**Major Ratings and Characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>440CNQ...</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{F(AV)}$</td>
<td>Rectangular waveform</td>
<td>440</td>
</tr>
<tr>
<td>$V_{RRM}$</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>$I_{FSM}$ @ $t_{p} = 5 \mu s$ sine</td>
<td></td>
<td>27,000</td>
</tr>
<tr>
<td>$V_{F}$ @ $220 Apk, T_J=125^\circ C$ (per leg)</td>
<td></td>
<td>0.41</td>
</tr>
<tr>
<td>$T_J$ range</td>
<td></td>
<td>-55 to 150</td>
</tr>
</tbody>
</table>

**Description/Features**

The 440CNQ030 center tap, high current, Schottky rectifier module has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, welding and reverse battery protection.

- 150 °C $T_J$ operation
- Center tap module
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very 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
440CNQ030 Series

Voltage Ratings

<table>
<thead>
<tr>
<th>Part number</th>
<th>440CNQ030</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_R</td>
<td>Max. DC Reverse Voltage (V)</td>
</tr>
<tr>
<td>V_RWM</td>
<td>Max. Working Peak Reverse Voltage (V)</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameters</th>
<th>440CNQ</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_F(AV) Max. Average Forward Current</td>
<td>440</td>
<td>A</td>
<td>50% duty cycle @ T_C = 115 °C, rectangular wave form</td>
</tr>
<tr>
<td>I_FSM Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7</td>
<td>27,000</td>
<td>A</td>
<td>5µs Sine or 3µs Rect. pulse</td>
</tr>
<tr>
<td>E_AS Non-Repetitive Avalanche Energy (Per Leg) * See Fig. 7</td>
<td>198</td>
<td>mJ</td>
<td>T_J = 25 °C, I_A = 44 Amps, L = 0.20 mH</td>
</tr>
<tr>
<td>I_AR Repetitive Avalanche Current (Per Leg) * See Fig. 1</td>
<td>44</td>
<td>A</td>
<td>Current decaying linearly to zero in 1 µsec</td>
</tr>
</tbody>
</table>

Electrical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>440CNQ</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_FM Max. Forward Voltage Drop (Per Leg) * See Fig. 1</td>
<td>0.50</td>
<td>V</td>
<td>@ 220A</td>
</tr>
<tr>
<td></td>
<td>0.60</td>
<td>V</td>
<td>@ 440A</td>
</tr>
<tr>
<td></td>
<td>0.41</td>
<td>V</td>
<td>@ 220A</td>
</tr>
<tr>
<td></td>
<td>0.52</td>
<td>V</td>
<td>@ 440A</td>
</tr>
<tr>
<td>I_RM Max. Reverse Leakage Current (Per Leg) * See Fig. 2</td>
<td>20</td>
<td>mA</td>
<td>@ 25 °C</td>
</tr>
<tr>
<td></td>
<td>1120</td>
<td>mA</td>
<td>@ 125 °C</td>
</tr>
<tr>
<td>C_T Max. Junction Capacitance (Per Leg)</td>
<td>14,800</td>
<td>pF</td>
<td>V_R = 5V_DC, (test signal range 100Khz to 1MHz) 25°C</td>
</tr>
<tr>
<td>L_s Typical Series Inductance (Per Leg)</td>
<td>5.0</td>
<td>nH</td>
<td>From top of terminal hole to mounting plane</td>
</tr>
<tr>
<td>dv/dt Max. Voltage Rate of Change (Rated V_R)</td>
<td>10,000</td>
<td>V/µs</td>
<td></td>
</tr>
</tbody>
</table>

Thermal-Mechanical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>440CNQ</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_J Max. Junction Temperature Range</td>
<td>-55 to 150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>T_stg Max. Storage Temperature Range</td>
<td>-55 to 150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>R_sJC Max. Thermal Resistance Junction to Case (Per Leg)</td>
<td>0.20</td>
<td>°C/W</td>
<td>DC operation * See Fig. 4</td>
</tr>
<tr>
<td>R_sJC Max. Thermal Resistance Junction to Case (Per Package)</td>
<td>0.10</td>
<td>°C/W</td>
<td>DC operation</td>
</tr>
<tr>
<td>R_sCS Typical Thermal Resistance, Case to Heatsink</td>
<td>0.10</td>
<td>°C/W</td>
<td>Mounting surface, smooth and greased</td>
</tr>
<tr>
<td>wt Approximate Weight</td>
<td>79 (2.80)</td>
<td>g/oz</td>
<td></td>
</tr>
<tr>
<td>T Mounting Torque</td>
<td>Min. 24 (20)</td>
<td>Kg-cm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max. 35 (30)</td>
<td>Kg-cm</td>
<td></td>
</tr>
<tr>
<td>Mounting Torque Center Hole</td>
<td>13.5 (12)</td>
<td>Kbf-in</td>
<td></td>
</tr>
<tr>
<td>Terminal Torque</td>
<td>Min. 35 (30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max. 46 (40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Style</td>
<td>TO-244AB</td>
<td>Modified JEDEC</td>
<td></td>
</tr>
</tbody>
</table>
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