

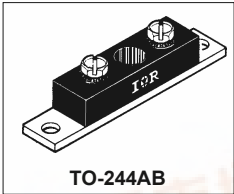
Bulletin PD-2.214 rev. C 07/01

International
IR Rectifier

403CNQ... SERIES

SCHOTTKY RECTIFIER

400 Amp



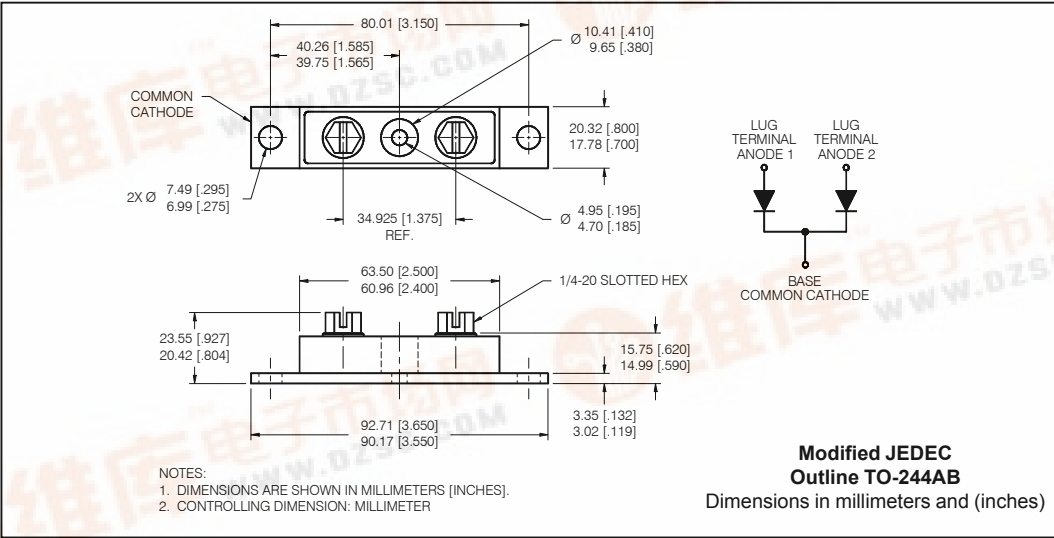
Major Ratings and Characteristics

Characteristics	403CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	400	A
V_{RRM} range	80 to 100	V
I_{FSM} @tp = 5 μ s sine	25,500	A
V_F @200Apk, $T_J=125^\circ\text{C}$ (per leg)	0.69	V
T_J range	-55 to 175	$^\circ\text{C}$

Description/Features

The 403CNQ center tap 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 $^\circ\text{C}$ junction temperature. Typical applications are in high current switching power supplies, plating power supplies, UPS systems, converters, free-wheeling diodes, welding, and reverse battery protection.

- 175 $^\circ\text{C}$ T_J operation
- Center tap module
- 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



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Voltage Ratings

Part number	403CNQ080	403CNQ100
V_R Max. DC Reverse Voltage (V)	80	100
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters		403CNQ	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	25,500	A	5 μs Sine or 3 μs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied	
		3300		10ms Sine or 6ms Rect. pulse		
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^{\circ}\text{C}$, $I_{AS} = 1$ Amps, $L = 30$ mH		
I_{AR}	Repetitive Avalanche Current (Per Leg)	1	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		403CNQ	Units	Conditions	
V _{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.83	V	@ 200A	T _J = 25 °C
		0.97	V	@ 400A	
		0.69	V	@ 200A	T _J = 125 °C
		0.82	V	@ 400A	
I _{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	6	mA	T _J = 25 °C	V _R = rated V _R
		80	mA	T _J = 125 °C	
C _T	Max. Junction Capacitance (Per Leg)	5500	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	403CNQ	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 (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	Min.	24 (20)	Kg-cm (lbf-in)
	Max.	35 (30)	
	Typ.	13.5 (12)	
	Min.	35 (30)	
Terminal Torque	Max.	46 (40)	
Case Style	TO - 244AB		Modified JEDEC

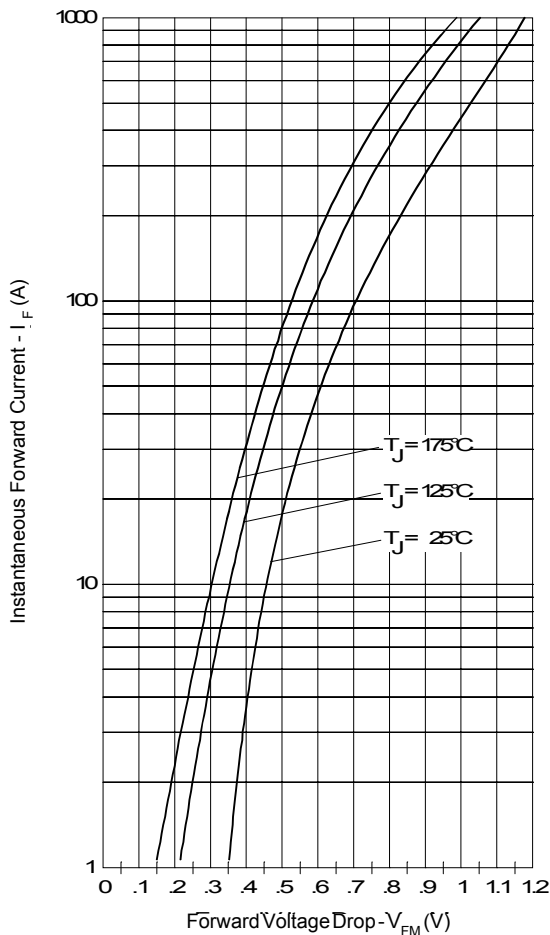


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

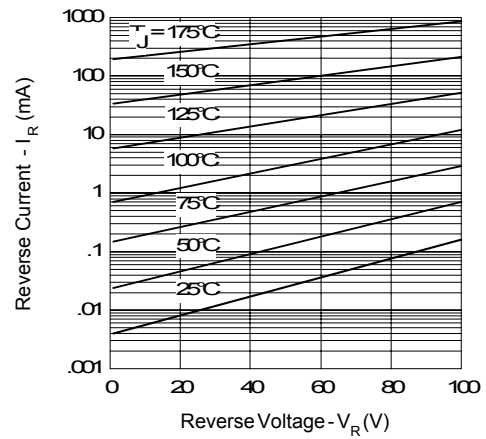


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

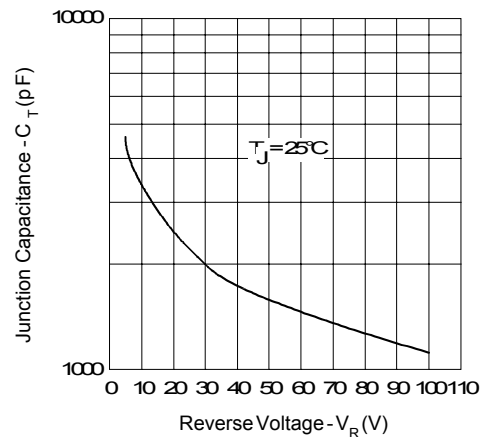


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

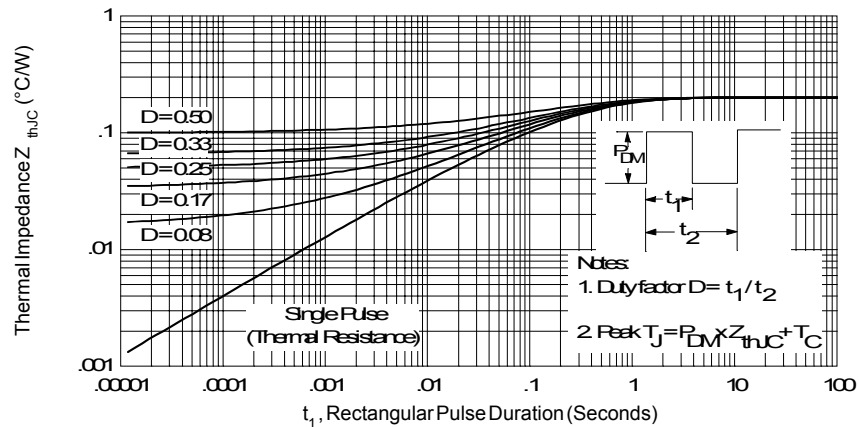


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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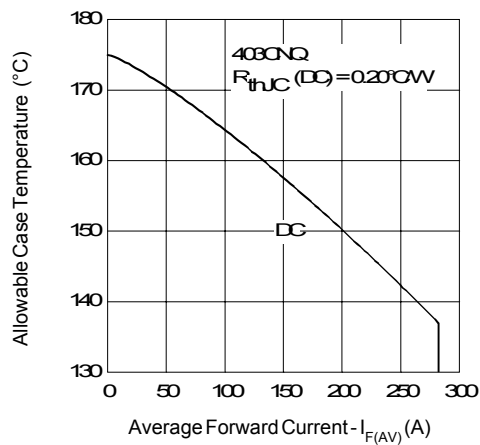


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

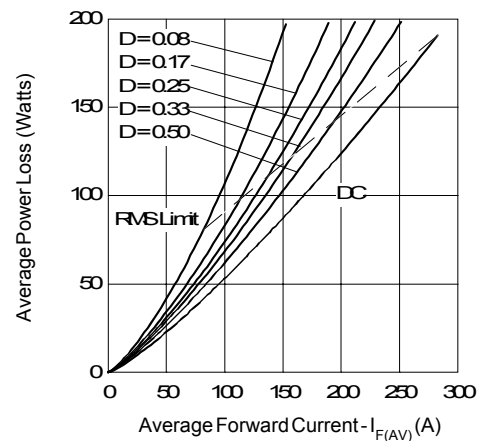


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

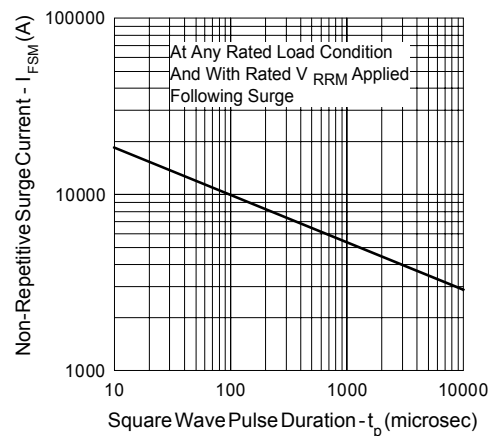


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

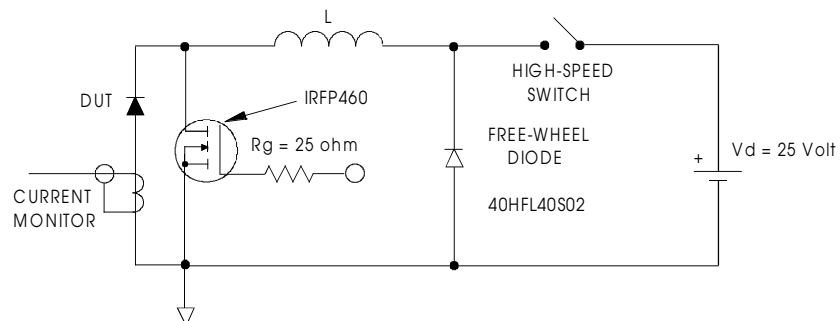


Fig. 8 - Unclamped Inductive Test Circuit

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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