

IPC-4101 /21 /24 /26 UL - File Number E41625

FR406 sets the industry standard for high performance epoxy materials.

PRODUCT FEATURES

Industry Recognition

- UL File Number: E41625
- RoHS Compliant

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

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.

PRODUCT ATTRIBUTES



ORDERING INFORMATION:

Contact your local sales representative or contact info@isola-group.com for further information.

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Typical Values Table

| Property | Typical Value | Units | | Test Method |
|--|--|--|-----------------------|---|
| | | Metric (English) | | IPC-TM-650 (or as noted) |
| Glass Transition Temperature (Tg) by DSC | 170 | | °C | 2.4.25C |
| Decomposition Temperature (Td) by TGA @ 5% weight loss | 300 | | °C | 2.4.24.6 |
| 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 % | 2.4.24C |
| X/Y-Axis CTE | Pre-Tg | 13 | ppm/°C | 2.4.24C |
| Thermal Conductivity | | 0.3-0.4 | W/m-K | 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 2.5.5.5 2.5.5.5 2.5.5.5 |
| 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 2.5.5.5 2.5.5.5 2.5.5.5 |
| 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 | 2.5.6B |
| Arc Resistance | | 90 | Seconds | 2.5.1B |
| Electric Strength (Laminate & laminated prepreg) | | 44 (1100) | kV/mm (V/mil) | 2.5.6.2A |
| 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) | 2.4.8C 2.4.8.2A 2.4.8.3 2.4.8.3 |
| Flexural Strength | A. Length direction B. Cross direction | 93.7 78.2 | ksi | 2.4.4B |
| Tensile Strength | A. Length direction B. Cross direction | 63.0 47.7 | ksi | ASTM D3039 |
| Young's Modulus | A. Length direction B. Cross direction | 3684 3116 | ksi | ASTM D790-15e2 |
| Poisson's Ratio | A. Length direction B. Cross direction | 0.191 0.154 | — | ASTM D3039 |
| Moisture Absorption | | 0.2 | % | 2.6.2.1A |
| Flammability (Laminate & laminated prepreg) | | V-0 | Rating | UL 94 |
| Relative Thermal Index (RTI) | | 130 | °C | UL 796 |

NOTES

Visit our site <http://www.isola-group.com> for more details.

Revisions:

A: Initial release - 4/17

B: Corrected units for Flexural and Tensile Strength - 8/18

C: Change MOT to RTI 5/19

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