Phase out

# Standard Rectifier Module

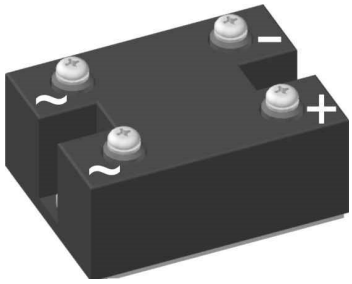
PHASE OUT

1~ Rectifier Bridge

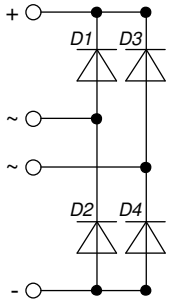
| 1~ Rectifier | | |
|---|---|---|
| $V_{RRM}$ | = | 800 V |
| $I_{DAV}$ | = | 100 A |
| $I_{FSM}$ | = | 1500 A |

**Part number**

**VBO105-08NO7**




E72873




**Features / Advantages:**

- Package with DCB ceramic
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

**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:** PWS-C

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Easy to mount with two screws
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Recommended replacement: VBO130-08NO7

**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.



© 2019 IXYS all rights reserved

## Rectifier

| Symbol | Definition | Conditions | | Ratings min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|---|
| $V_{RSM}$ | *max. non-repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 900 | V |
| $V_{RRM}$ | *max. repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 800 | V |
| $I_R$ | *reverse current* | $V_R$ = 800 V | $T_{VJ}$ = 25°C | | | 100 | µA |
| | | $V_R$ = 800 V | $T_{VJ}$ = 150°C | | | 2 | mA |
| $V_F$ | *forward voltage drop* | $I_F$ = 40 A | $T_{VJ}$ = 25°C | | | 1.09 | V |
| | | $I_F$ = 80 A | | | | 1.24 | V |
| | | $I_F$ = 40 A | $T_{VJ}$ = 125°C | | | 1.00 | V |
| | | $I_F$ = 80 A | | | | 1.19 | V |
| $I_{DAV}$ | *bridge output current* | $T_C$ = 100°C | $T_{VJ}$ = 150°C | | | 100 | A |
| | | rectangular d = 0.5 | | | | | |
| $V_{F0}$ | *threshold voltage* } *for power loss calculation only* | | $T_{VJ}$ = 150°C | | | 0.78 | V |
| $r_F$ | *slope resistance* } | | | | | 4.8 | mΩ |
| $R_{thJC}$ | *thermal resistance junction to case* | | | | | 0.8 | K/W |
| $R_{thCH}$ | *thermal resistance case to heatsink* | | | | 0.3 | | K/W |
| $P_{tot}$ | *total power dissipation* | | $T_C$ = 25°C | | | 155 | W |
| $I_{FSM}$ | *max. forward surge current* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 1.50 | kA |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 1.62 | kA |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 1.28 | kA |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 1.38 | kA |
| $I^2t$ | *value for fusing* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 11.3 | kA²s |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 10.9 | kA²s |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 8.13 | kA²s |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 7.87 | kA²s |
| $C_J$ | *junction capacitance* | $V_R$ = 400 V; f = 1 MHz | $T_{VJ}$ = 25°C | | 58 | | pF |

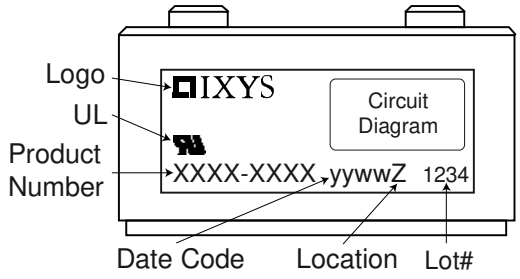
PHASE OUT



© 2019 IXYS all rights reserved

Phase out

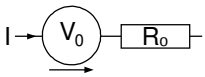
| Package PWS-C | | | | Ratings | | | |
|---|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | | **min.** | **typ.** | **max.** | **Unit** |
| $I_{RMS}$ | *RMS current* | per terminal | | | | 150 | A |
| $T_{VJ}$ | *virtual junction temperature* | | | -40 | | 150 | °C |
| $T_{op}$ | *operation temperature* | | | -40 | | 125 | °C |
| $T_{stg}$ | *storage temperature* | | | -40 | | 125 | °C |
| **Weight** | | | | | 237 | | g |
| $M_D$ | *mounting torque* | | | 4.25 | | 5.75 | Nm |
| $M_T$ | *terminal torque* | | | 4.25 | | 5.75 | Nm |
| $d_{Spp/App}$ | *creepage distance on surface \| striking distance through air* | | *terminal to terminal* | 26.0 | | | mm |
| $d_{Spb/Apb}$ | | | *terminal to backside* | 14.0 | | | mm |
| $V_{ISOL}$ | *isolation voltage* | t = 1 second | 50/60 Hz, RMS; $I_{ISOL}$ ≤ 1 mA | 3000 | | | V |
| | | t = 1 minute | | 2500 | | | V |




| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|---|---|---|---|---|---|
| Standard | VBO105-08NO7 | VBO105-08NO7 | Box | 10 | 475769 |

## Equivalent Circuits for Simulation

** on die level* $T_{VJ}$ = 150°C



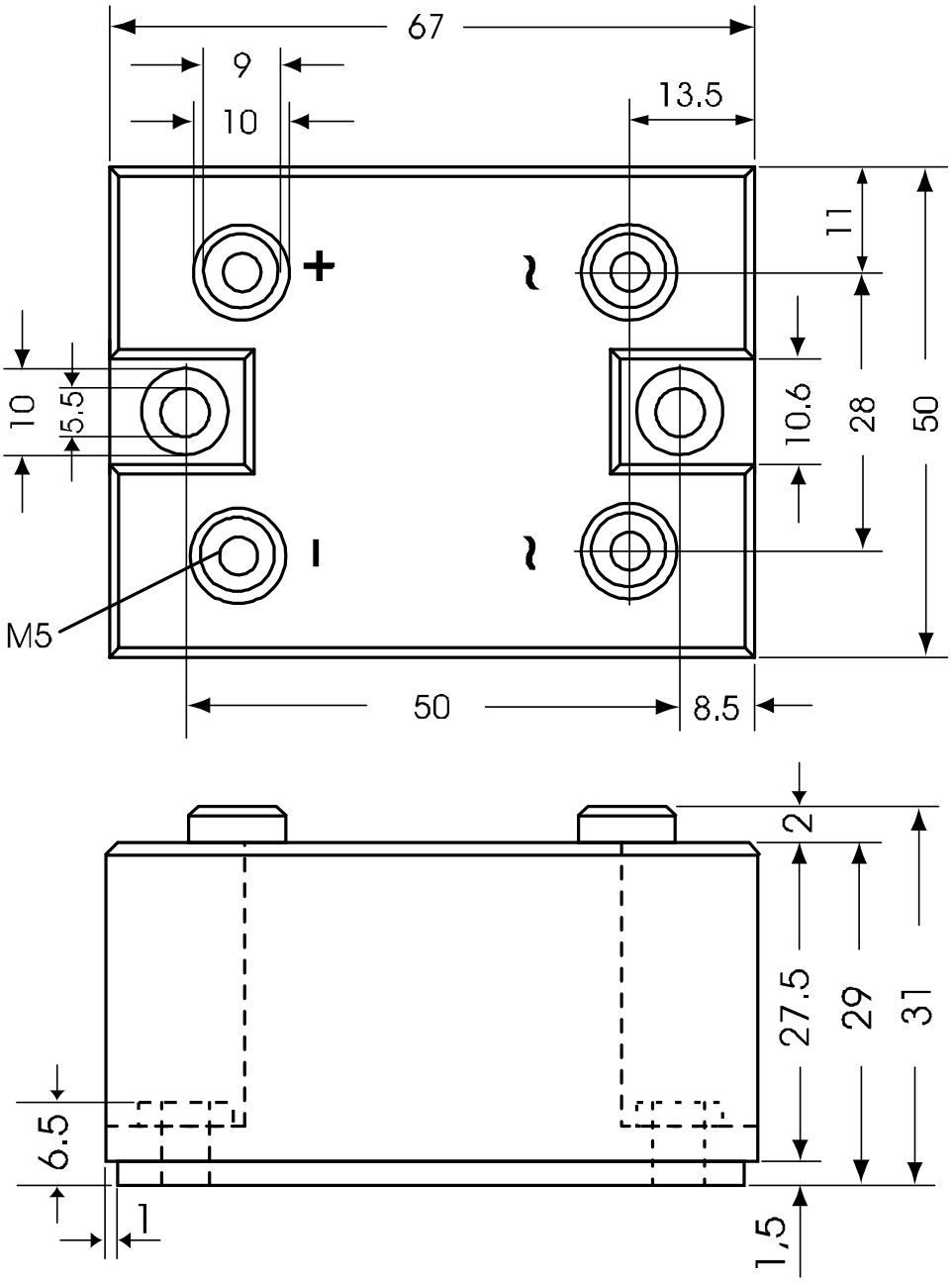

**Rectifier**

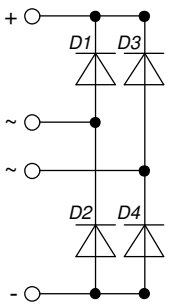
| | | | |
|---|---|---|---|
| $V_{0\,max}$ | *threshold voltage* | 0.78 | V |
| $R_{0\,max}$ | *slope resistance ** | 3.6 | mΩ |



© 2019 IXYS all rights reserved

## Outlines PWS-C






© 2019 IXYS all rights reserved

## Rectifier

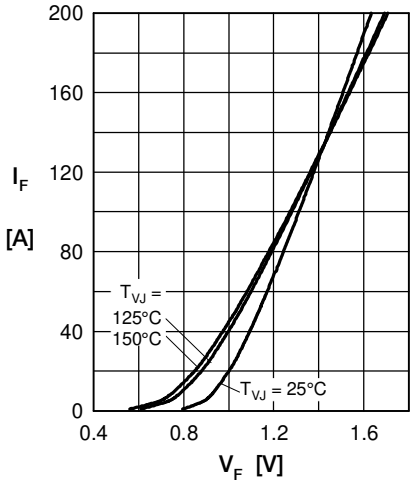



Fig. 1 Forward current versus voltage drop per diode

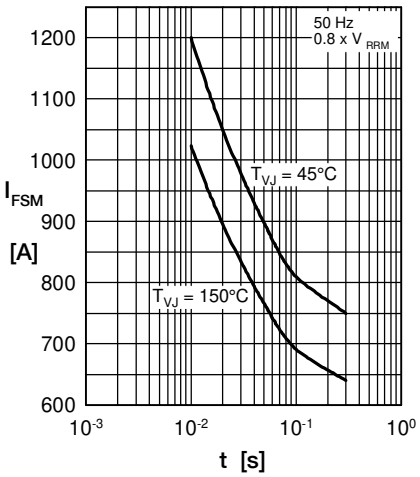



Fig. 2 Surge overload current vs. time per diode

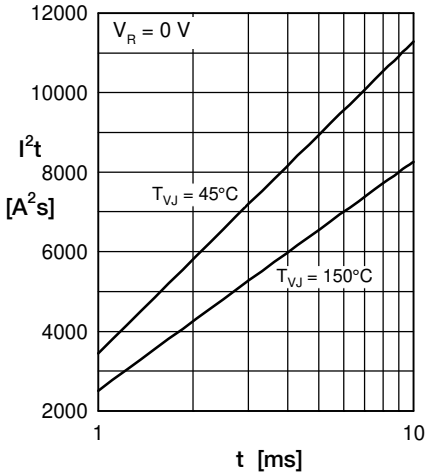



Fig. 3 $I^2t$ versus time per diode

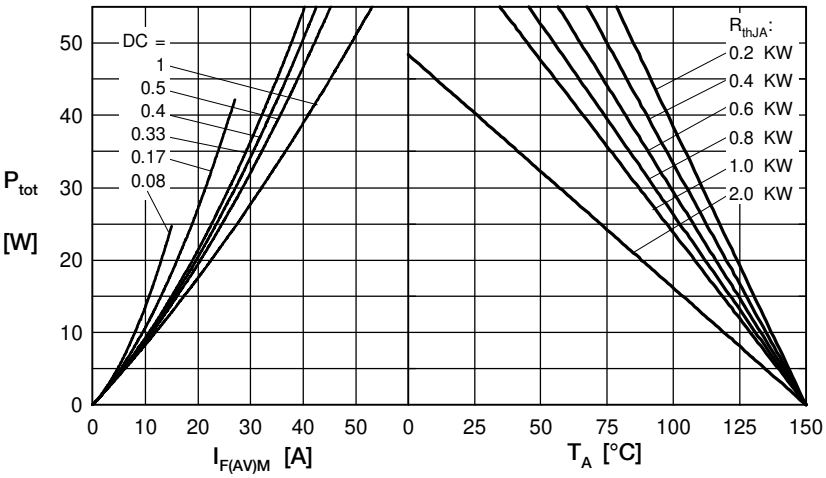



Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

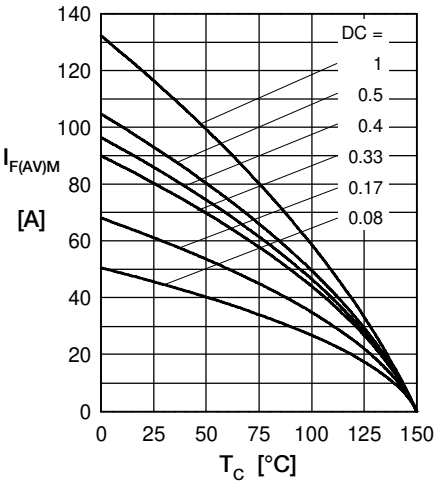



Fig. 5 Max. forward current vs. case temperature per diode

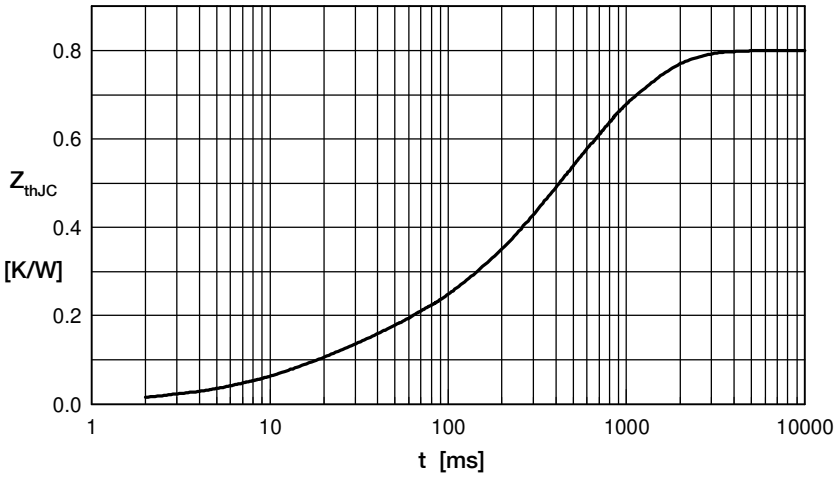



Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for $Z_{thJC}$ calculation:

| i | $R_{th}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.100 | 0.020 |
| 2 | 0.014 | 0.010 |
| 3 | 0.192 | 0.225 |
| 4 | 0.281 | 0.800 |
| 5 | 0.213 | 0.580 |



© 2019 IXYS all rights reserved