



IS415 High Thermal Performance Epoxy Material

IS415 sets the industry standard for high thermal performance epoxy materials and is ideally suited for designs requiring high signal integrity. This product is engineered to meet the demands of Lead (Pb) free multilayer printed circuit assembly, deliver CAF resistance with strong IST results and maintain FR-4 processing. IS415 offers good electrical performance, superior chemical and thermal performance and product consistency.

www.isola-group.com/products/IS415

ORDERING INFORMATION:

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

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High Performance

IS415 Data Sheet

Tg 200, Td 370
Dk 3.72, Df 0.0120
/98 /99/ 101 /126

Features

- High Thermal Performance
 - ▶ High Tg: 200°C (DSC)
 - ▶ High Td: 370°C (TGA @ 5% wt loss)
 - ▶ Superior performance through multiple thermal excursions
 - ▶ Superior chemical and thermal resistance
- T260: 60 minutes
- T288: >20 minutes
- RoHS Compliant
- UV Blocking and AOI Compatible
 - ▶ UV blocking and enhanced fluorescence
 - ▶ Compatible with all AOI equipment, including laser-enhanced reflectance systems
- Standard FR-4 Processing
 - ▶ No post bake after pressing
 - ▶ Drilling parameters and hole wall preparation are standard
- 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)
 - ▶ VLP-2 (2 micron)
- 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
 - ▶ Spread glass fabric available
- Industry Approvals
 - ▶ IPC-4101D WAM1 /98 /99/ 101 /126 (IPC-4101C /21 /24 /26 /121 /124 /129)
 - ▶ UL - File Number E41625
 - ▶ Qualified to UL's MCIL Program

IS415 Typical Values

Property		Typical Values		
		Typical Value	Units	Test Method
			Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		200	°C	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		370	°C	ASTM D3850
T260		60	Minutes	ASTM D3850
T288		>20	Minutes	ASTM D3850
CTE, Z-axis	A. Pre-Tg	45	ppm/°C	2.4.24
	B. Post-Tg	240		
CTE, X-, Y-axes	A. Pre-Tg	13	ppm/°C	2.4.24
	B. Post-Tg	14		
Z-axis Expansion (50-260°C)		2.8	%	2.4.24
Thermal Conductivity		0.4	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched	Pass	Rating	2.4.13.1
	B. Etched			
Dk, Permittivity (Laminate & prepreg as laminated) Tested at 56% resin	A. @ 100 MHz (HP4285A)	3.75	-	2.5.5.3
	B. @ 1 GHz (HP4291A)	3.71		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	3.72		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	3.71		2.5.5.5
	E. @ 10 GHz (Bereskin Stripline)	3.71		2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 56% resin	A. @ 100 MHz (HP4285A)	0.0107	-	2.5.5.3
	B. @ 1 GHz (HP4291A)	0.0131		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	0.0120		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	0.0127		2.5.5.5
	E. @ 10 GHz (Bereskin Stripline)	0.0125		2.5.5.5
Volume Resistivity	A. 96/35/90	-	MΩ-cm	2.5.17.1
	B. After moisture resistance	3.81x10 ⁸		
	C. At elevated temperature	3.90x10 ⁸		
Surface Resistivity	A. 96/35/90	-	MΩ	2.5.17.1
	B. After moisture resistance	2.81x10 ⁶		
	C. At elevated temperature	2.64x10 ⁸		
Dielectric Breakdown		>50	kV	2.5.6
Arc Resistance		120	Seconds	2.5.1
Electric Strength (Laminate & prepreg as laminated)		40 (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 – all copper weights >17 microns	1.14 (6.5)	N/mm (lb/inch)	2.4.8
	B. Standard profile copper	-		2.4.8.2
	1. After thermal stress	1.225 (7.0)		2.4.8.3
	2. At 125°C (257°F)	1.14 (6.5)		-
	3. After process solutions	0.90 (5.1)	-	-
Flexural Strength	A. Lengthwise direction	74,200	lb/inch ²	2.4.4
	B. Crosswise direction	51,600		
Tensile Strength	A. Lengthwise direction	43,750	lb/inch ²	-
	B. Crosswise direction	31,520		
Young's Modulus	A. Grain direction	3530	ksi	ASTM D790-15e2
	B. Fill direction	3200		
Poisson's Ratio	A. Grain direction	0.158	-	ASTM D3039-95a
	B. Fill direction	0.138		
Moisture Absorption		0.15	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	Rating	UL 94
Max Operating Temperature		130	°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.

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