Park Electrochemical Nelco® N4000-29 Multifunctional Epoxy

Category : Polymer , Thermoset , Epoxy

Material Notes:

The Nelco N4000-29 is an advanced, lead-free, low-CTE, high Tg (185° C by DSC) multifunctional epoxy dielectric substrate. This material has been designed for use not only in standard multilayer PWB designs, but for today's toughest, high-performance, lead-free applications.Key Features and Benefits:Low Z-axis expansionHigh Tg, excellent thermal stability and moisture resistanceCAF ResistantProprietary resin chemistrySuperior electrical propertiesOptimized FR-4 processingApplications/Qualifications:Advanced Lead-Free Assembly SubstrateLarge Format BackplanesTight Tolerance Via to Via ApplicationsHigh I / O Count BGA SubstratesExtreme Layer Count MultilayersLead-Free DCA ApplicationsHigh Temperature Underhood AutomotiveTelecommunications InfrastructureSophisticated Data Storage ApplicationsRoHS CompliantMeets IPC-4101/28, /98, /99 and /126 SpecificationsInformation provided by Park Electrochemical Corp.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Park-Electrochemical-Nelco-N4000-29-Multifunctional-Epoxy.php

Physical Properties	Metric	English	Comments
Density	1.99 g/cc	0.0719 lb/in³	50% Resin Content; Internal Method
Water Absorption	0.15 %	0.15 %	IPC-TM-650.2.6.2.1

Mechanical Properties	Metric	English	Comments
Modulus of Elasticity	20.0 GPa	2900 ksi	Y; ASTM D3039
	24.8 GPa	3600 ksi	X; ASTM D3039
Poissons Ratio	0.16	0.16	Y; ASTM D3039
	0.18	0.18	X; ASTM D3039
Peel Strength	1.56 kN/m	8.90 pli	at elevated temperature; IPC-TM-650.2.4.8.2a
	1.70 kN/m	9.70 pli	after exposure to process solutions; IPC-TM-650.2.4.8
	1.88 kN/m	10.7 pli	after solder float; IPC-TM-650.2.4.8

Thermal Properties	Metric	English	Comments
CTE, linear	12.0 - 15.0 µm/m-°C @Temperature -40.0 - 125 °C	6.67 - 8.33 µin/in-°F @Temperature -40.0 - 257 °F	X/Y; IPC-TM-650.2.4.41
	55.1 µm/m-°C @Temperature 50.0 - 185 °C	30.6 µin/in-°F @Temperature 122 - 365 °F	Z-Axis Alpha 1; IPC-TM-650.2.4.41

Thermal Properties	Metric	English	Comments
	265 µm/m-°C @Temperature 185 - 260 °C	147 µin/in-°F @Temperature 365 - 500 °F	Z-Axis Alpha 2; IPC-TM-650.2.4.41
Specific Heat Capacity	0.920 J/g-°C	0.220 BTU/lb-°F	ASTM E1461-92
Thermal Conductivity	0.460 W/m-K	3.19 BTU-in/hr-ft²-°F	ASTM E1461-92
Glass Transition Temp, Tg	>= 175 °C	>= 347 °F	TMA; IPC-TM-650.2.4.24c
	>= 185 °C	>= 365 °F	DSC; IPC-TM-650.2.4.25c
Decomposition Temperature	350 °C	662 °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	C - 96/35/90; IPC-TM-650.2.5.17.1
	1.00e+14 ohm-cm	1.00e+14 ohm-cm	E - 24/125; IPC-TM-650.2.5.17.1
Surface Resistance	1.00e+12 ohm	1.00e+12 ohm	C - 96/35/90; IPC-TM-650.2.5.17.1
	1.00e+13 ohm	1.00e+13 ohm	E - 24/125; IPC-TM-650.2.5.17.1
Dielectric Constant	4.0 @Frequency 1.00e+10 Hz	4.0 @Frequency 1.00e+10 Hz	Stripline; IPC-TM-650.2.5.5.5
	4.2 @Frequency 1.00e+10 Hz	4.2 @Frequency 1.00e+10 Hz	Split Post Cavity
	4.3 @Frequency 1.00e+9 Hz	4.3 @Frequency 1.00e+9 Hz	RF Impedance; IPC-TM-650.2.5.5.9
	4.5 @Frequency 1.00e+6 Hz	4.5 @Frequency 1.00e+6 Hz	TFC/LCR Meter; IPC-TM-650.2.5.5.3
Dielectric Strength	43.3 kV/mm	1100 kV/in	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>= 50000 V	>= 50000 V	IPC-TM-650.2.5.6
Dissipation Factor	0.015 @Frequency 2.50e+9 Hz	0.015 @Frequency 2.50e+9 Hz	Split Post Cavity
	0.016	0.016	

Electrical Properties	Metric	English	Comments
	@Frequency 1.00e+6 Hz	@Frequency 1.00e+6 Hz	TFC/LCR Meter; IPC-TM-650.2.5.5.3
	0.017 @Frequency 1.00e+10 Hz	0.017 @Frequency 1.00e+10 Hz	Split Post Cavity
Arc Resistance	129 sec	129 sec	IPC-TM-650.2.5.1

Descriptive Properties	Value	Comments
Methylene Chloride Resistance (% Weight Change)	0.01	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)	>60	IPC-TM-650.2.4.24.1
T288 (minutes)	15	IPC-TM-650.2.4.24.1
Z Axis Expansion (%)	3	50°C to 260°C; IPC-TM-650.2.4.41

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