

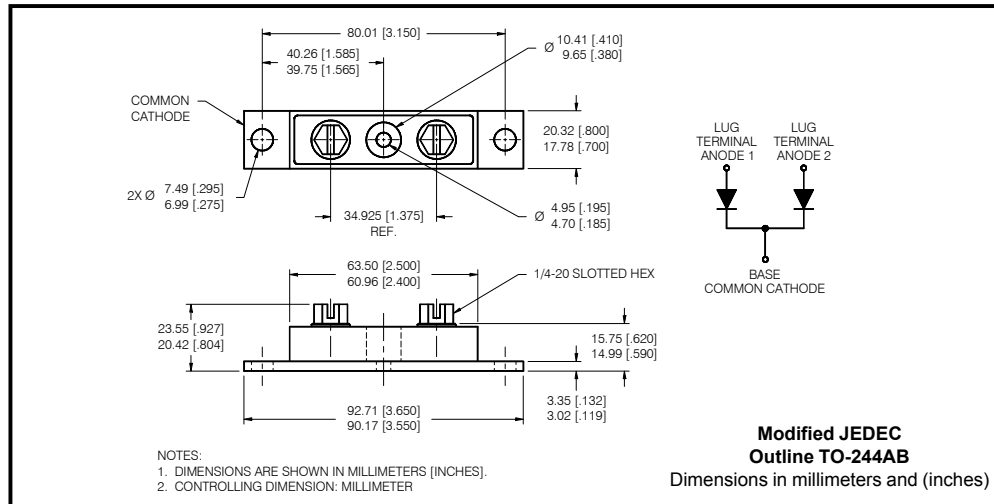
Major Ratings and Characteristics

Characteristics	200CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	200	A
V_{RRM} range	35 to 45	V
I_{FSM} @ tp = 5 μ s sine	26,000	A
V_F @ 100Apk, $T_J=125^\circ\text{C}$ (per leg)	0.49	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/Features

The 200CNQ 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 150 $^\circ\text{C}$ 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.

- 150 $^\circ\text{C}$ 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



200CNQ... Series

Bulletin PD-2.257 rev. D 07/01

Voltage Ratings

Part number	200CNQ035	200CNQ040	200CNQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	200CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	100 200	A	50% duty cycle @ $T_C = 114^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	26,000 1550	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RWM} applied
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	135	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 20$ 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. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	200CNQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.54	V	@ 100A $T_J = 25^\circ\text{C}$
	0.68	V	@ 200A
	0.49	V	@ 100A $T_J = 125^\circ\text{C}$
	0.64	V	@ 200A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	10	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	500	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.32	V	$T_J = T_J \text{ max.}$
r_f Forward Slope Resistance	0.81	m Ω	
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)	10000	V/ μs	

Thermal-Mechanical Specifications

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

Parameters	200CNQ	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)	0.40	$^\circ\text{C/W}$	DCoperation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.20	$^\circ\text{C/W}$	DCoperation
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.	24 (20)	Kg-cm (lbf-in)
	Max.	35 (30)	
	Typ.	13.5 (12)	
	Min.	35 (30)	
	Max.	46 (40)	
Terminal Torque			
Case Style	TO-244AB		Modified JEDEC

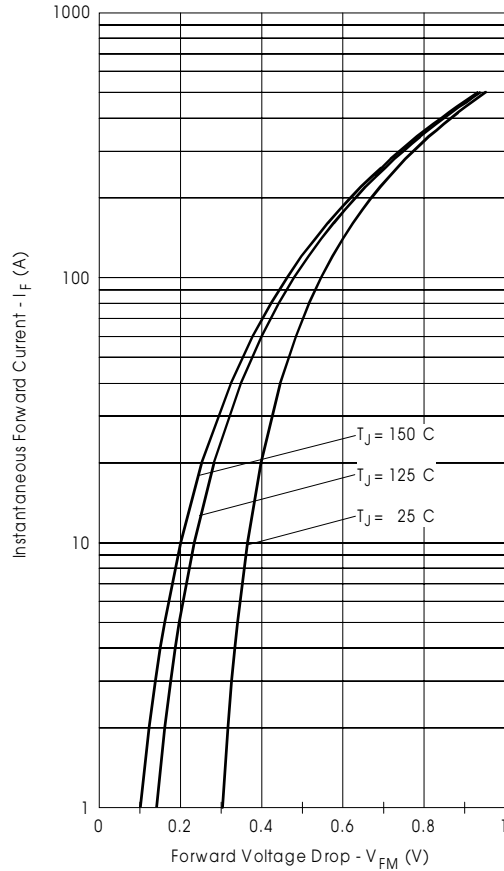


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

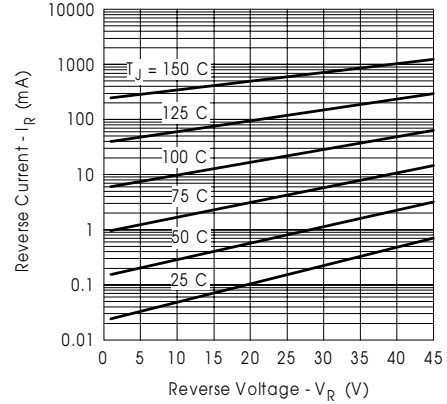


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

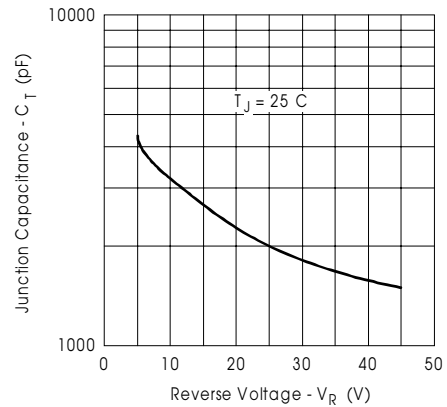


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

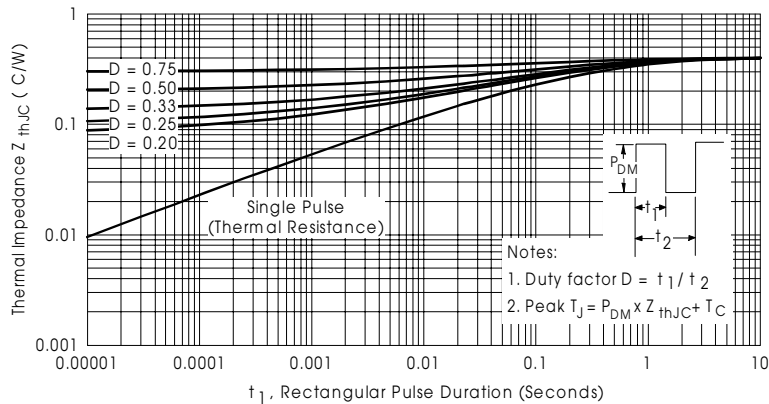


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

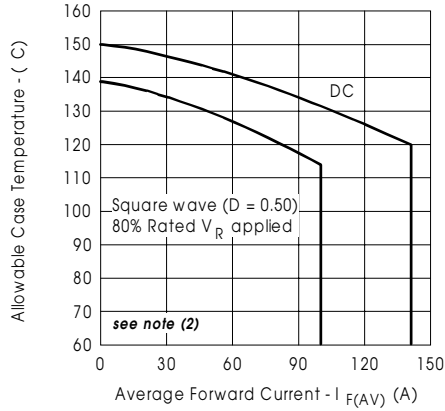


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

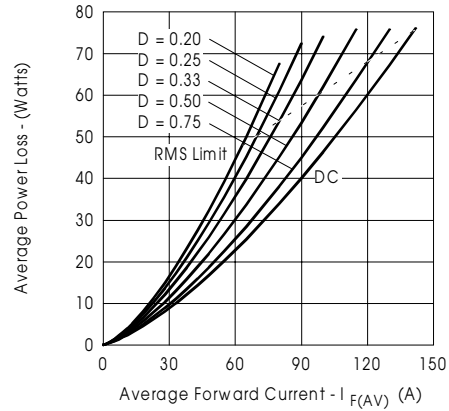


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

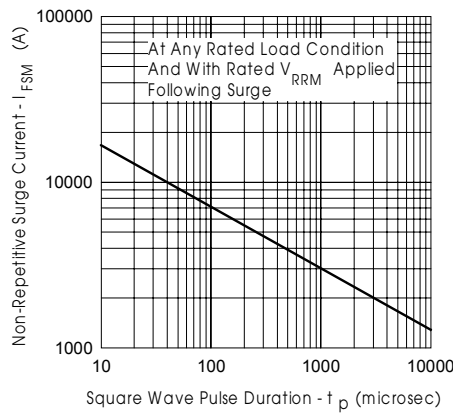


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

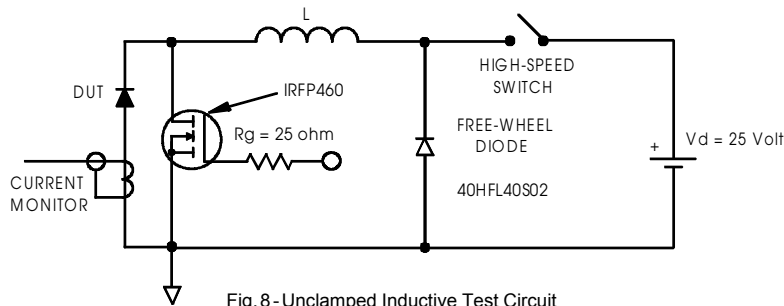


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$

P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)}/D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_{R1} (1-D)$; $I_{R1} @ V_{R1} = 80\%$ 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
IR Rectifier

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