

## TLT Low Loss RF/Microwave Laminates

TLT laminates are designed for applications where low loss and excellent mechanical and thermal properties are a critical requirement. These laminates are ideal for radar systems, phased array antennas, mobile communication systems, microwave test equipment, microwave transmission devices and RF components.

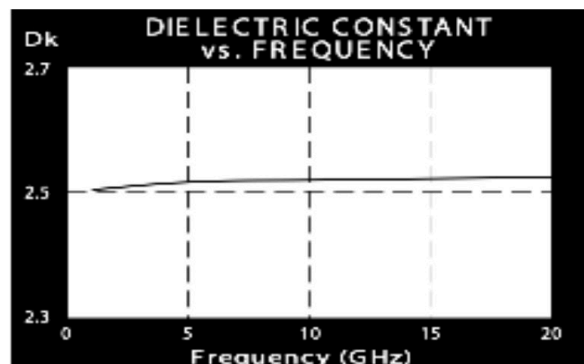
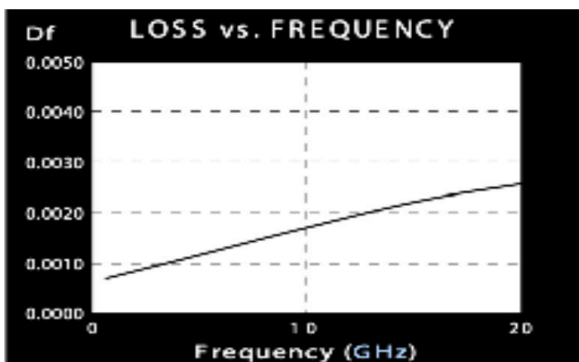
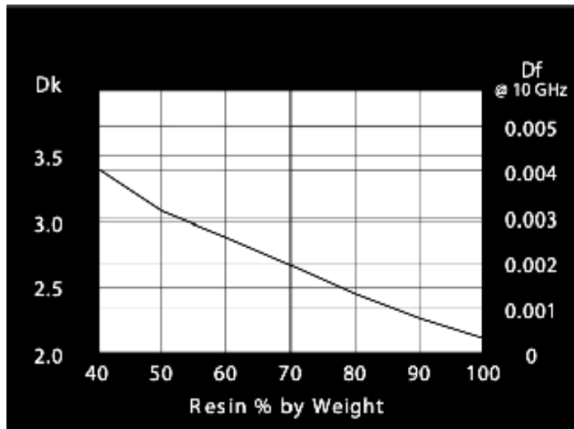
TLT laminates can be sheared, drilled, milled and plated using standard methods for PTFE/woven fiberglass materials. The laminates are dimensionally stable and exhibit virtually no moisture absorption during fabrication.

TLT laminates are generally ordered clad on both sides.

### Benefits & Applications:

- Excellent Mechanical & Thermal Properties
- Low Dissipation Factor
- Low & Stable Dielectric Constant
- UL 94 V-0 Rating

- LNAs, LNBs and LNCs
- PCS/PCN Large Format Antennas
- High Power Amplifiers
- Passive Components



## TLT Low Loss RF/Microwave Laminates

TLT Typical Values					
Property	Test Method	Unit	Value	Unit	Value
Dk @ 1 MHz	IPC-650 2.5.5.3		2.50		2.50
Df @ 1 MHz	IPC-650 2.5.5.3		0.0006		0.0006
Dk @ 10 GHz	IPC-650 2.5.5.3		2.48		2.48
Df @ 10 GHz	IPC-650 2.5.5.3		0.0017		0.0017
Moisture Absorption	IPC-650 2.6.2.1	%	<0.02	%	<0.02
Dielectric Breakdown	IPC-650 2.5.6	Kv	>60	Kv	>60
Volume Resistivity	IPC-650 2.5.17.1	Mohms/cm	10 <sup>7</sup>	Mohms/cm	10 <sup>7</sup>
Surface Resistivity	IPC-650 2.5.17.1	Mohms	10 <sup>7</sup>	Mohms	10 <sup>7</sup>
Arc Resistance	IPC-650 2.5.1	Seconds	>180	Seconds	>180
Flex Strength (MD)	IPC-650 2.4.4	psi	>23,000	N/mm <sup>2</sup>	>159
Flex Strength (CD)	IPC-650 2.4.4	psi	>19,000	N/mm <sup>2</sup>	>131
Peel Strength (1 oz ED)	IPC-650 2.4.8	lbs/in	12	N/mm	2.1
Thermal Conductivity	ASTM F 433	W/M*K	0.19	W/M*K	0.19
CTE (X-Y axis)	ASTM D 3386 (TMA)	ppm/°C	21-23	ppm/°C	21-23
CTE (Z axis)	ASTM D 3386 (TMA)	ppm/°C	215	ppm/°C	215
Flammability Rating	UL 94		V-0		V-0

All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.

Designation	Dk
TLT-9	2.50 ± 0.05
TLT-8	2.55 ± 0.05
TLT-7	2.60 ± 0.05
TLT-6	2.65 ± 0.05

Typical Thicknesses <sup>1</sup>	
Inches	mm
0.0014 - 0.1250	0.04 - 3.18

Available Sheet Sizes <sup>2</sup>	
Inches	mm
12 x 18	305 x 457
16 x 18	406 x 457
18 x 24	457 x 610
16 x 36	406 x 914
24 x 36	610 x 914

<sup>1</sup> Please call for availability of additional thicknesses.

<sup>2</sup> Standard sheet size is 36" x 48" (457 mm x 610 mm). Please call for availability of other sizes.

Please see our Product Selector Guide for Information on available copper cladding.

An example of our part number is: **TLT-9-0310-CV1/CV1 - 18" x 24" (457 mm x 610 mm)**