Teflon woven glass fabric copper-clad laminates with high permittivity F4BK-1/2

F4BK-1/2 is laminated by laying up of woven glass fabric with Teflon resin， according to the scientific formulation and strict technology process. This product takes some advantages over F4B series in the electrical performance（wider range of dielectric constant）.

Technical Specifications：

Appearance	Meet the specification requirements for the laminate of microwave PCB by National and Military Standards.					
Types	F4BK225	F4BK265				
Dielectric Constant	2.25	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.					
Thickness and Tolerance（mm）	Laminate thickness	0.25	0.5	0.8	1.0	
	Tolerance	±0.025	±0.05	±0.05	±0.05	
	Laminate thickness	1.5	2.0	3.0	4.0	5.0
	Tolerance	±0.05	±0.075	±0.09	±0.10	±0.10
	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.			
		Thickness 1mm，no burrs after cutting，minimum space between two punching holes is 1.10mm，no delamination.			
	Peel strength （ 1oz copper）	Normal state：≥12N/cm；No bubble、delamination、peel strength≥10N/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℃～+250℃
	Thermal Conductivity			W/m/k	0.3
	CTE （typical）	0～100℃ （εr：2.1~2.3）		ppm/℃	25（x）
					34（y）
					240（z）
	CTE （typical）	0～100℃ （εr：2.3~2.9）		ppm/℃	16（x）
					21（y）
					186（z）
	Shrinkage Factor	2 hours in boiling water		%	0.0002
	Surface Resistivity	500V DC	Normal state	M・Ω	≥3×104
			Constant humidity and temperature		≥8×103

	Volume Resistivity	Normal state	MΩ.cm	≥2×106
		Constant humidity and temperature		≥2×105
	Surface dielectric strength	Normal state	d=1mm（Kv/mm）	≥1.2
		Constant humidity and temperature		≥1.1
	Dielectric Constant	10GHZ	εr	2.25，2.65（±2%）
	Dissipation Factor	10GHZ	tgδ	≤1.5×10-3