PD-2.260 rev. A 12/97

International
IOR Rectifier

224CNQ... SERIES

SCHOTTKY RECTIFIER 220 Amp

Major Ratings and Characteristics

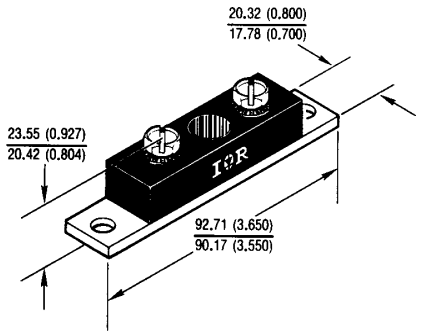
Characteristics		224CNQ...	Units
$I_{F(AV)}$	Rectangular waveform	220	A
V_{RRM}	range	35 to 45	V
I_{FSM}	@tp = 5 µs sine	27,000	A
V_F	@110Apk, T_J=100°C (per leg)	0.50	V
T_J	range	-55 to 125	°C

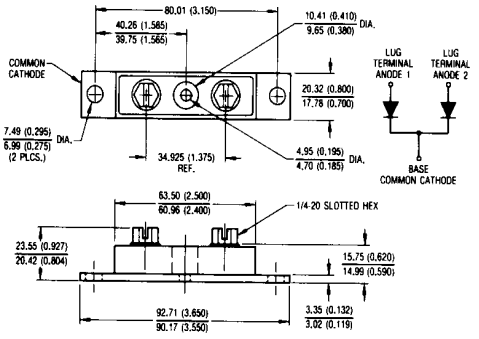
Description/Features

The 224CNQ high current, center tap Schottky rectifier module series has been optimized for extremely low forward voltage drop, with higher leakage. The proprietary barrier technology allows for reliable operation up to 125° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, welding, and reverse battery protection.

- 125° C T_J operation
- Center tap module
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Extremely low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

CASE STYLE AND DIMENSIONS





Modified JEDEC Outline TO - 244AB
Dimensions in millimeters and inches

Voltage Ratings

	Part number	224CNQ035	224CNQ040	224CNQ045
V_R	Max. DC Reverse Voltage (V)	35	40	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	224CNQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current *See Fig. 5	220	A	50% duty cycle @ T_C = 81 °C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	27,000	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		2400		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	135	mJ	T_J = 25 °C, I_{AS} = 20 Amps, L = 0.67 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	20	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	224CNQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.52	V	@ 110A	T_J = 25 °C
		0.68	V	@ 220A	
		0.50	V	@ 110A	T_J = 100 °C
		0.68	V	@ 220A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	10	mA	T_J = 25 °C	V_R = rated V_R
		1200	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance (Per Leg)	5200	pF	V_R = 5V_{DC}, (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance (Per Leg)	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		224CNQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 125	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 125	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		0.40	°C/W	DC operation *See Fig. 4
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.20	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.10	°C/W	Mounting surface, smooth and greased
wt	Approximate Weight		79 (2.80)	g (oz.)	
T	Mounting Torque Base	Min.	40 (35)	Kg-cm (lbf-in)	
		Max.	58 (50)		
	Mounting Torque Center Hole	Typ.	17 (15)		
	Terminal Torque	Min.	58 (50)		
		Max.	86 (75)		
	Case Style		TO - 244AB		Modified JEDEC

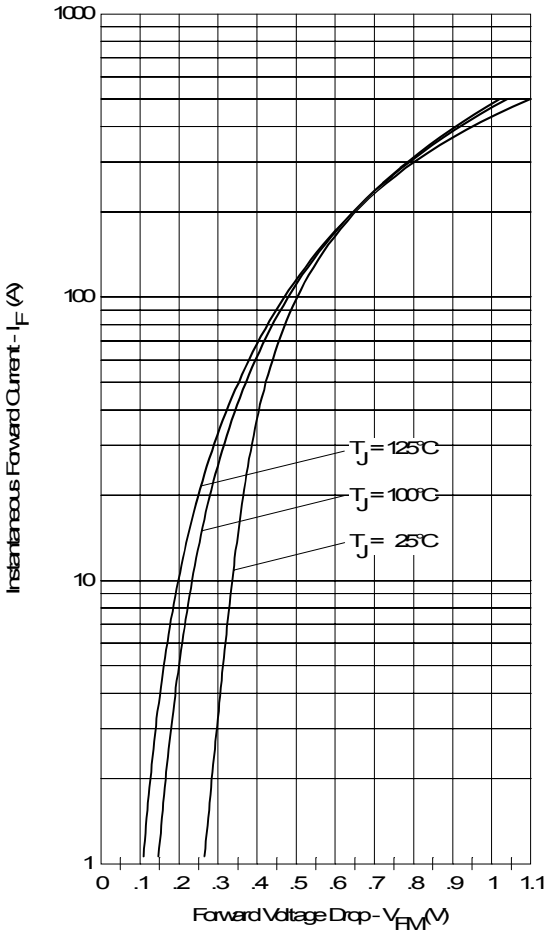


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

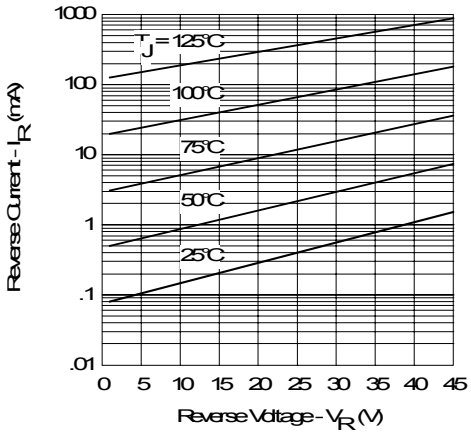


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

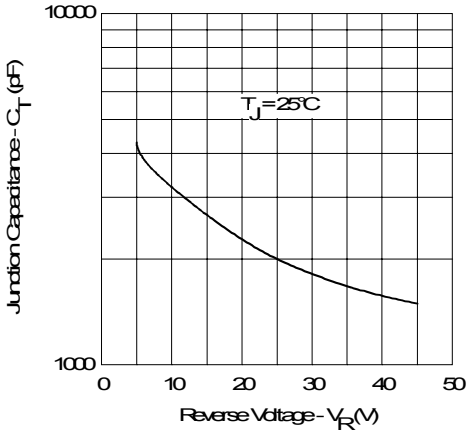


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

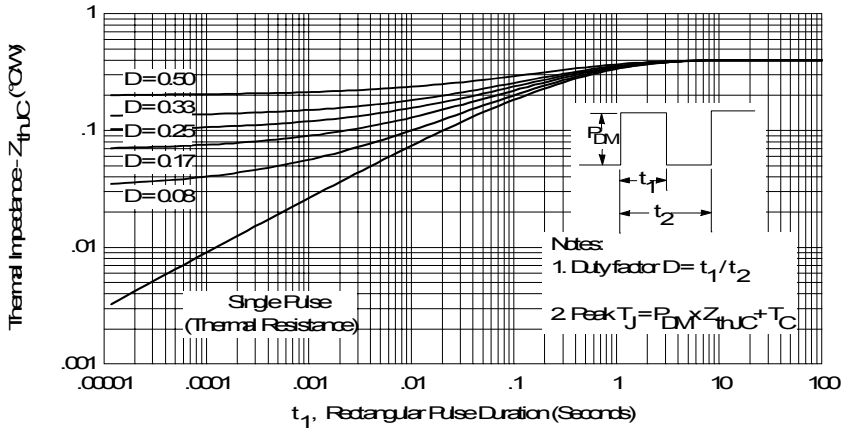


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

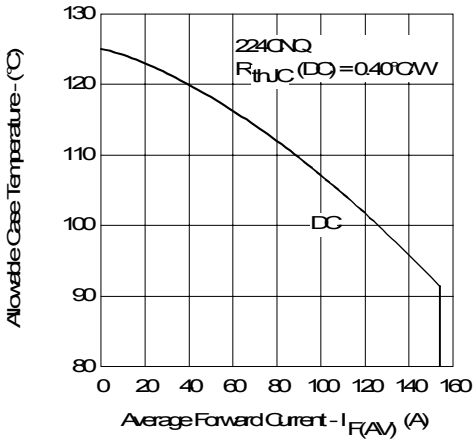


Fig. 5 - Max. Allowable Case Temperature
Vs. Average Forward Current (Per Leg)

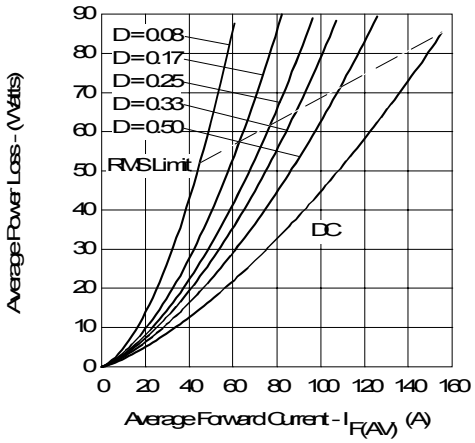


Fig. 6 - Forward Power Loss Characteristics
(Per Leg)

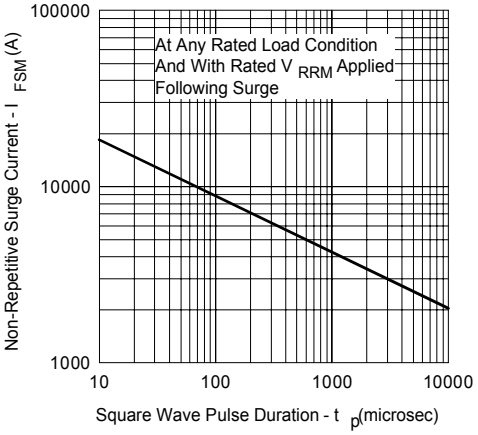


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

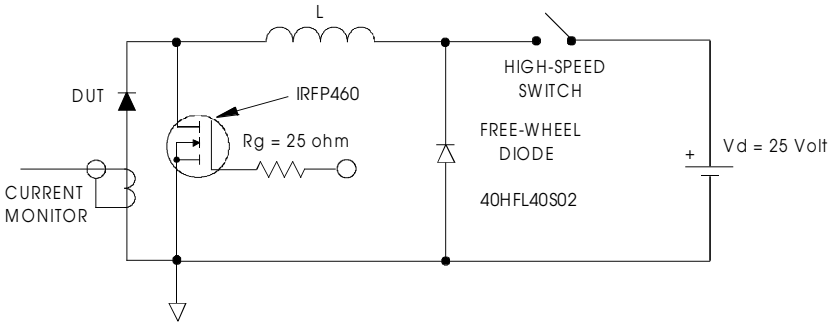


Fig. 8 - Unclamped Inductive Test Circuit