

CORPORATE CAPABILITIES PER SITE	ADVANCEDPCB - SANTA CLARA CA			ADVANCEDPCB - ORANGE COUNTY CA			ADVANCEDPCB - CHANDLER AZ			ADVANCEDPCB - ANAHEIM CA			ADVANCEDPCB - MAPLE GROVE MN			ADVANCEDPCB - AURORA CO		
Attributes	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)
Maximum Board Size	16x22	19x22		16x22	18x22	N/A	14x20	15x21	16x22	15x21	21x25		16 x 22	16 x 52, 22 x 28		16x22		
Maximum Panel Size	18 x 24	21x24, 20x26	N/A	18x24	21x24	N/A		18x24	21x24	18x24	24x26	>24x26	18 x 24	18 x 54, 24 x 30	36 x 119 DS	18x24		
Maximum Board Thickness	0.25			0.125	0.25	N/A	0.19	0.20	>.200	.250"	.320"			0.25		0.125	0.155	
Minimum Board Thickness	0.01	0.008		0.01	0.008	0.005	0.01	0.008	≤.007	0.002 flex	0.002 flex	0.002 flex	.010 Rigid	.008 Rigid	.006 Rigid	0.031	0.01	
Overall Board Thickness Tolerance (+/- %)	10%	7%	5%	10%	7%	5%	10%	8%	6%	10%	7%	5%	10%	7%	5%	10%		
Warpage/ Bow and Twist capability - mils per Inch	0.0100	0.0075	0.0050	0.0075	0.0060	0.0050	0.0100	0.0075	0.0050	0.0100	0.0075	0.0050	0.0100	0.0075	0.0050	0.0100	0.0075	
Maximum Rigid Layer Count	28	42	42+	<20	38	>40	24	26-30	32+	28	38	38+	26	40	40+	18	24	
Maximum Flex Layer Count										6	10	12+	N/A	N/A	N/A			
Maximum Rigid-Flex Layer Count										14	24	30+	N/A	N/A	N/A			
Minimum Core Thickness	0.002	0.001	0.0005	0.002			0.002	0.001	0.001 Flex	.0005 Flex	.001 Flex	.0005 Flex	0.004	0.002	0.0010	0.003		
Minimum Dielectric Thickness	0.002	0.001		0.003	0.002	0.0015	0.002	0.001	.001 Flex	.0005 Flex	.001 Flex	.0005 Flex	0.002	0.001	N/A	0.003		
Lam Cycles Rigid	5x	7x	9X	4X	6X	>6	3x	5x	8x	3x	4x	>4	3x	6x	>6x			
Lam Cycles Flex	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	2x	4x	>4	N/A	N/A	N/A			
Lam Cycles Rigid-Flex	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	3x	4x	>4	N/A	N/A	N/A			
Trace/Space - Base Copper Thickness																		
Inner Layer Width - 1/4 oz. Cu	0.0025	0.003		0.0025	0.002	0.0015	0.0025	0.003		0.0025	0.003							
Inner Layer Width - 1/2 oz. Cu	0.0035	0.0025	0.002	0.003	0.0025	0.002	0.0035	0.003	0.00275	0.0035	0.003	0.0025	0.003	0.0025		0.003		
Inner Layer Width - 1oz. Cu	0.0045	0.0035	0.003	0.004	0.0035	0.003	0.0045	0.0035	0.003	0.0045	0.0035	0.003	0.004	0.0035		0.004		
Inner Layer Width - 2 oz. Cu	0.006	0.0055	0.004	0.006	0.0055	0.005	0.006	0.0055	0.005	0.006	0.0055	0.0045	0.006	0.0055		0.005		
Inner Layer Width - 3 oz. Cu	0.008	0.0075	0.006	0.008	0.0075	0.007	0.008	0.0075	0.007	0.008	0.0075	0.006	0.008	0.007		0.008		
Inner Layer Width - 4 oz. Cu	0.01	0.009	N/A	0.01	0.009		0.01	0.009	0.0085	0.01	0.009	N/A	0.01	0.009		0.012	0.01	
Inner Layer Space - Trace to Trace - 1/2 oz. Cu	0.0035	0.0025	0.002	0.003	0.003	0.00275	0.0035	0.003	0.00275	0.0035	0.003	0.0025	0.003	0.0025		0.003		
Inner Layer Space - Trace to Trace - 1oz. Cu	0.0045	0.004	0.003	0.005	0.004	0.0035	0.0045	0.004	0.0035	0.0045	0.0035	0.003	0.004	0.004		0.004		
Inner Layer Space - Trace to Trace - 2 oz. Cu	0.006	0.0055	0.005	0.006	0.005	0.00475	0.006	0.0055	0.005	0.006	0.0055	0.005	0.007	0.006		0.005		
Inner Layer Space - Trace to Trace - 3 oz. Cu	0.008	0.0075	0.006	0.008	0.0075	0.007	0.008	0.0075	0.007	0.008	0.0075	0.006	0.01	0.009		0.008		
Inner Layer Space - Trace to Trace - 4 oz. Cu	0.01	0.009	N/A	0.01	0.009		0.01	0.009	0.008	0.01	0.009	N/A	0.013	0.012		0.012	0.01	
Outer Layer Width - 1/4 & 3/8 oz. Cu. Base	0.003	0.002	0.0015	0.003	0.0025	0.002	0.0035	0.003	0.00275	0.003	0.0025	0.002	0.003	0.0025		0.003		
Outer Layer Width - 1/2 oz. Cu. Base	0.0045	0.003	0.0022	0.0035	0.003	0.0025	0.0045	0.0035	0.003	0.0045	0.003	0.0025	0.003	0.0025		0.004		
Outer Layer Width - 1oz. Cu. Base	0.0055	0.004	0.003	0.005	0.004	0.003	0.0055	0.004	0.003	0.0055	0.004	0.003	0.004	0.004		0.005		
Outer Layer Width - 2 oz. Cu. Base	0.007	0.0055	0.004	0.007	0.006	0.0055	0.01	0.006	0.005	0.007	0.0055	0.004	0.005	0.005		0.008		
Outer Layer Width - 3 oz. Cu. Base	0.009	0.0075	0.006	0.009	0.008	n/a	0.009	0.0075	0.007	0.009	0.0075	0.006	0.008	0.008		0.012	0.01	
Outer Layer Space - Trace to Trace - 1/4 & 3/8 oz. Cu. Base	0.003	0.002	0.0015	0.003	0.00275	0.0025	0.0035	0.003	0.00275	0.003	0.0025	0.002	0.003	0.0025		0.003		
Outer Layer Space - Trace to Trace - 1/2 oz. Cu. Base	0.003	0.0025	0.0022	0.00375	0.0035	0.0025	0.004	0.0035	0.003	0.0035	0.003	0.0025	0.003	0.0025		0.004		
Outer Layer Space - Trace to Trace - 1oz. Cu. Base	0.0055	0.004	0.003	0.006	0.0055	0.005	0.0055	0.0045	0.0035	0.0055	0.004	0.003	0.005	0.004		0.005		
Outer Layer Space - Trace to Trace - 2 oz. Cu. Base	0.007	0.0055	0.005	0.007	0.006		0.007	0.0065	0.006	0.007	0.0055	0.005	0.007	0.006		0.008		
Outer Layer Space - Trace to Trace - 3 oz. Cu. Base	0.009	0.0075	0.006	0.009	0.008		0.009	0.008	0.007	0.009	0.0075	0.006	0.008	0.007		0.012	0.01	
Gold Body / Bi-Level Gold w/ 0.25oz foil	0.0035	0.003		0.004	0.0035					0.0035	0.003		0.0035	0.003				
Gold Body / Bi-Level Gold w/ 0.5oz foil	0.004	0.0035		0.0045	0.004					0.004	0.0035		0.004	0.0035		0.004		
Minimum Outer Layer Trace Widths for Boards With Filled and Plated Over Vias.	0.005	0.004	0.003	0.005	0.004	0.003	0.005	0.004	0.0035	0.005	0.004	0.003	0.004	0.0035		0.005	0.003	
Minimum Outer Layer Spacing for Boards With Filled and Plated Over Vias.	0.006	0.005	0.004	0.006	0.005	0.004	0.006	0.005	0.0045	.006	.005	.004	0.004	0.0035		0.005	0.003	
Etch Requirements																		
Minimum copper silver between antipads	0.005	0.004		0.005	0.005		0.005	0.004		0.005	0.004		0.005	0.004		0.005	0.004	
Etch Tolerance and factor 1/2 OZ Cu or less inner/outer NO VF	+/-0.0075	+/-0.005		20%	15%	10%	+/-0.0075	+/-0.005		±.00075	±.00005		±.00075	±.00005		+/-0.002	+/-0.001	
Etch Tolerance and factor 1/2 OZ Cu or less inner/outer w/ VF	+/-0.0015	+/-0.001		20%	15%	10%	+/-0.0015	+/-0.001		±.0015	±.001		±.001	±.001		+/-0.002	+/-0.001	
Etch Tolerance and factor 1 OZ Cu inner/outer NO VF	+/-0.0015	+/-0.001		20%	15%	10%	+/-0.0015	+/-0.001		±.0015	±.001		±.002	±.0015		+/-0.002	+/-0.001	
Etch Tolerance and factor 2 OZ Cu inner/outer NO VF	+/-0.002	+/-0.0015		20%	15%	10%	+/-0.002	+/-0.0015		±.002	±.0015		±.0025	±.002		+/-0.002	+/-0.0016	
Etch Tolerance and factor 3 OZ Cu inner/outer NO VF	+/-0.0025	+/-0.002		20%	15%		+/-0.0025	+/-0.002		±.0025	±.002		±.003	±.003		+/-0.003	+/-0.0024	
Drill & Rout																		
Smallest PTH - Via HDI				0.006	0.004	0.003	0.006	0.005	≤.004									
Smallest Mechanical PTH - Via (aspect ratio driven)	0.0059	0.005		0.0059	0.0051	0.004	0.0059	0.005		0.0059	0.005		0.0043			0.006	0.004	
Smallest PTH - Component	0.015			0.018	0.012		0.015			0.015	0.012		0.015			0.015		
PTH - Tolerance	0.003	0.002	0.0015	+/-0.003	+/-0.002	+/-0.0015	0.003	0.002	0.0015	±.003	±.002	±.0015	0.003	0.002		0.003	0.002	
PTH - Tolerance Press Fit	0.0025	0.002	0.0015	+/-0.002	+/-0.002	+/-0.0015	0.0025	0.002	0.0015	±.0025	±.002	±.0015	0.002	0.002		0.003	0.002	
NPTH - Tolerance	0.002	0.001		+/-0.002	+/-0.001		0.002	0.001		±.002	±.001		0.002	0.002		0.002	0.002	
NPTH - Slot Tolerance	+/-0.004	+/-0.003	+/-0.002	+/-0.003	+/-0.002	+/-0.0015	+/-0.004	+/-0.003	+/-0.002				+/-0.004	+/-0.004		+/-0.005	+/-0.003	
PTH - Slot Tolerance	+/-0.005	+/-0.004	+/-0.003	+/-0.004	+/-0.003	+/-0.002	+/-0.005	+/-0.004	+/-0.003				+/-0.005	+/-0.004		+/-0.005	+/-0.003	
Standard Rout Tolerances	+/-0.005	+/-0.004	+/-0.003	+/-0.005	+/-0.004	+/-0.003	+/-0.005	+/-0.004	+/-0.003	±.005	±.004	±.003	+/-0.005	+/-0.004		+/-0.005	+/-0.003	
Optical Rout Tolerances (Rout edge to feature location)	+/-0.003	+/-0.002	+/-0.0015	+/-0.003	+/-0.002	+/-0.0015	0.004	0.003		±.003	±.002	±.0015	-	-				
Aspect Ratio - Plated Through Holes -> .020" drilled	10:1	12:1	14:1	10:1	12.5:1		10:1	13:1	16:1	10:1	12:1	14:1	10:1	12:1		10:1		
Aspect Ratio - Plated Through Holes -.010"-.019" drilled	10:1	12:1	14:1	10:1	12.5:1	14:1	10:1	13:1	16:1	10:1	12:1	14:1	10:1	12:1		10:1		
Minimum Drill to Copper for PTH	0.01	0.008	0.006	0.008	0.007	0.006	0.01	0.008	0.007	0.01	0.008	0.006	0.007	0.006		0.01	0.008	
Minimum Drill to Copper for PTH Sub Assemblies	0.008	0.006	0.005	0.008	0.007	0.006	0.008	0.007		0.01	0.008	0.006	0.007	0.006				
Minimum Drill to Copper for Laser uVias	0.006	0.004		0.005	0.004	0.0035	0.006	0.0025	0.002	0.006	0.005		0.004	0.004				
Minimum hole to hole edge for PTH	0.012	0.01	0.008	0.0015	0.008	0.007	0.012	0.01	0.008	0.012	0.01	0.008	0.01	0.008		0.01		
Minimum hole to hole edge for Laser uVias	0.008	0.005		0.05	0.004	0.0035	0.008											

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Drill & Rout	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)	Standard	Advanced	Development (NPI)
SMT Pitch	0.01	0.008	0.006	0.01	0.008	0.006	0.016			0.01	0.008	0.006	0.01	0.008		0.01		
Buried Vias - Mechanical Drill Minimum Size	0.0059	0.005	0.004	0.0059	0.0051	0.004	0.0079	0.0059		0.008	0.006	0.004	0.0059	0.005				
Buried Vias - Mechanical Drill - Max Aspect Ratio	10:1	12:1	14:1	12:1	13:1	15:1	10:1	12:1	14:1	10:1	12:1	14:1	10:1	12:1				
Blind Vias - Mechanical Drill Minimum	0.0059	0.005		0.0059	0.0051	0.004	0.0079	0.0059		0.008	0.006	0.004	0.0059	0.0059				
Blind Vias - Mechanical Drill - Max Aspect Ratio	.7:1	.8:1	1:1	.7:1	.8:1	1:1	10:01	12:01	14:01	10:1	12:1	14:1	.7:1	.8:1				
Blind Vias - Laser Drilled. - Minimum Size	0.004	0.003	0.002	0.004	0.003	0.002	0.006	0.0055		0.004	0.003	0.002	0.004	0.003				
Blind Vias - Laser Drilled. - Maximum Size	0.007	0.008	0.009	0.01	0.012	N/A	0.007	0.008	0.009	0.007	0.008	0.009	0.008	0.007				
Blind Vias - Laser Drilled. - Maximum Aspect Ratio.	.7:1	.8:1	1.0:1	10:1	12:1	N/A	.5:1	0.75:1	.85:1	0.5:1	0.75:1	1:1	.75:1	0:1.0:1				
Maximum Copper Fill Depth Micro uVias	0.004	0.005	0.006	0.006	0.008	0.01	0.003	0.004	0.006	0.004	0.005	0.006	0.006	0.005				
Back Drill Depth Remaining Stub	0.01	0.008	0.006	0.01	0.008	0.006	0.01	0.008	0.006	0.01	0.008	0.006	0.008	0.005				
Back Drill - Minimum Over Primary Drill Size (Oversize bit will depend on primary drill size)	+/-0.012-0.007			0.012	0.01	0.008	0.01	0.009	0.008	0.012	0.01	0.008	0.01	0.008				
Back Drill - Depth Tolerance	+/-0.005	+/-0.003	+/-0.002	+/-0.005	+/-0.003	+/-0.002	+/-0.005	+/-0.003	+/-0.002	+/-0.005	+/-0.003	+/-0.002	0.005	0.003				
Min Back Drill Depth for filled & plated over BD holes	0.01	0.006		0.01	0.006		0.01	0.009		0.01	0.008		0.01	0.006				
Drill True Position Tolerance Standard (+/-)	0.005	0.004	0.003	0.005	0.003		0.003	0.002		0.006	0.005	0.004	0.004	0.003		0.005	0.004	
Drill True Position Tolerance w/ camera alignment (+/-)	0.003	0.002	0.001	0.003	0.002	0.001	0.002	0.0018		0.003	0.002	0.001	-	-				
Drill hole to hole positional tolerance (+/-)	0.003	0.002		0.003	0.0025	0.002	0.003	0.002		0.003	0.0025	0.002	0.003	0.002		0.003	0.002	
Minimum PTH Size That Can Be Filled With Non Conductive Material and Plated Over	0.0079	0.0059	0.005	0.006	0.005		0.0098	0.0079		0.0091	0.0078		0.0059	0.0059		0.008	.004 or 10:1 aspect ratio	
Maximum PTH Size That Can Be Filled With Non Conductive Material and Plated Over	0.018	0.02		0.018	0.025	0.03	0.035	0.04		0.025	0.028	.038	0.04	0.03		0.018	2:1 aspect ratio	
Impedance																		
Impedance - Tolerance	±10%	±5%	<±5%	+/-10%	+/-7%	+/-5%	±10%	±8%	±5%	±10%	±7%	±5%	±10%	±7%	±5%	10	5	
Maximum Impedance - Value Ohms	110Ω	150Ω		100Ω	130Ω		100Ω	110Ω		100Ω	130Ω		110Ω	150Ω		120		
Minimum Impedance - Value Ohms	28Ω	25Ω		28Ω	25Ω		50Ω	40Ω		28Ω	25Ω		35Ω	25Ω		35		
Impedance Coupon Size	.5"x 6"	custom		7" X .500"	.5"x 6"	custom	.5"x 6"	custom		.5"x 6"	custom		.5"x 6"	custom		8"x1" (varies)		
Solder Mask & Silkscreen																		
Solder Mask Web width over laminate (i.e. between pads)	0.004	0.003	0.002	0.0035	0.003	n/a	0.004	0.0035	0.003	0.004	0.003	0.002	0.004	0.004		0.004	0.003	
Solder Mask Web width over copper (i.e. over a trace)	0.003	0.002	0.002	0.0035	0.003		0.004	0.0035	0.003	0.003	0.002	0.002	0.004	0.004		0.004	0.003	
Solder Mask Clearance to Pad(i.e. annular ring)	0.003	0.002	0.001	0.003	0.002	0.001	0.003	0.002	0.0015	0.003	0.002	0.001	0.004	0.003		0.002		
Minimum Silkscreen line width / height (white only)	4 mils / 15-20 mils	3 mils / 15-20 mils		0.004	0.003		4 mils / 15-20 mils	3 mils / 15-20 mils	N/A	4 mils / 15-20 mils	3 mils / 15-20 mils		3.5 mils / 15-20 mils	3 mils / 15-20 mils		0.005	0.003	
Standard Silkscreen line width / height	4 mils / 15-20 mils	N/A		.004 / .020	.003 / .025		5 mils / 25-30 mils			5 mils / 25-30 mils	N/A		6 mils / 25-30 mils			0.005		
Maximum Tented Via	0.016	0.02		0.014	0.016	0.018	0.016	0.02		0.016	0.02		0.016	0.02		0.018		
Spacing & Registration																		
Minimum Copper spacing To Board Edge	0.01	0.008	0.005	0.01	0.008	0.005	0.01	0.008	0.005	.010	.008	.005	0.01	0.008	0.005	0.01		
Minimum hole spacing To Board Edge	0.01	0.008	0.005	0.01	0.008	0.005	0.01	0.008	0.005	.010	.008	.005	0.01	0.008	0.005	0.01		
Layer to Layer Registration - Different Cores	0.003	0.002		0.003	0.002		.003	0.002		0.005	0.004	0.003	0.003	0.002		-	0.003	
Outer layer feature True Position Tolerance	0.006	0.005	0.003	+/-0.005	+/-0.003	+/-0.002	20%	15%		0.006	0.005	0.004	.001"	.0005"		0.001		
Front to Back Registration (Same Core)	.001"	.0005"		.001"	.001"	.00005"	0.002	0.0015		.001"	0.0005"		0.006	0.005	0.003	0.006	0.005	
HASL Pad to Pad Space & Pad Size (Ganged areas not doable for SC)	.008/.020"			0.006	0.005	0.004	0.006	0.005										

All measurements are in inches unless otherwise specified.