

## F4BM-1/2 Woven-glass PTFE Copper-clad Substrate with a Wide Range of Dielectric Constant

This product is made from E-grade woven-glass, half solidification piece and PTFE resin with scientific compound by way of strict press processes. Its dielectric constant goes on over a wide range.

### ※ Technical Specifications:

1、 Exterior Looks: In conformity to the exterior looks, performances of microwave printed-circuit substrate materials specified by both the National and Military Standards.

2、 Types : F4BM220, F4BM255, F4BM265, F4BM300 and F4BM350 where 220,255,265,300 and 350 indicate the dielectric constants 2.20,2.55,2.65,3.0 and 3.50 respectively.

3、 Dimensions(mm): 300×250, 350×380, 500×500, 600×500, 840×840, 840×1200

4、 Thickness and Tolerance:

Thickness(mm): 0.25 , 0.5 , 0.8 , 1.0 Tolerance(mm): ±0.02 ~ ±0.04

Thickness(mm): 1.5 , 2.0 , 3.0 , 4.0 , 5.0 Tolerance(mm): ±0.05 ~ ±0.07

5、 Mechanical Properties

a. Flexibility Factor:

Thickness(mm)	Maximum Flexibility Factor(mm/mm)		
	Laminate Board With smooth Surface	Single-sided Copper-clad	Double-sided Copper-clad
0.25-0.5	0.03	0.05	0.025
0.8-1.0	0.025	0.03	0.020
1.5-2.0	0.020	0.025	0.015
3.0-5.0	0.015	0.020	0.010

b. Shearing and punching Properties:

Shearing: < 1mm thickness without burrs after shearing, the minimum separation between two holes punched being 0.55 without peeling off.

≥1mm thickness without burrs after , the minimum separation between two holes punched being 1.10 without peeling off.

c. Copper Peel Strength: ≥15N/cm (in normal condition).

≥12N/cm ( being Kept in constant damp and hot and 260°C±2°C solder conditions for 20seconds without blisters and peeling off )

d. Chemical Properties: Printed-circuits made by photo-fabrication with the performance of the dielectric materials of the substrate unchanged and moralizing holes process ability.

e. Physical and Electrical Properties:

Number	Item	Test Condition	Unit	Target value
1	Gravity	In normal	g/cm <sup>2</sup>	2.2 ~ 2.3
2	Water Absorption	Soaking in Distilled water of 20±2°C for 24 hours.	%	≤0.02
3	Operating Temperature	High AND Low Temperature Oven	°C	-50 ~ +260
4	Heat Conduction Coefficient		Kcal/m.hour°C	0.8
5	Linear Expansion Coefficient	Arise of 96°C in Temperature/hour	×1	≤5×10 <sup>-5</sup>
6	Shrinkage	To be boiled in Boiling water for 2 hors.	%	0.0002

7	Surface Insulation Resistance	500V direct current	normal	M.Ω	$\geq 1 \times 10^{-4}$
			const damp and hot		$\geq 1 \times 10^{-3}$
8	Bulk Resistance	In normal conditio		MΩ.cm	$\geq 1 \times 10^{-6}$
		const damp and hot			$\geq 1 \times 10^{-5}$
9	Resistance Between Plugs	500V direct current	In normal conditio	MΩ	$\geq 1 \times 10^{-5}$
			In constant damp condition		$\geq 1 \times 10^{-3}$
10	Surface Electric Strength	In normal conditio		$\delta = 1 \text{mm}(\text{kv/mm})$	$\geq 1.2$
		In constant damp condition			$\geq 1.1$
11	Dielectric Constant	10GHz		$\epsilon_r$	2.20 2.55 2.65 ( $\pm 2\%$ ) 3.0 3.5
12	Dielectric Constant Tangent	10GHz		$\text{tg}\delta$	$\leq 1 \times 10^{-3}$