



“Graphite-PAD” high thermal conductivity in z-direction

EYGT type

Graphite-PAD is a thermal interface material (TIM) that compatibly obtained excellent thermal conductivity in thickness direction (Z-axis direction) and high flexibility (deformable with a low load). The properties are greater than that of existing TIMs. The product is created by filling PGS Graphite Sheet into silicon resin.

Features

- High thermal conductivity : 13 W/m·K
- Excellent compressibility : 50 % (t=2 mm, Pressure 300 kPa)
- Thermal resistance : fit into uneven parts and provide excellent thermal resistance with a low load
- High reliability : correspond to -40 to 150 °C and maintains long-term reliability
- Thickness range : 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 mm
- RoHS compliant

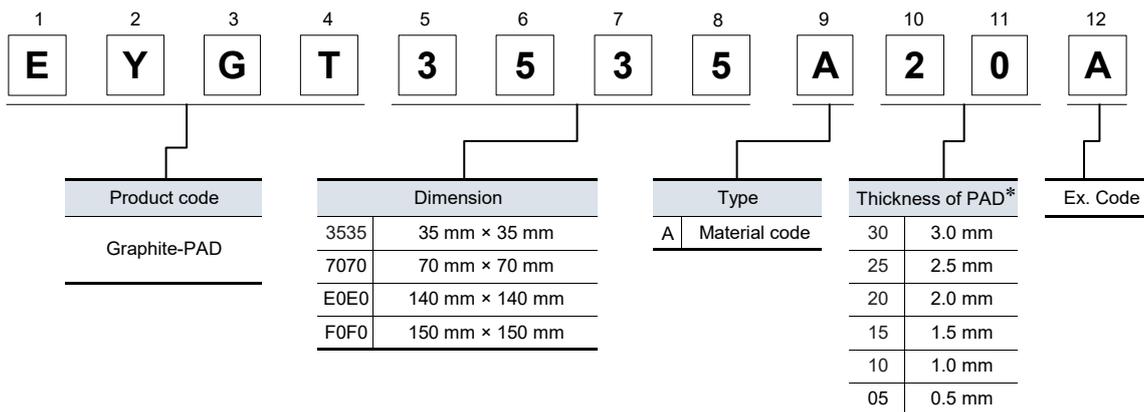
Recommended applications

Cooling of heat generating components, such as electronic devices, semiconductor memory device, etc.

- General-purpose inverter, medical equipment, and DSC
- Car-mounted camera, motor control unit, automotive lighting (LED), car navigation, luminous source of laser HUD
- Base station, IGBT module

Explanation of part numbers

- Graphite-PAD (EYGT*****A)



* E0E0 : 2.0 mm, 2.5 mm, 3.0 mm
F0F0 : 0.5 mm, 1.0 mm, 1.5 mm

** Please confirm other condition separately.

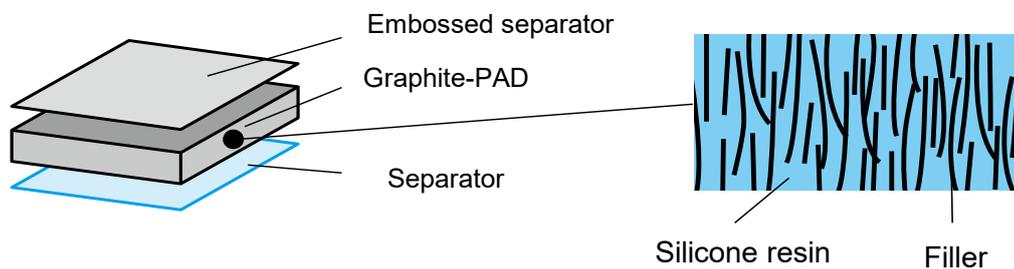
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Typical characteristics

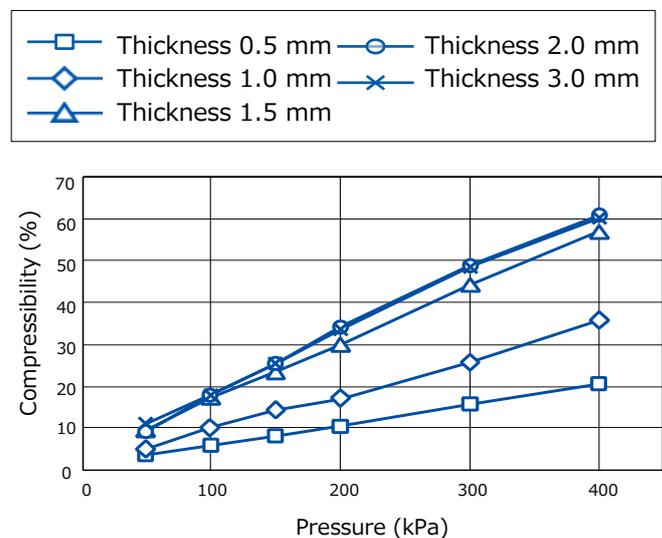
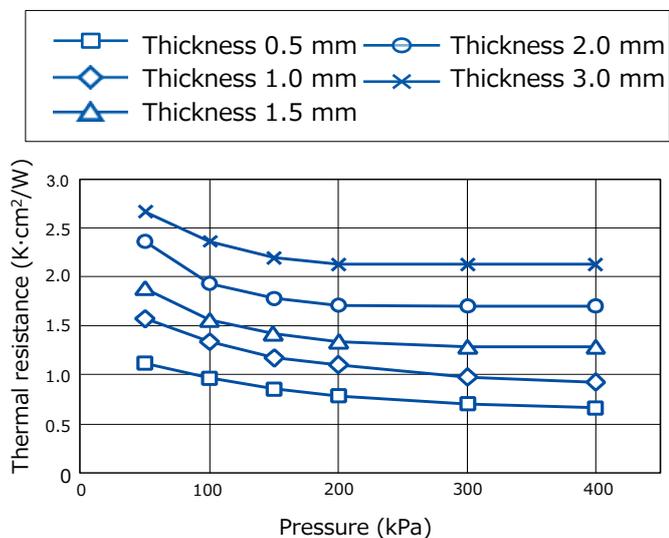
Items	Test equipment/ method	Condition	Data					
			0.5	1.0	1.5	2.0	2.5	3.0
Thickness (mm)			0.5	1.0	1.5	2.0	2.5	3.0
Thermal resistance (K·cm ² /W)	TIM Tester	100 kPa	0.96	1.34	1.56	1.93	2.10	2.36
Compressibility (%)	TIM Tester	100 kPa (50 °C)	5.78	10.29	17.46	17.8	17.6	17.9
Thermal conductivity of Graphite-PAD with a unit (W/m·K) <small>(including contact resistance)</small>	TIM Tester	100 kPa	5.08	7.02	7.80	8.60	9.66	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)		4×10 ⁵					
Operating temperature range (°C)			-40 to 150					
Siloxane		Σ (D4-D10)	≤ 70 ppm					

Typical values, not guaranteed.

Structure

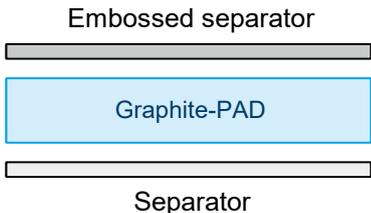


Thermal resistance and compressibility



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Composition example

Structure	 <p style="text-align: center;">Embossed separator</p> <p style="text-align: center;">Graphite-PAD</p> <p style="text-align: center;">Separator</p>				
Operating temperature range	-40 °C to 150 °C				
Standard dimension	35 × 35 mm	70 × 70 mm	140 × 140 mm	150 × 150 mm	
0.5 mm	Standard Part No.	EYGT3535A05A	EYGT7070A05A	-	EYGTf0f0A05A
	Thickness	0.5 mm	0.5 mm	-	0.5 mm
1.0 mm	Standard Part No.	EYGT3535A10A	EYGT7070A10A	-	EYGTf0f0A10A
	Thickness	1.0 mm	1.0 mm	-	1.0 mm
1.5 mm	Standard Part No.	EYGT3535A15A	EYGT7070A15A	-	EYGTf0f0A15A
	Thickness	1.5 mm	1.5 mm	-	1.5 mm
2.0 mm	Standard Part No.	EYGT3535A20A	EYGT7070A20A	EYGTE0E0A20A	-
	Thickness	2.0 mm	2.0 mm	2.0 mm	-
2.5 mm	Standard Part No.	EYGT3535A25A	EYGT7070A25A	EYGTE0E0A25A	-
	Thickness	2.5 mm	2.5 mm	2.5 mm	-
3.0 mm	Standard Part No.	EYGT3535A30A	EYGT7070A30A	EYGTE0E0A30A	-
	Thickness	3.0 mm	3.0 mm	3.0 mm	-

- * Above listed Part No. are examples for evaluation and selection, not for mass production.
Customized service available for mass production spec..
- ** Contact us for custom-made samples.
We can make samples in various forms and/or dimensions other than standard samples.

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<Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

Please note that we do not owe any liability and responsibility if our products are used beyond the description of this catalog or without complying with precautions in this catalog.



Application Guidelines

1. Precautions on the whole

- Do not use the products beyond the descriptions in this catalog.
- This catalog guarantees the quality of the products as individual components.
Before you use the products, please make sure to check and evaluate the products in the circumstance where they are installed in your product.
- This product was designed and manufactured for standard applications such as general electronics devices, office equipment, information and communications equipment, measuring instruments, household appliances and audio-video equipment.
- Therefore, if you intend to use the product in an application that requires a higher level of quality and reliability and where its failure or malfunction may directly threaten human life or cause harm to the human body (e.g., space and aviation equipment, transportation and traffic equipment, combustion equipment, medical equipment, disaster prevention and security equipment, safety equipment, etc.), consult with our sales office in advance and exchange product specifications appropriate for the application.

2. Safety and design considerations

- We are trying to improve the quality and the reliability, but the durability differs depending on the use environment and the use conditions. On use, be sure to confirm the actual product under the actual use conditions.
- For traffic transportation equipment (trains, automobiles, traffic signal equipment, etc.), medical equipment, aerospace equipment, electric heating equipment, combustion and gas equipment, rotators, disaster prevention and security equipment, etc., consider sufficiently a fail-safe design to ensure safety and in order to prevent the failure of this product from leading to the occurrence of human life loss or other serious damage.
 - ① The system is equipped with a protection circuit and protection device.
 - ② The system is equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault.
 - ③ The system is equipped with an arresting the spread of fire or preventing glitch.
- When a dogma shall be occurred about safety for this product, be sure to inform us rapidly, operate your technical examination.
- The temperature of this product at the time of use changes depending on mounting conditions and usage conditions, therefore, please confirm that the temperature of this product is the specified temperature after mounting it.
- This product does not take the use under the following special environments into consideration. Accordingly, the use in the following special environments, and such environmental conditions may affect the performance of the product; prior to use, verify the performance, reliability, etc. thoroughly.
 - ① Use in liquids such as water, oil, chemical, and organic solvent.
 - ② Use under direct sunlight, in outdoor or in dusty atmospheres.
 - ③ Use in places full of corrosive gases such as sea breeze, C_{12} , H_2S , NH_3 , SO_2 , and NO_x .
 - ④ Use the product in a contaminated state.
 - ⑤ Use in acid.
 - ⑥ Use outside the range defined by the operating temperature range.
 - ⑦ Use under reduced pressure or vacuum.

3. Precaution of installation

- Do not reuse this product after removal from the mounting board.
- Do not drop this product on the floor. If this product is dropped, it can be damaged mechanically.
Avoid using the dropped product.
- This product is soft, do not rub or touch it with rough materials to avoid scratching it.
- Lines or folds in this product may affect thermal conductivity.
- Never touch a this product during use because it may be extremely hot.
- Use protective materials when handling and/or applying this product, do not use items with sharp edges as they might tear or puncture this product.
- Do not handle with bare hands as there is a concern about performance degradation.

4. Precaution on storage conditions

- Storage period is less than one year after our shipping inspection is completed.
Please use within the period.
- If the product is stored in the following environments and conditions, the performance may be badly affected, avoid the storage in the following environments.
 - ① Storage in places full of corrosive gases such as sea breeze, Cl₂, H₂S, NH₃, SO₂, and NO_x.
 - ② Storage in places exposed to ultraviolet light.
*Recommended storage in the dark.
 - ③ Store at a temperature outside the storage temperature range specified by this catalog.
- In the case of a product configuration that assumes bonding, please use after checking the adhesiveness of the product when the storage period is over.

5. Precaution specific to this product

- This product has conductivity. If required, This product should be provided insulation.
- This product can not guarantee the insulation because there is a concern for powder falling off of conductive materials.
- Thermal conductivity is dependent on the way it is used. Test the adaptability of the product to your application before use.

6. Applicable laws and regulations, others

- No ODCs or other ozone-depleting substances which are subject to regulation under the Montreal Protocol are used in our manufacturing processes, including in the manufacture of this product.
- This product complies with the RoHS Directive (Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (DIRECTIVE 2011/65/EU and (EU)2015/863).
- All the materials used in this part are registered material under the Law Concerning the Examination and Regulation of Manufactures etc. of Chemical substances.
- If you need the notice by letter of "A preliminary judgment on the Laws of Japan foreign exchange and Foreign Trade control", be sure to let us know.
- These products are not dangerous goods on the transportation as identified by UN(United Nations) numbers or UN classification.
- As to the disposal of the module, check the method of disposal in each country or region where the modules are incorporated in your products to be used.
- The technical information in this catalog provides examples of our products typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.