

Mid-Tg and High Thermal Reliability Laminate and Prepreg



TU-668

Core: TU-668

Prepreg: TU-668P

TU-668/ TU-668P laminate/ prepreg are made of high quality woven E-glass coated with the epoxy resin system, which provides the laminates UV-block characteristic, and compatibility with automated optical inspection (AOI) process. These products are suitable for boards that need to survive severe thermal cycles, or to experience excessive assembly work. TU-668 laminates exhibit excellent CTE, superior chemical resistance, and thermal stability for lead free soldering assembly with general CAF resistance.

Applications

- Automotive
- Consumer Electronics

Performance and Processing Advantages

- Lead Free process compatible
- Excellent coefficient of thermal expansion
- Anti-CAF property
- Use friendly FR-4 processing conditions such as oxide, press, drilling and desmear
- Superior chemical and thermal resistance
- Fluorescence for AOI
- Optical characteristics provide UV-block property
- High interlayer bonding strength with optimum resin flow
- Low moisture absorption

Industry Approvals

- IPC-4101 Type Designation : /21, /98, /99, /101
- UL Designation – ANSI Grade: FR-4.0
- UL File Number: E189572
- Flammability Rating: 94V-0
- Maximum Operating Temperature: 130°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 6 oz (HTE) for built-up; 1/3 to 3 oz (HTE) for double sides and H to 2 oz (MLS)
- Prepregs: Available in roll or panel form
- Glass Styles: 106, 1080, 2113, 2116, 1506 and 7628 etc.

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Typical Properties for TU-668 Laminate			
	Typical Values	Test Condition	SPEC
Thermal			
Tg (DMA)	160 °C	E-2/105+des	N/A
Tg (DSC)	150 °C		
Tg (TMA)	140 °C		
Td (TGA)	340 °C		
CTE x-axis	11~15 ppm/°C	Ambient to Tg	N/A
CTE y-axis	11~15 ppm/°C	Ambient to Tg	N/A
CTE z-axis	3.2 %	50 to 260°C	< 3.5%
Thermal Stress, Solder Float, 288°C	> 60 sec	A	> 10 sec
T-260	> 60 min	E-2/105+des	> 30 min
T-288	> 10 min		> 5 min
Flammability	94V-0	E-24/125+des	94V-0
Electrical			
Permittivity (RC50%) 1MHz (LCR meter)	4.7	C-24/23/50	< 5.4
1GHz (SPC method/HP4291B)	4.4/4.3		N/A
Loss Tangent (RC50%) 1MHz (LCR meter)	0.016	C-24/23/50	< 0.035
1GHz (SPC method/HP4291B)	0.018/0.014		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			
Flexural Strength Lengthwise	> 75,000 psi	A	> 60,000 psi
Crosswise	> 65,000 psi	A	> 50,000 psi
Peel Strength, 1.0 oz. Cu foil	8~11 lb/in	A	> 4 lb/in
Bow and Twist 0.020"~0.031"	< 0.8%	A	Max 1.5
0.032"~0.065"	< 0.8%		Max 1.0
>0.066"	< 0.8%		Max 1.0
Dimensional Stability	< 0.03%	E-4/105+E-2/150	< 0.03 %
Water Absorption	0.13 %	E-1/105+des+D-24/23	< 0.8 %