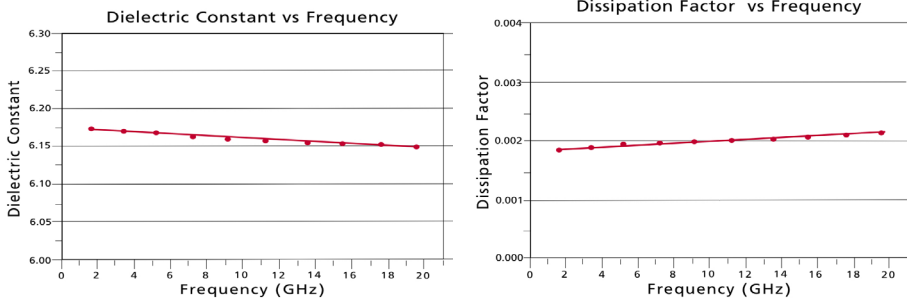
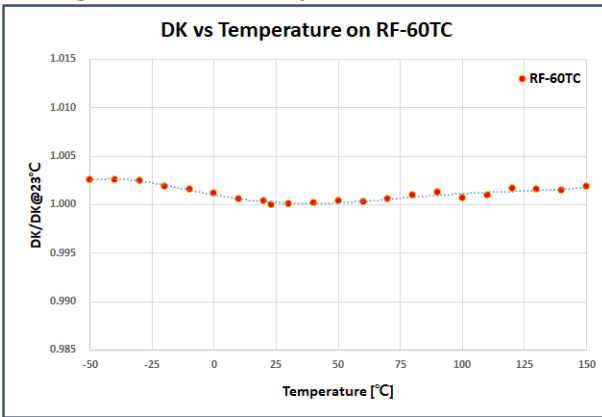


## RF-60TC Base Material for High Power RF Applications

RF-60TC is a PTFE based, ceramic filled fiberglass substrate for use as a base material for high power RF and microwave applications. This material is designed to provide lower operating temperatures in high power applications and better gains and efficiencies in miniaturized antenna applications for the 6.15 DK market through improved dielectric heat dissipation and exceptionally low dielectric losses.

RF-60TC's enhanced heat transfer allows for additional design margin, extends the active components' lifetime and improves long term reliability.

RF-60TC has excellent adhesion to very low profile and reverse treated copper for reduced insertion loss. Heavy metal backed laminates are also available. The low CTE and improved dimensional stability of RF-60TC make it possible to build high layer count multilayer PWBs with improved plated through hole reliability.



### Benefits & Applications:

- Improved loss tangent
    - Lower insertion loss
    - Enhanced antenna gain/efficiency
  - High thermal conductivity
    - Exceptional thermal management
    - Lower operating temperature
    - Higher power application
    - Long term reliability
  - Enhanced dimensional stability
  - Low Z-axis CTE
    - Multilayer application available
    - Reliable plated through hole
  - Excellent adhesion to metal
    - Lower profile copper available
    - Heavy metal back available
  - Stable DK over frequency
  - Stable DK over temperature
  - Low moisture absorption
- 
- High Power Amplifiers
  - Miniaturized Antennas
    - GPS, Patch, RFID reader
  - Filters, Couplers & Dividers
  - Satellites

RF-60TC Typical Values					
Property	Test Method	Unit	Value	Unit	Value
Dk @ 10 GHz	IPC-650 2.5.5.5.1 (Modified)		6.15 ± 0.15		6.15 ± 0.15
Df @ 10 GHz	IPC-650 2.5.5.5.1 (Modified)		0.0020		0.0020
T <sub>c</sub> K		ppm/°C	-3.581	ppm/°C	-3.581
Dielectric Breakdown	IPC-650 2.5.6	kV	55	kV	55
Dielectric Strength	IPC-650 2.5.6.2	V/mil	550	V/mm	21,654
Arc Resistance	IPC-650 2.5.1	Seconds	>180	Seconds	>180
Moisture Absorption	IPC-650 2.6.2.1	%	0.03	%	0.03
Flexural Strength (MD)	IPC-650 2.4.4	psi	10,000	N/mm <sup>2</sup>	69
Flexural Strength (CD)	IPC-650 2.4.4	psi	9,000	N/mm <sup>2</sup>	62
Tensile Strength (MD)	IPC-650 2.4.19	psi	9,000	N/mm <sup>2</sup>	62
Tensile Strength (CD)	IPC-650 2.4.19	psi	7,000	N/mm <sup>2</sup>	48
Young's Modulus (MD)	ASTM D 3039/IPC-TM-650 2.4.19	kpsi	721	N/mm <sup>2</sup>	4971
Poisson's Ratio (MD)	ASTM D 3039/IPC-TM-650 2.4.19		0.155		0.155
Peel Strength (1 oz. ED)	IPC-650 2.4.8	lbs/in	8	N/mm	1.43
Thermal Conductivity (Unclad)	IPC-650 2.4.50	W/M*K	0.90	W/M*K	0.90
Thermal Conductivity (CH/CH)	IPC-650 2.4.50	W/M*K	1.00	W/M*K	1.00
Thermal Conductivity (C1/C1)	IPC-650 2.4.50	W/M*K	1.05	W/M*K	1.05
Dimensional Stability (MD)	IPC-650 2.4.39 Sec. 5.4 (After Bake)	mils/in	0.01	mm/M	0.01
Dimensional Stability (CD)	IPC-650 2.4.39 Sec. 5.4 (After Bake)	mils/in	0.69	mm/M	0.69
Dimensional Stability (MD)	IPC-650 2.4.39 Sec. 5.5 (Thermal Stress)	mils/in	0.06	mm/M	0.06
Dimensional Stability (CD)	IPC-650 2.4.39 Sec. 5.5 (Thermal Stress)	mils/in	0.80	mm/M	0.80
Surface Resistivity	IPC-650 2.5.17.1 (After Humidity)	Mohm	1.0 x 10 <sup>8</sup>	Mohm	1.0 x 10 <sup>8</sup>
Volume Resistivity	IPC-650 2.5.17.1 (After Humidity)	Mohm/cm	1.0 x 10 <sup>8</sup>	Mohm/cm	1.0 x 10 <sup>8</sup>
CTE (X, Y axis)	IPC-650 2.4.41 (RT- 150 °C)	ppm/°C	9.9	ppm/°C	9.9
CTE (Z axis)	IPC-650 2.4.41 (RT- 150 °C)	ppm/°C	40	ppm/°C	40
Density (Specific Gravity)	IPC-650 2.3.5	g/cm <sup>3</sup>	2.84	g/cm <sup>3</sup>	2.84
Specific Heat	IPC-650 2.4.50	J/gK	0.94	J/gK	0.94
T <sub>d</sub> (2% Wt. Loss)	IPC - 650 2.4.24.6 / TGA	°F	930	°C	500
T <sub>d</sub> (5% Wt. Loss)	IPC - 650 2.4.24.6 / TGA	°F	960	°C	515
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	Typical Thicknesses <sup>1</sup>		Available Sheet Sizes <sup>2</sup>	
		Inches	mm	Inches	mm
RF-60TC	6.15 ± 0.15	0.0050	0.13	12 x 18	305 x 457
		0.0100	0.25	16 x 18	406 x 457
		0.0200	0.51	18 x 24	457 x 610
		0.0250	0.64	16 x 36	406 x 914
		0.0300	0.76	24 x 36	610 x 914
		0.0600	1.52		

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

<sup>2</sup> Standard sheet size is 18" x 24" (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:

**RF-60TC-0250-C1/C1 - 18" x 24"**  
**(457 mm x 610 mm)**

