



QueenEMS HDI Micro-vias manufacturing Process & Technology Capability

RFQ: info@queenems.com

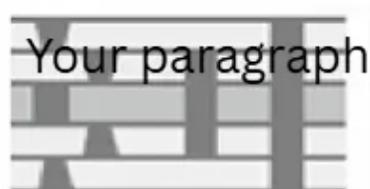
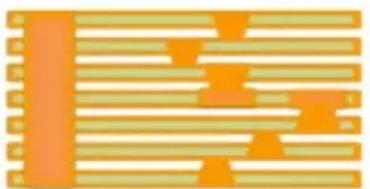
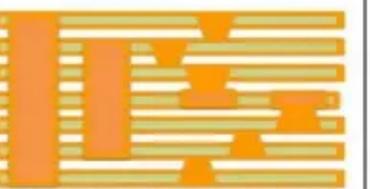
Web: www.queenems.com

QueenEMS Limited



Rigid Board Item	Double & Multilayer PCB
General Material	Normal Tg:S1141, KB6160, KB6164, NP-140F, H140A
Lead-free Material	MidTg:VT-481,901, S1000H, H150, NP-155F,M6 HighTg: S1000-2M,KB6167F 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, SR-500 G40, SR-500 LB01HF, SR-500HR30 RONG DA:H-9100, PSR-2000 CE800YE PSR4000-LEW3/LEW7S ; 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

1. HDI boards types

类型	1+N+1			
压合结构				
	A 型	B 型	C 型	D 型
类型	2+N+2			
压合结构				
	A 型	B 型	C 型	D 型
类型	3+N+3			
压合结构				
	A 型	B 型	C 型	D 型

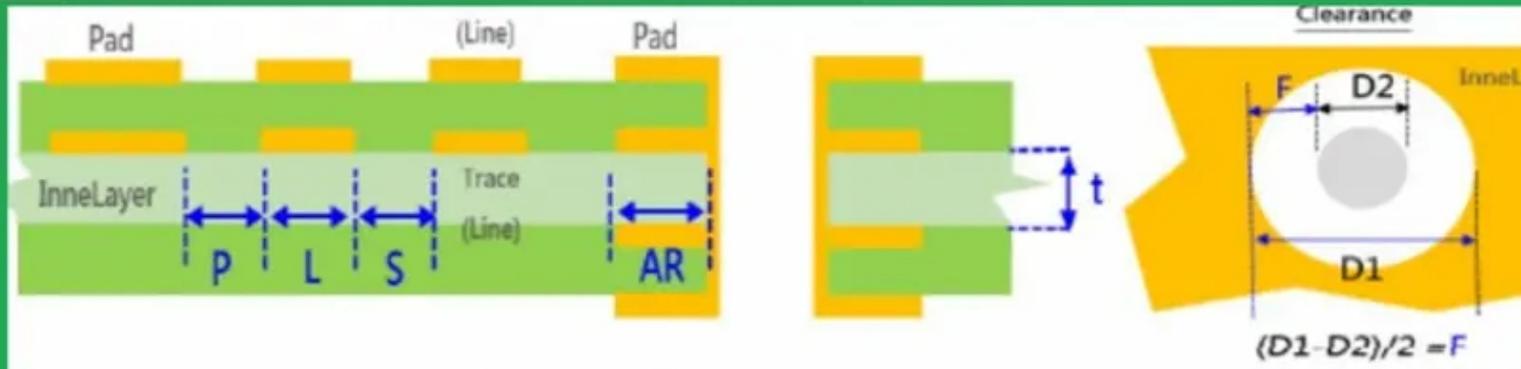
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Available Working Panel Size & Board Thickness 可生产板尺寸与板厚

项目	Capability Item	制程能力		
		Capability		
Layer		4	6	8-50
Finished Board Dimension(Max)		596*1200mm	590*900mm	590*800mm
Finished Board Dimension(Min)		70*50mm	70*50mm	70*50mm
Finished Board Thickness (Max)		6.5mm	6.5mm	6.5mm
Finished Board Thickness (Min)		0.3mm	0.4mm	0.6mm
Min.Inner Layer Core Thickness (excluding)		0.05mm	0.05mm	0.05mm
Finished Board Thickness Tolerance(Board Thickness > 0.8mm)		± 8%	± 8%	± 8%
Finished Board Thickness Tolerance(0.4mm ≤ Board Thickness ≤ 0.8mm)		± 0.076mm	± 0.076mm	± 0.076mm
Board Warp & Twist		≤ 0.5%	≤ 0.5%	≤ 0.5%

Inner-layer Circuit Formation 内层线路

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
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 mil
	线至Pad最小间距 (P) Min Line to Pad	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



Inner-layer Circuit Formation 内层线路

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
内层 线宽/线距 Inner-layer Line / Space)	H/HOZ	2.5mil/3mil	2.5mil/3mil
	1/10Z	3.5mil/3.5mil	3mil/3mil
	2/20Z	6mil/6mil	6mil/6mil
	3/30Z	8mil/8mil	7.5mil/7.5mil
	4/40Z	10mil/10mil	9mil/9mil
	6/60Z	14mil/14mil	12mil/12mil

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
钻孔 Drilling	最小孔径 (Min. Hole Dimension of Drilling)	6mil	6 mil
	PTH孔径公差 PTH Hole Dimension Tole	±3mil	±2mil
	Tole	±2mil	±2mil
	孔间距 hole distance	12mil	10mil
	孔位精度 Hole Position Accuracy of Drilling	3 mil	2 mil
Laser microvia hole and blind hole	Mechanical blind via	aspect ratio 0.5:1	aspect ratio 0.5:1
	Laser Microvias	aspect ratio 0.8:1	aspect ratio 0.8:1
	Mininum laser holesize	3mil	3mil

钻孔 & 电镀铜 Drilling & Cu Plating

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
Laser microvia hole and blind hole	Max laser hole size	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
	Laser method	1)DLD 2) Etch copper for large window before laser driling	1)DLD 2) Etch copper for large window before laser driling
电镀铜 Cu Plating	纵横比 Aspect Ratio	10:1	16:1 R 0.3mil
	电镀铜厚均匀性 Plating Uniformity	R 0.4mil	6 mil
		6 mil	

外层线路 Outer-layer Circuit Formation

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
外层 Outer-layer Circuit Formation	最小线宽 间距 / (L/S) Line / Space	3/3 mil	2.5/3 mil
	pad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 Line	3mil	0 mil
	线宽公差 Width Tolerance (Normal)	±20%	±10%
	阻抗线宽公差 (Impedance) Line Width Tolerance	±8%	±8%

外层线路 Outer-layer Circuit Formation

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
外层线宽/线距 Outer-layer Line / Space)	1/10Z	3mil/3mil	2.5mil/2.5mil
	2/20Z	7.8mil/7.8mil	6mil/6mil
	3/30Z	8.5mil/8.5mil	8mil/8mil
	4/40Z	12mil/12mil	10mil/10mil
	6/60Z	14mil/14mil	12mil/12mil

防焊 Solder Resistance



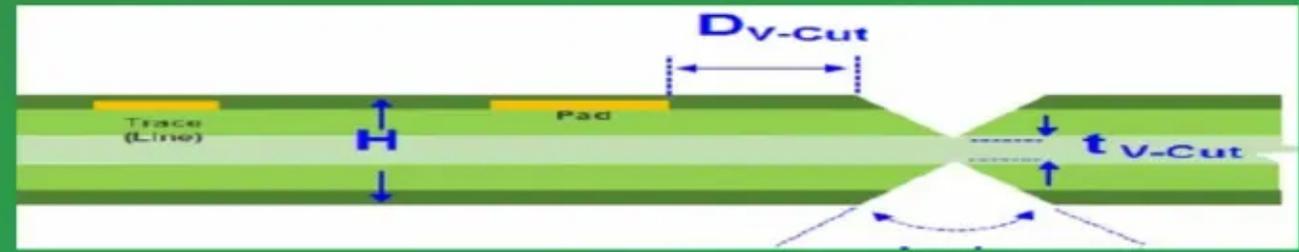
制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
防焊 Solder Resistance	防焊基材面油墨厚度 SR Thickness t	0.4mil	0.4mil
	防焊塞孔能力 SR Plug-in	8-20mil	6-20mil
	通孔叠能力 Developping Capability for Hole	13.8mil	11.8mil
	防焊至线路距离 (D) SR Opening to Line (Pad) Min.Distance	2mil	1.5mil
	防焊开窗Ring	1.5mil	1.0mil

防焊 Solder Resistance



制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
防焊 Solder Resistance	防焊隔焊最小宽度(Dam)Min. Solder Dam Dsign(by SR Type)	白 黑	4mil
		绿 蓝 红 黄 紫	3.5mil
	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

成型 Routing



制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
成型 Routing	成型尺寸公差 Dimension Tolerance	$\pm 4\text{mil}$	$\pm 3\text{mil}$
	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	$\pm 6\text{mil}$	$\pm 5\text{mil}$
	V-cut残厚 Remain thickness of V-cut	8mil (min)	8mil (min)
	V-CUT角度 V-CUT Angle Tolerance ($30^\circ \sim 60^\circ$)	$\pm 5^\circ$	$\pm 5^\circ$
	Pad至V-Cut边最小距离 (DV-Cut) Min. Pad to V-Cut Distance	16mil	16mil
	Control depth Drill	accuracy	$\pm 75\mu\text{m}$

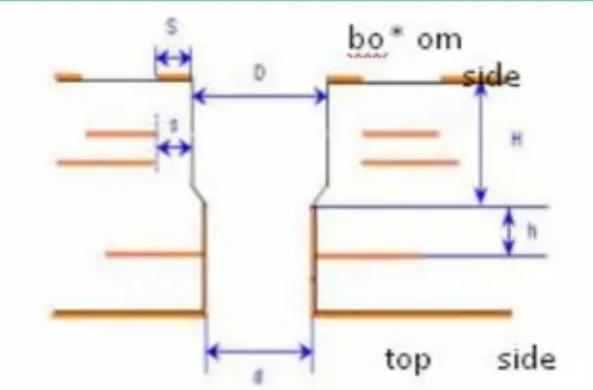
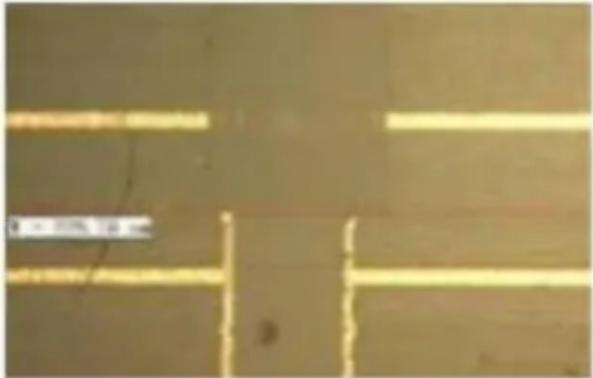
表面处理及其它

Metal Finish & Others

制程 Process	项目 Capability Item	Volume-Produce Capability 制程能力	Simple Production Capability 制程能力
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	10~25KΩ/sqcm
Others 其它	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 Impedance Tolerance	± 10%	± 8%

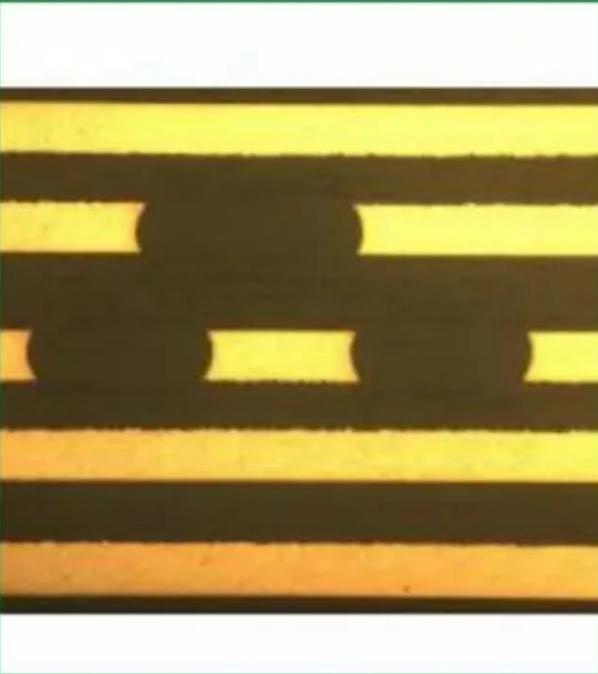
Item	2024	
FR-4+Ceramic Hybrid Rogers	Yes	
Heavy copper PCB	Yes	
Gold Finger	Yes	
Via in Pad (POFV)	Yes	
Selective Gold Plating	Yes	
Embedded PCB	Yes	
Blind / Buried Hole Board	Yes	
HDI (1+N+1 (2+N+2)... (5+N+5)	Yes	

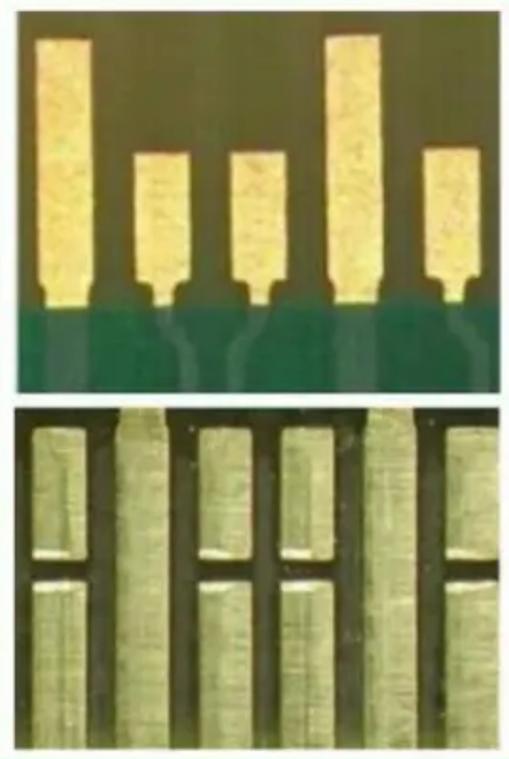
Item	2024	
Layers (Max)	50L	
Board Thickness (Max)	10.5mm	
Board Thickness (Min)	0.2mm	
Core Thickness (Min) (excluding Cu Thickness)	0.05mm	
PP Thickness (Min)	0.05mm	

Item	Illustration	Technical Item	Technical Capability
Back Drilling		NP diameter(D)	$\geq 0.45 \text{ mm}$
		PTH diameter (d)	$\geq 0.15 \text{ mm}$
		$(D - d) \div 2$	$\geq 0.10 \text{ mm}$
		Min. Clearance (S)	0.175 mm
			

Item	Illustration	Technical Item	Technical Capability
Back Drilling		Etching back drilling	Depth $\geq 10\mu\text{m}$

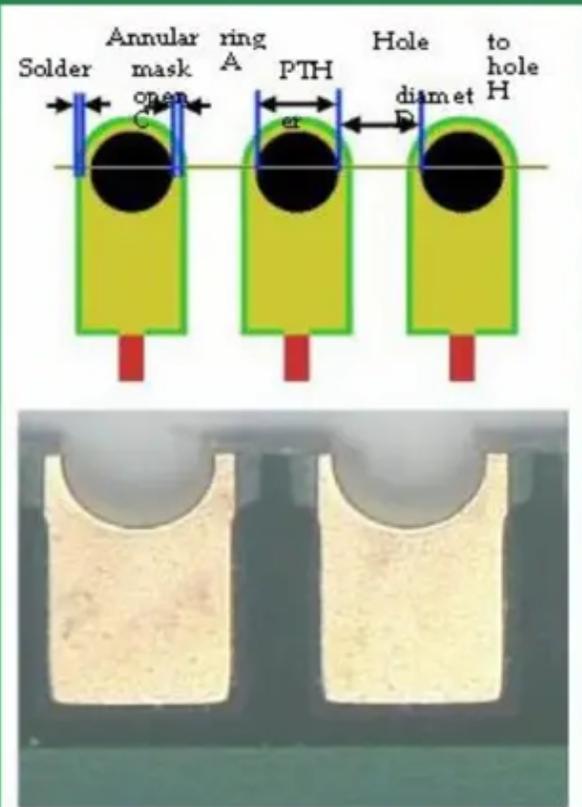
Special craftsmanship

Item	Illustration	Technical Item	Technical Capability
HeavyCopper PCB		Max. inner layer copper	200Z
		Min. inner layer line width	12mil
		Min. inner layer annular ring	12mil
		Max. out layer copper	120Z
		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
<p>Gold Finger with Different Length</p>		<p>Min. pcb width of finger tolerance</p>	<p>$\pm 75\mu\text{m}$</p>
		<p>Min. finger width tolerance</p>	<p>$\pm 0.025\text{mm}$</p>
		<p>finger length tolerance</p>	<p>0 -0.15mm</p>
		<p>finger edge to board edge length tolerance</p>	<p>$\pm 0.1\text{mm}$</p>

Item	Illustration	Technical Item	Technical Capability
Resin Plug-hole		Aspect ratio of Resin plugging hole	16:1
		Dimple	$\leq 25\mu\text{m}$

Item	Illustration	Technical Item	Technical Capability
Back Drill Resin Plug-hole		Aspect ratio of Resin plugging hole	10:1
		Dimple	/

Item	Illustration	Technical Item	
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

QueenEms Limited

Quick-Turn PCB Prototype & High Mix Volume

Manufacturer

RFQ: info@queenpcb.com Web: www.queenems.com

ISO 9001:2015/ISO 14001:2015/ ISO 45001:2018/

RoHS / REACH/ UL E518360