



FR406

FR406 sets the industry standard for high performance epoxy materials.

This product is engineered to meet the demands of the multilayer printed circuit board industry, while maintaining standard FR-4 processing. FR406 offers improved dimensional control, superior chemical and thermal performance and product consistency.

ORDERING INFORMATION:

Contact your local sales representative or visit www.isola-group.com for further information.

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Performance

Tg 170°C

Td 300°C

Dk 3.93

Df 0.0167

zIPC- 4101C /21 /24 /26 /98 /101 /126

UL - File Number E41625

Qualified to UL's MCIL Program

Product Features

- Industry Recognition
 - UL File Number: E41625
 - RoHS Compliant
- Performance Attributes
- Processing Advantages
 - FR-4 process compatible
 - UV blocking and AOI fluorescence
 - No post bake after pressing

Product Availability

- Standard Material Offering: Laminate
 - 2 to 125 mil (0.05 to 3.2 mm)
 - Available in full size sheet or panel form
- Copper Foil Type
 - HTE Grade 3
 - RTF (Reverse Treat Foil)
- Copper Weight
 - ½ to 2 oz (18 to 70 µm) available
 - Heavier copper available
 - Thinner copper foil available
- Standard Material Offering: Prepreg
 - Roll or panel form
 - Tooling of prepreg panels
- Glass Fabric Availability
 - E-glass
 - Square weave glass

FR406 Specifications

Property		Typical Value	Units	Test Method
			Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		170	°C	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		300	°C	2.4.24.2
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	10 >2	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	60 250 3.5	ppm/°C ppm/°C %	2.4.24
X/Y-Axis CTE	Pre-Tg	13	ppm/°C	2.4.24.1
Thermal Conductivity		0.3-0.4	W/mK	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 100 MHz B. @ 1 GHz C. @ 2 GHz D. @ 5 GHz E. @ 10 GHz	4.00 3.95 3.93 3.92 3.92	—	2.5.5.3 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Df, Loss Tangent	A. @ 100 MHz B. @ 1 GHz C. @ 2 GHz D. @ 5 GHz E. @ 10 GHz	0.0130 0.0161 0.0167 0.0172 0.0172	—	2.5.5.3 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Volume Resistivity	A. C-96/35/90 B. After moisture resistance C. At elevated temperature	9.0×10^7 — 3.0×10^7	MΩ-cm	2.5.17.1
Surface Resistivity	A. C-96/35/90 B. After moisture resistance C. At elevated temperature	3.0×10^8 — 8.0×10^8	MΩ	2.5.17.1
Dielectric Breakdown		>50	kV	2.5.6
Arc Resistance		90	Seconds	2.5.1
Electric Strength (Laminate & laminated prepreg)		44 (1100)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		3 (175-249)	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile copper foil all copper foil >17 μm [0.669 mil] B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions	1.19 (7.0) 1.60 (9.0) 1.19 (7.0) 1.60 (9.0)	N/mm (lb/inch)	2.4.8 2.4.8.2 2.4.8.3 2.4.8.3
Flexural Strength	A. Length direction B. Cross direction	93,700 78,200	lb/inch ²	2.4.4
Tensile Strength	A. Length direction B. Cross direction	62,950 47,680	lb/inch ²	ASTM D3039
Poisson's Ratio	A. Length direction B. Cross direction	0.191 0.154	—	ASTM D3039
Moisture Absorption		0.2	%	2.6.2.1
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Max Operating Temperature		130	°C	UL 796

The data, while believed to be accurate and based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.

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