High Performance

P96

Data Sheet

Tg 260, Td 416
Dk 3.76, Df 0.017
/40 /41 /42

P96 Polyimide-based Prepreg and Laminate

Isola offers a **P96** product line of polyimide-based prepreg and copper-clad laminates for high temperature printed circuit applications. These products consist of a flame resistant, polyimide-resin system suitable for military, commercial or industrial electronic applications requiring superior performance and the utmost in thermal properties. These products utilize a polyimide and thermoplastic blend resin, fully cured without the use of MDA (Methylenedianiline). This results in a polymer with a high Tg without the characteristic difficulties of brittleness and low initial bond strength associated with traditional thermoset polyimides.

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Features

- High Thermal Performance
  - Tg: 260°C (TMA)
  - Greater thermal performance over epoxy-bismaleimide blends
- T260: 60 minutes
- T288: 60 minutes
- RoHS Compliant
- Maintains Bond Strength at High Temperature
- Tough Resin System
  - Improved processing due to less brittleness
  - Less delamination from machining
- Brominated Chemistry, Thermally Stable Laminate System
  - Full benefits of 100% polyimide performance
- Non-MDA (Methylenedianiline) Chemistry
  - Meets all OSHA 1910.1050 requirements
- 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, 38 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 /40 /41 /42
  - UL - File Number E41625

ORDERING INFORMATION:

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

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P96 Specifications

Property		Typical Values			
				Units	Test Method
		Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		260	250	ºC	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		416	–	ºC	ASTM D3850
T260		60	–	Minutes	ASTM D3850
T288		60	–	Minutes	ASTM D3850
CTE, Z-axis	A. Pre-Tg B. Post-Tg	55	AABUS –	ppm/ºC	2.4.24
CTE, X-, Y-axes	A. Pre-Tg B. Post-Tg	13/14 14/17	AABUS –	ppm/ºC	2.4.24
Z-axis Expansion (50-260ºC)		–	–	%	2.4.24
Thermal Conductivity		0.4	–	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288ºC (550.4ºF)	A. Unetched B. Etched	Pass	Pass Visual	Rating	2.4.13.1
Dk, Permittivity (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A) B. @ 1 GHz (HP4291A) C. @ 2 GHz (Bereskin Stripline) D. @ 5 GHz (Bereskin Stripline) E. @ 10 GHz (Bereskin Stripline)	3.90 3.95 3.76 3.74 3.74	5.4 – – – –	–	2.5.5.3 2.5.5.9 2.5.5.5 2.5.5.5 2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A) B. @ 1 GHz (HP4291A) C. @ 2 GHz (Bereskin Stripline) D. @ 5 GHz (Bereskin Stripline) E. @ 8 GHz (Bereskin Stripline)	0.0180 0.0180 0.0170 0.0190 0.0210	0.035 – – – –	–	2.5.5.3 2.5.5.9 2.5.5.5 2.5.5.5 2.5.5.5
Volume Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– $3.0x10^8$ $7.0x10^8$	$1.0x10^6$ – $1.0x10^3$	MΩ-cm	2.5.17.1
Surface Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– $3.0x10^6$ $2.0x10^8$	$1.0x10^4$ – $1.0x10^3$	MΩ	2.5.17.1
Dielectric Breakdown		>55	–	kV	2.5.6
Arc Resistance		130	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)		4 (100-174)	–	Class (Volts)	UL-746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile – all copper weights >17 microns B. Standard profile copper 1. After thermal stress 2. At 125ºC (257ºF) 3. After process solutions	1.14 (6.5) – 1.25 (7.0) 1.25 (7.0) 1.14 (6.5)	0.70 (4.0) – 0.80 (4.5) 0.70 (4.0) 0.55 (3.0)	N/mm (lb/inch)	2.4.8 2.4.8.2 2.4.8.3 – –
Flexural Strength	A. Lengthwise direction B. Crosswise direction	83,600 55,500	–	$lb/inch^2$	2.4.4
Tensile Strength	A. Lengthwise direction B. Crosswise direction	55,000 35,370	–	$lb/inch^2$	–
Young's Modulus	A. Grain direction B. Fill direction	3958 3530	–	ksi	ww
Poisson's Ratio	A. Grain direction B. Fill direction	0.189 0.154	–	–	xx
Moisture Absorption		0.5	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	–	Rating	UL 94
Max Operating Temperature		140	UL Cert	ºC	–

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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