



IS410 Lead-free Epoxy Laminate and Prepreg

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.

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.

www.isola-group.com/products/IS410

ORDERING INFORMATION:

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

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High Performance

IS410 Data Sheet

Tg 180, Td 350
Dk 3.97, Df 0.02
/21 /24 /26 /28 /121
/124 /129

Features

- High Thermal Performance
 - ▶ Tg: 180°C (DSC)
 - ▶ Td: 350°C (TGA @ 5% wt loss)
 - ▶ Superior performance through multiple thermal excursions – passes 6x @ 288°C
- T260: 50 minutes
- T288: 10 minutes
- RoHS Compliant
- Enhanced Drilling Performance for High Aspect PTH
 - ▶ Greater than 10 to 1 aspect ratio
 - ▶ Optimized for drilling small holes (≤10 mils)
- Core Material Standard Availability
 - ▶ Thickness: 0.002" (0.05 mm) to 0.125" (3.2 mm)
 - ▶ Available in full size sheet or panel form
- Prepreg Standard Availability
 - ▶ Roll or panel form
 - ▶ Tooling of prepreg panels available
- Copper Foil Type Availability
 - ▶ Standard HTE Grade 3
 - ▶ RTF (Reverse Treat Foil)
- Copper Weights
 - ▶ ½, 1 and 2 oz (18, 35 and 70 µm) available
 - ▶ Heavier copper available upon request
 - ▶ Thinner copper foil available upon request
- Glass Fabric Availability
 - ▶ Standard E-glass
 - ▶ Square weave glass fabric available
- Industry Approvals
 - ▶ IPC-4101C /21 /24 /26 /28 /121 /124 /129
 - ▶ UL - File Number E41625

IS410 Specifications

Property		Typical Values			
				Units	Test Method
		Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		180	170-200	°C	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		350	–	°C	ASTM D3850
T260		50	–	Minutes	ASTM D3850
T288		10	–	Minutes	ASTM D3850
CTE, Z-axis	A. Pre-Tg	55	AABUS	ppm/°C	2.4.24
	B. Post-Tg	250	–		
CTE, X-, Y-axes	A. Pre-Tg	11	AABUS	ppm/°C	2.4.24
	B. Post-Tg	13	–		
Z-axis Expansion (50-260°C)		3.5	–	%	2.4.24
Thermal Conductivity		0.5	–	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched	Pass	Pass Visual	Rating	2.4.13.1
	B. Etched				
Dk, Permittivity (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A)	3.96	5.4	–	2.5.5.3
	B. @ 1 GHz (HP4291A)	3.90	–		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	3.97	–		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	3.87	–		2.5.5.5
	E. @ 10 GHz (Bereskin Stripline)	3.87	–		2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A)	0.0149	0.035	–	2.5.5.3
	B. @ 1 GHz (HP4291A)	0.0189	–		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	0.0200	–		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	0.0230	–		2.5.5.5
	E. @ 10 GHz (Bereskin Stripline)	0.0230	–		2.5.5.5
Volume Resistivity	A. 96/35/90	–	1.0x10 ⁶	MΩ-cm	2.5.17.1
	B. After moisture resistance	5.0x10 ⁸	–		
	C. At elevated temperature	3.6x10 ⁸	1.0x10 ³		
Surface Resistivity	A. 96/35/90	–	1.0x10 ⁴	MΩ	2.5.17.1
	B. After moisture resistance	8.0x10 ⁶	–		
	C. At elevated temperature	4.5x10 ⁸	1.0x10 ³		
Dielectric Breakdown		>50	–	kV	2.5.6
Arc Resistance		129	60	Seconds	2.5.1
Electric Strength (Laminate & prepreg as laminated)		44 (1100)	30 (750)	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 – all copper weights >17 microns	1.14 (6.5)	0.70 (4.0)	N/mm (lb/inch)	2.4.8
	B. Standard profile copper	–	–		2.4.8.2
	1. After thermal stress	1.225 (7.0)	0.80 (4.5)		2.4.8.3
	2. At 125°C (257°F)	1.14 (6.5)	0.70 (4.0)		–
	3. After process solutions	0.90 (5.1)	0.55 (3.0)	–	–
Flexural Strength	A. Lengthwise direction	82,600	–	lb/inch ²	–
	B. Crosswise direction	66,400			
Tensile Strength	A. Lengthwise direction	60,890	–	lb/inch ²	–
	B. Crosswise direction	45,750			
Young's Modulus	A. Grain direction	3677	–	ksi	ww
	B. Fill direction	3179			
Poisson's Ratio	A. Grain direction	0.175	–	–	xx
	B. Fill direction	0.143			
Moisture Absorption		0.20	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	–	Rating	UL 94
Max Operating Temperature		130	UL Cert	°C	–

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.

www.isola-group.com/products/IS410

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