

**Major Ratings and Characteristics**

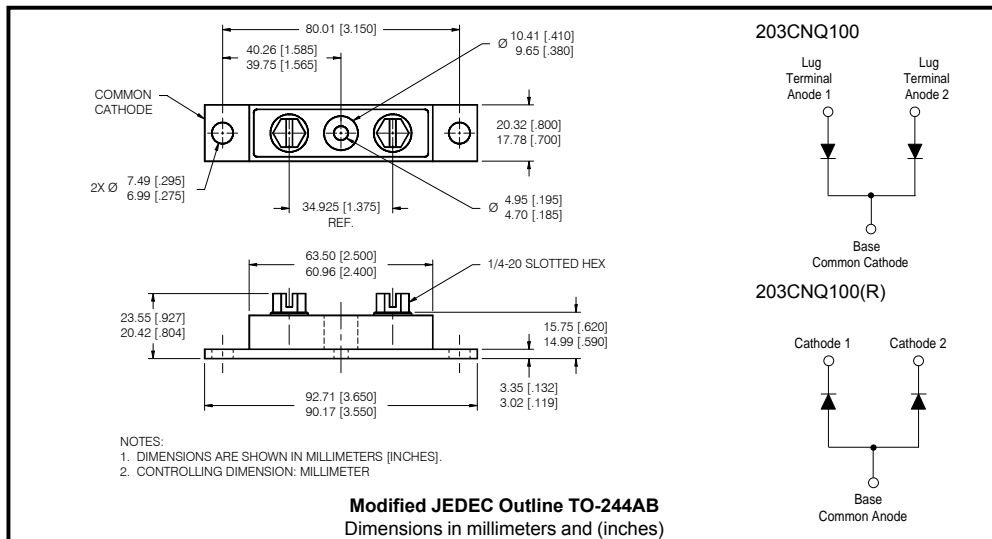
Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	200	A
$V_{RRM}$ range	80 and 100	V
$I_{FSM}$ @tp=5 $\mu$ s sine	16,000	A
$V_F$ @100Apk, $T_J=125^\circ\text{C}$ (per leg)	0.70	V
$T_J$ range	-55 to 175	$^\circ\text{C}$

**Description/ Features**

The 203CNQ...(R) 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



## Voltage Ratings

Part number	203CNQ080	203CNQ100
$V_R$ Max. DC Reverse Voltage (V)	80	100
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)		

## Absolute Maximum Ratings

Parameters	203CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	100 200	A	50% duty cycle @ $T_C = 137^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	16,000 2,100	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ 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)	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 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

## Electrical Specifications

Parameters	203CNQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.86	V	@ 100A $T_J = 25^\circ\text{C}$
	1.03	V	@ 200A
	0.70	V	@ 100A $T_J = 125^\circ\text{C}$
	0.84	V	@ 200A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	3	mA	$T_J = 25^\circ\text{C}$
	40	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.50	V	$T_J = T_J \text{ max.}$
$r_t$ Forward Slope Resistance	1.08	m $\Omega$	
$C_T$ Max. Junction Capacitance (Per Leg)	2,650	pF	$V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ 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/ $\mu\text{s}$	

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle <2%

## Thermal-Mechanical Specifications

Parameters	203CNQ	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)	0.40	$^\circ\text{C/W}$	DC operation * See Fig. 4	
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	0.20	$^\circ\text{C/W}$	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)		
	Mounting Torque Center Hole	Typ.		13.5 (12)
	Terminal Torque	Min.		35 (30)
		Max.		46 (40)
Case Style	TO-244AB		Modified JEDEC	

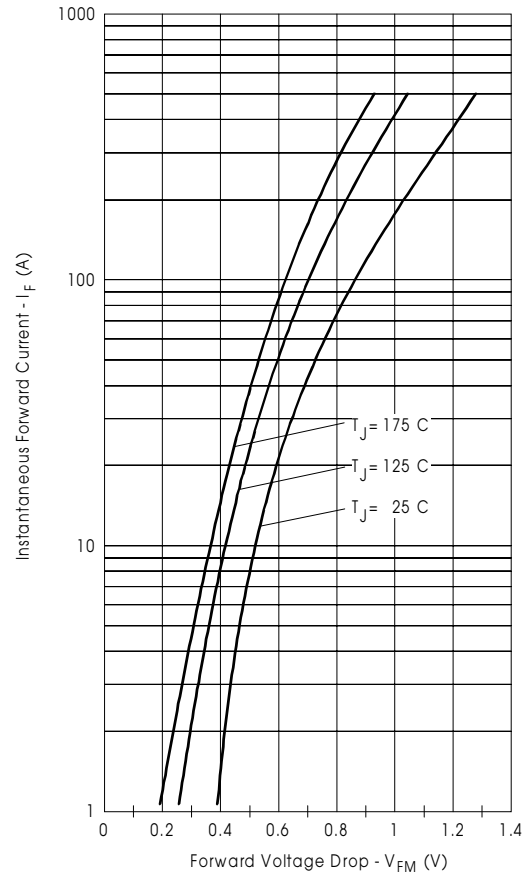


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

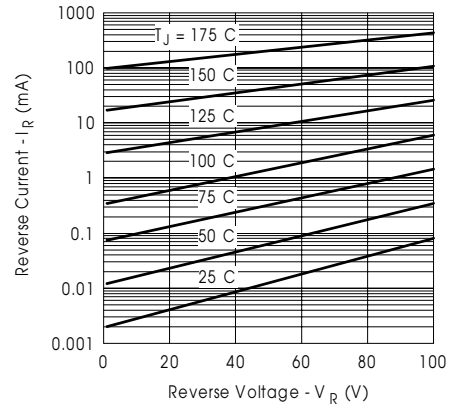


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

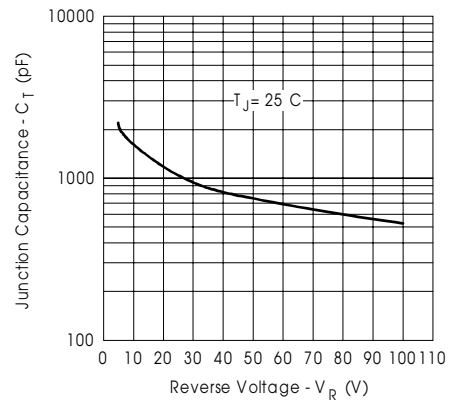


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

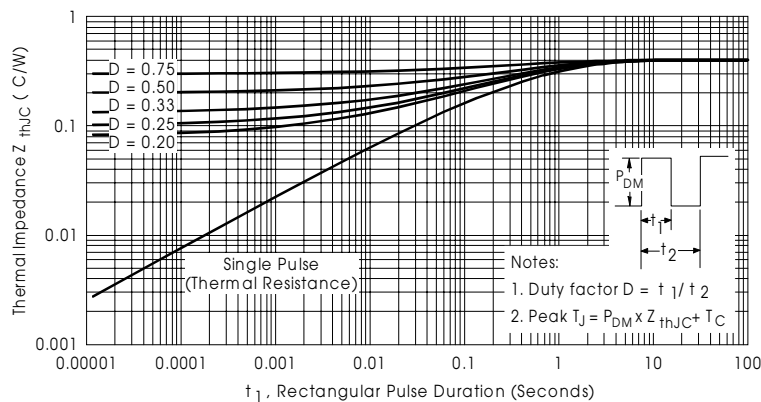


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

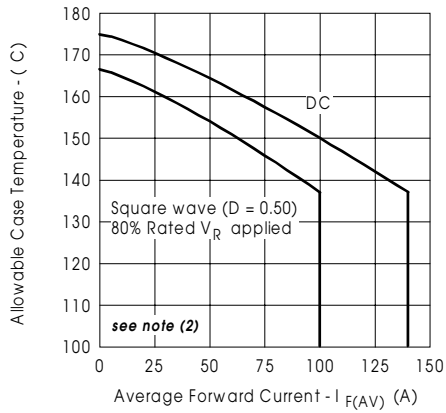


Fig.5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

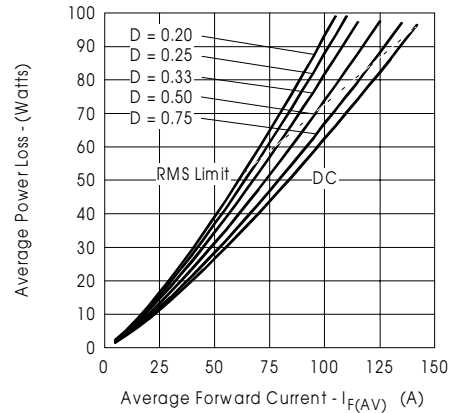


Fig.6- Forward Power Loss Characteristics (Per Leg)

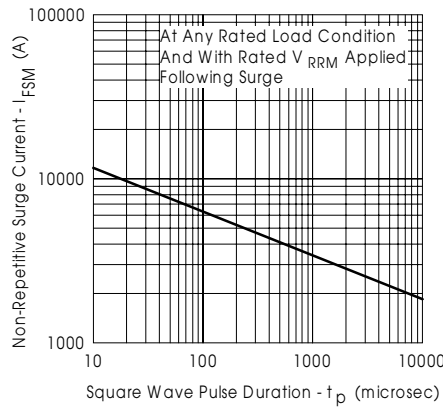


Fig.7- Max. Non-Repetitive Surge Current (Per Leg)

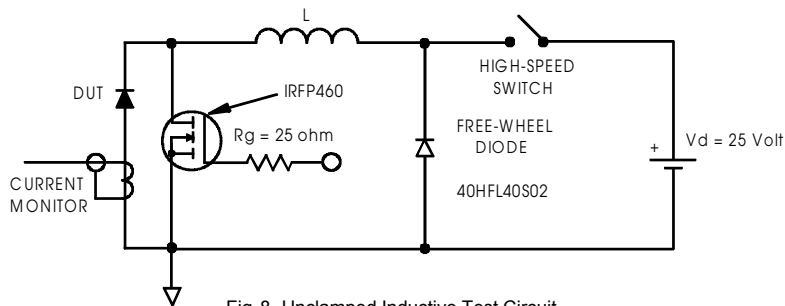


Fig.8- Unclamped Inductive Test Circuit

(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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