

Material Variety Table:

Category	Material (Thickness)	Special
Conductor	Copper Foil(1/3OZ, 1/2OZ, 1OZ, 2OZ)	Copper Foil(4-7OZ)
	Constantan(20-25um)	
	INCONNEL 600(12-25um)	
	Silver ink	
	Carbon ink	
Dielectric Materials	PI(0.5mil, 1mil, 2mil) (Yellow, White, Black)	PI(3mil-10mil)
	PET(1mil, 2mil, 3mil, 4mil, 5mil)	
	FR4/FR4 for Rigid-Flex Circuit Board(0.05mm-1.6mm)	
Double-sides adhesive Tape	Solder Mask (Green, Yellow, Black)	
Stiffener	3M467, 3M468, 3M9077, TESA8853	
	PI, FR4, PET, steel , Aluminum	

Fabricate process Table-General capabilities

Content	Production Capabilities -Rigid Flex (W/ HDI)	
	Normal(±)	Special(±)
Max. layer	12	
Aspect ratio(Thickness/Via diameter)	<= 8:1	<= 10:1
Min. hole pad(4 layers)	>=0.1mm	
Min. hole pad(4-8 layers)	>=0.125mm	
Min. hole pad(>8 layers)	>=0.15mm	
Via to Rigid-Flex area	>=1.5mm	
Min. Blind diameter	φ0.075mm	>=1.0mm
BURIED & BLIND VIA Diameter/Depth	<= 1:1	φ0.05mm
BURIED & BLIND VIA type	2	<= 1.2:1
Min. hole for Epoxy filled	0.2mm	3
Min. hole for copper plated	0.15mm	

Notes: Details will be reviewed based on the Gerber data

Content	Production Capabilities -FPC signal acquisition line for battery pack apply	
	Normal(±)	Special(±)
Max. Length	1200mm	

Content	Production Capabilities -Big size FPC	
	Normal(±)	Special(±)
Max. Panel Size (Singled-sided) FPC	610mm×1200mm(Max. Exposure Size)	250mm×35mm(For the prototyping Only)
Max. Panel Size (Doubled-sided FPC)	610mm×1200mm(Max. Exposure Size)	250mm×35mm(For the prototyping Only)
Max. Panel Size(Single and double sides without PTH) for Self drying Ink + UV Light Curing	610mm×1650mm	
Max. Panel Size (Double-Sided, with PTH)	250mm x 2000mm	610mm x 910mm(Special process, may have slight crease)
Max. Panel Size (Multi-layer, with PTH, Surface treatment)	250mm x 2000mm	400*2000 mm*mm

Content	Production Capabilities	
	Normal(±)	Special(±)
Min.Circuit Spacing/Width (Singled-sided FPC)	0.08mm/0.08mm(Before Compensation) 0.05mm/0.05mm(After Compensation)	0.05mm/0.05mm (Circuits lines are short and only a few, can be)
Min.Circuit Spacing/Width (Doubled-sided FPC)	0.10mm/0.10mm(Before Compensation) 0.07mm/0.07mm(After Compensation)	0.06mm/0.07mm
Layers Capabilities	1-6 layers	12layers
FPC Thickness(Min.)	0.05mm	
Tolerance of positioning Accuracy	±0.1mm (4Mil)	
Impedance Tolerance	±10%	+/-7.5%
Resistance Tolerance	±10%	+/-7.5%

Material Cutting

Content	Production capabilities	
	Normal(±)	Special(±)
Max. Panel Size	250mm×450mm	250mm×roll
Min. Panel Size	250mm×150mm	
Machine cutting Tolerance	±1mm	
Manual Cutting Tolerance	±2mm	

Drilling

Content	Production Capabilities	
	Normal(±)	Special(±)
Min. Drilling Hole Size	φ0.15mm	φ0.10mm
Min. Laser Hole Size	φ0.075mm	φ0.05mm
Max. Drilling Hole size	φ 6.2mm	
Min. Hole Space	0.15mm	0.125mm
Hole size tolerance	±0.10 mm	NPTH:±0.05mm, PTH:0.075mm
Slot Hole	Slot length= 2 times of hole size	Slot length is 1.5 times of hole size
Min. blind via	φ0.1mm	φ0.07mm

Copper Plating

Content	Production Capabilities	
	Normal(±)	Special(±)
PTH	8-15um;20-30 um	30-70 um
Max. production Panel Size for copper plating	250mm×350mm	250mm×1860mm (S-shape)
Max.production Panel Size for immersion copper	250mm×350mm	250mm×1860mm(S-shape)
Metal clip side	10mm	8mm
Aspect Ratio(thickness/Via dia)	6:1	10:1
Min blind hole dia./depth for PTH	≤1: 1	≤1.2: 1'10:1

Etching-Resistant Ink

Content	Production capabilities	
	Normal(±)	Special(±)
Max. Panel Size for Silkscreen machine	600×700mm (Whole Panel)	630 X1650 mm(Stencil Printing)
Blue Ink Thickness	15-20um	10-40um

Dry Film

Content	Production Capabilities	
	normal(±)	Special(±)
Max. Dry Film Size	330mm×50m	500mm×50m
Dry Film Thickness	30um;40um;	20um;50um

Exposure

Content	Production Capabilities	
	normal(±)	Special(±)
Distance of Circuit to outline	≥0.15mm	≥0.10mm
Distance of Circuit to NPTH hole	≥0.15mm	
Min. distance of outer circuit to copper	≥0.15mm	≥0.10mm
Min. distance of inner circuit to copper	≥0.15mm	≥0.10mm
Tolerance of Layer to Layer Registration	0.2mm	0.10mm
Min. Square SM opening size	0.40mm×0.40mm	
Min. Round SM opening size	∅0.35mm	∅0.25mm
Min. SM-Dam width	0.20mm	0.12mm
Distance of SM opening to circuit	0.1mm	0.05mm
Tolerance of Finger Pitch(Finger width≤20mm)	±0.03 mm	
Tolerance of Finger Pitch(20≤Finger width<60mm)	±0.05 mm	
Tolerance of Finger Pitch(60≤Finger width<100mm)	±0.07 mm	±0.05 mm
Tolerance of Finger Pitch(Finger width>100mm)	±0.1 mm	
Max. Exposure panel size(One sheet)	250mm×350mm	600mm×1200mm
Min. circuit width	0.05mm	
Min. circuit space	0.05mm	
Min round hole pad size (without via)	∅0.3mm	
Min. unilateral hole pad width	0.125mm	0.10mm

Etching

Content	Production Capabilities				
	normal			Special	
Max. Panel width for etching	250mm×350mm			500mm×500m	
Base material Copper Thickness	Min. circuit Width	Min. circuit space	Etching Tolerance	Min.circuit Width	Min. circuit space
12 um	0.065 mm	0.075 mm	±0.02mm	0.05 mm	0.05 mm
18 um	0.065 mm	0.075 mm	±0.025 mm	0.06 mm	0.06 mm
25~35 um (8-17um copper plating for the 1/2 OZ panel)	0.075 mm	0.1 mm	±0.03 mm		
35 um	0.1 mm	0.125 mm	±0.03 mm		
38~48 um (25um copper plating for the 1/2 OZ panel)	0.125 mm	0.15 mm	±0.05 mm		
45~55 um (25um copper plating for the 1 OZ panel)	0.15 mm	0.2 mm	±0.05 mm		
irregular Materials Over 2 OZ	TBD				

Coverlayer Layup

Content	Special Requirements	
	Normal (±)	Special(±)
Cutting Tolerance for film cutting machine	±0.15 mm	
Manual alignment tolerance	±0.30 mm	±0.20 mm
Min. distance of CVL opening to circuit	0.15mm	0.13mm
Min. Round CVL Opening size	∅0.80mm	∅0.60mm
Min. Square CVL Opening size	0.80mm×0.80mm	0.70mm×0.70mm
Min. distance of CVL opening to pad	0.15mm	0.13mm
Min. Coverlayer Thickness	0.028mm	
Max. Coverlayer Thickness	0.10mm	
Distance of CVL Opening to Pad.	0.35 mm	0.3mm
Double access board, Pressure finger width	0.5 mm	Round pad pressure width 0.3mm

Lamination

Content	Production capabilities	
	Normal(±)	Special(±)
Max. production Size for Quick-lamination Machine	340×400 mm	250mm×1860mm (by section)
Max. production Size for Vacuum amination Machine	630×550mm	
Squeeze-out amount x. Silk screen printing	Quick-lamination Machine:0.15+/-0.05mm (6±2 mil)	

Content	Production Capabilities	
	Normal	Special
Legend Ink Color:	White,Black	
Solder Mask Ink Color:	Yellow,Green,Black	Blue,White,Red
Silver & Carbon Ink Color:	Silver Ink: Silver / Carbon Ink: Black	
Silk screen width	600mm ×700 mm	630mm×1650mm (UV curing)
Min. Legend Width:	0.125 mm	0.10 mm
Min. Legend Height:	0.80 mm	0.70 mm
Distance of legend to Pad	0.5 mm	0.25 mm
Alignment tolerance for legend	±0.30mm	±0.20 mm
Alignment tolerance for Silver ink	±0.50mm	±0.38 mm
Alignment tolerance for Solder Mask Ink	±0.50mm	±0.3 mm
Distance of silk screen to outline	0.3 mm	
Min. Distance of silkscreen to NPTH	0.3 mm	
Printing Ink Thickness	Legend:3-7um	
	Solder Mask:12-20um	
	Silver Ink(surface resistance per cusstomer's requirement),/Carbon Ink:7-13um	

Surface treatment Capabilities

Content	Production Capabilities		
	Plating Layer thickness :normal(±)	Special	Max. production Size: normal
Hard gold plating	Ni:2-9um;Au:0.1-0.3um	Ni:2-9um;Au:0.3-0.7um	250mm ×320 mm
Soft gold	Ni:2-9um;Au:0.03-0.09um		250mm ×320 mm
Immersio n Tin	3.0-7.0um		250mm ×400 mm
ENIG	Ni:2-6um;Au:0.03-0.10um		250mm ×400 mm
Immersio n Tin	0.3-0.8um		250mm ×400 mm
OSP			250mm ×400 mm

E-Testing

Content	Production Capabilities	
	Normal(±)	Special(±)
Max. Testing counts	4096 Counts	

Paste Stiffener and PSA Tolerance

Content	Production Capacity	
	Normal(±)	Special(±)
Manual alignment tolerance for STF and PSA paste	±0.50 mm	±0.30 mm
Min. Distance of between stiffener /Silver film/PSA to PAD	±0.50 mm	±0.30 mm
Tolerance of PSA and Stiffener Paste(without VPTH)	±0.50 mm	±0.30 mm
Tolerance of PSA and Steel Paste(both with holes)	±0.2 mm	
Tolerance of Dome Paste	±0.2 mm	
Min. PSA Processing Width:	2.0mm	1.0 mm (strip shape)
Min. PSA processing Size	13×2.0 mm (release paper won't peel off after punching and SMT)	

Profile

Content	Production Capabilities		
		Normal(±)	Special(±)
Normal soft tooling/Outline size	L <100mm	±0.20 mm	
	L ≥100mm	±0.2% of the length	
Etching soft tooling ,outline size Tolerance (outline length L)	L <100mm	±0.10 mm	
	L ≥100mm	±0.15% of the length	
Common steel tooling , outline size tolerance (Las outline length)	L <100mm	±0.10 mm	
	100≤L<150mm	±0.15 mm	
	L ≥150mm	±0.15% of the length	±0.12% of the length
Precision Steel ,outline size tolerance (L as outline length)	L <100mm Outline length<100mm	±0.05 mm	
	100≤L<150mm	±0.1 mm	
	L ≥150mm	±0.12% of the length	±0.1% of the length
Outline tolerance for FPC need Punching separately		±0.15% of the length(steel Tooling)	
Min. Punching Hole Diameter and Tolerance:		∅ 0.60 ±0.05 mm	
Circuit line to Board Edge Tolerance		±0.10 mm	±0.07 mm(slow speed wire cutting)
Outline by Laser		±0.05 mm	±0.03 mm
Outline by milling		±0.15mm	
Outline by carving		±0.025 mm	

SMT

Content	Production Capabilities	
	normal(±)	Special(±)
Min. Panel Size	50mmX50mm	
Max. Panel Size	460mmX510mm	
Rack Shelf/Bags	8mm, 12mm, 16mm, 24mm, 32mm, 44mm	
Rack Steps	120 steps	
Min. Component Size	∅0201	
Max. Component Size	38mmX38mm	
Min. Pad Pitch	0.35mm	0.3mm
Max. Component Height	25mm	
Glue fillet/Dispensing glue	Black, Transparent, Thermally Conductive glue, Pressure glue	

Packing

Content	Production capabilities	
	normal(±)	Special(±)
Tray	according to FPC size	
Low Viscosity Paper	300*210mm	
Zip Lock Bag	according to FPC size	
Vacuum Package	according to FPC size(small and large)	

Tooling

Content	Strip steel tool (mm)		Full-cut tool (mm)	Remark
	Normal soft tooling	Etching soft tooling	Steel Die mould	
Min. Hole	∅ 2	∅ 1	∅ 0.60	
Min. Slot	2.0*2.0	0.30*0.30	0.50*0.80	Length<15mm
Min. distance of hole edges	1.5	0.5	0.5	
Min. distance of hole edge to outline	1	0.5	0.5	
Min. distance of hole edge to slot edge	1	0.5	0.5	
Min. distance of Slot/hole to circuit	0.2	0.15	0.15	
Slot tolerance	±0.20	±0.10	±0.10(Advance:±0.05)	
Outline tolerance	±0.20	±0.10	±0.10(Advance:±0.05)	
Hole tolerance	±0.20	±0.10	±0.10(Advance:±0.05)	
Hole/Slot position tolerance	±0.20	±0.10	±0.10(Advance:±0.05)	
Max. Outline tooling size(based on punching machine)	250*430	250*430	250*430	
Notes: If combine to use soft and steel mould, Max panel size could be 250*1860mm*mm, But there are one or several fittings, tolerance is +/-0.5mm, will be subject in EQ stage.				
Min. inner corner radius	R0.5	R0.3	R0.15	
Min. outer corner radius	R0.5	R0.3	R0.15	
min. distance of locating hole center(∅ 2.5) to outline	3.5	3	2.5	