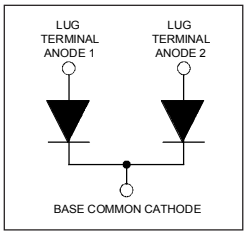
Bulletin PD-21111 12/05

International
IOR Rectifier

403CNQ100PbF

SCHOTTKY RECTIFIER 400 Amp



Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	400	A
V_{RRM}		100	V
I_{FSM}	@tp = 5 µs sine	25,500	A
V_F	@200Apk, T_J=125°C (per leg)	0.69	V
T_J	range	-55 to 175	°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 °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°C T_J operation
- Center tap module
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free

Case Styles

TO-244

Voltage Ratings

	Part number	403CNQ100PbF
V_R	Max. DC Reverse Voltage (V)	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	Per Device	400	A	50% duty cycle @ T_C = 141 °C, rectangular wave form	
		Per Leg	200			
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7		25,500	A	5µs Sine or 3µs 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 °C, I_{AS} = 13 Amps, L = 0.2 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 x V_R typical	

Electrical Specifications

	Parameters	403CNQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.84	V	@ 200A	T_J = 25 °C
		1.07	V	@ 400A	
		0.69	V	@ 200A	T_J = T_J max.
		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)	10000	V/ µs		

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal - Mechanical Characteristics

	Parameters		Min	Typ	Max	Units
T_J	Max. Junction Temperature Range		- 55	-	175	°C
T_{Stg}	Max. Storage Temperature Range		- 55	-	175	
R_{thJC}	Thermal Resistance, Junction to Case	Per Leg	-	-	0.19	°C/W
	Thermal Resistance, Junction to Case	Per Module	-	-	0.095	K/W
R_{thCS}	Thermal Resistance, Case to Heatsink		-	0.10	-	
Wt	Weight		-	68 (2.4)	-	g (oz)
T	Mounting Torque		35.4 (4)	-	53.1 (6)	lbf*in
	Mounting Torque Center Hole		30 (3.4)	-	40 (4.6)	(Nm)
	Terminal Torque		30 (3.4)	-	44.2 (5)	
	Vertical Pull		-	-	80	lbf.in
	2 inch Lever Pull		-	-	35	

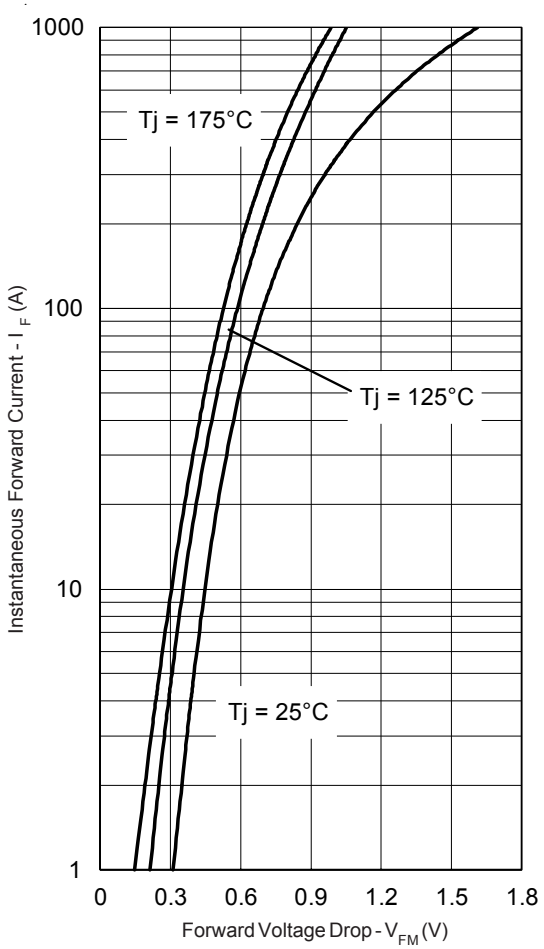


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

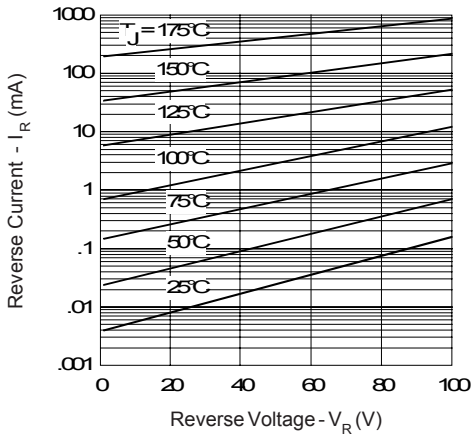


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

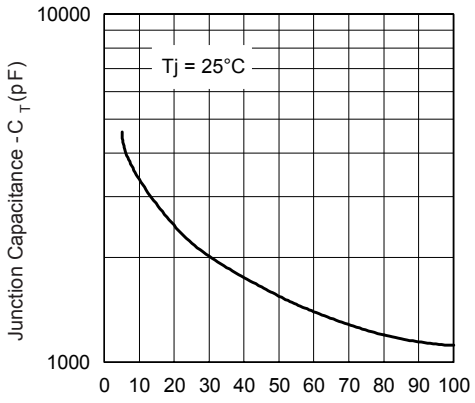


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

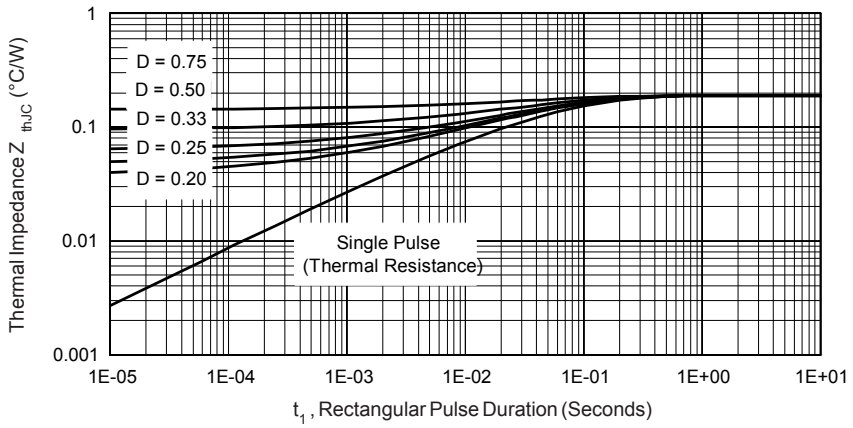


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

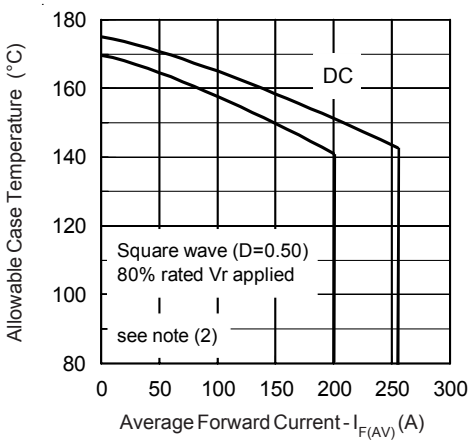


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

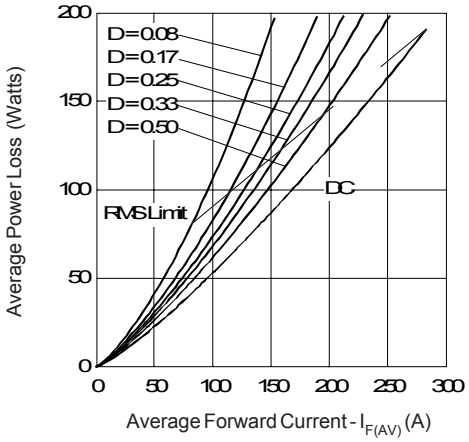


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

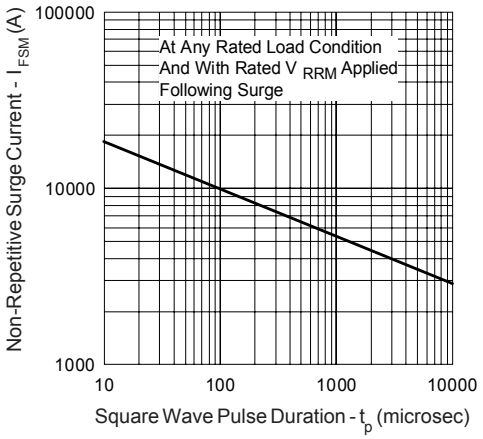


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

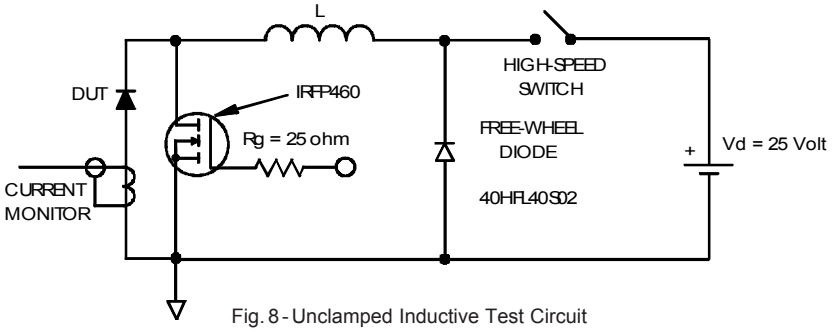
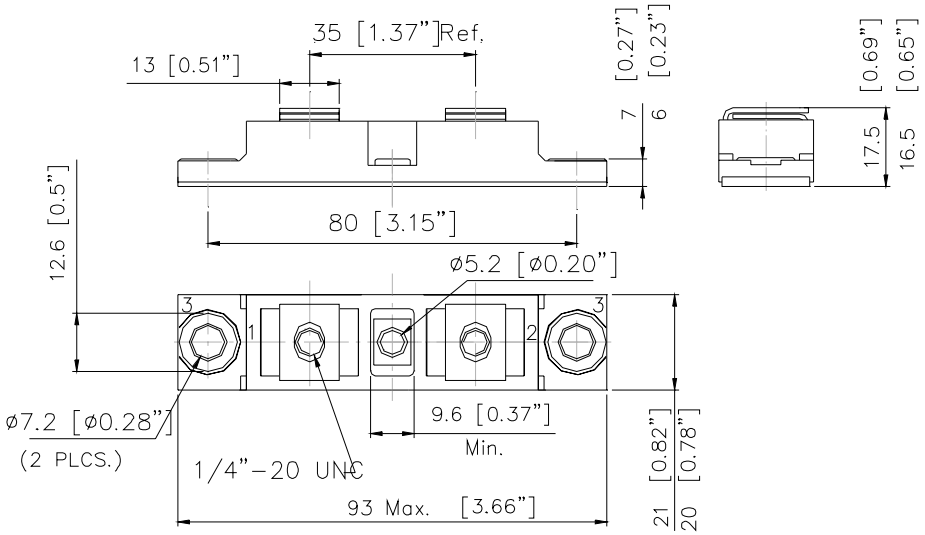


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table



Conforms to JEDEC Outline TO-244
Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

40	3	C	N	Q	100	PbF
1	2	3	4	5	6	7

1	-	Average Current Rating (x 10)
2	-	Product Silicon Identification
3	-	C = Circuit Configuration
4	-	N = NOt Isolated
5	-	Q = Schottky Rectifier Diode
6	-	Voltage Rating (100 = 100V)
7	-	Lead-Free

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

International
IOR Rectifier

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