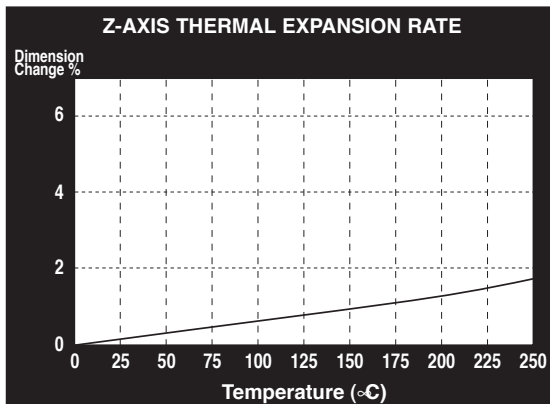


## TLC Low Cost RF Substrate

TLC laminates are engineered to provide a cost effective substrate suitable for a wide range of microwave applications. TLC laminates offer superior electrical performance compared to thermoset laminates (e.g. FR-4, PPO, BT, polyimide and cyanate ester). TLC's construction also provides exceptional mechanical stability.

TLC 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.



### Benefits & Applications:

- Excellent PIM Values in PCBs (measured at lower than -160 dBc\*)
  - Low Cost
  - Tightly Controlled Dk
  - Low Df
  - Excellent Dimensional Stability
  - High Flexural Strength
  - UL 94 V-0 Rating
- 
- LNBS
  - Power Amplifiers
  - PCS/PCN Large Format Antennas
  - Passive Components

\*Measurement using manufactured PCB coupon with 20 watts per channel @ 800 and 1800 MHz.

## TLC Low Cost RF Substrate

TLC-32 Typical Values					
Property	Test Method	Unit	Value	Unit	Value
Dk @ 10 GHz	IPC-650 2.5.5.5		3.20		3.20
Df @ 10 GHz	IPC-650 2.5.5.5		0.0030		0.0030
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
Flexural Strength (MD)	IPC-650 2.4.4	lbs/in	>40,000	N/mm <sup>2</sup>	>276
Flexural Strength (CD)	IPC-650 2.4.4	lbs/in	>35,000	N/mm <sup>2</sup>	>241
Peel Strength (1 oz. copper)	IPC-650 2.4.8	lbs/in	12.0	N/mm	2.1
Thermal Conductivity	ASTM F 433	W/M*K	0.24	W/M*K	0.24
CTE (x-y axis)	ASTM D 3386/TMA	ppm/°C	9 - 12	ppm/°C	9 - 12
CTE (z axis)	ASTM D 3386/TMA	ppm/°C	70	ppm/°C	70
UL-94 Flammability Rating	UL-94		V-0		V-0

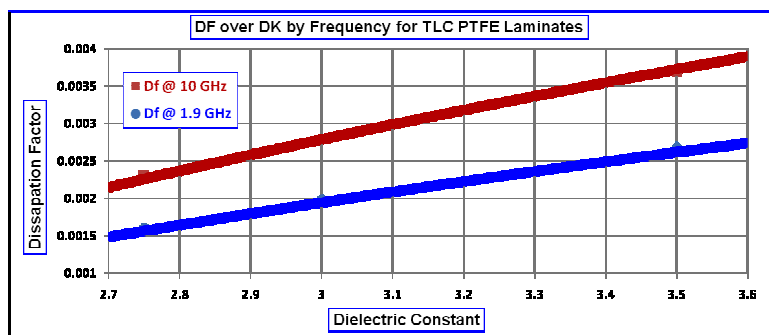
All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.

Designation	Dk	Dielectric Thickness inches	Dielectric Thickness mm
TLC-27	2.75 ± 0.05	≥0.0145	≥0.37
TLC-30	3.00 ± 0.05	≥0.0085	≥0.22
TLC-32	3.20 ± 0.05	≥0.0100	≥0.25

Available Sheet Sizes	
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
18 x 48	457 x 1220

<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: **TLC-32-0620-CH/CH - 18" x 24" (457 mm x 610 mm)**