



深圳市龙江昌电路有限公司

LONGJIANG CIRCUITS CO., LTD

Rigid+Flex PCB Manufacturing Capability

Item		Sample/Prototype	Mass production
Layer Count		0-20Layer(HDI 3+N+3)	0-16Layer(HDI 3+N+3)
Base material	Supplier	FR-4(Shengyi, KB, ILM, ITEQ,Ventec,Isola), BT, Aluminum, Rogers(RO4350/4003/RT5880 etc), Taconic, Megtron 6, F4B series, PTFE, Polyimide (Dupont), etc	FR-4(Shengyi, KB, ILM, ITEQ,Ventec,Isola), BT, Aluminum, Rogers(RO4350/4003/RT5880 etc), Taconic, Megtron 6, F4B series, PTFE, Polyimide (Dupont), etc
	Tg value	135°; 150°; 170°; 180°;	
Acceptable files/datas		Gerber 274, Gerber D, Eagle, DPF, MDA, DXF Protel99se, ODB++, Autocad, etc	Gerber 274, Gerber D, Eagle, DPF, MDA, DXF Protel99se, ODB++, Autocad, etc
Layer Registration Tolerance		≤2.5mil(0.064mm)	≤3mil(0.08mm)
Max.Board size		650*1500mm	500*1500mm
Min.Board size		200mil*120mil(Thickness>8mil)	400*200mil(Thickness>16mil)
Min. thickness for inner layer base material/copper		1mil(0.025mm) 1/3oz exclude copper	1mil(0.025mm) 1/3oz exclude copper
FPC & Rigid part distance(Min.)		distance=1/2 board thickness=(bend ≤60degrees) distance=board thickness(bend 90degrees) distance=4 times*board thickness(bend 90-180degrees)	
Rigid+Flex board Finished thickness	Single/Double	8mil-400mil(min. 0.6mm for HASL)	8mil-240mil(min. 0.6mm for HASL)
	Multilayer	10mil-400mil(min. 0.6mm for HASL)	10mil-240mil(min. 0.6mm for HASL)
Flex board Finished thickness	Single/Double	3mil-250mil	3mil-200mil
	Multilayer	11.8mil-400mil	11.8mil-200mil
Twist & Warp	Single side	0.5%; 0.75% & 1.5%	0.5%; 0.75% & 1.5%
	Double side	0.5%; 0.75% & 1.5%	0.5%; 0.75% & 1.5%
	Multilayer	0.5%; 0.75%	0.5%; 0.75% & 1.5%
Hole size	Ratio	1:10	1:8
	Hole size tolerance	PTH: ±3mil; NPTH: ±2mil; Pressure PTH: ±2mil	PTH: ±3mil; NPTH: ±2mil; Pressure PTH: ±2mil
	Hole location tolerance	PTH: ±3mil NPTH: ±2mil	PTH: ±3mil NPTH: ±2mil
	Countersunk Hole size tolerance	PTH: ±3mil; NPTH: ±2mil;	PTH: ±4mil; NPTH: ±3mil;
	Mechanical drilling	6mil-240mil (Ratio1:8(min. dis between hole 10mil)	6mil-240mil (Ratio1:8(min. dis between hole 12mil)
	Laser drilling	3mil(0.075mm)	4mil(0.10mm)
Outline tolerance	Routing	±4mil(0.1mm)	±5mil(0.13mm)
	V-CUT	±3mil(0.08mm)	±4mil(0.10mm)
	Depth routing	±4mil(0.1mm)	±4mil(0.1mm)
	Beveling	±4mil(0.1mm)	±4mil(0.1mm)
	Punching	±2mil(0.05mm) & ±4mil(0.1mm)	±4mil(0.1mm)
	Laser cutting	±2mil(0.05mm)	±3mil(0.08mm) & ±4mil(0.1mm)
Board thickness tolerance	≤20mil(0.508mm)	±2mil(0.05mm)	±4mil(0.10mm) & ±5mil(0.13mm)
	20mil< L < 40mil	±3mil(0.10mm) & ±4mil(0.10mm)	±4mil(0.10mm) & ±5mil(0.13mm)
	40mil< L < 62mil	±3mil(0.10mm) & ±4mil(0.10mm)	±4mil(0.10mm) & ±5mil(0.13mm)
	≥62mil	±8%mm	±10%mm
Min. Line width/space(Finished size)	1/3oz(=12um)	Min. 2/2mil(0.05mm)	Min. 3/3mil(0.08mm)
	H/Hoz(=17.5um)	Min. 3/3mil(0.08mm)	Min. 3/3mil(0.08mm)
	1/1oz(=35um)	Min. 3/3.5mil(0.08mm/0.09mm)	Min. 4/4mil(0.10mm)
	2/2oz(=70um)	Min. 5/4.5mil(0.13mm/0.11mm)	Min. 6/5.5mil(0.15mm/0.14mm)
	3/3oz(=105um)	Min. 7/6mil(0.18mm/0.15mm)	Min. 8/6mil(0.20mm/0.15mm)
	4/4oz(=140um)	Min. 9/8.5mil(0.23mm/0.22mm)	Min. 10/9mil(0.254mm/0.23mm)
	5/5oz(=175um)	Min. 11/9mil(0.28mm/0.23mm)	Min. 12/10mil(0.305mm/0.254mm)
	6/6oz(=210um)	Min. 13/12.5mil(0.33mm/0.31mm)	Min. 14/12.5mil(0.36mm/0.31mm)
	7/7oz(=245um)	Min. 15.5/15mil(0.40mm/0.38mm)	Min. 16/15.5mil(0.41mm/0.40mm)
Dielectric layer thickness tolerance	≥8oz(=280um)	need Gerber to confirm	need Gerber to confirm
	Single sheet	±8%mm	±10%mm
	2 sheets or above	±10%mm	±10%mm
Controlled Impedance	Single(ohm)	±5% or ±8% or ±10%	±8% or ±10%
	Difference(ohm)	±8% or ±10%	±10%
	Diff embedded coplanar strips(ohm)	±8% or ±10%	±10%

	Diff offset coplanar strips(ohm)	±8% or ±10%	±10%
Controlled Impedance line width/space	Tolerance	±8%	±10%
Finished Line width space	Tolerance	±8% or Per IPC standard	±10% or Per IPC standard
BGA PAD	Distance	4mil(0.10mm)	5mil(0.13mm)
	Pad size	8mil(0.20mm)	10mil(0.254mm)
Finished thickness of Copper	Outer layer	1/3~15oz	1/3~12oz
	Inner layer	1/2~15oz	1/2~12oz
coverlay	Coverlay bridge/bam	5mil(0.13mm)	8mil(0.20mm)
	Coverlay PI thickness	0.5mil(12.5um);1mil(25um);2mil(50um);3mil(75um);4mil(100um),etc	0.5mil(12.5um);1mil(25um);2mil(50um);3mil(75um);4mil(100um),etc
	Coverlay Adhesive thickness	0.5mil(12.5um);1mil(25um);2mil(50um);3mil(75um);4mil(100um),etc	0.5mil(12.5um);1mil(25um);2mil(50um);3mil(75um);4mil(100um),etc
	Coverlay color	Black, Matt Black, White, Matt White, Yellow, Matt Green, etc	Black, Matt Black, White, Matt White, Yellow, Matt Green, etc
	Positional deviation	4mil(0.10mm)	5mil(0.13mm)
Soldermask	Soldermask bridge/bam	3mil(0.075mm)	4mil(0.10mm)
	soldermask thickness	≥0.4mil(10um)	≥0.4mil(10um)
	soldermask color	Green, Black, White, Blue, Yellow, Matt Green, Matt Black, Matt White, Red, etc	Green, Black, White, Blue, Yellow, Matt Green, Matt Black, Matt White, Red, etc
	Exposure accuracy	1mil(0.025mm)	1.5mil(0.038mm)
	Plugged via size	6mil-18mil(0.15mm-0.45mm)	6mil-18mil(0.15mm-0.45mm)
	Positional deviation	1.5mil(0.038mm)	2.5mil(0.064mm)
Silkscreen	Thickness	≥0.2mil(5um)	≥0.2mil(5um)
	Tolerance	±7mil(0.18mm)	±8mil(0.20mm)
	Color	Green, Black, White, Blue, Yellow, Red, etc	Green, Black, White, Blue, Yellow, Red, etc
Surface treatment	Not need	NA	NA
	Immersion Gold(ENIG) or ENEPIG	Au: 0.001mil-0.004mil; Ni:0.08mil~0.25mil; Pa:0.004mil-0.02mil	Au: 0.001mil-0.004mil; Ni:0.08mil~0.025mil; Pa:0.004mil-0.02mil
	Lead Free HASL	Tin: ≥0.12mil (min.)	Tin: ≥0.12mil (min.)
	HASL(Sn)	Tin: ≥0.12mil (min.)	Tin: ≥0.12mil (min.)
	OSP/Entek	0.008mil-0.03mil	0.008mil-0.03mil
	Immersion Tin	Tin: ≥0.032mil (min.)	Tin: ≥0.032mil (min.)
	Immersion Silver/Ag	Ag: 0.008mil-0.016mil	Ag: 0.008mil-0.012mil
	Gold plating	Au: 0.001mil~0.004mil; Ni:0.08mil~0.25mil	Au: 0.001mil~0.004mil; Ni:0.08mil~0.25mil
	Hard Gold	Au: 0.004mil~0.04mil; Ni:0.08mil~0.25mil	Au: 0.004mil~0.04mil; Ni:0.08mil~0.25mil
	Carbon Ink	Resistance value: 20-100ohms	Resistance value: 20-100ohms
	ENIG+Carbon	Au: 0.001-0.004mil; Ni: 0.08mil-0.25mil; Resistance value: 20-100ohms	Au: 0.001-0.004mil; Ni: 0.08mil-0.25mil; Resistance value: 20-100ohms
	ENIG+OSP/Hard Gold	Ni: 0.08mil-0.2mil Immersion gold: 0.001mil-0.004mil Plating gold: 0.003mil-0.06mil OSP: 0.008mil-0.025mil	Ni: 0.08mil-0.2mil Immersion gold: 0.001mil-0.004mil Plating gold: 0.003mil-0.06mil OSP: 0.008mil-0.025mil
	LF HASL+Hard Gold	Tin: ≥0.12mil (min.) Ni: 0.08mil-0.2mil Au: 0.003mil-0.06mil	Tin: ≥0.12mil (min.) Ni: 0.08mil-0.2mil Au: 0.003mil-0.06mil
	LF HASL+Carbon	Tin: ≥0.12mil (min.) Resistance value: 20-100ohms	Tin: ≥0.12mil (min.) Resistance value: 20-100ohms
Package	Vacuum moisture-proof beads	Yes	Yes
	Antistatic bag-proof beads	Yes	Yes
Checking and accepted standard	IPC-6012/IPC6013/IPC-300/IPC-A-600H Class II, etc		
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