

#### **SFL-12 Dielectric**

### Features & Benefits

- Thermal resistance 100µm, 0.06 °C-in<sup>2</sup>/W
- Product Thermal conductivity of 12 W/m-K
  - o (2oz Cu x 100μm SFL-12 x 1.5 Al)
- High Electrical Strength
- · Lead-free solder compatible
- RoHS compliant and environmentally green
- Available as a laminated panel, RCC or prepreg
- Available on aluminum and copper base substrates
  - o Other substrates materials may be available.

TCLAD Metal Core PCB's (MCPCB's) minimize thermal impedance and conduct heat more efficiently than standard printed wiring boards (PWB's).

The distinguishing difference of Thermal Clad resides in the dielectric. This datasheet highlights the performance characteristics of TCLAD SFL-12 dielectric.

## **Applications**

- High power density applications where achieving low thermal resistance is required, such as:
- LED Lighting
- Power conversion
- Motor drives
- Solid state relays

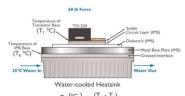
# **Configurations**

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 8oz (280), 10oz (350)
- Most common thicknesses
- \*\* Other thicknesses and alloys may be available. Please contact TCLAD sales department for more information.

ltem	Thickness	Unit	Value	Method
Thermal P	roperties			
Product Thermal Conductivity		W/m-K	12	TO220
Dielectric Thermal Conductivity		W/m-K	3.2	ASTM D5470
Thermal Resistance	I00μm (4mil)	°C-in²/W	0.06	ASTM D5470
Thermal Impedance	I 00μm (4mil)	°C/W	0.08	TO-220
Electrical F	Properties			
Dielectric Constant		-	8.27	IPC-TM-650 2.5.5.3
Dissipation Factor	I00μm (4mil)	1MHz	0.022	IPC-TM-650 2.5.5.3
Capacitance	I00μm (4mil)	pF/m²	0.73	IPC-TM-650 2.5.5.3
Volume Resistivity		$\Omega$ -cm	1013	IPC-TM-650 2.5.17.1
Surface Resistivity		Ω/sq	1013	IPC-TM-650 2.5.17.1
Breakdown Voltage	80µm (3.2mil) 100µm (4mil) 150µm (6mil)	KVAC	4 5 7	ASTM D149
Mechanical	Properties			
Color		-	Off-white	Visual
Peel Strength @ 25°C		Kg/cm	>1.3	IPC TM-650 2.4.8
Glass Transition (Tg)		°C	180	IPC TM-650 2.4.25
CTE in X,Y/Z Axis <tg< td=""><td>μm/m°C</td><td>15</td><td>IPC TM-650 2.4.24.5</td></tg<>		μm/m°C	15	IPC TM-650 2.4.24.5
CTE in X,Y/Z Axis >Tg		μm/m°C	18	IPC TM-650 2.4.24.5
Storage Modulus @ 25°C		GPa	18	ASTM D638
Chemical F	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 Ra	tings & Durabi	lity		
UL Maximum Operating Temperature (MOT)		°C	130	UL 746
UL Flammability		-	V-0	UL 94
UL Comparative Tracking Index		(CTI)	600	UL 746E

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



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