F4BK Woven-glass PTFE Copper-clad Substrate with a Wide Range of Dielectric Constant

This product is made from E-grade woven-glass and TPFE resin with scientific compound by way of strict press processes.It is 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 Milirary Standards.

2、Types：F4BK225, F4BK265 and F4BK350 where 225, 265 and 350 indicate the dielectric constants 2.25, 2.65 and 3.50 respectively.

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

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 Factory:

Thickness(mm)	Maxi am Flexibility Factor(mm/mm)		
	Laminate Board With smooth Surfaace	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 0.55without 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℃±2℃ 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/cm²	2.2～2.3
2	Water Absorption	Soaking in Distilled water of20±2℃ for 24 hours.	%	≤0.02
3	Operating Temperature	High AND Low Temperature Oven	℃	-50～+260
4	Heat Conduction Coefficient		Kcal/m.hour℃	0.8

<table>
<tr><td>5</td><td>Linear Expansion Coefficient</td><td colspan="2">Arise of 96℃ in Temperature/hour</td><td>×1</td><td>≤5×10-5</td></tr>
<tr><td>6</td><td>Shrinkage</td><td colspan="2">To be boiled in Boiling water for 2 hors.</td><td>%</td><td>0.0002</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Surface Insulation Resistance</td><td rowspan="2">500V direct current</td><td>normal</td><td rowspan="2">M.Ω</td><td>≥1×10-4</td></tr>
<tr><td>const damp and hot</td><td>≥1×10-3</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Bulk Resistance</td><td colspan="2">In normal conditio</td><td rowspan="2">MΩ.cm</td><td>≥1×10-6</td></tr>
<tr><td colspan="2">const damp and hot</td><td>≥1×10-5</td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">Resistance Between Plugs</td><td rowspan="2">500V direct current</td><td>In normal conditio</td><td rowspan="2">MΩ</td><td>≥1×10-5</td></tr>
<tr><td>In constant damp condition</td><td>≥1×10-3</td></tr>
<tr><td rowspan="2">10</td><td rowspan="2">Surface Electric Strength</td><td colspan="2">In normal conditio</td><td rowspan="2">δ=1mm(kv/mm)</td><td>≥1.2</td></tr>
<tr><td colspan="2">In constant damp condition</td><td>≥1.1</td></tr>
<tr><td>11</td><td>Dielectric Constant</td><td colspan="2">10GHz</td><td>εr</td><td>2.55
2.65
3.0
3.5 (±2%)</td></tr>
<tr><td>12</td><td>Dielectric Constant Tangent</td><td colspan="2">10GHz</td><td>tgδ</td><td>≤1×10-3</td></tr>
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