

Park Electrochemical Nelco® N4380-13 RF Microwave Performance, Modified Epoxy

Category : Polymer , Thermoset , Epoxy

Material Notes:

The Nelco N4350-13 RF and N4380-13 RF series are enhanced epoxy resin systems specifically engineered to provide a unique solution for design applications that demand outstanding thermal properties, tight dielectric constant tolerances and low signal loss properties. These next generation modified epoxies combine tightly controlled RF electrical properties with the mechanical reliability and competitive advantages of FR-4. Key Features and Benefits: Tg >210°C, outstanding thermal, electrical and signal loss properties, CAF Resistant, Tightly controlled electrical properties, N4000-13 based material, High-Tg FR-4 processing. Applications/Qualifications: 802.11 a, b and g Antennas, Automotive Power Amplifiers, Hybrid RF Multilayers, Telecommunications, High Speed Computing, Commercial RF Applications, Lead-Free Assembly Substrates. Information provided by Park Electrochemical Corp.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Park-Electrochemical-Nelco-N4380-13-RF-Microwave-Performance-Modified-Epoxy.php

| Physical Properties | Metric | English | Comments |
|---------------------|-----------|---------------------------|------------------------------------|
| Density | 1.77 g/cc | 0.0639 lb/in ³ | 50% Resin Content; Internal Method |
| Water Absorption | 0.10 % | 0.10 % | IPC-TM-650.2.6.2.1 |

| Mechanical Properties | Metric | English | Comments |
|-----------------------|-----------|----------|---|
| 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 | 10.0 - 14.0 µm/m-°C | 5.56 - 7.78 µin/in-°F | X/Y; IPC-TM-650.2.4.41 |
| | @Temperature -40.0 - 125 °C | @Temperature -40.0 - 257 °F | |
| Specific Heat Capacity | 1.21 J/g-°C | 0.290 BTU/lb-°F | ASTM E1461 |
| Thermal Conductivity | 0.350 W/m-K | 2.43 BTU-in/hr-ft ² -°F | ASTM E1461 |
| Glass Transition Temp, Tg | 200 °C | 392 °F | TMA; IPC-TM-650.2.4.24c |
| | 210 °C | 410 °F | DSC; IPC-TM-650.2.4.25c |
| | 240 °C | 464 °F | DMA (Tan δ Peak); IPC-TM-650.2.4.24.3 |
| Decomposition Temperature | 350 °C | 662 °F | 5% weight loss; TGA; IPC-TM-650.2.4.24.6 |

| Thermal Properties Flammability, UL 94 | Metric | English | Comments |
|---|--------|---------|----------|
|---|--------|---------|----------|

| 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 | 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 | 3.8 | 3.8 | Stripline; IPC-TM-650.2.5.5.5 |
| | @Frequency 1.00e+10 Hz | @Frequency 1.00e+10 Hz | |
| Dielectric Strength | 47.2 kV/mm | 1200 kV/in | IPC-TM-650.2.5.6.2 |
| | 47.2 kV/mm | 1200 kV/in | IPC-TM-650.2.5.6.2 |
| Dielectric Breakdown | >= 50000 V | >= 50000 V | IPC-TM-650.2.5.6 |
| | >= 50000 V | >= 50000 V | IPC-TM-650.2.5.6 |
| Dissipation Factor | 0.0070 | 0.0070 | Stripline; IPC-TM-650.2.5.5.5 |
| | @Frequency 1.00e+10 Hz | @Frequency 1.00e+10 Hz | |
| Arc Resistance | 123 sec | 123 sec | IPC-TM-650.2.5.1 |
| | 123 sec | 123 sec | IPC-TM-650.2.5.1 |

| Descriptive Properties | Value | Comments |
|---|-------|---|
| Methylene Chloride Resistance (% Weight Change) | 0.7 | 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) | >50 | IPC-TM-650.2.4.24.1 |
| T288 (minutes) | >8 | IPC-TM-650.2.4.24.1 |
| Z Axis Expansion (%) | 3.5 | 50°C to 260°C; IPC-TM-650.2.4.41 |

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