ThunderClad 2

Core: TU-883

Prepreg: TU-883P

ThunderClad 2 (TU-883) is a very low loss category material based on a high performance resin. This material is reinforced with regular woven E-glass and designed with very low dielectric constant and dissipation factor resin system for high speed low loss, radio frequency and wireless applications. ThunderClad 2 material is suitable for environmental protection lead free process and also compatible with FR-4 processes. ThunderClad 2 laminates also exhibit excellent moisture resistance, improved CTE, superior chemical resistance, thermal stability and CAF resistance.

Applications

- Radio frequency
- Backplane, High performance computing
- Line cards, Storage
- Servers, Telecom, Base station, Office Routers

Performance and Processing Advantages

- Excellent electrical properties
- Dielectric constant is 3.39 @ 10GHz
- Dissipation factor is 0.0045 @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-4101 Type Designation: /134
- IPC-4101/134 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 5 oz for built-up & double sides
- Prepregs: Available in roll or panel form
- Glass Styles: 106, 1080, 3313, 2116 and other prepreg grades are available upon request

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Typical Properties

	Typical Values	Test Condition
Thermal		
Tg (DMA) Tg (TMA) Td (TGA)	220 °C 170 °C 420 °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 240 ppm/°C 2.5 %	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	3.39 2.83	E-2/105
Loss Tangent (RC70%) 10GHz (SPC method)	0.0045	E-2/105
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	28 GPa 26 GPa	A
Flexural Strength Lengthwise Crosswise	> 60,000 psi > 50,000 psi	A A
Peel Strength, 1.0 oz. 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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