ThunderClad 400G

Core: TU-885 Sp

Prepreg: TU-885P Sp

ThunderClad 400G (TU-885 Sp) is a super low loss category material based on a high performance resin. This material is reinforced with low Dk woven glass fabric and designed with super low dielectric constant and dissipation factor resin system for high speed low loss, radio frequency and wireless applications. ThunderClad 400G material is suitable for environmental protection lead free process and also compatible with FR-4 processes. ThunderClad 400G laminates also exhibit excellent moisture resistance, improved CTE, superior chemical resistance, thermal stability and CAF resistance.

Applications

- 400G Switch
- Backplane, High performance computing
- Line cards, Storage
- Telecom, Base station
- Radio Frequency

Performance and Processing Advantages

- Excellent electrical properties & MOT level
- Dielectric constant is 3.17@ 10GHz
- Dissipation factor is 0.0018@ 10GHz
- Stable and flat Dk/Df performance over frequency and temperature
- Compatible with modified FR-4 processes
- Excellent moisture resistance and Lead Free reflow process compatible
- Improved z-axis thermal expansion
- Anti-CAF capability
- Excellent through-hole and soldering reliability
- Halogen Free

Industry Approvals

- IPC-4101E Specification Number: /134
- IPC-4101E/134 Validation Services QPL Certified
- UL File Number : E189572
- ANSI Grade : No-ANSI
- Flammability Rating: 94V-0
- Maximum Operating Temperature: 160°C

Standard Availability

- Thickness: 0.002"[0.05mm] to 0.062" [1.58mm], available in sheet or panel form
- Copper Foil Cladding: 1/3 to 3 oz for built-up & double sides
- Prepregs: Available in roll or panel form
- Glass Styles: 1035, 1078, 2113, 2116 and other prepreg grades are available upon request

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TUC Taiwan +886 3 555 1103 . TUC Changshu, China +86 512 5230 1688 . TUC Zhongshan, China +86 760 2813 6688

Typical Properties

	Typical Values	Test Condition
Thermal		
Tg (DMA) Tg (TMA) Td (TGA)	240 °C 200 °C 430 °C	E-2/105+des
CTE x/y axis CTE z-axis α1 CTE z-axis α2 CTE z-axis	12/13 ppm/°C 35 ppm/°C 200 ppm/°C 2.0%	Ambient to Tg Pre-Tg Post-Tg 50 to 260°C
Thermal Stress, Solder Float, 288°C	> 60 sec	A
T-260 T-288 T-300	> 60 min > 60 min > 60 min	E-2/105+des
Flammability	94V-0	E-24/125+des
Electrical		
Permittivity (RC70%) 10GHz (SPC method) Impedance simulation DK	3.17 2.90	C-24/23/50
Loss Tangent (RC70%) 10GHz (SPC method)	0.0018	C-24/23/50
Volume Resistivity	> 10^{10} MΩ·cm	C-96/35/90
Surface Resistivity	> 10^{8} MΩ	C-96/35/90
Electric Strength	> 40 KV/mm	-
Dielectric Breakdown Voltage	> 50 KV	-
Mechanical		
Young's Modulus Warp Direction Fill Direction	31 GPa 29 GPa	A
Flexural Strength Lengthwise Crosswise	> 60,000 psi > 50,000 psi	A A
Peel Strength, 1.0 oz. HVLP Cu foil	4~6 lb/in	A
Water Absorption	0.08 %	E-1/105+des+D-24/23

NOTE:
1. Property values are for information purposes only and not intended for specification.
2. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.
3. This product is based on a patent pending technology.

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