

## Thermally Conductive Insulators



### HIGH THERMAL AND DIELECTRIC PERFORMANCE INSULATOR PAD

Tgard™ K52 is a high thermal and dielectric performance insulator pad consisting of a ceramic filled phase change compound coated on PI film.

Tgard™ K52 phase change coating all but eliminates contact thermal resistance. The phase change coating melts at 52°C and replaces all contact areas that contain air. Tgard™ K52-1 is ideal for applications requiring the best thermal performing insulator material.

Tgard™ K52-2 has the best balance of thermal, dielectric, and cut through performance. Tgard™ K52-3 is a 3 mil PI film that provides the best crush, cut, and tear resistance available with thermal properties that are still in the high performance category.

### FEATURES AND BENEFITS

- High breakdown voltage of 4,000 – 9,000 VAC
- Resistant to tears and cut through
- Total thermal resistance of 0.13 - 0.30 °C-in<sup>2</sup>/watt at 20 psi clip force

### APPLICATIONS

- Audio amps
- Power modules
- Switching mode power supplies
- Power semiconductors (to packages , MOSFETs and IGBTs)

PROPERTY	TEST	K52-1	K52-2	K52-3
<b>ELECTRICAL PROPERTIES</b>				
Dielectric Withstand Voltage 6.3mm probe for 30 sec.	ASTM D149	3,000 volts DC	6,000 volts DC	7,500 volts DC
Dielectric Breakdown Voltage 6.3mm probe	ASTM D149	4,200 volts AC	7,800 volts AC	9,000 volts AC
Volume Resistivity	ASTM D257	4 x 10 <sup>14</sup>	4 x 10 <sup>14</sup>	4 x 10 <sup>14</sup>
Dielectric Constant @ 1 MHz	ASTM D257	1.8	1.8	1.8
<b>MECHANICAL PROPERTIES</b>				
Composite Thickness	ASTM D374	2 mil (0.051mm)	3 mil (0.076mm)	4 mil (0.102mm)
PI Film Thickness	ASTM D374	1 mil (0.025mm)	2 mil (0.051mm)	3 mil (0.076mm)
Tensile Strength	ASTM D412	13.5 kpsi (93 mPa)	18 kpsi (124 mPa)	20 kpsi (139 mPa)
Elongation MD	ASTM D412	80%	80%	80%
Operating Temperature Range		-60 to 150°C	-60 to 150°C	-60 to 150°C
Color		Light amber	Light amber	Medium amber

PRESSURE, PSI (KPA)	10 (69)	20 (138)	50 (345)	100 (689)	200 (1379)	400 (2758)
<b>TOTAL THERMAL RESISTANCE</b>						
°C-in <sup>2</sup> /watt(°C-cm <sup>2</sup> /watt)						
K52-1	0.14 (0.90)	0.14 (0.90)	0.13 (0.84)	0.13 (0.84)	0.13 (0.84)	0.13 (0.84)
K52-2	0.23 (1.48)	0.23 (1.48)	0.22 (1.42)	0.22 (1.42)	0.22 (1.42)	0.22 (1.42)
K52-3	0.33 (2.13)	0.32 (2.06)	0.31 (2.00)	0.30 (1.94)	0.30 (1.94)	0.30 (1.94)

THR-DS-Tgard-K52032123

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**Configurations Available:**

Sheets and standard die cut availability for TO-220, TO-247, TO-3P, TO-3PL, and TO-264  
Custom configurations available with standard tolerance of 0.5mm (0.020") and contact factory if any special shape need.

**Standard Options:**

Request no adhesive with "A0" suffix . Request adhesive on with "A1 "suffix. Please note this adhesive is intended to be a mounting aid and not for permanent bonding. A slight increase in thermal resistance may be seen in comparison to material with no adhesive.

**Storage Conditions:**

Store at 0-35°C and maximum 50%RH ; Should avoid high temperature (>40°C) exposure during shipping.

**Shelf-life:**

Product without adhesive is two years from date of shipment ; With adhesive (A1) is one year from date of shipment when store at above conditions.

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application

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