

Arlon CuClad 233 PTFE/Woven Fiberglass Laminate Microwave Printed Circuit Board Substrate

Category : Polymer , Thermoplastic , Fluoropolymer , PTFE

Material Notes:

CuClad 233 uses a medium fiberglass/PTFE ratio to balance lower dielectric constant and improved dissipation factor without sacrificing mechanical properties. Cross Plie Woven Fiberglass, alternating plies are oriented 90° to each other. High PTFE to Glass Ratio. Better dielectric constant uniformity than comparable non-woven fiberglass reinforced laminates. Benefits: Electrical and Mechanical isotropy in the X-Y Plane. Extremely Low Loss. Well Suited for Er Sensitive Circuits. Typical Applications: Military Electronics (Radars, ECM, ESM). Microwave Components (Filters, Couplers, LNAs, etc.). Information provided by Arlon Materials for Electronics (MED).

Order this product through the following link:

http://www.lookpolymers.com/polymer_Arlon-CuClad-233-PTFEWoven-Fiberglass-Laminate-Microwave-Printed-Circuit-Board-Substrate.php

Physical Properties	Metric	English	Comments
Density	2.26 g/cc	0.0816 lb/in ³	ASTM D792 Method A
Water Absorption	0.020 %	0.020 %	IPC TM-650 2.6.2.2
Outgassing - Total Mass Loss	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	
	0.010 %	0.010 %	
	@Pressure <=1.33e-10 MPa, Temperature 125 °C	@Pressure <=1.93e-8 psi, Temperature 257 °F	Collected Volatiles; NASA SP-R-0022A
	0.010 %	0.010 %	
	@Pressure <=1.33e-10 MPa, Temperature 125 °C	@Pressure <=1.93e-8 psi, Temperature 257 °F	
	0.010 %	0.010 %	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	67.6 MPa	9800 psi	Cross; ASTM D882
	71.0 MPa	10300 psi	Machine; ASTM D882
Modulus of Elasticity	2.85 GPa	414 ksi	Cross; ASTM D638
	3.52 GPa	510 ksi	Machine; ASTM D638
Flexural Modulus	>= 2.56 GPa	>= 371 ksi	ASTM D790
Compressive Modulus	1.90 GPa	276 ksi	ASTM D695
	2.45 kN/m	14.0 pli	After Thermal Stress; IPC TM-650

Peel Strength Mechanical Properties	Metric	English	2.4.8 Comments
Thermal Properties	Metric	English	Comments
CTE, linear	23.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	12.8 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	x direction; IPC TM-650 2.4.24
	@Temperature 0.000 - 100 $^\circ\text{C}$	@Temperature 32.0 - 212 $^\circ\text{F}$	
	24.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	13.3 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	y direction; IPC TM-650 2.4.24
	@Temperature 0.000 - 100 $^\circ\text{C}$	@Temperature 32.0 - 212 $^\circ\text{F}$	
CTE, linear, Transverse to Flow	194 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	108 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	z direction; IPC TM-650 2.4.24
	@Temperature 0.000 - 100 $^\circ\text{C}$	@Temperature 32.0 - 212 $^\circ\text{F}$	
Thermal Conductivity	0.258 W/m-K	1.79 BTU-in/hr-ft ² - $^\circ\text{F}$	ASTM E1225
	@Temperature 100 $^\circ\text{C}$	@Temperature 212 $^\circ\text{F}$	
Flammability, UL94	V-0	V-0	Vertical Burn

Electrical Properties	Metric	English	Comments
Volume Resistivity	8.00e+14 ohm-cm	8.00e+14 ohm-cm	C96/35/90; IPC TM-650 2.5.17.1
Surface Resistance	2.40e+12 ohm	2.40e+12 ohm	C96/35/90; IPC TM-650 2.5.17.1
Dielectric Constant	2.33	2.33	C23/50; IPC TM-650 2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
	2.33	2.33	C23/50; IPC TM-650 2.5.5.5
	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	
Dielectric Breakdown	>= 45000 V	>= 45000 V	D48/50; ASTM D149
Dissipation Factor	0.0013	0.0013	C23/50; IPC TM-650 2.5.5.5
	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	
Arc Resistance	>= 180 sec	>= 180 sec	D48/50; ASTM D495

Descriptive Properties	Value	Comments
Temperature Coefficient of Dielectric (ppm/ $^\circ\text{C}$)	-171	IPC TM-650 2.5.5.5 (-10 - 140 $^\circ\text{C}$)

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