Tachyon® 100G

Ultra Low Loss Laminate and Prepreg

Tg 215°C Td 360°C Dk 3.02 Df 0.0021

IPC-4103 /17 IPC-4101 /102 UL - File Number E41625

Tachyon 100G laminate materials are designed for very high-speed digital applications up to and beyond data rates of 100 Gb/s.

PRODUCT FEATURES

Industry Recognition

- UL File Number: E41625
- RoHS Compliant

Performance Attributes

- CAF resistant
- Low moisture absorption
- 6x 260°C reflow capable
- 6x 288°C solder float capable

Processing Advantages

- Multiple lamination cycles
- HDI technology compatible

PRODUCT AVAILABILITY

Standard Material Offering: Laminate

- 2 to 20 mil (0.05 to 0.51 mm)

Copper Foil Type

- HVLP3 (VLP1) ≤1.1 micron Rz JIS
- HVLP (VLP2) ≤2.5 micron Rz JIS
- Advanced RTF ≤2.5 micron Rz JIS
- Embedded resistor foil

Copper Weight

- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Heavier copper foil available
- Thinner copper foil available

Standard Material Offering: Prepreg

- Tooling of prepreg panels
- Moisture barrier packaging

Glass Fabric Availability

- Low Dk Glass -Asahi Japan, Asahi Tawian, TGI Taiwan
- Square weave glass
- Mechanically spread glass

Tachyon 100G materials exhibit exceptional electrical properties that are very stable over a broad frequency and temperature range between -55°C and +125°C up to 100 GHz. These electrical properties provide designers a scalable solution for next generation designs of backplanes and daughter cards, enabling 10x improvements from 10 Gb/s data rates.

Isola has developed Tachyon 100G with the highest level of thermal performance for high layer count line cards. The very low Z-axis CTE makes it a perfect choice for fine pitch BGA applications. The material is optimized with the use of spread glass to mitigate skew, improve rise times, reduce jitter, and increase eye width/height and that use ultra smooth HVLP (VLP2) 2um Rz copper that significantly reduces conductor losses.

PRODUCT ATTRIBUTES

TYPICAL MARKET APPLICATIONS

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		215	°C	2.4.25C
Glass Transition Temperature (Tg) by DMA		230	°C	2.4.24.4
Glass Transition Temperature (Tg) by TMA		210	°C	2.4.24C
Decomposition Temperature (Td) by TGA @ 5% weight loss		360	°C	2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288 C. T300	>60 >60 >20	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	45 250 2.5	ppm/°C ppm/°C %	2.4.24C
X/Y-Axis CTE	Pre-Tg	15	ppm/°C	2.4.24C
Thermal Conductivity		0.42	W/m·K	ASTM E1952
Thermal Stress 10 sec @ 288ºC (550.4ºF)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	3.04 3.02 3.02	—	2.5.5.5
Df, Loss Tangent	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0021	—	2.5.5.5
Volume Resistivity	C-96/35/90	$1.33x10^{7}$	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	$1.33x10^{5}$	MΩ	2.5.17.1
Dielectric Breakdown		60	kV	2.5.6B
Arc Resistance		125	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		60 (1500)	kV/mm (V/mil)	2.5.6.2A
Comparative Tracking Index (CTI)		3 (175 -249)	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. Low profile and very low profile copper foil B. Low profile and very low profile copper foil ... After thermal stress	0.79 (4.5) 0.96 (5.5)	N/mm (lb/inch)	2.4.8C 2.4.8.2A
Flexural Strength	A. Length direction B. Cross direction	303 (44.0) 283 (41.0)	MPa (kpsi)	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	207 (30.0) 172 (25.0)	MPa (kpsi)	ASTM D3039
Young's Modulus	A. Length direction B. Cross direction	2,551 2,417	ksi	ASTM D790-15e2
Taylor's Modulus	A. Length direction B. Cross direction	2,264 2,197	ksi	ASTM D790-15e2
Poisson's Ratio	A. Length direction B. Cross direction	0.165 0.156	—	ASTM D3039
Moisture Absorption		0.1	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Relative Thermal Index (RTI)		130	°C	UL 746

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: Changed VLP2 to HVLP to aligned with common industry terms 4/21
F: Changed TMA Tg to 210C, DSC Tg to 215C and DMA to 230C based on long term data 9/22
G: Added HVLP3, Advanced RTF and 2 ounce copper options, added 20 mil thickness option - 3/24