

## THERMATTACH® Adhesive Tapes

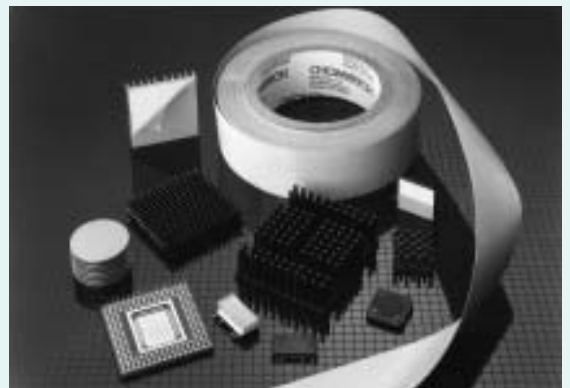
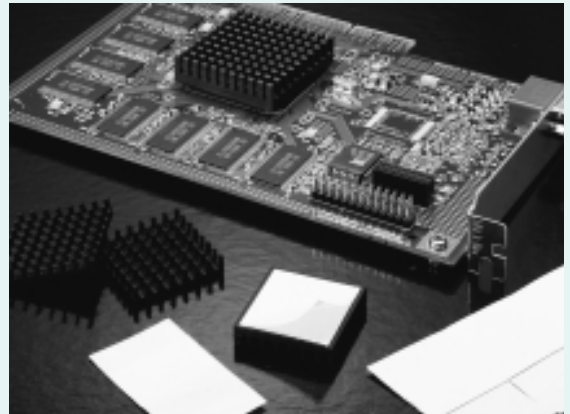
The THERMATTACH family of thermally conductive adhesive tapes is used extensively to bond heat sinks to microprocessors and other power-dissipating semiconductors. Offered with a choice of aluminum oxide or titanium diboride fillers coated on Kapton<sup>†</sup> film, aluminum foil, fiberglass or expanded aluminum, these tapes combine exceptional bonding strength with low thermal impedance to effectively replace thermal grease and mechanical fasteners.

### Typical Applications

- bonding heat sinks to plastic packages (T410 and T411)
- bonding heat sinks to metal or ceramic packages (T404, T405 and T412)
- heat spreader to circuit board attachment (T413 and T414)

### Features/Benefits

- double-sided adhesive system replaces mechanical fasteners
- acrylic or silicone adhesives
- loaded with ceramic fillers for low impedance connections
- electrically isolating and non-insulating versions available



### Typical Properties

THERMATTACH® Material	Dielectric Strength (Vac)	Carrier	Color	Thickness inches (mm)	Thermal Impedance	Features/Typical Applications
T410	NA	Aluminum	Clear/White	0.007 (0.18)	1.1°C-in <sup>2</sup> /W	• Attach heat sinks to plastic packages
T411	NA	Expanded Aluminum	Clear/Silver	0.011 (0.28)	1.0°C-in <sup>2</sup> /W	• Accommodates non-flat plastic surfaces
T404	5000	Kapton MT	Beige	0.005 (0.13)	0.6°C-in <sup>2</sup> /W	• Electrically insulating
T405	NA	Aluminum	White	0.006 (0.15)	0.5°C-in <sup>2</sup> /W	• Electrically non-insulating
T412	NA	Expanded Aluminum	Gray	0.009 (0.23)	0.25°C-in <sup>2</sup> /W	• Best thermal performance
T413	3700	Fiberglass	White	0.007 (0.18)	0.65°C-in <sup>2</sup> /W	• Ionically clean
T414	5000	Kapton MT	Beige	0.005 (0.13)	0.6°C-in <sup>2</sup> /W	• Ionically clean • Electrically insulating

NA= Not Applicable

<sup>†</sup> Trademark of DuPont

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**Parker** Seals

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- 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

# THERMATTACH® T410 and T411

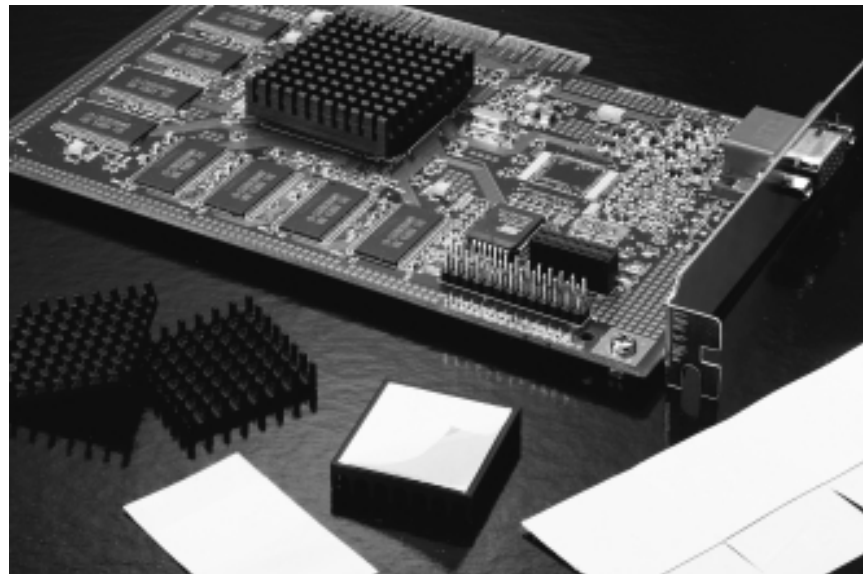
## Thermally Conductive Tapes for Heat Sink Attachment to BGAs and other Plastic Encapsulated Components

**DESCRIPTION**

Chomerics' patented THERMATTACH T410 and T411 double-sided adhesive tapes provide an effective thermal interface and heat sink attachment method for plastic component packages. The tapes are thermally conductive and have exceptional bonding properties. They can also be used to adhere components to vertical heat sinks or to metal chassis walls in place of clips, screws or other mechanical fasteners, without the need for additional thermal compounds.

THERMATTACH T410 tape consists of a high bond strength, pressure sensitive acrylic adhesive loaded with aluminum oxide and coated onto a 0.002 inch (0.05 mm) aluminum foil carrier. The other side of the foil carrier has a silicone pressure sensitive adhesive which provides excellent adhesion to silicone-contaminated plastics and other low energy surfaces.

THERMATTACH T411 tape consists of a high bond strength pressure-sensitive adhesive with an expanded aluminum mesh carrier layer. The mesh carrier allows the tape to conform to curved surfaces of plastic molded IC packages,



providing a high adhesive strength attachment for heat sinks. The high performance silicone PSA allows adhesion to silicone-contaminated plastics and other low energy surfaces.

*NOTE: THERMATTACH T410 and T411 tapes do not feel sticky to the touch although their adhesion is excellent when applied to plastic components.*

*continued*

TYPICAL PROPERTIES		T410	T411	TEST METHOD
CONSTRUCTION	Adhesive (to heat sink side)	Acrylic	Silicone	—
	Color (to heat sink side)	White	Clear (Silver)	Visual
	Carrier	Aluminum Foil	Aluminum Mesh	—
	Adhesive (onto component side)	Silicone	Silicone	—
	Color (to component side)	Clear (Silver)	Clear (Silver)	—
	Thickness, inch (mm)	0.007 (0.18)	0.011 (0.28)	ASTM D374
THERMAL	Thermal impedance @ <1 psi °C-in <sup>2</sup> /W (°C-cm <sup>2</sup> /W)	1.1 (7.1)	1.0 (6.5)	ASTM D5470
	Operating Temperature Range, °C	-50 to +150	-50 to +150	—
ELEC	Voltage Breakdown, Vac	N/A	N/A	ASTM D149
	Volume Resistivity, ohm-cm	N/A	N/A	ASTM D257
MECH	Lap Shear Adhesion, psi (MPa)	60 (0.414)	14 (0.094)	ASTM D1002
	Die Shear Adhesion, psi (MPa) Steel/FR4 25°C 125°C	170 (1.172) 40 (0.276)	80 (0.552) 20 (0.138)	Chomerics Test Procedure No.54

\* Pressure Sensitive Tape Council

**APPLICATION INSTRUCTIONS**

**Step 1:** Ensure that bonding surfaces are free from oil, dust, etc.

**Step 2:** Cut tape to size and remove clear liner or remove pre-cut tape from roll. For optimal surface contact with typical plastic packages, tape should be cut smaller than component size, leaving a 0.05 to 0.10 inch (1.27 to 2.54 mm) border.

**Step 3:** For T410 tape, apply the white adhesive side to the center of the heat sink bonding area. For T411 tape, apply either side to heat sink. Smooth over the entire surface using moderate pressure.

**Step 4:** Remove paper liner from tape. Center heat sink over plastic component and press into place using finger pressure or 5-10 psi.

Effective contact surface area and adhesive performance can be slightly improved by applying pressure and/or heat during heat sink placement. The table below provides some temperature/pressure options.

Pressure	Temperature	Time
10 psi (0.069 MPa)	22°C	15 sec.
10 psi (0.069 MPa)	50-65°C	5 sec.

Please contact Chomerics Applications Engineering Department for additional information.

Approximately 70% of the ultimate adhesive bond strength is achieved with initial application and 80-90% is reached within 15 minutes. Ultimate adhesive strength is achieved within 36 hours. However, the next manufacturing step can occur immediately following the initial application.

**REMOVAL INSTRUCTIONS**

Materials needed: Single-edge razor blade or a small, thin-bladed pocket knife and a soft, thin metal spatula.

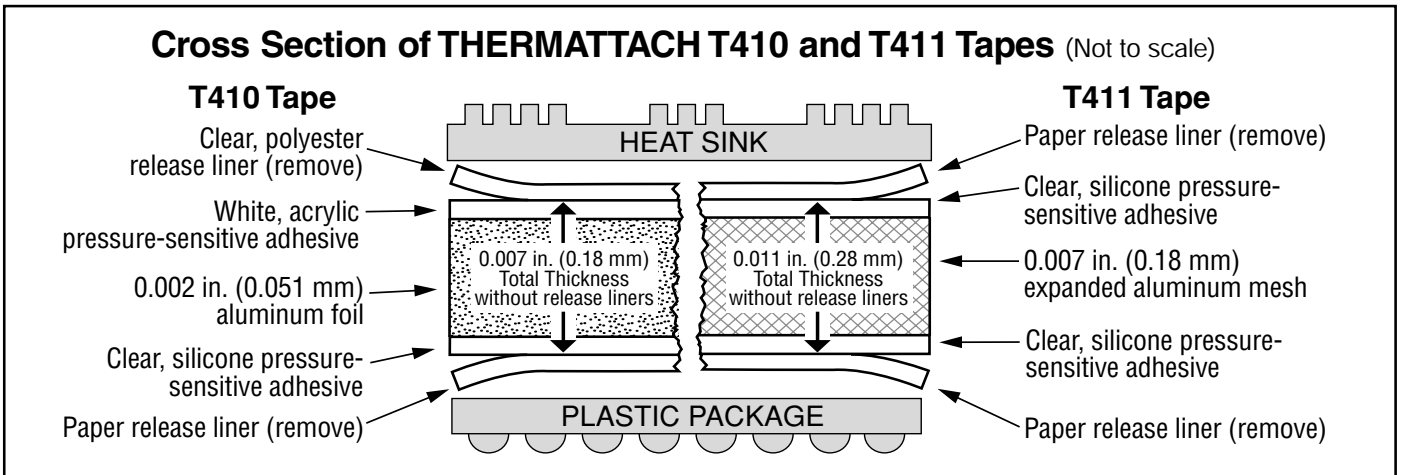
**Step 1:** Carefully insert the blade edge into the bond line at a corner between the heat sink and the component. The penetration need not be very deep.

**Step 2:** Remove the blade and insert the spatula into the wedge. Slowly twist the spatula blade so that it exerts a slight upward pressure.

**Step 3:** Continue the twisting motion and upward force until the two surfaces are completely separated.

**Step 4:** After the two components are separated, the tape can be removed and discarded. Any remaining adhesive on the component surface must be removed. Use solvent (isopropyl alcohol, MEK or acetone) to remove all adhesive residue.

**Step 5:** Let solvent-cleaned components air dry 15 minutes before applying new tape.



**ORDERING INFORMATION**

*Standard Rolls*

THERMATTACH T410 thermal tapes are available in standard roll sizes of 6 inch (15.2 cm) width x 100 ft. (30.5 m) or 400 ft. (122 m). Custom pre-cut parts are available in kiss-cut, rectangular shapes on rolls.

THERMATTACH T411 tape is available as pre-cut parts supplied kiss-cut on rolls in the following standard sizes.

For availability of THERMATTACH parts for other components or package sizes, please contact Chomerics' Inside Sales Department.

**67 - XX - 0600 - T410**

Roll Length
10 = 100 ft. (30.5 m)
40 = 400 ft. (122 m)

**60 - 13 - XX - T411**

Pad Size
18 = 18 mm x 18 mm (0.71 in. x 0.71 in.)
20 = 20 mm x 20 mm (0.79 in. x 0.79 in.)
25 = 25 mm x 25 mm (0.98 in. x 0.98 in.)
30 = 30 mm x 30 mm (1.18 in. x 1.18 in.)
35 = 35 mm x 35 mm (1.38 in. x 1.38 in.)