

meteorwave® 8350

High Speed / Extremely Low Loss

3.50 Dk Laminate

Laminate Part Number Meteorwave 8000L
Prepreg Part Number Meteorwave 8000P

Meteorwave® 8350 high frequency very low loss digital and RF electronic material is tailored to meet the needs of the RF and Microwave markets. Meteorwave® 8350 is a controlled Dk 3.5 +/- 0.05 laminate based on Meteorwave® 8000. The very advanced electrical performance and very high reliability of Meteorwave® 8350 is designed for multiple high temperature lead-free assemblies and high layer count printed circuit board designs requiring very high levels of reliability. Meteorwave® 8350 laminate and Meteorwave® 8000 prepreg offers flexibility and freedom to design high performance RF and Microwave printed wiring boards and antennae.

Key Features

Excellent Electrical Properties utilizing Nelco SI® Technology

- Controlled Dk 3.5 +/- 0.05 for all laminate thicknesses.
- Extremely low Df electrical performance - 0.0018 @ 10 GHz
- Stable electrical properties versus frequency and environmental conditions
- Designed for 100 Gbs applications

Highly CAF Resistant

- All constructions utilize super spread weaves and fiberglass finishes optimized for CAF performance..

Thermal and Mechanical Properties

- Good peel strength on ultra smooth copper
- Outstanding thermal reliability. T300 > 40 minutes.
- Meets NASA outgasing specification

High-Tg FR-4 Processing

- Processes similar to other high-Tg materials
- 30 minute lamination at 177°C plus 90 minutes cure at 216°C and 250 - 400 psi.

Available in a variety of constructions

- Available in a wide variety of constructions, copper weights and glass styles including ultra low profile copper, standard copper, double treat and RTFOIL®
- Available in laminate thicknesses from 1.2 mil and up.
- Meets UL 94V-0, IPC4105 /102 and IPC 4103 /540 specifications
- All of AGC Nelco's PCB materials are RoHS compliant

Applications

Base Station Equipment

- Filters, combiners and components

Automotive

- Radar
- Broadband communication
- Road tolling

Satellite Communication

- LNB's / LNA's
- GPS Military
- High reliability communications
- Guidance
- Radar

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| Mechanical Properties | Meteorwave® 8350 | U.S. Units | Meteorwave® 8350 | Metric | Test Method |
|--|---------------------|-----------------------|---------------------|---------------------|---------------------------------|
| Peel Strength - 1 oz. (35 micron) Cu | 3.0 | lb / inch | 0.52 | N / mm | IPC-TM-650.2.4.8 |
| After Solder Float | 3.1 | lb / inch | 0.54 | N / mm | IPC-TM-650.2.4.8 |
| At Elevated Temperature | 3.3 | lb / inch | 0.58 | N / mm | IPC-TM-650.2.4.8.2a |
| After Exposure to Process Solutions | 3.5 | lb / inch | 0.61 | N / mm | IPC-TM-650.2.4.8 |
| X / Y CTE [-40°C to +125°C] | 14 / 16 | ppm / °C | 14 / 16 | ppm / °C | IPC-TM-650.2.4.41 |
| Z Axis CTE Alpha 1 [50°C to Tg] 55% RC | 35 | ppm / °C | 35 | ppm / °C | IPC-TM-650.2.4.24 |
| Z Axis CTE Alpha 2 [Tg to 260°C] 55% RC | 185 | ppm / °C | 185 | ppm / °C | IPC-TM-650.2.4.24 |
| Z Axis Expansion [50°C to 260°C] 55% RC | 2.5 | % | 2.5 | % | IPC-TM-650.2.4.24 |
| Young's Modulus (X / Y) | 2.9 / 2.7 | psi x 10 ⁶ | 19.9 / 18.6 | GN / m ² | ASTM D3039 |
| Poisson's Ratios (X / Y) | 0.177 / 0.163 | | 0.177 / 0.163 | | ASTM D3039 |
| Flexural Strength (X / Y) | 44,989 / 55,199 | psi | 0.31 / 0.381 | GN / m ² | ASTM D3039 |
| Flexural Strength @ 150°C (X / Y) | 34,000 / 22,000 | psi | 0.234 / 0.151 | GN / m ² | ASTM D3039 |
| Thermal Conductivity | 0.51 | W / mK | 0.51 | W / mK | ASTM E1461 |
| Specific Heat | 0.943 | J / gK | 0.943 | J / gK | ASTM E1461 |
| Electrical Properties | | | | | |
| Dielectric Constant (75% RC) | | | | | |
| @ 2 GHz (Stripline) | 3.52 | | 3.52 | | IPC-TM-650.2.5.5.5 |
| @ 10 GHz (Stripline) | 3.50 | | 3.50 | | IPC-TM-650.2.5.5.5 |
| Dissipation Factor (75% RC) | | | | | |
| @ 2 GHz (Split Post Cavity) | 0.0014 | | 0.0014 | | |
| @ 10 GHz (Split Post Cavity) | 0.0018 | | 0.0018 | | |
| Volume Resistivity | | | | | |
| C - 96 / 35 / 90 | 4.2x10 ⁶ | MΩ - cm | 4.2x10 ⁶ | MΩ - cm | IPC-TM-650.2.5.17.1 |
| E - 24 / 125 | 8.8x10 ⁷ | MΩ - cm | 8.8x10 ⁷ | MΩ - cm | IPC-TM-650.2.5.17.1 |
| Surface Resistivity | | | | | |
| C - 96 / 35 / 90 | 3.1x10 ⁵ | MΩ | 3.1x10 ⁵ | MΩ | IPC-TM-650.2.5.17.1 |
| E - 24 / 125 | 3.6x10 ⁷ | MΩ | 3.6x10 ⁷ | MΩ | IPC-TM-650.2.5.17.1 |
| Electric Strength | 1500 | V / mil | 5.9x10 ⁴ | V / mm | IPC-TM-650.2.5.6.2 |
| Dielectric Breakdown | >50 | kV | >50 | kV | IPC-TM-650.2.5.6 |
| Arc Resistance | 184 | seconds | 184 | seconds | IPC-TM-650.2.5 |
| Thermal Properties | | | | | |
| *Glass Transition Temperature (Tg) | | | | | |
| TMA (°C) | 165 | °C | 165 | °C | IPC-TM-650.2.4.24c |
| DMA (°C) (Tan d Peak) | 185 | °C | 185 | °C | IPC-TM-650.2.4.24.3 |
| Degradation Temp (TGA) (5% wt. loss) | 376 | °C | 376 | °C | IPC-TM-650.2.3.40 |
| Pressure Cooker-60 min then solder dip @288°C until failure (max 10 min.) | pass | | pass | | IPC-TM-650.2.6.16 (modified) |
| Time to Delamination | | | | | |
| T288 | >120 | minutes | >120 | minutes | IPC-TM-650.2.4.24.1 |
| T300 | 40 | minutes | 40 | minutes | IPC-TM-650.2.4.24.1 |
| Chemical / Physical Properties | | | | | |
| Moisture Absorption | 0.01 | wt. % | 0.01 | wt. % | IPC-TM-650.2.6.2.1 |
| Methylene Chloride Resistance | 0.21 | % wt. chg. | 0.21 | % wt. chg. | IPC-TM-650.2.3.4.3 |
| Density [50% resin content] | 1.85 | g / cm ³ | 1.85 | g / cm ³ | |

All test data provided are typical values and not intended to be specification values. For review of critical specification tolerances, please contact a company representative directly.

*DMA is the preferred method for measuring Tg - other methods may be less accurate.