

# isola

## Tachyon<sup>®</sup> 100G

### Ultra Low Loss Laminate Material

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

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 Tachyon 100G a perfect choice for fine pitch BGA applications of 0.8 mm or less and designs with multiple 2 ounce copper ground planes. Tachyon 100G materials are optimized laminate and prepreg forms that use mechanically spread glass to mitigate skew, improve rise times, reduce jitter, and increase eye width/height and that use ultra smooth VLP2 (2um Rz) copper that significantly reduces conductor losses.

### Product Attributes

High Thermal Reliability , High Speed Digital , High Density Interconnect

### Typical Market Applications

Aerospace & Defense , Computing, Storage & Peripherals , Networking & Communication Systems

#### ORDERING INFORMATION:

Contact your local sales representative or visit [www.isola-group.com](http://www.isola-group.com) for further information.

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High Thermal Reliability

## Data Sheet

Tg 200°C

Td 360°C

Dk 3.02

Df 0.0021

IPC-4103 - / 17

UL - File Number E41625

Last Updated September 1, 2018  
Revision No: B

### 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 18 mil (0.05 to 0.46 mm)
- Copper Foil Type
  - HTE Grade 3
  - VLP-2 (2 micron), 1 oz and below
  - RTF (Reverse Treat Foil)
- Copper Weight
  - ½ to 2 oz (18 to 70 µm) available
  - Thinner copper foil available
- Standard Material Offering: Prepreg
  - Moisture barrier packaging
- Glass Fabric Availability
  - Low Dk glass
  - Square weave glass
  - Mechanically spread glass

# Tachyon<sup>®</sup> 100G Typical Values

Last Updated Sep 1, 2018

Property		Typical Value	Units	Test Method
			Metric (English)	IPC-TM-650 (or as noted)
Test data generated from rigid laminate	Resin Content	55	%	2.3.16.2
Glass Transition Temperature (Tg) by DSC		200	°C	2.4.25C
Glass Transition Temperature (Tg) by DMA		220	°C	2.4.24.4
Glass Transition Temperature (Tg) by TMA		180	°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/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	3.04 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 <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	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile copper foil all copper foil >17 μm [0.669 mil]	0.79 (4.5)	N/mm (lb/inch)	2.4.8C
	B. Standard profile copper 1. After thermal stress	0.96 (5.5)		2.4.8.2A
Flexural Strength	A. Length direction B. Cross direction	44.0 41.0	ksi	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	30.0 25.0	ksi	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
Max Operating Temperature		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/tachyon-100g/>

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## NOTE

Visit our site <http://www.isola-group.com> for more details.  
Rev B - Corrected moisture uptake value to reflect correct value