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 less than 4.0
- Dissipation factor less than 0.005
- 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

Taiwan Union Technology Corporation (TUC)
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	SPEC
Thermal			
Tg (DMA) Tg (TMA) Td (TGA)	220 °C 170 °C 420 °C	E-2/105+des	N/A
CTE z-axis α1 CTE z-axis α2 CTE z-axis	35 ppm/°C 240 ppm/°C 2.5 %	Pre-Tg Post-Tg 50 to 260°C	< 60 ppm/°C < 300 ppm/°C < 3.0%
Thermal Stress, Solder Float, 288°C	> 60 sec	A	> 10 sec
T-260 T-288 T-300	> 60 min > 60 min > 60 min	E-2/105+des	> 30 min > 15 min
Flammability	94V-0	E-24/125+des	94V-0
Electrical			
Permittivity (RC63%) 1GHz (SPC method) 5GHz (SPC method) 10GHz (SPC method)	 3.60 3.58 3.57	C-24/23/50	N/A
Loss Tangent (RC63%) 1GHz (SPC method) 5GHz (SPC method) 10GHz (SPC method)	 0.0030 0.0037 0.0046	C-24/23/50	N/A
Volume Resistivity	> 10^{10} MΩ·cm	C-96/35/90	> 10^{6} MΩ·cm
Surface Resistivity	> 10^{8} MΩ	C-96/35/90	> 10^{4} MΩ
Electric Strength	> 40 KV/mm	-	> 30 KV/mm
Dielectric Breakdown Voltage	> 50 KV	-	> 40 KV
Mechanical			
Young's Modulus Warp Direction Fill Direction	 28 GPa 26 GPa	A	N/A
Flexural Strength Lengthwise Crosswise	 > 60,000 psi > 50,000 psi	 A A	 > 60,000 psi > 50,000 psi
Peel Strength, 1.0 oz. Cu foil	4~6 lb/in	A	> 4 lb/in
Water Absorption	0.08 %	E-1/105+des+D-24/23	< 0.8 %

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.

Taiwan Union Technology Corporation (TUC)
TUC Taiwan +886 3 555 1103 . TUC Changshu, China +86 512 5230 1688 . TUC Zhongshan, China +86 760 2813 6688