LONE STAR CIRCUITS

Capabilities

	Standard	Advanced
Stackups		
Overall Board Thickness	.006 - .250"	<.006, >.250
< 0.020" Overall Board Thickness Tolerance	+/- .002"	+/- .002"
0.031" Overall Board Thickness Tolerance	+/- .003"	+/- .002"
0.062" Overall Board Thickness Tolerance	+/- .006"	+/- .004"
0.093" Overall Board Thickness Tolerance	+/- .009"	+/- .0065"
0.125" Overall Board Thickness Tolerance	+/- .012"	+/- .009"
0.187" Overall Board Thickness Tolerance	+/- .018"	+/- .013"
0.250" Overall Board Thickness Tolerance	+/- .025"	+/- .018"
Thinnest Dielectric Finished	.003"	.002"
Thinnest Finished Overall Thickness	.010"	.005"
Thinnest Plated Core	.004"	.003"
Maximum Useable Area (for 16" x 18" panel)	14.7 x 16.7"	
Maximum Useable Area (for 18" x 24" panel)	16.7 x 22.7"	
Maximum Useable Area (for 21" x 24" panel)	19.7 x 22.7"	
Maximum Useable Area (for 24" x 28" panel)	22.7 x 26.7"	
Custom Oversized Panel Sizes	Available (Autoclave Processing)	
Special Products/Unique Capabilities		
In-House Bonded Heatsinks	Copper/Aluminum	
In-House Metal-Backed	Copper/Aluminum	
Advanced Cavity Constructions	Pre-Rout + Lamination	Controlled Depth/Cu Following
Heavy Copper	5 oz	>5 oz
In-House High Aspect Ratio Via in Pad	12:1	>12:1
In-House UV/CO2 Laser	Yes	
Multilayer PTFE Constructions	High Temp Lamination	Autoclave
Mechanical Capabilities		
Primary Drilled Hole Location Tolerance to Datum (Hole) Zero (DTP)	.006"	.003"
2nd Drill Hole Location Tolerance to Datum Zero (DTP)	.006"	.003"
Minimum Clearance from Copper Conductor to Mechanical Drilled Hole	.008"	.006"
Minimum Clearance from Copper Conductor to a Laser Drilled Hole	.008"	.006"
Plated Through Hole Capabilities - Smallest Plated Through Hole Size with 0.001" Minimum Average Copper Requirement		
Finished Panel Thickness < 0.020"	.004"	<.004"
Finished Panel Thickness 0.031"	.004"	<.004"
Finished Panel Thickness 0.062"	.005"	<.005"
Finished Panel Thickness 0.093"	.008"	<.008"
Finished Panel Thickness 0.125"	.010"	<.010"
Finished Panel Thickness 0.187"	.016"	<.016"
Finished Panel Thickness 0.250"	.020"	<.020"
Plated Hole Size Tolerance	+/-.003"	+/-.002"
Plated Hole Size Press Fit applications	+/-.002"	+/-.002"
Aspect Ratio (with 0.008" drill)	12:1	18:1
Isolated Plated Hole Spacing Minimum (Drilled hole to hole)	.010"	.008"
Non Plated Through Holes		
Smallest Non Plated Hole Size (Finished)	.006"	.004"
Largest Non-Plated Hole Size Routed	No limit	
Non-plated Routed Hole Tolerance	+/-.005"	+/-.003"
Minimum NPTH to Edge of Board Spacing	.010"	.008"

LONE STAR CIRCUITS

Capabilities

	Standard	Advanced
Blind/Buried Vias (Sequential Lamination)		
Minimum FINISHED Via Hole Diameter - Epoxy Filled	.006”	<.006”
Maximum FINISHED Via Hole Diameter - Epoxy Filled	.018”	≥.020"
Maximum Aspect Ratio for Epoxy Filled Via Holes	10:1	25:1
Available Epoxy Fill Types	San-Ei Kagaku, Taiyo, Peters	DuPont, Tatsuta
Laser Microvia (µVia) Capabilities		
Smallest (as ablated) Laser Via	.003”	.002”
Largest (as ablated) Laser Via	.008”	>.008”
Via Aspect Ratio (Depth to Diameter)	1:1	1:1
Capture Pad Size	.010”	.008”
Target/Landing Pad Size	.010”	.008”
Number of Stacked Via Layers	3 Layers	>3 Layers
Copper-Filled Microvia	Yes	Yes
Control Depth Drill and Backdrill Capabilities		
Backdrill - PTH Stub Removal	+.010” over PTH Diameter	+.008” over PTH Diameter
Minimum Backside Dielectric Separation	.003”	.002”
Control Depth Drill Depth Tolerance	+/-.0025”	+/-.0005”
Scoring Capabilities		
Angles	20°, 30°, 45°	1 Edge Scoring
Offset Tolerance	.003”	.002”
Optimum Remaining Web Thickness	1/3 of thickness	
Remaining Web Tolerance	+/-.002”	
True Position Tolerance	.005”	
Edge Connector Bevel Capabilities		
Finger Tip Angle	20°, 30°, 45°	
Bevel Depth Tolerance	+/- 0.005”	
Profile Capabilities		
Standard Router Bit Diameter	.093”	.011” (.040” Max Thickness)
Routed Profile Tolerance	+/-.005”	<.005”
Minimum Internal Rout Radius	.0465”	.0055”
Minimum Routed PTH Slot Width	.031”	.011”
Feature Size Capabilities - Innerlayer Capabilities - Minimum Conductor Width and Spacing		
Internal Starting Copper Weight 1/4 oz.	.003” Line - .003” Space	.0025” Line - .003” Space
Internal Starting Copper Weight 1/2 oz.	.003” Line - .004” Space	
Internal Starting Copper Weight 1 oz.	.003” Line - .005” Space	
Internal Starting Copper Weight 2 oz.	.004” Line - .007” Space	
Internal Starting Copper Weight 3 oz	.005” Line - .009” Space	
Internal Starting Copper Weight 4 oz	.006” Line - .011” Space	
Internal Starting Copper Weight 5 oz	.008” Line - .014” Space	
Internal Starting Copper Weight 6 oz (Not UL Certified)	.010” Line - .016” Space	

LONE STAR CIRCUITS

Capabilities

	Standard	Advanced
Feature Size Capabilities - Outerlayer Capabilities - Minimum Conductor Width and Spacing		
External Copper Finished Thickness 1.0 oz.	.003" Line - .003" Space	
External Copper Finished Thickness 1.5 oz.	.003" Line - .005" Space	
External Copper Finished Thickness 2.0 oz.	.004" Line - .006" Space	
External Copper Finished Thickness 3.0 oz.	.005" Line - .009" Space	
External Copper Finished Thickness 4.0 oz.	.006" Line - .011" Space	
External Copper Finished Thickness 5.0 oz.	.008" Line - .014" Space	
External Copper Finished Thickness 6.0 oz. (Not UL Certified)	.010" Line - .017" Space	
External Copper Finished Thickness 7.0 oz. (Not UL Certified)	.012" Line - .019" Space	
External Copper Finished Thickness 8.0 oz. (Not UL Certified)	.014" Line - .021" Space	
Pad Diameter to Drilled Hole Size		
Component holes	Drill Size + .010"	Drill Size +.008"
Via holes	Drill Size + .010"	Drill Size +.008"
Pad Diameter to Laser Ablated Hole Size	Drill + .004"	Drill + .003"
Solder Mask		
Min. LPI Soldermask Clearance (LDI Imaged)	.0015"	.001"
Pad size larger than NPTH	.003"	
Web Between Surface Mount Pads	.004"	.003"
Solder Mask Colors	Green, Red, Blue, Yellow, White, Black, Clear Custom	
Solder Mask Type	Taiyo/ Electra/ Enthone	
Solder Mask Type	LPI, LDI	
Minimum Mask Defined Pad Diameter	.006"	<.006"
Silkscreen		
LPI Legend Capability	Yes	
Width LPI Legend	.003"	
Screened/LPI Legend Colors	Green, Red, Blue, Yellow, White, Black	
Via-in-Pad		
Epoxy Filled – Non-Conductive	Yes	
Epoxy Filled Thru Hole Capability	Yes	
Epoxy Filled Thru Hole Minimum	.004"	.001"
Epoxy Filled Thru Hole Maximum	.018"	>.020"
Minimum Board Thickness	.020"	<.020"
Maximum Board Thickness	.125"	>.125"
Via Fill Aspect Ratio	10:1	25:1
Conductive VIP Options	DuPont, Tatsuta	
Non-Conductive VIP Options	Taiyo, San-Ei Kagaku, Peters	
Orrmet pad to pad connection		Yes
Copper Plated/ Filled		
Copper Filled µVia Process	Yes	
Copper Filled µVia Hole Minimum	.003"	
Copper Filled µVia Hole Maximum	.007"	.010"
Via Fill Aspect Ratio	.5:1	1:1
Military		
Etch Back	Yes	
IPC Class 3 Etchback Specification	Yes	

LONE STAR CIRCUITS

Capabilities

	Standard	Advanced
Surface Finishes Options		
Hot Air Solder Level (lead based)	Yes	
Electroless Nickel Immersion Gold	Yes	
Immersion Silver	Yes	
OSP	Yes (Outsourced)	
Electroless Nickel Electroless Palladium Immersion Gold (ENEPIG)	Yes (Outsourced)	
Immersion Tin	Yes (Outsourced)	
Full Body Gold	Yes	
Bondable Gold	Yes	
Plated Nickel	Yes	
Electroless Nickel	Yes	
Fused Tin Lead Reflow	Yes	
Copper	Yes	
HASL with Selective Gold	Yes	
Dual Gold Plating	Yes	
Immersion Gold with Selective Hard Gold	Yes	
Recessed Fingers	Yes	
Testing Capabilities		
Minimum Test Continuity Resistance	.5 Ohms	.5 Ohms
Maximum Test Voltage	250 Volts	250 Volts
Maximum Test Isolated Resistance	77.6 Megaohms	77.6 Megaohms
Largest Test - Fixture	13 x 18”	13 x 18”
Largest Test - Flying Probe	21 x 24”	21 x 24”
Electrical Test Pitch (Fixture Test)	.070”	.070”
Electrical Test Pitch (Flying Probe Test)	Not Applicable	Not Applicable
Electrical Performance		
TDR Test Tolerance (Print and Etch)	+/-10%	+/-5%
TDR Test Tolerance (Plated Copper)	+/-10%	+/-5%
TDR Test Tolerance Differential Measurements	+/-10%	+/-5%
TDR Tolerance Single Ended Tolerance	+/-10%	+/-5%
HiPot Testing (AC & DC)	Yes	
Quality, Data, and Documentation		
Certifications	ISO 9001:2015, AS9100D, MIL-PRF-55110, MIL-PRF-31032	
ITAR Registered	Yes	
Manufacturing Specifications	IPC6012 Classes 2-3A, IPC6018	
Tooling Formats		
Film Data Formats	DXF, 274X, ODB++	
Drill Data Formats	ASCII, Excellon Format	
Electrical Test Formats	IPC-D356	
Netlist Compare Formats	IPC-D356	
Tooling Communication		
Media Types & Data Transfer	Email	
Compression Formats	ZIP, TAR, TGZ	
Secured Data Transfer Methods	Secure Data Transfer, PGP, Customer Specified	

901 Hensley Lane, Wylie, Texas 75098

Phone: 214-291-1427 - www.lscpcbs.com - Send quotes to: sales@lscpcbs.com