



TerraGreen® Halogen-free, Very Low Loss Material

TerraGreen laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. TerraGreen is engineered for such high-performance applications as power amplifier boards for LTE base stations, internet infrastructure and cloud computing. TerraGreen features a Dielectric Constant (Dk) that is stable between -55°C and 125°C, up to 20 GHz.

TerraGreen is a lead-free assembly material and is easy to process. This high-performance material utilizes a short-lamination cycle; the product is easy to drill, does not require plasma desmear, and the prepreg shelf life is similar to FR-4 materials. TerraGreen is suitable for high-layer count, high-speed digital backplanes and is compatible with Isola's FR-4 materials for hybrid designs.

TerraGreen meets UL 94 V-0 and is halogen free.

www.isola-group.com/products/TerraGreen

ORDERING INFORMATION:

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

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**Halogen Free
High Speed Digital
RF/Microwave**

TerraGreen® Data Sheet

**Tg 200, Td 390
Dk 3.44, Df 0.0039
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Features

- High Thermal Performance
 - ▶ Tg: 200°C (DSC), (Base Laminate)
 - ▶ Td: 390°C (TGA @ 5% wt loss)
 - ▶ Low CTE in the Z-axis 2.9% (50°C – 260°C)
- T260: >60 minutes
- T288: >60 minutes
- Lead-free Compatible and RoHS Compliant
- UV Blocking and AOI Fluorescence
 - ▶ High throughput and accuracy during PCB fabrication and assembly
- Superior Processing
 - ▶ Closest to conventional FR-4 processing of all high speed digital materials
- Core Material Standard Availability
 - ▶ Thickness: 0.002" (0.050 mm) to 0.018" (0.450 mm), 0.020" (0.500 mm), 0.030" (0.750 mm) and 0.060" (1.50 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
 - ▶ 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
 - ▶ UL 94 V-0
 - ▶ IPC-4103 /17

TerraGreen® 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		390	°C	ASTM D3850
T260		60	Minutes	ASTM D3850
T288		60	Minutes	ASTM D3850
CTE, X-, Y-axes	Pre-Tg	16	ppm/°C	2.4.24
Z-axis Expansion (50-260°C)		2.9	%	2.4.24
Thermal Conductivity		0.32	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Rating	2.4.13.1
Dk, Permittivity	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	3.44 3.44 3.44	–	2.5.5.5
Df, Loss Tangent	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0039 0.0039 0.0039	–	Bereskin Stripline
Volume Resistivity	95/35/90	1.33x10 ⁷	MΩ-cm	2.5.17.1
Surface Resistivity	95/35/90	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 (Laminate & prepreg as laminated)		45 (1133)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		In Testing	Class (Volts)	UL-746A ASTM D3638
Peel Strength	1 oz/0.5 oz EDC (Standard) Foil	0.88 (5.0)	N/mm (lb/inch)	2.4.8.2 2.4.8.3
Tensile Strength	A. Lengthwise direction B. Crosswise direction	40 39	ksi	ASTM D3039-095a
Tensile Modulus/Young's Modulus	A. Lengthwise direction B. Crosswise direction	3,125 2,745	ksi	ASTM D3039-095a
Flexural Strength	A. Lengthwise direction B. Crosswise direction	75.5 60	ksi	ASTM D790-10
Flexural Modulus/Taylor's Modulus	A. Lengthwise direction B. Crosswise direction	3,120 2,840	ksi	ASTM D790-10
Poisson's Ratio	A. Lengthwise direction B. Crosswise direction	0.238 0.231	–	ASTM D3039-095a
Moisture Absorption		0.05	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	Rating	UL 94
Max Operating Temperature		140	°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.

www.isola-group.com/products/TerraGreen

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