



meteorwave® 1000 High Speed/Very Low Loss meteorwave® 2000 High Speed/Very Low Loss Laminate & Prepreg

Meteorwave® 1000 and Meteorwave® 2000 high speed/very low loss digital electronic materials offer very advanced electrical performance and very high reliability. Meteorwave® 1000 and Meteorwave® 2000 are designed for multiple high temperature lead-free assemblies and high layer count printed circuit board designs which require very high levels of reliability.

Key Features

Excellent Electrical Properties

- Very low Dk/Df electrical performance
- Stable electrical properties versus frequency when tested over environmental conditions

Lead-Free Compatibility

- Designed to withstand multiple lead-free assembly reflow cycles at 260°C

Highly CAF Resistant

- CAF resistant material after high temperature reflow

Thermal and Mechanical Properties

- Very low Z-axis expansion for high reliability
- Good peel strength
- Excellent IST performance
- High Tg material

High-Tg FR-4 Processing

- Processes similar to other high-Tg materials
- 30 min press at 177°C plus 60 min press at 216°C and 250-350 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 as a 2 mil core product meeting the specifications of a capacitive laminate
- Meets UL 94V-0 and IPC-4101/91 and /102 specifications
- All of Park's electronic materials are RoHS compliant

Applications

- Telecommunications
- High Speed Services
- High Speed Storage Networks
- Internet Switching / Routing Systems
- Wireless Communications
- Backplanes

Park's UL file number: E36295

meteorwave® 1000 High Speed/Very Low Loss meteorwave® 2000 High Speed/Very Low Loss Laminate and Prepreg

Mechanical Properties	Meteorwave®	Meteorwave®	U.S. Units	Meteorwave®	Meteorwave®	Metric	Test Method
	1000	2000		1000	2000		
Peel Strength - 1 oz. (35 micron) Cu							
After Solder Float	6.6	6.6	lb / inch	1.16	1.16	N / mm	IPC-TM-650.2.4.8
At Elevated Temperature	5.6	5.6	lb / inch	0.98	0.98	N / mm	IPC-TM-650.2.4.8.2a
After Exposure to Process Solutions	5.3	5.3	lb / inch	0.93	0.93	N / mm	IPC-TM-650.2.4.8
X / Y CTE [-40°C to +125°C]	10-14	10-14	ppm / °C	10-14	10-14	ppm / °C	IPC-TM-650.2.4.41
Z Axis CTE Alpha 1 [50°C to Tg] 55% RC	55	55	ppm / °C	55	55	ppm / °C	IPC-TM-650.2.4.24
Z Axis CTE Alpha 2 [Tg to 260°C] 55% RC	260	260	ppm / °C	260	260	ppm / °C	IPC-TM-650.2.4.24
Z Axis Expansion [50°C to 260°C] 43% RC	1.5		%	1.5		%	IPC-TM-650.2.4.24
Z Axis Expansion [50°C to 260°C] 55% RC	1.9	1.9	%	1.9	1.9	%	IPC-TM-650.2.4.24
Young's Modulus (X / Y)	3.6 / 3.2	2.7 / 2.5	psi x 10 ⁶	24.4 / 21.7	18.3 / 17.0	GN / m ²	ASTM D3039
Poisson's Ratios (X / Y)	.148 / .132	.166 / .169		.148 / .132	.166 / .169		ASTM D3039
Thermal Conductivity	.46	.43	W / mK	.46	.43	W / mK	ASTM E1461
Specific Heat	.92	.97	J / gK	.92	.97	J / gK	ASTM E1461
Electrical Properties							
Dielectric Constant (Typical)							
@ 2 GHz (Stripline)	3.7	3.4		3.7	3.4		IPC-TM-650.2.5.5.5
@ 10 GHz (Stripline)	3.7	3.4		3.7	3.4		IPC-TM-650.2.5.5.5
Dissipation Factor (Typical)							
@ 2 GHz (Split Post Cavity)	0.004	0.003		0.004	0.003		
@ 10 GHz (Split Post Cavity)	0.0055	0.004		0.0055	0.004		
Volume Resistivity							
C - 96 / 35 / 90	1.93x10 ⁸	3.60x10 ⁷	MΩ - cm	1.93x10 ⁸	3.60x10 ⁷	MΩ - cm	IPC-TM-650.2.5.17.1
E - 24 / 125	3.22x10 ⁸	2.60x10 ⁸	MΩ - cm	3.22x10 ⁸	2.60x10 ⁸	MΩ - cm	IPC-TM-650.2.5.17.1
Surface Resistivity							
C - 96 / 35 / 90	6.12x10 ⁷	2.10x10 ⁶	MΩ	6.12x10 ⁷	2.10x10 ⁶	MΩ	IPC-TM-650.2.5.17.1
E - 24 / 125	9.34x10 ⁷	1.10x10 ⁸	MΩ	9.34x10 ⁷	1.10x10 ⁸	MΩ	IPC-TM-650.2.5.17.1
Electric Strength	1667	1800	V / mil	4.2x10 ⁴	4.6x10 ⁴	V / mm	IPC-TM-650.2.5.6.2
Dielectric Breakdown	>50	>50	kV	>50	>50	kV	IPC-TM-650.2.5.6
Arc Resistance	157	157	seconds	157	157	seconds	IPC-TM-650.2.5.1
Thermal Properties							
*Glass Transition Temperature (Tg)							
TMA (°C)	215	215	°C	215	215	°C	IPC-TM-650.2.4.24c
DMA (°C) (Tan d Peak)	240	240	°C	240	240	°C	IPC-TM-650.2.4.24.3
Degradation Temp (TGA) (5% wt. loss)	390	390	°C	390	390	°C	IPC-TM-650.2.3.40
Pressure Cooker-60 min then solder dip @288°C until failure (max 10 min.)	pass	pass		pass	pass		IPC-TM-650.2.6.16 (modified)
T300	>120	>120	minutes	>120	>120	minutes	IPC-TM-650.2.4.24.1
Chemical / Physical Properties							
Moisture Absorption	0.12	0.12	wt. %	0.12	0.12	wt. %	IPC-TM-650.2.6.2.1
Methylene Chloride Resistance	0.27	0.27	% wt. chg.	0.27	0.27	% wt. chg.	IPC-TM-650.2.3.4.3
Density [50% resin content]	1.83	1.76	g / cm ³	1.83	1.76	g / cm ³	

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

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.

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