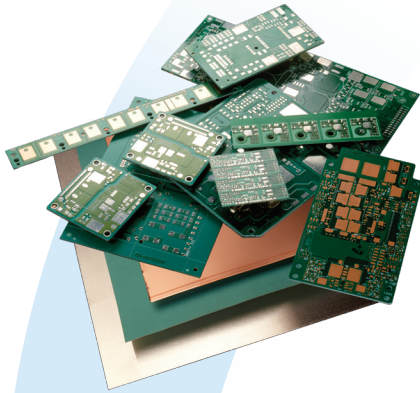




### THERMALLY CONDUCTIVE PRINTED CIRCUIT BOARD SUBSTRATE

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

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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-in2/watt<br>(°C-cm2/watt) | 0.05<br>(0.34) | 0.08<br>(0.52) | 0.11<br>(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  | Tlam SS 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/in2                       | 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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