

International  
**IOR** Rectifier

**80SQ... SERIES**

**SCHOTTKY RECTIFIER**

**8 Amp**

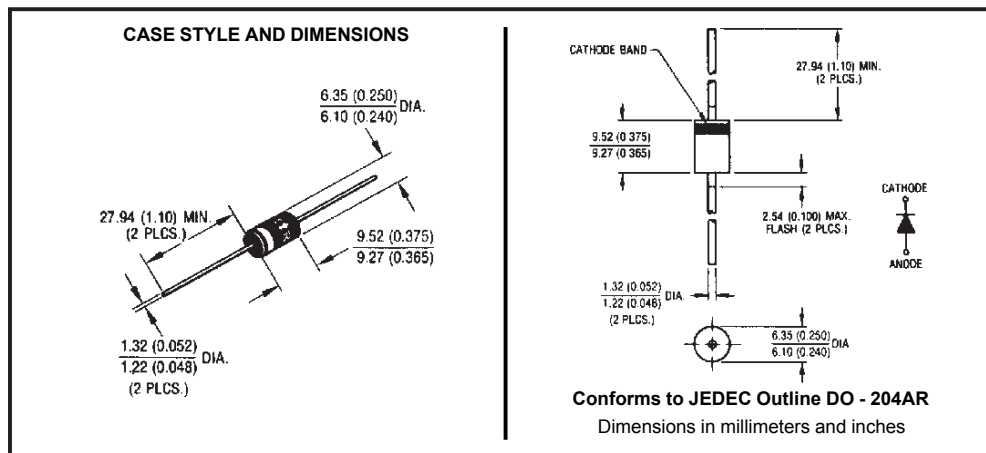
### Major Ratings and Characteristics

| Characteristics                    | 80SQ...    | Units      |
|------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform   | 8          | A          |
| $V_{RRM}$ range                    | 30 / 45    | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine   | 2400       | A          |
| $V_F$ @ 8 Apk, $T_J = 125^\circ C$ | 0.44       | V          |
| $T_J$ range                        | -55 to 175 | $^\circ C$ |

### Description/ Features

The 80SQ axial leaded Schottky rectifier 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 switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C  $T_J$  operation
- 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
- Lead-Free plating



## Voltage Ratings

| Part number                                     | 80SQ030 | 80SQ035 | 80SQ040 | 80SQ045 |
|---|---------|---------|---------|---------|
| $V_R$ Max. DC Reverse Voltage (V)               | 30      | 35      | 40      | 45      |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |         |         |         |         |

## Absolute Maximum Ratings

| Parameters  | 80SQ | Units | Conditions   |
|---|------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current<br>* See Fig. 5                | 8    | A     | 50% duty cycle @ $T_C = 119^\circ\text{C}$ , rectangular wave form   |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 2400 | A     | Following any rated load condition and with rated $V_{RWM}$ applied  |
|   | 380  |       |  |
| $E_{AS}$ Non-Repetitive Avalanche Energy                                | 10   | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 1.6$ Amps, $L = 7.8$ mH   |
| $I_{AR}$ Repetitive Avalanche Current                                   | 1.6  | 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  | 80SQ  | Units            | Conditions  |
|---|-------|------------------|---|
| $V_{FM}$ Max. Forward Voltage Drop (1)<br>* See Fig. 1    | 0.53  | V                | @ 8A<br>$T_J = 25^\circ\text{C}$  |
|   | 0.60  | V                | @ 16A   |
|   | 0.44  | V                | @ 8A<br>$T_J = 125^\circ\text{C}$                                       |
|   | 0.55  | V                | @ 16A   |
| $I_{RM}$ Max. Reverse Leakage Current (1)<br>* See Fig. 2 | 2     | mA               | $T_J = 25^\circ\text{C}$  |
|   | 15    | mA               | $T_J = 125^\circ\text{C}$<br>$V_R = \text{rated } V_R$                  |
| $C_T$ Max. Junction Capacitance                           | 900   | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance                           | 10.0  | nH               | Measured lead to lead 5mm from body                                     |
| $dv/dt$ 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   | 80SQ       | Units                     | Conditions  |
|--|------------|---------------------------|---|
| $T_J$ Max. Junction Temperature Range                  | -55 to 175 | $^\circ\text{C}$          |   |
| $T_{stg}$ Max. Storage Temperature Range               | -55 to 175 | $^\circ\text{C}$          |   |
| $R_{thJL}$ Max. Thermal Resistance Junction to Lead    | 8.0        | $^\circ\text{C}/\text{W}$ | DC operation * See Fig. 4<br>1/8 inch lead length |
| $R_{thJA}$ Typical Thermal Resistance, Junction to Air | 44         | $^\circ\text{C}/\text{W}$ |   |
| wt Approximate Weight                                  | 1.4(0.049) | g(oz.)                    |   |
| Case Style   | DO-204AR   | JEDEC                     |   |

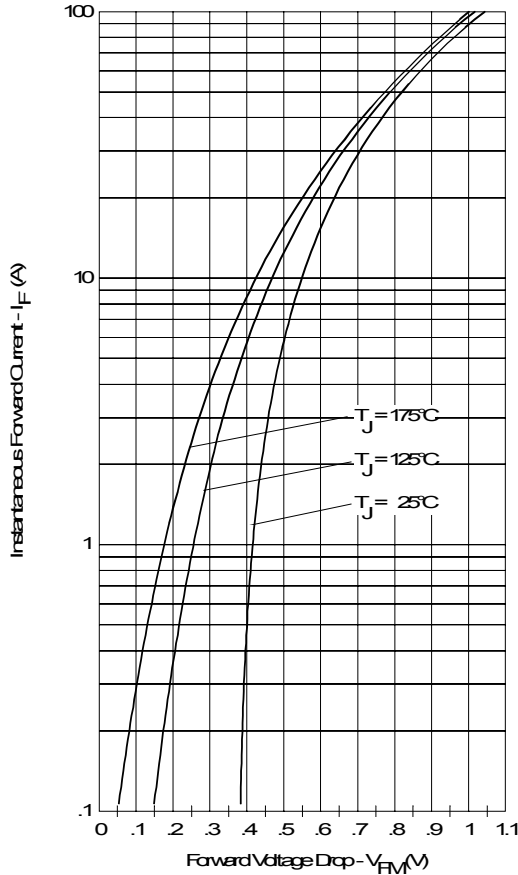


Fig. 1 - Maximum Forward Voltage Drop Characteristics

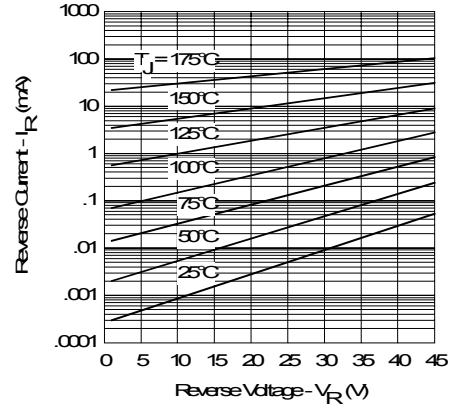


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

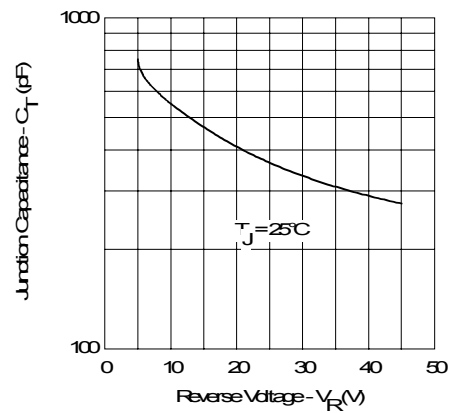


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

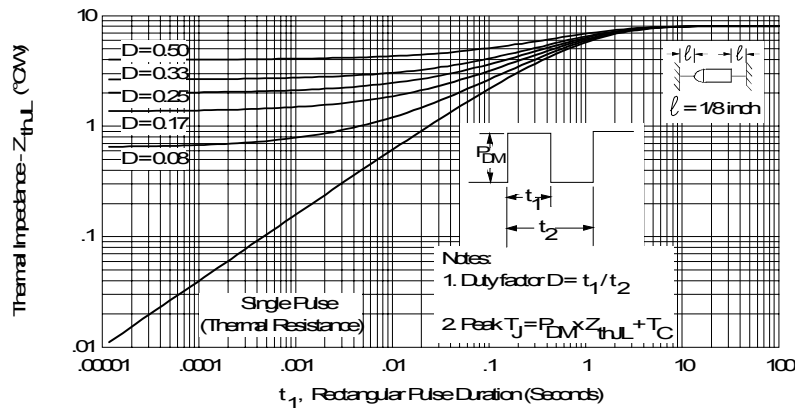


Fig. 4 - Maximum Thermal Impedance  $Z_{thJL}$  Characteristics

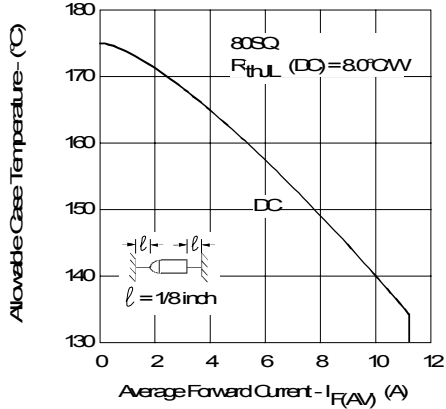


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

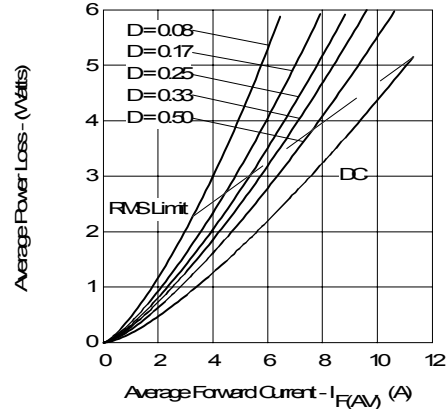


Fig. 6 - Forward Power Loss Characteristics

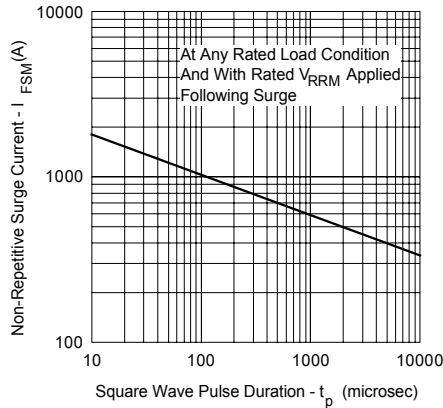


Fig. 7 - Maximum Non-Repetitive Surge Current

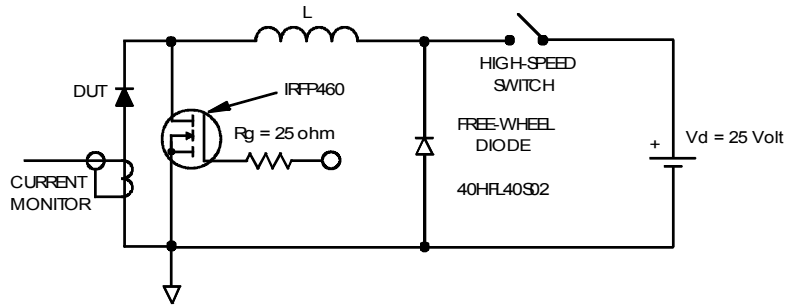


Fig. 8 - Unclamped Inductive Test Circuit

Ordering Information Table

| Device Code |   |    |     |    |     |    |   |   |   |   |   |
|-------------|---|----|-----|----|-----|----|---|---|---|---|---|
|             | <table border="1"> <tr> <td style="padding: 5px;">80</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">Q</td> <td style="padding: 5px;">045</td> <td style="padding: 5px;">TR</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> </tr> </table> | 80 | S   | Q  | 045 | TR | ① | ② | ③ | ④ | ⑤ |
| 80          | S   | Q  | 045 | TR |     |    |   |   |   |   |   |
| ①           | ②   | ③  | ④   | ⑤  |     |    |   |   |   |   |   |
| <b>1</b>    | - 80 = current x 10   |    |     |    |     |    |   |   |   |   |   |
| <b>2</b>    | - S = DO-204AR  |    |     |    |     |    |   |   |   |   |   |
| <b>3</b>    | - Q = Schottky Q Series   |    |     |    |     |    |   |   |   |   |   |
| <b>4</b>    | - Voltage Rating  |    |     |    |     |    |   |   |   |   |   |
| <b>5</b>    | - TR = Tape & Reel package (1500 pcs)<br>- = Box package (200 pcs)  |    |     |    |     |    |   |   |   |   |   |
|             | 030 = 30V<br>035 = 35V<br>040 = 40V<br>045 = 45V  |    |     |    |     |    |   |   |   |   |   |

Data and specifications subject to change without notice.  
 This product has been designed and qualified for Industrial Level and Lead-Free.  
 Qualification Standards can be found on IR's Web site.



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