

400CNQ... SERIES

SCHOTTKY RECTIFIER

400 Amp

Major Ratings and Characteristics

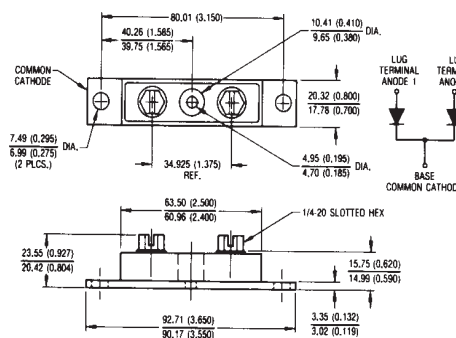
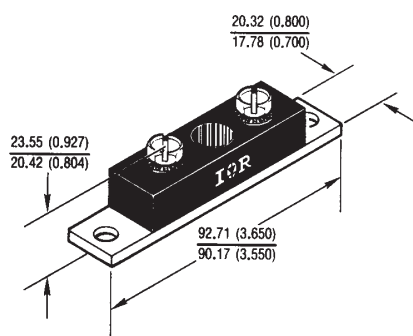
Characteristics	400CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	400	A
V_{RRM} range	35 to 45	V
I_{FSM} @ $t_p = 5 \mu s$ sine	29,000	A
V_F @ 200Apk, $T_J = 125^\circ C$ (per leg)	0.52	V
T_J range	-55 to 150	$^\circ C$

Description/Features

The 400CNQ center tap, 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, welding, and reverse battery protection.

- $150^\circ C$ T_J operation
- Center tap module
- 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



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

Voltage Ratings

Part number	400CNQ035	400CNQ040	400CNQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	400CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	400	A	50% duty cycle @ $T_C = 105^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	29,000	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
	3400		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	180	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 40$ Amps, $L = 0.22$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	40	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	400CNQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.57	V	@ 200A $T_J = 25^\circ\text{C}$
	0.73	V	@ 400A
	0.52	V	@ 200A $T_J = 125^\circ\text{C}$
	0.68	V	@ 400A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	20	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	800	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	10,300	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	5.0	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	400CNQ	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 (Per Leg)	0.20	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.10	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.10	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	79 (2.80)	g (oz.)	
T Mounting Torque	Base Min.	40 (35)	Kg-cm (lbf-in)
	Base Max.	58 (50)	
	Center Hole Typ.	17 (15)	
	Terminal Torque Min.	58 (50)	
	Terminal Torque Max.	86 (75)	
Case Style	TO - 244AB		Modified JEDEC

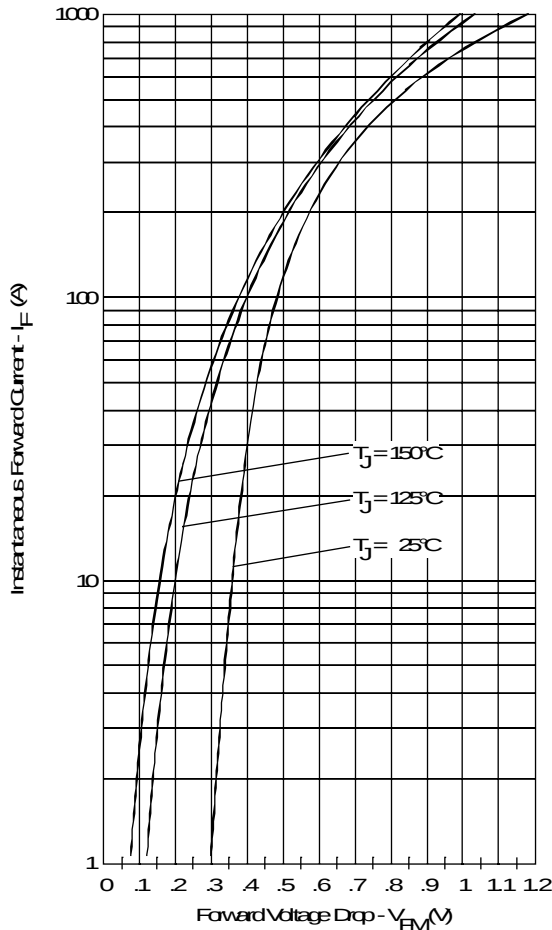


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

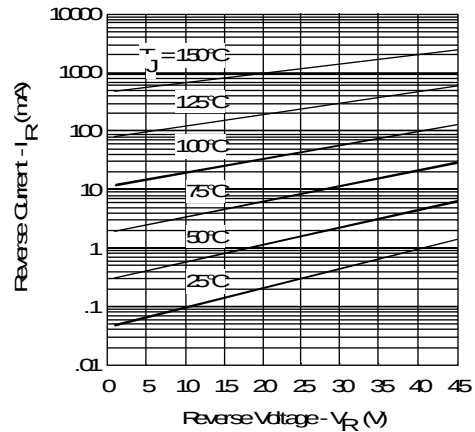


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

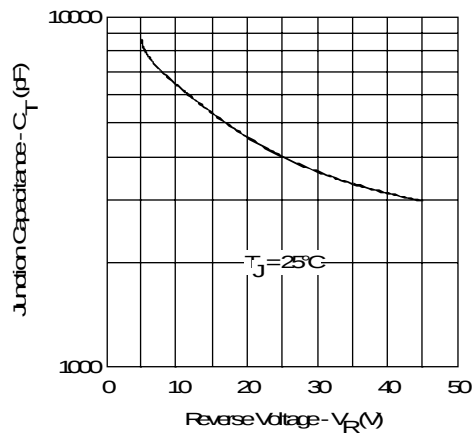


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

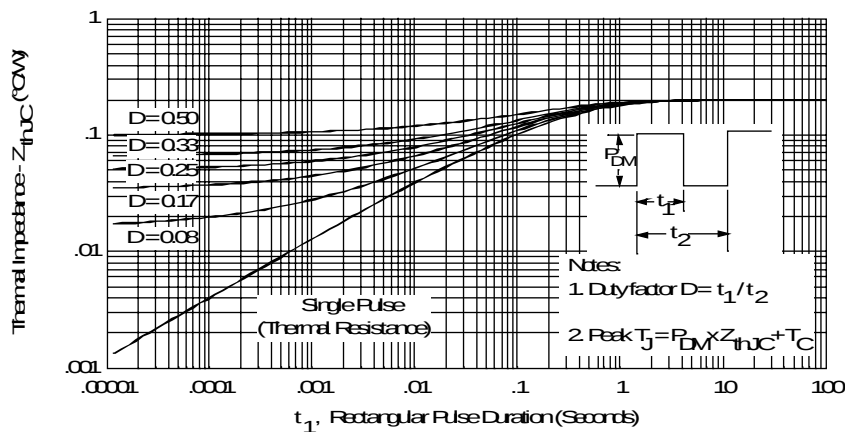


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

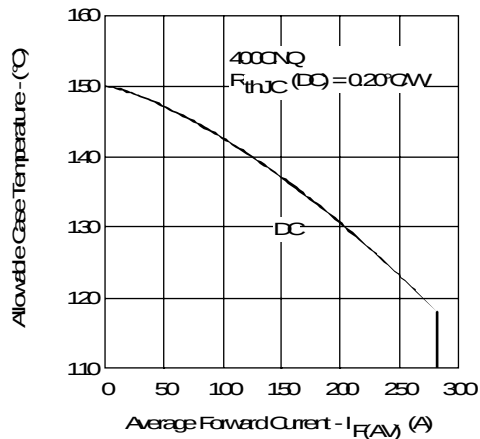


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

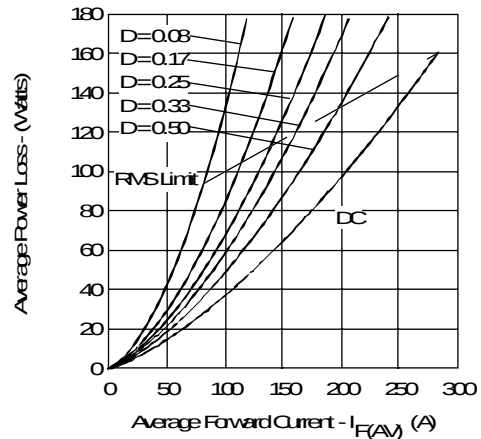


Fig. 6- Forward Power Loss Characteristics (Per Leg)

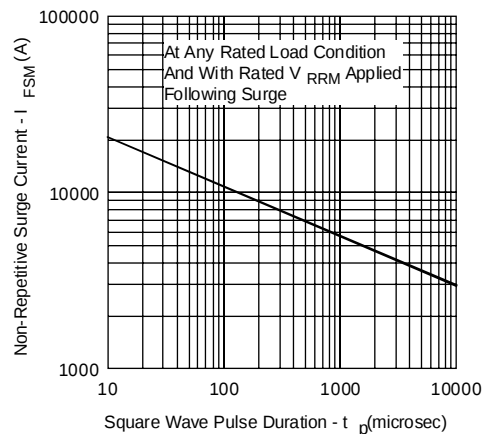


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

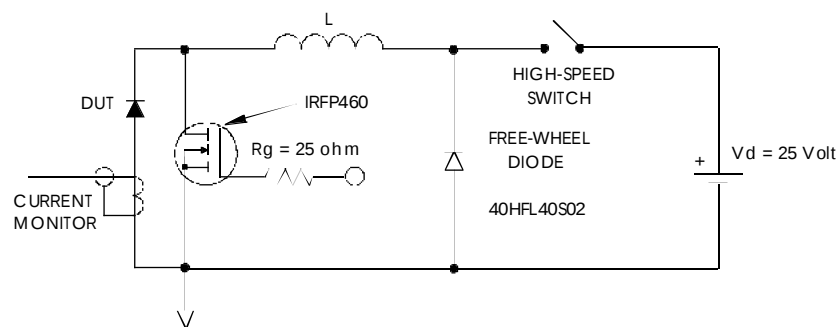


Fig. 8- Unclamped Inductive Test Circuit