

Features & Benefits

- Very low thermal resistance 100µm, <0.015 °C-in²/W
- Product Thermal conductivity of 15 W/m-K
 - (2oz Cu x 100µm SPL-15 HT x 1.5 Al)
- Dielectric Thermal Conductivity 10 W/m-K
- High operating temperature, ~ 200°C
- Lead-free solder compatible
- RoHS compliant and environmentally green
- Available as a laminated panel, RCC or prepreg
- Available on aluminum and copper base substrates
- Other substrates materials may be available.
- TCLAD Metal Core PCB's (MCPCB's) minimize thermal impedance and conducts heat more efficiently than standard printed wiring boards (PWB's).
- The differentiating technology of Thermal Clad resides in the dielectric. This datasheet highlights the performance characteristics of TCLAD SPL-15 HT.

Applications

- High power density applications where achieving low thermal resistance is required
- Power conversion, Inverter, DC/DC etc.
- Industrial motor drives
- High temperature SiC IGBT modules

Configurations

- | Base Metal | Thickness mm (mil) |
|-----------------|--|
| • 5052 Aluminum | 0.8 (32), 1.0 (40)*, 1.5 (59)*, 2.0 (80) |
| • 6061 Aluminum | 0.8 (32), 1.0 (40)*, 1.5 (59)*, 2.0 (80) |
| • 1050 Aluminum | 0.8 (32), 1.0 (40)*, 1.5 (59)*, 2.0 (80) |
| • 4045 Aluminum | 1.5 (59), 2.0 (80) |
| • Copper C1100 | 1.0 (40)*, 1.5 (59)*, 2.0 (80) |
-
- | Copper Foil | Weight oz (thickness µm) |
|--------------|---|
| • ED Copper: | 1oz (35), 2oz (70), 3oz (105), 4oz (140), 6oz (210) |
| • RA Copper: | 8oz (280), 10oz (350), higher |

* Most common thicknesses

** Other thicknesses and alloys may be available. Please contact TCLAD sales department for more information.

Item	Thickness	Unit	Value	Method
Thermal Properties				
Product Thermal Conductivity		W/m-K	15	TO-220
Dielectric Thermal Conductivity		W/m-K	10	ASTM D5470
Thermal Resistance	100µm (4mil)	°C-in ² /W	<0.015	ASTM D5470
Electrical Properties				
Dielectric Constant		-	8.4	IPC-TM-650 2.5.5.3
Dissipation Factor	100µm (4mil)	1MHz	0.018	IPC-TM-650 2.5.5.3
Capacitance	100µm (4mil)	pF/cm ²	110	IPC-TM-650 2.5.5.3
Volume Resistivity		Ω-cm	10 ¹³	IPC-TM-650 2.5.17.1
Surface Resistivity		Ω/sq	10 ¹³	IPC-TM-650 2.5.17.1
Breakdown Voltage	80µm (3.2mil)		3	
	100µm (4mil)	KVAC	4	ASTM D149
	150µm (6mil)		6	
Mechanical Properties				
Color		-	Light brown	Visual
Peel Strength @ 25°C		Kg/cm	>1.0	IPC-TM-650 2.4.8
Glass Transition (Tg)		°C	270	IPC-TM-650 2.4.25
CTE in X,Y/Z Axis <Tg		µm/m°C	11.7	IPC-TM-650 2.4.24.5
CTE in X,Y/Z Axis >Tg		µm/m°C	24.3	IPC-TM-650 2.4.24.5
Youngs Modulus		GPa	30	ASTM D638
Solder Heat Resistance (min)		°C	>60	IPC-TM-650 2.4.24.1
Chemical Properties				
Water Vapor Retention		%	< 0.5	IPC-TM-650 2.6.2.1
Out-Gassing Total Mass Loss		%	< 0.1	ASTM E595
Collect Volatile Condensable Material		%	< 0.1	ASTM E595
Agency Ratings & Durability				
UL Maximum Operating Temperature (MOT)		°C	TBD expect 200C	UL 746
UL Flammability		-	TBD expect V-0	UL 94
UL Comparative Tracking Index	(CTI)		TBD expect 600	UL 746E

Test Thermal Performance of Insulated Metal Substrate (IMS®) TO-220 Set-up

