PD-2.278 rev. A 12/97

International
IOR Rectifier

182NQ030

SCHOTTKY RECTIFIER 180 Amp

Major Ratings and Characteristics

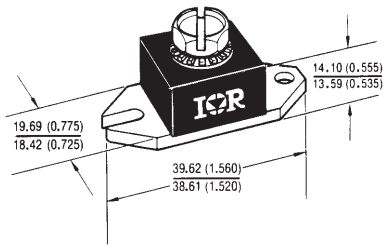
Characteristics		182NQ030	Units
$I_{F(AV)}$	Rectangular waveform	180	A
V_{RRM}		30	V
I_{FSM}	@ tp = 5 µs sine	30,000	A
V_F	@180Apk, T_J=125°C	0.41	V
T_J	range	-55 to 150	°C

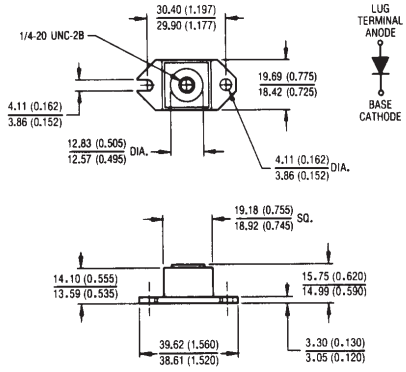
Description/Features

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° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° 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

CASE STYLE AND DIMENSIONS





Outline HALF PAK Module
Dimensions in millimeters and inches

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° C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current *See Fig. 7	30,000	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		3450		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	162	mJ	T_J = 25 °C, I_{AS} = 36 Amps, L = 0.25 mH	
I_{AR}	Repetitive Avalanche Current	36	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x 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 °C
		0.61	V	@ 360A	
		0.41	V	@ 180A	T_J = 125 °C
		0.54	V	@ 360A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	15	mA	T_J = 25 °C	V_R = rated V_R
		840	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance	7700	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25 °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/ µs		

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

Thermal-Mechanical Specifications

	Parameters		182NQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case		0.30	°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		

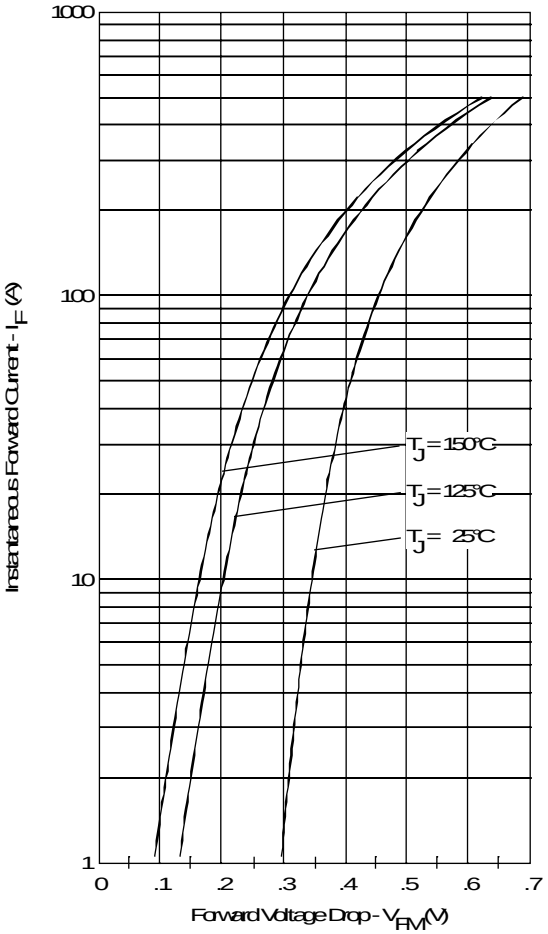


Fig. 1 - Maximum Forward Voltage Drop Characteristics

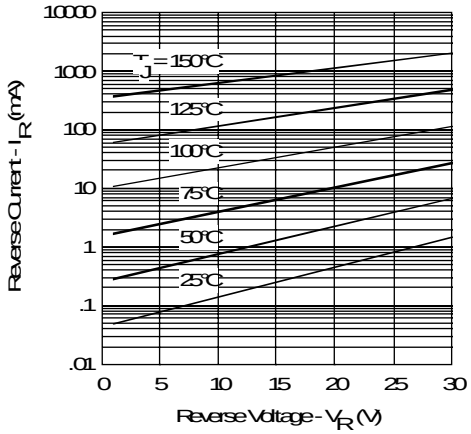


Fig. 2 - Typical Values of Reverse Current
Vs. Reverse Voltage

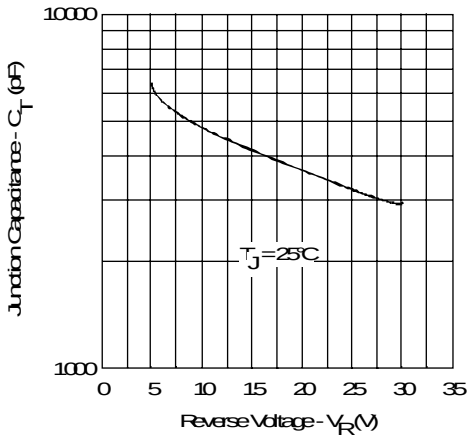


Fig. 3 - Typical Junction Capacitance
Vs. Reverse Voltage

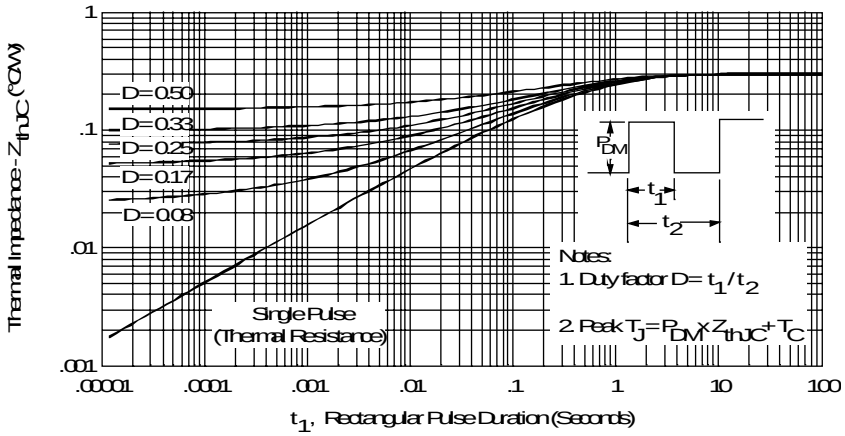


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

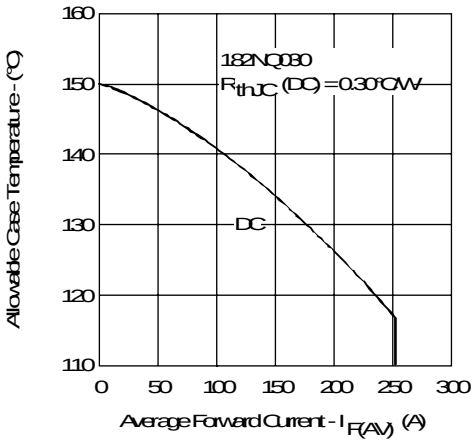


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

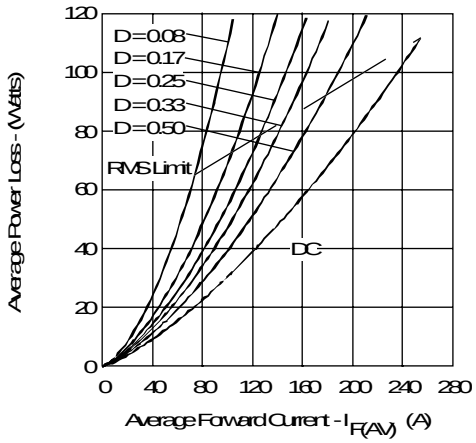


Fig. 6 - Forward Power Loss Characteristics

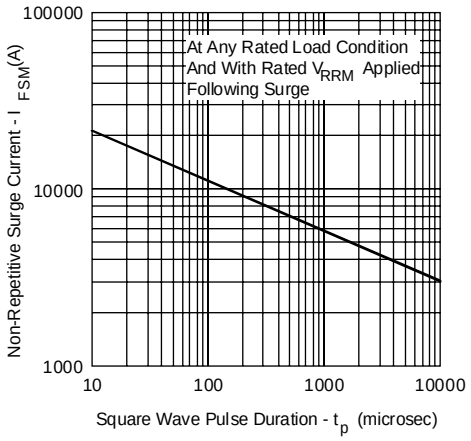


Fig. 7 - Maximum Non-Repetitive Surge Current

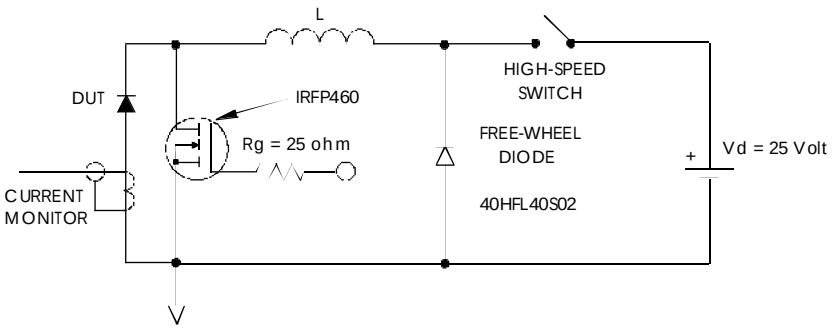


Fig. 8 - Unclamped Inductive Test Circuit