High Performance
RF/Microwave

I-Tera® MT40

Data Sheet

Tg 200, Td 360
Dk 3.38 / 3.45 / 3.75,
Df 0.0028 - 0.0035
/17

I-Tera MT40 Very Low-loss Laminate Material

I-Tera® MT40 laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. I-Tera MT40 is suitable for many of today's high speed digital and RF/microwave printed circuit designs. I-Tera MT40 features a dielectric constant (Dk) that is stable between -55°C and +125°C up to W-band frequencies. In addition, I-Tera MT40 offers a very low dissipation factor (Df) of 0.0031 making it a cost effective alternative to PTFE and other commercial microwave and high-speed digital laminate materials.

I-Tera MT40 laminate materials are currently being offered in both laminate and prepreg form in typical thicknesses and standard panel sizes. This provides a complete materials solution package for high-speed digital multilayer, hybrid, RF/microwave, multilayer and double-sided printed circuit designs. I-Tera MT40 does not require any special through hole treatments commonly needed when processing PTFE-based laminate materials.

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Features

- High Thermal Performance
  - Tg: 200°C (DSC)
  - Td: 360°C (TGA @ 5% wt loss)
  - Low CTE in the Z-axis – 2.8% (50-260°C)
- T260: >60 minutes
- T288: >60 minutes
- RoHS Compliant
- Electrical Properties
  - Dk: 3.38 / 3.45 / 3.75
  - Df: 0.0028 / 0.0031 / 0.0035
  - Typical electrical properties over a broad frequency and temperature range per IPC-TM-650-2.5.5.5
- Core Material Standard Availability
  - Thickness: 0.0020″-0.018″, 0.020″ and 0.030″
  - 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 (Rz = 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
  - Square weave glass fabric available
  - Spread glass fabric available
- Industry Approvals
  - UL 94 V-0
  - UL Qualified - 130 MOT
  - Non-ANSI
  - IPC-4103 /17

ORDERING INFORMATION:

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

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I-Tera® MT40 Typical Values

Property		Typical Values		
			Units	Test Method
		Typical Value	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		190-200	ºC	2.4.24
Glass Transition Temperature (Tg) by TMA		175-185	°C	2.4.24
Decomposition Temperature (Td) by TGA @ 5% weight loss		360	ºC	ASTM D3850
T260		>60	Minutes	–
T288		>60	Minutes	–
CTE, Z-axis	A. Pre-Tg B. Post-Tg	55 290	ppm/ºC	2.4.24
CTE, X-, Y-axes	Pre-Tg	12	ppm/ºC	2.4.24
Z-axis Expansion (50-260ºC)		2.8	%	2.4.24
Thermal Conductivity (-100-250ºC)		0.61	W/mK	ASTM 1952
Thermal Stress 10 sec @ 288ºC (550.4ºF)	A. Unetched B. Etched	Pass	Rating	2.4.13.1
Dk, Permittivity / Df, Loss Tangent (Core thickness 0.010)	@ 10 GHz	3.38 / 0.0028 3.45 / 0.0031 3.75 / 0.0035	–	2.5.5.5 / Bereskin Stripline
Dk, Permittivity / Df, Loss Tangent (Core thickness 0.020)	@ 10 GHz	3.38 / 0.0028 3.45 / 0.0031 3.75 / 0.0032	–	2.5.5.5 / Bereskin Stripline
Dk, Permittivity / Df, Loss Tangent (Core thickness 0.030)	@ 10 GHz	3.38 / 0.0028 3.45 / 0.0031 3.75 / 0.0032	–	2.5.5.5 / Bereskin Stripline
PIM (VLP-2 Cu)*		< 160	dBc	Rosenberger PIM Analyzer 850 MHz - 1.9 GHz
Volume Resistivity	96/35/90	$1.33x10^7$	MΩ-cm	2.5.17.1
Surface Resistivity	96/35/90	$1.33x10^5$	MΩ	2.5.17.1
Dielectric Breakdown		45.4	kV	2.5.6
Arc Resistance		139	Seconds	2.5.1
Electric Strength		45 (1133)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		3	Class (Volts)	UL-746A ASTM D3638
Peel Strength	1 oz. (38µm) EDC foil	1.0 (5.7)	N/mm (lb/inch)	2.4.8.3
Tensile Strength	A. Lengthwise direction B. Crosswise direction	39 35	ksi	ASTM D3039-95a
Tensile Modulus/Young's Modulus	A. Lengthwise direction B. Crosswise direction	3,060 2,784	ksi	ASTM D3039-95a
Flexural Strength	A. Lengthwise direction B. Crosswise direction	71 58	ksi	ASTM D790-10
Flexural Modulus/Taylor's Modulus	A. Lengthwise direction B. Crosswise direction	2,857 2,743	ksi	ASTM D790-10
Poisson's Ratio	A. Lengthwise direction B. Crosswise direction	0.234 0.222	–	ASTM D3039-95a
Moisture Absorption		0.1	%	2.6.2.1
Flammability		V-0	Rating	UL 94
Max Operating Temperature		130	ºC	–

* PIM values are influenced by copper foil treatment roughness. PIM values presented were achieved with the use of VLP-2 copper foil.
Dk & Df are dependent on resin content. NOTE: Dk/Df is at one resin percentage. Please refer to the Isola website for a complete list of Dk/Df values. 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.

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