

IPC-4103 /17 UL - File Number E41625

TerraGreen® laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range.

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)

Copper Foil Type

- HTE Grade 3
- HVLP (VLP2) ≤ 2.5 micron Rz JIS

Copper Weight

- ½, 1 oz (18 and 35 μm) available
- Heavier copper foil available
- Thinner copper foil available

Glass Fabric Availability

- Square weave glass
- Mechanically spread glass

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



HIGH THERMAL RELIABILITY



RADIO FREQUENCY & MICROWAVE

TYPICAL MARKET APPLICATIONS



AUTOMOTIVE & TRANSPORTATION



RADIO FREQUENCY & MICROWAVE



AEROSPACE & DEFENSE

ORDERING INFORMATION:

Contact your local sales representative or contact info@isola-group.com for further information.

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Typical Values Table

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/m·K	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	1.33×10^7	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	1.33×10^5	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	525 (75.5) 414 (60.0)	MPa (kpsi)	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	276 (40.0) 269 (39.0)	MPa (kpsi)	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

NOTES

Visit our site <http://www.isola-group.com> for more details.

Revisions:

A: Initial release - 4/17

B: Corrected moisture uptake value 6/18

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

D: Change MOT to RTI 5/19

E: Updated CTI value 01/20

F: Changed VLP2 to HVLP to align with common industry terms 4/21

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