

## Rogers Corporation TMM® TMM10 Ceramic Thermoset Polymer Composite

Category : Polymer , Thermoset

### Material Notes:

TMM® Thermoset microwave materials are ceramic thermoset polymer composites designed for high plate-thru-hole reliability stripline and microstrip applications. The electrical and mechanical properties of TMM laminates combine many of the benefits of both ceramic and traditional PTFE microwave circuit laminates, without requiring the specialized production techniques common to these materials. Features: Wide range of dielectric constants. Ideal for single material systems on a wide variety of applications. Excellent mechanical properties. Resists creep and cold flow. Exceptionally low thermal coefficient of dielectric constant. Coefficient of thermal expansion matched to copper. High reliability of plated through holes. Resistant to process chemicals. No damage to material during fabrication and assembly processes. Thermoset resin for reliable wirebonding. No specialized production techniques required. TMM 10 and 10i laminates can replace alumina substrates. Lead-free process compatible. Typical Applications: RF and Microwave Circuitry, Global Positioning Systems, Antennas, Power Amplifiers and Combiners, Patch Antennas, Filters and Coupler, Dielectric Polarizers and Lenses, Satellite Communication Systems, Chip Testers. Information provided by Rogers Corporation.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Rogers-Corporation-TMM-TMM10-Ceramic-Thermoset-Polymer-Composite.php](http://www.lookpolymers.com/polymer_Rogers-Corporation-TMM-TMM10-Ceramic-Thermoset-Polymer-Composite.php)

Physical Properties	Metric	English	Comments
Specific Gravity	2.77 g/cc	2.77 g/cc	ASTM D792
Water Absorption	0.090 %	0.090 %	D/48/50; ASTM D570
	@Thickness 1.27 mm	@Thickness 0.0500 in	
	0.20 %	0.20 %	D/48/50; ASTM D570
	@Thickness 3.17 mm	@Thickness 0.125 in	
Thickness	381 - 12700 microns	15.0 - 500 mil	Range of Standard Thicknesses

Mechanical Properties	Metric	English	Comments
Flexural Strength	93.9 MPa	13600 psi	X, Y direction; Condition A; ASTM D790
Flexural Modulus	12.3 GPa	1780 ksi	X, Y direction; Condition A; ASTM D790
Izod Impact, Notched	0.230 J/cm	0.430 ft-lb/in	X, Y direction; ASTM D256A
Peel Strength	0.877 kN/m	5.00 pli	X, Y direction; after solder float 1 oz. EDC; IPC-TM-650 2.4.8

Thermal Properties	Metric	English	Comments
CTE, linear	20.0 µm/m-°C	11.1 µin/in-°F	Z-Direction; ASTM D3386
	@Temperature 0.000 - 140 °C	@Temperature 32.0 - 284 °F	

Thermal Properties	Metric	English	Comments
	@Temperature 0.000 - 140 °C	@Temperature 32.0 - 284 °F	X-, Y-Direction; ASTM D3386
Specific Heat Capacity	0.740 J/g-°C	0.177 BTU/lb-°F	calculated
Thermal Conductivity	1.76 W/m-K @Temperature 80.0 °C	12.2 BTU-in/hr-ft <sup>2</sup> -°F @Temperature 176 °F	ASTM C518
Decomposition Temperature	425 °C	797 °F	TGA; ASTM D3850

Electrical Properties	Metric	English	Comments
Volume Resistivity	2.00e+14 ohm-cm	2.00e+14 ohm-cm	ASTM D257
Surface Resistance	4.00e+13 ohm	4.00e+13 ohm	ASTM D257
Insulation Resistance	>= 2.00e+12 ohm	>= 2.00e+12 ohm	C/96/60/95; ASTM D257
Dielectric Constant	8.97 - 9.43 @Frequency 1.00e+10 Hz	8.97 - 9.43 @Frequency 1.00e+10 Hz	Z direction; IPC-TM-650 2.5.5.5
Dissipation Factor	0.0022 @Frequency 1.00e+10 Hz	0.0022 @Frequency 1.00e+10 Hz	Z direction; IPC-TM-650, 2.5.5.5

Descriptive Properties	Value	Comments
Thermal Coefficient of Dielectric Constant	-38 ppm/°C	IPC-TM-650 2.5.5.5; -55°C to 125°C

## Contact Songhan Plastic Technology Co.,Ltd.

Website : [www.lookpolymers.com](http://www.lookpolymers.com)

Email : [sales@lookpolymers.com](mailto:sales@lookpolymers.com)

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China