

# isola

## TerraGreen® (RF/MW)

**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 to W-band.

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.

### Product Attributes

Halogen Free , RF/Microwave , High Thermal Reliability

### Typical Market Applications

RF / Microwave , Aerospace & Defense , Automotive & Transportation

#### ORDERING INFORMATION:

Contact your local sales representative or contact [info@isola-group.com](mailto:info@isola-group.com) for further information.

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**Halogen Free**

## Data Sheet

**Tg 200°C**  
**Td 390°C**  
**Dk 3.45**  
**Df 0.0032**

**IPC-4103 - / 17**

**UL - File Number E41625**

Last Updated June 22, 2020  
Revision No: E

### Product Features

- Industry Recognition
  - RoHS Compliant
- Performance Attributes
  - Lead-free assembly compatible
  - Halogen free
- Processing Advantages
  - FR-4 process compatible
  - UV blocking and AOI fluorescence

### Product Availability

- Standard Material Offering: Laminate
  - 10, 20, 30, 60 mil (0.25, 0.51, 0.76, 1.5 mm)
  - Available in full size sheet or panel form
- Copper Foil Type
  - VLP-2 (2 micron), 1 oz and below
- Copper Weight
  - ½ to 2 oz (18 to 70 µm) available
  - Thinner copper foil available
- Standard Material Offering: Prepreg
  - Roll or panel form
  - Tooling of prepreg panels
- Glass Fabric Availability

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	390	°C	2.4.24.6	
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	60	Minutes	2.4.24.1
Z-Axis CTE	50 to 260°C. (Total Expansion)	2.9	%	2.4.24C
X/Y-Axis CTE	Pre-Tg	16	ppm/°C	2.4.24C
Thermal Conductivity		0.63	W/mK	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	3.45	—	2.5.5.5
Df, Loss Tangent	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0032	—	Bereskin Stripline
Volume Resistivity	C-96/35/90	$1.33 \times 10^7$	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	$1.33 \times 10^5$	MΩ	2.5.17.1
Dielectric Breakdown		45.4	kV	2.5.6B
Arc Resistance		139	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		45 (1133)	kV/mm (V/mil)	2.5.6.2A
Comparative Tracking Index (CTI)		2	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. 0.5 oz. EDC foil B. 1 oz. EDC foil	0.88 (5.0)	N/mm (lb/inch)	2.4.8C
Flexural Strength	A. Length direction B. Cross direction	75.5 60.0	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	40.0 39.0	ksi	ASTM D3039
Poisson's Ratio	A. Length direction B. Cross direction	0.238 0.231	—	ASTM D3039
Moisture Absorption		0.05	%	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/terrag-rf-mw/>

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## NOTE

### Revisions:

A: Initial release - 4/17

B: Corrected moisture uptake value -3/18

C: Corrected units for Flexural and Tensile Strength - 8/18

D: Change MOT to RTI - 5/19

E: Added CTI value - 1/20