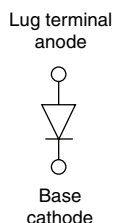


Schottky Rectifier, 180 A


HALF-PAK (D-67)


FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free
- Designed and qualified for industrial level


RoHS
COMPLIANT

DESCRIPTION

The 182NQ.. high current Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in high current switching power supplies, plating power supplies, UPS systems, converters, freewheeling diodes, welding, and reverse battery protection.

PRODUCT SUMMARY

| | |
|-------------|-------|
| $I_{F(AV)}$ | 180 A |
| V_R | 30 V |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform | 180 | A |
| V_{RRM} | | 30 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 20 000 | A |
| V_F | 180 Apk, $T_J = 125^\circ C$ | 0.45 | V |
| T_J | Range | - 55 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 182NQ030PbF | UNITS |
|--------------------------------------|-----------|-------------|-------|
| Maximum DC reverse voltage | V_R | 30 | 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 $T_C = 108^\circ C$, rectangular waveform | 180 | 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 | 2500 | |
| Non-repetitive avalanche energy | E_{AS} | $T_J = 25^\circ C$, $I_{AS} = 18 A$, $L = 1 mH$ | 162 | 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 | 36 | A |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---|--------------------------------|---|---------------------------------------|--------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop See fig. 1 | V _{FM} ⁽¹⁾ | 180 A | T _J = 25 °C | 0.59 | V |
| | | 360 A | | 0.8 | |
| | | 180 A | T _J = 125 °C | 0.45 | |
| | | 360 A | | 0.65 | |
| Maximum reverse leakage current See fig. 2 | I _{RM} | T _J = 25 °C | V _R = Rated V _R | 15 | mA |
| | | T _J = 125 °C | | 840 | |
| Maximum junction capacitance | C _T | V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz) 25 °C | | 7700 | pF |
| Typical series inductance | L _S | From top of terminal hole to mounting plane | | 6.0 | nH |
| Maximum voltage rate of change | dV/dt | Rated V _R | | 10 000 | V/μs |

Note(1) Pulse width = 500 μ s

| THERMAL - MECHANICAL SPECIFICATIONS | | | | |
|--|-----------------------------------|--------------------------------------|-----------------|---------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
| Maximum junction and storage temperature range | T _J , T _{Stg} | | - 55 to 150 | °C |
| Maximum thermal resistance, junction to case | R _{thJC} | DC operation See fig. 4 | 0.28 | °C/W |
| Typical thermal resistance, case to heatsink | R _{thCS} | Mounting surface, smooth and greased | 0.05 | |
| Approximate weight | | | 30 | g |
| | | | 1.06 | oz. |
| Mounting torque | minimum | Non-lubricated threads | 3 (26.5) | N · m (lbf · in) |
| | maximum | | 4 (35.4) | |
| Terminal torque | minimum | | 3.4 (30) | |
| | maximum | | 5 (44.2) | |
| Case style | | | HALF-PAK module | |

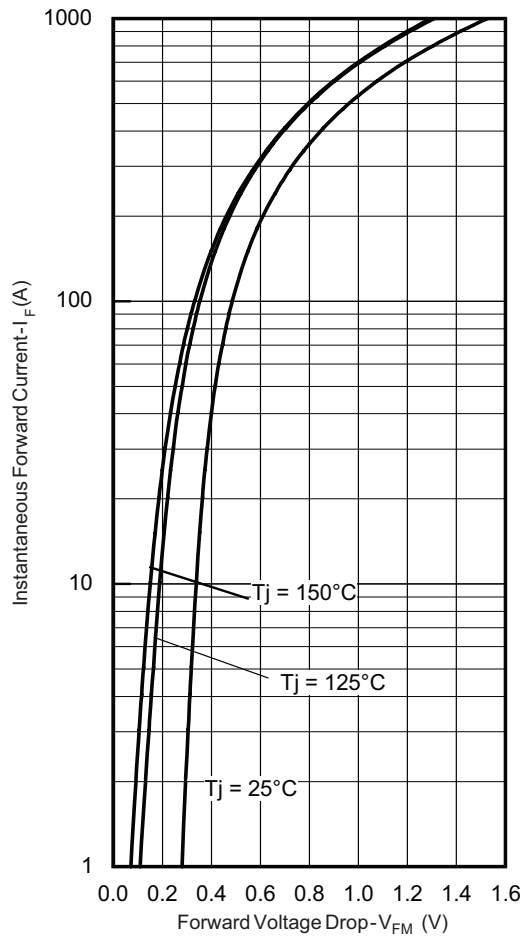


Fig. 1 - Maximum Forward Voltage Drop Characteristics

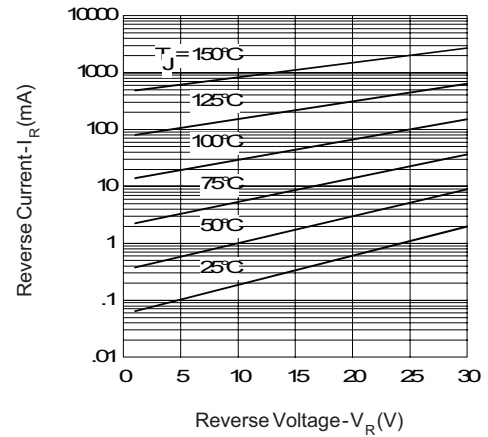


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

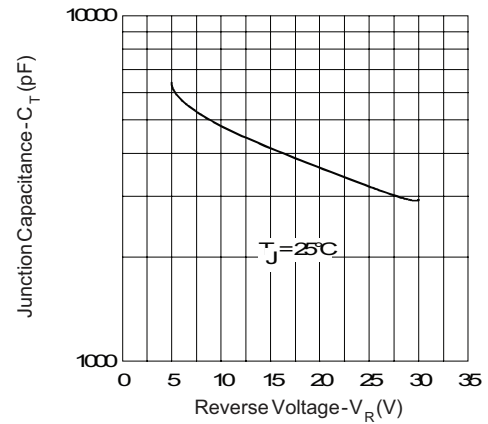
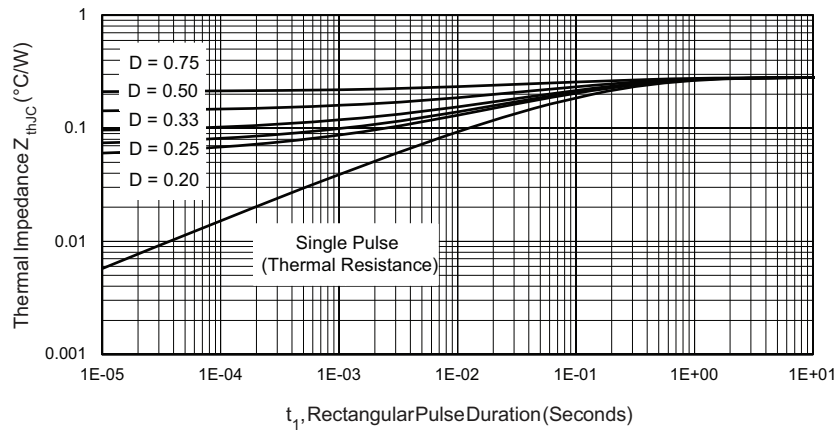


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

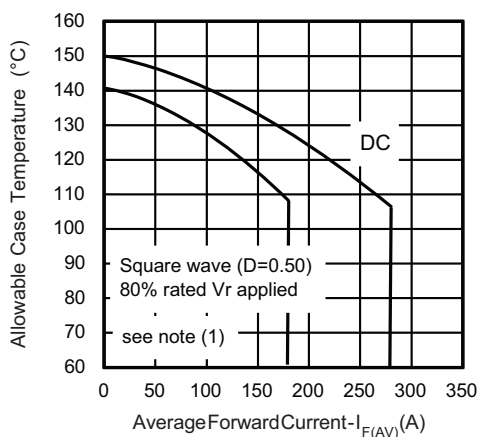


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

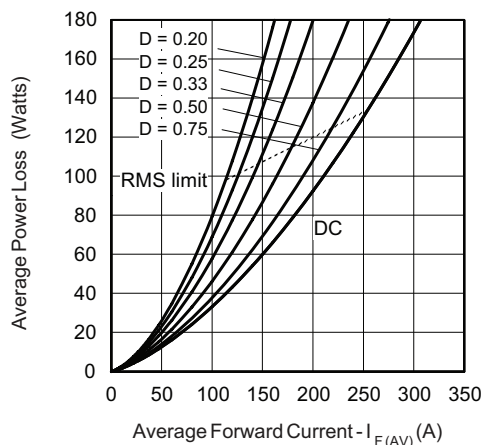


Fig. 6 - Forward Power Loss Characteristics

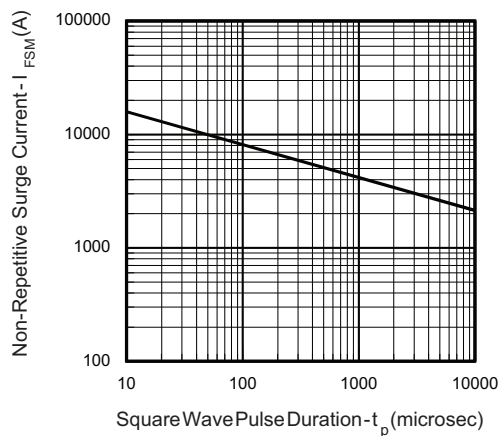


Fig. 7 - Maximum Non-Repetitive Surge Current

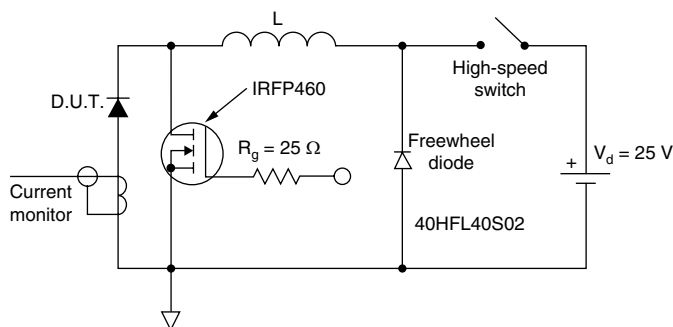


Fig. 8 - Unclamped Inductive Test Circuit

Note

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



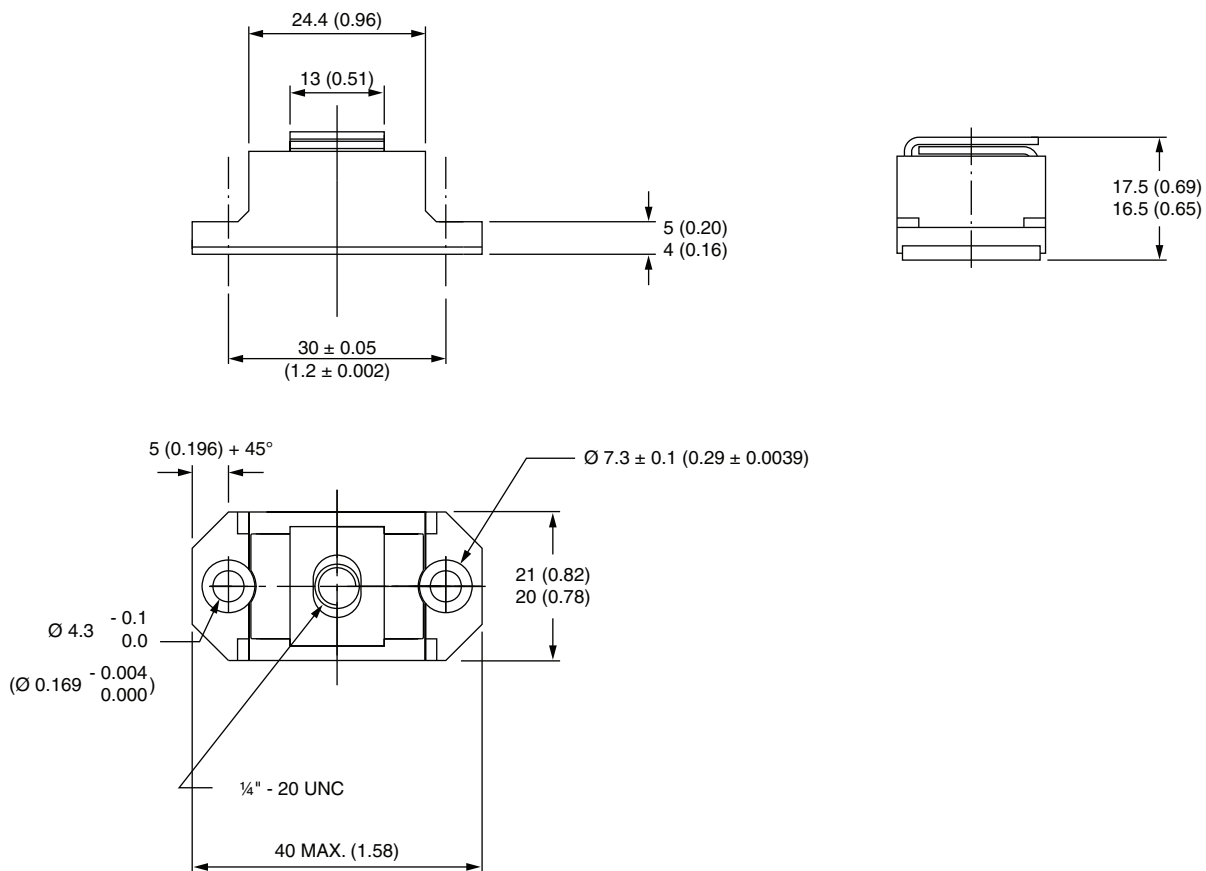
ORDERING INFORMATION TABLE

| | | | | | | |
|-------------|----|---|--------------------------------|---|-----|-----|
| Device code | 18 | 2 | N | Q | 030 | PbF |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | 1 | - | Average current rating (x 10) | | | |
| | 2 | - | Product silicon identification | | | |
| | 3 | - | N = Not isolated | | | |
| | 4 | - | Q = Schottky rectifier diode | | | |
| | 5 | - | Voltage rating (030 = 30 V) | | | |
| | 6 | - | Lead (Pb)-free | | | |

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95020 |

D-67 HALF-PAK

DIMENSIONS in millimeters (inches)





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