Phase out

# Standard Rectifier Module

| 3~ Rectifier | | |
|---|---|---|
| $V_{RRM}$ | = | 1400 V |
| $I_{DAV}$ | = | 120 A |
| $I_{FSM}$ | = | 1500 A |

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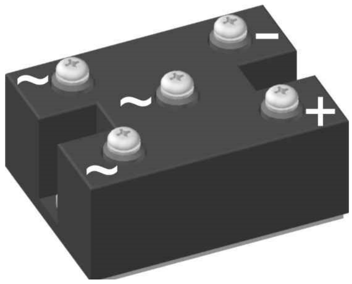
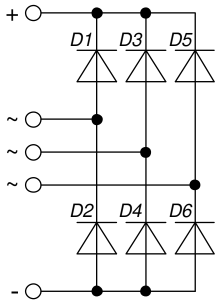
3~ Rectifier Bridge

**Part number**

**VUO105-14NO7**




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 three 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: VUO105-16NO7

Phase out

| Rectifier | | | | Ratings | | | |
|---|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | | **min.** | **typ.** | **max.** | **Unit** |
| $V_{RSM}$ | *max. non-repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 1500 | V |
| $V_{RRM}$ | *max. repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 1400 | V |
| $I_R$ | *reverse current* | $V_R$ = 1400 V | $T_{VJ}$ = 25°C | | | 100 | µA |
| | | $V_R$ = 1400 V | $T_{VJ}$ = 150°C | | | 2 | mA |
| $V_F$ | *forward voltage drop* | $I_F$ = 40 A | $T_{VJ}$ = 25°C | | | 1.09 | V |
| | | $I_F$ = 120 A | | | | 1.38 | V |
| | | $I_F$ = 40 A | $T_{VJ}$ = 125°C | | | 1.00 | V |
| | | $I_F$ = 120 A | | | | 1.36 | V |
| $I_{DAV}$ | *bridge output current* | $T_C$ = 105°C<br>rectangular d = ⅓ | $T_{VJ}$ = 150°C | | | 120 | A |
| $V_{F0}$ | *threshold voltage* | *for power loss calculation only* | $T_{VJ}$ = 150°C | | | 0.78 | V |
| $r_F$ | *slope resistance* | *for power loss calculation only* | | | | 4.8 | mΩ |
| $R_{thJC}$ | *thermal resistance junction to case* | | | | | 0.8 | K/W |
| $R_{thCH}$ | *thermal resistance case to heatsink* | | | | 0.30 | | 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 |

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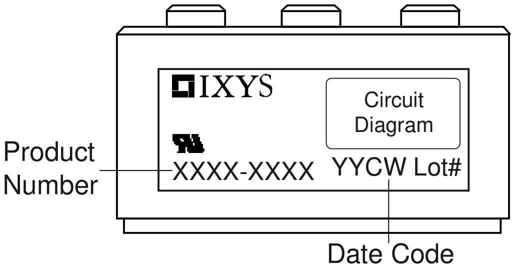
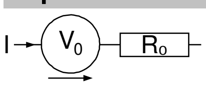
| Package PWS-C | | | | | Ratings | | |
|---|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | | **min.** | **typ.** | **max.** | **Unit** |
| $I_{RMS}$ | *RMS current* | per terminal | | | | 150 | A |
| $T_{VJ}$ | *virtual junction temperature* | | | -40 | | 150 | °C |
| $T_{op}$ | *operation temperature* | | | -40 | | 125 | °C |
| $T_{stg}$ | *storage temperature* | | | -40 | | 125 | °C |
| **Weight** | | | | | 250 | | 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; $I_{ISOL} \leq 1$ mA | 3000 | | | V |
| | | t = 1 minute | | 2500 | | | V |




| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|---|---|---|---|---|---|
| Standard | VUO105-14NO7 | VUO105-14NO7 | Box | 10 | 456721 |

## 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 |

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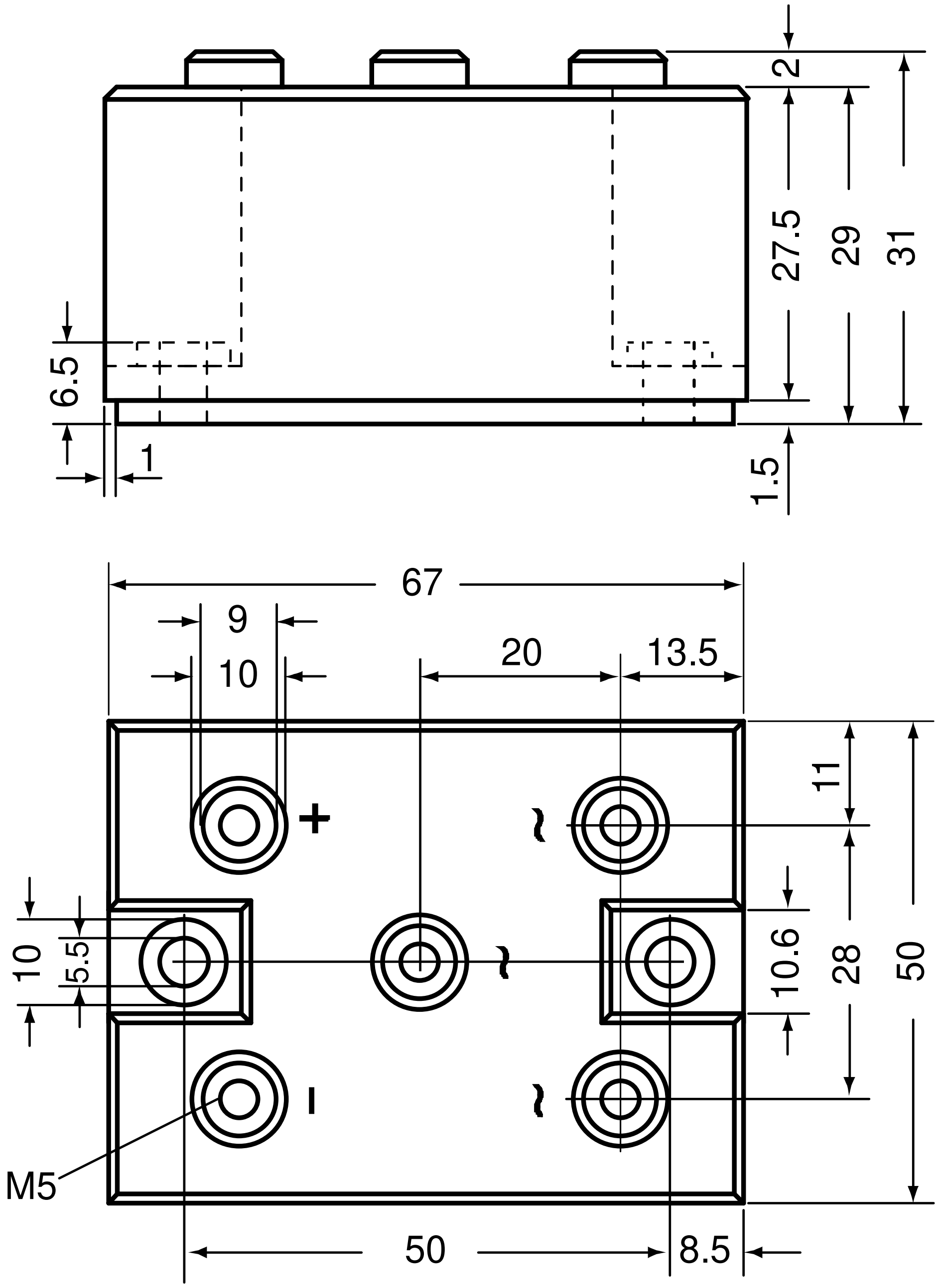
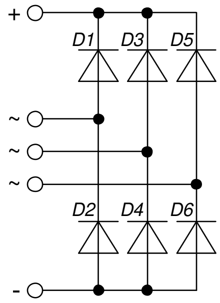
## Outlines PWS-C



## Rectifier

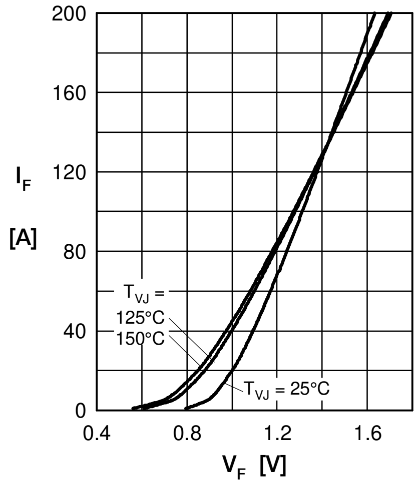



Fig. 1 Forward current versus voltage drop per diode

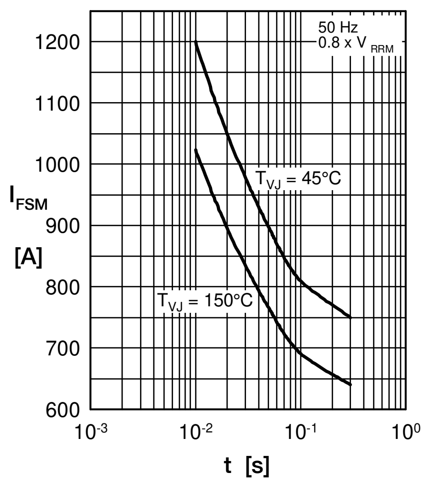



Fig. 2 Surge overload current vs. time per diode

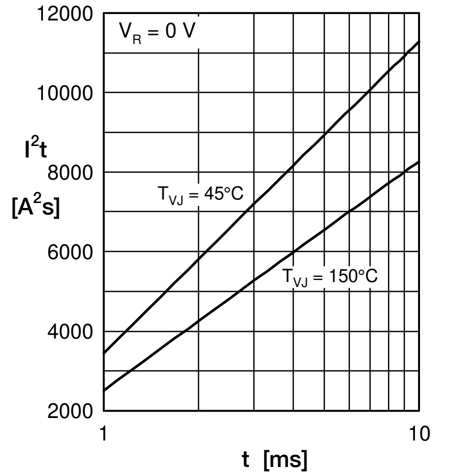



Fig. 3 $I^2t$ versus time per diode

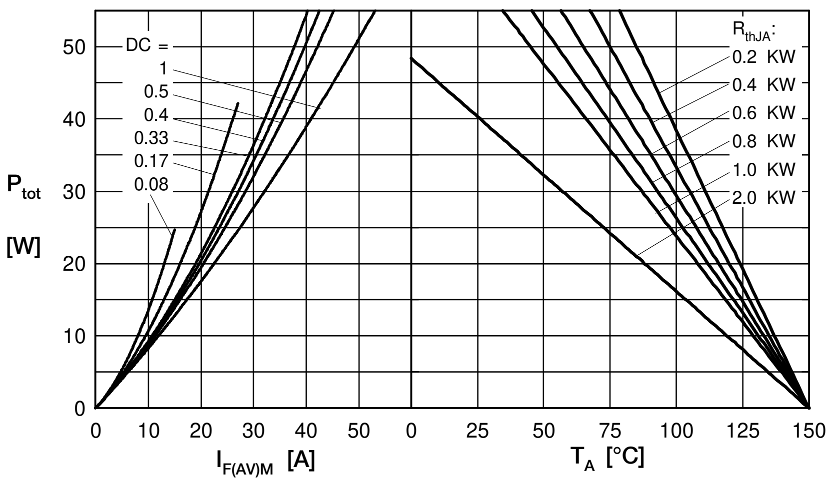



Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

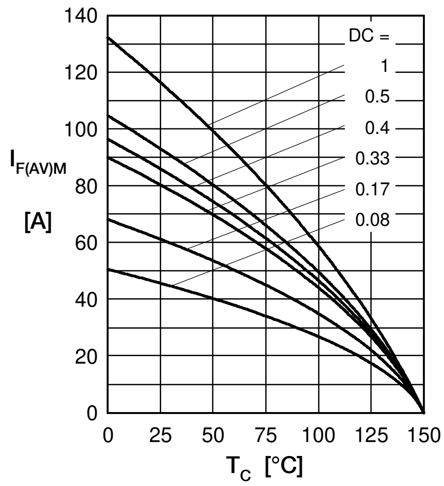



Fig. 5 Max. forward current vs. case temperature per diode

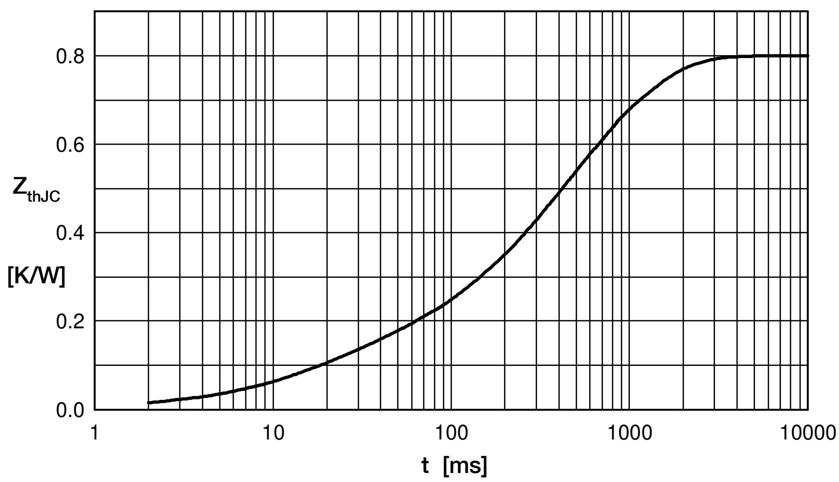



Fig. 6 Transient thermal impedance junction to case vs. time per diode

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 |