

Park Electrochemical Nelco® N4000-7 FR-4 Epoxy Laminate and Prepreg

Category : Polymer , Thermoset , Epoxy

Material Notes:

The Nelco® N4000-7 low-CTE epoxy laminate and prepreg system is a cost-effective solution for use in a broad range of multilayer PCB designs requiring low Z-axis expansion, excellent thermal stability and superior hole-wall integrity. Key Features and Benefits: Outstanding Z-axis, thermal stability and hole wall integrity Automotive Testing SI (Signal Integrity) option CAF resistant Cost-effective standard FR-4 processing Applications/Qualifications: Wireless Handsets Wireless Infrastructure Digital Broadband Multilayers Automotive Underhood Automotive Backplanes Fine-Line Multilayers Fine Pitch BGA Multilayers Direct Chip Attach RoHS Compliant Meets IPC-4101/98 Specifications Information provided by Park Electrochemical Corp.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Park-Electrochemical-Nelco-N4000-7-FR-4-Epoxy-Laminate-and-Prepreg.php

Physical Properties	Metric	English	Comments
Density	1.97 g/cc	0.0712 lb/in ³	50% Resin Content; Internal Method
Water Absorption	0.070 %	0.070 %	IPC-TM-650.2.6.2.1

Mechanical Properties	Metric	English	Comments
Modulus of Elasticity	19.3 GPa	2800 ksi	Y; ASTM D3039
	24.1 GPa	3500 ksi	X; ASTM D3039
Poissons Ratio	0.11	0.11	Y; ASTM D3039
	0.13	0.13	X; ASTM D3039
Peel Strength	1.31 kN/m	7.50 pli	after solder float; IPC-TM-650.2.4.8
	1.42 kN/m	8.10 pli	at elevated temperature; IPC-TM-650.2.4.8.2a
	1.58 kN/m	9.00 pli	after exposure to process solutions; IPC-TM-650.2.4.8

Thermal Properties	Metric	English	Comments
CTE, linear	12.0 - 15.0 $\mu\text{m}/\text{m}^{\circ}\text{C}$	6.67 - 8.33 $\mu\text{in}/\text{in}^{\circ}\text{F}$	X/Y; IPC-TM-650.2.4.41
	@Temperature -40.0 - 125 $^{\circ}\text{C}$	@Temperature -40.0 - 257 $^{\circ}\text{F}$	
	50.0 $\mu\text{m}/\text{m}^{\circ}\text{C}$	27.8 $\mu\text{in}/\text{in}^{\circ}\text{F}$	Z-Axis Alpha 1; IPC-TM-650.2.4.41
@Temperature 50.0 - 155 $^{\circ}\text{C}$	@Temperature 122 - 311 $^{\circ}\text{F}$		
	270 $\mu\text{m}/\text{m}^{\circ}\text{C}$	150 $\mu\text{in}/\text{in}^{\circ}\text{F}$	Z-Axis Alpha 2; IPC-TM-650.2.4.41
	@Temperature 155 -	@Temperature 311 -	

Thermal Properties	260 °C Metric	500 °F English	Comments
Specific Heat Capacity	1.21 J/g-°C	0.290 BTU/lb-°F	ASTM E1461
Thermal Conductivity	0.525 W/m-K	3.64 BTU-in/hr-ft ² -°F	ASTM E1461
Glass Transition Temp, Tg	150 °C	302 °F	TMA; IPC-TM-650.2.4.24c
	155 °C	311 °F	DSC; IPC-TM-650.2.4.25c
	160 °C	320 °F	DMA (Tan d Peak); IPC-TM-650.2.4.24.3
Decomposition Temperature	330 °C	626 °F	5% weight loss; TGA; IPC-TM-650.2.4.24.6
Flammability, UL94	V-0	V-0	

Electrical Properties	Metric	English	Comments
Volume Resistivity	1.00e+13 ohm-cm	1.00e+13 ohm-cm	E - 24/125; IPC-TM-650.2.5.17.1
	1.00e+14 ohm-cm	1.00e+14 ohm-cm	C - 96/35/90; IPC-TM-650.2.5.17.1
Surface Resistance	1.00e+13 ohm	1.00e+13 ohm	E - 24/125; IPC-TM-650.2.5.17.1
	1.00e+14 ohm	1.00e+14 ohm	C - 96/35/90; IPC-TM-650.2.5.17.1
Dielectric Constant	3.9	3.9	Stripline; IPC-TM-650.2.5.5.5
	@Frequency 2.50e+9 Hz	@Frequency 2.50e+9 Hz	
	3.9	3.9	Stripline; IPC-TM-650.2.5.5.5
	@Frequency 1.00e+10 Hz	@Frequency 1.00e+10 Hz	
	4.0	4.0	RF Impedance; IPC-TM-650.2.5.5.9
	@Frequency 1.00e+9 Hz	@Frequency 1.00e+9 Hz	
	4.5	4.5	TFC/LCR Meter; IPC-TM-650.2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
Dielectric Strength	49.2 kV/mm	1250 kV/in	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>= 50000 V	>= 50000 V	IPC-TM-650.2.5.6
Dissipation Factor	0.017	0.017	Stripline; IPC-TM-650.2.5.5.5
	@Frequency 2.50e+9 Hz	@Frequency 2.50e+9 Hz	
	0.017	0.017	Stripline; IPC-TM-650.2.5.5.5

Electrical Properties	@Frequency 1.00e+10 Metric Hz	@Frequency 1.00e+10 English Hz	Comments
	0.018	0.018	TFC/LCR Meter; IPC-TM-650.2.5.5.3
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	
Arc Resistance	124 sec	124 sec	IPC-TM-650.2.5.1

Descriptive Properties	Value	Comments
Methylene Chloride Resistance (% Weight Change)	0.31	IPC-TM-650.2.3.4.3
Pressure Cooker	Pass	60 min then solder dip @288°C until failure (max 10 min.); IPC-TM-650.2.6.16 (modified)
T260 (minutes)	16	IPC-TM-650.2.4.24.1
Z Axis Expansion (%)	3.7	50°C to 260°C; IPC-TM-650.2.4.41

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