

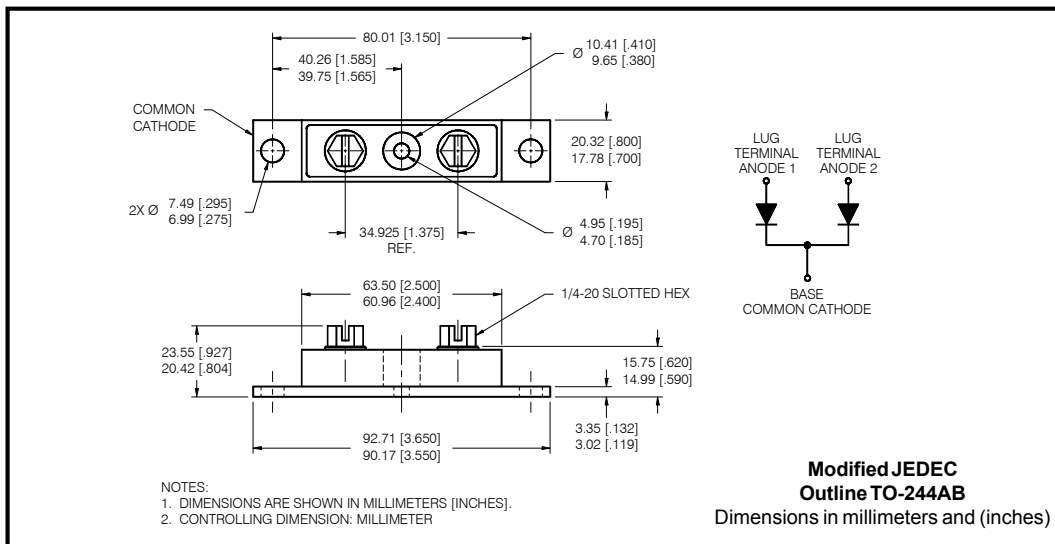
**Major Ratings and Characteristics**

Characteristics	209CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	200	A
$V_{RRM}$ range	135 to 150	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	10,000	A
$V_F$ @100Apk, $T_J$ = 125°C (per leg)	0.71	V
$T_J$ range	-55 to 175	°C

**Description/Features**

The 209CNQ 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
- 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



## Voltage Ratings

Partnumber	209CNQ135	209CNQ150
V <sub>R</sub> Max. DC Reverse Voltage (V)	135	150
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)		

## Absolute Maximum Ratings

Parameters	209CNQ	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	100 200	A	50% duty cycle @ T <sub>c</sub> = 118°C, rectangular waveform
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	10,000 1200	A	5µs Sine or 3µs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V <sub>RRM</sub> applied
E <sub>AS</sub> Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	T <sub>J</sub> = 25°C, I <sub>AS</sub> = 1 Amps, L = 30 mH
I <sub>AR</sub> Repetitive Avalanche Current (Per Leg)	1	A	Current decaying linearly to zero in 1 µsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical

## Electrical Specifications

Parameters	209CNQ	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	1.03	V	@ 100A T <sub>J</sub> = 25 °C
	1.22	V	@ 200A
	0.71	V	@ 100A T <sub>J</sub> = 125 °C
	0.82	V	@ 200A
I <sub>RM</sub> Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	3	mA	T <sub>J</sub> = 25 °C
	45	mA	T <sub>J</sub> = 125 °C V <sub>R</sub> = rated V <sub>R</sub>
C <sub>T</sub> Max. Junction Capacitance (Per Leg)	3000	pF	V <sub>R</sub> = 5V <sub>DC</sub> , (test signal range 100Khz to 1Mhz) 25°C
L <sub>S</sub> 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 <sub>R</sub> )	10000	V/µs	

(1) Pulse Width &lt; 300µs, Duty Cycle &lt;2%

## Thermal-Mechanical Specifications

Parameters	209CNQ	Units	Conditions	
T <sub>J</sub> Max. Junction Temperature Range	-55 to 175	°C		
T <sub>stg</sub> Max. Storage Temperature Range	-55 to 175	°C		
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Leg)	0.40	°C/W	DC operation * See Fig. 4	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Package)	0.20	°C/W	DC operation	
R <sub>thCS</sub> 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	Min.	24(20)	Kg-cm (lbf-in)	
	Max.	35(30)		
	Mounting Torque Center Hole	Typ.		13.5(12)
	Terminal Torque	Min.		35(30)
		Max.		46(40)
Case Style	TO-244AB		Modified JEDEC	

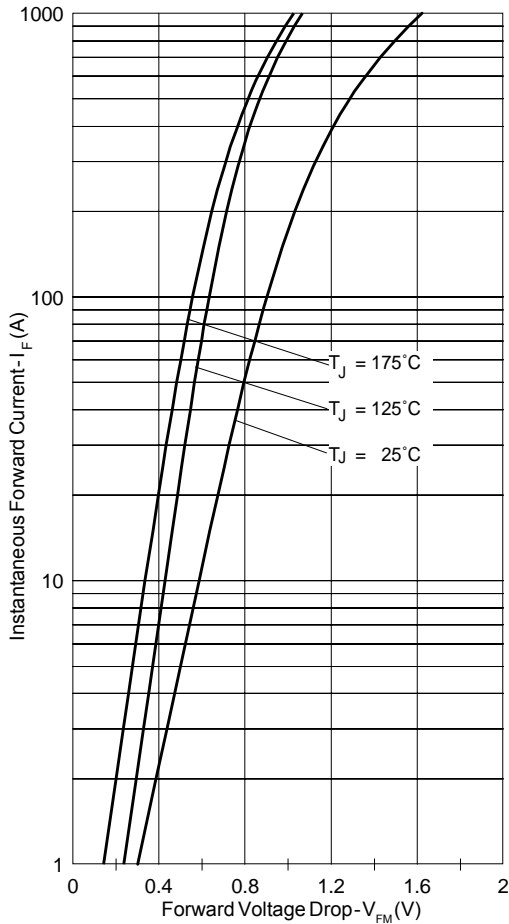


Fig. 1 - Max. Forward Voltage Drop Characteristics

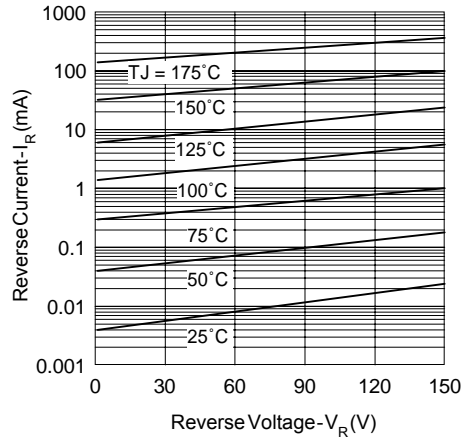


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

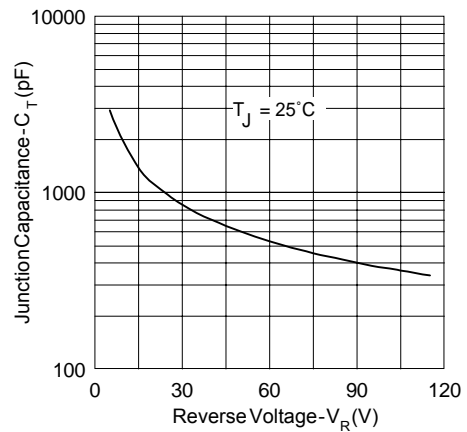


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

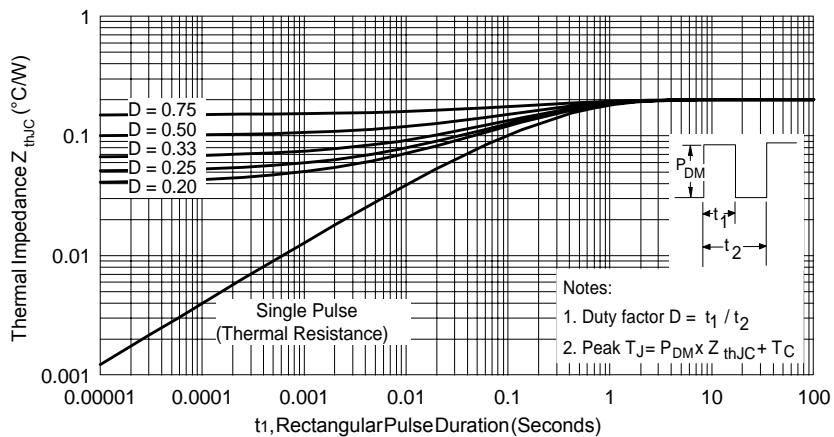


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics

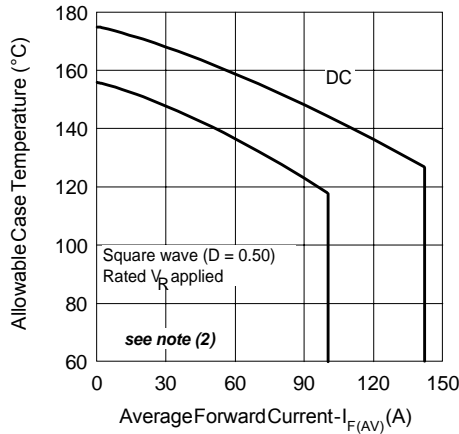


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

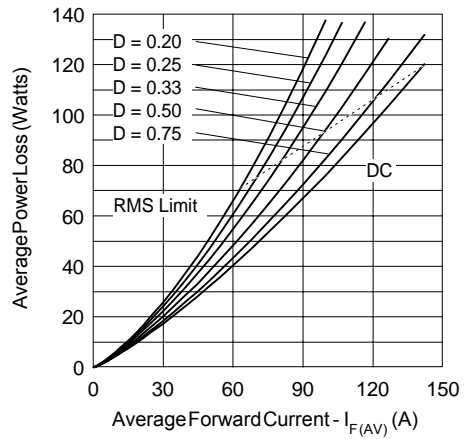


Fig. 6 - Forward Power Loss Characteristics

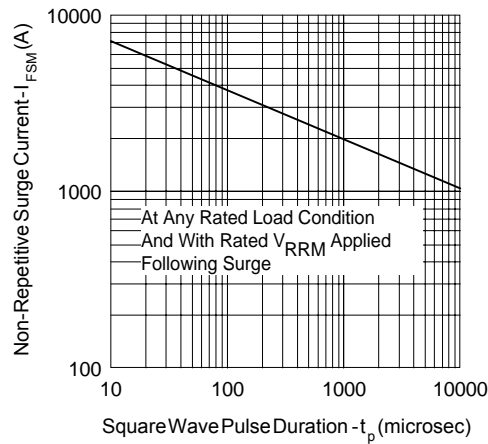


Fig. 7 - Max. Non-Repetitive Surge Current

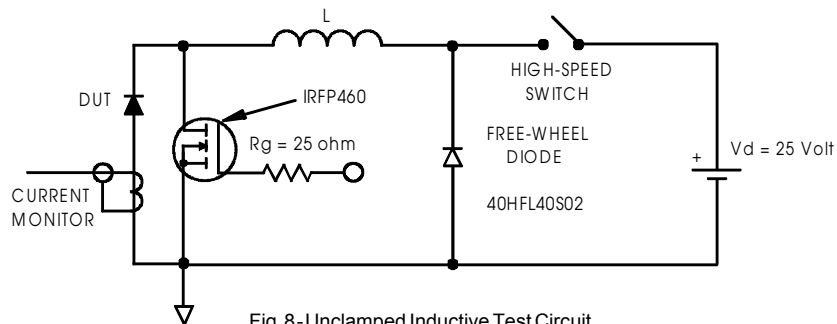


Fig. 8 - Unclamped Inductive Test Circuit

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

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.

International  
**IOR** Rectifier

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