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.

Product Attributes

High Thermal Reliability , High Speed Digital , High Density Interconnect

Typical Market Applications

Computing, Storage & Peripherals

ORDERING INFORMATION:

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

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High Thermal Reliability

Data Sheet

Tg 200°C
Td 370°C
Dk 3.72
Df 0.0120

IPC-4101 - / 98 / 99 / 101 / 126

UL - File Number E41625

Last Updated May 17, 2019
Revision No: C

Product Features

- Industry Recognition
  - UL File Number: E41625
  - Qualified to UL's MCIL Program
  - RoHS Compliant
- Performance Attributes
  - CAF resistant
- 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
  - VLP-2 (2 micron), 1 oz and below
  - 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
  - Mechanically spread glass

IS415 Typical Values

Last Updated May 17, 2019

Property		Typical Value	Units	Test Method
			Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		200	°C	2.4.25C
Decomposition Temperature (Td) by TGA @ 5% weight loss		370	°C	2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	60 >20	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	45 240 2.8	ppm/°C ppm/°C %	2.4.24C
X/Y-Axis CTE	Pre-Tg	13	ppm/°C	2.4.24C
Thermal Conductivity		0.4	W/mK	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	3.75 3.71 3.72 3.71 3.71	—	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	0.0107 0.0131 0.0120 0.0127 0.0125	—	2.5.5.3 2.5.5.9 Bereskin Stripline Bereskin Stripline Bereskin Stripline
Volume Resistivity	A. After moisture resistance B. At elevated temperature	3.81×10^8 3.90×10^8	MΩ-cm	2.5.17.1
Surface Resistivity	A. After moisture resistance B. At elevated temperature	2.81×10^6 2.64×10^8	MΩ	2.5.17.1
Dielectric Breakdown		>50	kV	2.5.6B
Arc Resistance		120	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		40 (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 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	74.2 51.6	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	43.8 31.5	ksi	ASTM D3039
Young's Modulus	A. Length direction B. Cross direction	3530 3200	ksi	ASTM D790-15e2
Poisson's Ratio	A. Length direction B. Cross direction	0.158 0.138	—	ASTM D3039
Moisture Absorption		0.15	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Relative Thermal Index (RTI)		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.

https://www.isola-group.com/products/all-printed-circuit-materials/is415/

NOTE

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