**International Rectifier**

**203CNQ...(R) SERIES**

**SCHOTTKY RECTIFIER**

200 Amp

---

**Major Ratings and Characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_F(\text{AV})$ Rectangular waveform</td>
<td>200</td>
<td>A</td>
</tr>
<tr>
<td>$V_{\text{RRM}}$ range</td>
<td>80 and 100</td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{FSM}}$ @ $t_p=5\ \mu s$ sine</td>
<td>16,000</td>
<td>A</td>
</tr>
<tr>
<td>$V_F$ @ 100Apk, $T_J=125°C$ (per leg)</td>
<td>0.70</td>
<td>V</td>
</tr>
<tr>
<td>$T_J$ range</td>
<td>-55 to 175</td>
<td>°C</td>
</tr>
</tbody>
</table>

---

**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 °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

---

Modified JEDEC Outline TO-244AB

Dimensions in millimeters and (inches)

www.irf.com

Bulletin PD-2259 rev. E 06/01
## Voltage Ratings

<table>
<thead>
<tr>
<th>Part number</th>
<th>203CNQ080</th>
<th>203CNQ100</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_R$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{RWM}$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameters</th>
<th>203CNQ</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{F(AV)}$</td>
<td>Max. Average Forward Current (Per Leg)</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg)</td>
<td>16,000</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_{AS}$</td>
<td>Non-Repetitive Avalanche Energy (Per Leg)</td>
<td>15</td>
<td>mJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{AR}$</td>
<td>Repetitive Avalanche Current (Per Leg)</td>
<td>1</td>
<td>A</td>
</tr>
</tbody>
</table>

## Electrical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>203CNQ</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$VFM$</td>
<td>Max. Forward Voltage Drop (Per Leg)</td>
<td>0.86</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>@ 100A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.03</td>
<td>V</td>
<td>$T_j = 125{\degree}C$</td>
</tr>
<tr>
<td></td>
<td>@ 200A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.70</td>
<td>V</td>
<td>$T_j = 25{\degree}C$</td>
</tr>
<tr>
<td></td>
<td>@ 100A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.84</td>
<td>V</td>
<td>$T_j = 125{\degree}C$</td>
</tr>
<tr>
<td></td>
<td>@ 200A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Thermal-Mechanical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>203CNQ</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_J$</td>
<td>Max. Junction Temperature Range</td>
<td>-55 to 175</td>
<td>{\degree}C</td>
</tr>
<tr>
<td>$T_{SUS}$</td>
<td>Max. Storage Temperature Range</td>
<td>-55 to 175</td>
<td>{\degree}C</td>
</tr>
<tr>
<td>$R_{ThJC}$</td>
<td>Max. Thermal Resistance Junction to Case (Per Leg)</td>
<td>0.40</td>
<td>°C/W</td>
</tr>
<tr>
<td>$R_{ThPC}$</td>
<td>Max. Thermal Resistance Junction to Case (Per Package)</td>
<td>0.20</td>
<td>°C/W</td>
</tr>
<tr>
<td>$R_{ThCS}$</td>
<td>Typical Thermal Resistance, Case to Heatsink</td>
<td>0.10</td>
<td>°C/W</td>
</tr>
<tr>
<td>$wt$</td>
<td>Approximate Weight</td>
<td>79(2.80)</td>
<td>g (oz.)</td>
</tr>
<tr>
<td>$T$</td>
<td>Mounting Torque</td>
<td>Min.</td>
<td>24(20)</td>
</tr>
<tr>
<td></td>
<td>Max.</td>
<td>35(30)</td>
<td></td>
</tr>
<tr>
<td>Terminal Torque</td>
<td>Min.</td>
<td>35(30)</td>
<td>(lbf-in)</td>
</tr>
<tr>
<td></td>
<td>Max.</td>
<td>46(40)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Pulse Width < 300µs, Duty Cycle <2%*
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)

Notes:
1. Duty factor $D = \frac{t_1}{t}$
2. Peak $I_{DM} = P_{DM} \times Z_{thJC} \times T_{JC}$
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: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$

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

$P_{dREV} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\% \text{ rated } V_R$