PD-2.249 rev. A 12/97

International
IOR Rectifier

121NQ... SERIES

SCHOTTKY RECTIFIER 120 Amp

Major Ratings and Characteristics

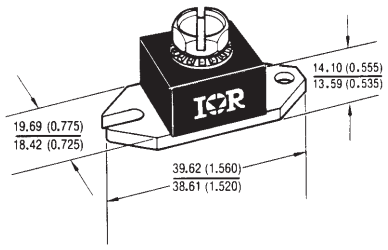
Characteristics		121NQ...	Units
$I_{F(AV)}$	Rectangular waveform	120	A
V_{RRM}	range	35 to 45	V
I_{FSM}	@ tp = 5 µs sine	19,800	A
V_F	@120Apk, T_J=125°C	0.56	V
T_J	range	-55 to 175	°C

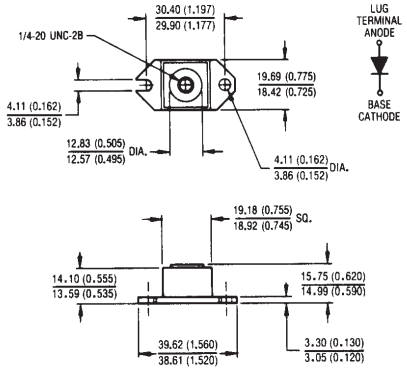
Description/Features

The 121NQ high current Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Unique high power, Half-Pak module
- Replaces two 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
- 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	121NQ035	121NQ040	121NQ045
V_R	Max. DC Reverse Voltage (V)	35	40	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	121NQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current *See Fig. 5	120	A	50% duty cycle @ T_C = 133° C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current *See Fig. 7	19,800	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		2200		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	81	mJ	T_J = 25 °C, I_{AS} = 12 Amps, L = 1.12 mH	
I_{AR}	Repetitive Avalanche Current	12	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	121NQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) * See Fig. 1	0.65	V	@ 120A	T_J = 25 °C
		0.83	V	@ 240A	
		0.56	V	@ 120A	T_J = 125 °C
		0.70	V	@ 240A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	10	mA	T_J = 25 °C	V_R = rated V_R
		90	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance	5200	pF	V_R = 5V_{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		121NQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 175	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 175	°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		

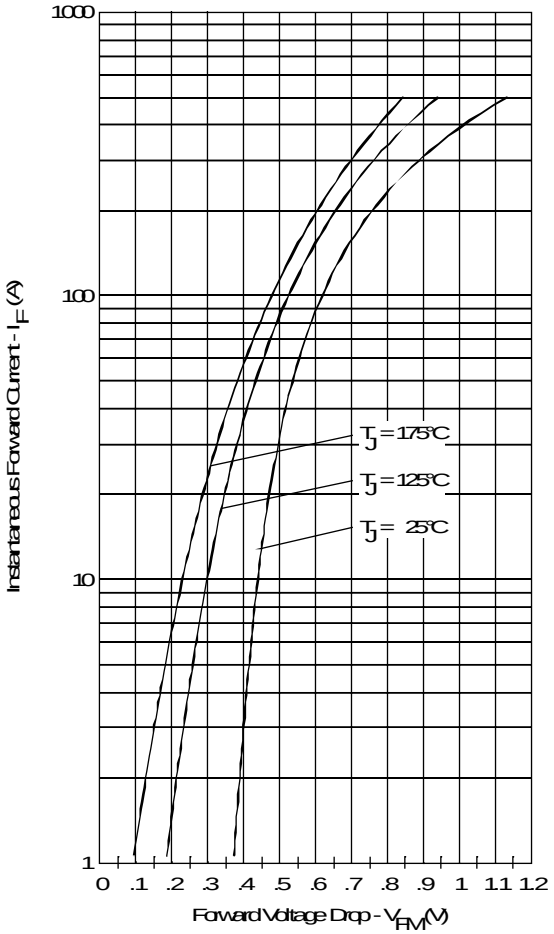


Fig. 1 - Maximum Forward Voltage Drop Characteristics

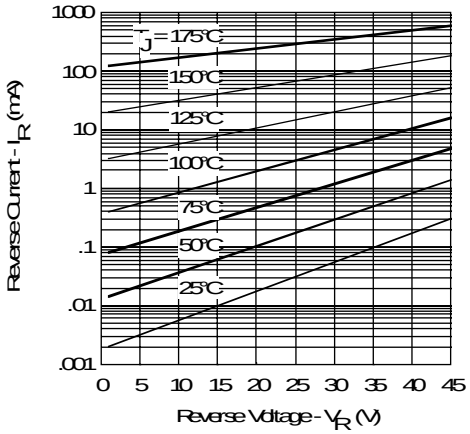


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

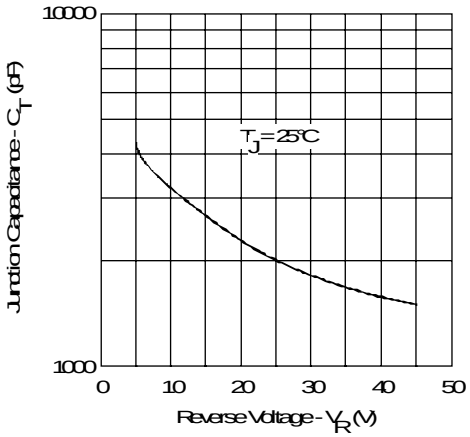


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

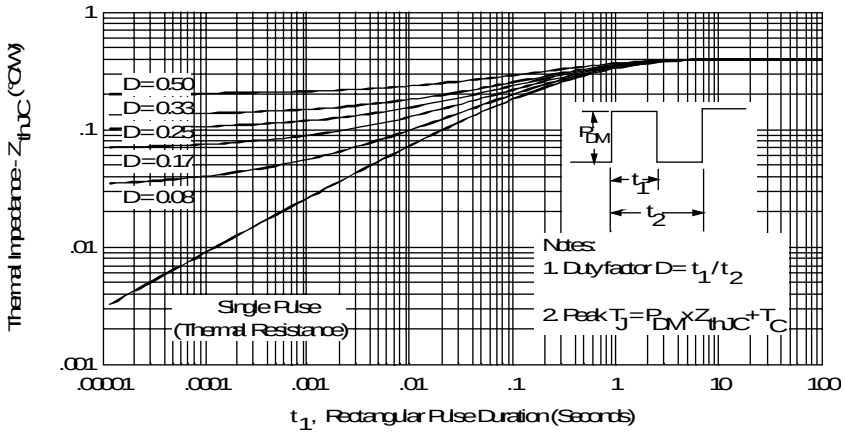


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

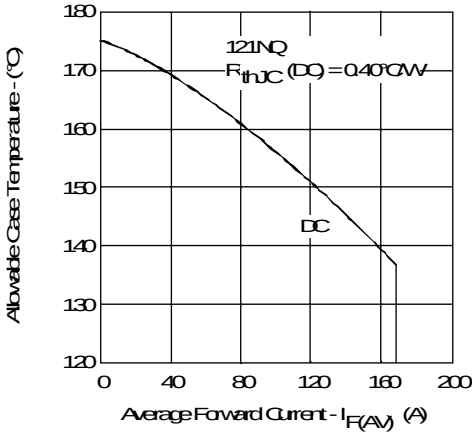


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

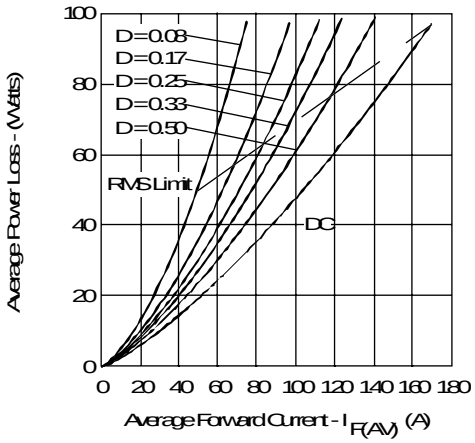


Fig. 6 - Forward Power Loss Characteristics

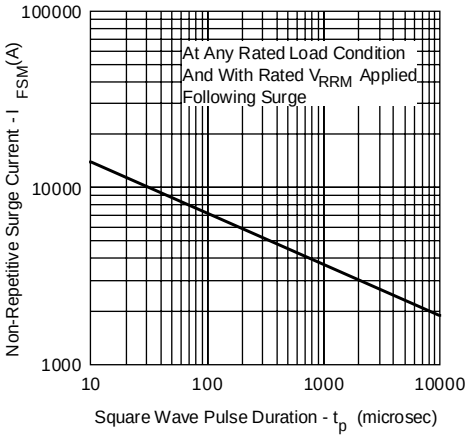


Fig. 7 - Maximum Non-Repetitive Surge Current

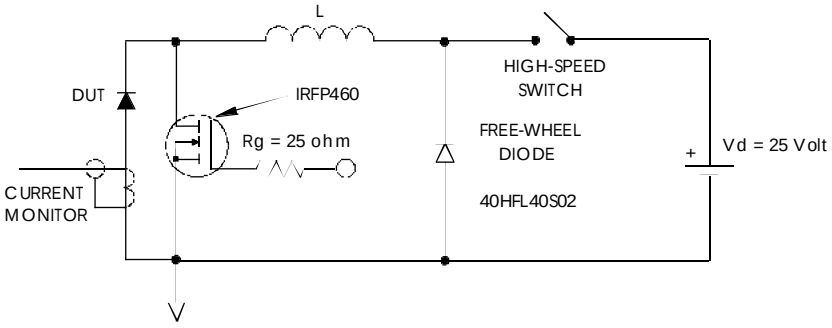


Fig. 8 - Unclamped Inductive Test Circuit