

International IOR Rectifier

PD-2.227 rev. B 12/97

180NQ... SERIES

SCHOTTKY RECTIFIER

180 Amp

Major Ratings and Characteristics

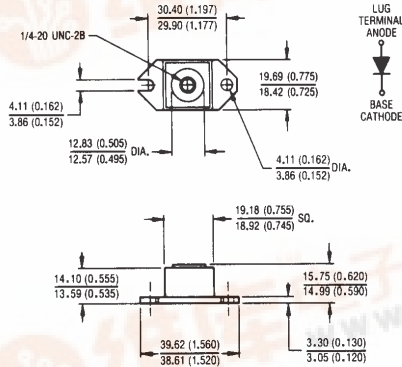
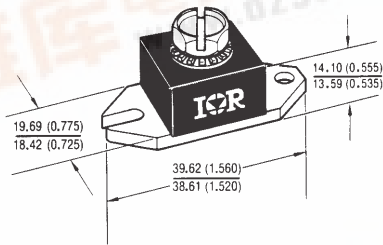
Characteristics	180NQ...	Units
$I_{F(AV)}$ Rectangular waveform	180	A
V_{RRM} range	35 to 45	V
I_{FSM} @ $t_p = 5 \mu s$ sine	25,500	A
V_F @ 180Apk, $T_J = 125^\circ C$	0.56	V
T_J range	-55 to 150	$^\circ C$

Description/Features

The 180NQ high current Schottky rectifier module series 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

CASE STYLE AND DIMENSIONS



Outline HALF PAK Module

Dimensions in millimeters and inches



180NQ... Series

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International
IR Rectifier

Voltage Ratings

Part number	180NQ035	180NQ040	180NQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	180NQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	180	A	50% duty cycle @ $T_C = 90^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	25,500 2900	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RWM} applied
E_{AS} Non-Repetitive Avalanche Energy	243	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 36\text{ Amps}$, $L = 0.37\text{ mH}$
I_{AR} Repetitive Avalanche Current	36	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	180NQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1	0.60	V	@ 180A $T_J = 25^\circ\text{C}$
	0.78	V	@ 360A
	0.56	V	@ 180A $T_J = 125^\circ\text{C}$
	0.75	V	@ 360A
I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2	15	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	600	mA	$T_J = 125^\circ\text{C}$
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 the top of terminal hole to mounting plane
dv/dt Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs	

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

Thermal-Mechanical Specifications

Parameters			180NQ	Units	Conditions
T _J	Max. Junction Temperature Range		-55to150	°C	
T _{stg}	Max. Storage Temperature Range		-55to150	°C	
R _{thJC}	Max. Thermal Resistance Junction to Case		0.30	°C/W	DCoperation * See Fig. 4
R _{thCS}	Typical Thermal Resistance, Case to Heatsink		0.15	°C/W	Mountingsurface, 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		

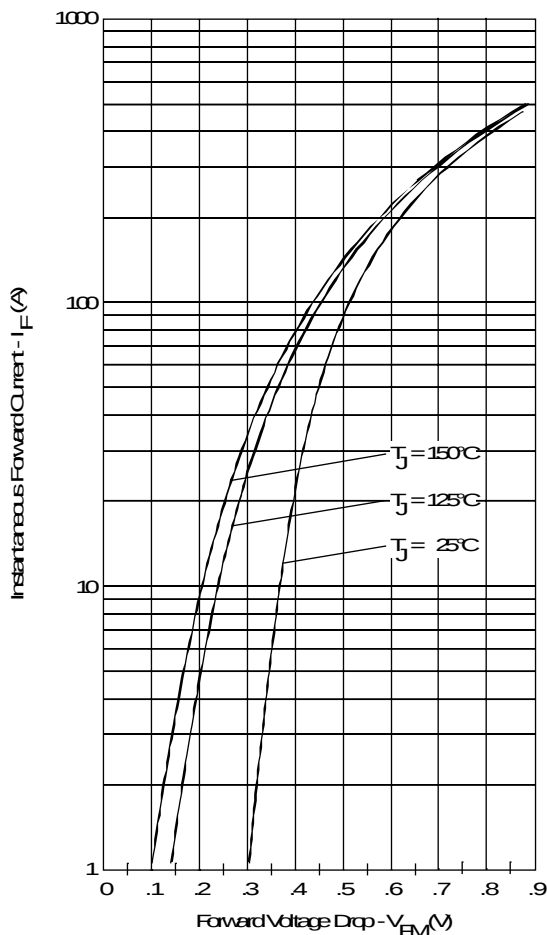


Fig. 1 - Maximum Forward Voltage Drop Characteristics

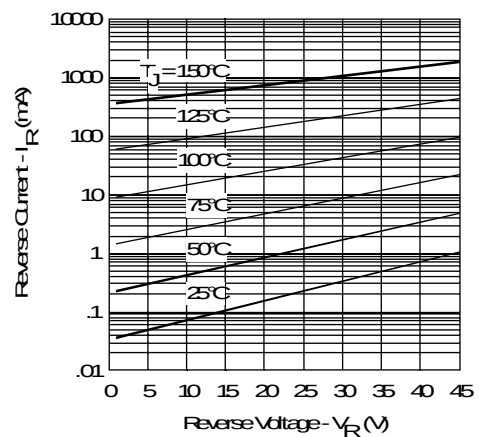


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

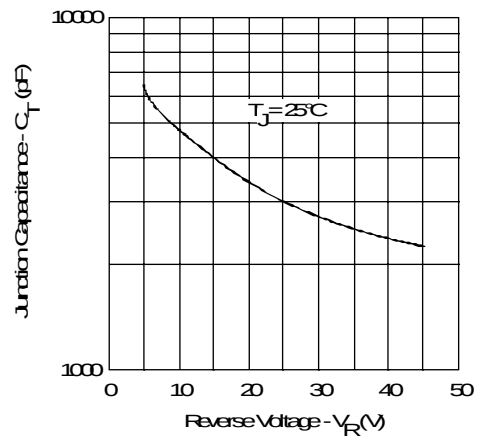


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

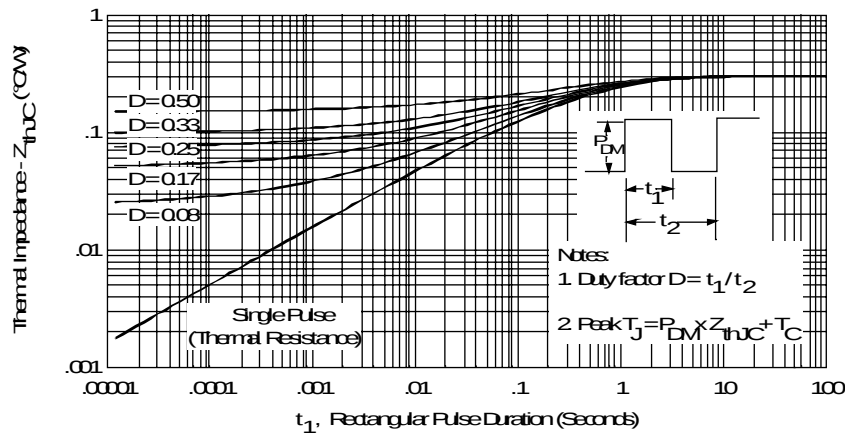


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

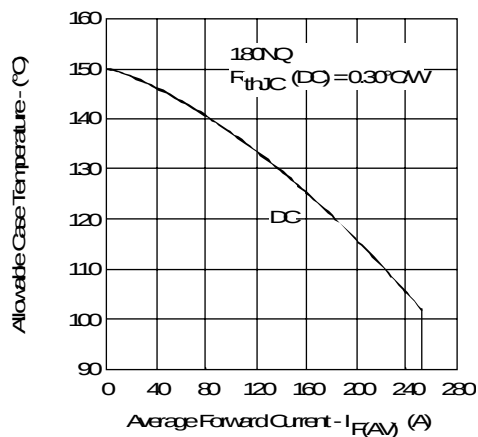


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

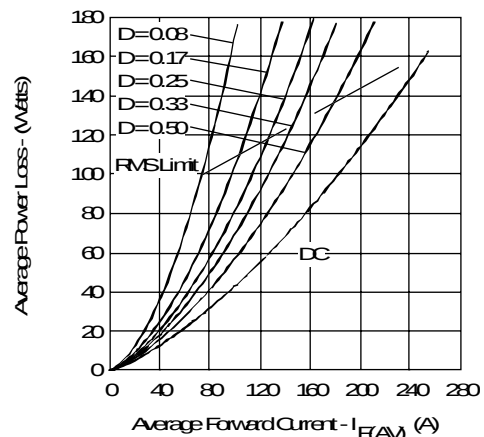


Fig. 6 - Forward Power Loss Characteristics

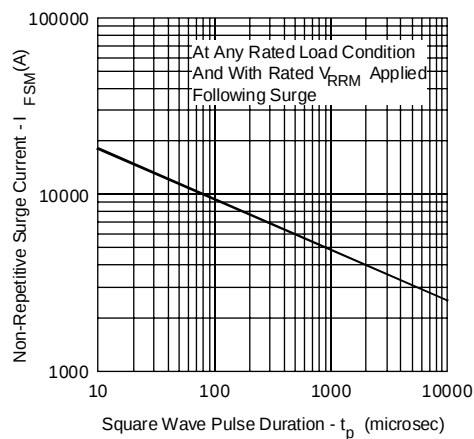


Fig. 7 - Maximum Non-Repetitive Surge Current

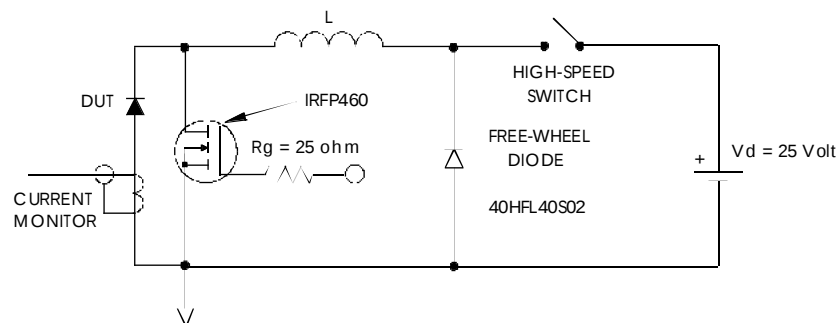


Fig. 8 - Unclamped Inductive Test Circuit