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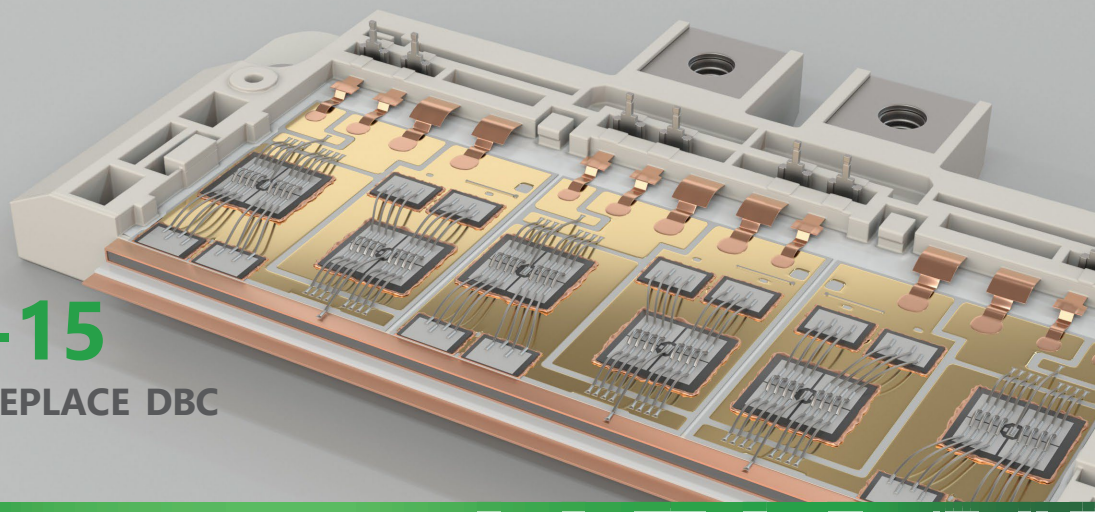

TCLAD SPL-15

VIABLE SOLUTION TO REPLACE DBC

SPL-15 offers high thermal conductivity, high operating temperature, improved mechanical properties, greater design flexibility compared to DBC, and outstanding long-term reliability, making it a competitive alternative to traditional ceramic-based substrates used in power modules and other high-performance applications.

KEY BENEFITS

- High Thermal Conductivity – 10 W/m-K
- High T_g – 270°C (190 – 200°C operating)
- Improved Reliability – Low modulus when compared to DBC (SPL-15 30 GPa vs DBC 250-370 depending on type) allowing for much better long-term reliability related to CTE mismatch
- Greater Design Flexibility
- Cost Effective

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 (4 mil)	°C-in²/W	< 0.015	ASTM D5470
Electrical Properties				
Dielectric Constant		-	8.4	IPC-TM-650 2.5.5.3
Dissipation Factor	100µm (4 mil)	1 MHz	0.018	IPC-TM-650 2.5.5.3
Capacitance	100µm (4 mil)	pF/cm²	110	IPC-TM-650 2.5.5.3
Volume Resistivity		Ωcm	10^{13}	IPC-TM-650 2.5.17.1
Surface Resistivity		Ω/sq	10^{13}	ASTM D149
Breakdown Voltage	30µm (3.2 mil) 100µm (4 mil) 150µm (6 mil)	KVAC	3 4 6	ASTM D149

Item	Thickness	Unit	Value	Method
Mechanical Properties				
Color		-	Light brown	Visual
Peel Strength at 25°C		Kg/cm	> 1.0	IPC TM-650 2.4.8
Glass Transition (T_g)		°C	270	IPC TM-650 2.4.25
CTE in X,Y/Z Axis <T_g		µm/m°C	11.7	IPC TM-650 2.4.24.5
CTE in X,Y/Z Axis >T_g		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	ASTM E595
Out-Gassing Total Mass Loss		%	< 0.1	ASTM E595
Collect Volatile Condensable Material		%	< 0.1	ASTM E595
Agency Ratings & Durability				
UL (RTI) Maximum Operating Temperature (MOT)		°C	155	UL 746
UL Flammability		-	V-0	UL 94
UL Comparative Tracking Index		(CTI)	600	UL 746E

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FEATURES & BENEFITS

- Dielectric Thermal Conductivity 10 W/m-K
- High T_g, ~ 270°C,
- Lead-free solder-compatible
- RoHS-compliant and environmentally green
- Available as a finished substrate (circuit) or IMS panel (rigid or thin core) or a laminating film – RCC or Prepreg
- Available on aluminum and copper base substrates
- TCLAD Metal Core PCB's (MCPCB's) minimize thermal impedance and conducts heat more efficiently than standard printed wiring boards (PWB's)

APPLICATIONS

- High power density applications where achieving low thermal resistance is required
- High temperature SiC IGBT modules
- High Power LEDs and Laser 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.

To learn more about TCLAD visit **tclad.com**

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Across the Board, Around the Globe, TCLAD is the most recognized IMS thermal management material for performance and reliability.