

# International **IOR** Rectifier

## 185NQ015

### SCHOTTKY RECTIFIER

180 Amp

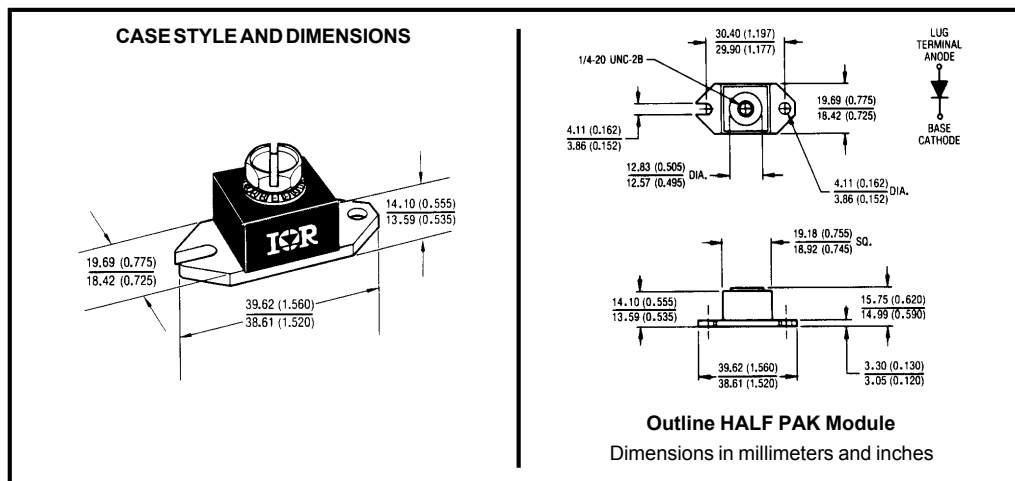
#### Major Ratings and Characteristics

| Characteristics                    | 185NQ015   | Units      |
|------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform   | 180        | A          |
| $V_{RRM}$                          | 15         | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine   | 15,000     | A          |
| $V_F$ @ 180Apk, $T_J = 75^\circ C$ | 0.34       | V          |
| $T_J$ range                        | -55 to 125 | $^\circ C$ |

#### Description/Features

The 185NQ015 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  $125^\circ C$  junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- $125^\circ C$   $T_J$  operation ( $V_R < 5V$ )
- 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



# 185NQ015

Bulletin PD-2.279 rev. B 02/01

International  
**IR** Rectifier

## Voltage Ratings

| Part number                                     | 185NQ015 |
|-------------------------------------------------|----------|
| $V_R$ Max. DC Reverse Voltage (V)               | 15       |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |          |

## Absolute Maximum Ratings

| Parameters                                                              | 185NQ  | Units | Conditions                                                                                                             |
|-------------------------------------------------------------------------|--------|-------|------------------------------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. Average Forward Current<br>* See Fig. 5                | 180    | A     | 50% duty cycle @ $T_C = 66^\circ\text{C}$ , rectangular wave form                                                      |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 15,000 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse                                                                    |
|                                                                         | 2250   |       | 10ms Sine or 6ms Rect. pulse                                                                                           |
| $E_{AS}$ Non-Repetitive Avalanche Energy                                | 9      | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 2\text{ Amps}$ , $L = 4.5\text{ mH}$                                              |
| $I_{AR}$ Repetitive Avalanche Current                                   | 2      | A     | Current decaying linearly to zero in 1 $\mu\text{sec}$<br>Frequency limited by $T_J$ max. $V_A = 3 \times V_R$ typical |

## Electrical Specifications

| Parameters                                                | 185NQ  | Units            | Conditions                                                              |
|-----------------------------------------------------------|--------|------------------|-------------------------------------------------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop (1)<br>* See Fig. 1    | 0.40   | V                | @ 180A                                                                  |
|                                                           | 0.51   | V                | @ 360A                                                                  |
|                                                           | 0.34   | V                | @ 180A                                                                  |
|                                                           | 0.45   | V                | @ 360A                                                                  |
| $I_{RM}$ Max. Reverse Leakage Current (1)<br>* See Fig. 2 | 60     | mA               | $T_J = 25^\circ\text{C}$                                                |
|                                                           | 3000   | mA               | $T_J = 100^\circ\text{C}$                                               |
|                                                           | 2670   | mA               | $T_J = 100^\circ\text{C}$                                               |
|                                                           | 1620   | mA               | $T_J = 100^\circ\text{C}$                                               |
| $C_T$ Max. Junction Capacitance                           | 12,300 | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance                           | 6.0    | nH               | From top of terminal hole to mounting plane                             |
| $dv/dt$ Max. Voltage Rate of Change<br>(Rated $V_R$ )     | 10,000 | V/ $\mu\text{s}$ |                                                                         |

## Thermal-Mechanical Specifications

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

| Parameters                                              | 185NQ           | Units              | Conditions                           |
|---------------------------------------------------------|-----------------|--------------------|--------------------------------------|
| $T_J$ Max. Junction Temperature Range                   | -55 to 125      | $^\circ\text{C}$   |                                      |
| $T_{stg}$ Max. Storage Temperature Range                | -55 to 150      | $^\circ\text{C}$   |                                      |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case     | 0.30            | $^\circ\text{C/W}$ | DC operation * See Fig. 4            |
| $R_{thCS}$ Typical Thermal Resistance, Case to Heatsink | 0.15            | $^\circ\text{C/W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight                                   | 25.6(0.9)       | g(oz.)             |                                      |
| T Mounting Torque                                       | Min.            | 40(35)             | Non-lubricated threads               |
|                                                         | Max.            | 58(50)             |                                      |
|                                                         | Min.            | 58(50)             |                                      |
|                                                         | Max.            | 86(75)             |                                      |
| Terminal Torque                                         | Min.            | 58(50)             |                                      |
|                                                         | Max.            | 86(75)             |                                      |
| Case Style                                              | HALF PAK Module |                    |                                      |

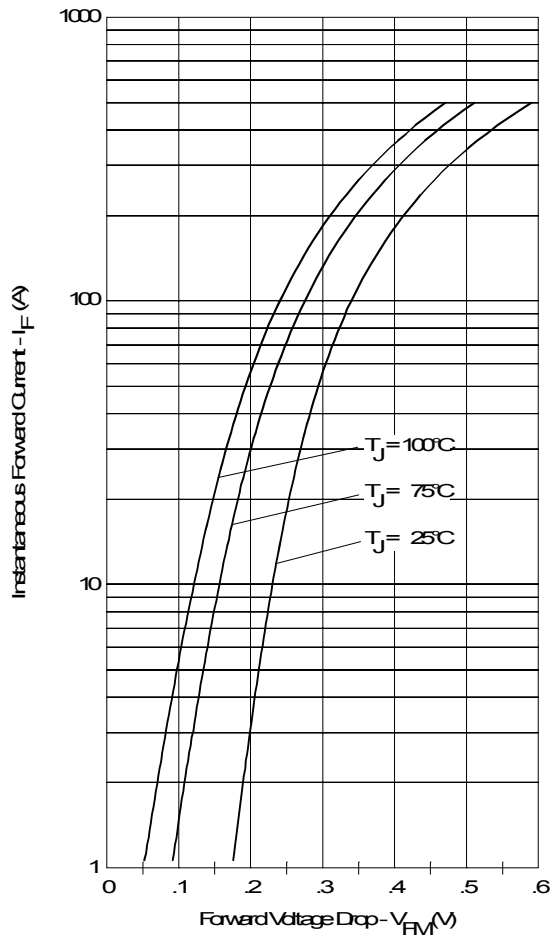


Fig. 1 - Maximum Forward Voltage Drop Characteristics

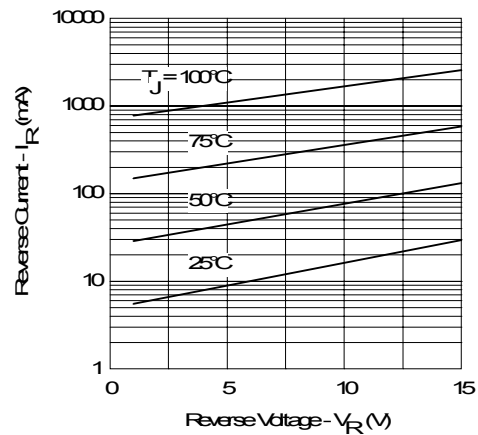


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

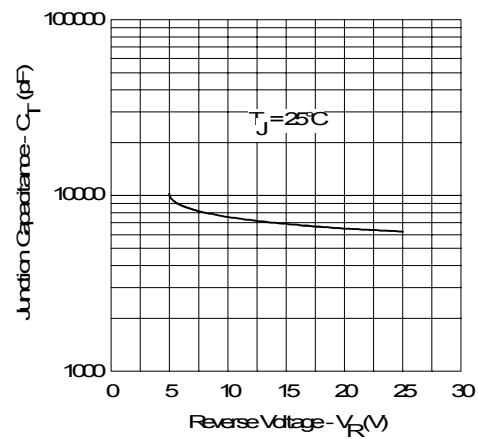


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

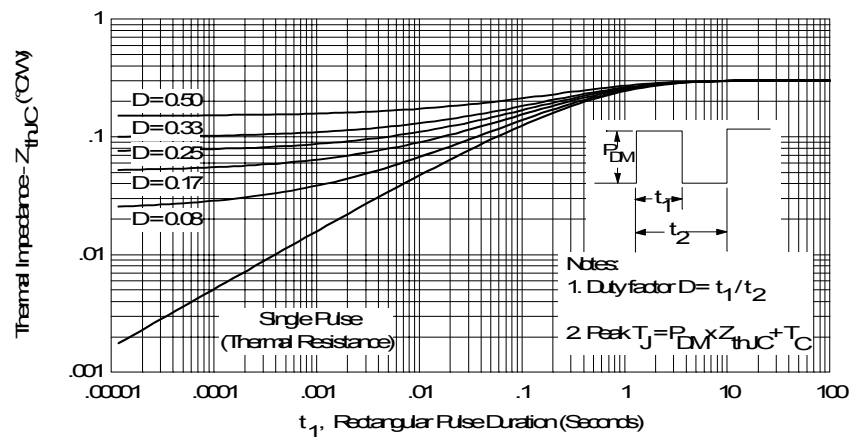


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

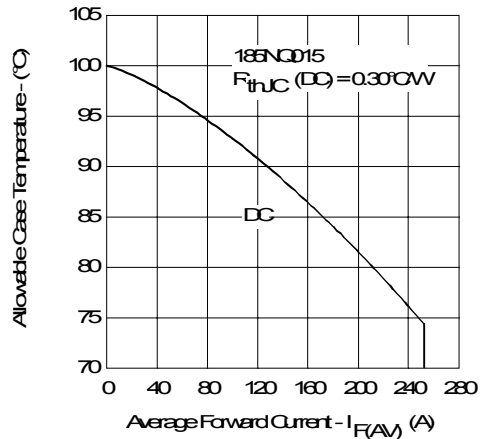


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

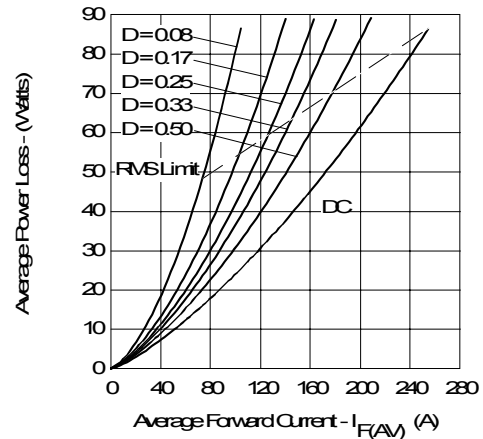


Fig. 6 - Forward Power Loss Characteristics

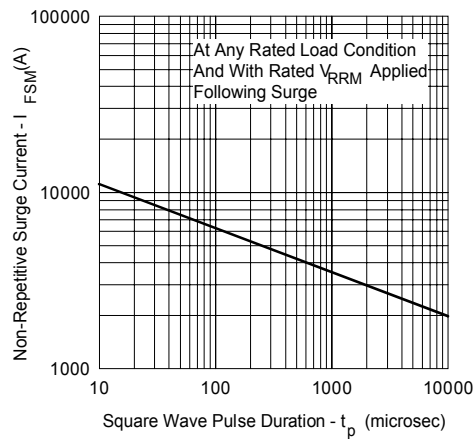


Fig. 7 - Maximum Non-Repetitive Surge Current

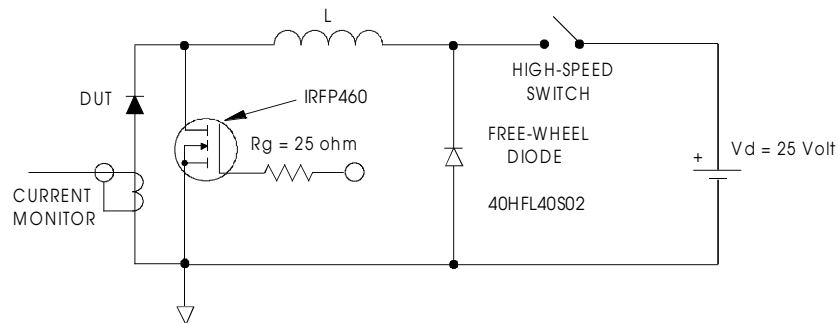


Fig. 8 - Unclamped Inductive Test Circuit