



## IS350MD Halogen-free, Low-Dk Laminates & Prepregs

**IS350MD** is a base material of type FR-4. The resin matrix is based on a modified epoxy resin; conventional E-glass-fabric is used for reinforcement. The requirements of flammability class V-0 as per UL 94 are met without addition of antimony compounds. Since this material does not contain halogens, it displays greater thermal stability than a standard FR-4, as time to delamination (T288) measurements prove.

IS350MD is engineered for ease of manufacturing. It requires a short press cycle and does not require plasma for desmear. It desmears similarly to FR-4 materials, making it ideal for high density interconnect (HDI) mobile applications, while providing a low cost of total ownership.

[www.isola-group.com/products/IS350MD](http://www.isola-group.com/products/IS350MD)

### ORDERING INFORMATION:

Contact your local sales representative or visit [www.isola-group.com](http://www.isola-group.com) for further information.

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Halogen Free, Low Dk

# IS350MD

## PRELIMINARY Data Sheet

Tg 162, Td 387  
Dk 3.35, Df 0.014

### Features

- High Thermal Performance
  - ▶ Tg: 162°C (DSC)
  - ▶ Td: 387°C (TGA @ 5% weight loss)
  - ▶ Superior performance through multiple thermal excursions
  - ▶ Superior chemical & thermal resistance
  - ▶ Lower CTE from ambient to 288°C
- T260: 60 minutes
- T288: 60 minutes
- RoHS Compliant
- Core and Prepreg Standard Availability
  - ▶ Thickness: 0.002" (0.05 mm) to 0.060"/0.062" (1.5 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
  - ▶ 1/3, 1/2 and 1 oz (12, 18 and 35 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
  - ▶ UL - File Number E41625

# IS350MD Specifications

Property	Typical Values				
			Units	Test Method	
	Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)	
<b>Glass Transition Temperature (Tg) by DSC</b>		162	150-170	°C	2.4.25
<b>Glass Transition Temperature (Tg) by DMA</b>		177	150-190	°C	2.4.25
<b>Glass Transition Temperature (Tg) by TMA</b>		151	140-170	°C	2.4.25
<b>Decomposition Temperature (Td) by TGA @ 5% weight loss</b>		387	–	°C	ASTM D3850
<b>T260</b>		60	–	Minutes	2.4.25
<b>T288</b>		60	–	Minutes	2.4.25
<b>CTE, Z-axis</b>	A. Pre-Tg B. Post-Tg	45 235	AABUS –	ppm/°C	2.4.24
<b>CTE, X-, Y-axes</b>	A. Pre-Tg B. Post-Tg	15 16	AABUS –	ppm/°C	2.4.24
<b>Z-axis Expansion (50-260°C)</b>		2.8	–	%	2.4.24
<b>Thermal Conductivity</b>		TBD	–	W/mK	ASTM D5930
<b>Thermal Stress 10 sec @ 288°C (550.4°F)</b>	A. Unetched B. Etched	Pass	Pass Visual	Rating	2.4.13.1
<b>Dk, Permittivity (Laminate &amp; prepreg as laminated) Tested at 75% resin</b>	@ 1 GHz (Bereskin Stripline)	3.35	–	–	2.5.5.5
<b>Df, Loss Tangent (Laminate &amp; prepreg as laminated) Tested at 75% resin</b>	@ 1 GHz (Bereskin Stripline)	0.0138	–	–	2.5.5.5
<b>Volume Resistivity</b>	A. 96/35/90 B. After moisture resistance C. At elevated temperature	TBD TBD TBD	1.0x10 <sup>6</sup> – 1.0x10 <sup>3</sup>	MΩ-cm	2.5.17.1
<b>Surface Resistivity</b>	A. 96/35/90 B. After moisture resistance C. At elevated temperature	TBD TBD TBD	1.0x10 <sup>4</sup> – 1.0x10 <sup>3</sup>	MΩ	2.5.17.1
<b>Dielectric Breakdown</b>		TBD	40	kV	2.5.6
<b>Arc Resistance</b>		TBD	60	Seconds	2.5.1
<b>Electric Strength (Laminate &amp; prepreg as laminated)</b>		TBD	30 (750)	kV/mm (V/mil)	2.5.6.2
<b>Comparative Tracking Index (CTI)</b>		TBD	–	Volts	UL-746A ASTM D3638
<b>Peel Strength</b>	A. 0.5 oz HTE copper B. 1 oz HTE copper	5.70 TBD	–	lb/inch	
<b>Flexural Strength</b>	A. Lengthwise direction B. Crosswise direction	TBD TBD	–	lb/inch <sup>2</sup>	2.4.4
<b>Tensile Strength</b>	A. Lengthwise direction B. Crosswise direction	TBD TBD	–	lb/inch <sup>2</sup>	–
<b>Young's Modulus</b>	A. Grain direction B. Fill direction	TBD TBD	–	ksi	–
<b>Poisson's Ratio</b>	A. Grain direction B. Fill direction	TBD TBD	–	–	–
<b>Moisture Absorption</b>		TBD	–	%	2.6.2.1
<b>Flammability (Laminate &amp; prepreg as laminated)</b>		V-0	–	Rating	UL 94
<b>Max Operating Temperature</b>		TBD	UL Cert	°C	–

The data, while believed to be accurate & based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms & conditions of the agreement under which they are sold.

[www.isola-group.com/products/IS350MD](http://www.isola-group.com/products/IS350MD)

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