Panasonic

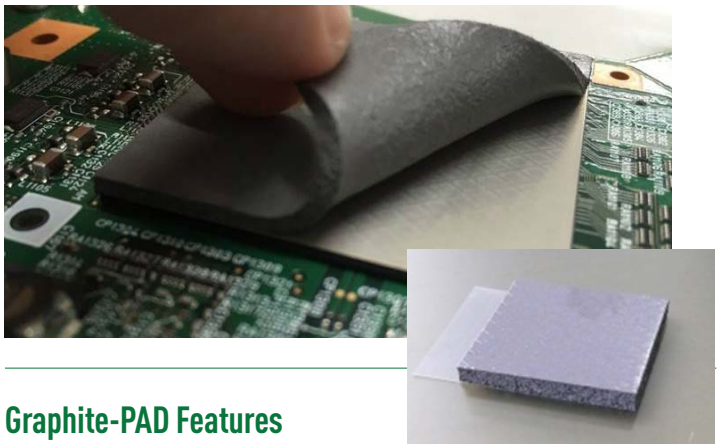
CP CIRCUIT PROTECTION

Introducing The New EYG-T Series "Graphite-PAD" Thermal Interface Material From Panasonic

High Thermal Conductivity In The Z-Direction With Superior Flexibility

Panasonic's new Thermal Management material, the **EYG-T Series Graphite-PAD**, is a thermal interface material that compatibly obtains excellent thermal conductivity in Z-axis thickness direction along with providing superior flexibility. The new **Graphite-PAD** product provides properties that are greater than that of most existing thermal interface materials.

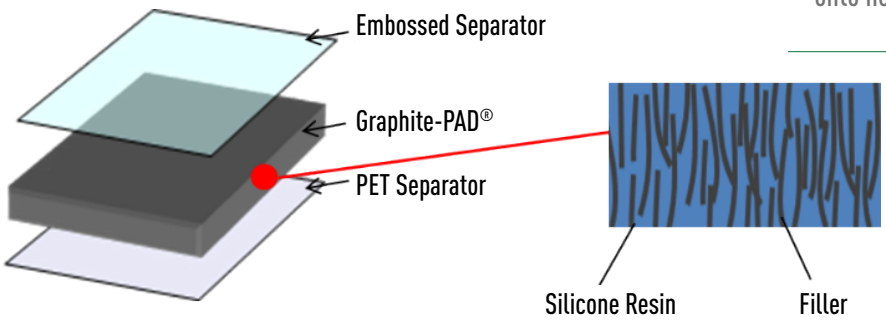
Graphite-PADs are composed of silicone resin and Pyrolytic Graphite Sheets (PGS) as filler. This combination of materials offers high Thermal Management reliability by enabling designs with high heat dissipation. The PGS inside the resin is oriented in a vertical direction as shown in Figure 1. This oriented structure provides excellent thermal conductivity in thickness direction. The component is very flexible (deformable) since it is mainly composed of silicone resin. Being deformable with a low load facilitates installation.



Graphite-PAD Features

- Thermal Conductivity in Thickness Direction
- Thermal Conductivity Of The Material: 13 W/m-K
- Improved thermal conductivity in thickness direction is obtained by having PGS Graphite Sheet® oriented in vertical direction filled into silicon resin.
- Excellent Flexibility
- Hardness: TYPE E 25
- Provides efficient heat conduction thanks to its high adhesion performance generated from flexibility. Flexibility also provides degree of freedom in design because the component can be set onto heat sources with a low load.

Figure 1: Graphite-PAD Structure



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Items		Test Equipment/ Method	Condition	Data				
				0.5 mm	1.0 mm	1.5 mm	2.0 mm	3.0 mm
Thickness	(mm)	Micrometer		0.50	1.0	1.5	2.0	3.0
Thermal Resistance	(°C - cm^2/W)	TIM Tester	100 kPa	0.96	1.34	1.56	1.93	2.36
Compressibility	(%)	TIM Tester	100 kPa(at 50°C)	5.78	10.29	17.46	17.80	17.90
Thermal Conductivity of Graphite-PAD with a unit (including contact resistance)	(W/m-K)	TIM Tester	100 kPa	5.08	7.02	7.80	8.60	10.10
Thermal Conductivity of the Graphite-PAD	(W/m-K)	(ASTM D5470)	50 kPa	13				
Hardness		(ASTM D2240)	TYPE E	25				
Adhesive				Adhesive on both faces				
Volume Resistivity	(Ω-cm)	(ASTM D257)		$4x10^5$				
Operating Temperature Range	(°C)			-40 to 150				
Siloxane		Solvent extraction	∑ (D4-D10)	≤70ppm				

Figure 2: Thermal Resistance Depending On Pressure

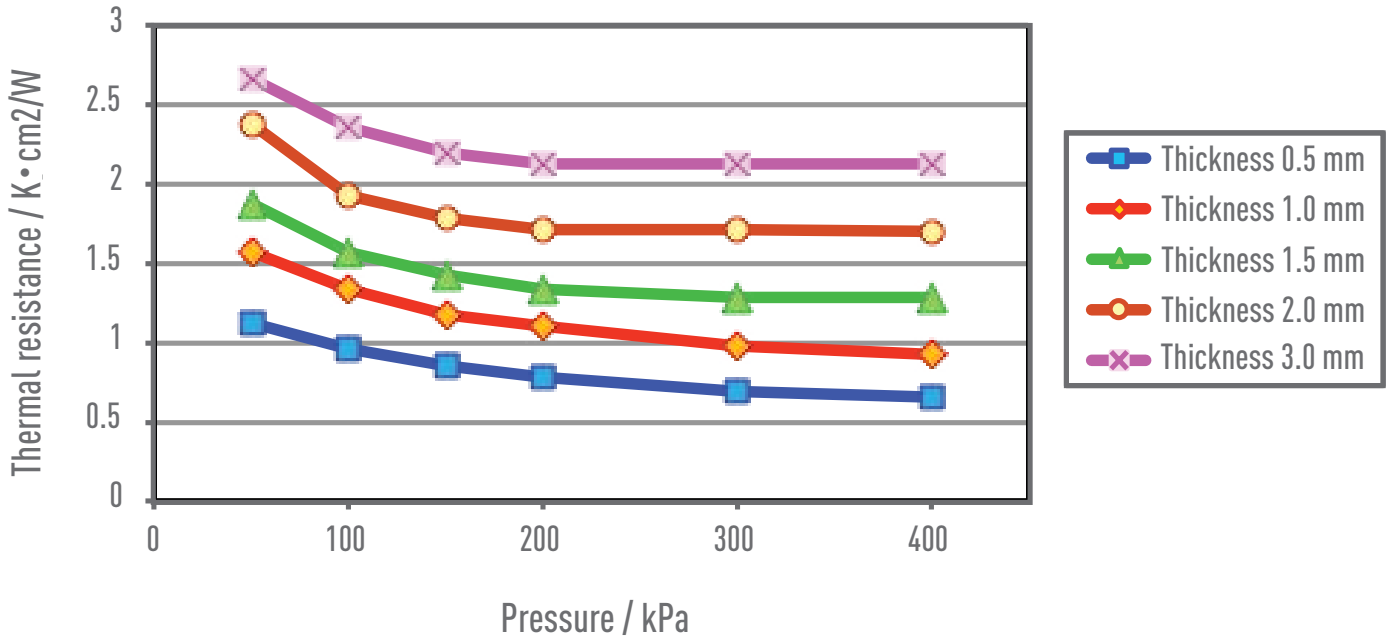

Figure 3: Compressibility Depending On Pressure

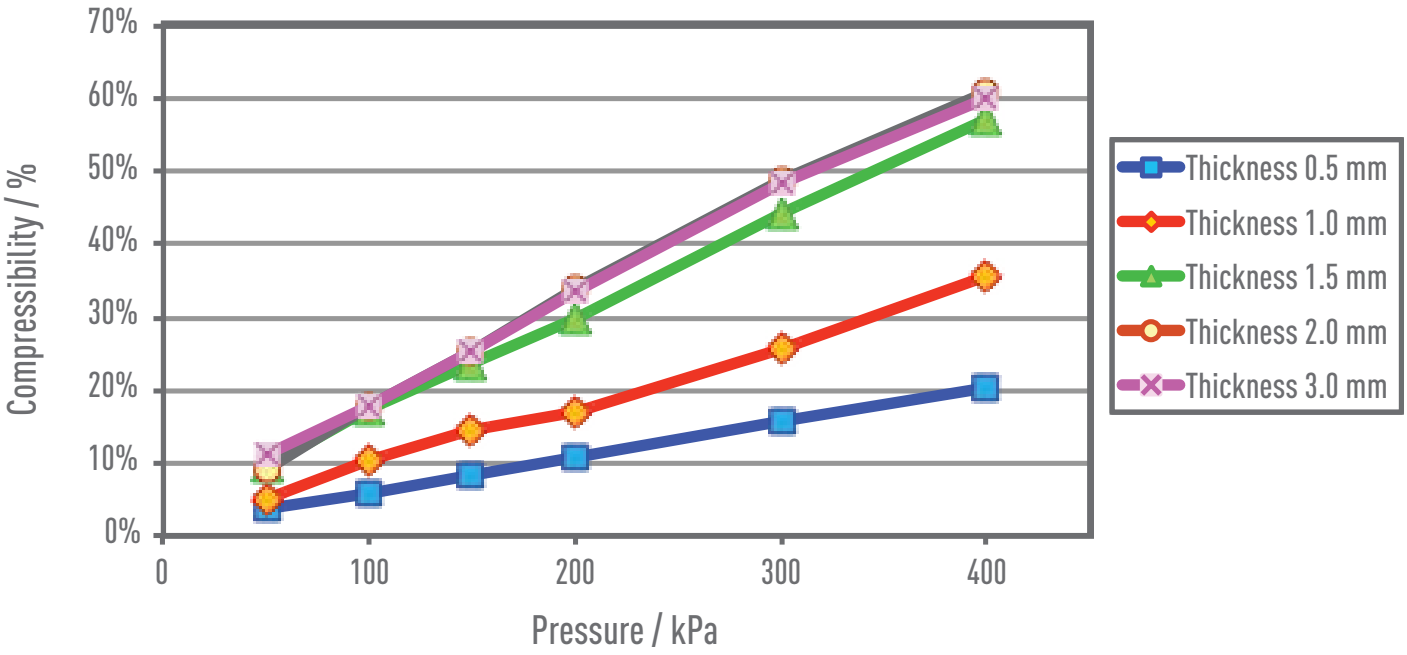

Figure 4: Comparison Of Thermal Conductivity

Figure 4 shows an experiment to compare Graphite-PAD and a generally used thermal interface material. The pictures clarify that the Graphite-PAD quickly spreads heat in the thickness direction.