PD-2.275 rev. A 12/97

International
IOR Rectifier

# 125NQ015

## SCHOTTKY RECTIFIER 120 Amp

### Major Ratings and Characteristics

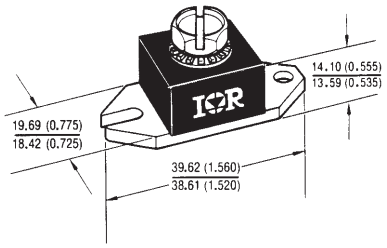
| Characteristics | | 125NQ015 | Units |
|---|---|---|---|
| $I_{F(AV)}$ | Rectangular waveform | 120 | A |
| $V_{RRM}$ | | 15 | V |
| $I_{FSM}$ | @ tp = 5 µs sine | 10,800 | A |
| $V_F$ | @ 120 Apk, $T_J$ = 75°C | 0.33 | V |
| $T_J$ | range | -55 to 100 | °C |

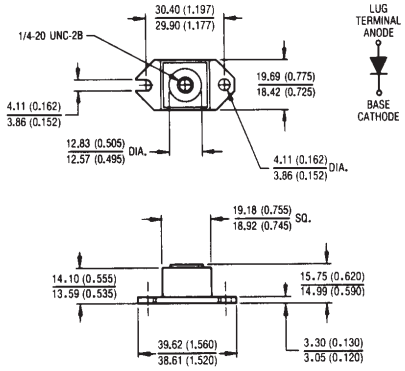
### Description/Features

The 125NQ015 high current Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 100 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 100 °C $T_J$ operation
- Unique high power, Half-Pak module
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance

**CASE STYLE AND DIMENSIONS**




**Outline HALF PAK Module**
Dimensions in millimeters and inches

## Voltage Ratings

| | Part number | 125NQ015 |
|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) | 15 |
| $V_{RWM}$ | Max. Working Peak Reverse Voltage (V) | 25 |

## Absolute Maximum Ratings

| | Parameters | 125NQ | Units | Conditions | |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward Current *See Fig. 5 | 120 | A | 50% duty cycle @ $T_C$ = 71° C, rectangular wave form | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive Surge Current *See Fig. 7 | 10,800 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | | 1700 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy | 9 | mJ | $T_J$ = 25 °C, $I_{AS}$ = 2 Amps, L = 4.5 mH | |
| $I_{AR}$ | Repetitive Avalanche Current | 2 | A | Current decaying linearly to zero in 1 µsec<br>Frequency limited by $T_J$ max. $V_A$ = 3 x $V_R$ typical | |

## Electrical Specifications

| | Parameters | 125NQ | Units | Conditions | |
|---|---|---|---|---|---|
| $V_{FM}$ | Max. Forward Voltage Drop (1)<br>* See Fig. 1 | 0.39 | V | @ 120A | $T_J$ = 25 °C |
| | | 0.52 | V | @ 240A | |
| | | 0.33 | V | @ 120A | $T_J$ = 75 °C |
| | | 0.45 | V | @ 240A | |
| $I_{RM}$ | Max. Reverse Leakage Current (1)<br>* See Fig. 2 | 40 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_R$ |
| | | 2000 | mA | $T_J$ = 100 °C | |
| | | 1780 | mA | $T_J$ = 100 °C | $V_R$ = 12V |
| | | 1080 | mA | $T_J$ = 100 °C | $V_R$ = 5V |
| $C_T$ | Max. Junction Capacitance | 7700 | pF | $V_R$ = 5$V_{DC}$, (test signal range 100Khz to 1Mhz) 25 °C | |
| $L_S$ | Typical Series Inductance | 7.0 | nH | From top of terminal hole to mounting plane | |
| dv/dt | Max. Voltage Rate of Change (Rated $V_R$) | 10,000 | V/ µs | | |

(1) Pulse Width < 300µs, Duty Cycle < 2%

## Thermal-Mechanical Specifications

| | Parameters | | 125NQ | Units | Conditions |
|---|---|---|---|---|---|
| $T_J$ | Max. Junction Temperature Range | | -55 to 100 | °C | |
| $T_{stg}$ | Max. Storage Temperature Range | | -55 to 100 | °C | |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case | | 0.40 | °C/W | DC operation *See Fig. 4 |
| $R_{thCS}$ | Typical Thermal Resistance, Case to Heatsink | | 0.15 | °C/W | Mounting surface, smooth and greased |
| wt | Approximate Weight | | 25.6(0.9) | g(oz.) | |
| T | Mounting Torque | Min. | 40(35) | Kg-cm (lbf-in) | Non-lubricated threads |
| | | Max. | 58(50) | | |
| | Terminal Torque | Min. | 58(50) | | |
| | | Max. | 86(75) | | |
| | Case Style | | HALF PAK Module | | |

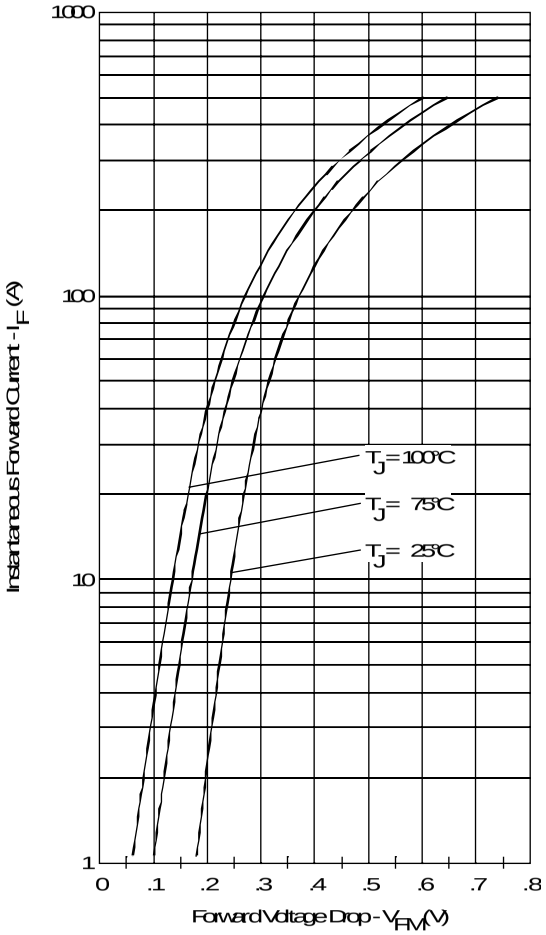



Fig. 1 - Maximum Forward Voltage Drop Characteristics

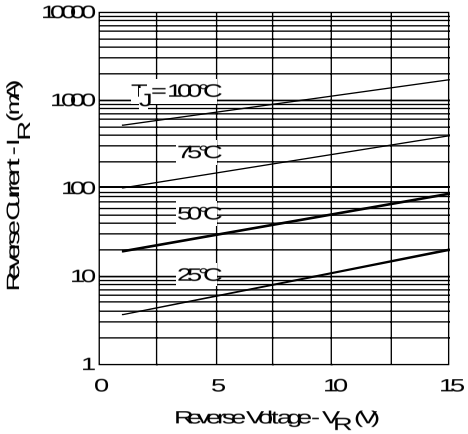



Fig. 2 - Typical Values of Reverse Current
Vs. Reverse Voltage

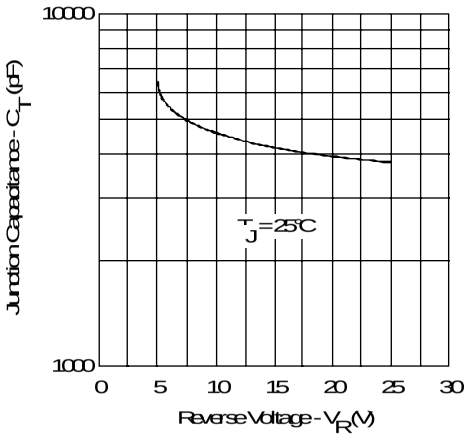



Fig. 3 - Typical Junction Capacitance
Vs. Reverse Voltage

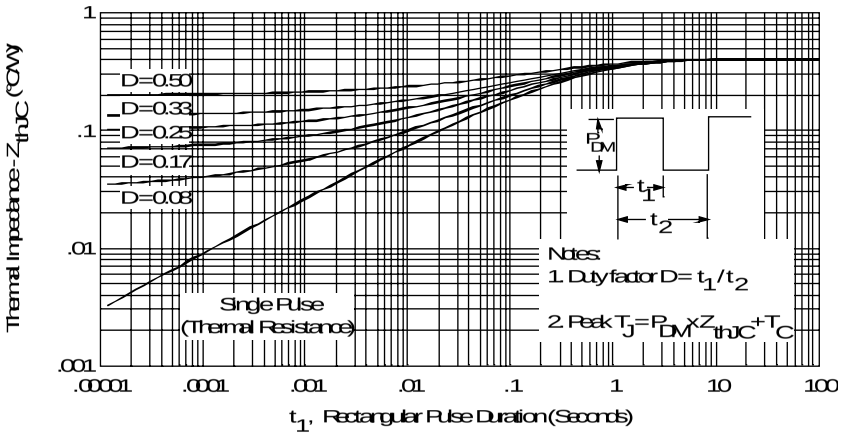



Fig. 4 - Maximum Thermal Impedance $Z_{thJC}$ Characteristics

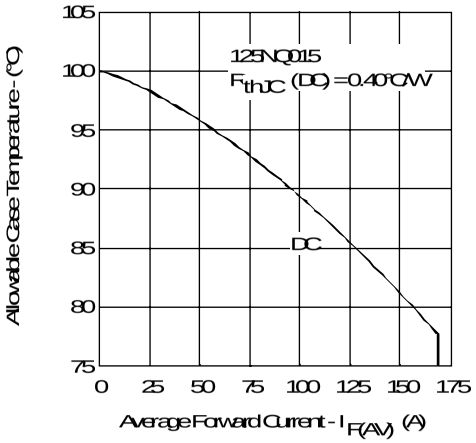



Fig.5 - Maximum Allowable Case Temperature
Vs. Average Forward Current

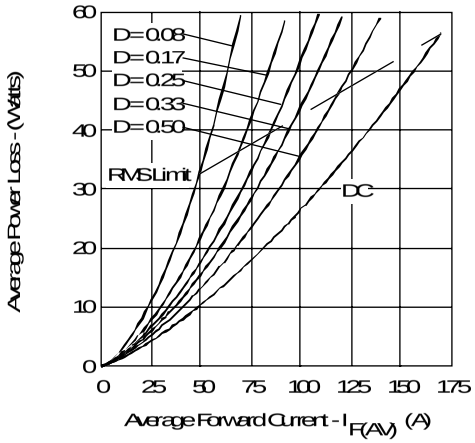



Fig.6 - Forward Power Loss Characteristics

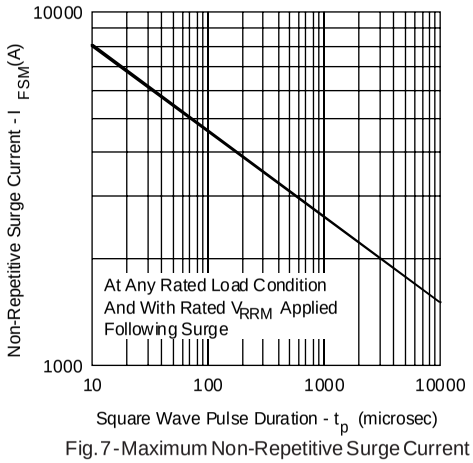



Fig.7 - Maximum Non-Repetitive Surge Current

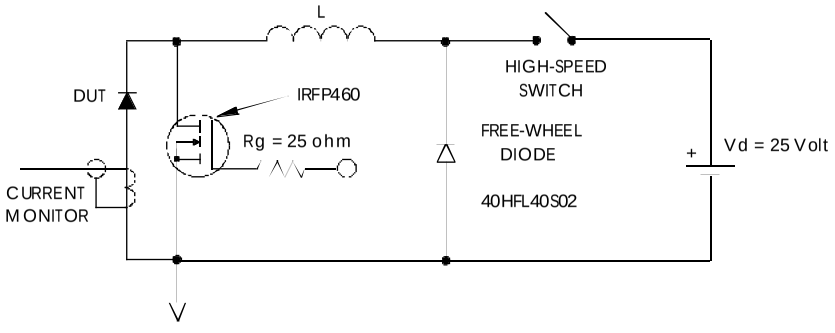



Fig.8 - Unclamped Inductive Test Circuit