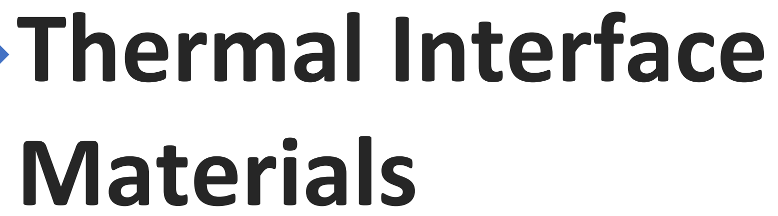

Thermal Interface Materials

Datasheet Catalog

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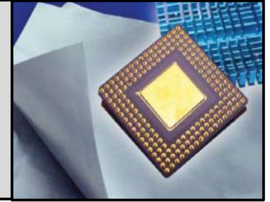
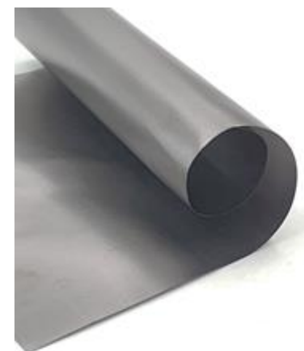
TCGS-100 - Data Sheet



- **Product Introduction**

Designed for mid power electronic device applications, TCGS-100 series is a graphite-based thermal interface material with excellent thermal performance in both horizontal and vertical planes which enhances the efficiency of heat dissipating from the original heat source. The soft and highly flexible properties allow higher conformity between two surfaces. This high-performance material has low mass with ultra-thin and light weight configurations. This material is also customizable into different shapes and sizes based on application requirements. This thermally diffusive material is commonly used in handheld devices to avoid hotspots by extracting heat (generated from electronic devices) evenly over a large surface area, acting as a super lightweight heatsink.

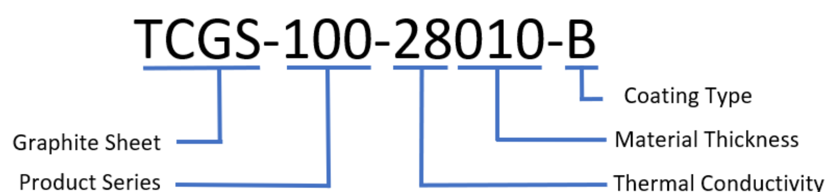
- **About Thermal Interface Material (TIM)**
  - Thermal interface material (TIMs) is used in heat transfer between two surfaces (from higher thermal energy to lower thermal energy).
  - Such materials are commonly used to enhance heat transfer for power semiconductor and devices.
  - Current TIM technologies include thermal grease/paste, phase change material, solder paste and thermally conductive adhesive tapes.
  - With the advancing technology, higher expectations on performance from semiconductors and electronics devices causing higher heat generated, thus demanding for better and higher efficiency of heat dissipating material.



- **Features**
  - Acts as a heat spreader with an excellent thermal conductivity in the horizontal XY-plane up to 1,950 W/m-K
  - Good flexibility & compression ratio
  - Environmentally friendly, does not contain any toxic ingredients
  - Flexible and can be easily bent and trim to customized sizes
  - Thin and lightweight
  - Heat resistant up to 400°C

- **Areas of Application**
  - Semiconductor device testing, e.g. CPU, GPU, MCM, etc
  - Mobile phones & PC tablets, PCs, Servers, and cloud storage
  - PDP, LED devices, IGBT Modules
  - Optical communications equipment, medical equipment

- **Part Number – Definition**



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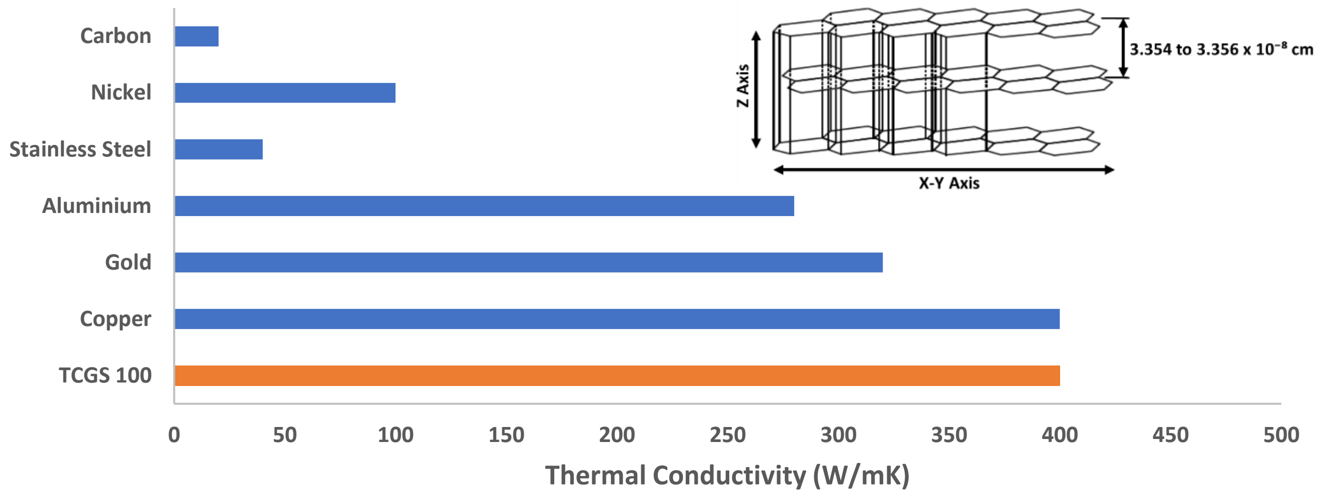
- # Technical Specifications

Description	Unit	TCGS-100 Specifications				Test Method
Part Number		TCGS-100-28XXX-B*	TCGS-100-25XXX-LTPSA*	TCGS-100-20XXX-HTPSA*	TCGS-100-20XXX-TSA*	
Type	-	Bare	Pressure-Sensitive Adhesive (Low Tack)	Pressure-Sensitive Adhesive (High Tack)	Temperature-Sensitive Adhesive	
# of Sides Coated	-	NA	Single / Double	Single / Double	Single / Double	
Material	-	Graphite	Graphite	Graphite	Graphite	-
Film Thickness	um	200 / 350	200 / 350	200 / 350	200 / 350	ASTM D374
Operating Temperature	°C	-55 ~ 400	-10 ~ 150	-10 ~ 150	-18 ~ 135	ASTM D1329
Thermal Conductivity(X-Y)	W/m-K	400 / 200	350 / 150	350 / 150	350 / 150	ASTM D5470
Thermal Conductivity(Z)	W/m-K	28	25	20	20	ASTM D5470
Density	g/cm^3	1.0	1.0	1.0	1.0	ASTM D792
Flexible Strength	MPa	18.0	18.0	18.0	18.0	ASTM D412
Flame Rating	V-0	V-0	V-0	V-0	V-0	UL 94

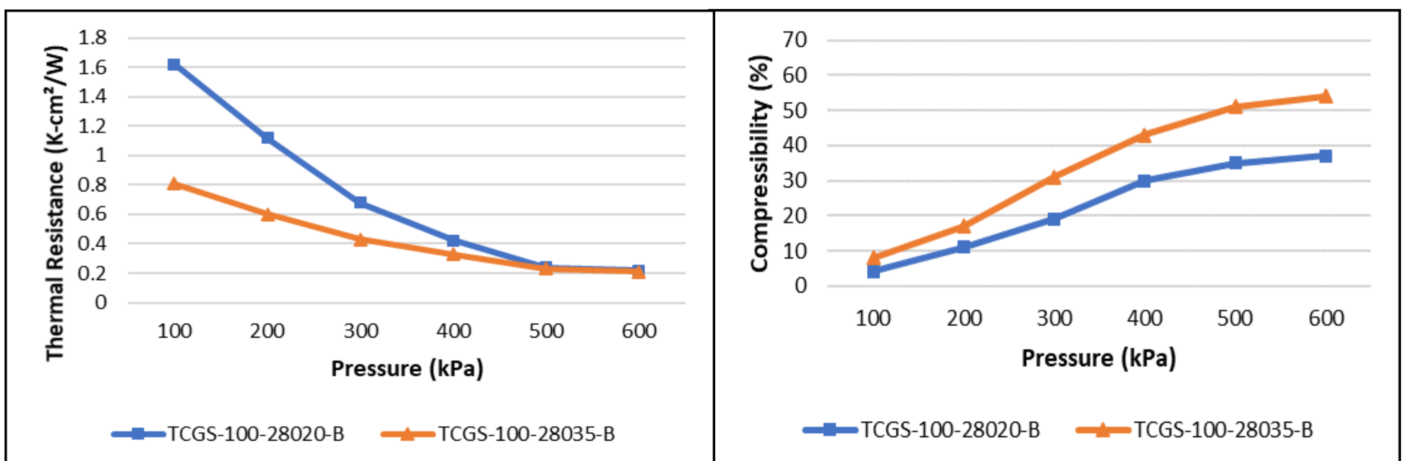
*For part number, XXX represents the thickness of material. For example, 200um thick will be 020 & 350um thick will be 035
For applications where the adhesive needs to operate above 200°C, please contact factory directly.

- # Structure

Thermal Conductivity Comparison Chart



- # Thermal Resistance & Compressibility



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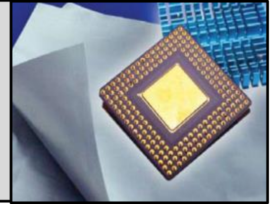
TCGS-220 - Data Sheet



Product Introduction

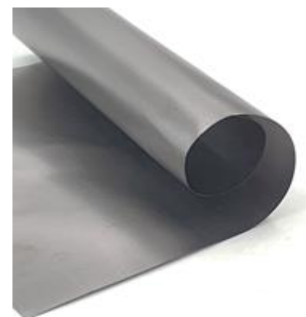
Designed for high power electronic devices applications, TCGS-220 series is a graphite-based thermal interface material with excellent thermal performance in both horizontal and vertical plane which enhances the efficiency of heat dissipation from the original heat source. The soft and highly flexible properties allow higher conformity between two surfaces. This high-performance material has low mass with ultra-thin and light weight configurations. This material is also customizable into different shapes and sizes based on application requirements. This thermally diffusive material is commonly used in handheld devices to avoid hotspots by extracting heat (generated from electronic devices) evenly over a large surface area, acting as a super lightweight heatsink.

About Thermal Interface Material (TIM)

- Thermal interface material (TIMs) is used in heat transfer between 2 surfaces (from higher thermal energy to lower thermal energy).
- Such materials are commonly used to enhance heat transfer for power semiconductor and devices.
- Current TIM technologies include thermal grease/paste, phase change material, solder paste and thermally conductive adhesive tapes.
- With the advancing technology, higher expectations on performance from semiconductors and electronics devices causing higher heat generated, thus demanding for better and higher efficiency of heat dissipating material.

Features

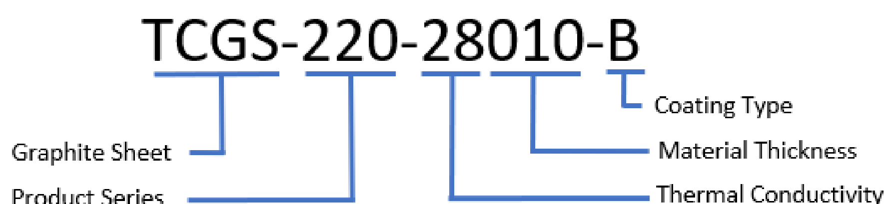
- Acts as a heat spreader with an excellent thermal conductivity in the horizontal XY-plane up to 1,950 W/m-K
- Good flexibility & compression ratio
- Environmentally friendly, does not contain any toxic ingredients
- Flexible and can be easily bent and trim to customized sizes
- Thin and lightweight
- Heat resistant up to 400°C



Areas of Application

- Semiconductor device testing, e.g. CPU, GPU, MCM, etc
- Mobile phones & PC tablets, PCs, Servers, and cloud storage
- PDP, LED devices, IGBT Modules
- Optical communications equipment, medical equipment

Part Number – Definition



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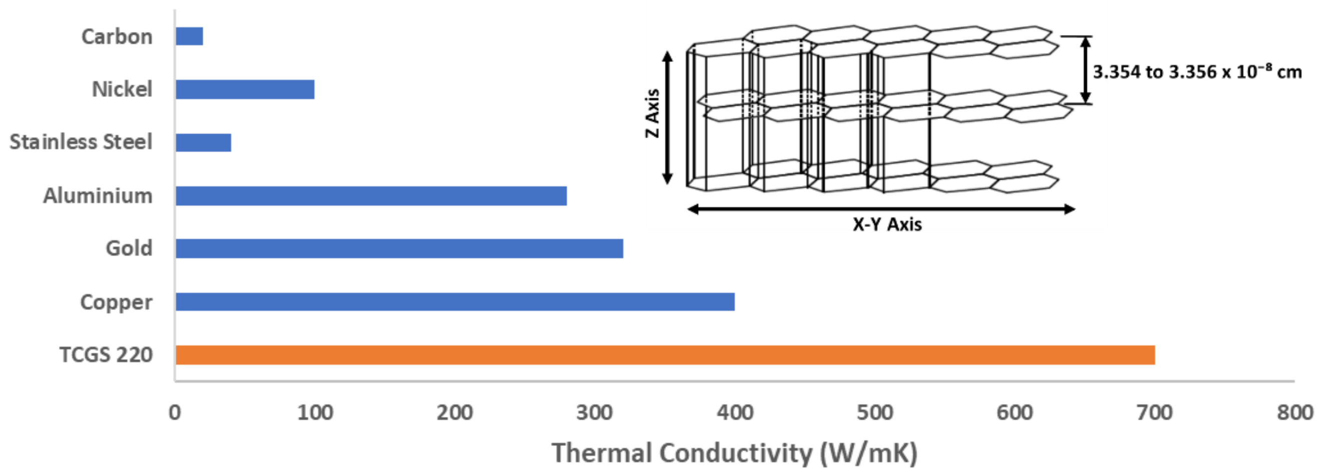
- ## Technical Specifications

Description	Unit	TCGS-220 Specifications				Test Method
Part Number		TCGS-220-28010-B	TCGS-220-25010-LTPSA	TCGS-220-20010-HTPSA	TCGS-220-20010-TSA	
Type	-	Bare	Pressure-Sensitive Adhesive (Low Tack)	Pressure-Sensitive Adhesive (High Tack)	Temperature-Sensitive Adhesive	-
# of Sides Coated	-	NA	Single / Double	Single / Double	Single / Double	
Material	-	Graphite	Graphite	Graphite	Graphite	-
Film Thickness	um	100	110	110	110	ASTM D374
Operating Temperature	°C	-50 ~ 400	-10 ~ 150	-10 ~ 150	-18 ~ 135	ASTM D1329
Thermal Conductivity(X-Y)	W/m-K	700	550	550	550	ASTM D5470
Thermal Conductivity(Z)	W/m-K	28	25	20	20	ASTM D5470
Density	g/cm^3	1.0	1.0	1.0	1.0	ASTM D792
Flexible Strength	MPa	20	20	20	20	ASTM D412
Flame Rating	V-0	V-0	V-0	V-1	V-0	UL 94

For applications where the adhesive needs to operate above 200°C, please contact factory directly.

- ## Structure

Thermal Conductivity Comparison Chart



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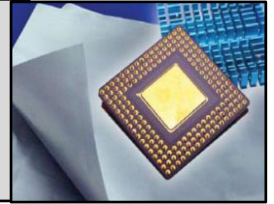
CTP-300 - Data Sheet



Product Introduction

CTP-300 series is a thermal interface material, which is highly flexible and has high thermal conductivity in the vertical (z-plane) direction. The material is made of silicone resin with highly oriented carbon fiber. This material is highly flexible with good compression ratio to allow better compliance to unevenness of any surfaces. It can also be customized into different shapes and sizes based on the requirements of the application.

About Thermal Interface Material (TIM)

- Thermal interface material (TIMs) is used in heat transfer between 2 surfaces (from higher thermal energy to lower thermal energy).
- Such materials are commonly used to enhance heat transfer for power semiconductor devices.
- Current TIM technologies include thermal grease/paste, phase change material, solder paste and thermally conductive adhesive tapes.
- With the advancement of technology, higher expectation of performance in semiconductors and electronics devices causing higher heat generated, thus demanding for better and higher efficiency of heat dissipating material.

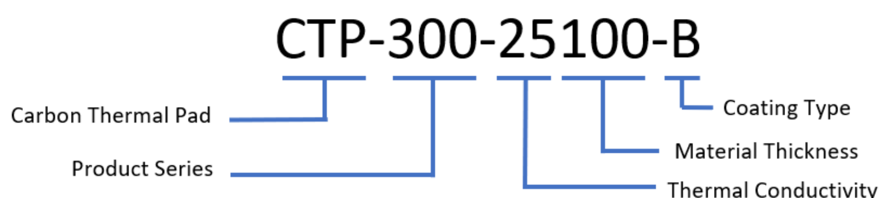
Features

- Excellent thermal conductivity in the vertical z-plane (15 – 35 W/m-K)
- Good flexibility & compression ratio
- Environmentally friendly, does not contain any toxic ingredients
- Flexible and can be easily bent and trim to customized sizes
- Thin and lightweight
- Heat resistant up to 150°C
- RoHS compliant

Areas of Application

- Semiconductor device testing, e.g. CPU, GPU, MCM, etc
- Mobile phones & PC tablets, PCs, Servers, and cloud storage
- PDP, LED devices, IGBT Modules
- Optical communications equipment, medical equipment

Part Number – Definition



Technical Specifications

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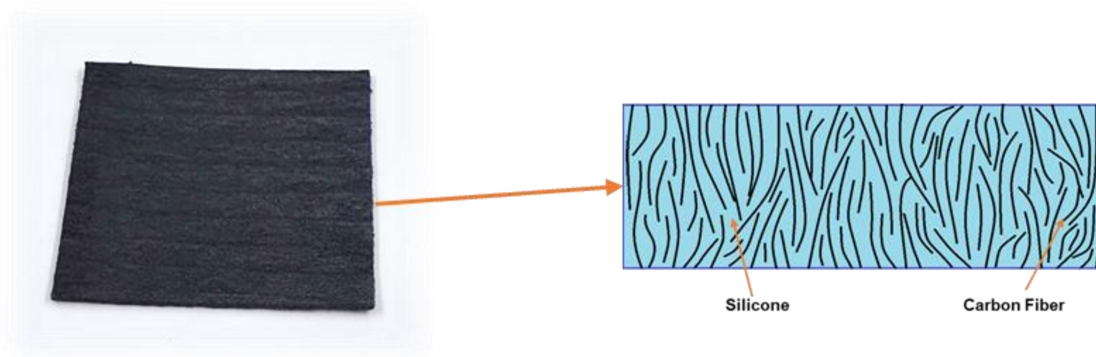
Description/Type	Unit	CTP-300 Specifications		Test Method
Part Number		CTP-300-15XXX*	CTP-300-25XXX*	
Material	-	Carbon Fiber	Carbon Fiber	NA
Colour	-	Black	Black	Visual
Thickness	mm	0.5 / 1.0 / 3.0	0.5 / 1.0 / 3.0	ASTM D374
Thermal Conductivity (Z-plane)	W/m-K	15	25	ASTM D5470
Density	g/cm³	2.4	2.6	ASTM D1329
Hardness	Shore 00	55	55	ASTM D2240
Breakdown Voltage	KV/mm	< 0.1	< 0.1	ASTM D149
Operating Temperature	°C	-50 ~ 150	-50 ~ 150	ASTM D1329
RoHS	-	PASS	PASS	IEC 62321
REACH	-	PASS	PASS	EN 14373
Flame Rating	V0	V-0	V-0	UL 94

- **Structure**



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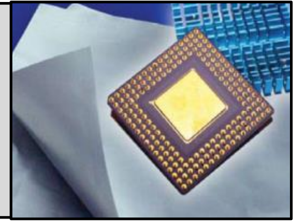
STP-400 - Data Sheet



Product Introduction

STP-400 series is a very cost-effective thermal interface material, which is soft, flexible and has its self-microtack properties. The material is made of silicone resin with proprietary interface conductive filler. This material is highly flexible with good compression ratio to allow better compliance for unevenness to any surfaces. There are options of non-silicone material which has high dielectric strength at high temperature. The material has a natural sticky tack effect, which is easy to install and can be reused. It can also be customized into different shapes and sizes based on the requirements of the application.

About Thermal Interface Material (TIM)

- Thermal interface material (TIMs) is used in heat transfer between two surfaces (from higher thermal energy to lower thermal energy).
- Such materials are commonly used to enhance heat transfer for power semiconductor and devices.
- Current TIM technologies include thermal grease or paste, phase change material, solder paste and thermally conductive adhesive tapes.
- With the advancement of technology, higher expectation of performance in semiconductors and electronics will result in more heat generated, thus the need for better heat dissipation.

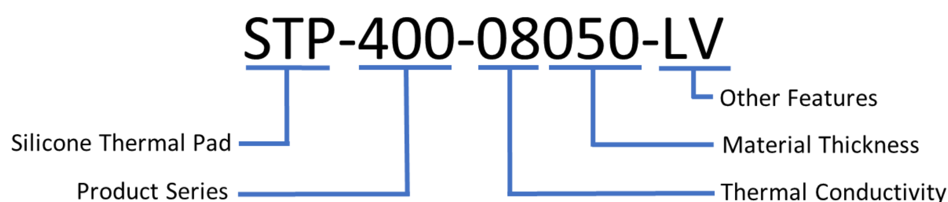
Features

- Excellent thermal conductivity in the vertical z-plane (3 – 8 W/m-K)
- Good flexibility & compression ratio
- Environmentally friendly, does not contain any toxic ingredients
- Flexible and can be easily bent and trim to customized sizes
- Thin and lightweight
- Heat resistant up to 200°C
- RoHS compliant

Areas of Application

- Semiconductor device testing, e.g. CPU, GPU, MCM, etc
- Mobile phones & PC tablets, PCs, Servers, and cloud storage
- PDP, LED devices, IGBT Modules
- Optical communications equipment, medical equipment

Part Number – Definition



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- # Technical Specifications

Description	Unit	STP-400 Specifications					Test Method
Part Number		**STP-400-03XXX***	**STP-400-05XXX***	**STP-400-08XXX***	**STP-400-04XXX-NS***	**STP-400-03XXX-TF***	
Material	-	Silicone	Silicone	Silicone	Non Silicone	Fabric	NA
Colour	-	Blue	Dark Red	Gray	White	White	Visual
Thickness	mm	0.5 / 1.0 / 3.0	0.5 / 1.0 / 3.0	0.5 / 1.0 / 3.0	0.5 / 1.0 / 3.0	0.5 / 1.0 / 3.0	ASTM D374
Thermal Conductivity (Z-plane)	W/m-K	3	5	8	4	3.5	ASTM D5470
Thermal Impedance @1mm/20Psi	°C-in2/W	0.42	0.21	0.25	0.45	0.23	ASTM D5470
Hardness	Shore 00	50	60	70	55	90	ASTM D2240
Specific Gravity	g/cm^3	3	3	3.1	2	2.47	ASTM D792
Volume Resistivity	Ω·cm	1.0×10^{14}	1.0×10^{14}	1.0×10^{11}	1.0×10^{10}	1.0×10^{13}	ASTM D257
Breakdown Voltage	KV/mm	≥ 9	≥ 10	≥ 8	≥ 8.0	6.0	ASTM D149
Operating Temperature	°C	-50 ~ 200	-50 ~ 200	-40 ~ 150	-40 ~ 110	-40 ~ 110	EN344
Dielectric Constant	@1MHz	5.6	5	13.5	-	-	ASTM D150
RoHS	-	Pass	Pass	Pass	Pass	Pass	IEC 62321
Flame Rating	V0	V-0	V-0	V-0	V-0	V-0	UL 94

*For part number, XXX represents the thickness of material. For example, 0.5mm thick will be 050 & 1.0mm thick will be 100

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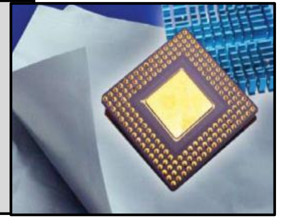
PCM-500 - Data Sheet



• Product Introduction

PCM Series is a thermal interface material made from 99.99% Indium which is very soft and shapeable & has good thermal conductivity in the vertical (z-plane) direction. This material is a solid material at room temperature. When subjected to its specific temperature, its properties change and becomes soft (into semi-flowing paste). This will allow easy shape conformation between 2 compressed surfaces. The material will return back into solid state when it reaches below its specific temperature. It can also be customized into different shapes and sizes based on the requirements of the application.

• About Thermal Interface Material (TIM)

- Thermal interface material (TIMs) is used to transfer heat from a surface of higher thermal energy to another surface of lower surface energy.
- Such materials are commonly used to enable the heat transfer of low/mid power semiconductor devices.
- Current TIM technologies include thermal grease or paste, phase change material, solder paste and thermally conductive adhesive tapes.
- With the advancement of technology, higher expectation of performance in semiconductors and electronics will result in more heat generated, thus the need for better heat dissipation.

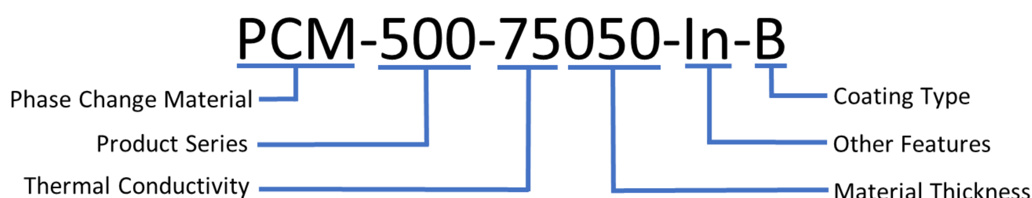
• Features

- Excellent thermal conductivity in the vertical z-plane (75 W/m-K)
- Good flexibility & compression ratio
- Environmentally friendly, does not contain any toxic ingredients
- Flexible and can be easily bent and trim to customized sizes
- Thin and lightweight
- Heat resistant up to 600°C
- RoHS compliant

• Areas of Application

- Semiconductor device testing, e.g. CPU, GPU, MCM, etc
- Mobile phones & PC tablets, PCs, Servers, and cloud storage
- PDP, LED devices, IGBT Modules
- Optical communications equipment, medical equipment

• Part Number – Definition



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- ## Technical Specifications

Description/Type	Unit	PCM-500 Specifications			Test Method
Part Number		**PCM-500-75XXX-In-B***	**PCM-500-75XXX-In-LTPSA***	**PCM-500-75XXX-In-HT PSA***	
Type	-	Bare	Pressure-Sensitive Adhesive (Low Tack)	Pressure-Sensitive Adhesive (High Tack)	-
# of Sides Coated	-	NA	Single / Double	Single / Double	-
Material	-	Indium	Indium	Indium	NA
Thickness	mm	0.1 / 0.2 / 0.5 / 1.0	0.1 / 0.2 / 0.5 / 1.1	0.1 / 0.2 / 0.5 / 1.0	ASTM D374
Thermal Conductivity (Z-plane)	W/m·K	75	74	75	ASTM D5470
Operating Temperature	°C	-50 ~ 600	-50 ~ 599	-50 ~ 600	EN344
Phase Change Temperature	°C	56	55	56	-
RoHS	-	PASS	PASS	PASS	IEC 62321

*For part number, XXX represents the thickness of material. For example, 0.2mm thick will be 020 & 1.0mm thick will be 100

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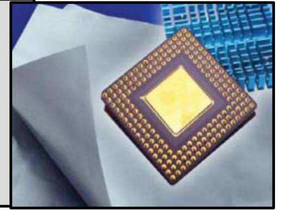
TG-600 - Data Sheet



• Product Introduction

TG-600 Series is a thermal interface material, which is highly flexible & has good thermal conductivity in the vertical (z-plane) direction. The material is a single component, silicone-based and thermally conductive gap-filling material. This material has good thermal conductivity with its low thermal resistance properties. Due to its soft material properties, it is suitable for applications with large gap tolerances to improve heat transfer performance between 2 compressed surfaces.

• About Thermal Interface Material (TIM)

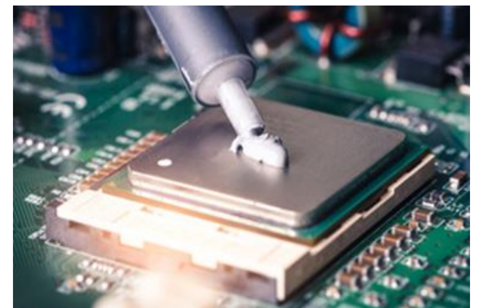
- Thermal interface material (TIMs) is used to transfer heat from a surface of higher thermal energy to another surface of lower surface energy.
- Such materials are commonly used to enable the heat transfer of low/mid power semiconductor devices.
- Current TIM technologies include thermal grease or paste, phase change material, solder paste and thermally conductive adhesive tapes.
- With the advancement of technology, higher expectation of performance in semiconductors and electronics will result in more heat generated, thus the need for better heat dissipation.

• Features

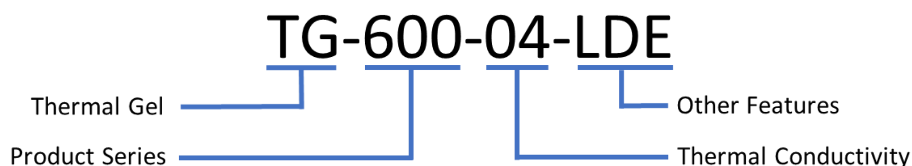
- Excellent thermal conductivity in the vertical z-plane (2 – 9 W/m-K)
- Good flexibility & compression ratio
- Environmentally friendly, does not contain any toxic ingredients
- Flexible and can be easily bent and trim to customized sizes
- Thin and lightweight
- Heat resistant up to 200°C
- RoHS compliant

• Areas of Application

- Semiconductor device testing, e.g. CPU, GPU, MCM, etc
- Mobile phones & PC tablets, PCs, Servers, and cloud storage
- PDP, LED devices, IGBT Modules
- Optical communications equipment, medical equipment



• Part Number – Definition



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• Technical Specifications

Description	Unit	TG-600 Specifications					Test Method
Part Number	-	TG-600-02-LDE	TG-600-04	TG-600-04-LDE	TG-600-07	TG-600-09	-
Thermal Conductivity (Z-plane)	W/m·K	2	4	4	7	9	ASTM D5470
Exteusion Rate	g/min	40	25	40	15	15	-
Density	g/cm³	1.7	2.9	1.6	3.3	3.5	ASTM D792
Volatitlity	%	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	ASTM E595
Specific Heat Capacity	J/g·K	1.1	1.1	1.1	1.1	1.1	ASTM E1269
Volume Resistivity	Ω·cm	-	1.0×10^{13}	-	1.0×10^{13}	-	ASTM D257
Breakdown Voltage	KV/mm	≥ 8.0	≥ 5.0	≥ 8.0	> 5.0	≥ 6.0	ASTM D149
Dielectric Constant	@1MHz	3.7	-	3.9	-	12	ASTM D150
Operating Temperature	°C	-50 ~ 200	-50 ~ 200	-50 ~ 200	-50 ~ 200	-50 ~ 200	EN344
RoHS	-	Pass	Pass	Pass	Pass	Pass	IEC 62321
Flame Rating	V0	V-0	V-0	V-0	V-0	V-0	UL 94

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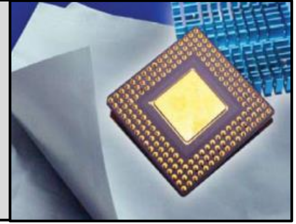
LVM-700 - Data Sheet



Product Introduction

LVM-700 Series is a thermal interface material, which is a chemical combination of gallium-indium-tin alloy. The material has a boiling point up to 2,000°C with very stable physical and chemical properties, making it non-volatile in air. It is a viscous thermal compound with 100% metal content and has good thermal conductivity in the vertical (z-plane) direction. It is able to fill up any possible air gap between 2 compressed surfaces and obtaining high temperature performance. This material has good wettability and adhesion with higher temperature resistance properties. It is stable in liquid state at low temperature and will remain in its state when subjected to high temperature.

About Thermal Interface Material (TIM)

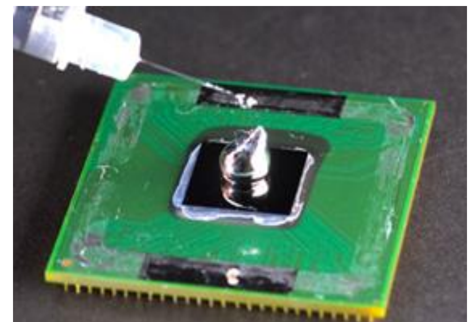
- Thermal interface material (TIMs) is used to transfer heat from a surface of higher thermal energy to another surface of lower surface energy.
- Such materials are commonly used to enable the heat transfer of low/mid power semiconductor devices.
- Current TIM technologies include thermal grease or paste, phase change material, solder paste and thermally conductive adhesive tapes.
- With the advancement of technology, higher expectation of performance in semiconductors and electronics will result in more heat generated, thus the need for better heat dissipation.

Features

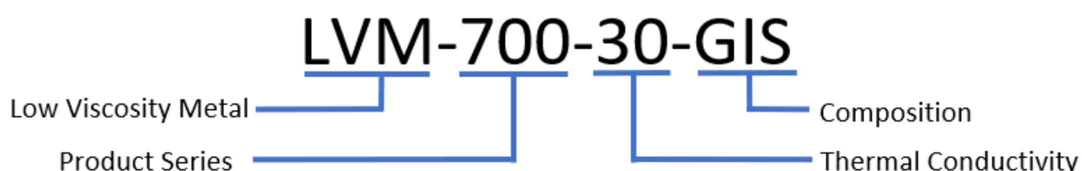
- Excellent thermal conductivity in the vertical z-plane (40 – 70 W/m-K)
- Good flexibility & compression ratio
- Environmentally friendly, does not contain any toxic ingredients
- Flexible and can be easily bent and trim to customized sizes
- Thin and lightweight
- Heat resistant up to 600°C
- RoHS compliant

Areas of Application

- Semiconductor device testing, e.g. CPU, GPU, MCM, etc
- Mobile phones & PC tablets, PCs, Servers, and cloud storage
- PDP, LED devices, IGBT Modules
- Optical communications equipment, medical equipment



Part Number – Definition



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• Technical Specifications

Description	Unit	LVM-700 Specifications		Test Method
Part Number		**LVM-700-40-GIS**	**LVM-700-70-GIS**	
Composition	-	GaInSnZn	GaInSnZn	NA
Volatility	%	< 0.001	< 0.001	ASTM DE595
Thermal Conductivity (Z-plane)	W/m·K	40	70	ASTM D5470
Conductivity	S/m	8 × 10^6	8 × 10^6	-
Viscosity	mPa·s	4200	4200	-
Operating Temperature	°C	-50 ~ 600	-50 ~ 600	EN344

*Note : Do not apply LVM-700 on aluminium surface as it will create a chemical reaction forming extensive black oxidation. It will be suitable for copper with electroless nickel plating.

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