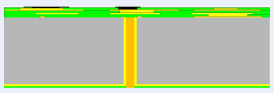
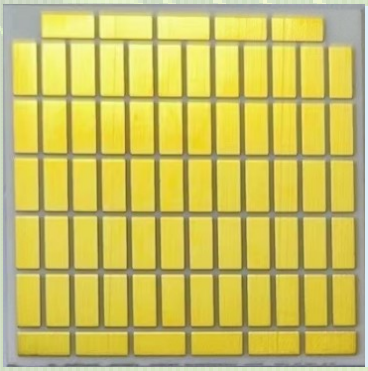
PRODUCT TYPES

DPC technology	Single-sided	
	Double-sided with PTH	
	Double- sided with via filling	
	Vertical box dam (Metal package)	
	Stepped box dam	

DBC&AMB technology	Single-sided	
	Double-sided	
	Double-sided with PTH	

Thick film technology	Standard technology	
	Carrying resistance	
	Integrated circuit	

Product introduction



TEC(Thermo-Electric Cooler）

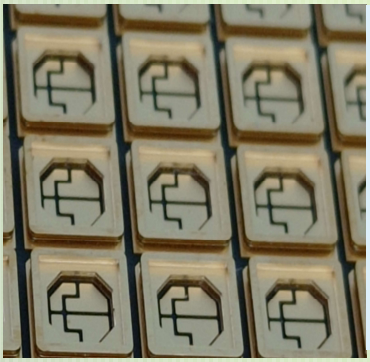
Min line space: 0.05mm

Min pad size: 0.25mm

Sensor module packaging substrate

Min half hole size: 0.25mm

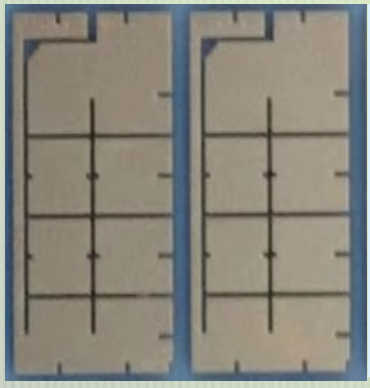
Min line width: 0.075mm



3D ceramic packaging substrate

Box dam height(Metal package thickness): 1500um

Min conductor space: 0.1mm

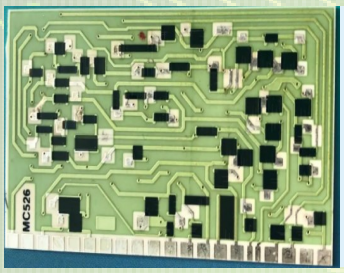


Flat LED ceramic bracket

PTH: Metal filling vias.

Min conductor space: 0.075mm.

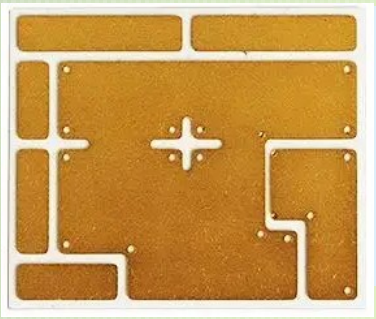
Product introduction



Thick film integrated circuit

Min conductor space: 0.18mm

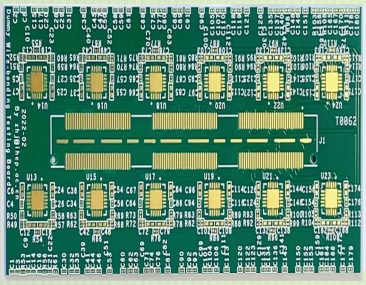
Resistance Accuracy:±1%



High power packaging carrier board

Copper thickness: 200-400um

Max board size: 140*190mm



Ceramic circuit board

Copper thickness: 35um

Min conductor space: 0.075mm

Laser Radar Integrated board

Partial copper thickness: 100um

Min conductor space: 0.1mm

Applications

Semiconductor Lighting

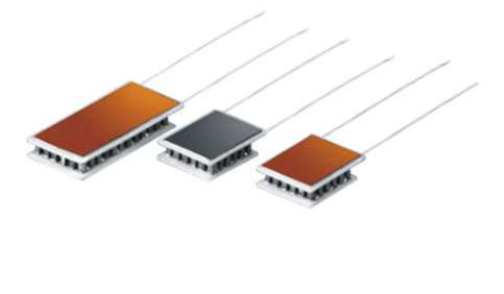
Mature hole filling technology.

Surface roughness Ra≤0.3um.

Thermoelectric Coolers

Capability of minisize design.

Thick copper and thin copper production.



Deep UV disinfection

Accurate dam alignment technology.

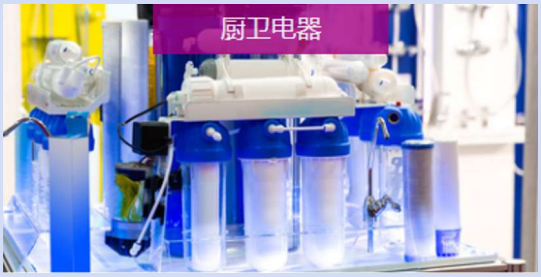
Super high dam height.

Industrial control

Stable and reliable quality.

Application of various ceramic materials.

High-power device.



Laser Radar

The most cutting-edge technology research and development capabilities.

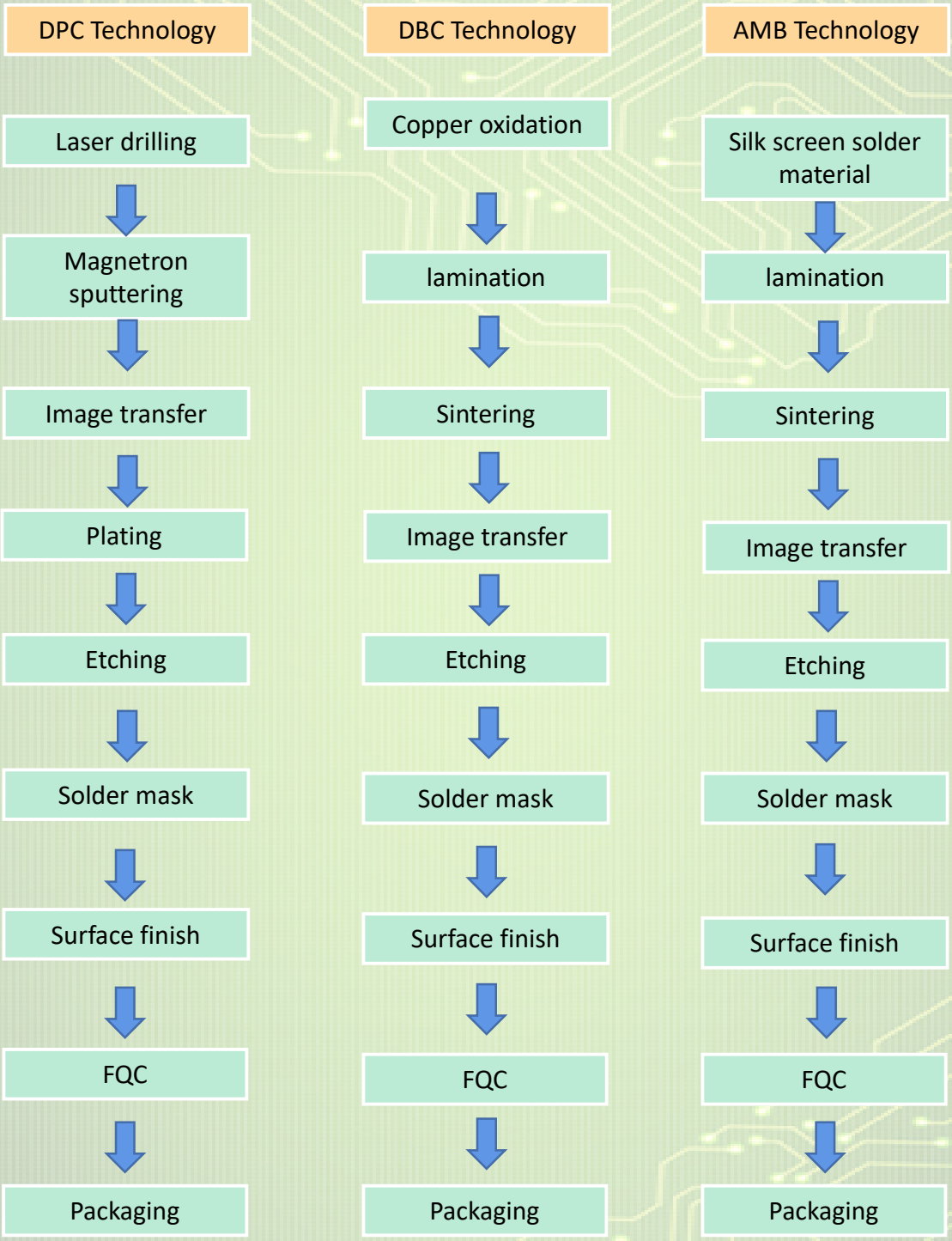
High reliability product quality control.

Sensor

Rich experince in vavious sensors.

Mature hole filling and half hole processes.

工艺流程 Technical process



Features of Ceramic boards

96 Al_2O_3 ceramic			
项目	**Item**	**Value**	**Unit**
颜色状态	Colour	白色 White	——
体积密度	Density	＞3.7	g/cm³
导热率	Thermal Conductivity	＞24	W/(m·K)，20℃
介电常数	Dielectric Constant	9–10	1MHz
介电损耗	Dielectric Loss	3	10^{-4}
击穿强度	Dielectric Strength	＞17	KV/mm
抗弯强度	Flexural Strength	＞350	MPa
翘曲度	Camber	＜3‰	Length‰
吸水率	Water absorption	0	%
体积电阻率	Volume resistivity	＞10^{14}	Ω .cm 20℃
热膨胀系数	Thermal expansivity	6.5–7.5	10^{-6}/℃,20–300℃
		6.5–8.0	10^{-6}/℃,300–800℃

Features of Ceramic boards

AlN ceramic			
项目	**Item**	**Value**	**Unit**
颜色状态	Colour	灰色 Gray	——
体积密度	Density	≥3.33	g/cm^3
导热率	Thermal Conductivity	≥170	W/(m·K)，20℃
介电常数	Dielectric Constant	8–10	1MHz
介电损耗	Dielectric Loss	3	10^{-4}
击穿强度	Dielectric Strength	＞17	KV/mm
抗弯强度	Flexural Strength	＞450	MPa
翘曲度	Camber	＜3‰	Length‰
吸水率	Water absorption	0	%
体积电阻率	Volume resistivity	＞10^{13}	Ω.cm，20℃
热膨胀系数	Thermal expansivity	2–3	10^{-6}/℃,20–300℃

Design rules

1. Material types

Item	Spec
Standard material	AL2O3(92%,95%,96%) AIN(thermal conductivity 170-200W)
Material need special control	AL2O3(99%) AIN(thermal conductivity 200-230W)
Material need evaluation	Zirconia,Beryllium oxide,silicon nitride,quartz glass

2. Material size

Item	Spec
Common material size	50mmX50mm 120mmX120mm 140mmX190mm
Special material size	Materials out of above range need evaluation.

3. Material thickness

Substrate type	Substrate thickness（mm)
AL2O3\AIN ceramic pcb	0.38mm, 0.5mm, 0.635mm, 0.8mm, 1.0mm,1.2mm,1.5mm, 1.8mm, 2.0mm,2.5mm, 3.0mm
Material need special control	AL2O3 0.125mm, 0.2mm, 0.25mm, 0.3mm AIN 0.25mm, 0.3mm
Material need evaluation	Materials out of above range need evaluation.

4. Laser drill

Board thickness(mm)	Standard(um)	In advance min hole size(um)
0.25 mm	80 um	60 um
0.3 mm	80 um	60 um
0.38 mm	100 um	80 um
0.5 mm	120 um	100 um
0.635 mm	180 um	150 um
0.8 mm	200 um	180 um
1.0 mm	250 um	200 um
1.2 mm	300 um	250 um
1.5 mm	380 um	300 um
2.0 mm	500 um	300 um
When board thickness >2.5mm, board thickness/hole size ≧4:1,or min hole size out of above range, evaluation is needed.		
Hole to hole space:0.25mm or larger.		

Design rules

5. Line with/Line space

Copper thickness	Standard	In advance
18(um)	60(um)	≥50(um)
30(um)	≥75(um)	≥60(um)
60(um)	≥100(um)	≥75(um)）
80(um)	120(um)	≥100(um)
Evaluation is needed when line width/space smaller than 50um, or line width/space smaller than above data.		

6. Solder mask and silkscreen

Item	Standard	In advance	Need evaluation
Solder mask color	Green, blue, yellow, red, light green, matte green, matte blue, matte black	transparent, gray,Neon green	Other colors
Solder mask dam	Green: 120um Other colors:150um	Green:100um Other colors:120um	Smaller width than left columns.
Silkscreen color	Black, white	Same as standard solder mask colors.	
Silkscreen height	≥800(um)	≥650(um)	Smaller height than left columns.

7. Surface finish and thickness

Standard surface finish and plating thickness	Special controlled surface finish and plating thickness
Hard gold plating(um) NI:3.05-5.08, AU:0.127-2 ENEPIG(um) NI:3.05-5.08, PD:0.025-0.2, AU:0.025-0.2 Immersion silver: 0.2-1 Immersion Tin: OSP: 0.2-0.6 HASL (LF)	ENIG:(um) NI:5.08-6.35, AU:0.2-0.76 Hard gold plating(um) NI:5.08-6.35, AU:2-4 ENEPIG(um) NI:5.08-6.35, PD:0.2-0.5, AU:0.2-0.76
Evaluation is needed when hard gold plating area bigger than 50%, silver plating and other plating thickness exceed above parameters.	

8. Outline process

Process	Tolerance	Max board size
Laser cutting	±0.1mm	130*140mm
Water Jet Cutting	±0.1mm	130*140mm
Evaluation is needed when tolerance exceed above parameters.		

Item	Requirement
Laser pre cutting(lineation)	Standard technique, board thickness 0.5mm, pre-cut depth15-30%.
	Special controlled, board thickness 0.38mm, pre-cut depth 10-15%.
	Evaluatoin is needed when board thickness less than 0.38mm, and laser pre cutting is required.

Item	Requirement
Laser cutting	Standard technique: board to board space ≥0.25mm Special controlled: board to board space ≥0.2mm
Water Jet Cutting	Depends on blade width
Others need evaluation.	

Design rules

9. Warpage control

Item	Requirement
Standard	0.5%≤Warpage≤0.7%
Special controlled	Warpage≤0.5%
Need evaluation	Others need evaluation.

10. Height of box dam

Item	Requirement
Standard	＜1000μm
Special controlled	＞1000μm≤1500μm
Need evaluation	Others need evaluation.

11. Surface copper thickness

Item	Requirement
Standard	＜80μm
Special controlled	＞80μm＜100μm (non-box dam/non metal package)
Need evaluation	Others need evaluation.

12. Board edge design

Item	Requirement
Cutting space	≥0.2mm
Copper to board edge space	≥0.127mm

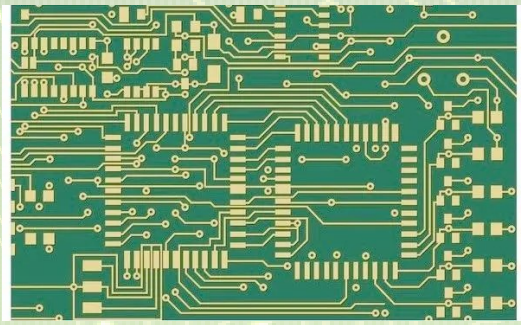
Capabilities

DPC Technology			
Process	**Item**		**MP capability**
Standard	Layers		1-2L
	Base material thickness		0.15-2.5mm
	Board thickness tolerance		±10%
	Warpage		≤0.7%
Laser drill	Min laser hole size		0.06mm
	Hole tolerance	PTH	±0.075mm
		NPTH	±0.025mm
Electroplating	aspect ratio	Through hole	4:1
	Electroplating filling via	Filling via size	0.07-0.25mm
Layout design	Max base copper	Outer layer	≤100um
	Line width/space (outer layer)	Copper thickness 10-35um	3/3mil
		Copper thickness 35-100um	4/4mil
	Line width tolerance	Line width≥10mil	±2mil
		Line width<10mil	±20%
	Pad size tolerance	Pad size≥12mil	≥±10%
	Box dam height	150um-1200um	±50um
Outline	Laser cutting or water jet cutting	Outline tolerance	≤±100um
		Max board size	130*180mm
Surface finish	Hard gold plating	Gold thickness	0.127-2um
		Nickel thickness	3.05-5.08um
	ENIG	Gold thickness	0.025-0.76um
		Nickel thickness	3.05-5.08um
	ENEPIG	Gold thickness	0.025-0.76um
		Palladium thickness	0.025-0.2um
		Nickel thickness	3.05-5.08um
	OSP	Film thickness	0.2-0.6um
	Immersion silver	Silver thickness	0.2-1um

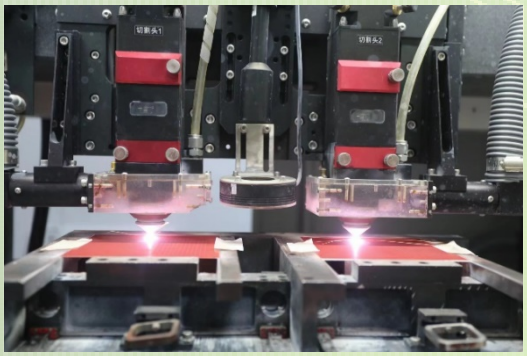
Capabilities

DBC&AMB technology			
Process	**Item**		**MP capability**
Standard	Layers		1-2L
	Base material thickness		0.38-1.0mm
	Board thickness tolerance		±10%
	Warpage		≤0.7%
Laser drill	Min laser hole size		0.15mm
	Hole tolerance	PTH	/
		NPTH	±0.1mm
	Aspect ratio	Through hole	4:1
Layout design	Max base copper thickness	Outer layer	127-400um
	Copper thickness	0.127mm	Space: 0.30mm
		0.20mm	Space: 0.35mm
		0.25mm	Space: 0.40mm
		0.30mm	Space: 0.45mm
		0.40mm	Space: 0.55mm
	Line width tolerance	Line width≥10mil	±2mil
		Line width<10mil	±20%
	Pad size tolerance	Pad size≥15mil	≥±10%
Outline process	Laser cutting or water jet cutting	Outline tolerance	≤±100um
		Max board size	130*180mm
Surface finish	ENIG	Gold thickness	0.025-0.76um
		Nickel thickness	3.05-5.08um
	ENEPIG	Gold thickness	0.025-0.76um
		Palladium thickness	0.025-0.2um
		Nickel thickness	3.05-5.08um
	OSP	Film thickness	0.2-0.6um
	Immersion silver	Silver thickness	0.2-1um

Equipments



Engineering

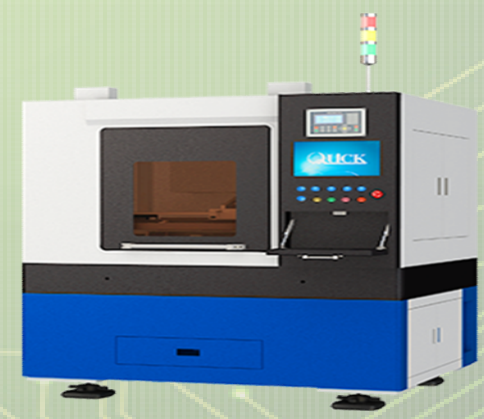


Laser drill

Vacuum Plating/coating

Full automatic electroplating

Laser direct imaging



Automatic cutting

Contact: Iris Wong
Email: sales02@mtlpcb.com
Phone: 15974188197