

Standard Rectifier Module

| |
|---------------------------|
| 3~ Rectifier |
| $V_{RRM} = 1200\text{ V}$ |
| $I_{DAV} = 125\text{ A}$ |
| $I_{FSM} = 1200\text{ A}$ |

3~ Rectifier Bridge

Part number

VUO110-12N07



 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

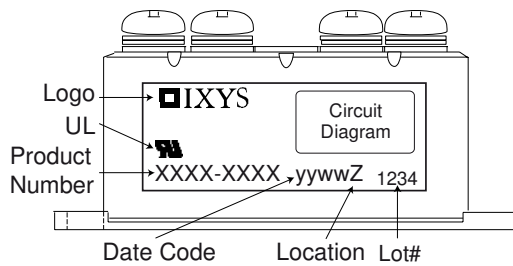
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| Rectifier | | | | Ratings | | | |
|------------|--|-----------------------------|-------------------|------------------------------|------|-----------------------------------|-------------------|
| Symbol | Definition | Conditions | | min. | typ. | 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 | | $T_{VJ} = 25^\circ\text{C}$ | | 100 | μA |
| | | $V_R = 1200$ V | | $T_{VJ} = 150^\circ\text{C}$ | | 2 | mA |
| V_F | forward voltage drop | $I_F = 50$ A | | $T_{VJ} = 25^\circ\text{C}$ | | 1.13 | V |
| | | $I_F = 150$ A | | | | 1.46 | V |
| | | $I_F = 50$ A | | $T_{VJ} = 125^\circ\text{C}$ | | 1.04 | V |
| | | $I_F = 150$ A | | | | 1.47 | V |
| I_{DAV} | bridge output current | $T_C = 110^\circ\text{C}$ | | $T_{VJ} = 150^\circ\text{C}$ | | 125 | A |
| | | rectangular | $d = \frac{1}{3}$ | | | | |
| V_{FO} | threshold voltage | | | $T_{VJ} = 150^\circ\text{C}$ | | 0.79 | V |
| r_F | slope resistance | | | | | 4.5 | m Ω |
| | | | | | | } for power loss calculation only | |
| 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 | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 45^\circ\text{C}$ | | 1.20 | kA |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 1.30 | kA |
| | | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 150^\circ\text{C}$ | | 1.02 | kA |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 1.10 | kA |
| I^2t | value for fusing | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 45^\circ\text{C}$ | | 7.20 | kA ² s |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 6.98 | kA ² s |
| | | $t = 10$ ms; (50 Hz), sine | | $T_{VJ} = 150^\circ\text{C}$ | | 5.20 | kA ² s |
| | | $t = 8,3$ ms; (60 Hz), sine | | $V_R = 0$ V | | 5.04 | kA ² s |
| C_J | junction capacitance | $V_R = 400$ V; $f = 1$ MHz | | $T_{VJ} = 25^\circ\text{C}$ | | 37 | pF |

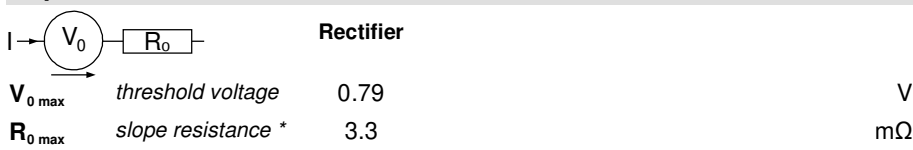
| Package PWS-E | | | | Ratings | | | |
|---------------|--|----------------------|------|---------|------|------|--|
| Symbol | Definition | Conditions | min. | typ. | max. | Unit | |
| I_{RMS} | RMS current | per terminal | | | 200 | A | |
| T_{VJ} | virtual junction temperature | | -40 | | 150 | °C | |
| T_{op} | operation temperature | | -40 | | 125 | °C | |
| T_{stg} | storage temperature | | -40 | | 125 | °C | |
| Weight | | | | | 284 | 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 | 12.0 | | | mm | |
| $d_{Spb/Apb}$ | | terminal to backside | 26.0 | | | 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 | VUO110-12NO7 | VUO110-12NO7 | Box | 5 | 462373 |

Equivalent Circuits for Simulation

* on die level

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




Outlines PWS-E





Rectifier

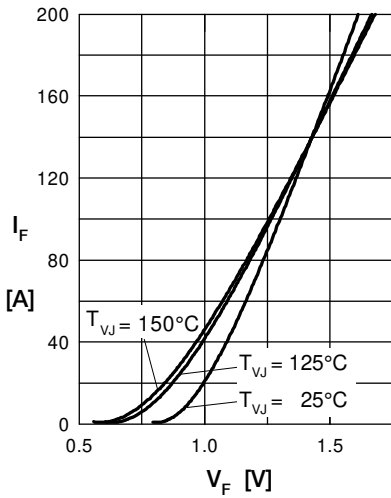


Fig. 1 Forward current vs. voltage drop per diode

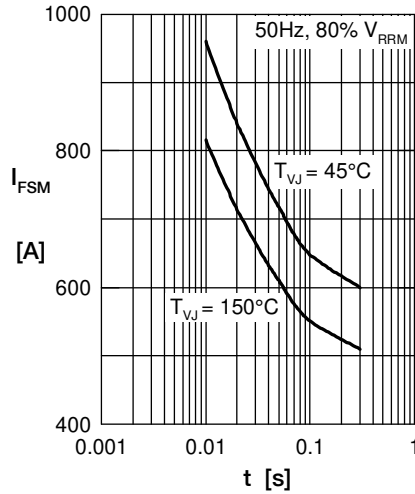


Fig. 2 Surge overload current vs. time per diode

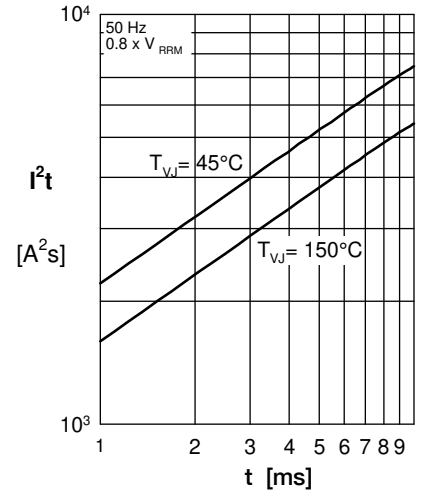


Fig. 3 I^2t vs. time per diode

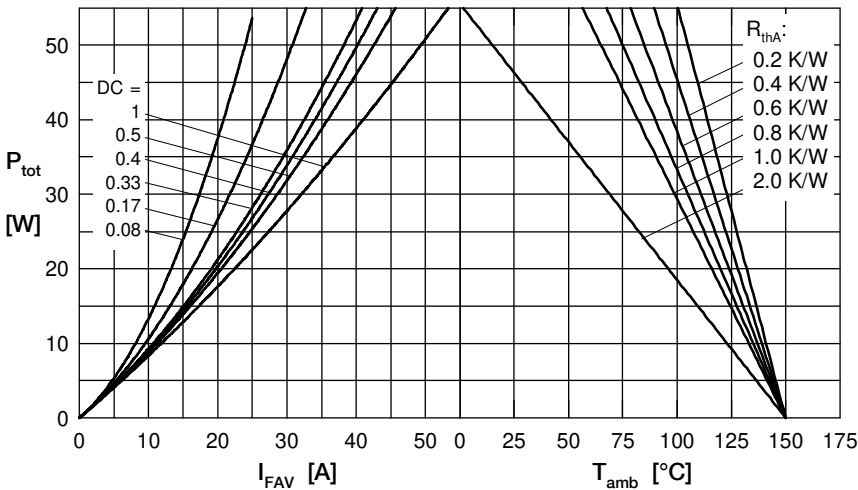


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

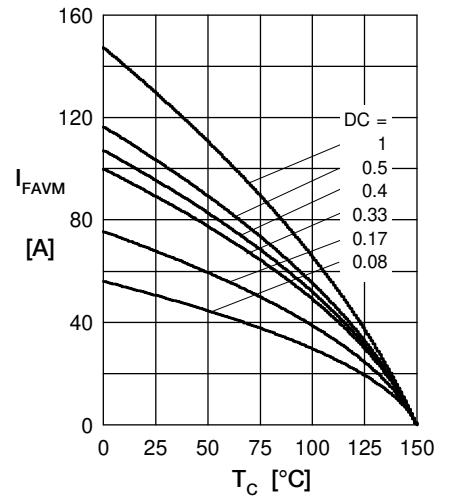


Fig. 5 Max. forward current vs. case temperature per diode

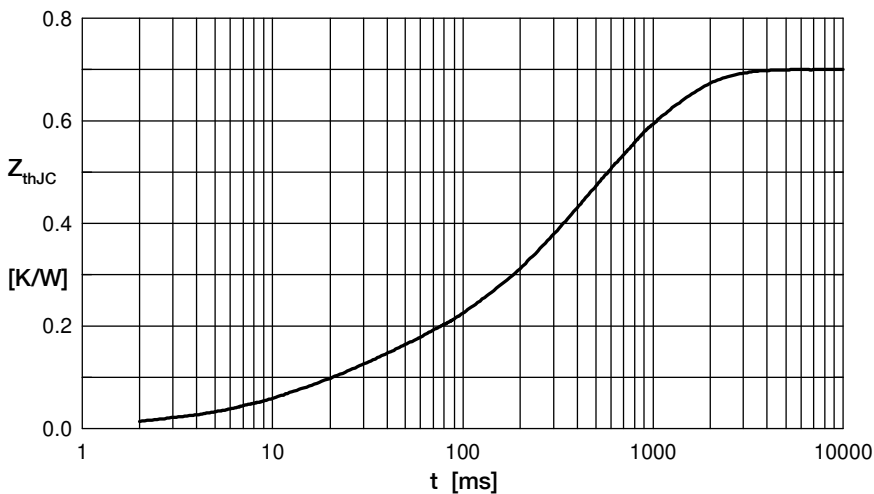


Fig. 6 Transient thermal impedance junction to case vs. time per diode

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