Thermal Management Solutions For Electronics

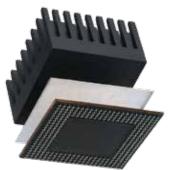




3M[™] Thermally Conductive Adhesive Transfer Tapes



Transfer Tapes 8805, 8810, 8815, 8820. High temperature adhesion with good dielectric strength. Applies quickly and easily using die-cut shapes.



Heat Sink. Thermally Conductive Adhesive Transfer Tape bonds a heat sink to a component and provides a thermal path for component cooling.



Conductive Adhesive Transfer Tape 8810 replaces silicone grease and screws for attaching transistors to heat sink.

3M[™] Thermal Management Solutions for Electronics

This range of high adhesion thin tapes offers efficient thermal transfer for a wide range of applications requiring a thermal management solution: bonding heat sinks, heat spreaders and other cooling devices to IC packages, power transistors, and other heat generating components.

Each tape combines 3M high performance acrylic adhesive with highly conductive ceramic particles for an extremely reliable and user-friendly thermal interface. Highly conformable construction provides excellent wet-out on surfaces.

Select 5, 10, 15 and 20 mil thicknesses to meet application requirements.

3M[™] Thermally Conductive Interface Materials Selection Guide

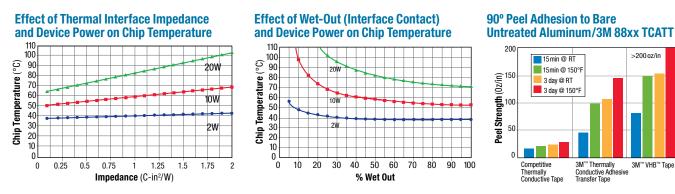
		Des	cription		Adhesion		ermal rmance	Dielectric Properties					
Product	Base Material Type	Product Thickness mil(mm)	Filler Type	Liner Type	Peel Strength @ 72 hr Dwell at RT (N/cm)	Conductivity (W/m-K)**	Impedance °C-in²/W (°C-cm²/W)	Dielectric Strength (kV/mm)	Volume Resistivity (ohm-cm)				
	BM [™] Thermally Conductive Interface Tapes Softer - Improved Surface Conformability Acrylic Thermal Tape												
8805 8810 8815 8820	Filled Acrylic Polymer	5 (0.13) 10 (0.25) 15 (0.38) 20 (0.51)	Ceramic	Silicone Release Polyester Dual Liners	7.5 13.0 19.0 26.0	0.6	0.48 (3.1) 0.88 (5.7) 1.17 (7.6) 1.50 (9.7)	26 8815 tested	5.2 x 10 ¹¹ 3.9 x 10 ¹¹ 3.8 x 10 ¹¹ 3.8 x 10 ¹¹				
	3M™ Thermally Conductive Interface Tapes Standard Acrylic Thermal Tape												
9882 9885 9890	Filled Acrylic Polymer	2 (0.05) 5 (0.13) 10 (0.25)	Ceramic	Silicone Release Polyester	5 6.5 9.5	0.6	0.32 (2.1) 0.49 (3.2) 0.89 (5.7)	29 9890 tested	2 x 1014				
3M[™] Ther High Adhes	mally Conc ion	luctive Inte	rface Ta	pes***									
TM-670SA* TM-671SA* TM-672SA*	Filled Acrylic Polymer	10 (0.25) 15 (0.375) 20 (0.5)	Ceramic	Silicone Release Polyester	25.0/5.5 30.0/9.3 42.0/11.6	0.6	1.1 (7.1) 1.2 (7.8) 1.4 (9.1)	24 TM-670SA tested	-				
8943	rolymor	6.7 (0.17)		Film Liner	6.7	0.4	0.73 (4.7)	33 8940 tested					
		luctive Inte c Thermal Ta _l		pes									
8904-02		7.9 (0.2)			8.8	1.5	1.31 (8.49)	15	-				
8904-025	Filled	10 (0.25)		Clear PET Liner	11	1.5	1.35 (8.74)	15	-				
8904-05	Acrylic Polymer	20 (0.5)	Ceramic		9.9	1.5	1.50 (9.70)	15	-				
8940		7.5 (0.19)		Film Liner	6.7	0.4	0.78 (5.1)	33 8940 tested	-				
8910-03		11.8 (0.3)		Paper	20.5	0.6	1.1 (7.2)	23	-				

	rmally Con Conductive /			ding Tapes					
9876-10	Acrylic Polymer	Acrylic 3.9 (0.1)		3M Logo Printed Silicone Release Paper	9	250 (X-Y)	0.21 (1.4)	20 9876-15	
9876-15	on Cu Laver	5.9 (0.15)	N/A	3M Logo Printed Film Liner	10	0.8 (Z-axis)	0.28 (1.8)	tested	
* TM 67V +c	noo oro dooig	nod with a hic	h/low odł	agion construction		*** Drodu	ata ara anaaia	lordor in the L	ICA

* TM-67X tapes are designed with a high/low adhesion construction. Face side or non-liner side when product roll is unwound is the lower adhesion side.

** 3M tested in accordance with ASTM 05470TM method.

** Products are special order in the USA. Please contact your 3M sales support for details.



3M[™] Thermally Conductive Interface Materials Selection Guide (Continued)

Product	UL Flammability Rating	Potential Operating Temperature Range* (°C)	Typical Applications	Notes
3M™ Therma	ally Conductive Interface Tape – Softer - Improv	ved Surface Conformability Acr	ylic Thermal Tape	
8805 8810 8815 8820	UL Testing Note: Adhesive tapes are not intended to be used independently as a single component. Tapes are recognized for use with specific substrates and the tape/substrate is tested for a UL rating.	Short Term (Hours-Days) 125-150 Long Term (Weeks-Months) 90-100	Thermally conductive adhesive transfer tapes with high mechanical strength, improved surface wet-out, and excellent shock performance. Applications include: heat sink attachment, flex circuit bonding, power device attachment and general thermal attachment solutions.	
3M [™] Therma	ally Conductive Interface Tape – Standard Acr	ylic Thermal Tape		
9882 9885 9890	UL Testing Note: Adhesive tapes are not intended to be used independently as a single component. Tapes are recognized for use with specific substrates and the tape/substrate is tested for a UL rating.	Short Term (Hours-Days) 125-150 Long Term (Weeks-Months) 90-100	3M's original thermally conductive adhesive transfer tape for applications requiring thin bonding with good thermal transfer.	
3M™ Therma	ally Conductive Interface Tape – High Adhesion	**		
TM-670SA* TM-671SA* TM-672SA*	Not Applicable - Non-Compliant	Short Term (Hours-Days) 110-130 Long Term (Weeks-Months) 80-90	3M TCAT TM-67X tapes are designed with a high/low adhesion construction. Face side or non-liner side when product is unwound is the lower adhesion side for good reworkability.	
8943	Not Applicable	Short Term (Hours-Days) 125-150 Long Term (Weeks-Months) 90-100	Thermally conductive tape with good bonding strength. 3M tape 8943 is a single coated tape version of 3M tape 8940.	
3M [™] Therma	ally Conductive Adhesive Tapes (TCAT) – Flam	e Retardant Acrylic Thermal Ta	pe**	
8904-02				ANSI/UL 94 small-scale test data does not pertain to
8904-025	UL 94-V-0 UL 94-V-0	Short Term (Hours-Days) 80-90 Long Term (Weeks-Months)	High thermal conductivity adhesive tape (15W/m-k), application in LED and heat sink bonding. Re-workability and with exclosed to the surfaces	building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used
		80-90		building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for
8904-025	UL 94-V-0	80-90 Long Term (Weeks-Months)	application in LED and heat sink bonding. Re-workability	building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of
8904-025 8904-05	UL 94-V-0 UL 94-V-0 UL 94 V-0 See UL listing for specifics of UL test criteria.	80-90 Long Term (Weeks-Months) 70-80 Short Term (Hours-Days) 125-150 Long Term (Weeks-Months)	application in LED and heat sink bonding. Re-workability and with excellent conformability to surfaces. Thermally conductive tape with good bonding strength	building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of
8904-025 8904-05 8940 8910-03	UL 94-V-0 UL 94-V-0 UL 94 V-0 See UL listing for specifics of UL test criteria. Product tested with a substrate.	80-90 Long Term (Weeks-Months) 70-80 Short Term (Hours-Days) 125-150 Long Term (Weeks-Months) 90-100 Short Term (Hours-Days) 110 - 130 Long Term (Weeks-Months)	application in LED and heat sink bonding. Re-workability and with excellent conformability to surfaces. Thermally conductive tape with good bonding strength and flame retardant performance. For the advanced thermally conductive tape with super adhesion and good flame retardant, 3M TCAT 8910-03 can be considered and recommended as one of high	building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL. ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of
8904-025 8904-05 8940 8910-03	UL 94-V-0 UL 94-V-0 UL 94 V-0 See UL listing for specifics of UL test criteria. Product tested with a substrate. UL 94 V-2	80-90 Long Term (Weeks-Months) 70-80 Short Term (Hours-Days) 125-150 Long Term (Weeks-Months) 90-100 Short Term (Hours-Days) 110 - 130 Long Term (Weeks-Months)	application in LED and heat sink bonding. Re-workability and with excellent conformability to surfaces. Thermally conductive tape with good bonding strength and flame retardant performance. For the advanced thermally conductive tape with super adhesion and good flame retardant, 3M TCAT 8910-03 can be considered and recommended as one of high	building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL. ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of

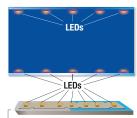
other environmental conditions. Suggested temperature range is based on a UL-746 Test Method or a 3M Test Method.

3M[™] Thermal Management Solutions for Electronics

3M[™] Thermally Conductive Interface Pads



LED BLU Application LED Assembly



3M[™] Thermally Conductive Interface Pads or 3M[™] Thermally Conductive Interface Tapes Heat Sink or Heat Spreader Plate

3

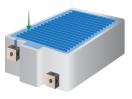
5589H

5590H

5567H

Automotive Battery Application

Battery Assembly



3M[™] Thermally Conductive Acrylic Interface Pads

Notebook Thermal Module Application



Through innovative 3M technology, these soft and conformable pads provide high levels of conductivity for the more demanding applications in the electronics industry. The pads provide excellent handling and can be die cut to fit most applications. Available in silicone and non-silicone elastomers. Polymeric Supporting Film (S Versions)

Filled Thermally Conductive

Removable Release Liner

Silicone Elastomer

or Removable Release Liner

- Thermal conductivity: 1.0-4.9 W/m-k
- Available in silicone and acrylic elastomers

3M[™] Thermally Conductive Interface Pads Selection Guide

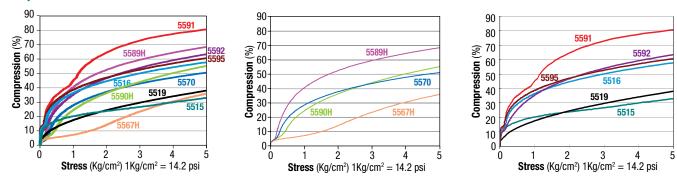
	-					_			
	De	escription	ı		Adhesion/Shore 00 Softness		ermal prmance		ectric erties
Product	Base Material Type	Liner Type Filler Type Product Thick- mil (mm) Base Material Type		Liner Type	Adhesion Characterization/// Shore 00 Testing based on TM 6 mm thickness	Conductivity** (W/m-K)	Impedance*** °C-in²/W (°C-cm²/W)	Dielectric Strength kV/mm	Volume Resistivity (Ohm-cm)
3M [™] Thermally	/ Conduct	tive Silico	ne	Inte	erface Pads				
5514					No added adhesive layer. Pad is tacky and conformable/// Shore 00=58	1.6	0.44 (2.8) 0.47 (3.0)	14.0	8.6 × 10 ¹³
5515		7.9 (0.2) 9.8 (0.25)			No added adhesive layer.	3.0	0.29 (1.8) 0.40 (2.6)	14.5	3.6 × 10 ¹⁴
5515S*					Pad is tacky and conformable/// Shore 00=80	2.7	0.62 (3.9) 0.70 (4.5)	17.7	8.6 × 10 ¹⁴
5516		20 (0.5) 40 (1.0)			No added adhesive layer.		0.31 (2.0) 0.53 (3.4)	13.1	0.0 1011
5516S*		60 (1.5) 80 (2.0)			Pad is tacky and conformable/// Shore 00=50	3.1	0.75 (4.9) 0.98 (6.3)	16.0	6.9 × 10 ¹⁴
5517	Fillec	40 (1.0) 60(1.5) 80(2.0)			No adhesive layer. Pad is tacky and highly conformable//// Shore = 33	3	0.73 (4.7) 0.98 (6.3) 1.22 (7.9)	4.1	5.0 × 10 ¹³
5519	Filled Silicone Polymer	20 (0.5) 40 (1.0)	Ceramic	PET	No added adhesive layer.	4.9	0.29 (1.9) 0.48 (3.1)	11.1	4 7 4014
5519S*	e Polym	60 (1.5) 80 (2.0)	nic		Pad is tacky and conformable/// Shore 00=70	4.5	0.65 (4.2) 0.82 (5.3)	13.5	1.7 × 10 ¹⁴
5591	α 20 (0.5) 40 (1.0) 60 (1.5) 80 (2.0) 20 (0.5) 40 (1.0)				No added adhesive layer.		1.14 (7.3) 1.92 (12.4)	5.5	
5591S*		.5)			Pad is tacky and conformable/// Shore 00=10-15	1.0	2.71 (17.5) 3.49 (22.5)	7.9	2.0 × 10 ¹²
5592			No added adhesive layer.		0.64 (4.1) 1.15 (7.4)	12.2			
5592S*		40 (1.0) 60 (1.5) 80 (2.0)		Pad is tacky and conformable/// Shore 00=43	1.1	1.66 (10.7) 2.43 (15.7)	14.7	3.0 × 10 ¹²	
5595		20 (0.5) 40 (1.0)			No added adhesive layer.	1.6	0.70 (4,5)	13.1	
5595S*		60 (1.5) 80 (2.0)			Pad is tacky and conformable/// Shore 00=50		1.71 (11.0) 2.22 (14.3)	15.7	5.0 × 10 ¹²
3M [™] Thermally	Conduct	tive Ac <u>ry</u> l	ic <u>I</u>	nter	face Pads				
5570	20 (0.5) 40 (1.0)				No added adhesive layer. Pad is tacky and conformable/// Shore 00=50	1.3	0.67 (4.3) 1.18 (7.6) 1.69 (10.9) 2.30 (14.9)	20	2.9 × 10 ¹²
5571	Fille	60 (1.5) 80 (2.0)			No added adhesive layer. Pad is tacky and conformable/// Shore 00 = 70	2	0.81 (5.2) 1.24 (8.0) 1.68 (10.8) 2.11 (13.6)	23	3.3 × 10 ¹²
5578H	Filled Acrylic P	20 (0.5) 40 (1.0)	Ceramic	PET	No added adhesive layer. Pad is tacky and conformable/// Shore 00 = 70	3.5	0.81 (5.4)	19	1.7 × 1012

Polymer No added adhesive laver. 40 (1.0) 1.33 (8.6) Pad is tacky and conformable/// 2.0 21 3.4 × 1012 60 (1.5) 1.67 (10.8) Shore 00 = 4820 (0.5) 0.46 (3.0) No added adhesive layer. 40 (1.0) Pad is tacky and conformable/// 3.0 0.70 (4.5) 16 2.7×10^{12} Shore 00=61 60 (1.5) 0.95(6.1) 20 (0.5) No added adhesive layer. 0.46 (3.0) 40 (1.0) Pad is tacky and conformable/// 3.0 0.70 (4.5) 16 2.7×10^{12} 60 (1.5) Shore 00=63 0.95 (6.1)

*Pads ending with S have a polymeric film on one side to be used as a non-tacky surface for ease of reworking an assembly. **3M tested in accordance with ASTM 05470 test method.

***Thermal impedance is measured with the test sample under a nominal 10 psi pressure to reflect a typical end use application.

Compression vs. Stress



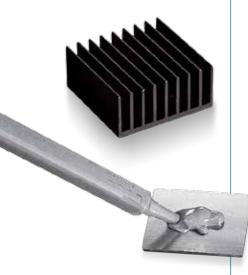
3M[™] Thermally Conductive Interface Pads Selection Guide (Continued)

Product	UL Flammability Rating	Potential Operating Temperature Range****(°C)	Typical Applications	Notes		
3M [™] Thermally (Conductive Silicone	e Interface Pads				
5514	UL 94 V-1		3M Pad 5514 is designed for applications requiring complicated shape, thin thickness (<0.25 mm) and good flexibility with over-bending.			
5515	UL 94 V-0		3M Pad 5515 is designed for applications requiring higher K(3 w/m-k) and thin thickness ($<\!0.25$ mm).	Thermally conductive interface pads (silicone) for applications requiring gap filling and superior thermal performance without		
5515S	Not Applicable	Short Term (Hours-Days)	3M Pad 5515S is Thermal Pad 5515 with a permanent polyimide film on one side to be used as a non- tacky surface for anti-abrsion and ease of reworking on assembly. Thermal conductivity and thermal impedance are slightly changed with addition of thin polyimide film.			
5516	UL 94 V-0	180-200°C Long Term (Weeks-Months)	1) 3M Pad 5516S is Thermal Pad 5516 with a polymeric permanent film on one side to be used as a non-tacky surface for ease of reworking an assembly. Thermal conductivity and thermal impedance are slightly changed with addition of the film, while Dielectric strength is improved.	bonding. Provides IC package and PCB thermal interfacing with heat sinks or other cooling device, and metal cases.		
5516S	UL 94 V-1 or V-0	150-160°C	2) Optional thickness > 2.0 mm are available.	"S" designation signifies a		
5517	-		3M Pad 5517 is a highly conformable, slightly tacky silicone elastomer flexible to fit to the shape.			
5519	UL 94 V-0		1) 3M Pad 5519S is Thermal Pad 5519 with a polymeric permanent film on one side to be used as a non-tacky surface for ease of reworking an assembly. Thermal conductivity and thermal impedance are slightly changed with addition of the film, while Dielectric strength is improved.	one side to provide a non-tacky surface. "H" designation signifies a product with one non-tacky surface without the use of a		
5519S			2) Optional thickness > 2.0 mm are available.	PET film.		
5591	Not Applicable	Short Term	1) 3M Pad 5591S has a polymeric permanent film on one side to be used as a non-tacky surface for ease of reworking an assembly.	ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related		
5591S	UL 94 V-1 or V-0	(Hours-Days) 160-180°C	 2) 3M Pad 5591S is available in 0.5 mm -2.0 mm thickness. 3) Optional thickness > 2.0 mm are available. 	contents. ANSI/UL 94 small- scale test data is intended solely		
5592		Long Term (Weeks-Months)	 3M Pad 5592S is Thermal Pad 5592 with a polymeric film on one side to be used as a non-tacky surface for ease of reworking and assembly. Thermal conductivity and thermal impedance are slightly changed with addition of the film, while dielectric strength is improved. 	for determining the flammability of plastic materials used in the components and parts of end-		
5592S	UL 94 V-1 or V-0	130-140°C	 a) 3M Pad 5592S is available in the 0.5 mm-2.0mm thickness. 3M Pad 5592 1.0-2.0 mm thickness a) Optional thicknesses > 2.0 mm are available. 	components and parts of end- product devices and appliances, where the acceptability of the combination is determined by UL.		
5595		Short Term (Hours-Days) 180-200°C	1) 3M Pad 5595S is Thermal Pad 5595 with a polymeric film on one side to be used as a non-tacky surface for ease of reworking and assembly. Thermal conductivity and thermal impedance are slightly changed with addition of the film, while dielectric strength is improved.			
5595S	UL 94 V-0	Long Term (Weeks-Months) 150-160°C	 a) 3M Pad 5595S is available in the 0.5 mm-2.0 mm thickness. 3M Pad 5595 1.0-2.0 mm thickness 3) Optional thicknesses > 2.0 mm are available. 			

3M [™] Thermally C	Conductive Acrylic	Interface Pads			
5570					
5571		Short Term (Hours-Days) 110-130°C Long Term (Weeks-Months) 90-100°C		3M Pad 5571 has good recovery and a medium tack surface for both sides and uses an acrylic elastomer for applications that require a non-silicone thermal pad.	ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related
5578H	UL 94 V-0		3M Pad 5578H has good recovery, a low tack surface and a very low tack surface, and uses an acrylic elastomer for applications that require a non-silicone thermal pad.	contents. ANSI/UL 94 small- scale test data is intended solely for determining the flammability	
5589H				3M Pad 5589H has a very low tack surface and a medium tack surface and uses an acrylic elastomer for applications that require a non-silicone thermal pad.	of plastic materials used in the components and parts of end-
5590H	-		3M Pad 5590H has a very low tack surface and a medium tack surface and uses an acrylic elastomer for applications that require a non-silicone thermal pad.	product devices and appliances, where the acceptability of the combination is determined by UL.	
5567H			3M Pad 5567H has low odor, a very low tack surface and a medium tack surface on soft layer and uses an acrylic elastomer for applications that require a non-silicone thermal pad.		

**** End use application testing will determine final temperature range based on final design and other environmental conditions. Suggested temperature range is based on a UL-746 Test Method or a 3M Test Method.

3M[™] Thermally Conductive Epoxies



3M[™] Thermal Management Solutions for Electronics

This range of liquid adhesives has less odor and good structural strength adhesion. Dispensing is easy for high output, in-line automated manufacturing and manual application. Adhesive flows and fills micro-spaces on surfaces. Ultra-thin bond line helps achieve low thermal impedance.

3M[™] Thermally Conductive Epoxies Selection Guide

		I	Descrij	otior	ı		ermal rmance		ectric perties			
Product		Base Material Type	Product Thickness mil (mm)	Filler Type	Packaging	Conductivity (W/m-K 3M-ASTM 05470TM)	Impedance °C-in ² /W(°C-cm ² /W) 2.0 mil (50µm) bondline thickness	Dielectric Strength (kV/mm)	Volume Resistivity (ohm/cm)	Potential Operating Temperature Range* (°C)	Typical Applications	Notes
3M	™Tľ	nerm	ally Co	ondu	ıctiv	ve Epox	ies					
TC-2	2707	Filled Epoxy	Various	Aluminum Metal	2-part Epoxy/3M Duo-Pak	0.72	0.105 (0.67)	2.1	2.4 × 10 ¹¹			As the 3M TM Thermally Conductive Adhesive TC-2707 uses aluminum metal fillers, under certain end use application conditions the effective resistivity and/ or effective dielectric strength could be significantly lower than noted. If the metal fillers are "trapped" or "pinched" between two surfaces, an electrical bridge path via the aluminum fillers could occur between these surfaces. Epoxy Adhesive TC-2707 is not suggested for applications where a powered electrical circuit is used or where a reliable volume resistivity and/ or dielectric strength is desired. 3M TM Thermally Conductive Epoxy Adhesive TC-2810 uses ceramic filler and is suggested product to test for these types of application performance needs.
TC-2	2810			Ceramic		1.0-1.4	0.05 (0.32)	3	76 × 10 ¹²			Thermal Conductivity (TC) can vary in an application as the filler is a boron nitride (BN) platelette shape and alignment can change effective TC.

End use application testing will determine mina temperature range based on mina design and our environmental conditions. Suggested temperature range is based on a UL-746 Test Method or a 3M Test Method.

3M[™] EPX Applicator and Nozzle simultaneously and accurately mixes, meters, and applies adhesive with a squeeze of the trigger

The 3M[™] Thermally Conductive Greases are high performance thermal interface materials for transferring thermal energy from a heat source (e.g. processor chip, graphics chip, High Power LED) to a heat sink. The proprietary blend of inorganic fillers contained in an organic matrix (non-silicone) ensures high thermal conductivity and low thermal resistance. Grease products are available in two versions: Standard viscosity and a lower viscosity version that can be useful in screen printing application methods.

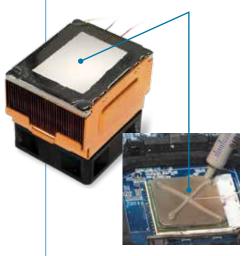
3M[™] Thermally Conductive Greases Selection Guide

		Desc	crip	tion	Therr Perforn		Dielec Proper				
Product	Base Material Type	Product Thickness mil(mm)	Filler Type	Steady State Shear Viscosity @ 1.0 Shear/Rate	Conductivity (W/m-K3M-ASTM 05470 TM)	Impedance °C-in²/W (°C-cm²/W)	Dielectric Strength kV/mm (Film version tested)	Volume Resistivity (ohm/cm)	Potential Operating Temperature Range* (°C)	Typical Applications	Notes
3M [™] The	rma	lly Coi	ndu	ctive Gre	ases						
TCG-2035/ TCG-2031	Non-Silicone Polymeric Binder	Various	Ceramic	2100/150	4.1	0.0127 (0.81)	4.7	1.36 × 10 ⁹	Short Term (Hours-Days) 125-150°C Long Term (Weeks-Months) 100-125°C	Thermally conductive greases provide a thin thermal interface to optimize thermal heat transfer between hot running devices and heat sinking surfaces. Excellent flow properties for improved interface wet-out.	3M Greases TCG-2031 and TCG-2033 are supplied with a small wt% of a solvent added to lower viscosity. Lower viscosity can allow for reduced thickness during application and may benefit screen printing options. Effective thermal measurements are not significantly different from non-solvent added versions. Shear rate viscosity reduced by 5-10×.

* End use application testing will determine final temperature range based on final design and other environmental conditions. Suggested temperature range is based on a UL-746 Test Method or a 3M Test Method.

3M[™] Thermally Conductive Greases

3M[™] Thermal Grease



3M[™] Thermal Management Solutions for Electronics

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