

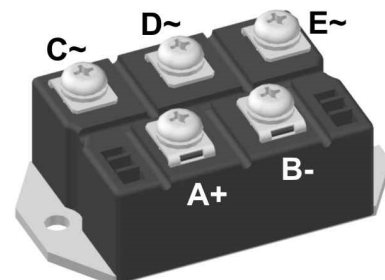
# Standard Rectifier Module

| 3~<br>Rectifier |          |
|-----------------|----------|
| $V_{RRM}$       | = 800 V  |
| $I_{DAV}$       | = 125 A  |
| $I_{FSM}$       | = 1200 A |

## 3~ Rectifier Bridge

Part number

**VUO110-08NO7**



 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 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-E

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

### Disclaimer Notice

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| Rectifier  |                                              |                                                   |                                                     | Ratings                        |      |      |                   |
|------------|----------------------------------------------|---------------------------------------------------|-----------------------------------------------------|--------------------------------|------|------|-------------------|
| Symbol     | Definition                                   | Conditions                                        |                                                     | min.                           | typ. | max. | Unit              |
| $V_{RSM}$  | max. non-repetitive reverse blocking voltage | $T_{VJ} = 25^{\circ}\text{C}$                     |                                                     |                                |      | 900  | V                 |
| $V_{RRM}$  | max. repetitive reverse blocking voltage     | $T_{VJ} = 25^{\circ}\text{C}$                     |                                                     |                                |      | 800  | V                 |
| $I_R$      | reverse current                              | $V_R = 800\text{ V}$                              | $T_{VJ} = 25^{\circ}\text{C}$                       |                                |      | 100  | $\mu\text{A}$     |
|            |                                              | $V_R = 800\text{ V}$                              | $T_{VJ} = 150^{\circ}\text{C}$                      |                                |      | 2    | mA                |
| $V_F$      | forward voltage drop                         | $I_F = 50\text{ A}$                               | $T_{VJ} = 25^{\circ}\text{C}$                       |                                |      | 1.13 | V                 |
|            |                                              | $I_F = 150\text{ A}$                              |                                                     |                                |      | 1.46 | V                 |
|            |                                              | $I_F = 50\text{ A}$                               | $T_{VJ} = 125^{\circ}\text{C}$                      |                                |      | 1.04 | V                 |
|            |                                              | $I_F = 150\text{ A}$                              |                                                     |                                |      | 1.47 | V                 |
| $I_{DAV}$  | bridge output current                        | $T_C = 110^{\circ}\text{C}$<br>rectangular        | $T_{VJ} = 150^{\circ}\text{C}$<br>$d = \frac{1}{3}$ |                                |      | 125  | A                 |
| $V_{F0}$   | threshold voltage                            | } for power loss calculation only                 |                                                     | $T_{VJ} = 150^{\circ}\text{C}$ |      | 0.79 | V                 |
| $r_F$      | slope resistance                             |                                                   |                                                     |                                |      | 4.5  | m $\Omega$        |
| $R_{thJC}$ | thermal resistance junction to case          |                                                   |                                                     |                                |      | 0.7  | K/W               |
| $R_{thCH}$ | thermal resistance case to heatsink          |                                                   |                                                     |                                | 0.3  |      | K/W               |
| $P_{tot}$  | total power dissipation                      | $T_C = 25^{\circ}\text{C}$                        |                                                     |                                |      | 175  | W                 |
| $I_{FSM}$  | max. forward surge current                   | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 45^{\circ}\text{C}$                       |                                |      | 1.20 | kA                |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$                                  |                                |      | 1.30 | kA                |
|            |                                              | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 150^{\circ}\text{C}$                      |                                |      | 1.02 | kA                |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$                                  |                                |      | 1.10 | kA                |
| $I^2t$     | value for fusing                             | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 45^{\circ}\text{C}$                       |                                |      | 7.20 | kA <sup>2</sup> s |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$                                  |                                |      | 6.98 | kA <sup>2</sup> s |
|            |                                              | $t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$  | $T_{VJ} = 150^{\circ}\text{C}$                      |                                |      | 5.20 | kA <sup>2</sup> s |
|            |                                              | $t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$ | $V_R = 0\text{ V}$                                  |                                |      | 5.04 | kA <sup>2</sup> s |
| $C_J$      | junction capacitance                         | $V_R = 400\text{ V}; f = 1\text{ MHz}$            |                                                     |                                | 37   |      | pF                |

| Package PWS-E        |                                                              |                      |                                         | Ratings |      |      |  |
|----------------------|--------------------------------------------------------------|----------------------|-----------------------------------------|---------|------|------|--|
| Symbol               | Definition                                                   | Conditions           | min.                                    | typ.    | max. | Unit |  |
| I <sub>RMS</sub>     | RMS current                                                  | per terminal         |                                         |         | 200  | A    |  |
| T <sub>VJ</sub>      | virtual junction temperature                                 |                      | -40                                     |         | 150  | °C   |  |
| T <sub>op</sub>      | operation temperature                                        |                      | -40                                     |         | 125  | °C   |  |
| T <sub>stg</sub>     | storage temperature                                          |                      | -40                                     |         | 125  | °C   |  |
| Weight               |                                                              |                      |                                         | 284     |      | g    |  |
| M <sub>D</sub>       | mounting torque                                              |                      | 4.25                                    |         | 5.75 | Nm   |  |
| M <sub>T</sub>       | terminal torque                                              |                      | 4.25                                    |         | 5.75 | Nm   |  |
| d <sub>Spp/App</sub> | creepage distance on surface   striking distance through air | terminal to terminal | 12.0                                    |         |      | mm   |  |
| d <sub>Spb/Apb</sub> |                                                              | terminal to backside | 26.0                                    |         |      | mm   |  |
| V <sub>ISOL</sub>    | isolation voltage                                            | t = 1 second         | 3000                                    |         |      | V    |  |
|                      |                                                              | t = 1 minute         | 2500                                    |         |      | V    |  |
|                      |                                                              |                      | 50/60 Hz, RMS; I <sub>ISOL</sub> ≤ 1 mA |         |      |      |  |



| Ordering | Ordering Number | Marking on Product | Delivery Mode | Quantity | Code No. |
|----------|-----------------|--------------------|---------------|----------|----------|
| Standard | VUO110-08NO7    | VUO110-08NO7       | Box           | 5        | 462365   |

### Equivalent Circuits for Simulation

\* on die level

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



Rectifier

$V_{0 \max}$  threshold voltage 0.79

V

$R_{0 \max}$  slope resistance \* 3.3

mΩ

**Outlines PWS-E**



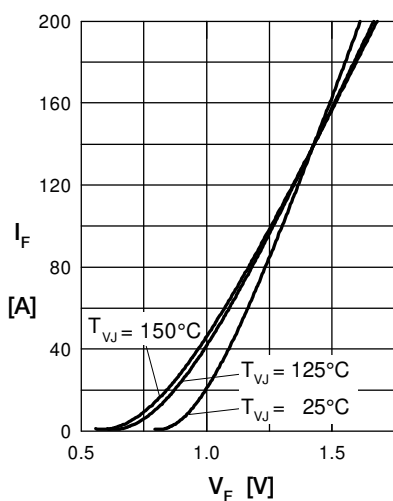
**Rectifier**


Fig. 1 Forward current vs. voltage drop per diode

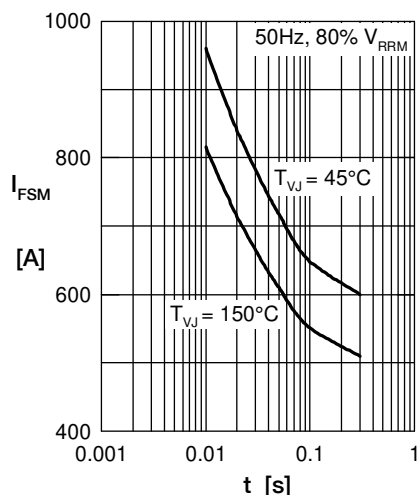


Fig. 2 Surge overload current vs. time per diode

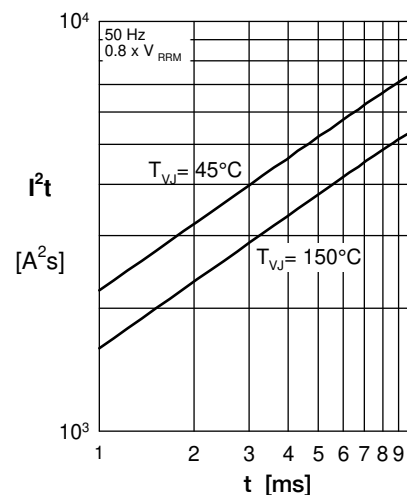


Fig. 3  $I^2t$  vs. time per diode

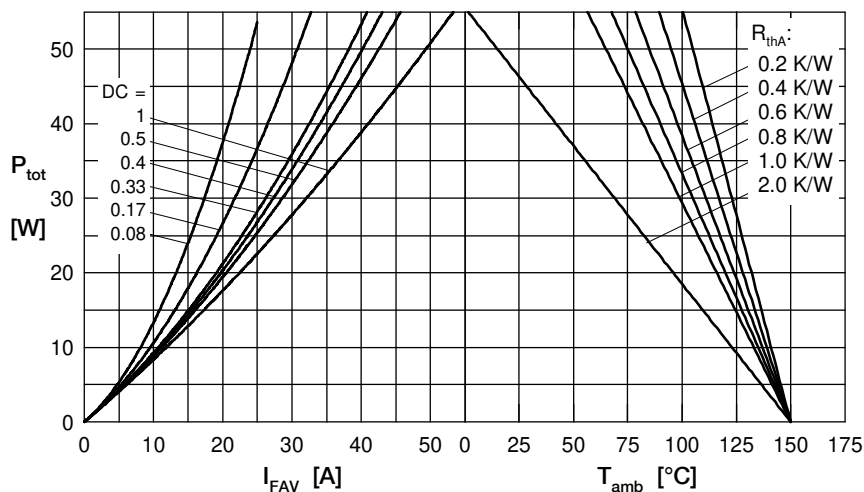


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

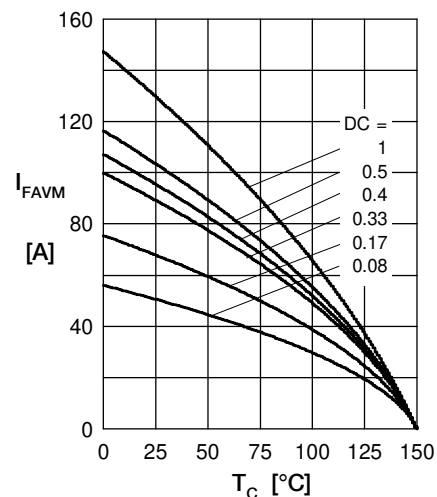


Fig. 5 Max. forward current vs. case temperature per diode

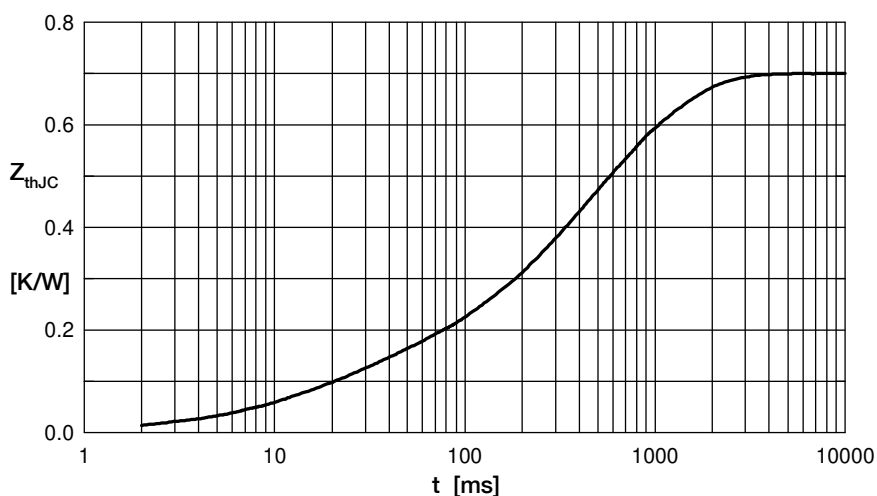


Fig. 6 Transient thermal impedance junction to case vs. time per diode

| $R_i$ | $t_i$ |
|-------|-------|
| 0.100 | 0.020 |
| 0.010 | 0.010 |
| 0.162 | 0.225 |
| 0.258 | 0.800 |
| 0.170 | 0.580 |