

# International IOR Rectifier

PD-2.278 rev. A 12/97

## 182NQ030

### SCHOTTKY RECTIFIER

180 Amp

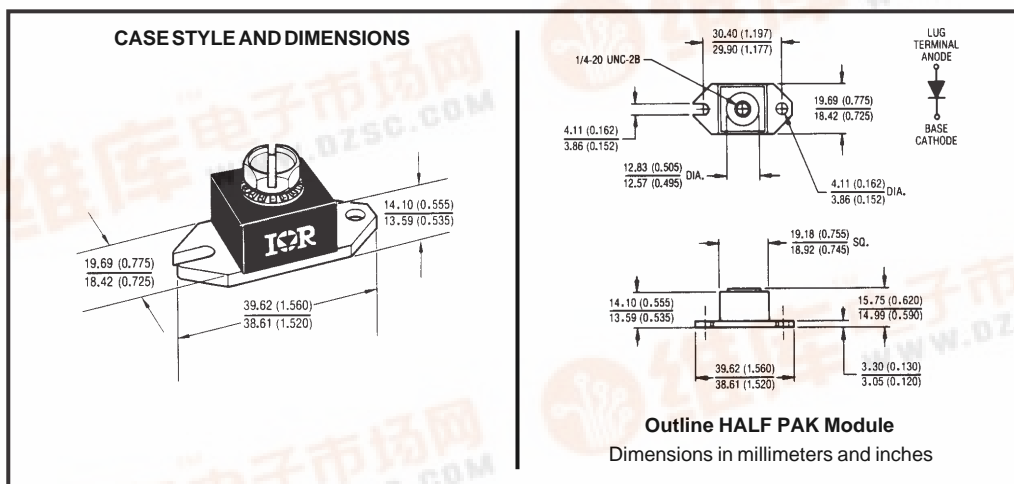
#### Major Ratings and Characteristics

Characteristics	182NQ030	Units
$I_{F(AV)}$ Rectangular waveform	180	A
$V_{RRM}$	30	V
$I_{FSM}$ @ $t_p = 5 \mu s$ sine	30,000	A
$V_F$ @ 180Apk, $T_J = 125^\circ C$	0.41	V
$T_J$ range	-55 to 150	$^\circ C$

#### Description/Features

The 182NQ030 high current Schottky rectifier module has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to  $150^\circ C$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ C$   $T_J$  operation
- Unique high power, Half-Pak module
- Replaces three 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
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



### Voltage Ratings

Part number	182NQ030
$V_R$ Max. DC Reverse Voltage (V)	30
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

### Absolute Maximum Ratings

Parameters	182NQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	180	A	50% duty cycle @ $T_C = 107^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	30,000	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse
	3450		
$E_{AS}$ Non-Repetitive Avalanche Energy	162	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 36$ Amps, $L = 0.25$ mH
$I_{AR}$ Repetitive Avalanche Current	36	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

### Electrical Specifications

Parameters	182NQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) * See Fig. 1	0.51	V	@ 180A $T_J = 25^\circ\text{C}$
	0.61	V	@ 360A
	0.41	V	@ 180A $T_J = 125^\circ\text{C}$
	0.54	V	@ 360A
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	15	mA	$T_J = 25^\circ\text{C}$
	840	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$C_T$ Max. Junction Capacitance	7700	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 (Rated $V_R$ )	10,000	V/ $\mu\text{s}$	

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

### Thermal-Mechanical Specifications

Parameters	182NQ	Units	Conditions	
$T_J$ Max. Junction Temperature Range	-55 to 150	$^\circ\text{C}$		
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$		
$R_{thJC}$ Max. Thermal Resistance Junction to Case	0.30	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4	
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.15	$^\circ\text{C}/\text{W}$	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)		
	Terminal Torque	Min.		58 (50)
		Max.		86 (75)
Case Style	HALF PAK Module			

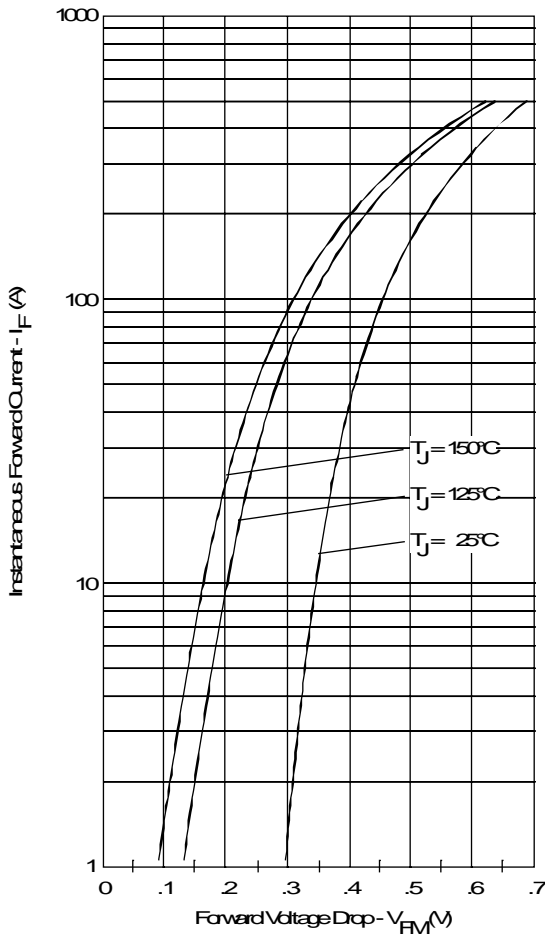


Fig. 1 - Maximum Forward Voltage Drop Characteristics

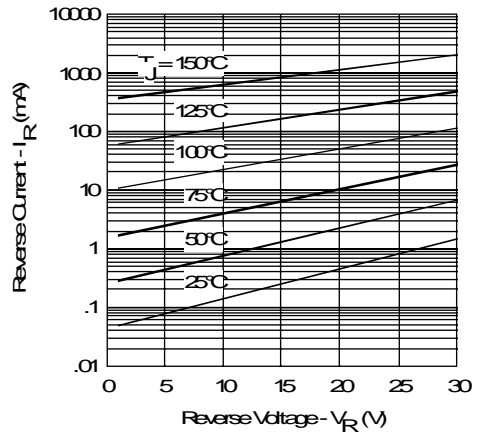


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

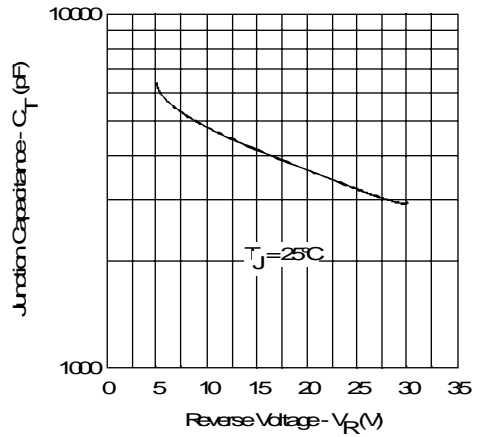


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

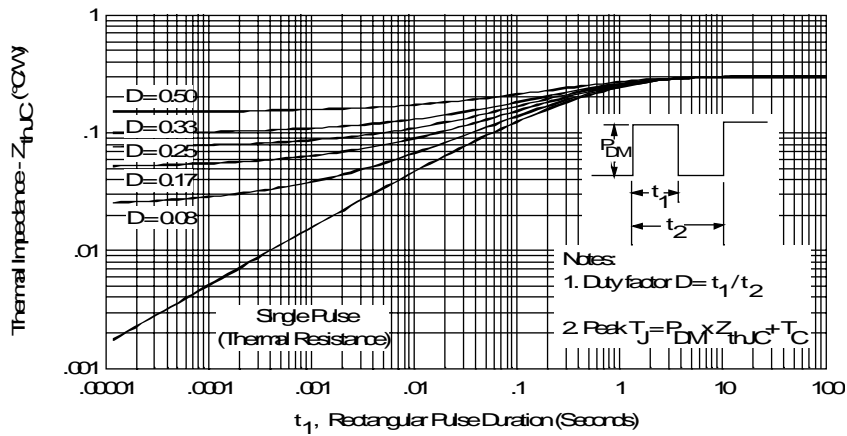


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

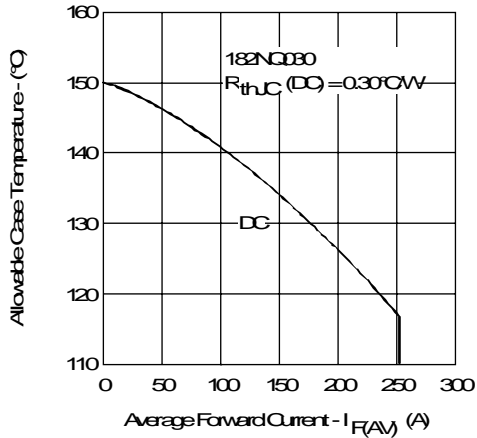


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

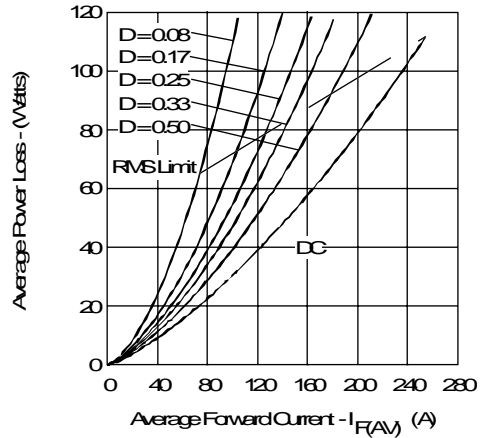


Fig. 6 - Forward Power Loss Characteristics

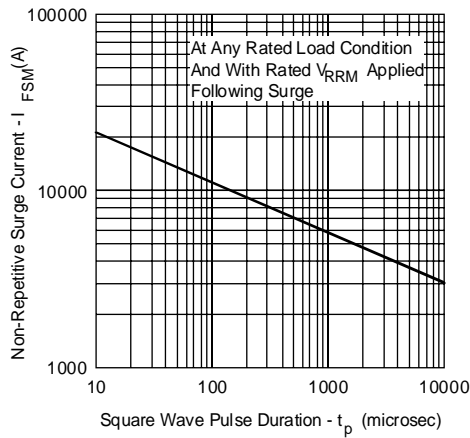


Fig. 7 - Maximum Non-Repetitive Surge Current

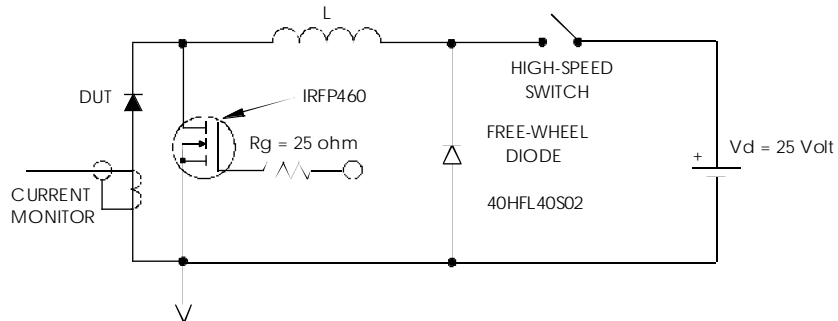


Fig. 8 - Unclamped Inductive Test Circuit