



PRODUCT DESCRIPTION

Tlam™ is a thermally conductive IMPCB substrate used for heat dissipation in electronics circuit boards used in Power Supplies, DC-DC Converters, LEDs & Ballast Lighting, Automotive, Appliances, Commercial & Industrial Motor Drives, and Military & Aerospace Applications.

The heart of this system is the thermally conductive pre-preg, Tlam™ PP HTD. This ceramically filled 2.2 W/mK, dielectric prepreg offers 8 times better thermal performance over FR4, while maintaining good adhesion and voltage breakdown properties. Tlam™ PP HTD is a “B” State epoxy film providing room temperature stability for 6 months. Tlam™ PP HTD is provided in multiple thicknesses. Thinner films offer better thermal performance while thicker films offer better dielectric strength.

Tlam™ PP HTD can be used to build many different combinations of PCB laminates. The simplest is copper foil, Tlam™ PP HTD dielectric and an aluminum base plate which acts as a heatsink and adds rigidity. Board complexity goes up from here offering multi-layer boards constructions and PCB structures can further include varying layers of Tlam™ PP HTD and FR4 layers to give the thermal properties where need while maintaining cost effectiveness.

Tlam™ PP HTD can be laminated with copper foils from ½ oz to 4 oz can be used aluminum or copper base plates ranging from 2.5mm to 6mm thick. Further Tlam™ PP HTD can be laminated on both sides with copper films to make traditional type PCB Cores.

For detailed information on Design and Fabrication:

[A18422: Tlam™ System Design Guide: Part 1: Performance and Reliability](#)

[A18423: Tlam™ System Design Guide: Part 1: Manufacturability](#)

[A18424: Tlam™ System Fabrication Guide](#)

FEATURES & BENEFITS

- Low Thermal Resistance for SMD & Chip & Wire Components
- UL® 746 B RTI of 150°C
- Compatible with Heavy Copper Foil & most Pre-pregs
- Low Modulus for Stress Relief & High Reliability
- High Tg for Excellent HV & Hi-Temperature Operation (HTD)
- Mechanically Rugged under Vibration and Mechanical Shock
- Integral aluminum Base Plate for Mechanical & Thermal Interface
- Compatible with Power Substrate & Multilayer Construction
- Uses Standard low-cost PCB Fabrication Techniques

MARKETS

- Power supplies
- DC/DC Converters
- Audio Amplifiers
- LED & Ballast Lighting
- Battery Charging
- Inverters
- Automotive - LV under hood & EV motor drives
- Appliances
- Commercial & Industrial Motor Drives
- Military & Aerospace



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AVAILABILITY

- Tlam™ PP HTD is typically supplied in 0.1mm (0.004"), and 0.15mm (0.006")
- Standard sheet size is 18" x 24"

STORAGE CONDITIONS

- 5C to 25C & <60% RH
- Shelf life 6 months from the date of shipment

TYPICAL PROPERTIES

PROPERTY	UNITS	HTD04	HTD06
Dielectric Thickness	Inches (mm)	0.004 (0.102)	0.006 (0.152)
Peel Strength	lbs/in (Kg/cm)	6.5 (1.16)	7.0 (1.25)
Thermal Conductivity	(Watt/m ² K)	2.2	2.2
Thermal Resistance	°C-in ² /watt (°C-cm ² /watt)	0.072 (0.464)	0.107 (0.690)
Glass Transition Temperature	°C	168	168
Max Operating Temperature	°C	150	150
Max Soldering Temperature	°C	288	288
Heat Capacity	J/g °K	1.12	1.12
UL Continuous Operating Temperature	°C	150	150
Dielectric Constant	KHz/MHz	5.1/4.9	4.9/4.7
Dissipation Factor	KHz	0.007	0.007
Capacitance @1KHz	pF/in ² (pF/cm ²)	287 (45)	191 (31)
Volume Resistivity@25°C	ohm-cm	1.40x10 ¹⁵	1.40x10 ¹⁵
Volume Resistivity@150°C	ohm-cm	2.0x10 ¹¹	2.0x10 ¹¹
Surface Resistivity	ohm	1.5x10 ¹²	1.5x10 ¹²
Continuous AC	VAC	240	480
Continuous DC	VDC	450	950
Peak Recurring	Vp	600	1200
Dielectric Strength	VAC/mil (KVAC/mm)	1000 (39.3)	1000 (39.3)
Withstand voltage	VDC	>4000	>60000
CTE in XY/Z axis < Tg	ppm	16/36	16/36
CTE in XY/Z axis > Tg	ppm	18/155	18/155
Young's Modulus @ 25/150°C	MPa	13180/6810	13180/6810
Poisson's Ratio @ 25/150°C		0.277/0.263	0.277/0.263
Flexural Strength	MPa	142	142
UL Flammability E165095		94V0	94V0
Comparative Tracking Index		600	600
Solder Float (3 min. @ 288°C)		Pass	Pass

All properties are typical @ 25°C, unless otherwise specified. For design engineer guidance only, observed performance varies in application. Engineers are reminded to test the material in application. Peel strength is measured with 1oz Cu weight. All properties are based on nominal thickness. The layout and process may require thicker starting Tlam PP HTD to meet nominal laminated thickness.

Tlam™ PP HTD was formerly known as Thermagon™ T-Preg™ HTD