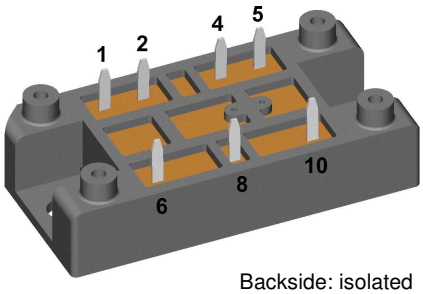
# Standard Rectifier Module

| 3~ Rectifier | | |
|---|---|---|
| $V_{RRM}$ | = | 1800 V |
| $I_{DAV}$ | = | 60 A |
| $I_{FSM}$ | = | 350 A |

## 3~ Rectifier Bridge

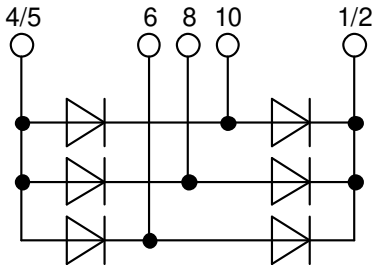
**Part number**

**VUO52-18NO1**




Backside: isolated

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:** V1-A-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

**Terms and Conditions of Usage**

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, conditions and dimensions. Data according to IEC 60747and per semiconductor unless otherwise specified 20151030d

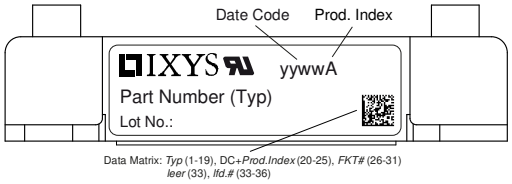
© 2015 IXYS all rights reserved

| Rectifier | | | | Ratings | | | |
|---|---|---|---|---|---|---|---|
| **Symbol** | **Definition** | **Conditions** | | **min.** | **typ.** | **max.** | **Unit** |
| $V_{RSM}$ | *max. non-repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 1900 | V |
| $V_{RRM}$ | *max. repetitive reverse blocking voltage* | | $T_{VJ}$ = 25°C | | | 1800 | V |
| $I_R$ | *reverse current* | $V_R$ = 1800 V | $T_{VJ}$ = 25°C | | | 40 | µA |
| | | $V_R$ = 1800 V | $T_{VJ}$ = 150°C | | | 1.5 | mA |
| $V_F$ | *forward voltage drop* | $I_F$ = 20 A | $T_{VJ}$ = 25°C | | | 1.13 | V |
| | | $I_F$ = 60 A | | | | 1.44 | V |
| | | $I_F$ = 20 A | $T_{VJ}$ = 125°C | | | 1.07 | V |
| | | $I_F$ = 60 A | | | | 1.50 | V |
| $I_{DAV}$ | *bridge output current* | $T_C$ = 110°C | $T_{VJ}$ = 150°C | | | 60 | A |
| | | rectangular d = ⅓ | | | | | |
| $V_{F0}$ | *threshold voltage* } *for power loss calculation only* | | $T_{VJ}$ = 150°C | | | 0.83 | V |
| $r_F$ | *slope resistance* } | | | | | 11.5 | mΩ |
| $R_{thJC}$ | *thermal resistance junction to case* | | | | | 1.3 | K/W |
| $R_{thCH}$ | *thermal resistance case to heatsink* | | | | 0.3 | | K/W |
| $P_{tot}$ | *total power dissipation* | | $T_C$ = 25°C | | | 95 | W |
| $I_{FSM}$ | *max. forward surge current* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 350 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 380 | A |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 300 | A |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 320 | A |
| $I^2t$ | *value for fusing* | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 45°C | | | 615 | A²s |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 600 | A²s |
| | | t = 10 ms; (50 Hz), sine | $T_{VJ}$ = 150°C | | | 450 | A²s |
| | | t = 8,3 ms; (60 Hz), sine | $V_R$ = 0 V | | | 425 | A²s |
| $C_J$ | *junction capacitance* | $V_R$ = 400 V; f = 1 MHz | $T_{VJ}$ = 25°C | | 10 | | pF |



© 2015 IXYS all rights reserved

| Package V1-A-Pack | | | | 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** | | | | | 37 | | g |
| $M_D$ | *mounting torque* | | | 2 | | 2.5 | Nm |
| $d_{Spp/App}$ | *creepage distance on surface \| striking distance through air* | | *terminal to terminal* | 6.0 | | | mm |
| $d_{Spb/Apb}$ | | | *terminal to backside* | 12.0 | | | mm |
| $V_{ISOL}$ | *isolation voltage* | t = 1 second | 50/60 Hz, RMS; $I_{ISOL}$ ≤ 1 mA | 3600 | | | V |
| | | t = 1 minute | | 3000 | | | V |

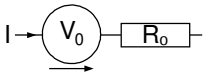



| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|---|---|---|---|---|---|
| Standard | VUO52-18NO1 | VUO52-18NO1 | Blister | 24 | 461199 |

| Similar Part | Package | Voltage class |
|---|---|---|
| VUO52-08NO1 | V1-A-Pack | 800 |
| VUO52-12NO1 | V1-A-Pack | 1200 |
| VUO52-14NO1 | V1-A-Pack | 1400 |
| VUO52-16NO1 | V1-A-Pack | 1600 |
| VUO52-20NO1 | V1-A-Pack | 2000 |
| VUO52-22NO1 | V1-A-Pack | 2200 |
| VUO34-16NO1 | V1-A-Pack | 1600 |
| VUO34-18NO1 | V1-A-Pack | 1800 |

## Equivalent Circuits for Simulation

** on die level* $T_{VJ}$ = 150 °C



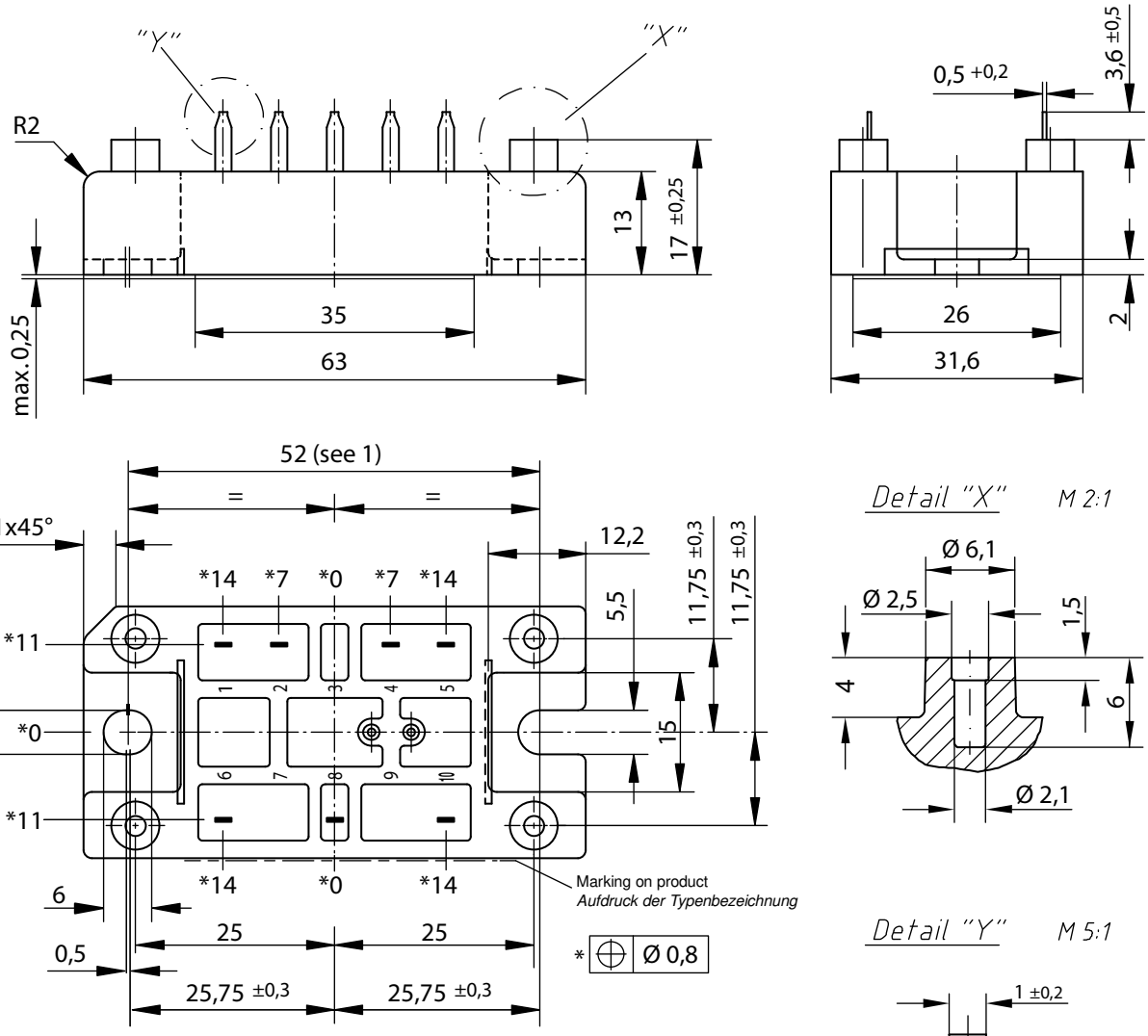

**Rectifier**

| | | | |
|---|---|---|---|
| $V_{0\,max}$ | *threshold voltage* | 0.83 | V |
| $R_{0\,max}$ | *slope resistance ** | 10.2 | mΩ |



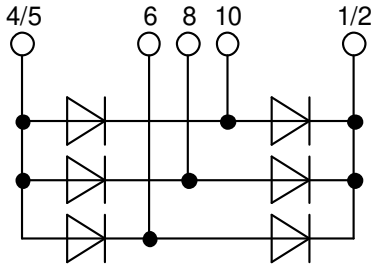
© 2015 IXYS all rights reserved

## Outlines V1-A-Pack




**Remarks** / ***Bemerkungen:***

1. Nominal distance mounting screws on heat sink: 52 mm / *Nennabstand Befestigungsschrauben auf Kühlkörper: 52 mm*
2. General tolerance / *Allgemeintoleranz*: DIN ISO 2768 -T1-c
3. Surface treatment of pins: tin plated (Sn) in hot dip / *Oberflächenbehandlung der Pins: verzinnt (Sn) im Tauchbad*
4. *Detail X:*
   EJOT PT® self-tapping screws (dimension K25) to be recommended for mounting on PCB
   *selbstschneidende Schraube (Größe K25) empfohlen für die PCB-Montage*
   Take care on the maximum screw length according to board thickness and the maximum hole depth of 6 mm
   *Bei der Wahl der Schraubenlänge die PCB-Dicke und die maximale Lochtiefe von 6mm beachten*
   Recommended mounting torque: 1.5 Nm / *Empfohlenes Drehmoment: 1.5 Nm*






© 2015 IXYS all rights reserved

## Rectifier

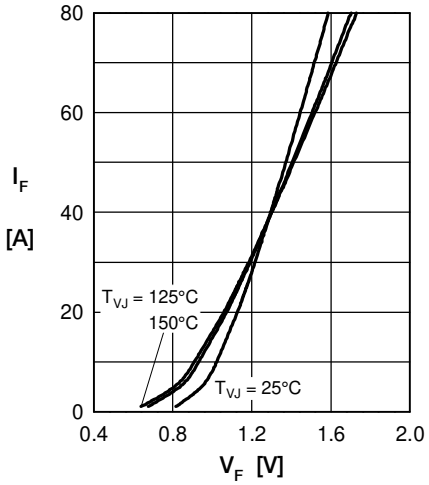



Fig. 1 Forward current vs. voltage drop per diode

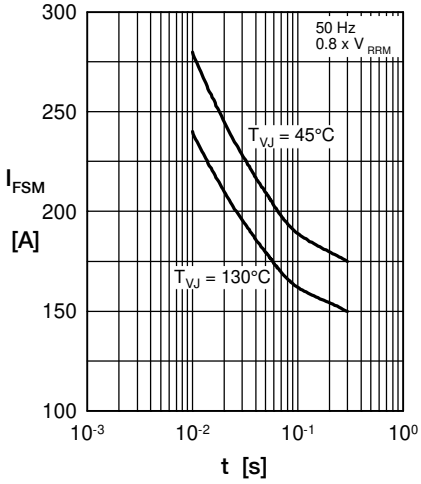



Fig. 2 Surge overload current vs. time per diode

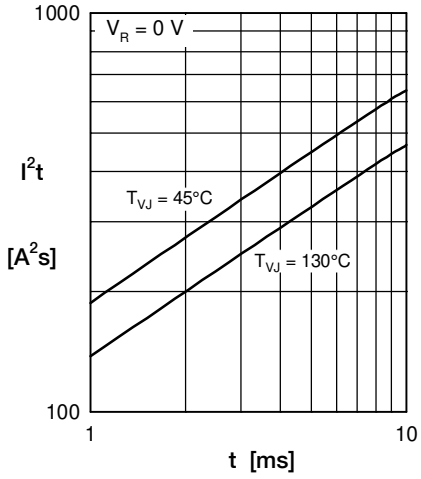



Fig. 3 $I^2t$ vs. time per diode

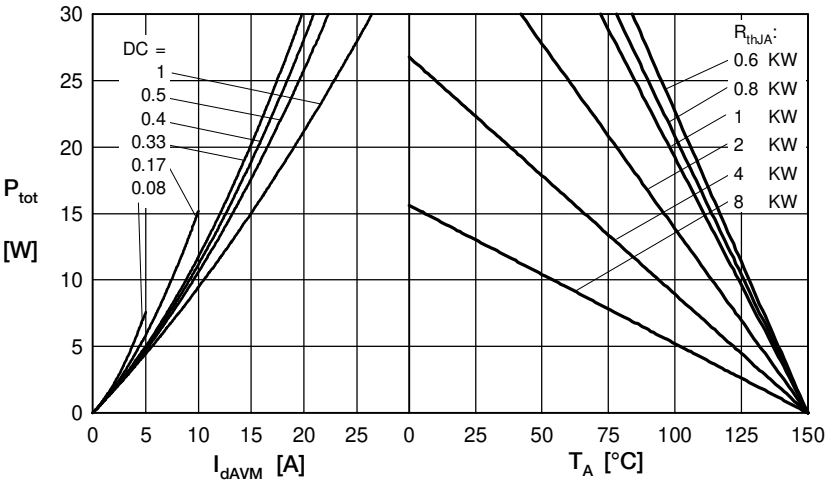



Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

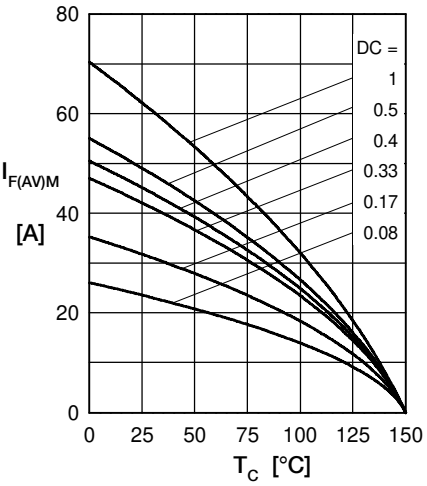



Fig. 5 Max. forward current vs. case temperature per diode

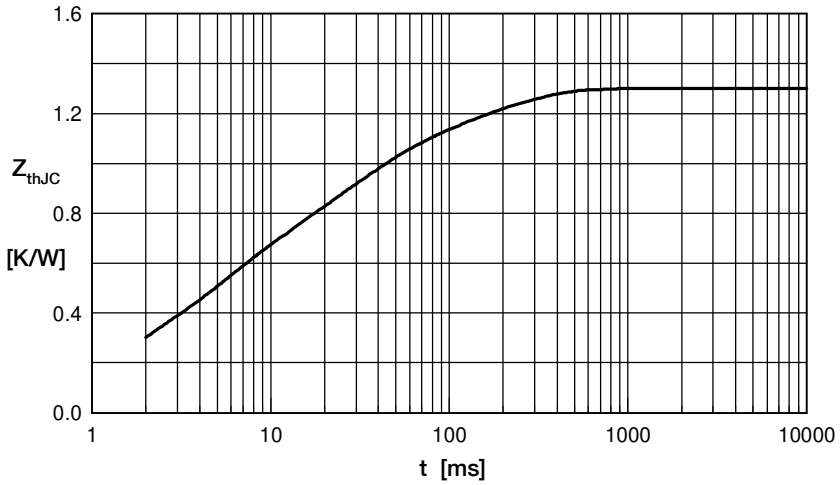



Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for $Z_{thJC}$ calculation:

| i | $R_{th}$ (K/W) | $t_i$ (s) |
|---|---|---|
| 1 | 0.06070 | 0.008 |
| 2 | 0.173 | 0.05 |
| 3 | 0.3005 | 0.06 |
| 4 | 0.463 | 0.3 |
| 5 | 0.3028 | 0.15 |



© 2015 IXYS all rights reserved