

- Phase-change thermal interface materials
- Thermally conductive adhesive tapes
- Thermally conductive insulator pads
- Thermally conductive gap fillers
- Thermally conductive silicone compounds
- Flexible heat spreaders • Thermal management for BGAs

LEADER IN THERMAL MANAGEMENT: DESIGN, INNOVATION AND MATERIALS

# CHO-THERM<sup>®</sup> 1680

## Thermally Conductive Insulators For Surface Mount Applications

### MATERIAL DESCRIPTION & PRODUCT FORM

CHO-THERM 1680 thermal interface insulators efficiently transfer heat away from mounted components without the need for clamping force. These pads have a high tack, pressure-sensitive adhesive on one or both sides. This configuration is optimized for mounting multichip modules and other surface mount components to PCBs. CHO-THERM 1680 thermal pads are composed of a polyimide film beneath a layer of boron nitride-filled silicone, with adhesive on one or both sides.

The 0.001 in. thick polyimide film offers excellent resistance to cut-through. The film is coated on one side with a resilient boron nitride-filled silicone, providing an effective thermal path. The adhesive bonds components to provide good

heat transfer under low mounting pressures. This is especially useful in applications such as hybrid, ceramic, and flat packages.

### CRITICAL PERFORMANCE CHARACTERISTICS

There are generally two objectives that must be satisfied in the interface between power semiconductor devices and their heat sinks:

1. To enhance the flow of heat from the device to the metal heat sink.
2. To electrically isolate the device from the metal heat sink.

CHO-THERM 1680 material performs both functions simultaneously.

### THERMAL INTERFACE IMPEDANCE

Thermal impedance is the measure of a material's ability to conduct heat. In addition, thermal impedance describes a material's ability to conform to irregular surfaces and minimize contact resistance.

### VOLTAGE BREAKDOWN CHARACTERISTICS

When using thermal interface pads to electrically isolate a component from a metal heat sink or chassis, the critical material property for the pad is its dielectric strength. Dielectric strength is a measure of how well a material can prevent the voltage on the component case from arcing through the material and allowing an electrical short circuit between the component and the metal mounting surface. This property is commonly presented as the voltage breakdown shown in the Typical Properties Table and is determined by electrical testing of multiple flat sheet samples in accordance with the test procedures detailed in ASTM D149. The higher the value of voltage breakdown, the better the material is at withstanding applied voltages.

The dielectric strength of a material can also be affected by many external factors including: insulator thickness, area of the contact surfaces, temperature, humidity, mechanical stress applied to the insulator, the presence of partial discharge, etc. Contact Chomerics Applications Engineering for details of test methods and assistance with the electrical requirements of your specific application.

TYPICAL PROPERTIES		1680	TEST METHOD
CONSTRUCTION	Binder	Silicone	—
	Filler	Boron Nitride	—
	Carrier	Polyimide	—
	Color	White/Gold	Visual
	Thickness, inch (mm)	0.007 (0.18)	ASTM D374
THERMAL	Thermal Impedance °C-in <sup>2</sup> /W(°C-cm <sup>2</sup> /W)	0.40 (2.6)	ASTM D5470
	Thermal Conductivity, W/m-K	0.65	ASTM D5470
	Operating Temperature Range, °C	-60 to +200	—
ELEC.	Voltage Breakdown, Vac	6000	ASTM D149
	Volume Resistivity, ohm-cm	1 x 10 <sup>14</sup>	ASTM D257
MECHANICAL	Tensile Strength psi, (MPa)	4000 (27.6)	ASTM D412
	Tear Strength, lb/in (kN/m)	200 (35.02)	ASTM D624
	Elongation, %	25	ASTM D412
	Hardness (Shore A)	10	ASTM D2240
	Specific Gravity	1.45	ASTM D792

continued

### CLEANING & WAVE SOLDERING COMPATIBILITY

CHO-THERM 1680 material is compatible with standard PCB wave soldering processes. Because of the relatively short exposure times, CHO-THERM 1680 material can be safely used with fluorocarbon or water based cleaning solutions. Cleaning steps should be performed after soldering.

### ORDERING INFORMATION

CHO-THERM 1680 thermally conductive mounting pad material is available in standard roll sizes of 12 in. (30.5 cm) width x 100 ft. (30.5 m) length. This material is also available in kiss-cut rectangular shapes. Contact Chomerics Sales Department for details on custom sizes or die-cut parts. Part numbers for standard rolls are:

**66-10-1200-1680** Adhesive One Side

**67-10-1200-1680** Adhesive Two Sides

