

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
- 0.8 mm pitch capable
- 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)  $\leq 1.1$  micron Rz JIS
- HVLP (VLP2)  $\leq 2.5$  micron Rz JIS
- Advanced RTF  $\leq 2.5$  micron Rz JIS
- Embedded resistor foil

#### Copper Weight

- ½, 1 and 2 oz (18, 35 and 70  $\mu\text{m}$ ) 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 of 0.8 mm or less. 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



HIGH DENSITY  
INTERCONNECT



HIGH SPEED  
DIGITAL



HIGH THERMAL  
RELIABILITY

### TYPICAL MARKET APPLICATIONS



NETWORKING &  
COMMUNICATIONS



AEROSPACE  
& DEFENSE



COMPUTING, STORAGE  
& PERIPHERALS

**ORDERING 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	>60	Minutes	2.4.24.1
	B. T288	>60		
	C. T300	>20		
Z-Axis CTE	A. Pre-Tg	45	ppm/°C	2.4.24C
	B. Post-Tg	250	ppm/°C	
	C. 50 to 260°C, (Total Expansion)	2.5	%	
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 @ 288°C (550.4°F)	A. Unetched	Pass	Pass Visual	2.4.13.1
	B. Etched			
Dk, Permittivity	A. @ 2 GHz	3.04	—	2.5.5.5
	B. @ 5 GHz	3.02		
	C. @ 10 GHz	3.02		
Df, Loss Tangent	A. @ 2 GHz	0.0021	—	2.5.5.5
	B. @ 5 GHz			
	C. @ 10 GHz			
Volume Resistivity	C-96/35/90	1.33x10 <sup>7</sup>	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	1.33x10 <sup>5</sup>	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	0.79 (4.5)	N/mm (lb/inch)	2.4.8C
	B. Low profile and very low profile copper foil ... After thermal stress	0.96 (5.5)		2.4.8.2A
Flexural Strength	A. Length direction	303 (44.0)	MPa (kpsi)	2.4.4B
	B. Cross direction	283 (41.0)		
Tensile Strength	A. Length direction	207 (30.0)	MPa (kpsi)	ASTM D3039
	B. Cross direction	172 (25.0)		
Young's Modulus	A. Length direction	2,551	ksi	ASTM D790-15e2
	B. Cross direction	2,417		
Taylor's Modulus	A. Length direction	2,264	ksi	ASTM D790-15e2
	B. Cross direction	2,197		
Poisson's Ratio	A. Length direction	0.165	—	ASTM D3039
	B. Cross direction	0.156		
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

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