



## Tachyon® 100G Ultra Low Loss Laminate Material

**Tachyon 100G** laminate materials are designed for very high-speed digital applications up to and beyond speeds of 100 Gb/s. Tachyon 100G materials exhibit exceptional electrical properties that are very stable over a broad frequency and temperature range. Tachyon 100G is suitable for scaling current products to their next generation through design of new backplanes and daughter cards, enabling almost 10x improvements from 10 Gb/s data rates. Tachyon 100G targets line cards that require the highest thermal performance. It has identical electricals as Tachyon, but offers a 30% improvement in Z-axis CTEs on high-layer count PCBs. This makes it a perfect choice for higher layer line cards that have multiple 2 oz. planes and BGAs with pitches at 0.8 mm or less.

Tachyon 100G products use spread glass and reduced profile copper to mitigate skew and improve rise times, reduce jitter, increase eye width and height. Use of ultra smooth copper is enabled by very high adhesive bond between the resin and the metal. Tachyon 100G has a nominal dielectric constant (Dk) of 3.02 that is stable between -55°C and +125°C up to 40 GHz. In addition, Tachyon 100G offers a very low nominal dissipation factor (Df) of 0.0021.

Tachyon 100G laminate materials are available in optimized laminate and prepreg forms in typical thicknesses and standard panel sizes to provide a complete material solution for high-speed digital multilayer backplanes and daughter cards.

[www.isola-group.com/products/Tachyon-100G](http://www.isola-group.com/products/Tachyon-100G)

### ORDERING INFORMATION:

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

**Isola Group**  
3100 West Ray Road  
Suite 301  
Chandler, AZ 85226  
Phone: 480-893-6527  
Fax: 480-893-1409  
[info@isola-group.com](mailto:info@isola-group.com)

**Isola Asia Pacific (Hong Kong) Ltd.**  
Unit 3512 - 3522, 35/F  
No. 1 Hung To Road, Kwun Tong,  
Kowloon, Hong Kong  
Phone: 852-2418-1318  
Fax: 852-2418-1533  
[info.hkg@isola-group.com](mailto:info.hkg@isola-group.com)

**Isola GmbH**  
Isola Strasse 2  
D-52348 Düren, Germany  
Phone: 49-2421-8080  
Fax: 49-2421-808164  
[info-dur@isola-group.com](mailto:info-dur@isola-group.com)

High Performance

## Tachyon® 100G Data Sheet

Tg 185, Td 380  
Dk 3.02, Df 0.0021  
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### Features

- High Thermal Performance
  - ▶ Tg: 185°C (DSC)
  - ▶ Td: 380°C (TGA @ 5% wt loss)
  - ▶ Low CTE in the Z-axis – 2.5% (50-260°C)
- T260: >60 minutes
- T288: >60 minutes
- T300: >20 minutes
- RoHS Compliant
- Electrical Properties
  - ▶ Dk: 3.02
  - ▶ Df: 0.0021
  - ▶ Typical electrical properties over a broad frequency and temperature range per IPC-TM-650-2.5.5.5
- Core Material Standard Availability
  - ▶ Thickness: 0.002" to 0.018" (0.6 mm to 0.05 mm)
  - ▶ Available in full size sheet or panel form
- Prepreg Standard Availability
  - ▶ Roll or panel form
  - ▶ Tooling of prepreg panels available
- Copper Foil Type Standard Availability
  - ▶ VLP-2 (2 micron)
  - ▶ Standard HTE Grade 3 available upon request
  - ▶ RTF (Reverse Treat Foil) available upon request
- Copper Weights
  - ▶ ½, 1 and 2 oz (18, 38 and 70 µm) available
  - ▶ Heavier copper available upon request
  - ▶ Thinner copper foil available upon request
- Glass Fabric Standard Availability
  - ▶ Square weave glass fabric
  - ▶ Spread glass fabric
- Industry Approvals
  - ▶ UL 94 V-0
  - ▶ UL Qualified - 130 MOT
  - ▶ Non-ANSI
  - ▶ IPC-4103 /17

# Tachyon® 100G Typical Values

Property		Typical Values			
		Typical Value	Units	Test Method	
			Metric (English)	IPC-TM-650 (or as noted)	
Glass Transition Temperature (Tg) by DMA		220	°C	2.4.25	
Glass Transition Temperature (Tg) by DSC		185	°C	–	
Glass Transition Temperature (Tg) by TMA		180	°C	–	
T260		>60	Minutes	2.4.25	
T288		>60	Minutes	2.4.25	
T300		>20	Minutes	2.4.25	
CTE, Z-axis	A. Pre-Tg	45	ppm/°C	2.4.24	
	B. Post-Tg	250			
CTE, X-, Y-axes		15	ppm/°C	2.4.24	
Z-axis Expansion (50-260°C)		2.5	%	2.4.24	
Thermal Conductivity (-100-250°C)		0.42	W/mK	ASTM D5930	
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched	Pass	Rating	2.4.13.1	
	B. Etched				
Dk, Permittivity (Laminate & prepreg as laminated) Tested at 56% resin	A. @ 2 GHz	3.04	–	2.5.5.5	
	B. @ 5 GHz	3.02		2.5.5.5	
	C. @ 10 GHz	3.02		2.5.5.5	
Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 56% resin	A. @ 2 GHz (Bereskin Stripline)	0.0021	–	2.5.5.5	
	B. @ 5 GHz (Bereskin Stripline)	0.0021		2.5.5.5	
	C. @ 10 GHz (Bereskin Stripline)	0.0021		2.5.5.5	
Volume Resistivity		96/35/90	TBD	MΩ-cm	2.5.17.1
Surface Resistivity		96/35/90	TBD	MΩ	2.5.17.1
Dielectric Breakdown		60	kV	2.5.6	
Arc Resistance		125	Seconds	2.5.1	
Electric Strength (Laminate & prepreg as laminated)		60 (1500)	kV/mm (V/mil)	2.5.6.2	
Comparative Tracking Index (CTI)		2	Class (Volts)	UL-746A ASTM D3638	
Peel Strength	A. Low-profile copper foil & very low profile - all copper	0.79 (4.5)	N/mm (lb/inch)	2.4.8.3	
	B. Standard-profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions	0.96 (5.5)			
Flexural Strength	A. Lengthwise direction	44	ksi	ASTM D3039-95a	
	B. Crosswise direction	41			
Tensile Strength	A. Lengthwise direction	30	ksi	ASTM D3039-95a	
	B. Crosswise direction	25			
Young's Modulus	A. Lengthwise direction	2,551	ksi	ASTM D790-10	
	B. Crosswise direction	2,417			
Taylor's Modulus	A. Lengthwise direction	2,264	ksi	ASTM D790-10	
	B. Crosswise direction	2,197			
Poisson's Ratio	A. Lengthwise direction	0.165	–	ASTM D3039-95a	
	B. Crosswise direction	0.156			
Moisture Absorption		0.05	%	2.6.2.1	
Flammability (Laminate & prepreg as laminated)		V-0	Rating	UL 94	
Max Operating Temperature		130	°C	–	

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.

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