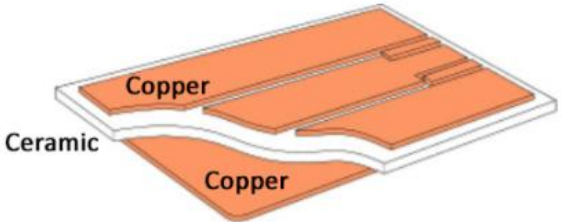
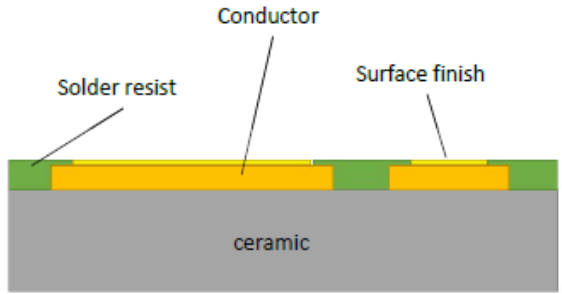



## CERAMIC MANUFACTURING PROCESS

Ceramic Manufacturing Process		Manufacturing Guidelines	Rules and Guidelines	
<b>Dimensions &amp; Thickness</b>  	<b>Panel Dimensions</b>		<b>Panel Dimensions (master)</b>	
	Standard metric	Special	115mm x 115mm Up to 170mm x 250mm	Panel Dimensions (usable) 105mm x 105mm Up to 160mm x 240mm
	Standard imperial	Special	4.5" x 4.5" Up to 6.5" x 9.5"	4.13" x 4.13" Up to 6.3" x 9.45"
	<b>Thickness</b>			
	Standard metric	Special	0.25/0.38/0.5/0.635/1.0/1.5mm Available upon request	Most Common/Widely used
	Standard imperial	Special	10 / 15 / 20 / 25 / 39 / 59 mil Available upon request	
<b>Metallisation &amp; Finish</b>				
	<b>Conductor</b>			
	Standard	Special	Copper – Cu Available upon request	Most Common/Widely Used
	Standard metric	Special	35µm - 140µm 18µm / 175µm – 350µm	Most Common/Widely Used 800µm possible with AMB
	Standard imperial	Special	1oz – 2oz 0.5oz / 5oz – 10oz	22oz possible with AMB
	<b>Surface finish</b>			
	Standard	Special	OSP, Immersion Silver, Immersion Tin, ENIG, ENEPIG and EPAG (no nickel)	Most Common/Widely Used EPAG (non-magnetic finish)
	<b>Solder resist</b>			
	Standard	Special	Green, Black, White, Transparent Other – please enquire	
<b>Solder resist specification</b>		Min SR width 0.2mm Standard (0.1mm Special) SR height: >15-20µm as standard		

**CERAMIC MANUFACTURING PROCESS**

	<b>Manufacturing Guidelines</b>		<b>Rules and Guidelines</b>
Solder resist specification (cont..)	Min SR-SR gap (SR bridge) standard 0.2mm (0.1mm Special)	Min SR-Copper (SR clearance) Standard 0.1mm	Solder Resist - 130°C is maximum long term exposure for any SR. As a minimum, all Solder Resists used pass IPC thermal stress test; 3 times, 288°, 10 seconds.
	Min SR-Board edge standard 0.2mm	Positional accuracy = +/- 0.05mm	
Silk screen / legend			
Standard	Black, white		
Layers			
Standard	Single, double sided		
<b>Spacing and Vias</b>			
	Min. line width / gap (a) and (b)		
	Standard	0.2mm / 8 mil	0.1mm accepted upon DFM approval
	Special	0.1mm / 4 mil	
	Line/pad to edge spacing (f)		
	Standard	0.2mm / 8 mil	
	Via specifications		
	Via diameter (c)	0.08mm / 3 mil	PTH not available for DBC or AMB
	Min. via spacing (b)	0.15mm / 6 mil	
	Via/hole to edge spacing	3 x via diameter	
	Min via diameter (c) (Aspect Ratio)	(Al2O3 thickness/5)	
Through hole metallisation			Plated through hole (PTH)
Annular ring specifications			
Min. annular ring diameter (d)	Via diameter + 0.20mm / 8 mil		Minimum 0.10mm either side of via
Min. annular ring spacing (e)	0.20mm / 8 mil		
Annular ring to edge spacing (g)	0.20mm / 8 mil		
Line to hole/via spacing (h)			
Standard	0.2mm / 8 mil	0.1mm accepted upon DFM approval	
Special	0.1mm / 4 mil		

## CERAMIC MANUFACTURING PROCESS

		Manufacturing Guidelines	Rules and Guidelines
	Dimensional tolerance		
	Standard	+/- 100µm / 4 mil	
	Thickness tolerance		
	Standard	+/- 10%	
	Hole tolerance		
	Standard	+/- 100µm / 4 mil	
	Pad to hole/via tolerance		
	Standard	+/- 100µm / 4 mil	