

THERMAL INTERFACE MATERIAL

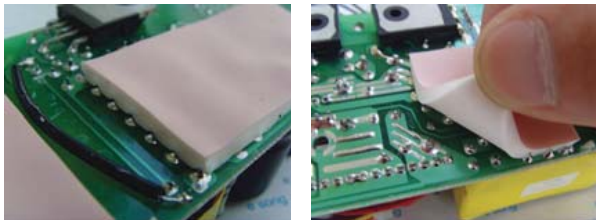


- [RoHS compliant](#)
- [Excellent thermal conductivity](#)
- [Flame retardant](#)

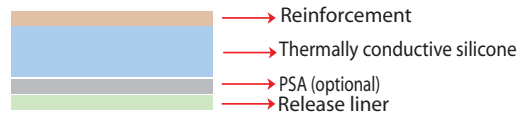
- Made of silicone resin and thermally conductive filler
- Many are inherently tacky and easy to attach
- Thermally conductive PSA is available, if not inherently tacky.



SILICONE PAD TYPE



■ Structure



■ Features

- Highly thermally conductive
- Soft and tacky for close-contact for high conductivity
- Reusable

■ Applications

PDP TV, heat spreader for CPU and CDROM, heatsink for semiconductor, etc.

■ Types and specifications

	Part number	Color	Thickness [mm]	Hardness	Thermal conductivity [W/mK]	Operating temp. [°C]	Volume resistivity [Ω · m]
Ultra soft type	THEA710	White	0.5~15	Shore 00 5	1.0	-60~200	Min. 1x10 ¹¹
	THEA710H	White	0.5~15	Shore 00 25	1.0	-60~200	Min. 1x10 ¹¹
Soft type	THEA715	Gray	0.5~10	Shore 00 50	1.5	-60~200	Min. 1x10 ¹¹
	THEA720	Gray	0.5~10	Shore 00 60	2.0	-60~200	Min. 1x10 ¹¹
	THEA730	Gray	0.5~10	Shore 00 60	3.0	-60~200	Min. 1x10 ¹¹
	THEA750	Gray	0.5~10	Shore 00 65~85	5.0	-60~200	Min. 1x10 ¹¹
	THEA770	Gray	0.5~10	Shore 00 65~85	7.0	-60~200	Min. 1x10 ¹¹
Hard type	THEA909F	Pink	0.13, 0.23, 0.28	Shore A 85	0.9	-60~180	Min. 2x10 ¹³
	THEA916F	Pink	0.13, 0.23, 0.28	Shore A 90	1.6	-60~180	Min. 5x10 ¹³

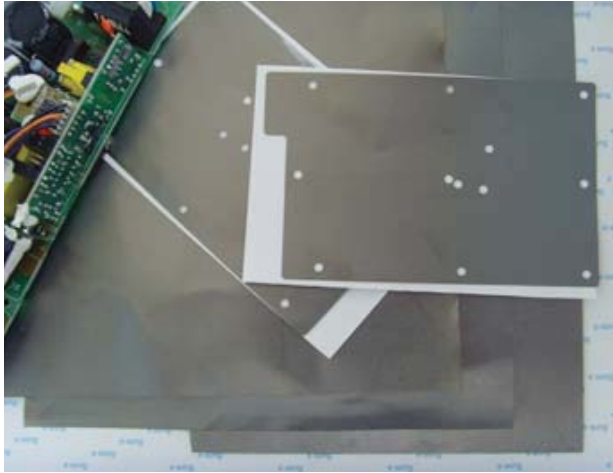
Note: Above data is for reference only.

F at the end of part number indicates fiber-glass reinforcement.

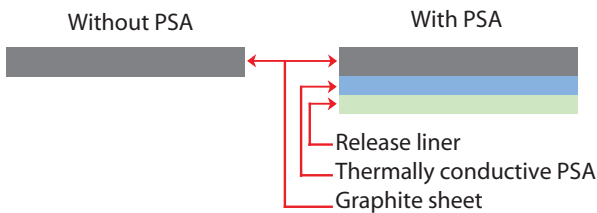
Fiber-glass reinforcement is available for all part numbers.

Ultra-thin PET film reinforcement is also available.

GRAPHITE SHEET

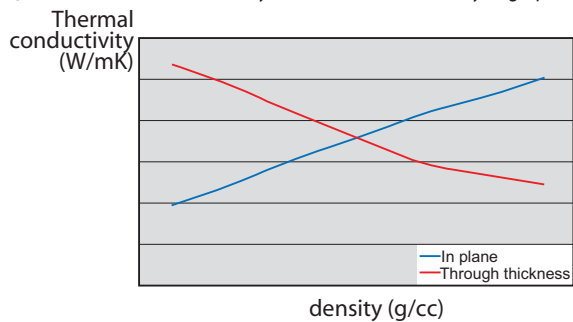


■ Structure



■ Typical performance

① Correlation between density and thermal conductivity of graphite



■ Features

- 300 W/mK conductivity in plane, spreading heat energy quickly (heat spreader)
- 6.25 W/mK conductivity through thickness (thermal pad)
- Special coated surface to keep out foreign particles
- High operating temperature
- Corrosion resistant

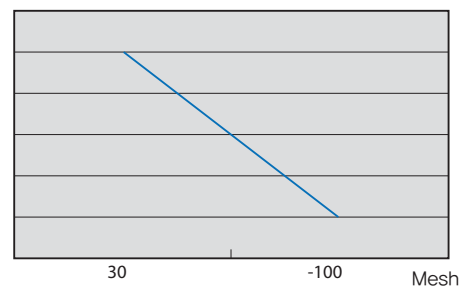
■ Specifications

Part number: THGS-PS-300625

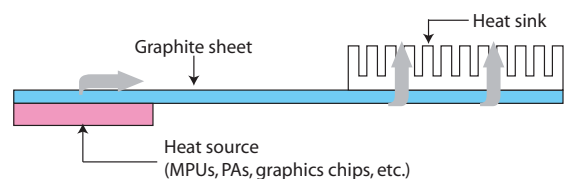
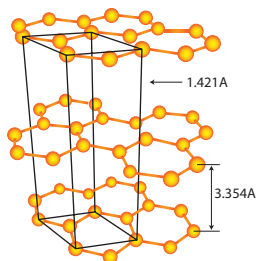
	Unit	Value	Test Method
Color		Dark gray	
Restoration	%	≥ 9.0	ASTM F36A
Compression Rate	%	35 ~ 55	ASTM F36A
Tensile Strength	Mpa	> 3.5	JB/T 91412
Thermal Conductivity	W/mK	6.25 / 300 *	ASTM 5470
Thickness	mm	0.2~1.0	
Width	mm	500, 1,000, 1,500	
Length	m	50, 70	

* 6.25 through thickness; 300 in plane

② Correlation between expansion rate factor and thermal conductivity of graphite



■ Graphite Structure



Graphite sheet transfers heat to a remote heatsink when the heatsink cannot be mounted on the heat source, due to space limitation.

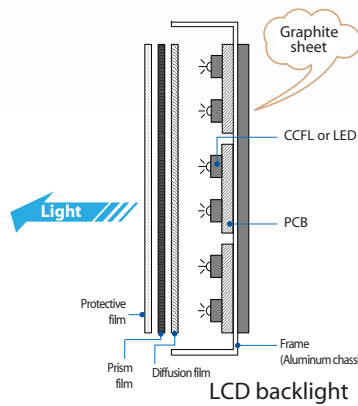
■ Usage examples

CPU, SMPS, Power AMP, LCD/PDP TV, etc.



Digital camcorder

TH754G
Graphite sheet



THERMAL GREASE



■ Feature

- Highly thermally conductive
- Auto-dispensing compatible
- Silk-screen printing compatible
- High use temperature, low outgassing and little weight change in usage

■ Part numbers

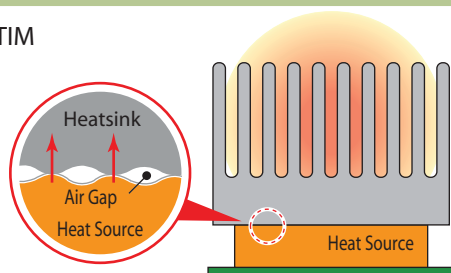
THEA-P2100 rated at 2.1W/mK thermal conductivity
THEA-P4100 rated at 4.1W/mK thermal conductivity.

■ THEA-P4100 Specifications

Property	Unit	THEA-P2100	THEA-P4100
Color		Light Gray	Gray
Thermal Conductivity	W/mK	2.1	4.1
Specific Gravity	At 23°C	2.5	2.9
Viscosity	Pa.s	250	300
Bleed	150C/24h (Wt%)	<0.1	<0.1
Evaporation	150C/24h (Wt%)	0.3	0.3
Volume Resistance	Ω · m	0.05	0.05
Breakdown Voltage	kV/0.25mm	4.1	4.1
Operating Temp.	°C	-50~170	-50~170

ROLE OF THERMAL INTERFACE MATERIAL (TIM) AND MEASURING THERMAL CONDUCTIVITY

■ Role of TIM



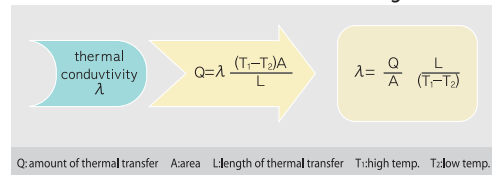
The surfaces of CPU and heatsink are not truly flat and there are numerous air gaps where the two surfaces meet. Air gaps hinder transfer of heat from the heat source to the heatsink. The grease fills these air gaps, provides efficient thermal transfer.

■ How to measure thermal conductivity

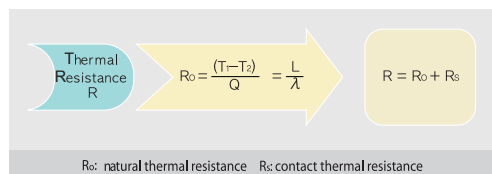
Hot Wire Method (JIS R 2616)

The hot wire method is used for unhardened product(oil compound). Probe(hot wire and thermocouple) on the insulation layer on the sample measure thermal conductivity according to flow changes, voltage, current and time.

■ Heat characteristic evaluation and measuring method



■ Calculation of thermal resistance



Evaluating the Resistance to Thermal Transmission of Materials by the Guarded Heat Flow Meter Technique (ASTM E-1530)

This method is used for hardened products (ie. rubber, RTV rubber, gel, etc.) After inserting sample and measuring probe between heat-source and heatsink, thermal conductivity is calculated based on the differences in temperature and heat flow.