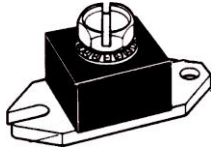


Schottky Rectifier, 240 A


HALF-PAK (D-67) Reverse

Lug terminal cathode



Base anode

FEATURES

- 175 °C T_J operation
- Unique high power, HALF-PAK module
- Replaces four parallel DO-5's
- Easier to mount and lower profile than DO-5's
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


RoHS
COMPLIANT

PRODUCT SUMMARY

| | |
|-------------|-------|
| $I_{F(AV)}$ | 240 A |
| V_R | 150 V |

DESCRIPTION

The 249NQ150R high current Schottky rectifier module has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---|-------------|------------------|
| $I_{F(AV)}$ | Rectangular waveform | 240 | A |
| V_{RRM} | | 150 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 20 000 | A |
| V_F | 240 Apk, $T_J = 125 \text{ }^\circ\text{C}$ | 0.72 | V |
| T_J | Range | - 55 to 175 | $^\circ\text{C}$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 249NQ150R | UNITS |
|--------------------------------------|-----------|-----------|-------|
| Maximum DC reverse voltage | V_R | 150 | V |
| Maximum working peak reverse voltage | V_{RWM} | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|-------------|---|--------|-------|
| Maximum average forward current See fig. 5 | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 117 \text{ }^\circ\text{C}$, rectangular waveform | 240 | A |
| Maximum peak one cycle non-repetitive surge current See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 20 000 | |
| | | 10 ms sine or 6 ms rect. pulse | 2300 | |
| Non-repetitive avalanche energy | E_{AS} | $T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 1 \text{ A}$, $L = 30 \text{ mH}$ | 15 | mJ |
| Repetitive avalanche current | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | 1 | A |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---|----------------|---|-----------------------------------|--------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop See fig. 1 | $V_{FM}^{(1)}$ | 240 A | $T_J = 25\text{ }^\circ\text{C}$ | 1.07 | V |
| | | 480 A | | 1.27 | |
| | | 240 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.74 | |
| | | 480 A | | 0.86 | |
| Maximum reverse leakage current See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 6 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 85 | |
| Maximum junction capacitance | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$ | | 6000 | pF |
| Typical series inductance | L_S | From top of terminal hole to mounting plane | | 5.0 | nH |
| Maximum voltage rate of change | dV/dt | Rated V_R | | 10 000 | V/ μ s |

Note(1) Pulse width < 300 μ s, duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | |
|--|----------------|--------------------------------------|--|-----------------------|------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | | - 55 to 175 | $^\circ\text{C}$ |
| Maximum thermal resistance, junction to case | R_{thJC} | DC operation See fig. 4 | | 0.20 | $^\circ\text{C/W}$ |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | | 0.15 | |
| Approximate weight | | | | 25.6 | g |
| | | | | 0.9 | oz. |
| Mounting torque | minimum | Non-lubricated threads | | 40 (35) | kgf · cm (lbf · in) |
| | maximum | | | 58 (50) | |
| Terminal torque | minimum | | | 58 (50) | |
| | maximum | | | 86 (75) | |
| Case style | | | | D-67 HALF-PAK Reverse | |

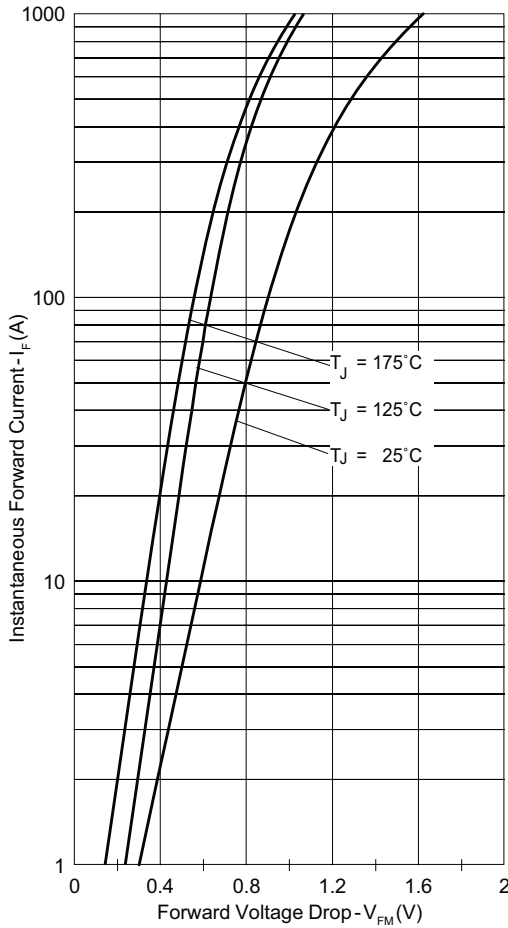


Fig. 1 - Maximum Forward Voltage Drop Characteristics

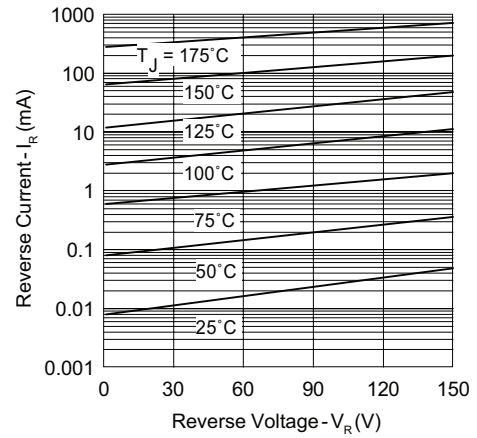


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

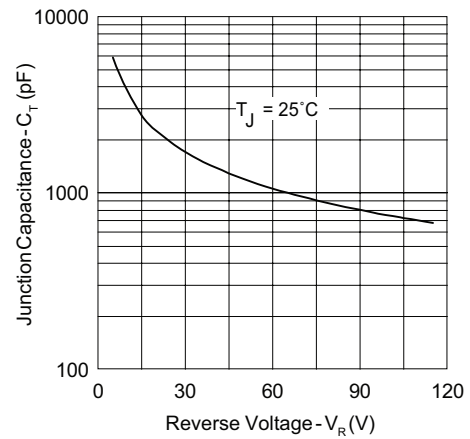


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

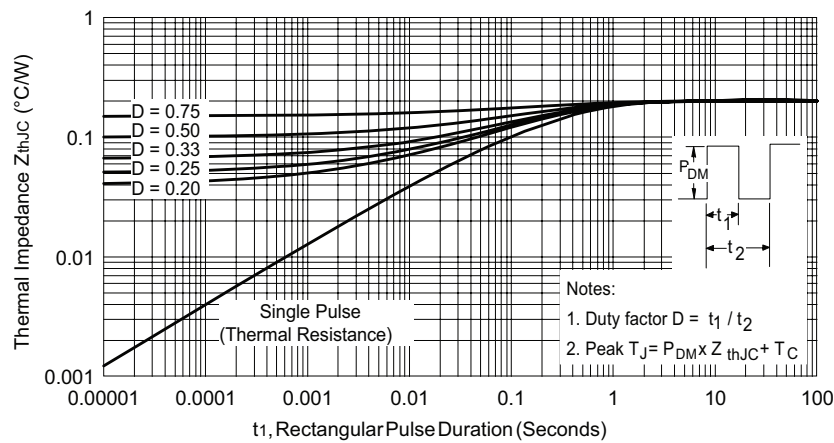


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

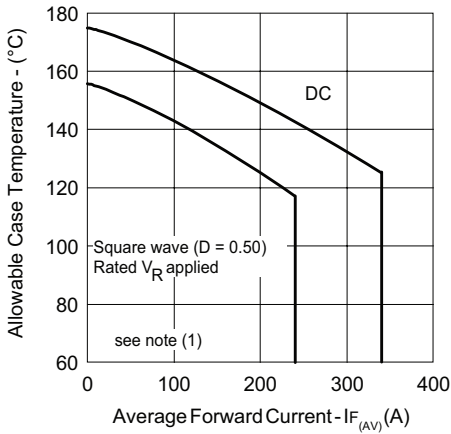


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

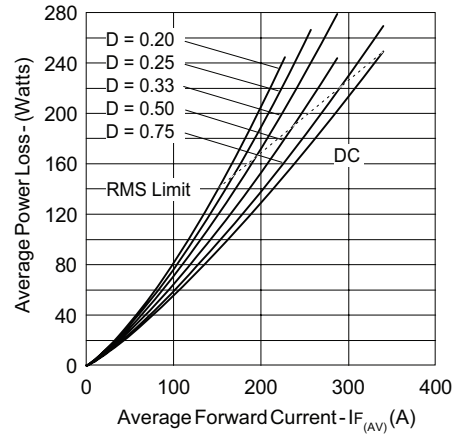


Fig. 6 - Forward Power Loss Characteristics

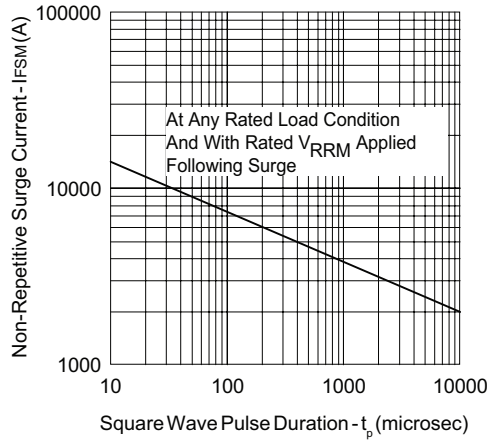


Fig. 7 - Maximum Non-Repetitive Surge Current

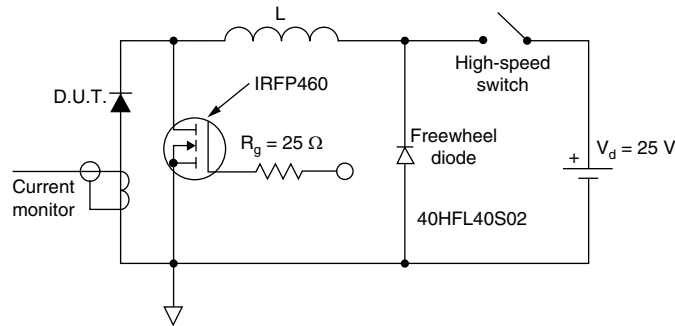


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
 Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); Pd_{REV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95378 |



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