



Chronon®

Chronon has been engineered to mitigate/eliminate skew issues in 40 Gb/s or more designs that require more bandwidth, such as backplanes and line cards.

It also delivers the necessary thermal robustness for lead-free applications and for electrical (low loss) applications that require tighter control of loss and skew. In addition, it delivers the necessary thermal robustness for lead-free applications and electrical bandwidth (low loss) for applications that require more stringent signal integrity. It also has PCB designerfriendly advantages because the Dk and Df ratings are close enough in value that they can be considered constant for all of the specified cores and prepregs.

Chronon is a proprietary high-performance, 185°C glass transition temperature (Tg) system for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required. Chronon products use spread glass and reduced profile copper to mitigate skew in differential pair designs. The use of ultra-smooth copper is enabled by very high adhesive bond between the resin and the metal. Chronon has a nominal dielectric constant (Dk) of 3.68 and a very low nominal dissipation factor (Df) of 0.0040. Both are stable between -55°C and +125°C up to 40 GHz.

Chronon laminate materials are available in optimized laminate and prepreg forms in typical thicknesses and standard panel sizes to provide a complete material solution for high-speed digital multilayer backplanes and daughter cards.

ORDERING INFORMATION:

Contact your local sales representative or visit www.isola-group.com for further information.

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Performance

Tg 185°C

Td 390°C

Dk 3.68

Df 0.0038

zIPC- 4101C /21 /24 /26 /98 /101 /126

UL - File Number E41625

Qualified to UL's MCIL Program

Product Features

- Industry Recognition
 - RoHS Compliant
- Performance Attributes
 - Lead-free assembly compatible
- Processing Advantages
 - FR-4 process compatible
 - UV blocking and AOI fluorescence

Product Availability

- Standard Material Offering: Laminate
 - 2 to 60 mil (0.5 to 1.5 mm)
 - Available in full size sheet or panel form
- Copper Foil Type
 - HTE Grade 3
 - RTF (Reverse Treat Foil)
- Copper Weight
 - ½ to 2 oz (18 to 70 µm) available
 - Heavier copper available
 - Thinner copper foil available
- Standard Material Offering: Prepreg
 - Roll or panel form
 - Tooling of prepreg panels
- Glass Fabric Availability
 - Low Dk glass
 - Square weave glass
 - Mechanically spread glass

Chronon® Specifications

Property	Typical Value	Units	Test Method	
		Metric (English)	IPC-TM-650 (or as noted)	
Glass Transition Temperature (Tg) by TMA	180	°C	2.4.24	
Glass Transition Temperature (Tg) by DSC	185	°C	2.4.25	
Decomposition Temperature (Td) by TGA @ 5% weight loss	390	°C	2.4.24.2	
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	>60 >20	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	50 250 2.5	ppm/°C ppm/°C %	2.4.24
X/Y-Axis CTE	Pre-Tg	15	ppm/°C	2.4.24.1
Thermal Conductivity		.44	W/mK	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	3.68	—	Bereskin Stripline
Df, Loss Tangent	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.0038 0.0040 0.0040	—	Bereskin Stripline
Volume Resistivity	A. C-96/35/90 B. After moisture resistance C. At elevated temperature	—	MΩ-cm	2.5.17.1
Surface Resistivity	A. C-96/35/90 B. After moisture resistance C. At elevated temperature	—	MΩ	2.5.17.1
Dielectric Breakdown		60	kV	2.5.6
Arc Resistance		125	Seconds	2.5.1
Electric Strength (Laminate & laminated prepreg)		60 (1500)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		2	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile copper foil all copper foil >17 μm [0.669 mil] B. Standard profile copper 1. After thermal stress C. Low profile copper foil and very low profile copper foil all copper foil >17 μm [0.669 mil] 2. After thermal stress	0.81 (4.5) 0.96 (5.5)	N/mm (lb/inch)	2.4.8 2.4.8.2 2.4.8.3 2.4.8.3
Flexural Strength	A. Length direction B. Cross direction	41000 42000	lb/inch ²	2.4.4
Tensile Strength	A. Length direction B. Cross direction	26000 25000	lb/inch ²	ASTM D3039
Poisson's Ratio	A. Length direction B. Cross direction	0.226 0.202	—	ASTM D3039
Moisture Absorption		0.08	%	2.6.2.1
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Max Operating Temperature		130	°C	UL 796

The data, while believed to be accurate and based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.

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