


**BOSCO Printed Circuits (Pty Ltd)****Manufacturing Capabilities**

<b>Base Laminate Materials</b> Standards: IPC4101/21: Flammability UL 94 V-0 RoHS Compliant   (Data Sheets for Aluminium Substrate and FR-4 Base Materials are available on our Download Page on our website: <a href="http://www.bosco.co.za">www.bosco.co.za</a> )	<b>Aluminium Substrate Pcb's (5052 Alu Alloy)</b>				
	<b>Thickness</b>	<b>Di-Electric Thickness</b>	<b>Finished Copper (Cu) Thickness</b>	<b>Thermal Conductivity W/m.K</b>	
	1.5mm	100 µm	35/00	1.5 (± 0.2W/m*k)	
	<b>FR - 4 Epoxy Glass Laminate</b>				
	<b>Thickness</b>	<b>Copper (Cu) Thickness</b>			<b>Tg °C</b>
	0.8mm	Base 35/00	Base 17/17	~	135 °C (±5)
	Finished Cu Thickness	35/00	> 35/35	~	
	1.0mm	Base 35/00	Base 17/17	* Base 70/70	135 °C (±5)
	Finished Cu Thickness	35/00	> 35/35	> 90/90	
	1.2mm	Base 35/00	Base 17/17	~	135 °C (±5)
	Finished Cu Thickness	35/00	> 35/35	~	
	* 1.55mm	Base 35/00	Base 17/17	~	135 °C (±5)
	Finished Cu Thickness	35/00	> 35/35	~	
1.55mm	Base 70/00	70/70	~	135 °C (±5)	
Finished Cu Thickness	70/70	> 90/90	~		
* 2.4mm	Base 35/35	~	~	135 °C (±5)	
Finished Cu Thickness	> 55/55	~	~		
* 3.2mm	Base 35/35	~	~	135 °C (±5)	
Finished Cu Thickness	> 55/55	~	~		
<b>Note:</b> Laminate Thickness Includes Copper Cladding.					
D/S THP Pcb's: Base Copper will be Electroplated with an additional > 20 microns of copper each side.					
For Pcb's with HAL Surface Finish - add 6-20 microns Tin on each side.					
* Subject to material stocks on hand					
Maximum Pcb Size	Maximum Pcb Size			450 x 540mm	
	Maximum Pcb Size for Edge Connector Side			340mm	
	Maximum Pcb Size for Bare Board Test			320 x 410mm	
Minimum Finished Hole Diameter	0.4mm	For PTH - Up to 1.6mm max material thickness			
	0.3mm	<i>For PTH - Up to 1.6mm max material thickness BUT subject to prior consultation with the Technical Director &amp; BBT (Bare Board Test / Electrical Test is Mandatory)</i>			
	0.6mm	PTH - Material thickness > 2.0mm			
	0.5mm	Non-PTH - Up to 3.2mm max material thickness			
Tolerance of Finished Hole Diameters	- 0.00mm : + 0.05mm	THP Holes : 0.4 - 1.5mm Diameter			
	-0.00 mm : + 0.1mm	THP Holes : > 1.5mm Diameter			
	±0.05mm	Non-THP Holes : 0.5 - 1.6mm Diameter			
	±0.05mm	Non-THP Holes : > 1.6mm Diameter			
	±0.15mm	Routed Holes > 6.0mm			

Minimum Annular Ring  (i.e. by Pattern Registration)	0.08mm	PTH Hole			
	0.15mm	Non-PTH Hole			
	0.3mm	PTH Hole for 70 µm Copper Thickness			
	0.3mm	Non-PTH Hole for 70 µm Copper Thickness			
Minimum Conductor (Track) <b>Widths and Spacing</b> for THP ( <b>Through Hole Plated Pcb's</b> )	Base Cu Thickness	Plated Cu Thickness	Finished Cu Thickness	Minimum Conductor (Trace) <b>Width</b>	Minimum Conductor (Trace) <b>Space</b>
	17 µm	20 µm	37 µm	* 0.15mm (6 Mil)	* 0.15mm (6 Mil)
	17 µm	20 µm	37 µm	0.2mm (8 Mil) Preferred	0.2mm (8 Mil) Preferred
	35 µm	20 µm	55 µm	* 0.15mm (6 Mil)	* 0.15mm (6 Mil)
	70 µm	20 µm	90 µm	0.2mm (8 Mil)	0.2mm (8 Mil)
* Subject to prior consultation & BBT (Bare Board Test / Electrical Test is Mandatory)					
Minimum Conductor (Track) <b>Widths and Spacing</b> for S/S ( <b>Single Sided Pcb's</b> )	Base Cu Thickness	Plated Cu Thickness	Finished Cu Thickness	Minimum Conductor (Trace) <b>Width</b>	Minimum Conductor (Trace) <b>Space</b>
	35 µm	~	35 µm	* 0.15mm (6 Mil)	0.15mm (6 Mil)
	35 µm	~	35 µm	0.2mm (8 Mil) Preferred	0.2mm (8 Mil) Preferred
	70 µm	~	70 µm	0.25mm (10 Mil)	0.25mm (10 Mil)
* Subject to prior consultation & BBT (Bare Board Test / Electrical Test is Mandatory)					
Land (Pad) Size <b>by Design</b>	Minimum Land (Pad) Size: <b>Component Hole Diameter</b> +0.4mm (i.e. Annular Ring 0.2mm / 10 Mil)				
	Minimum Via Land (Pad) Size: <b>Via Hole Diameter</b> +0.3mm (i.e. Annular Ring 0.15mm / 6 Mil)				
Landless Hole to Conductor Spacing	0.2mm (8 Mil)	Preferred			
	0.175mm (7 Mil)	Bare Board Test / Electrical Test is Mandatory			
Minimum Distance of <b>ANY</b> Feature from Edges of the Routed Pcb including the Pcb Edges supplied on V-Scored Panels	0.8 - 3.2mm Thickness Material		0.3mm	Routed	
	0.8 - 1.0mm Thickness Material		0.3mm	V-Scored	
	1.2 - 1.6mm Thickness Material		0.4mm	V-Scored	
	2.4 & 3.2mm Thickness Material		0.6mm	V-Scored	
Minimum Distance between Hole Walls	0.3mm [12 Mil]				
Minimum Distance between Holes and Pcb Edge / Panel Edge / Cut-outs (Excluding Edge Connectors)	1.0mm (0.3mm subject to Consultation with the Technical Director)				
Minimum Slot Width	1.0mm (0.8mm subject to Consultation with the Technical Director)				
Minimum Radius on internal Cut-outs	1.2mm (0.5mm Subject to Consultation with the Technical Director)				
Routing Diameter	2.4mm Standard				
Routing Tolerance	±0.1mm This applies to internal cutouts as well as for the CNC Routed Pcb Profile				

Plating Thickness	Pattern Plated & THP Copper	20 µm Minimum (25µm Normal)	
	Gold over Nickel Edge Connector	0.8 µm Minimum (1.0 µm Normal)	
	Nickel (for Edge Connector)	2.5 µm	
Surface Finishes	Solder Hot Air Level (HAL - Lead Free)	6 - 20µ	± 6 µm Minimum
Solder Resist (Photo-Imagable)	Curtain Coat	Green	
	Screen Print Coat	Blue, Red, White, Black & Yellow	
	Minimum Resist Thicknes	10 µm (Measured at Conductor Knee)	
Minumum Resist Clearance around Lands / Pads	0.1mm	Min. Solder Dam	0.2mm
Notation Ink (Legend, Ident)	Colours	White, Black	
	Barcode & Number Serialization	Offered for White Only	
Conductive Carbon	Used for Keypads and other Carbon Contact purposes		
	Surface Resistance	< 35 ohm / Square	
	Loop Resistance	< 75 ohm	
Temporary Solder Resist	Min. Thickness	15 µ	
	(Peelable Blue Mask)	Note: Maximum Hole Diameter for Hole Tenting is 1.10mm	
Electrical Bare Board Testing (BBT)	Minimum Pitch	0.3mm (12 Mil) (By Flying Probe : 0.15mm)	
	Test Voltage	10 Volts	
	Isolation	2 Mohm	
V-Scoring  (See our V-Score Specification: available on our Download Page on our website: <a href="http://www.bosco.co.za">www.bosco.co.za</a> )	Web Thickness	0.3mm	Min 0.27mm : Max 0.35mm
	V-Score Angle	30°	
	Nominal Breaking Point Tolerance (on each side of the Pcb)	0.1 - 0.15mm	See our V-Score Specification VS001 Rev 1 2016
Quality	ISO 9001 : 2008 ANSI/IPC A 600 (ANSI: American National Standards Institute) (IPC: Institute for Interconnecting and Packaging Electronic Circuits)		
RoHS Compliance	All Pcb's manufactured and Supplied by Bosco are RoHS Compliant		

**Please consult with our Technical Director for any other special requirements or requests.**

**Non Standard Base Materials that are not available from Bosco but are available from our offshore Pcb Manufacturer**

Laminates	Unit	Bosco Standard	Non-Standard - Available Offshore Only
<b>FR-4 Base Material:</b>			
Available Thicknesses S/S & D/S	mm	0.8 ( $\pm 0.1$ ) ; 1.0 ( $\pm 0.13$ ) ; 1.2 ( $\pm 0.13$ ) ; 1.55 ( $\pm 0.13$ ) ; 2.4 ( $\pm 0.23$ ) ; 3.2 ( $\pm 0.23$ )	0.35 ( $\pm 0.05$ )
Available Finished Copper Thickness	$\mu\text{m}$	35 ; 70 ; 90	105
Glass Transition Temperature - Tg	$^{\circ}\text{C}$	135 ( $\pm 5$ )	170
<b>Aluminium Substrate Base Material:</b>			
Available Thicknesses S/S	mm	1.5 ( $\pm 0.13$ )	1.0 ( $\pm 0.13$ ) ; 2.0 ( $\pm 0.18$ )
Available Thicknesses D/S ( <b>Offshore Only</b> )	mm	~	0.8 ( $\pm 0.1$ ) ; 1.0 ( $\pm 0.13$ ) ; 1.5 ( $\pm 0.13$ ) ; 2.0 ( $\pm 0.18$ )
Available Finished Copper Thicknesses	$\mu\text{m}$	35	70
Dielectric Thickness	$\mu\text{m}$	100	150
Glass Transition Temperature - Tg	$^{\circ}\text{C}$	$\geq 110$	$\geq 110$
THERMAL Conductivity - W/m*K	W/m*K	1.5 ( $\pm 0.2$ W/m*K)	2.0 ; 3.0 ( $\pm 0.3$ W/m*K)

