



### **THERMALLY CONDUCTIVE PRINTED CIRCUIT BOARD SUBSTRATE**

Tlam SS HTD is a thermally conductive PCB substrate. The construction consists of a copper circuit layer bonded to an aluminum or copper base plate with 150 C rated Tlam HTD dielectric. Tlam SS HTD laminate is processed through standard FR4 print and etch operations.

Tlam SS HTD products have 6-8 times better thermal conductivity than FR4--key to keeping components cool. The Tlam SS HTD boards are run through standard pick and place SMT and manual wire bond processes.

Tlam SS HTD is designed for use in high temperature and/or high-voltage applications typically found in industrial motor drives and automotive motor controls.

Standard constructions are made with 1 and 2 ounce copper and 0.040 (1mm) and 0.062 (1.6mm) inch thick aluminum. Custom construction of heavier weight circuit copper and thicker aluminum and copper base plates are also available.

### **FEATURES AND BENEFITS**

- Lower thermal resistance
- UL® 746 B RTI of 150°C
- High withstand voltage >6000 VDC
- RoHS compliant
- Environmentally green
- Significantly reduces power device temperature
- Lead free solder compatible

### **APPLICATIONS**

- Automotive - LV under hood and EV motor drives
- 120-480VAC commercial and industrial motor drives, UPS and welders
- Power Supplies - AC/DC and DC/DC for telecom and commercial products

# Tlam™ SS HTD

## Thermally Conductive PCB Substrate

OPERATING VOLTAGE	UNITS	TLam SS HTD04	TLam SS HTD06
Continuous AC, Max	VAC	240	480
Continuous DC, Max	VDC	450	950
Peak Recurring, Max	Vp	600	1200
THERMAL PROPERTIES	UNITS	TLam SS HTD04	TLam SS HTD06
Thermal Conductivity	watt/m °K	2.2	2.2
Thermal Resistance	°C-in <sup>2</sup> /watt (°C-cm <sup>2</sup> /watt)	0.072 (0.464)	0.107 (0.690)
Glass Transition Temperature	°C	168	168
Soldering Temperature, Maximum	°C	288	288
Heat Capacity	J/g°C	1.12	1.12
ELECTRICAL PROPERTIES	UNITS	TLam SS HTD04	TLam SS HTD06
Dielectric Constant @ 1KHz/1MHz		5.1/4.9	4.9/4.7
Dissipation Factor @ 1KHz		0.007	0.007
Capacitance @ 1KHz	pF/in <sup>2</sup> (pF/cm <sup>2</sup> )	287 (45)	191 (31)
Volume Resistivity @ 25°C	ohm-cm	1.4E+15	1.4E+15
Volume Resistivity @ 150°C	ohm-cm	2.0E+11	2.0E+11
Surface Resistivity	ohm	1.5E+12	1.5E+12
Dielectric Strength	VAC/mil(kVAC/mm)	1000 (39.3)	1000 (39.3)
Withstand Voltage (DC)	VDC	>4000	>6000
MECHANICAL PROPERTIES	UNITS	TLam SS HTD04	TLam SS HTD06
Dielectric Thickness	inch (mm)	0.004 (0.102)	0.006 (0.152)
Peel Strength	lbs/in (Kg/cm)	6.5 (1.16)	7.0 (1.25)
CTE < Tg XYZ axis	ppm/°C	16/36	16/36
CTE > Tg XYZ axis	ppm/°C	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 25 °C	MPa	142	142
AGENCY RATINGS & DURABILITY	UNITS	TLam SS HTD04	TLam SS HTD06
UL Continuous Operating Temp	°C	150	150
UL Flammability	E165095	94V0	94V0
Comparative Tracking Index		600	600
Solder Float (4 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 Tpreg to meet nominal laminated thickness.

THR-DS-Tlam-SS-HTD 0711

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