

# 120NQ... SERIES

## SCHOTTKY RECTIFIER

120 Amp

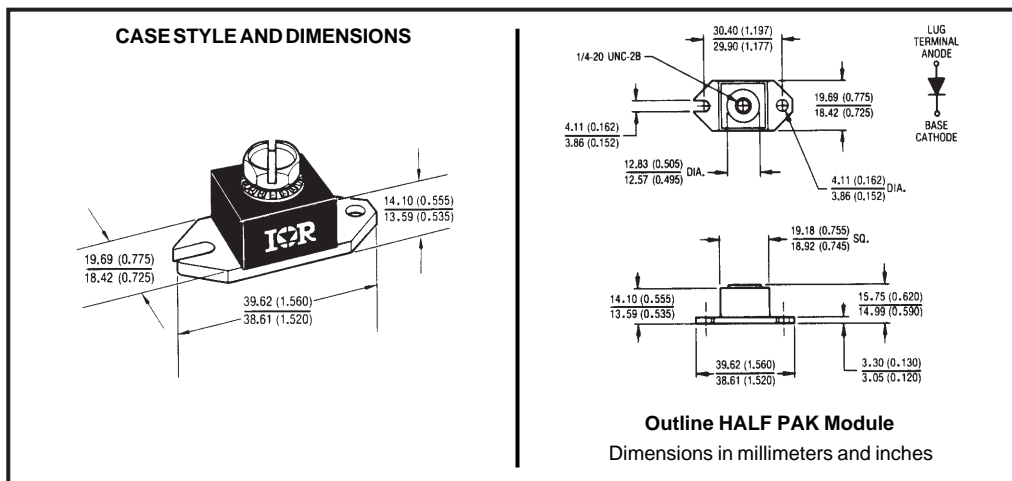
### Major Ratings and Characteristics

Characteristics	120NQ...	Units
$I_{F(AV)}$ Rectangular waveform	120	A
$V_{RRM}$ range	35 to 45	V
$I_{FSM}$ @ tp = 5 $\mu$ s sine	29,000	A
$V_F$ @ 120Apk, $T_J=125^\circ\text{C}$	0.52	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

### Description/Features

The 120NQ 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° 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 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
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



### Voltage Ratings

Part number	120NQ035	120NQ040	120NQ045
$V_R$ Max. DC Reverse Voltage (V)	35	40	45
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)			

### Absolute Maximum Ratings

Parameters	120NQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	120	A	50% duty cycle @ $T_C=99^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	29,000	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	1550		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 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A=1.5 \times V_R$ typical

### Electrical Specifications

Parameters	120NQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) * See Fig. 1	0.57	V	@ 120A
	0.73	V	@ 240A
	0.52	V	@ 120A
	0.69	V	@ 240A
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	10	mA	$T_J=25^\circ\text{C}$
	400	mA	$T_J=125^\circ\text{C}$
$C_T$ Max. Junction Capacitance	5200	pF	$V_R=5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ 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/ $\mu\text{s}$	

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

### Thermal-Mechanical Specifications

Parameters	120NQ	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	0.40	$^\circ\text{C/W}$	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)		
	Terminal Torque	Min.		58(50)
		Max.		86(75)
Case Style	HALF PAK Module			

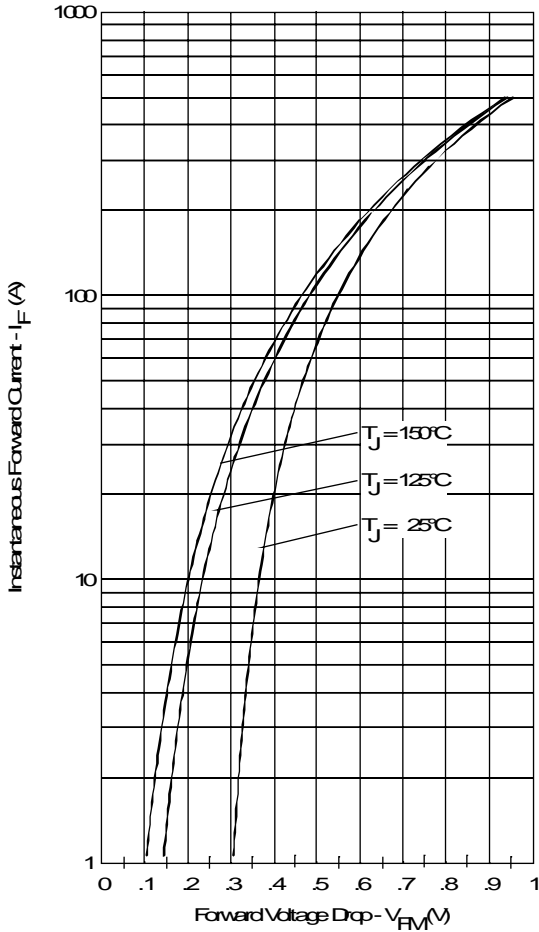


Fig. 1 - Maximum Forward Voltage Drop Characteristics

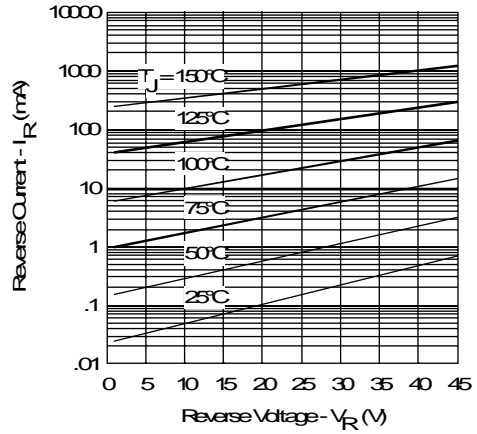


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

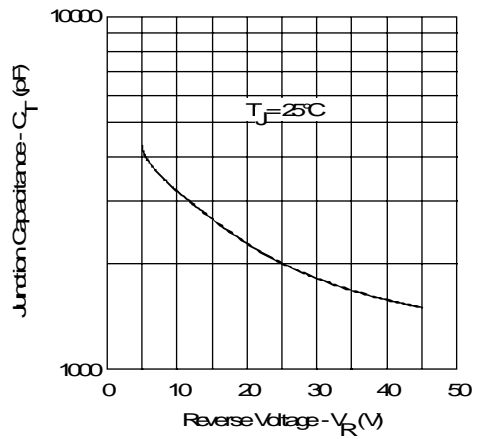


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

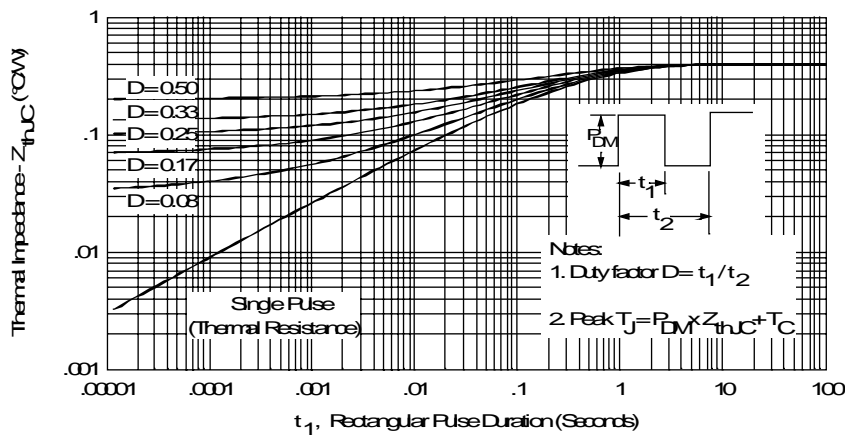


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

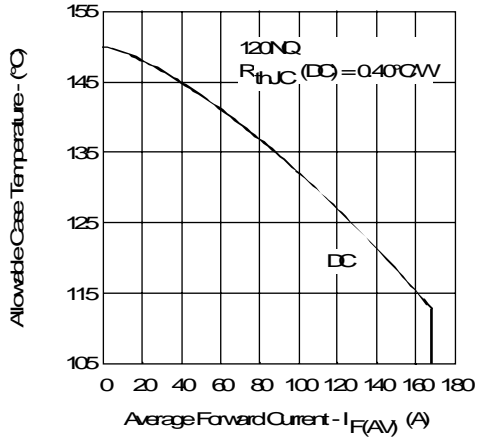


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

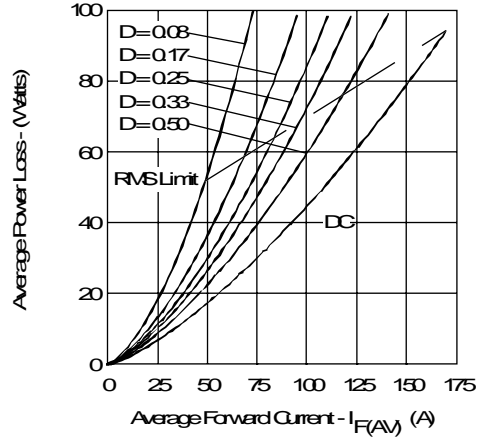


Fig. 6 - Forward Power Loss Characteristics

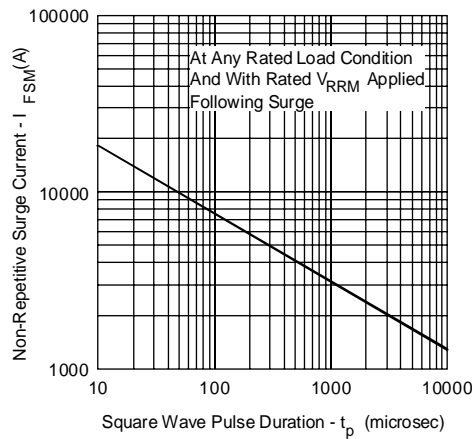


Fig. 7 - Maximum Non-Repetitive Surge Current

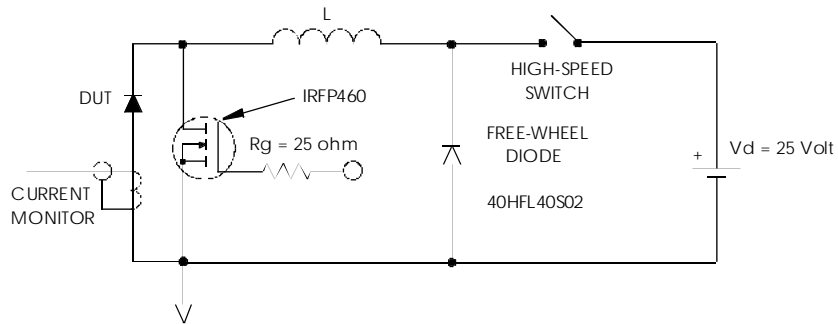


Fig. 8 - Unclamped Inductive Test Circuit