

**Major Ratings and Characteristics**

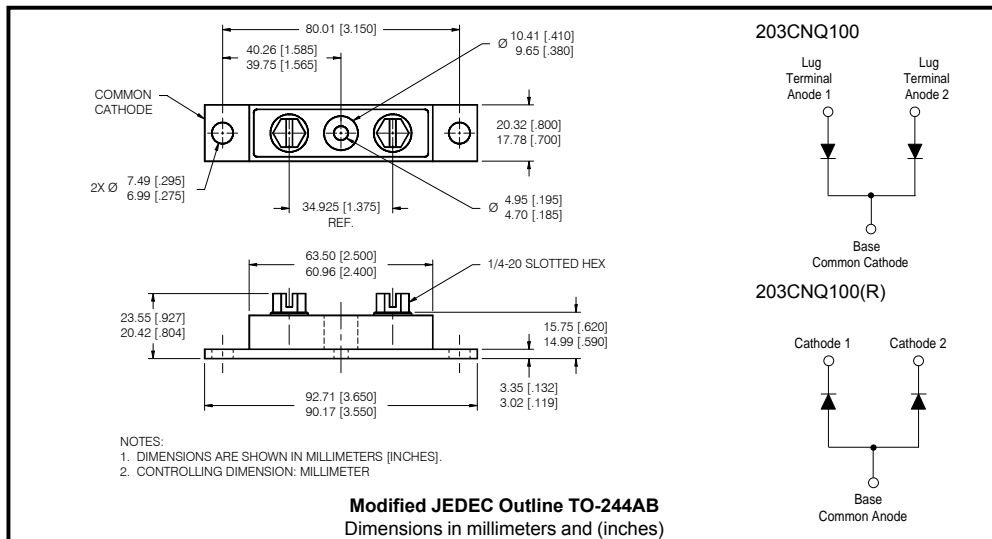
| Characteristics                                  | Value      | Units            |
|--|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                 | 200        | A                |
| $V_{RRM}$ range                                  | 80 and 100 | V                |
| $I_{FSM}$ @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<br>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<br>2,100 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse<br>10ms Sine or 6ms Rect. pulse<br>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 $\mu\text{sec}$<br>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<br>$T_J = 25^\circ\text{C}$                                      |
|  | 1.03   | V                | @ 200A  |
|  | 0.70   | V                | @ 100A<br>$T_J = 125^\circ\text{C}$                                     |
|  | 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               | $T_J = 125^\circ\text{C}$<br>$V_R = \text{rated } V_R$                  |
| $V_{F(TO)}$ 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                        | $^\circ\text{C}/\text{W}$ | DC operation * See Fig. 4            |           |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 0.20                        | $^\circ\text{C}/\text{W}$ | DC operation                         |           |
| $R_{thCS}$ Typical Thermal Resistance, Case to Heatsink           | 0.10                        | $^\circ\text{C}/\text{W}$ | Mounting surface, smooth and greased |           |
| wt Approximate Weight   | 79 (2.80)                   | g (oz.)                   |                                      |           |
| T Mounting Torque   | Min.                        | 24 (20)                   | Kg-cm<br>(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                       |           |

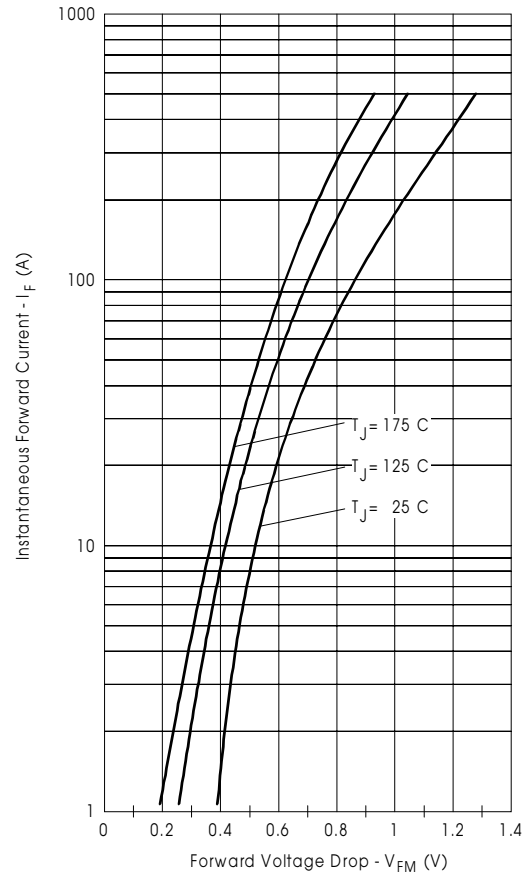


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

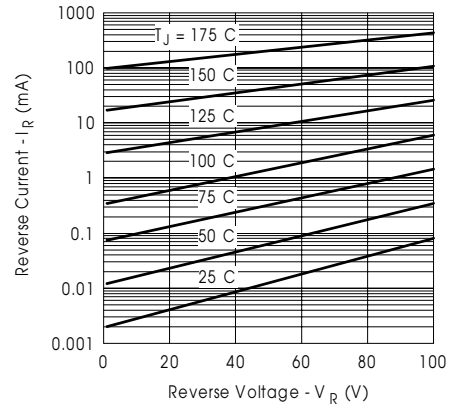


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

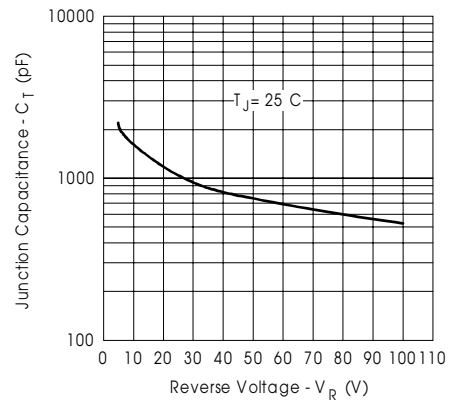


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

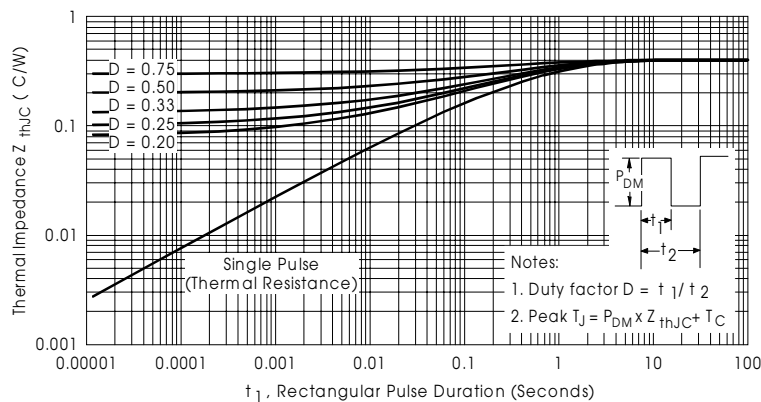


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

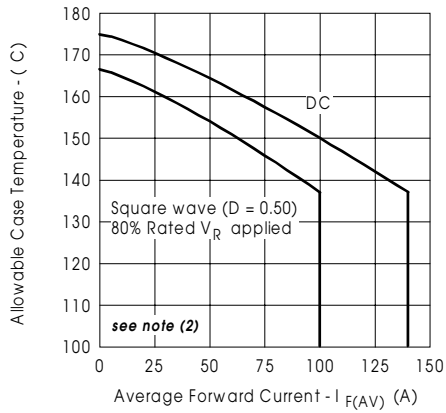


Fig.5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

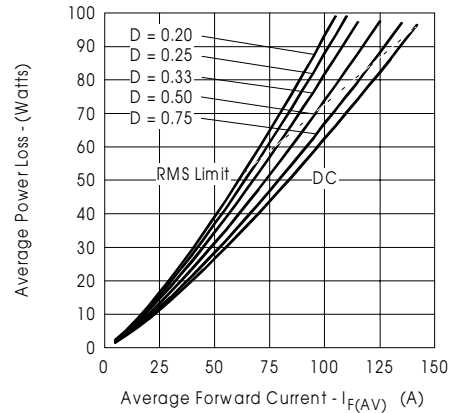


Fig.6- Forward Power Loss Characteristics (Per Leg)

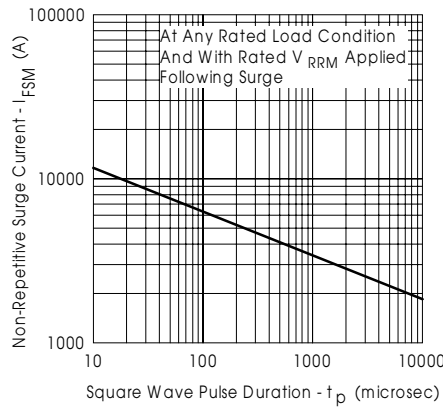


Fig.7- Max. Non-Repetitive Surge Current (Per Leg)

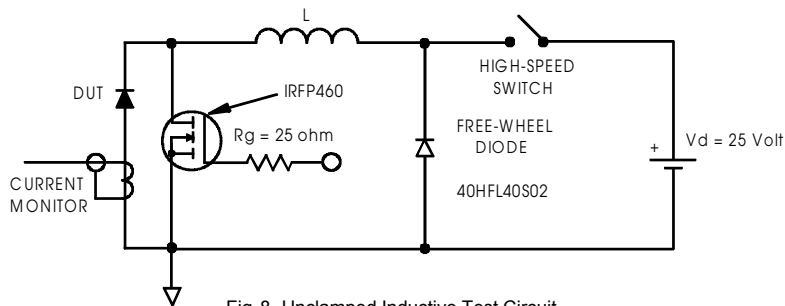


Fig.8- Unclamped Inductive Test Circuit

(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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