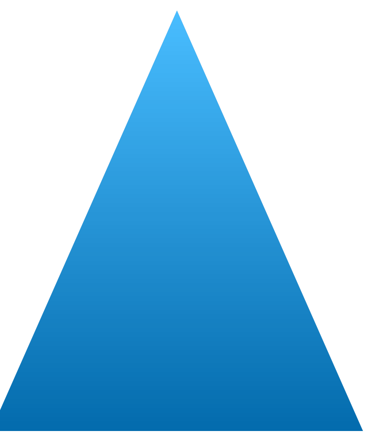
Q&D Multilayer PCB manufacture Process &Technology Capability

DATE： November 08, 2022

Base material

Rigid Board Item	Double & Multilayer PCB
General Material	Normal Tg:S1141, KB6160, KB6164, NP-140F, H140A
Lead-free Material	Mid Tg:VT-481, S1000H, H150, NP-155F High Tg: S1000-2M,IT180A, NP-175FB,EM827,370HR
Halogen Free Material	S1150G,S1170G,NPG-170N, NPG-151,EM-285
Low Loss DK&DF	NPG-170D,TU872LK
countersink	82° ,60° ,90° ,100° ,120° ,Other angles need to be customized
Solder Mask	TAIYO:PSR-2000,PSR-4000 RONG DA:H-9100 HONG TAI： HT-50 DG4； RONG DA： H-8100
Special Material	Cu-matrix、Aluminium base、Teflon PTFE、Ceramic materials,Dupont
Surface Finish	Lead Free HASL、ENIG、 OSP、 Immersion-Silver、Immersion-Tin、Gold Finger

Flexible+Rigid Item	Double & Multilayer PCB
flexible base material (inclue glue)	SF305: PI=0.5mil/1mil/2mil AD=13um/20um Cu=0.33oz/0.5oz/1oz
Flexible base material (exclue glue)	R-F775 PI=1mil/3mil Cu=0.33oz/0.5oz/1oz Dupont AP PI=1mil/2mil/3mil Cu=0.5oz/1oz ThinFlex(W/A): PI=1mil/2mil Cu=0.5oz/1oz
Coverlay	SF305(yelow):0515/0525/1025/2030 Taiflex(yellow):1025/1035
Adhesive	Taiflex： AD=10um/25um/4um SF315B:AD=13um/25um/40um
PI stiffener	Taiflex(MHK):PI=1mil/2mil/3mil/5mil/7mil/9mil
3M Tape	946/090/779/458/468
EMI	SF-PC600-U1 Protective layer:6um Glue:10um
No Flow PP	Ventec: VT-47NF EM-37B(L)



Base material

Process Capability&Technology Roadmap

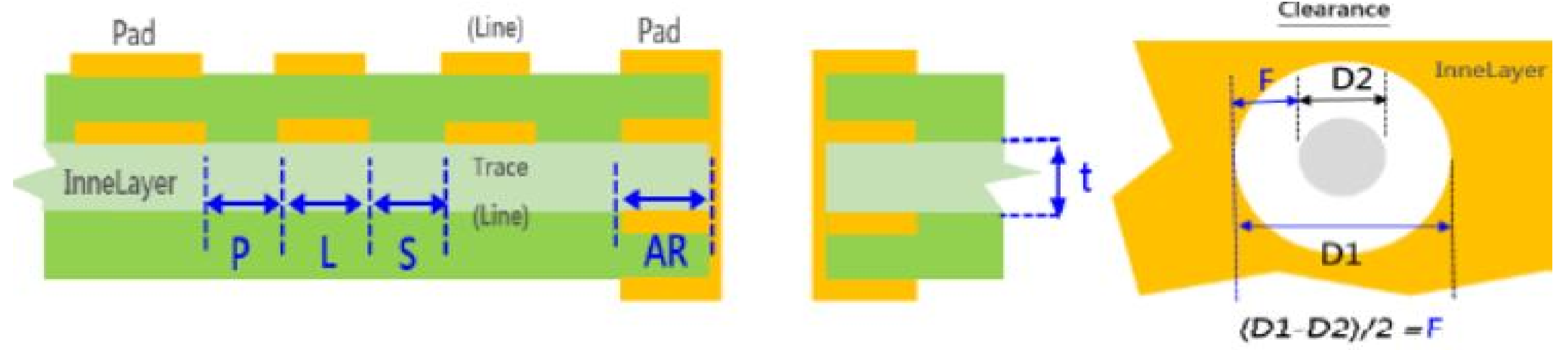
Special Technology

1.可生产板尺寸与板厚Available Working Panel Size & Board Thickness

项目 Capability Item	2022制程能力 Capability			
Layer	2	4	6	8-60
Finished Board Dimension (Max)	600*1300mm	596*900mm	590*900mm	590*800mm
Finished Board Dimension (Min)	70*50mm	70*50mm	70*50mm	70*50mm
Finished Board Thickness (Max)	6.5mm	6.5mm	6.5mm	6.5mm
Finished Board Thickness (Min)	0.3mm	0.3mm	0.3mm	0.3-1.2mm
Min. Inner Layer Core Thickness (excluding)	/	0.05mm	0.05mm	0.05mm
Finished Board Thickness Tolerance(Board Thickness>0.8mm)	±8%	±8%	±8%	±8%
Finished Board Thickness Tolerance(0.4mm≤Board Thickness≤0.8mm)	±0.076mm	±0.076mm	±0.076mm	±0.076mm
Board Warp & Twist	≤0.5%	≤0.5%	≤0.5%	≤0.5%

2、内层线路Inner-layer Circuit Formation

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
内层 Inner-layer Circuit Formation	最小基板厚度(t)Min. CCL Thickness	4 mil	3 mil
	线宽/间距(L/S) Min. Line / Space	2.5/ 3 mil	2.5/ 3.0 mil
	线至Pad最小间距(P) Min Line to Pad Space	3.5 mil	3 mil
	孔环(AR)Hole Annual Ring	4 mil	3 mil
	孔隔离环(F) (Hole Clearance)	7 mil	5.5 mil

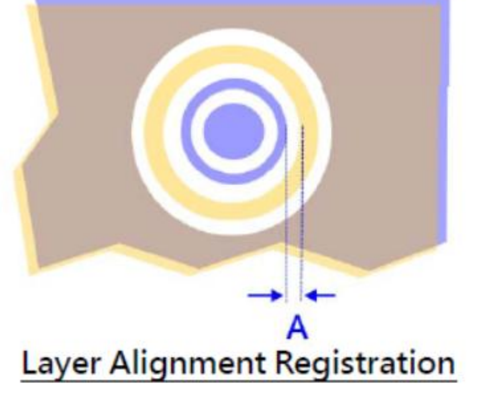


2、内层线路Inner-layer Circuit Formation

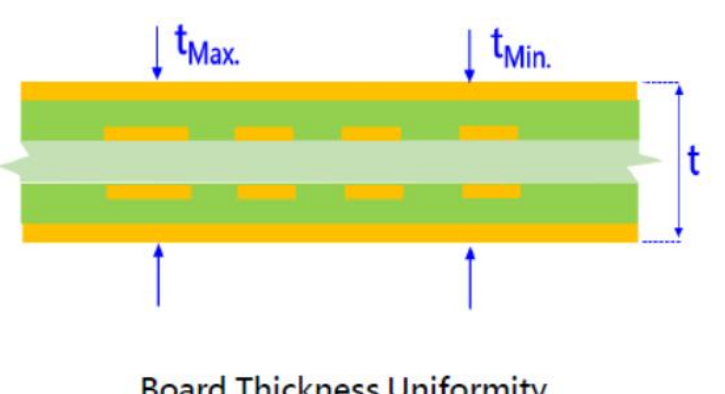
制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
内层线宽/线距 Inner-layer Line / Space)	H/HOZ	2.5mil/3mil	2.5mil/3mil
	1/1OZ	3.5mil/3.5mil	3mil/3mil
	2/2OZ	6mil/6mil	6mil/6mil
	3/3OZ	8mil/8mil	7.5mil/7.5mil
	4/4OZ	10mil/10mil	9mil/9mil
	6/6OZ	14mil/14mil	12mil/12mil

3、压合Lamination

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
压合 Lamination	层间偏移(A) Layer Alignment Registration	≦ 2.5mil	≦2 mil
	压合板厚均匀性 Board Thickness Uniformity tmax-tmin	≦ 4 mil	≦ 3 mil
	压合板厚公差 Board Thickness Tolerance	±10%	±8%
	可使用铜箔厚度 Copper Foil	1/3~6oz	1/3~12oz



Layer Alignment Registration



Board Thickness Uniformity

4、钻孔&电镀铜Drilling & Cu Plating

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
钻孔 Drilling	最小孔径 (Min. Hole Dimension of Drilling)	6 mil	6 mil
	PTH孔径公差 PTH Hole Dimension Tole	±3mil	±2mil
	NPTH孔径公差 NPTH Hole Dimension Tole	±2mil	±2mil
	孔间距 hole distance	12mil	10mil
	孔位精度 Hole Position Accuracy of Drilling	≦ 3 mil	≦ 2 mil
电镀铜 Cu Plating	纵横比 Aspec Ratio	10:1	12:1
	电镀铜厚均匀性 Plating Uniformity	R≦0.4mil	R≦0.3mil
	可电镀铜最小孔径 Mini. Hole Dimension of Plating	6 mil	6 mil

5、外层线路Outer-layer Circuit Formation

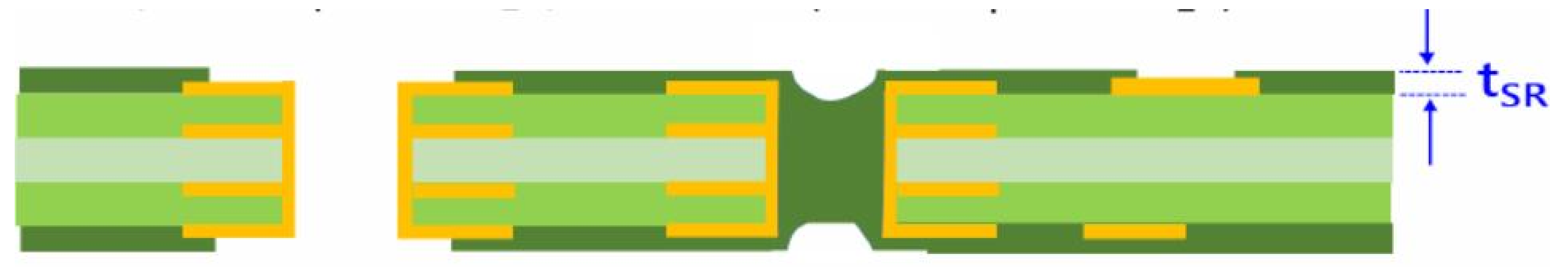
制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
外层 Outer-layer Circuit Formation	最小线宽/间距(L/S) Line / Space	3/3 mil	2.5/3 mil
	线至Pad间距 Line to Pad Space	≧4mil	≧ 3.5 mil
	pad至Pad间距 Pad to Pad Space	≧4mil	≧ 3.5 mil
	外层孔环 external Annular ring	3mil	0 mil
	线宽公差 Line Width Tolerance（Normal）	±20%	±10%
	阻抗线宽公差 Line Width Tolerance （Impedance ）	±8%	±8%

5、外层线路Outer-layer Circuit Formation

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
外层线宽/线距 Outer-layer Line / Space)	1/1OZ	3mil/3mil	2.5mil/3mil
	2/2OZ	7.8mil/7.8mil	6mil/6mil
	3/3OZ	8.5mil/8.5mil	8mil/8mil
	4/4OZ	12mil/12mil	10mil/10mil
	6/6OZ	14mil/14mil	12mil/12mil

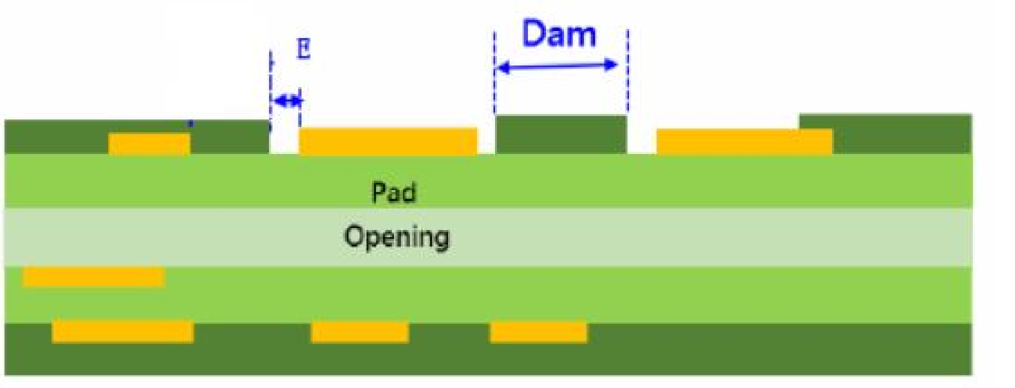
6、防焊Solder Resistance

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
防焊 Solder Resistance	防焊基材面油墨厚度 SR Thickness t	≧ 0.4mil	≧ 0.4mil
	防焊塞孔能力 SR Plug-in	8-20mil	6-20mil
	通孔显影能力 Developping Capability for Hole	13 .8mil	11. 8mil
	防焊开口至线路距离(D)SR Opening to Line (Pad) Min.Distance	2mil	1.5mil
	防焊开窗Ring	1.5mil	1.0mil



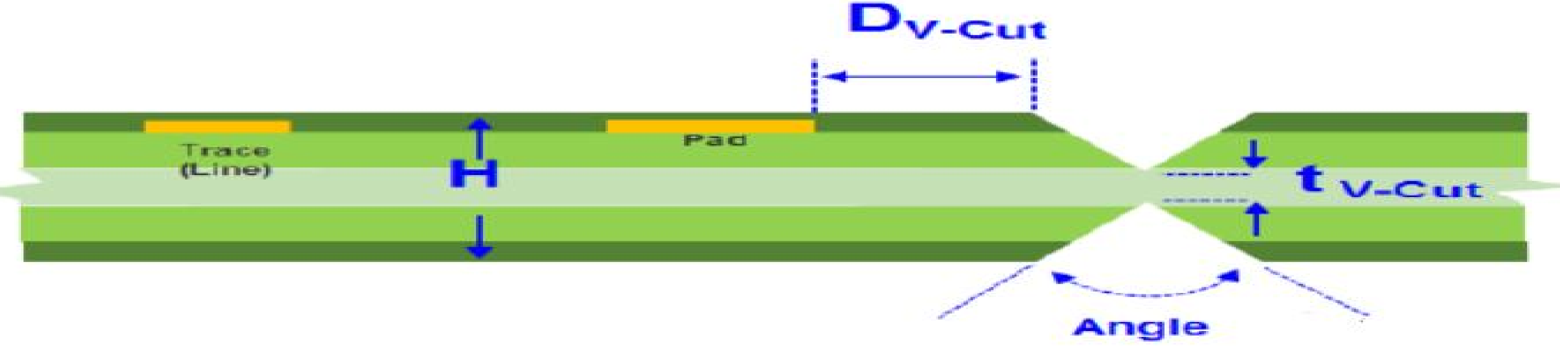
6、防焊Solder Resistance

制程 Process	项目 Capability Item		2021制程能力 Capability	2022制程能力 Capability
防焊 Solder Resistance	防焊隔焊最小宽度 (Dam)Min. Solder Dam Dsign (by SR Type)	白/黑	4mil	3.5mil
		绿/蓝/红/黄	3.5mil	3mil
	文字线宽(L) Min. Legend Width		≧ 5 mil	≧ 4 mil
	文字至PAD最小距离(P)Min. Space of Legend to PAD		≧ 8 mil	≧ 5 mil



7、成型Routing

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
成型Routing	成型尺寸公差 Dimension Tolerance	±4mil	±3mil
	Pad至板边最小距离 Min. Pad to Edge Distance	8mil	7mil
	Pad至板边公差 Pad to Edge Tolerance	±6mil	±5mil
	V-cut残厚 Remain thickness of V-cut	8mil（min）	8mil（min）
	V-CUT角度 V-CUT Angle Tolerance (30° ~60°)	±5°	±5°
	Pad至V-Cut边最小距离(DV-Cut) Min. Pad to V-Cut Distance	≧ 16 mil	≧ 16 mil



8、表面处理&其它Metal Finish & Others

制程 Process	项目 Capability Item	2021制程能力 Capability	2022制程能力 Capability
化学镍金 ENIG	镍厚 Ni Thickness	3~6um	3~6um
	金厚 Au Thickness	0.03~0.1um	0.03~0.1um
OSP	膜厚 OSP film thickness	0.2~0.5um	0.2~0.5um
化锡Immersion Tin	锡厚Immersion Tin Thickness	≧ 1um	≧ 1um
化银Immersion Silver	银厚Immersion Silver Thickness	0.15~0.4um	0.15~0.4um
无铅喷锡 Lead-free HASL	锡厚Tin Thickness	1~40um	1~40um
碳油Carbon oil	碳油Carbon oil Impedance	10~25Ω/sqcm	10~25Ω/sqcm
其它 Others	板弯翘 Board Warp & Twist	0.5%	0.5%
	FD-FD公差 Fidical Mark To Fidical Mark	±3mil	±2mil
	阻抗公差 Impendance Tolerance	±10%	±8%

Process Capability&Technology Roadmap

Item	2021	2022
FR-4+Ceramic Hybrid Rogers	Yes	Yes
Heavy copper PCB	Yes	Yes
Gold Finger	Yes	Yes
Via in Pad (POFV)	Yes	Yes
Selective Gold Plating	Yes	Yes
Embedded Capacitor PCB	Yes	Yes
Flexible PCB	Yes	Yes
Rigid-Flex PCB	Yes	Yes

Process Capability&Technology Roadmap

Item	2021	2022
Aluminum Substrate Single-sided	Yes	Yes
Aluminum Substrate　Double-sided	Yes	Yes
Blind Hole Board	Yes	Yes
Buried Hole Board	Yes	Yes
HDI （1+N+1）（2+N+2）（3+N+3）	Yes	Yes
HDI（4+N+4）	Yes	Yes
HDI（5+N+5）	Yes	Yes
High-frequency and high-speed board	Yes	Yes

Item	2021	2022
Layers (Max)	48L	60L
Board Thickness (Max)	6.5mm	6.5mm
Board Thickness (Min)	0.3mm	0.3mm
Core Thickness (Min) (excluding Cu Thickness)	0.076mm	0.05mm
PP Thickness (Min)	0.076mm	0.05mm

Item	Illustration	Technical Item	Technical Capability
Back Drilling		NP diameter(D)	≥ 0.45 mm
		PTH diameter (d)	≥ 0.15 mm
		(D—d) ÷ 2	≥ 0.10mm
		Min. Clearance (S)	0.175 mm
		Min Stub	0.20mm

Item	Illustration	Technical Item	Technical Capability
Back Drilling	14.1(um) 14.1(um)	Etching back drilling	Depth ≥10um

Special Technology

Item	Illuatration	Technical Item	Technical Capability
Heavy Copper PCB		Max. inner layer copper	6OZ
		Min. inner layer line width	12mil
		Min. inner layer annular ring	12mil
		Max. out layer copper	12OZ
		Min. out layer line width	10mil
		Min. out layer annular ring	1mil
		Min. Clearance	11mil
		Min. dielectric thickness	5.3mil

Item	Illustration	Technical Item	Technical Capability
Glod Finger with Different Length		Min. pcb width of finger tolerance	±75μm
		Min. finger width tolerance	±0.025mm
		finger length tolerance	0 - 0.15mm
		finger edge to board edge length tolerance	±0.1mm

Item	Illustration	Technical Item	Technical Capability
PTH Half-hole		Min. PTH diameter (D)	0.3mm
		Min. Hole edge to hole edge (H)	0.3mm
		Min. Annular ring (A)	0.15mm
		Min. Solder mask open (C)	0.05mm

Item	Illustration	Technical Item	Technical Capability
Selective Gold Plating		Max. nickle thickness	6µm
		Max. gold thickness	2.0µm

Special Technology

Item	Illustration	Technical Item	Technical Capability
Resin Plug-hole		Aspect ratio of Resin plugging hole	10:1
		Dimple	≤25um

Special Technology

Item	Illustration	Technical Item	Technical Capability
Aluminum Substrate Drilling		Buried hole	A-B≥0.6mm
		Through hole	B ≥0.2mm
		Distance from through hole to aluminum plate	C ≥0.3mm

Flexible-Rigid Stack-Up

layer	um	mil			
	20	0.79	Solder mask		Solder mask
L1	35	1.38	(15+plating)copper		(15+plating)copper
	200	7.87	SHENG YI S1000-2M		SHENG YI S1000-2M
L2	18	0.71	Copper		Copper
	150	5.91	1080*1 RC68% NO FLOW(EM-37B(L))	25um cvl PI(ITEQ IF-FC2525NHJ1)	1080*1 RC68% NO FLOW(EM-37B(L))
			1080*1 RC68% NO FLOW(EM-37B(L))	25um cvl AD(IDEQ)	1080*1 RC68% NO FLOW(EM-37B(L))
L3	18	0.71	Copper	18um copper	Copper
	75	2.96	Polymide	75um pi(Panasonic R-F775 32RB-M)	Polymide
L4	18	0.71	Copper	18um copper	Copper
				25um cvl AD(IDEQ)	
				25um cvl PI(ITEQ IF-FC2525NHJ1)	
	75	2.95	1080*1 RC68% NO FLOW(EM-37B(L))	air gap	1080*1 RC68% NO FLOW(EM-37B(L))
				25um cvl PI(ITEQ IF-FC2525NHJ1)	
				25um cvl AD(IDEQ)	
L5	18	0.71	Copper	18um copper	Copper
	75	2.95	Polymide	75um pi(Panasonic R-F775 18-75-18RA)	Polymide
L6	18	0.71	Copper	18um copper	Copper
	150	5.91	1080*1 RC68% NO FLOW(EM-37B(L))	25um cvl PI(ITEQ IF-FC2525NHJ1)	1080*1 RC68% NO FLOW(EM-37B(L))
			1080*1 RC68% NO FLOW(EM-37B(L))	25um cvl AD(IDEQ)	1080*1 RC68% NO FLOW(EM-37B(L))
L7	18	0.71	Copper	25um cvl PI(ITEQ IF-FC2525NHJ1)	Copper
	200	7.87	SHENG YI S1000-2M		SHENG YI S1000-2M
L8	35	1.38	(15+plating)copper		(15+plating)copper
	20	0.79	Solder mask		Solder mask
	1143	45.02			

Flex thickness: 0.4mm+/-0.05mm

Rigid thickness: 1.25mm+-/0.15mm

Thanks!