

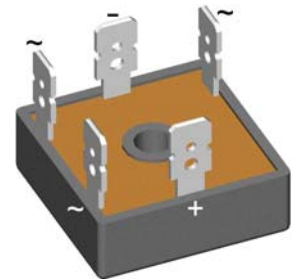
## Standard Rectifier Module

|                         |          |
|-------------------------|----------|
| <b>3~<br/>Rectifier</b> |          |
| $V_{RRM}$               | = 1600 V |
| $I_{DAV}$               | = 27 A   |
| $I_{FSM}$               | = 550 A  |

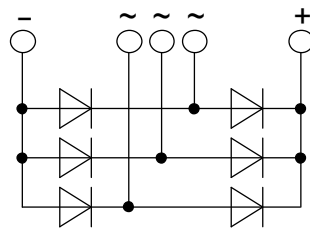
### 3~ Rectifier Bridge

Part number

VUO36-16NO8



 E72873



#### Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

#### Applications:

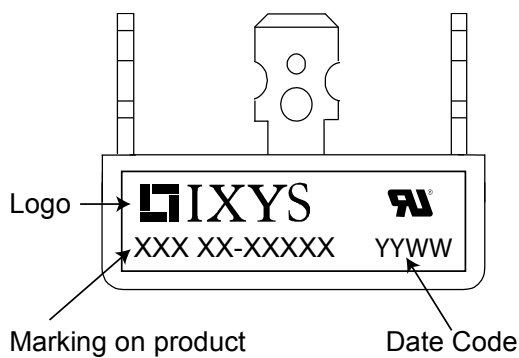
- Diode for main rectification
- For three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

#### Package: FO-B

- Industry standard outline
- RoHS compliant
- ¼" fast-on terminals
- Easy to mount with one screw

| Rectifier  |  |  |                         | Ratings |      |                   |
|------------|--|--|-------------------------|---------|------|-------------------|
| Symbol     | Definition                                   | Conditions   | min.                    | typ.    | max. | Unit              |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}C$                               |                         |         | 1700 | V                 |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}C$                               |                         |         | 1600 | V                 |
| $I_R$      | reverse current                              | $V_R = 1600 V$                                       | $T_{VJ} = 25^{\circ}C$  |         | 40   | $\mu A$           |
|            |  | $V_R = 1600 V$                                       | $T_{VJ} = 150^{\circ}C$ |         | 1.5  | mA                |
| $V_F$      | forward voltage drop                         | $I_F = 15 A$   | $T_{VJ} = 25^{\circ}C$  |         | 1.04 | V                 |
|            |  | $I_F = 45 A$   |                         |         | 1.23 | V                 |
|            |  | $I_F = 15 A$   | $T_{VJ} = 125^{\circ}C$ |         | 0.93 | V                 |
|            |  | $I_F = 45 A$   |                         |         | 1.18 | V                 |
| $I_{DAV}$  | bridge output current                        | $T_C = 85^{\circ}C$<br>rectangular $d = \frac{1}{3}$ | $T_{VJ} = 150^{\circ}C$ |         | 27   | A                 |
| $V_{FO}$   | threshold voltage                            | } for power loss calculation only                    | $T_{VJ} = 150^{\circ}C$ |         | 0.76 | V                 |
| $r_F$      | slope resistance                             |  |                         |         | 9.1  | m $\Omega$        |
| $R_{thJC}$ | thermal resistance junction to case          |  |                         |         | 7    | K/W               |
| $R_{thCH}$ | thermal resistance case to heatsink          |  |                         | 1       |      | K/W               |
| $P_{tot}$  | total power dissipation                      |  | $T_C = 25^{\circ}C$     |         | 17   | W                 |
| $I_{FSM}$  | max. forward surge current                   | $t = 10 \text{ ms; (50 Hz), sine}$                   | $T_{VJ} = 45^{\circ}C$  |         | 550  | A                 |
|            |  | $t = 8,3 \text{ ms; (60 Hz), sine}$                  | $V_R = 0 V$             |         | 595  | A                 |
|            |  | $t = 10 \text{ ms; (50 Hz), sine}$                   | $T_{VJ} = 150^{\circ}C$ |         | 470  | A                 |
|            |  | $t = 8,3 \text{ ms; (60 Hz), sine}$                  | $V_R = 0 V$             |         | 505  | A                 |
| $I^2t$     | value for fusing                             | $t = 10 \text{ ms; (50 Hz), sine}$                   | $T_{VJ} = 45^{\circ}C$  |         | 1.52 | kA <sup>2</sup> s |
|            |  | $t = 8,3 \text{ ms; (60 Hz), sine}$                  | $V_R = 0 V$             |         | 1.48 | kA <sup>2</sup> s |
|            |  | $t = 10 \text{ ms; (50 Hz), sine}$                   | $T_{VJ} = 150^{\circ}C$ |         | 1.11 | kA <sup>2</sup> s |
|            |  | $t = 8,3 \text{ ms; (60 Hz), sine}$                  | $V_R = 0 V$             |         | 1.06 | kA <sup>2</sup> s |
| $C_J$      | junction capacitance                         | $V_R = 400 V; f = 1 \text{ MHz}$                     | $T_{VJ} = 25^{\circ}C$  |         | 18   | pF                |

| Package FO-B  |  | Ratings              |                                     |      |      |      |
|---------------|--|----------------------|-------------------------------------|------|------|------|
| Symbol        | Definition   | Conditions           | min.                                | typ. | max. | Unit |
| $I_{RMS}$     | RMS current  | per terminal         |                                     |      | 100  | A    |
| $T_{stg}$     | storage temperature  |                      | -40                                 |      | 125  | °C   |
| $T_{VJ}$      | virtual junction temperature                                 |                      | -40                                 |      | 150  | °C   |
| <b>Weight</b> |  |                      |                                     | 20   |      | g    |
| $M_D$         | mounting torque  |                      | 1.8                                 |      | 2.2  | Nm   |
| $d_{Spp/App}$ | creepage distance on surface   striking distance through air | terminal to terminal | 9.0                                 | 7.0  |      | mm   |
| $d_{Spb/Apb}$ |  | terminal to backside | 10.0                                | 10.0 |      | mm   |
| $V_{ISOL}$    | isolation voltage  | t = 1 second         |                                     |      | 3000 | V    |
|               |  | t = 1 minute         | 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA |      | 2500 | V    |



| Ordering | Part Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-------------|--------------------|---------------|----------|----------|
| Standard | VUO36-16NO8 | VUO36-16NO8        | Box           | 50       | 465178   |

### Equivalent Circuits for Simulation

\* on die level

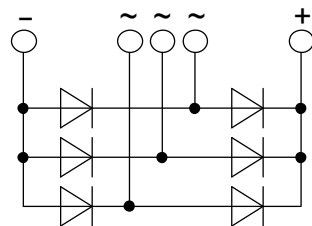
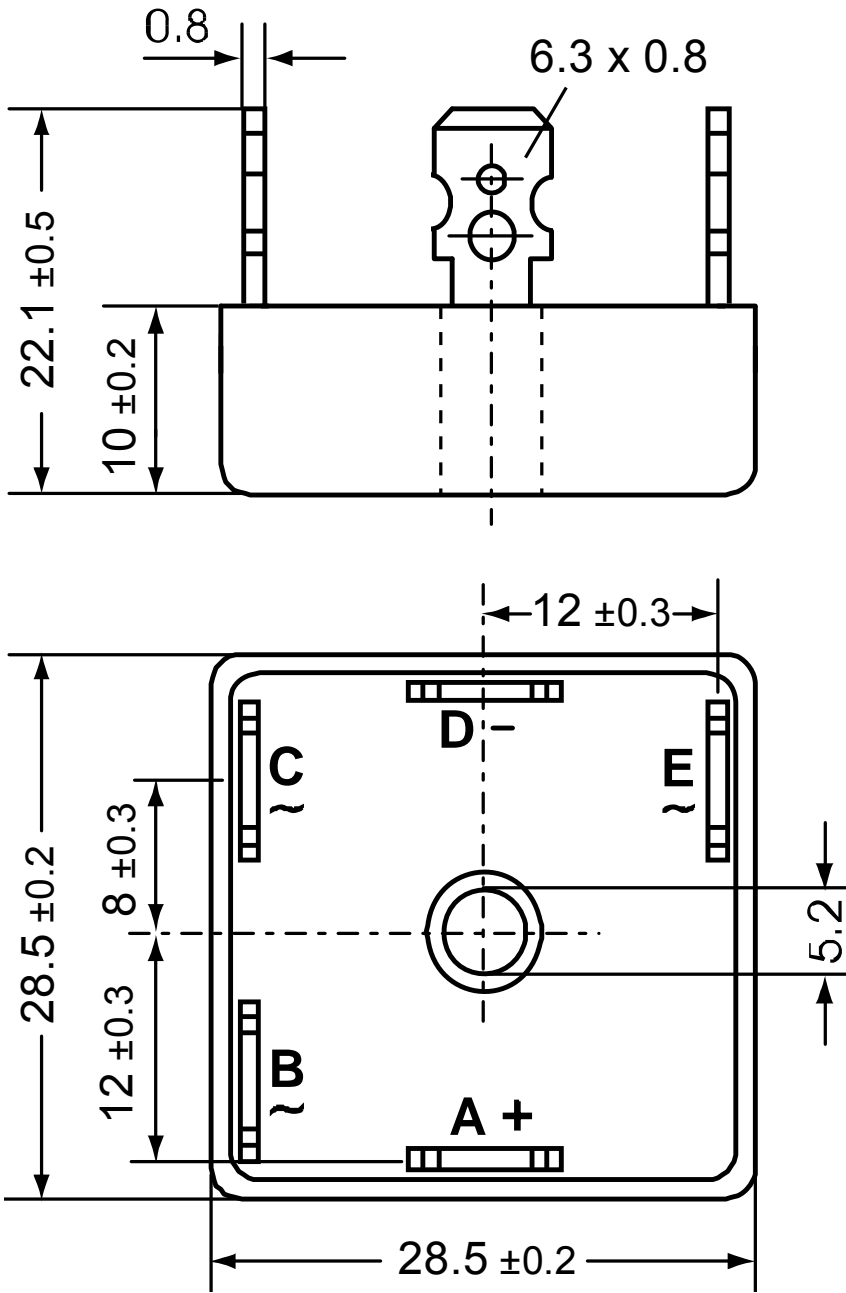
$T_{VJ} = 150^\circ\text{C}$



Rectifier

|             |                    |      |    |
|-------------|--------------------|------|----|
| $V_{0\max}$ | threshold voltage  | 0.76 | V  |
| $R_{0\max}$ | slope resistance * | 7.9  | mΩ |

Outlines FO-B



## Rectifier

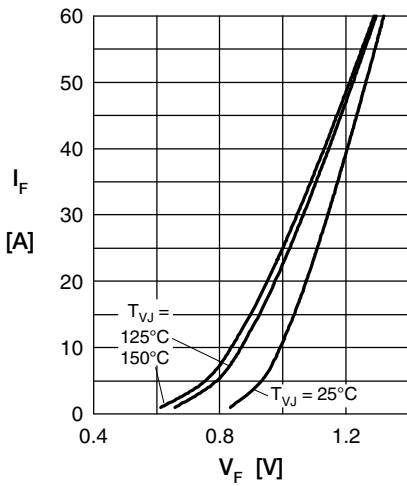


Fig. 1 Forward current vs. voltage drop per diode

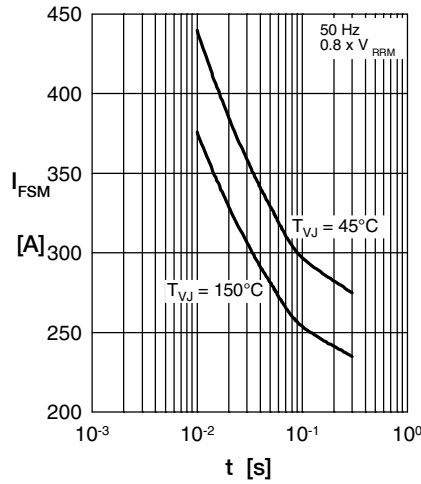


Fig. 2 Surge overload current vs. time per diode

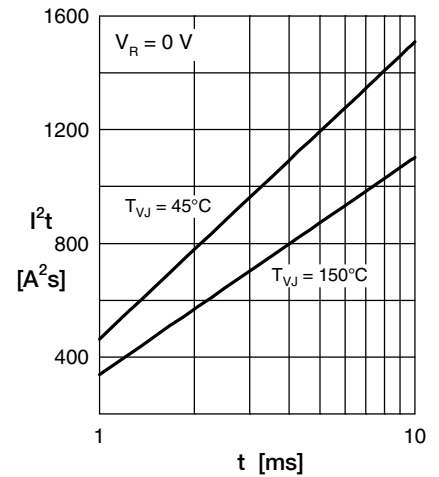


Fig. 3  $I^2t$  vs. time per diode

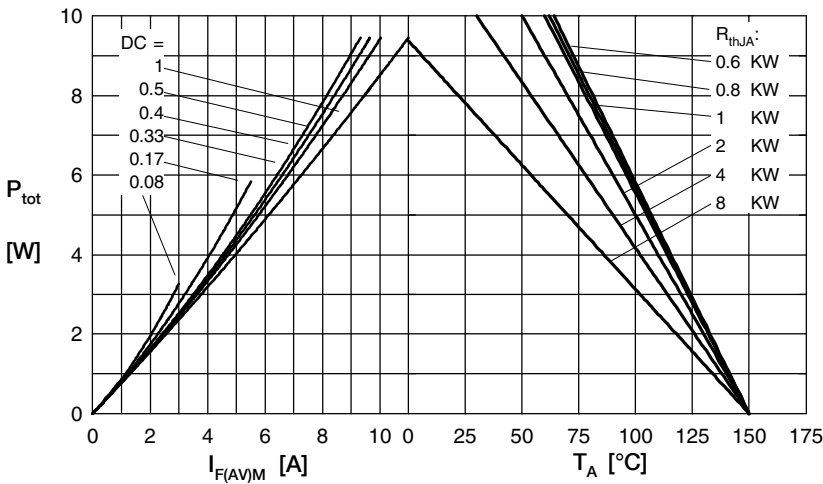


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

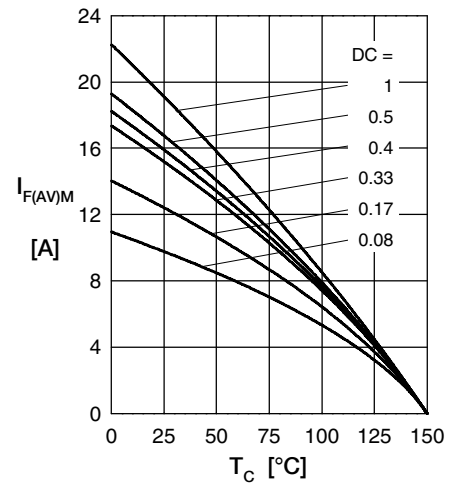


Fig. 5 Max. forward current vs. case temperature per diode

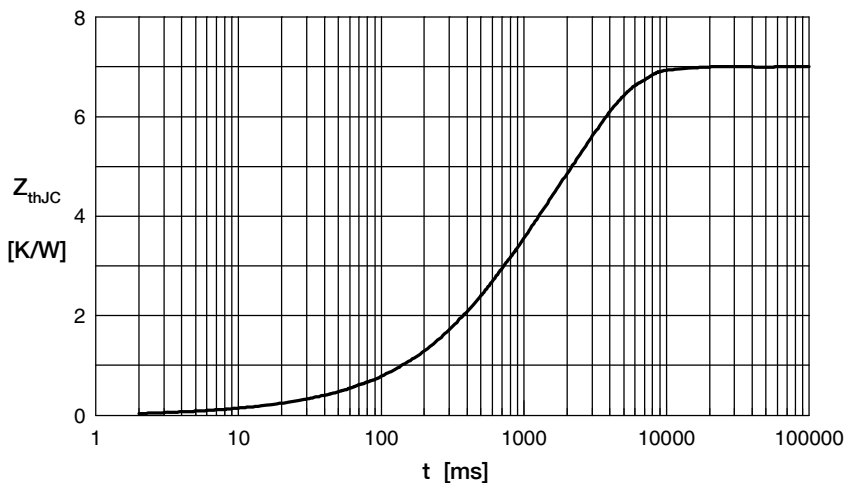


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

| i | $R_{th}$ (K/W) | $t_i$ (s) |
|---|----------------|-----------|
| 1 | 0.040          | 0.005     |
| 2 | 0.150          | 0.030     |
| 3 | 1.710          | 0.400     |
| 4 | 5.100          | 2.300     |