

Arlon CLTE Microwave Printed Circuit Board Substrate

Category : Polymer , Thermoplastic , Fluoropolymer , PTFE

Material Notes:

CLTE is a ceramic powder-filled and woven micro fiberglass reinforced PTFE composite engineered to produce a stable, low water absorption laminate with a nominal Dielectric Constant of 2.98. Ceramic/PTFE composite Low water absorption High thermal conductivity Low loss Tight Dk and Thickness tolerance Benefits: Thermally stable Dk and Df Dimensional stability Typical Applications: Radar Manifolds Phased Array Antennas Microwave Feed Networks Phase Sensitive Electric Structures PAs, LNAs, LNBSatellite & Space Electronics This data represents typical values for the production material and should not be used as material specifications. Information provided by ARLON Silicone Technologies Division.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Arlon-CLTE-Microwave-Printed-Circuit-Board-Substrate.php

Physical Properties	Metric	English	Comments
Density	2.38 g/cc	0.0860 lb/in ³	ASTM D792 Method A
Water Absorption	0.040 %	0.040 %	IPC TM-650 2.6.2.1
Outgassing - Total Mass Loss	0.00 %	0.00 %	Collected Volatiles; NASA SP-R-0022A
	@Pressure <= 1.33e-10 MPa, Temperature 125 °C	@Pressure <= 1.93e-8 psi, Temperature 257 °F	
	0.00 %	0.00 %	Water Vapor Recovered; NASA SP-R-0022A
	@Pressure <= 1.33e-10 MPa, Temperature 125 °C	@Pressure <= 1.93e-8 psi, Temperature 257 °F	
	0.020 %	0.020 %	NASA SP-R-0022A
	@Pressure <= 1.33e-10 MPa, Temperature 125 °C	@Pressure <= 1.93e-8 psi, Temperature 257 °F	

Mechanical Properties	Metric	English	Comments
Tensile Strength	48.3 MPa	7000 psi	Cross; IPC TM-650 2.4.18.3
	56.5 MPa	8200 psi	Machine; IPC TM-650 2.4.18.3
Modulus of Elasticity	7.24 GPa	1050 ksi	IPC TM-650 2.4.18.3
Flexural Strength	120 MPa	17400 psi	Cross; IPC TM-650 2.4.4
	132 MPa	19100 psi	Machine; IPC TM-650 2.4.4
Compressive Modulus	1.55 GPa	225 ksi	ASTM D3410
Poissons Ratio	0.13	0.13	ASTM D3039

Mechanical Properties	Metric	English	Comments
	1.23 kN/m	7.00 pli	To Copper (1 oz./35 micron); After Thermal Stress; IPC TM-650 2.4.8
	1.30 kN/m	7.40 pli	To Copper (1 oz./35 micron); At Elevated Temperatures; IPC TM-650 2.4.8.2

Thermal Properties	Metric	English	Comments
CTE, linear	10.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	5.56 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	x direction; IPC TM-650 2.4.41
	@Temperature 50.0 - 150 $^\circ\text{C}$	@Temperature 122 - 302 $^\circ\text{F}$	
	12.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.67 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	y direction; IPC TM-650 2.4.41
	@Temperature 50.0 - 150 $^\circ\text{C}$	@Temperature 122 - 302 $^\circ\text{F}$	
CTE, linear, Transverse to Flow	34.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	18.9 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	z direction; IPC TM-650 2.4.24
	@Temperature 50.0 - 150 $^\circ\text{C}$	@Temperature 122 - 302 $^\circ\text{F}$	
Thermal Conductivity	0.500 W/m-K	3.47 BTU-in/hr-ft ² - $^\circ\text{F}$	ASTM E1461
Decomposition Temperature	493 $^\circ\text{C}$	919 $^\circ\text{F}$	Onset; IPC TM-650 2.4.24.6
	525 $^\circ\text{C}$	977 $^\circ\text{F}$	5 percent; IPC TM-650 2.4.24.6
Flammability, UL94	V-0	V-0	

Electrical Properties	Metric	English	Comments
Volume Resistivity	2.25e+14 ohm-cm	2.25e+14 ohm-cm	E24/125; IPC TM-650 2.5.17.1
	1.40e+15 ohm-cm	1.40e+15 ohm-cm	C96/35/90; IPC TM-650 2.5.17.1
Surface Resistance	1.30e+11 ohm	1.30e+11 ohm	C96/35/90; IPC TM-650 2.5.17.1
	7.52e+14 ohm	7.52e+14 ohm	E24/125; IPC TM-650 2.5.17.1
Dielectric Constant	2.98	2.98	may vary by thickness; IPC TM-650 2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
	2.98	2.98	may vary by thickness; IPC TM-650 2.5.5.5
	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	
	2.75	2.75	
	@Thickness 0.0000787	@Thickness	

Electrical Properties	mm Metric	0.00000310 in English	Comments
	2.85	2.85	
	@Thickness 0.000135 mm	@Thickness 0.00000530 in	
	2.94	2.94	
	@Thickness 0.000241 mm	@Thickness 0.00000950 in	
	2.98	2.98	
	@Thickness 0.00237 mm	@Thickness 0.0000932 in	
Dielectric Strength	43.3 kV/mm	1100 kV/in	IPC TM-650 2.5.6.2
Dielectric Breakdown	64000 V	64000 V	IPC TM-650 2.5.6
Dissipation Factor	0.00225	0.00225	
	@Temperature 0.000 °C	@Temperature 32.0 °F	
	0.0025	0.0025	
	@Temperature 100 °C	@Temperature 212 °F	
	0.0015	0.0015	IPC TM-650 2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
	0.0023	0.0023	IPC TM-650 2.5.5.5
	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	
Arc Resistance	245 sec	245 sec	IPC TM-650 2.5.1

Descriptive Properties	Value	Comments
IPC Delamination - T260 (minutes)	> 60	IPC TM-650 2.4.24.1
IPC Delamination - T288 (minutes)	> 60	IPC TM-650 2.4.24.1
IPC Delamination - T300 (minutes)	> 60	IPC TM-650 2.4.24.1
Temperature Coefficient of Dielectric (ppm/°C)	-9	IPC TM-650 2.5.5.5
Z-Axis Expansion (%)	1.5	IPC TM-650 2.4.24 (50-260°C)

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