

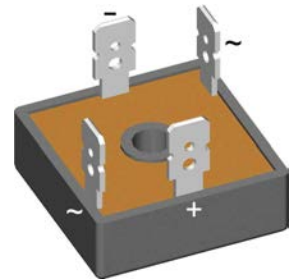
Standard Rectifier Module

| | |
|-------------------------|----------|
| 1~ Rectifier | |
| V_{RRM} | = 1200 V |
| I_{DAV} | = 14 A |
| I_{FSM} | = 380 A |

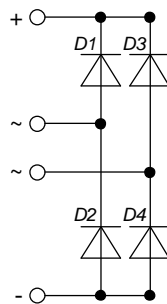
1~ Rectifier Bridge

Part number

VBO22-12N08



 E72873



Features / Advantages:

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

Applications:

- Diode for main rectification
- For one 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

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- ¼" fast-on terminals
- Easy to mount with one screw

Disclaimer Notice

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| Rectifier | | | | Ratings | | | |
|------------|--|---------------------------|---------|------------------------------|------|------|---------------------------------|
| Symbol | Definition | Conditions | | min. | typ. | max. | Unit |
| V_{RSM} | max. non-repetitive reverse blocking voltage | | | | | 1300 | V |
| V_{RRM} | max. repetitive reverse blocking voltage | | | | | 1200 | V |
| I_R | reverse current | $V_R = 1200$ V | | $T_{VJ} = 25^\circ\text{C}$ | | 40 | μA |
| | | $V_R = 1200$ V | | $T_{VJ} = 150^\circ\text{C}$ | | 1,5 | mA |
| V_F | forward voltage drop | $I_F = 10$ A | | $T_{VJ} = 25^\circ\text{C}$ | | 1,05 | V |
| | | $I_F = 20$ A | | | | 1,15 | V |
| | | $I_F = 10$ A | | $T_{VJ} = 125^\circ\text{C}$ | | 0,94 | V |
| | | $I_F = 20$ A | | | | 1,08 | V |
| I_{DAV} | bridge output current | $T_C = 85^\circ\text{C}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 14 | A |
| | | rectangular | d = 0.5 | | | | |
| V_{FO} | threshold voltage | | | $T_{VJ} = 150^\circ\text{C}$ | | 0,77 | V |
| r_F | slope resistance | | | | | 14,2 | m Ω |
| | | | | | | | for power loss calculation only |
| R_{thJC} | thermal resistance junction to case | | | | | 8 | K/W |
| R_{thCH} | thermal resistance case to heatsink | | | | 1 | | K/W |
| P_{tot} | total power dissipation | | | $T_C = 25^\circ\text{C}$ | | 15 | W |
| I_{FSM} | max. forward surge current | t = 10 ms; (50 Hz), sine | | $T_{VJ} = 45^\circ\text{C}$ | | 380 | A |
| | | t = 8,3 ms; (60 Hz), sine | | $V_R = 0$ V | | 410 | A |
| | | t = 10 ms; (50 Hz), sine | | $T_{VJ} = 150^\circ\text{C}$ | | 325 | A |
| | | t = 8,3 ms; (60 Hz), sine | | $V_R = 0$ V | | 350 | A |
| I^2t | value for fusing | t = 10 ms; (50 Hz), sine | | $T_{VJ} = 45^\circ\text{C}$ | | 720 | A ² s |
| | | t = 8,3 ms; (60 Hz), sine | | $V_R = 0$ V | | 700 | A ² s |
| | | t = 10 ms; (50 Hz), sine | | $T_{VJ} = 150^\circ\text{C}$ | | 530 | A ² s |
| | | t = 8,3 ms; (60 Hz), sine | | $V_R = 0$ V | | 510 | A ² s |
| C_J | junction capacitance | $V_R = 400$ V; f = 1 MHz | | $T_{VJ} = 25^\circ\text{C}$ | | 10 | pF |



| Package FO-B | | Ratings | | | | |
|---------------|--|----------------------|------|------|------|------|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit |
| I_{RMS} | RMS current | per terminal | | | 100 | A |
| T_{VJ} | virtual junction temperature | | -40 | | 150 | °C |
| T_{op} | operation temperature | | -40 | | 125 | °C |
| T_{stg} | storage temperature | | -40 | | 125 | °C |
| Weight | | | | 19 | | 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 | 2500 | | | V |



| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | VBO22-12NO8 | VBO22-12NO8 | Box | 50 | 476951 |

Equivalent Circuits for Simulation

* on die level

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

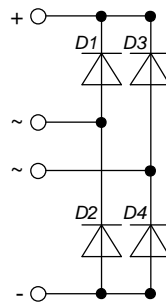
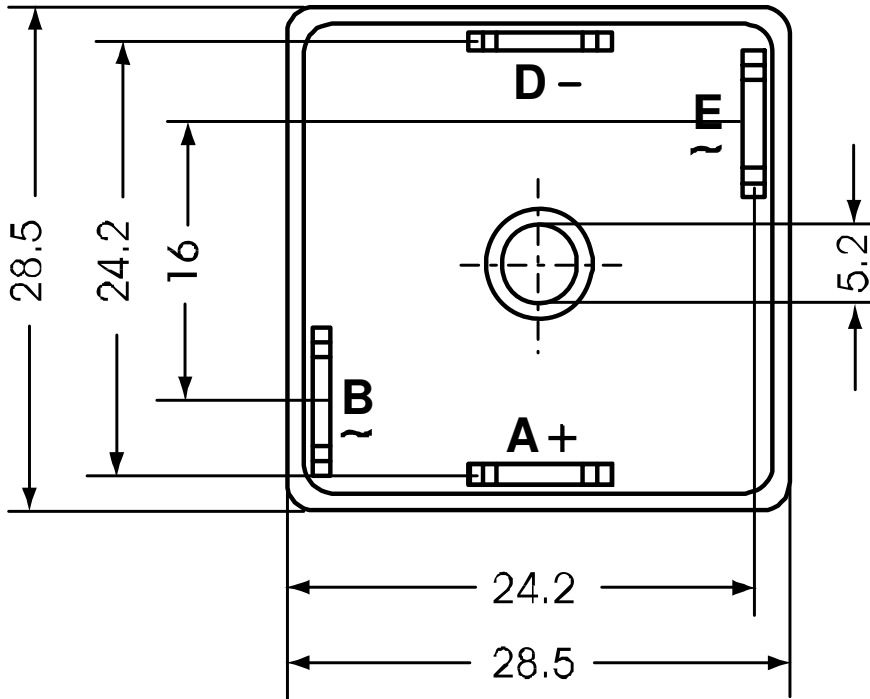
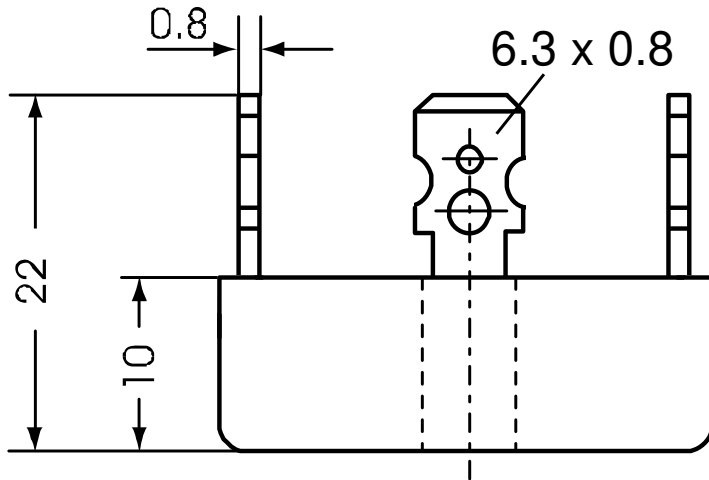


Rectifier

| | | | |
|--------------|--------------------|------|----|
| $V_{0\ max}$ | threshold voltage | 0,77 | V |
| $R_{0\ max}$ | slope resistance * | 13 | mΩ |



Outlines FO-B



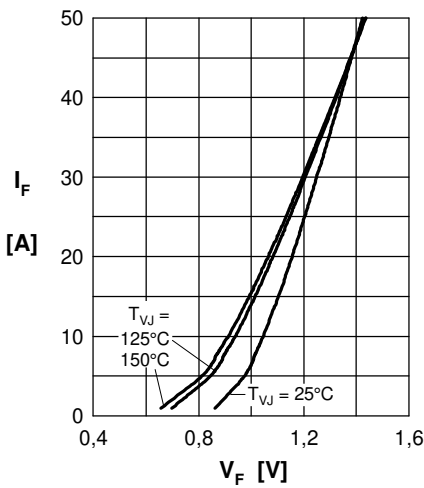
Rectifier


Fig. 1 Forward current vs. voltage drop per diode

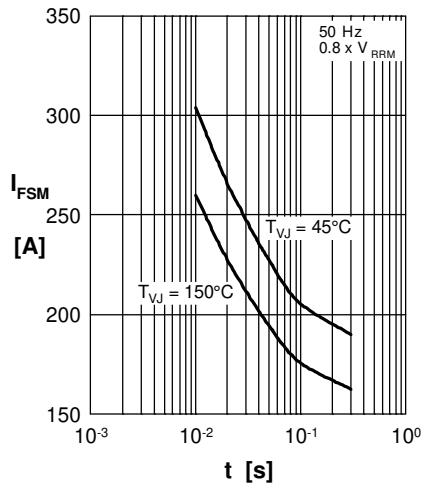


Fig. 2 Surge overload current vs. time per diode

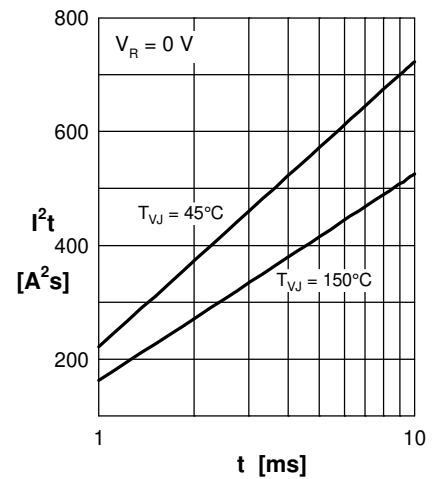
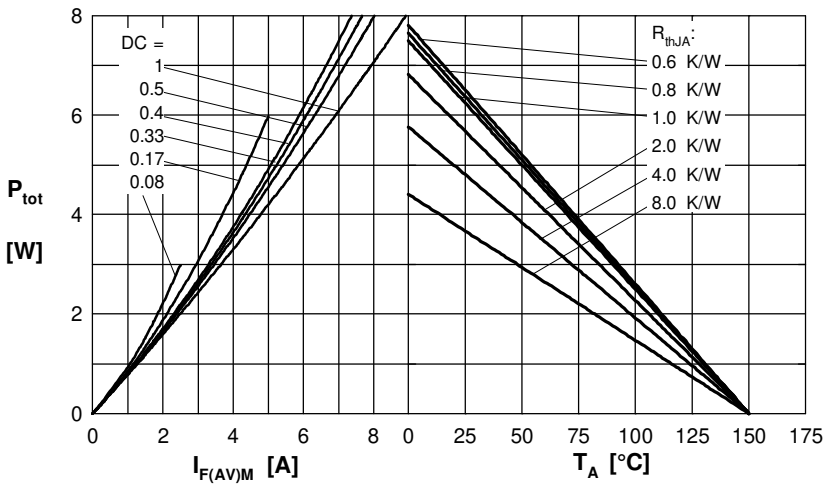

 Fig. 3 I^2t vs. time per diode


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

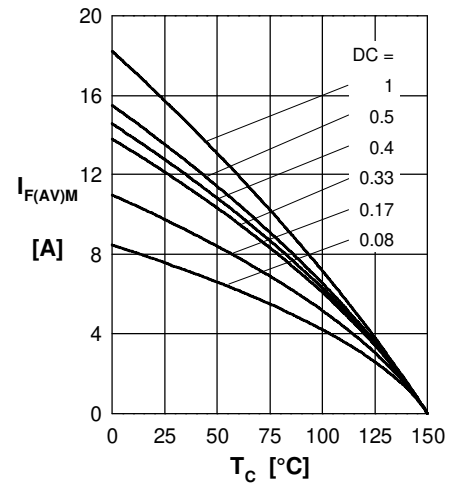


Fig. 5 Max. forward current vs. case temperature per diode

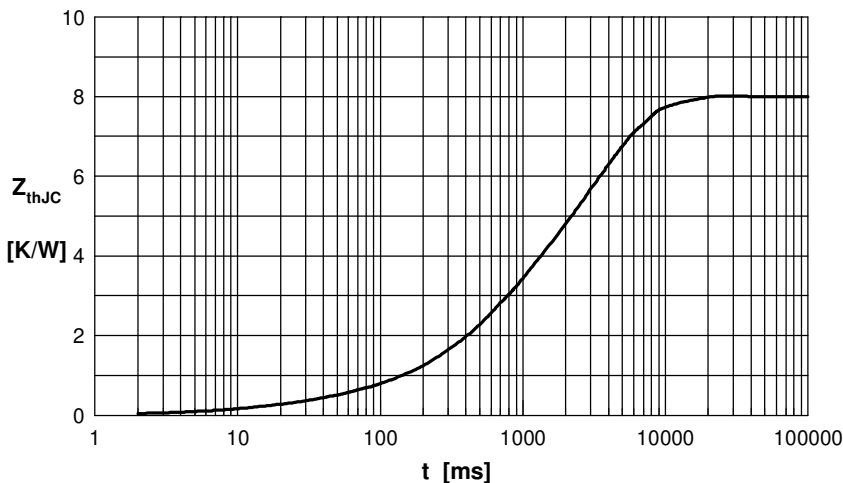


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 Constants for Z_{thJC} calculation:

| i | R_{th} (K/W) | t_i (s) |
|---|----------------|-----------|
| 1 | 0.040 | 0.005 |
| 2 | 0.250 | 0.030 |
| 3 | 1.810 | 0.500 |
| 4 | 5.900 | 3.200 |