

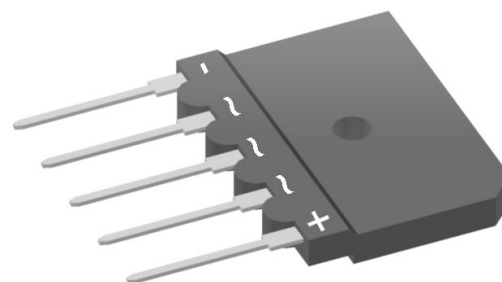
# Standard Rectifier

| 3~<br>Rectifier |          |
|-----------------|----------|
| $V_{RRM}$       | = 1200 V |
| $I_{DAV}$       | = 40 A   |
| $I_{FSM}$       | = 370 A  |

## 3~ Rectifier Bridge

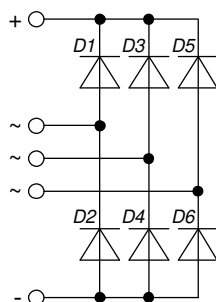
Part number

**GUO40-12NO1**



Backside: isolated

 E72873



### Features / Advantages:

- Low forward voltage drop
- Planar passivated chips
- Easy to mount with one screw
- Space and weight savings

### Applications:

- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

### Package: GUFP

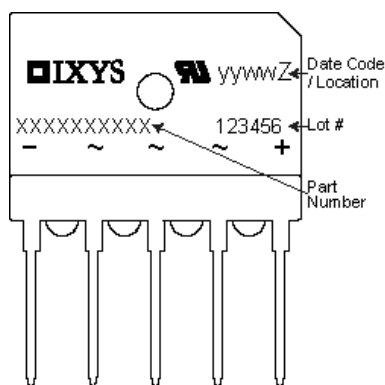
- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Base plate: Plastic overmolded tab
- Reduced weight

### Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).

| Rectifier  |                                              |                                                   |                                | Ratings                        |      |      |                  |
|------------|----------------------------------------------|---------------------------------------------------|--------------------------------|--------------------------------|------|------|------------------|
| Symbol     | Definition                                   | Conditions                                        |                                | min.                           | typ. | max. | Unit             |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}\text{C}$                     |                                |                                |      | 1300 | V                |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                     |                                |                                |      | 1200 | V                |
| $I_R$      | reverse current                              | $V_R = 1200\text{ V}$                             | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 40   | $\mu\text{A}$    |
|            |                                              | $V_R = 1200\text{ V}$                             | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 1.5  | mA               |
| $V_F$      | forward voltage drop                         | $I_F = 10\text{ A}$                               | $T_{VJ} = 25^{\circ}\text{C}$  |                                |      | 1.06 | V                |
|            |                                              | $I_F = 30\text{ A}$                               |                                |                                |      | 1.28 | V                |
|            |                                              | $I_F = 10\text{ A}$                               | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 0.92 | V                |
|            |                                              | $I_F = 30\text{ A}$                               |                                |                                |      | 1.23 | V                |
| $I_{DAV}$  | bridge output current                        | $T_C = 90^{\circ}\text{C}$                        | $T_{VJ} = 175^{\circ}\text{C}$ |                                |      | 40   | A                |
|            |                                              | rectangular $d = \frac{1}{3}$                     |                                |                                |      |      |                  |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                 |                                | $T_{VJ} = 175^{\circ}\text{C}$ |      | 0.74 | V                |
| $r_F$      | slope resistance                             |                                                   |                                |                                |      | 16.3 | m $\Omega$       |
| $R_{thJC}$ | thermal resistance junction to case          |                                                   |                                |                                |      | 4.3  | K/W              |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                   |                                |                                | 0.5  |      | K/W              |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                        |                                |                                |      | 35   | W                |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 370  | A                |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$             |                                |      | 400  | A                |
|            |                                              | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 315  | A                |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$             |                                |      | 340  | A                |
| $I^2t$     | value for fusing                             | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 45^{\circ}\text{C}$  |                                |      | 685  | A <sup>2</sup> s |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$             |                                |      | 665  | A <sup>2</sup> s |
|            |                                              | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 150^{\circ}\text{C}$ |                                |      | 495  | A <sup>2</sup> s |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$             |                                |      | 480  | A <sup>2</sup> s |
| $C_J$      | junction capacitance                         | $V_R = 400\text{ V}; f = 1\text{ MHz}$            |                                |                                | 10   |      | pF               |

| Package GUFP  |                                                              |                      |                                     | Ratings |      |      |      |
|---------------|--------------------------------------------------------------|----------------------|-------------------------------------|---------|------|------|------|
| Symbol        | Definition                                                   | Conditions           |                                     | min.    | typ. | max. | Unit |
| $I_{RMS}$     | RMS current                                                  | per terminal         |                                     |         |      | 70   | A    |
| $T_{VJ}$      | virtual junction temperature                                 |                      |                                     | -40     |      | 175  | °C   |
| $T_{op}$      | operation temperature                                        |                      |                                     | -40     |      | 150  | °C   |
| $T_{stg}$     | storage temperature                                          |                      |                                     | -40     |      | 150  | °C   |
| <b>Weight</b> |                                                              |                      |                                     |         | 8.5  |      | g    |
| $M_D$         | mounting torque                                              |                      |                                     | 0.8     |      | 1.2  | Nm   |
| $F_C$         | mounting force with clip                                     |                      |                                     | 20      |      | 120  | N    |
| $d_{Spp/App}$ | creepage distance on surface   striking distance through air | terminal to terminal | 6.7                                 | 5.4     |      |      | mm   |
| $d_{Spb/Apb}$ |                                                              | terminal to backside | 10.0                                | 8.0     |      |      | mm   |
| $V_{ISOL}$    | isolation voltage                                            | t = 1 second         | 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA | 2500    |      |      | V    |
|               |                                                              | t = 1 minute         |                                     | 2100    |      |      | V    |
| $R_{thJA}$    | thermal resistance junction to ambient                       |                      |                                     |         | 50   |      | K/W  |



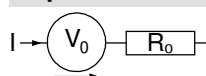
| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | GUO40-12NO1     | GUO40-12NO1        | Tube          | 14       | 514892   |

| Similar Part | Package | Voltage class |
|--------------|---------|---------------|
| DNA40U2200GU | GUFP    | 2200          |
| DMA40U1800GU | GUFP    | 1800          |
| GUO40-16NO1  | GUFP    | 1600          |
| GUO40-08NO1  | GUFP    | 800           |

### Equivalent Circuits for Simulation

\* on die level

$T_{VJ} = 175^{\circ}\text{C}$



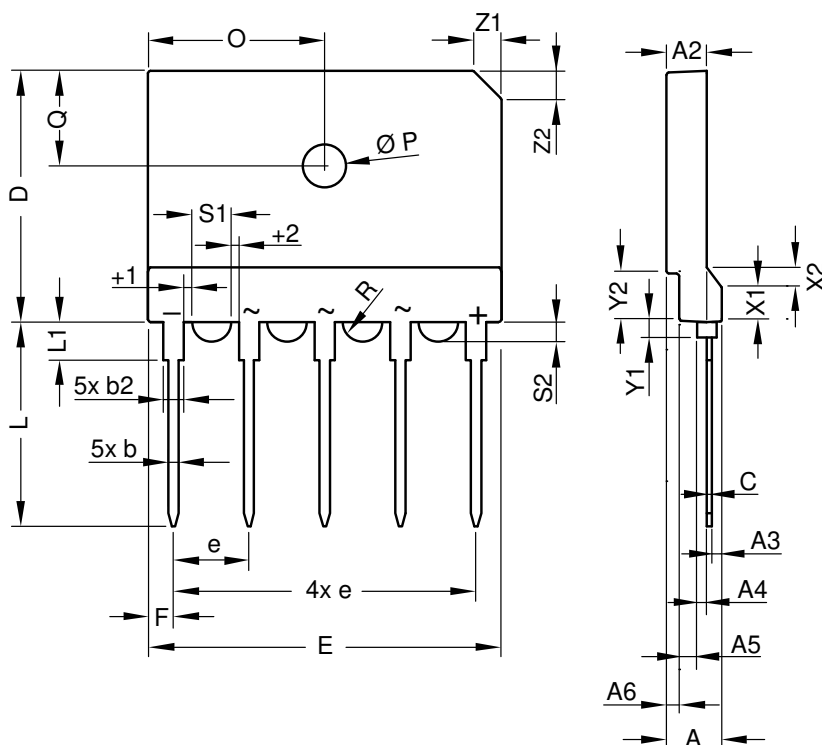
Rectifier

$V_{0 \max}$  threshold voltage 0.74

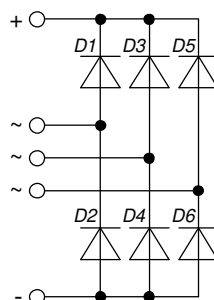
$R_{0 \max}$  slope resistance \* 13.7

V

mΩ

**Outlines GUPF**


| Dim.  | Millimeter |       |       | Inches    |       |       |
|-------|------------|-------|-------|-----------|-------|-------|
|       | min        | typ.  | max   | min       | typ.  | max   |
| A     | 5.40       | 5.50  | 5.60  | 0.213     | 0.217 | 0.221 |
| A2    | 3.90       | 4.00  | 4.10  | 0.154     | 0.158 | 0.162 |
| A3    | 0.95       | 1.00  | 1.10  | 0.037     | 0.039 | 0.043 |
| A4    | 0.95       | 1.00  | 1.05  | 0.037     | 0.039 | 0.041 |
| A5    | 1.60       | 1.70  | 1.80  | 0.063     | 0.067 | 0.071 |
| A6    | 1.25       | 1.30  | 1.35  | 0.049     | 0.051 | 0.053 |
| b     | 0.95       | 1.00  | 1.05  | 0.037     | 0.039 | 0.041 |
| b2    | 1.95       | 2.00  | 2.05  | 0.077     | 0.079 | 0.081 |
| C     | 0.45       | 0.50  | 0.55  | 0.018     | 0.020 | 0.022 |
| D     | 24.80      | 25.00 | 25.20 | 0.977     | 0.985 | 0.993 |
| E     | 34.70      | 35.00 | 35.30 | 1.367     | 1.379 | 1.391 |
| e     | BSC 7.50   |       |       | BSC 0.296 |       |       |
| F     | 2.40       | 2.50  | 2.60  | 0.095     | 0.099 | 0.102 |
| L     | 20.30      | 20.40 | 20.50 | 0.800     | 0.804 | 0.808 |
| L1    | 3.70       | 3.75  | 3.80  | 0.146     | 0.148 | 0.150 |
| O     | 17.40      | 17.50 | 17.60 | 0.686     | 0.690 | 0.693 |
| Ø P   | 4.10       | 4.20  | 4.30  | 0.162     | 0.165 | 0.169 |
| Q     | 9.20       | 9.30  | 9.40  | 0.362     | 0.366 | 0.370 |
| Ø/2 R |            | 1.77  |       |           | 0.070 |       |
| s1    | 3.45       | 3.50  | 3.55  | 0.136     | 0.138 | 0.140 |
| s2    | 1.45       | 1.50  | 1.55  | 0.057     | 0.059 | 0.061 |
| t1    | 0.95       | 1.00  | 1.05  | 0.037     | 0.039 | 0.041 |
| t2    | 0.95       | 1.00  | 1.05  | 0.037     | 0.039 | 0.041 |
| x1    | 3.20       | 3.30  | 3.40  | 0.126     | 0.130 | 0.134 |
| x2    | 1.90       | 2.00  | 2.10  | 0.075     | 0.079 | 0.083 |
| y1    | 1.60       | 1.65  | 1.70  | 0.063     | 0.065 | 0.067 |
| y2    | 4.65       | 4.70  | 4.75  | 0.183     | 0.185 | 0.187 |
| z1    | 2.80       | 2.90  | 3.00  | 0.110     | 0.114 | 0.118 |



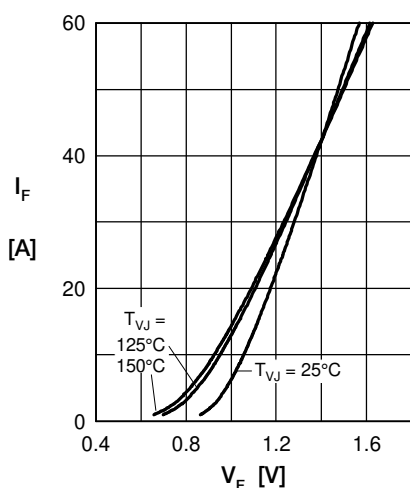
**Rectifier**


Fig. 1 Forward current vs. voltage drop per diode

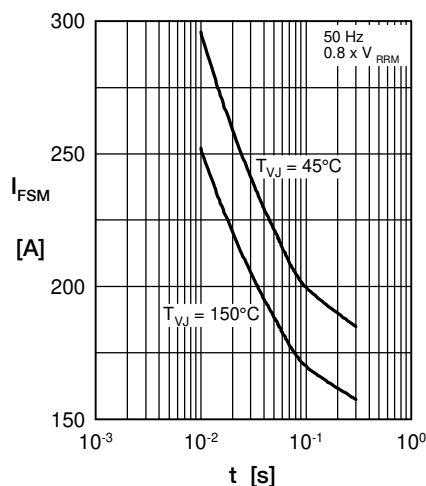


Fig. 2 Surge overload current vs. time per diode

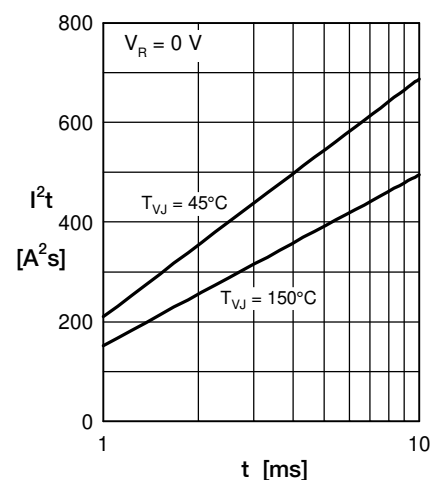


Fig. 3  $I^2t$  vs. time per diode

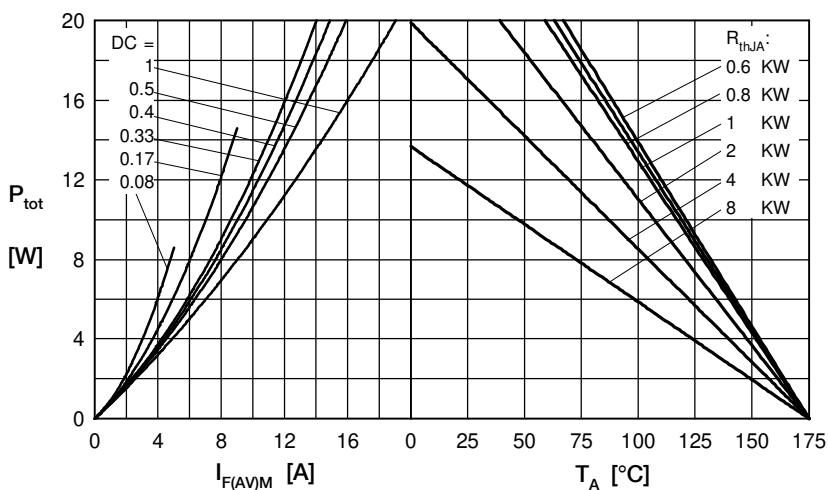


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

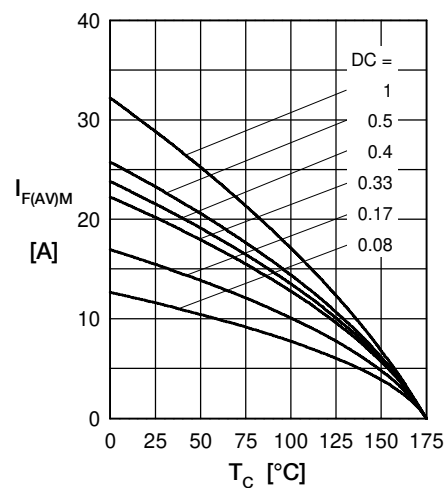


Fig. 5 Max. forward current vs. case temperature per diode

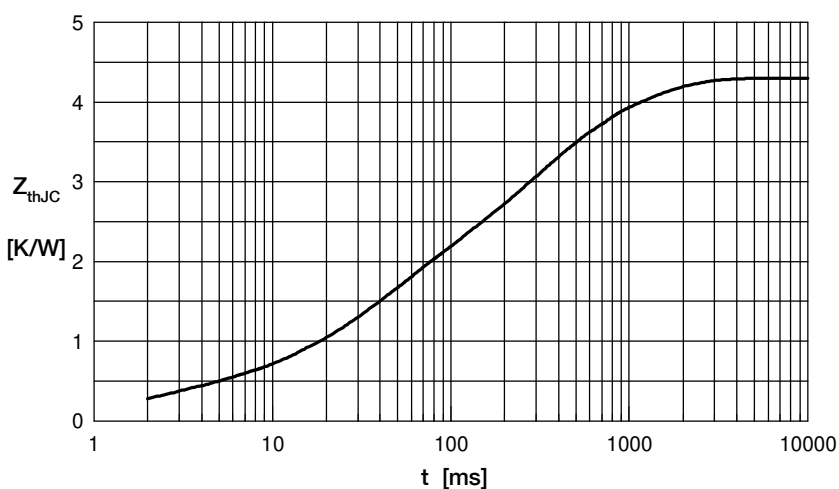


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

| i | $R_{th}$ (K/W) | $t_i$ (s) |
|---|----------------|-----------|
| 1 | 0.302          | 0.002     |
| 2 | 1.252          | 0.032     |
| 3 | 1.582          | 0.227     |
| 4 | 1.164          | 0.820     |

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9