IS410

Lead-free Epoxy Laminate and Prepreg

Tg 180°C Td 350°C Dk 3.97 Df 0.0200

IPC-4101 /21 /24 /26 /121 /124 /129 UL - File Number E41625

IS410 is a high-performance FR-4 epoxy laminate and prepreg system designed to support the printed circuit board industry's requirements for higher levels of reliability and the trend to use lead‑free solder.

PRODUCT FEATURES

Industry Recognition

- UL File Number: E41625
- RoHS Compliant

Performance Attributes

- Lead-free assembly compatible
- 6x 288°C solder float capable

Processing Advantages

- FR-4 process compatible

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

Isola's IS410 has a glass transition temperature (Tg) of 180°C and is specially formulated for superior performance through multiple thermal excursions, passing 6X solder tests at 288°C. IS410 is optimized for enhanced drilling performance allowing high aspect ratio holes of ‑10 mils. Its unique resin chemistry provides CAF resistance with the benefit of long-term reliability of boards built with small feature designs.

PRODUCT ATTRIBUTES

LEGACY

TYPICAL MARKET APPLICATIONS

AUTOMOTIVE & TRANSPORTATION

NETWORKING & COMMUNICATIONS

AEROSPACE & DEFENSE

CONSUMER ELECTRONICS

MEDICAL, INDUSTRIAL & INSTRUMENTATION

ORDERING 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		180	°C	2.4.25C
Decomposition Temperature (Td) by TGA @ 5% weight loss		350	°C	2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	50 10	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	55 250 3.5	ppm/°C ppm/°C %	2.4.24C 2.4.24C
X/Y-Axis CTE	Pre-Tg	11	ppm/°C	2.4.24C
Thermal Conductivity		0.5	W/m·K	ASTM E1952
Thermal Stress 10 sec @ 288ºC (550.4ºF)	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	3.96 3.90 3.97 3.87 3.87	—	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	0.0149 0.0189 0.0200 0.0230 0.0230	—	2.5.5.3 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Volume Resistivity	A. After moisture resistance B. At elevated temperature	8.0×10^{8} 3.6×10^{8}	MΩ-cm	2.5.17.1
Surface Resistivity	A. After moisture resistance B. At elevated temperature	8.0×10^{6} 4.5 x 10(8)	MΩ	2.5.17.1
Dielectric Breakdown		>50	kV	—
Arc Resistance		129	Seconds	—
Electric Strength (Laminate & laminated prepreg)		44 (1100)	kV/mm (V/mil)	—
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 125ºC (257ºF) 3. After process solutions	1.14 (6.5) 1.225 (7.0) 1.14 (6.5) 0.90 (5.1)	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	82.6 66.4	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	60.9 45.8	ksi	ASTM D3039
Poisson's Ratio	A. Length direction B. Cross direction	0.175 0.143	—	ASTM D3039
Moisture Absorption		0.20	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Relative Thermal Index (RTI)		130	°C	UL 796

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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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