

Calluna FPC Limited

Supplier Technology Road Map

Version 1

01-Feb-17

Description of Characteristic	Flexible & Flex Rigid Multilayer			Reel to Reel Flexible Circuits		
	Production	High Tech	Advanced	Production	High Tech	Advanced
ISO9001	Yes	Yes	Yes	Yes	Yes	Yes
QS9000						
ISO/TS16949	Yes	Yes	Yes	Yes	Yes	Yes
ISO14000	Yes	Yes	Yes	Yes	Yes	Yes
ISO13485	Yes	Yes	Yes	Yes	Yes	Yes
Underwriters Laboratories	Yes	Yes		Yes	Yes	
OHSAS18001				Yes	Yes	Yes

Product;

	Production	High Tech	Advanced	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				Yes	Yes	Yes

Description of Characteristic**Flexible Circuits****Reel to Reel Flexible Circuits**

Production

High Tech

Advanced

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				Yes	Yes	Yes
Reel Spool Width; 48mm				Yes	Yes	Yes
Reel Spool Width; 70mm				Yes	Yes	Yes

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	Yes		
Polyimide (PI) substrate with foils down to 12um	Yes	Yes	Yes	Yes	Yes	
Polyimide (PI) substrate with foils down to 8um		Yes	Yes		Yes	Yes
Polyester (PET) substrate with foils down to 18um	Yes			Yes		
Polyester (Polyester Napthalate (PEN) substrate with foils down to 18um	Yes			Yes		

Description of Characteristic**Flexible Circuits****Reel to Reel Flexible Circuits**

Production

High Tech

Advanced

Production

High Tech

Advanced

Process Capability

Minimum Track and Gap	75um	50um	25um	75um	50um	25um
Minimum Hole Size; CNC Drill	0.30mm		0.20mm	0.30mm		0.20mm
Minimum Hole Size; Laser Drill				0,05mm		
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	+/- 0.125mm	+/- 0.125mm	+/- 0.03mm
Metal Finish; Electroless Nickel / Gold	Yes	Yes	Yes	Yes	Yes	Yes
Metal Finish; Electrolytic Nickel / Gold	Yes	Yes	Yes	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	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	Dupont	Rogers	Arisawa	Nippon Steel	ThinFlex	Tai-flex
Polyimide (PI) substrate with foils down to 18um	Pyr lux	Yes	Yes	Yes	Yes	Yes
Polyimide (PI) adhesivless substrate with foils down to 8um	Pyr lux	Yes	Yes	Yes	Yes	Yes
Polyester (PET) substrate with foils down to 18um			Yes	Yes		
Polyester (PEN) substrate with foils down to 18um	Yes		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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