



# ThunderClad 4SN / TU-943SN

Core: TU-943SN

Prepreg: TU-943P SN

**TU-943SN** is an advanced material designed for high speed computing, telecommunications, radio frequency super low loss filed applications. **TU-943SN** electrical performance is competitive with PTFE-based, hydrocarbon-based very low loss materials, but capable for high layer count circuit board design with excellent thermal reliability.

**TU-943SN** laminates also exhibit excellent moisture resistance, improved CTE, superior chemical resistance, thermal stability, CAF resistance, and also compatible with modified FR-4 processes.

## Applications

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

## Performance and Processing Advantages

- Excellent electrical and thermal properties
- Dielectric constant is 3.16 @ 10GHz
- Dissipation factor is 0.0014 @ 10GHz
- Stable and flat Dk/Df performance over frequency and temperature variance.
- Compatible with modified FR-4 processes
- Excellent moisture resistance and Lead Free reflow process compatible
- Improved z-axis thermal expansion
- Superior dimensional stability, thickness uniformity and flatness
- Anti-CAF capability
- Excellent through-hole and soldering reliability

## Industry Approvals

- IPC-4101E Specification Number : 102
- IPC-4101E/102 Validation Services QPL Certified
- UL File Number: E189572
- ANSI Grade: non-ANSI
- Flammability Rating: 94V-0
- Maximum Operating Temperature: 140°C

## Standard Availability

- Thickness: 0.002" [0.05mm] to 0.028" [0.71mm], available in sheet or panel form
- Copper Foil Cladding: 1/3 to 2 oz for built-up & double sides
- Prepregs: Available in roll or panel form
- Glass Styles: 1035, 1078 and other prepreg grades are available upon request.





	Typical Values	Conditioning
<b>Thermal</b>		
Tg (DMA)	225 °C	E-2/105
Tg (TMA)	195 °C	
Td (TGA)	420 °C	
CTE x/y axis	12/13 ppm/°C	Ambient to Tg Pre-Tg Post-Tg 50 to 260°C
CTE z-axis α1	32 ppm/°C	
CTE z-axis α2	210 ppm/°C	
CTE z-axis	1.7 %	
Thermal Stress, Solder Float, 288°C	> 120 sec	A
T-260	> 60 min	E-2/105
T-288	> 60 min	
T-300	> 60 min	
Flammability	94V-0	E-24/125
<b>Electrical</b>		
Permittivity (RC70%) 10 GHz (SPDR method)	3.16	E-2/105
Impedance simulation DK	2.71	
Loss Tangent (RC70%) 10 GHz (SPDR method)	0.0014	E-2/105
Volume Resistivity	> 10 <sup>10</sup> MΩ·cm	C-96/35/90
Surface Resistivity	> 10 <sup>8</sup> MΩ	C-96/35/90
Electric Strength	> 40 KV/mm	A
Dielectric Breakdown Voltage	> 50 KV	A
<b>Mechanical</b>		
Young's Modulus Warp Direction	24 GPa	A
Fill Direction	23 GPa	
Flexural Strength Lengthwise	> 60,000 psi	A
Crosswise	> 50,000 psi	
Peel Strength, 1.0 oz. HVLP Cu foil	4~6 lb/in	A
Moisture Absorption	0.08 %	E-1/105 + D-24/23

NOTE:

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

