 oz	4 oz	6 oz
Min copper foil - External	3/8 oz	1/4 oz	1/4 oz
Max copper foil - External	1 oz	3 oz	>3 oz
Inner Layer Print and Etch			
Minimum designed line width/spacing, 1/4 ounce foil	.002"		<.002"
Minimum designed line width/spacing, 3/8 ounce foil	.003"/.003"	.0025"/.003"	<.0025"/.002"
Minimum designed line width/spacing, 1/2 ounce foil	.004"/.004"	.003"/.003"	<.003/.003"
Minimum designed line width/spacing, 1 ounce foil	.005"/.005"	.004"/.004"	.0035"/.004"
Minimum designed line width/spacing, 2 ounce foil	.008"/.008"	.006"/.008"	.006".006"
Minimum designed line width/spacing, 3 ounce foil	.010".010"	.008"/.010"	.008"/.008"

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Plated External Layers			
Minimum designed line width/spacing, 1/4 ounce foil		.0025"/.0025	.002"/.002"
Minimum designed line width/spacing, 3/8 ounce foil	.004"/.004"	.003"/.003"	.0025"/.003"
Minimum designed line width/spacing, 1/2 ounce foil	.005"/.005"	.004"/.004"	.003"/.004"
Minimum designed line width/spacing, 1 ounce foil	.006"/.006"	.005"/.005"	.004"/.005"
Minimum designed line width/spacing, 2 ounce foil	.012"/.012"	.010"/.010"	.008"/.008"
Minimum designed line width/spacing, greater than 3 ounce foil			Requires engineering review
Copper fill to round feature spacing (donuts)	.006"	.005"	.005"
Flex Button Plate			
Flex PCB Button Plate: Pad + Drill, Button +Drill	Pad = DRL+ .016"/Button=DRL + .008"	Pad = DRL+ .014"/Button=DRL + .006"	Pad = DRL+ .012"/Button=DRL + .004"
Soldermask			
LDI solder mask minimum web width, green color	.004"	.003"	less than .003"
LDI solder mask clearance	+/- .002"	+/- .0015"	less than +/- .0015"
Legend			
Inkjet legend printing	White	White	White
Color options	Green	Red, Blue, Black, White	Red, Blue, Black, White
Mechanical			
Board profile dimensional tolerance	+/- .005"	+/- .002"	<+/- .002"
Plated through hole diameter tolerance	+/- .003"	+/- .002"	<+/- .002"
Non-plated through hole diameter tolerance	+ .002"/- .001"	+/- .001"	<+/- .001"
Board flatness, warp and twist Per IPC-TM-650 2.4.22	<.75%	<.5% Balanced Construction	Unbalanced Constructions AABUS
Impedance Testing			
Impedance controlled - single ended +/- %	+/-10%	+/-5%	<+/- 5%
Impedance controlled - edge coupled diff. +/- %	+/-10%	+/-8%	<+/- 5%
Impedance controlled - broad side diff. +/- %	+/-10%	+/-8%	<+/- 5%
Impedance controlled - broad side diff. +/- %	10%	5%	5%