



### THEMALLY CONDUCTIVE PRINTED CIRCUIT BOARD SUBSTRATE

Tlam SS 1KA™ is a thermally conductive printed circuit board (PCB) substrate. The substrate consists of a copper circuit layer bonded to an aluminum or copper base plate with Laird Technologies' 3 watt/m-K 1KA dielectric. Tlam SS 1KA™ materials are processed through standard FR4 print and etch operations.

Tlam SS 1KA has 8-10 times better thermal conductivity compared to FR4, and this is the key to keeping components cool. The Tlam SS 1KA boards run through standard pick and place SMT and manual wire bond processes.

Tlam SS 1KA is designed for applications that require the best thermal performance and resistance to thermal cycling. Customers have found that Tlam SS 1KA reduces the stress on solder bonds with ceramic devices.

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

### FEATURES AND BENEFITS

- UL 746B Electrical/Mechanical RTI as high as 130°C
- RoHS compliant
- Environmentally green
- Lead-free solder compatible
- Compliant for low bond stress

### APPLICATIONS

- Network DC/DC power converters
- Battery powered equipment DC/DC power converters
- Ultra bright LED substrates

### global solutions: local support™

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# Tlam™ SS 1KA

## Thermally Conductive PCB Substrate

OPERATING VOLTAGE	UNITS	Tlam SS 1KA04	Tlam SS 1KA06	Tlam SS 1KA08
Continuous AC	VAC	50	120	240
Continuous DC	VDC	95	225	450
Peak Recurring	Vp	140	300	600
THERMAL PROPERTIES	UNITS	Tlam SS 1KA04	Tlam SS 1KA06	Tlam SS 1KA08
Thermal Conductivity*	Watt/m °K	3	3	3
Thermal Resistance	°C-in <sup>2</sup> /watt (°C-cm <sup>2</sup> /watt)	0.05 (0.34)	0.08 (0.52)	0.11 (0.70)
Glass Transition Temperature	°C	105	105	105
Operating Temperature, Maximum	°C	110	120	130
Soldering Temperature, Maximum	°C	288	288	288
Heat Capacity	J/g °K	1.53	1.53	1.53
ELECTRICAL PROPERTIES	UNITS	Tlam SS 1KA04	Tlam SS 1KA06	TlamSS 1KA08
Dielectric Constant @ 1KHz/1MHz		4.3/4.1	4.3/4.1	4.3/4.1
Dissipation Factor @ 1KHz/1MHz		0.008/0.035	0.008/0.035	0.008/0.035
Capacitance @ 1KHz/1MHz	pF/in <sup>2</sup>	244/230	161/153	121/115
Volume Resistivity	ohm-cm	1.20E+14	1.20E+14	1.20E+14
Surface Resistivity	ohm	1.00E+10	1.00E+10	1.00E+10
Dielectric Strength	VAC/mil (KVAC/mm)	650 (25.6)	800 (31.5)	800 (31.5)
Withstand Voltage	VDC	1800	2500	3500
MECHANICAL PROPERTIES	UNITS	Tlam SS 1KA04	Tlam SS 1KA06	Tlam SS 1KA08
Dielectric Thickness	inches (mm)	0.004 (0.102)	0.006 (0.152)	0.008 (0.203)
Peel Strength	lbs/in (Kg/cm)	4.5 (0.8)	4.5 (0.8)	5.0 (1.0)
CTE in XY/Z axis < Tg	ppm	32/43	32/43	32/43
CTE in XY/Z axis > Tg	ppm	81/171	81/171	81/171
Tensile Strength	MPa	52.2	52.2	52.2
Elongation 25/150°C	%	0.8/1.1	0.8/1.1	0.8/1.1
Young's Modulus @ 25/150°C	MPa	9700/2700	9700/2700	9700/2700
Poisson's Ratio @ 25/150°C		0.26/0.16	0.26/0.16	0.26/0.16
Flexural Strength	MPa	49.7	49.7	49.7
CHEMICAL PROPERTIES	UNITS	Tlam SS 1KA04	Tlam SS 1KA06	Tlam SS 1KA08
Water Absorption after 168 hours	% wt.	0.5	0.5	0.5
Out-Gassing-Total Mass Loss	% wt.	0.57	0.57	0.57
Collect Volatile Condensable Material	% wt.	0.06	0.06	0.06
AGENCY RATINGS & DURABILITY	UNITS	Tlam SS 1KA04	Tlam SS 1KA06	Tlam SS 1KA08
UL Continuous Operating Temperature	°C	110	120	130
UL Flammability	E165095	94V0	94V0	94V0
Comparative Tracking Index		600	600	600
Solder Float ( 3 min. @ 288°C)		Pass	Pass	Pass

\*As measured on dielectric compound only.

Typical value, 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.

THR-DS-Tlam-SS-1KA 1110

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