

Calluna FPC Limited

Supplier Technology Road Map

Version 1 01-Feb-17

Description of Characteristic

Flexible & Flex Rigid Multilayer

Approvals;

	Production	High Tech	Advanced
ISO9001	Yes	Yes	Yes
QS9000			
ISO/TS16949	Yes	Yes	Yes
ISO14000	Yes	Yes	Yes
ISO13485	Yes	Yes	Yes
Underwriters Laboratories	Yes	Yes	
OHSAS18001			

Product;

	Production	High Tech	Advanced
Single and Double Sided Flexible Printed Circuits (FPC's)	Yes		
Flexible Printed Circuits with Air Gap	Yes		
Flexi-Rigid Printed Circuits	Yes		
Multilayer Flexi-Rigid Printed Circuits	8 layers	12 layers	16 layers
Single and Double Sided Reel to Reel FPC's			

Description of Characteristic

Flexible Circuits

Production High Tech Advanced

Maximum Panel Size;

600 x 500mm (24 x 20 inch)	Yes		
450 x 300mm (18 x 12 inch)		Yes	Yes
Reel Spool Width; 35mm			
Reel Spool Width; 48mm			
Reel Spool Width; 70mm			

Materials;

FR4 TG130, Copper Clad with foils down to 12um	Yes		
FR4 TG150, Copper Clad with foils down to 12um	Yes		
FR4 TG180, Copper Clad with foils down to 12um	Yes		
FR4 TG200, Copper Clad with foils down to 12um			Yes
Polyimide Glass, Copper Clad with foils down to 12um			Yes
Polyimide (PI) substrate with foils down to 18um	Yes	Yes	Yes
Polyimide (PI) substrate with foils down to 12um	Yes	Yes	Yes
Polyimide (PI) substrate with foils down to 8um		Yes	Yes
Polyester (PET) substrate with foils down to 18um	Yes		
Polyester (Polyester Napthalate (PEN) substrate with foils down to 18um	Yes		

Description of Characteristic**Flexible Circuits**

Production	High Tech	Advanced
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Process Capability

Minimum Track and Gap	75um	50um	25um
Minimum Hole Size; CNC Drill	0.30mm		0.20mm
Minimum Hole Size; Laser Drill			
Blind via holes	Yes	Yes	Yes
Buried via holes	Yes	Yes	Yes
Profile; CNC	+/- 0.10mm	+/- 0.10mm	+/- 0.10mm
Profile; Steel Rule Die (FPC)	+/- 0.50mm	+/- 0.50mm	+/- 0.50mm
Profile; Hard Tool - Wire Eroded Process(FPC)	+/- 0.125mm	+/- 0.125mm	+/- 0.03mm
Metal Finish; Electroless Nickel / Gold	Yes	Yes	Yes
Metal Finish; Electrolytic Nickel / Gold	Yes	Yes	Yes
Metal Finish; Electrolytic Nickel, Immersion Palladium, Immersion Gold (ENIG)		Yes	Yes
Metal Finish; Electrolytic Tin	Yes	Yes	Yes
Metal Finish; Hot Air Solder Level [Lead Free]	Yes	Yes	Yes
Metal Finish; Electrolytic Tin plating	Yes	Yes	Yes
Electrical Test; Continuity by "Bed of Nails" Test	Yes	Yes	Yes
Electrical Test; Continuity by "Roving Probe " Test	Yes	Yes	Yes
Electrical Test; Controlled Impedance (50 ohm)	Yes	Yes	Yes

Typical Material Suppliers - Copper Clad and Coverfilm	FLEXIBLE MATERIALS		
Typical suppliers of materials used in the manufacturing process	Nippon Steel	ThinFlex	Tai-flex
Polyimide (PI) substrate with foils down to 18um	Yes	Yes	Yes
Polyimide (PI) adhesivless substrate with foils down to 8um	Yes	Yes	Yes
Polyester (PET) substrate with foils down to 18um			Yes
Polyester (PEN) substrate with foils down to 18um	Yes		Yes

Typical Material Suppliers - Copper Clad Rigid Laminate	RIGID MATERIALS		
Typical suppliers of materials used in the manufacturing process	Park Nelco	Rogers	Nanya
FR4 - TG130 to TG200, Copper Clad, foils down to 12um	Yes	Yes	Yes
Polyimide Glass, Copper Clad, foils down to 12um	Yes	Yes	

	Tatsuta
EMC Shielding Film	Yes

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