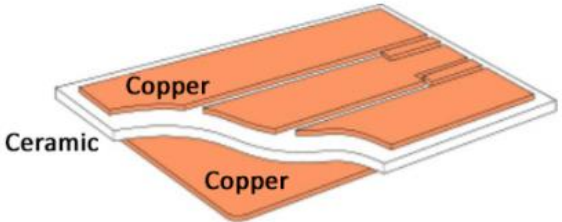
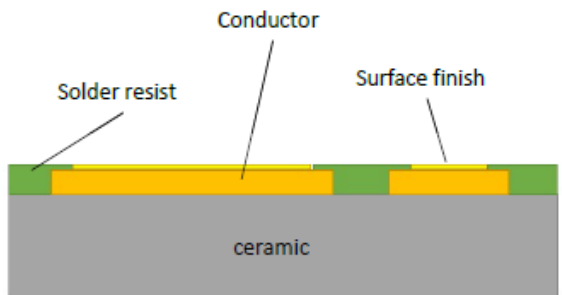



CERAMIC MANUFACTURING PROCESS

Ceramic Manufacturing Process		Manufacturing Guidelines	Rules and Guidelines
Dimensions & Thickness 	Panel Dimensions		Panel Dimensions (master)
	Standard	115mm x 115mm	105mm x 105mm
	Special	Up to 170mm x 250mm AlN: 220mmx220mm (T:1.0mm) Alumina: 150mmx200mm (T:0.63/1.0mm)	160mm x 240mm 210mm x 210mm 140mm x 190mm
	Thickness		
Standard	0.25/0.38/0.5/0.635/1.0/1.5mm	Most Common/Widely used	
Special	Available upon request Minimum: 0.1mm (sapphire/ZrO2) Maximum:3.0mm(alumina/ZrO2)		
Metallisation & Finish			
	Conductor		
	Standard	Copper – Cu	Most Common/Widely Used
	Special	Available upon request	
	Standard metric	35µm - 140µm	0.3/0.4/0.5/0.8mm copper
Special	18µm / 175µm – 350µm Maximum: 2000µm(DPC) Multi-thickness: from 5 to 2000um on one side	AMB	
Surface finish			
Standard	OSP, Immersion Silver, Immersion Tin, ENIG, ENEPIG and EPAG (no nickel)	Most Common/Widely Used	
Special		EPAG (non-magnetic finish)	

CERAMIC MANUFACTURING PROCESS

	Manufacturing Guidelines		Rules and Guidelines	
	Solder resist			
	Standard Special	Green, Black, White, Transparent Other – please enquire SR height: >15-20µm as std (150µm max) Min SR width 0.15mm Std (0.1mm Special) Min SR-SR gap (SR bridge) standard 0.15mm (0.1mm Special) Min SR-Copper (SR clearance) Standard 0.1mm (min 0.05mm) Min SR-Board edge standard 0.2mm Positional accuracy = +/- 0.05mm	Solder Resist - 130°C is max long term exposure for any SR. As a minimum, all Solder Resists used pass IPC thermal stress test; 3 times, 288°, 10 seconds.	
	Silk screen / legend			
	Standard	Black, white		
	Layers			
	Standard	Single, double sided		
Spacing and Vias	Min. line width / gap (a) and (b)			
	Standard Special	0.1mm 0.05mm	0.1mm accepted upon DFM approval	
	Line/pad to edge spacing (f)			
	Standard	0.1mm (laser) 0mm (diamond blade cutting)		
	Via specifications			
	Via diameter (c) Min. via spacing (b) Via/hole to edge spacing Min via diameter (c) (Aspect Ratio) Through hole metallisation	0.08mm 0.15mm 3 x via diameter (Al2O3 thickness/6) PTH holes must be same weight as track copper		PTH not available for DBC or AMB

CERAMIC MANUFACTURING PROCESS

	Manufacturing Guidelines		Rules and Guidelines
	Annular ring specifications		
	Min. annular ring diameter (d)	Via diameter + 0.20mm	Minimum 0.10mm either side of via
	Min. annular ring spacing (e)	0.20mm	
	Annular ring to edge spacing (g)	0.20mm	
	Line to hole/via spacing (h)		
	Standard	0.2mm	0.1mm accepted upon DFM approval
	Special	0.1mm	
Tolerance 	Dimensional tolerance		
	Standard	+/- 100µm (laser) +/- 60µm (diamond blade)	
	Thickness tolerance		
	Standard	+/- 10%	
	Hole tolerance		
	Standard	+/- 100µm	
	Pad to hole/via tolerance		
	Standard	+/- 100µm	