

Park's Advanced Circuitry Materials

N4800-20 N4800-20 SI[®]



High-Speed Multifunctional Epoxy Laminate & Prepreg

N4800-20 and N4800-20 SI[®] are high performance enhanced epoxy systems for multilayer PCBs requiring maximum thermal and stable electrical performance. N4800-20 and N4800-20 SI[®] are designed to be lead-free assembly compatible and CAF resistant. N4800-20 SI[®] is available with SI[®] glass for optimal signal integrity and impedance control.

Key Features

Excellent Electrical Properties

- Stable electrical properties versus frequency when tested over environmental conditions
- SI[®] glass available for low-loss applications and enhanced performance

Lead-Free Assembly Compatible

- Formulated to withstand multiple 260°C lead-free excursions

CAF Resistant

- CAF resistant material providing long term field reliability

Buried Capacitance[™] Options

- Approved ZBC-2000[®] laminates available for high density designs

Thermal and Mechanical Properties

- Low thermal expansion for superior through hole reliability
- Excellent peel strength
- Designed for high layer count multilayers

High-Tg FR-4 processing

- Processes similar to traditional high Tg FR-4 materials
- 90 min press at 193°C and 275-350 psi

Available in a variety of constructions

- Vacuum laminated
- Available in a wide variety of constructions, copper weights and glass styles including standard copper, double treat and RTFOIL[®] laminate.
- Available as a 2 mil core product meeting the specifications of a capacitive laminate
- Meets UL 94V-0 and IPC-4101/29 specifications
- All materials are RoHS compliant.

Applications

- Fine-Line Multilayers
- Backplanes
- Surface-Mount Multilayers
- BGA Multilayers
- MCM-Ls
- CSP Attachment
- Wireless Communication Infrastructure
- High Speed Services
- High Speed Storage Networks
- Internet Switching / Routing Systems

Global Availability

Nelco Products, Inc. (California) - Americas
+1.714.879.4293

Neltec, Inc. (Arizona) - Americas
+1.480.967.5600

Nelco Products Pte. Ltd. - Asia Pacific
+65.6861.7117

Neltec, S.A. - Europe
+33.562.98.52.90

www.parkelectro.com
info@parkelectro.com

Park's UL file number: E36295



PARK
ELECTROCHEMICAL
CORP.

МЕХНОЛОГИЧЕСКИЙ
КОМПЛЕКС

N4800-20 and N4800-20 SI®

High-Speed Multifunctional Epoxy Laminate & Prepreg

Mechanical Properties	N4800-20	N4800-20 SI	U.S. Units	N4800-20	N4800-20 SI	Metric	Test Method
Peel Strength - 1 oz. (35 micron) Cu							
After Solder Float	7.0	7.0	lb / inch	1.23	1.23	N / mm	IPC-TM-650.2.4.8
At Elevated Temperature	6.5	6.5	lb / inch	1.14	1.14	N / mm	IPC-TM-650.2.4.8.2a
After Exposure to Process Solutions	7.0	7.0	lb / inch	1.23	1.23	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]	27	31	ppm / °C	27	31	ppm / °C	IPC-TM-650.2.4.24
Z Axis CTE Alpha 2 [Tg to 260°C]	205	210	ppm / °C	205	210	ppm / °C	IPC-TM-650.2.4.24
Z Axis Expansion [50°C to 260°C] 43% RC	1.8	1.8	%	1.8	1.8	%	IPC-TM-650.2.4.24
Z Axis Expansion [50°C to 260°C] 55% RC	2.0	2.0	%	2.0	2.0	%	IPC-TM-650.2.4.24
Young's Modulus (X / Y)	4.0 / 3.7	3.2 / 2.9	psi x 10 ⁶	27.6 / 25.5	22.1 / 20.0	GN / m ²	ASTM D3039
Poisson's Ratios (X / Y)	0.177 / 0.154	0.189 / 0.168		0.177 / 0.154	0.189 / 0.168		ASTM D3039
Thermal Conductivity	0.47	0.47	W / mK	0.47	0.47	W / mK	ASTM E1461
Specific Heat	0.82	0.91	J / gK	0.82	0.91	J / gK	ASTM E1461
Electrical Properties							
Dielectric Constant (50% resin content)							
@ 2 GHz (Stripline)	3.7	3.55		3.7	3.55		IPC-TM-650.2.5.5.5
@ 10 GHz (Stripline)	3.8	3.4		3.8	3.4		IPC-TM-650.2.5.5.5
Dissipation Factor (50% resin content)							
@ 2 GHz (Split Post Cavity)	0.007	0.0055		0.007	0.0055		
@ 10 GHz (Split Post Cavity)	0.0075	0.006		0.0075	0.006		
Volume Resistivity							
C - 96 / 35 / 90	4.21x10 ⁸	4.20x10 ⁷	MΩ - cm	4.21x10 ⁸	4.20x10 ⁷	MΩ - cm	IPC-TM-650.2.5.17.1
E - 24 / 125	6.29x10 ⁸	2.50x10 ⁸	MΩ - cm	6.29x10 ⁸	2.50x10 ⁸	MΩ - cm	IPC-TM-650.2.5.17.1
Surface Resistivity							
C - 96 / 35 / 90	5.48x10 ⁸	3.50x10 ⁶	MΩ	5.48x10 ⁸	3.50x10 ⁶	MΩ	IPC-TM-650.2.5.17.1
E - 24 / 125	2.91x10 ⁸	8.80x10 ⁷	MΩ	2.91x10 ⁸	8.80x10 ⁷	MΩ	IPC-TM-650.2.5.17.1
Electric Strength	1660	1900	V / mil	4.2x10 ⁴	4.8x10 ⁴	V / mm	IPC-TM-650.2.5.6.2
Dielectric Breakdown	50	TBD	kV	50	TBD	kV	IPC-TM-650.2.5.6
Arc Resistance	145	145	seconds	145	145	seconds	IPC-TM-650.2.5.1
Thermal Properties							
Glass Transition Temperature (Tg)							
DSC (°C)	200	200	°C	200	200	°C	IPC-TM-650.2.4.25c
TMA (°C)	180	180	°C	180	180	°C	IPC-TM-650.2.4.24c
DMA (°C) (Tan d Peak)	210	210	°C	210	210	°C	IPC-TM-650.2.4.24.3
Degradation Temp (TGA) (5% wt. loss)	360	360	°C	360	360	°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)
T288	40	40	minutes	40	40	minutes	IPC-TM-650.2.4.24.1
T300	10	10	minutes	10	10	minutes	IPC-TM-650.2.4.24.1
Chemical / Physical Properties							
Moisture Absorption	0.07	0.07	wt. %	0.07	0.07	wt. %	IPC-TM-650.2.6.2.1
Methylene Chloride Resistance	0.09	0.09	% wt. chg.	0.09	0.09	% wt. chg.	IPC-TM-650.2.3.4.3
Density [50% resin content]	1.92	1.83	g / cm ³	1.92	1.83	g / cm ³	Internal Method

Park Electrochemical Corp. is a global advanced materials company which develops and manufactures high-technology digital and RF/microwave printed circuit materials and advanced composite materials, parts and assemblies. The company operates under the Nelco®, Nelcote® and Nova™ names. All test data provided are typical values and not intended to be specification values. For review of critical specification tolerances, please contact a Nelco representative directly. Nelco reserves the right to change these typical values as a natural process of refining our testing equipment and techniques. Nelco reserves the right to make changes without further notice to any products herein to improve reliability, function or design. Nelco does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights nor the rights of others. This disclaimer of warranty is in lieu of all warranties whether expressed, implied or statutory, including implied warranties of merchantability or fitness for a particular purpose.

Aeroglide™, CoreFix™, Easy Cure™, EPO-EP™, LD®, Mercurywave™, Nelco®, Nelcote®, Nova™, PeelCote™, RTFoil® and SiO are trademarks of Park Electrochemical Corp. BC®, ZBC-2000® and Buried Capacitance™ are Trademarks of the Sammina-SCI Corporation. 1Refer to the [N4000-13 Best Practices](#) document and [Contract Manufacturing Q&A](#) for PCB processing recommendations. 2CAF resistance has been established to greater than 500 hours using a specific OEM coupon design and test procedure. Visit www.parkelectro.com for more information.

