

International IOR Rectifier

121NQ...(R) SERIES

SCHOTTKY RECTIFIER

120 Amp

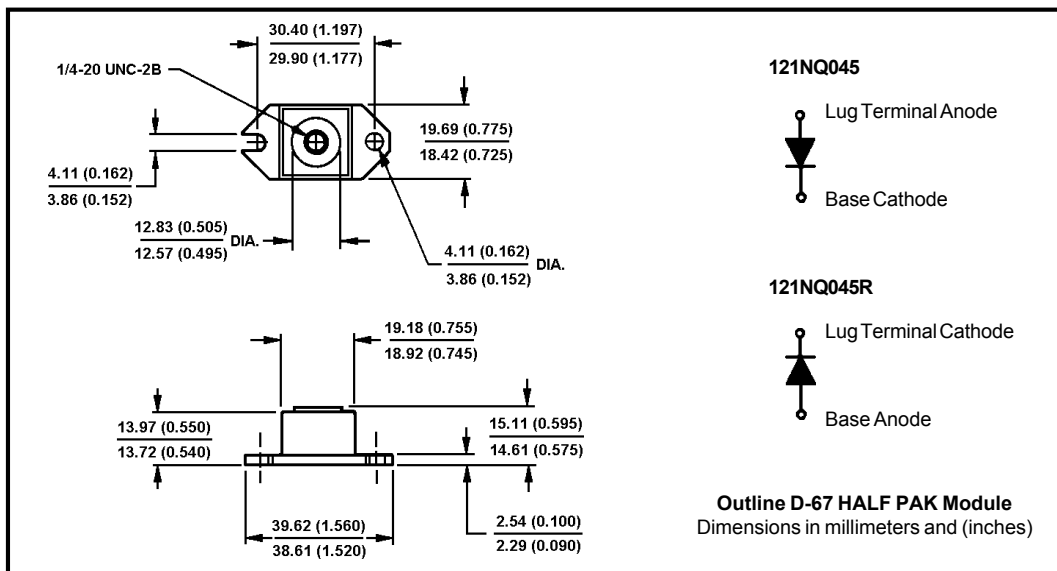
Major Ratings and Characteristics

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

Description/Features

The 121NQ...(R) 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 $175^\circ C$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $175^\circ C$ 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



121NQ... Series

Bulletin PD-2.249 rev. B 03/01

International
IR Rectifier

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 @ $T_C = 133^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	19,800	A	5 μs Sine or 3 μs Rect. pulse
	2200		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	81	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 12\text{Amps}$, $L = 1.12\text{mH}$
I_{AR} Repetitive Avalanche Current	12	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	121NQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1	0.65	V	@ 120A
	0.83	V	@ 240A
	0.56	V	@ 120A
	0.70	V	@ 240A
I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2	10	mA	$T_J = 25^\circ\text{C}$
	90	mA	$T_J = 125^\circ\text{C}$
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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	121NQ	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case	0.40	$^\circ\text{C/W}$	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			
Case Style	HALF PAK Module		

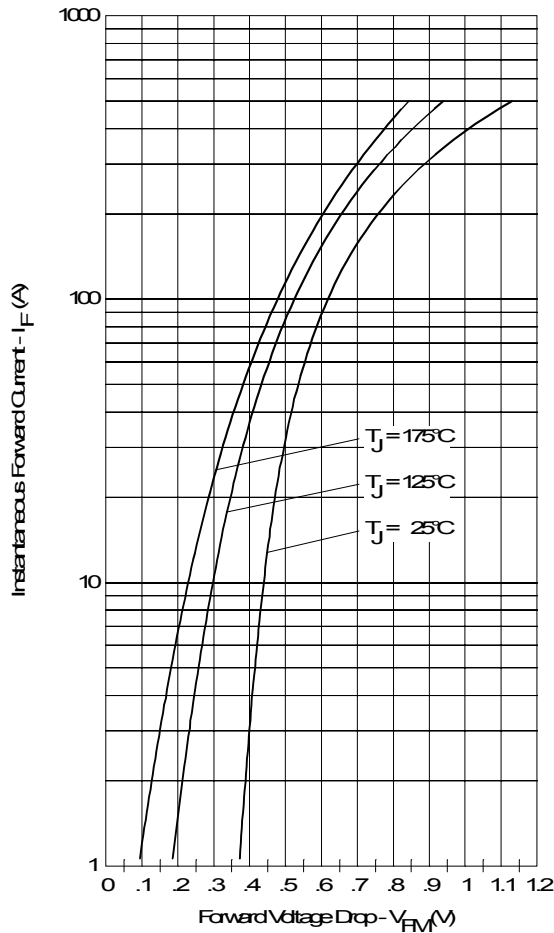


Fig. 1 - Maximum Forward Voltage Drop Characteristics

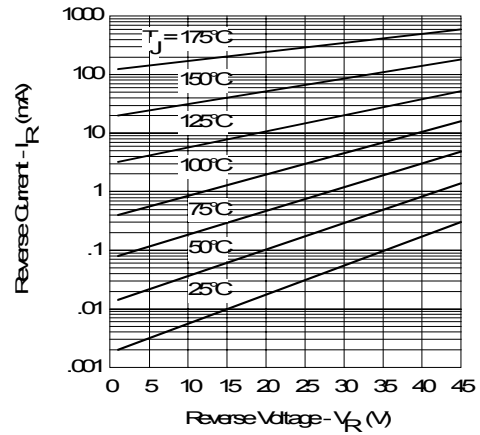


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

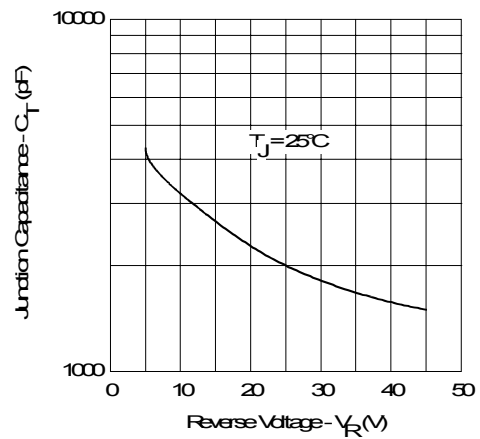


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

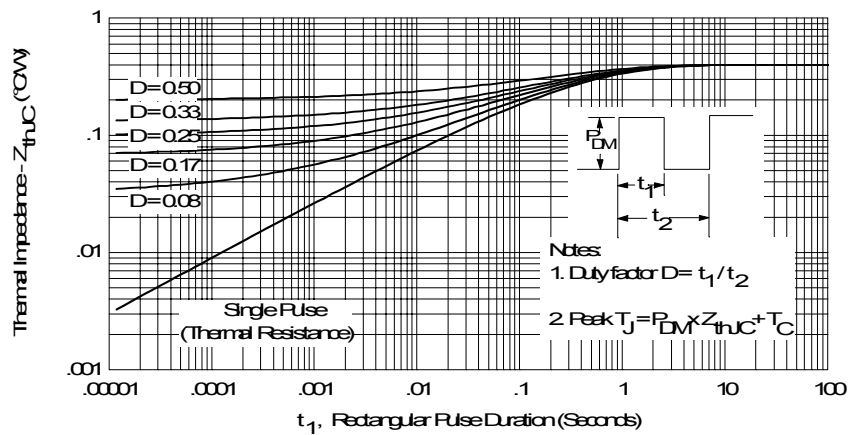


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

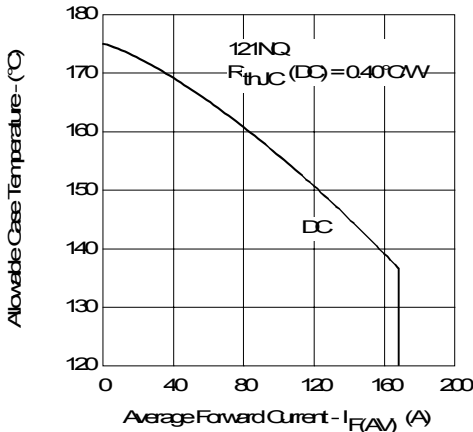


Fig. 5- Maximum Allowable Case Temperature Vs. Average Forward Current

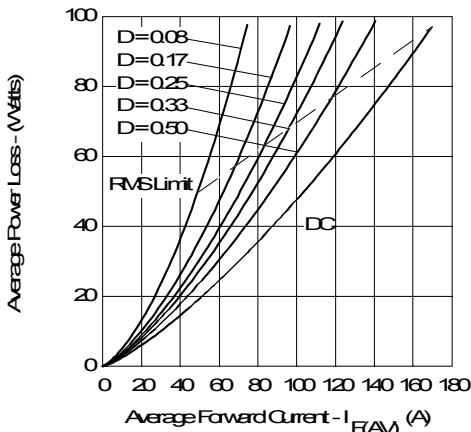


Fig. 6- Forward Power Loss Characteristics

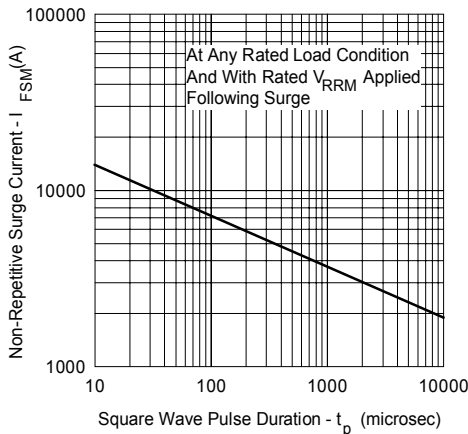


Fig. 7- Maximum Non-Repetitive Surge Current

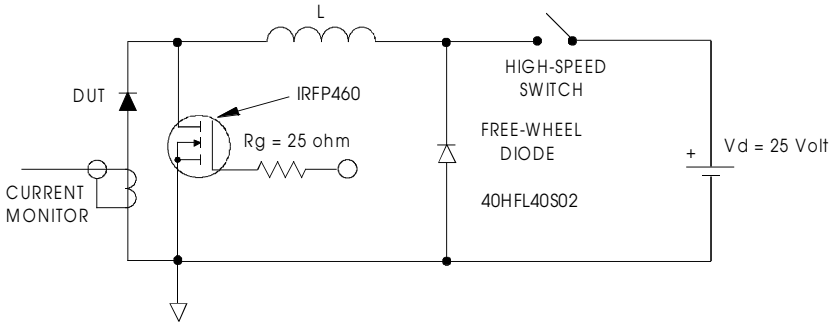


Fig. 8- Unclamped Inductive Test Circuit