

Teflon woven glass fabric copper-clad laminates
(F4B-1/2)

F4B-1/2 is laminated with excellent material according to the requirements of microwave circuit in electrical performance. It is a kind of laminate of microwave PCB due to its excellent electrical performance and higher mechanical strength.

Technical Specifications:

Appearance	Meet the specification requirements for the laminate of microwave PCB by National and Military Standards.					
Types	F4B255	F4B265				
Dielectric Constant	2.55	2.65				
Dimension (mm)	300×250 380×350 440×550 500×500 460×610 600×500					
	840×840 1200×1000 1500×1000					
	For special dimension, customized laminates is available.					
Copper thickness	0.035 μ m, 0.018μm					
Thickness	Laminate thickness	0.17, 0.25	0.5, 0.8, 1.0	1.5, 2.0	3.0, 4.0, 5.0	

and Tolerance （mm）	Tolerance	±0.025	±0.05	±0.05	±0.09	
	The laminate thickness includes the copper thickness. For special dimension, customized laminates is available.					
Mechanical Strength	Warp	Thickness（mm）	Maximum Warp			
			Original board	Single side	Double side	
		0.25～0.5	0.030	0.050	0.025	
		0.8～1.0	0.025	0.030	0.020	
		1.5～2.0	0.020	0.025	0.015	
		3.0～5.0	0.015	0.020	0.010	
	Cutting/punching Strength	Thickness<1mm, no burrs after cutting, minimum space between two punching holes is 0.55mm, no delamination.				
		Thickness³1mm, no burrs after cutting, minimum space between two punching holes is 1.10mm, no delamination.				
	Peel strength（1oz copper）	Normal state: ≥15N/cm; No bubble, delamination, peel strength≥12N/cm（in the constant humidity and temperature, and keep in the melting solder of 260℃±2℃ for 20 seconds）.				
Chemical Property	According to the properties of laminate, the chemical etching method for PCB can be used. The dielectric properties of laminate are not changed. The plating through hole can be done, but the sodium treatment or the plasma treatment must be used.					
Electrical Property	Name	Test condition		Unit	Value	
	Density	Normal state		g/ cm3	2.2～2.3	
	Moisture Absorption	Dip in the distilled water of 20±2℃ for24 hours		%	≤0.1	
	Operating Temperature	High-low temperature chamber		℃	-50℃～+260℃	

	Thermal Conductivity			W/m/k	0.3
	CTE (typical)	0~100℃		ppm/℃	16 (x)
					21 (y)
					186 (z)
	Shrinkage Factor	2 hours in boiling water		%	< 0.0002
	Surface Resistivity	500V	Normal state	M • Ω	≥1×10 ⁴
		DC	Constant humidity and temperature		≥5×10 ³
	Volume Resistivity	Normal state		MΩ.cm	≥1×10 ⁶
		Constant humidity and temperature			≥9×10 ⁴
	Pin Resistance	500VDC	Normal state	MΩ	≥5×10 ⁴
Constant humidity and temperature			≥5×10 ²		
Surface dielectric strength	Normal state		d=1mm (Kv/mm)	≥1.2	
	Constant humidity and temperature			≥1.1	
Dielectric Constant	10GHZ		ε r	2.55, 2.65 (±2%)	
Dissipation Factor	10GHZ		tg δ	≤1×10 ⁻³	