

### “Soft-PGS (Compressible Type)” PGS with low thermal resistance

Type: **EYGS**



Soft-PGS (Compressible Type) is a graphite sheet that is dedicated for use as a thermal interface material.

The Soft-PGS (Compressible Type) has very high compressibility compared to standard PGS, which enables reducing the thermal resistance by following gap, warpage, and distortion of targets/substrates.

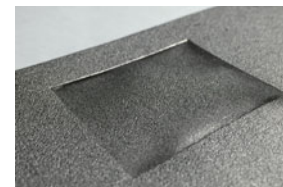
Excellent heat resistance and reliability of the Soft-PGS help obtaining longer service life and higher performance of various components, such as power modules.

The Soft-PGS (Compressible Type) is cost-saving, because it may allow you to reduce your existing processes. Unlike grease, there is no necessity for printing process, since it is a sheet-type product.

There are no problems that are found in grease and phase change materials in the Soft-PGS, which makes it excellent TIM.

#### Features

- Thermal resistance : 0.2K·cm<sup>2</sup>/W (600 kPa)  
To draw a good thermal resistance from sheet, pressure the Soft-PGS. A close adherence would make the product fit into the uneven part and enhance the performance.
- Thermal conductivity : X-Y direction 400W/m·K, Z direction (20W/m·K)
- Compressibility : 40 % (600k Pa)
- High and long term reliability : operating temperature range -55 to 400 °C
- RoHs compliant



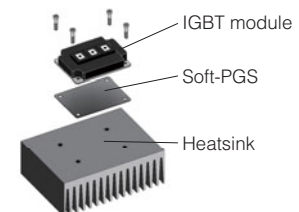
After pressure

#### Recommended applications

For cooling/heat transfer of electronic devices that generates heat, such as power modules.

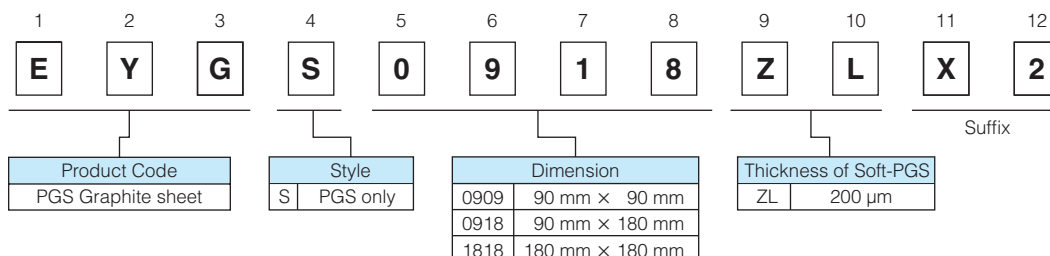
- Inverters and converters
- Car-mounted camera, motor control unit, automotive LED, luminous source of laser HUD, medical equipment
- Base station, Server

Install in IGBT module



#### Explanation of Part Numbers

- Soft-PGS(EYGS\*\*\*\*ZL\*\*)



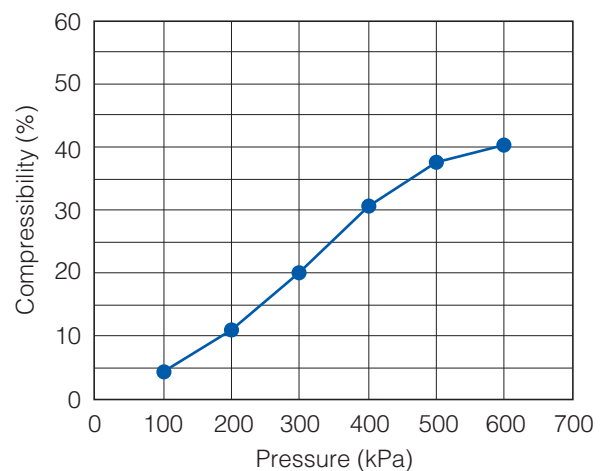
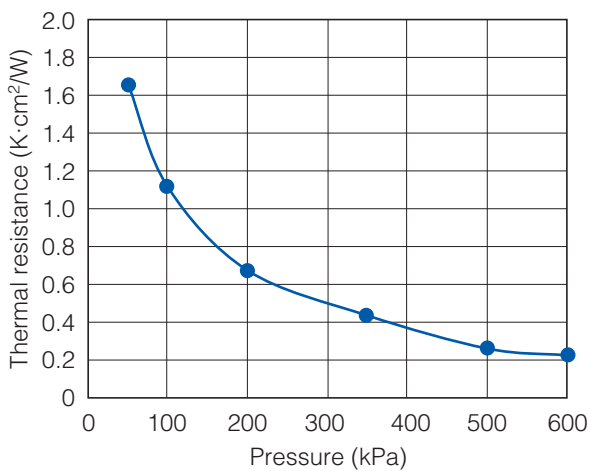
\* Please contact us for custom-made products.

### Typical characteristics

| Items  | Test method | Condition | Data             |
|--|-------------|-----------|------------------|
| Thickness ( $\mu\text{m}$ )                                |             |           | 200              |
| Thermal resistance ( $\text{K}\cdot\text{cm}^2/\text{W}$ ) | TIM Tester  | 600 kPa   | 0.2              |
| Compressibility (%)  | TIM Tester  | 600 kPa   | 40               |
| Thermal conductivity ( $\text{W}/\text{m}\cdot\text{K}$ )  | Laser PIT   | X-Y       | 400 (300 to 600) |
|  |             | Z         | TBD              |
| Operating temperature range ( $^{\circ}\text{C}$ )         |             |           | -55 to 400       |

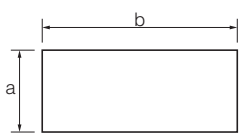
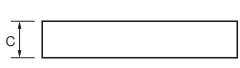
Typical values, not guaranteed.

### Thermal resistance and compressibility



### Lamination type/Composition example

- Soft-PGS (Compressible Type) standard form

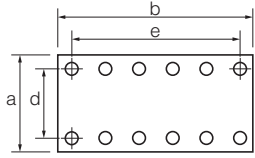
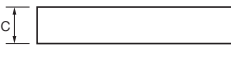
| Type                        |              | Sheet only  |
|-----------------------------|--------------|---|
|                             |              | S Type  |
| Process for IGBT mounting   |              | -   |
| Structure                   | Front        |  |
|                             | Side         |  |
| Operating Temperature Range |              | -55 to 400 $^{\circ}\text{C}$   |
| Thickness: c                |              | 200 $\mu\text{m}$   |
| Standard Part No.           | 90 × 90 mm   | EYGS0909ZLX2  |
|                             | 90 × 180 mm  | EYGS0918ZLX2  |
|                             | 180 × 180 mm | EYGS1818ZLX2  |

\* Part numbers listed above are all standard samples for your consideration.

\*\* Contact us for custom-made samples.

We can make samples in various forms and/or dimensions other than standard samples.

● PGS in IGBT forms

|                             |       |  |
|-----------------------------|-------|--|
| Type                        |       | Sheet only   |
|                             |       | S Type   |
| Process for IGBT mounting   |       | Lamination   |
| Structure                   | Front |  <p>* This shape is an example, please contact us for detailed shape of each part no.</p> |
|                             | Side  |   |
| Operating Temperature Range |       | -55 to 400 °C  |
| Thickness: c                |       | 200 μm   |

| No. | Standard Part No. | a : Lateral size (mm) | b : Longitudinal size (mm) | Hole number | Hole diameter (φmm) | d : Lateral hole pitch (mm) | e : Longitudinal hole pitch (mm) |
|-----|-------------------|-----------------------|----------------------------|-------------|---------------------|-----------------------------|----------------------------------|
| 1   | EYGS1431ZLAA      | 140                   | 308                        | 12          | 6                   | 126                         | 290                              |
| 2   | EYGS0925ZLWA      | 85                    | 246                        | 14          | 6                   | 73                          | 234                              |
| 3   | EYGS1419ZLWB      | 136                   | 186                        | 8           | 7.5                 | 124                         | 171                              |
| 4   | EYGS0917ZLWC      | 85                    | 168                        | 10          | 6                   | 73                          | 156                              |
| 5   | EYGS1316ZLAC      | 125                   | 163                        | 8           | 6.1                 | 110                         | 150                              |
| 6   | EYGS1216ZLWD      | 120                   | 160                        | 8           | 6                   | 110                         | 150                              |
| 7   | EYGS1116ZLMA      | 108.8                 | 158                        | 8           | 6                   | 92.75                       | 144                              |
| 8   | EYGS1315ZLGA      | 129.5                 | 150                        | 8           | 7                   | 118.5                       | 137.5                            |
| 9   | EYGS1314ZLWE      | 126                   | 136                        | 6           | 7.5                 | 114                         | 124                              |
| 10  | EYGS1014ZLAD      | 97.8                  | 138                        | 4           | 6.8                 | 86                          | 127                              |
| 11  | EYGS0714ZLAE      | 70                    | 138                        | 4           | 5.7                 | 57                          | 128                              |
| 12  | EYGS0714ZLAF      | 69                    | 136                        | 4           | 7.2                 | 57                          | 124                              |
| 13  | EYGS1113ZLMB      | 106                   | 132                        | 4           | 5.7                 | 95                          | 121                              |
| 14  | EYGS1313ZLGB      | 128                   | 128                        | 4           | 6.7                 | 110                         | 110                              |
| 15  | EYGS0713ZLAG      | 66                    | 126                        | 4           | 5.7                 | 50                          | 116                              |
| 16  | EYGS0813ZLMD      | 71                    | 123                        | 2           | 4.7                 | Center                      | 116                              |
| 17  | EYGS1212ZLGC      | 120                   | 120                        | 4           | 5.7                 | 110                         | 110                              |
| 18  | EYGS0912ZLGD      | 88                    | 120                        | 4           | 5.7                 | 78                          | 110                              |
| 19  | EYGS0612ZLWF      | 60                    | 120                        | 4           | 5.7                 | 50                          | 110                              |
| 20  | EYGS0512ZLGE      | 53                    | 118                        | 2           | 5.7                 | Center                      | 106                              |
| 21  | EYGS0811ZLGH      | 80                    | 113                        | 4           | 5.7                 | 70                          | 103                              |
| 22  | EYGS0811ZLWG      | 78                    | 108                        | 4           | 6.7                 | 62                          | 93                               |
| 23  | EYGS0611ZLWH      | 60                    | 106                        | 4           | 6.7                 | 48                          | 93                               |
| 24  | EYGS0411ZLWJ      | 43                    | 105.5                      | 2           | 5.7                 | Center                      | 93                               |
| 25  | EYGS0610ZLAH      | 59.4                  | 104.4                      | 4           | 6.7                 | 48                          | 93                               |
| 26  | EYGS0410ZLAJ      | 43                    | 102.8                      | 2           | 5.7                 | Center                      | 93                               |
| 27  | EYGS1010ZLME      | 98                    | 98                         | 4           | 6.7                 | 87                          | 87                               |

| No. | Standard Part No. | a : Lateral size (mm) | b : Longitudinal size (mm) | Hole number | Hole diameter (φmm) | d : Lateral hole pitch (mm) | e : Longitudinal hole pitch (mm) |
|-----|-------------------|-----------------------|----------------------------|-------------|---------------------|-----------------------------|----------------------------------|
| 28  | EYGS0409ZLGJ      | 44                    | 93                         | 2           | 6.7                 | Center                      | 80                               |
| 29  | EYGS0509ZLGK      | 46                    | 92                         | 2           | 6.7                 | Center                      | 80                               |
| 30  | EYGS0309ZLMF      | 32                    | 92                         | 2           | 6.7                 | Center                      | 80                               |
| 31  | EYGS0409ZLMG      | 41                    | 88                         | 2           | 5.7                 | Center                      | 80                               |
| 32  | EYGS0309ZLAK      | 29.5                  | 89.5                       | 2           | 6.6                 | Center                      | 80                               |
| 33  | EYGS0509ZLMH      | 51                    | 86                         | 2           | 4.7                 | –                           | 80                               |
| 34  | EYGS0508ZLMJ      | 46.2                  | 83                         | 2           | 4.7                 | –                           | 77                               |
| 35  | EYGS0608ZLMK      | 55                    | 78                         | 2           | 4.5                 | Center                      | 40                               |
| 36  | EYGS0607ZLGL      | 58                    | 69.7                       | 4           | 5.7                 | 50                          | 62                               |
| 37  | EYGS0507ZLML      | 45.3                  | 66                         | 2           | 4.7                 | –                           | 60                               |
| 38  | EYGS0407ZLAL      | 40                    | 65.5                       | 1           | 7.7                 | Center                      | Center                           |
| 39  | EYGS0506ZLMM      | 48                    | 55                         | 1           | 4.5                 | Center                      | Center                           |
| 40  | EYGS0404ZLMP      | 36                    | 38                         | 1           | 4.5                 | Center                      | Center                           |
| 41  | EYGS1018ZLSA      | 104.5                 | 182.5                      | 8           | 7                   | 93                          | 171                              |
| 42  | EYGS1516ZLSB      | 148                   | 158                        | 8           | 5                   | 137                         | 150                              |
| 43  | EYGS1116ZLSC      | 112                   | 158                        | 8           | 5                   | 101                         | 150                              |
| 44  | EYGS0715ZLSD      | 67                    | 153                        | 4           | 5.6                 | 57                          | 143                              |
| 45  | EYGS0613ZLSE      | 61                    | 127.5                      | 4           | 5.6                 | 50                          | 116                              |
| 46  | EYGS0612ZLSF      | 63.3                  | 124                        | 4           | 5.6                 | 50                          | 110                              |
| 47  | EYGS0612ZLSG      | 61.5                  | 124                        | 4           | 5.6                 | 50                          | 110                              |
| 48  | EYGS1012ZLSH      | 104.5                 | 121                        | 4           | 6.7                 | 93                          | 109.5                            |
| 49  | EYGS0410ZLSJ      | 43                    | 103                        | 2           | 5.7                 | Center                      | 93                               |
| 50  | EYGS0609ZLSK      | 61.5                  | 91                         | 4           | 5.6                 | 50                          | 77                               |
| 51  | EYGS0606ZLSL      | 58                    | 61.5                       | 2           | 5.6                 | 44                          | 50                               |
| 52  | EYGS0305ZLSM      | 27                    | 51                         | 1           | 4.6                 | Center                      | Center                           |
| 53  | EYGS0204ZLSN      | 24                    | 36.5                       | 1           | 4.6                 | Center                      | Center                           |
| 54  | EYGS0303ZLSP      | 29                    | 32                         | 1           | 4.5                 | Center                      | Center                           |
| 55  | EYGS0911ZLDA      | 92                    | 109                        | 4           | 6                   | 78                          | 93                               |
| 56  | EYGS1014ZLDB      | 98                    | 138                        | 4           | 6.7                 | 86                          | 127                              |

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