

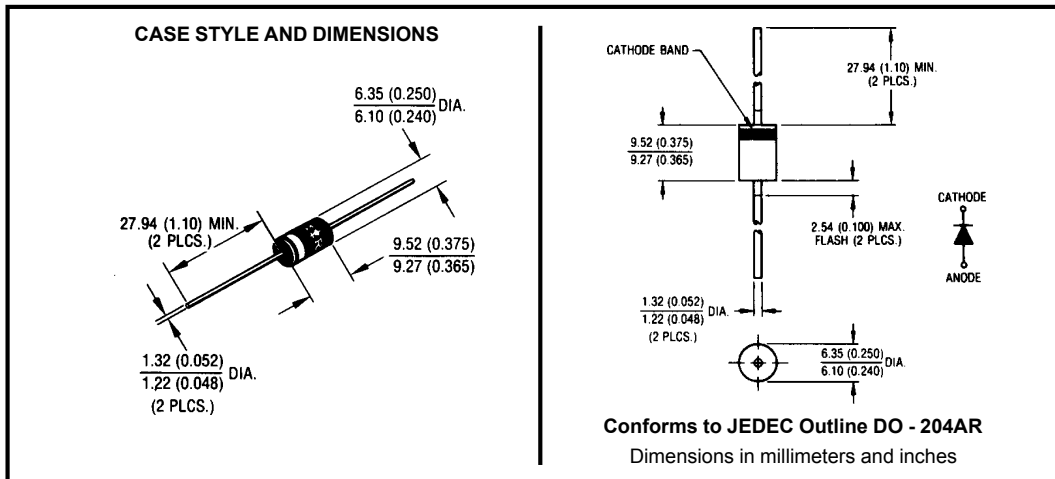
Major Ratings and Characteristics

| Characteristics | 90SQ... | Units |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 9 | A |
| V_{RRM} range | 35 to 45 | V |
| I_{FSM} @tp = 5 μ s sine | 2150 | A |
| V_F @9 Apk, $T_J = 125^\circ\text{C}$ | 0.42 | V |
| T_J range | -55 to 150 | $^\circ\text{C}$ |

Description/Features

The 90SQ axial leaded Schottky rectifier series 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, and reverse battery protection.

- 150° C T_J operation
- 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



Voltage Ratings

| Part number | 90SQ035 | 90SQ040 | 90SQ045 |
|---|---------|---------|---------|
| V_R Max. DC Reverse Voltage (V) | 35 | 40 | 45 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | | | |

Absolute Maximum Ratings

| Parameters | 90SQ | Units | Conditions |
|---|------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 5 | 9 | A | 50% duty cycle @ $T_C = 69^\circ\text{C}$, rectangular wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 2150 | A | Following any rated load condition and with rated V_{RRM} applied |
| | 340 | | |
| E_{AS} Non-Repetitive Avalanche Energy | 12 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 1.8\text{Amps}$, $L = 7.4\text{mH}$ |
| I_{AR} Repetitive Avalanche Current | 1.8 | A | Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical |

Electrical Specifications

| Parameters | 90SQ | Units | Conditions |
|---|-------|------------------|---|
| V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1 | 0.48 | V | @ 9A |
| | 0.57 | V | @ 18A |
| | 0.42 | V | @ 9A |
| | 0.52 | V | @ 18A |
| I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2 | 1.75 | mA | $T_J = 25^\circ\text{C}$ |
| | 70 | mA | $T_J = 125^\circ\text{C}$ |
| C_T Max. Junction Capacitance | 900 | pF | $V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°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/ μs | |

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

| Parameters | 90SQ | Units | Conditions |
|--|------------|--------------------|---|
| T_J Max. Junction Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| R_{thJL} Max. Thermal Resistance Junction to Lead | 8.0 | $^\circ\text{C/W}$ | DC operation * See Fig. 4 1/8 inch lead length |
| R_{thJA} Typical Thermal Resistance, Junction to Air | | 44 | $^\circ\text{C/W}$ |
| wt Approximate Weight | 1.4(0.049) | g(oz.) | |
| Case Style | DO-204AR | JEDEC | |

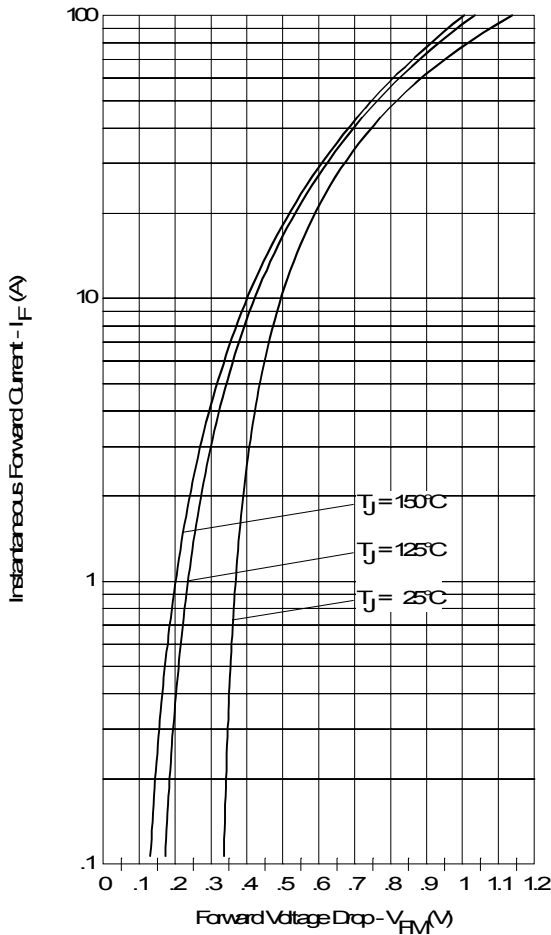


Fig. 1 - Maximum Forward Voltage Drop Characteristics

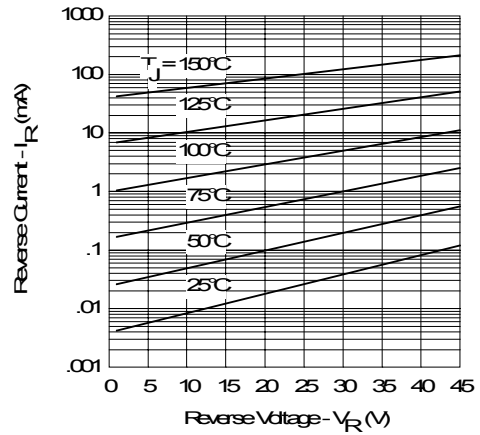


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

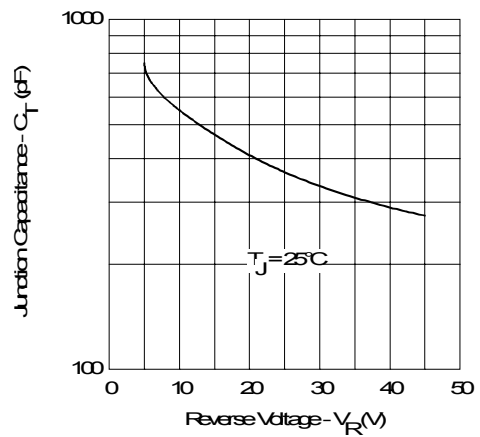


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

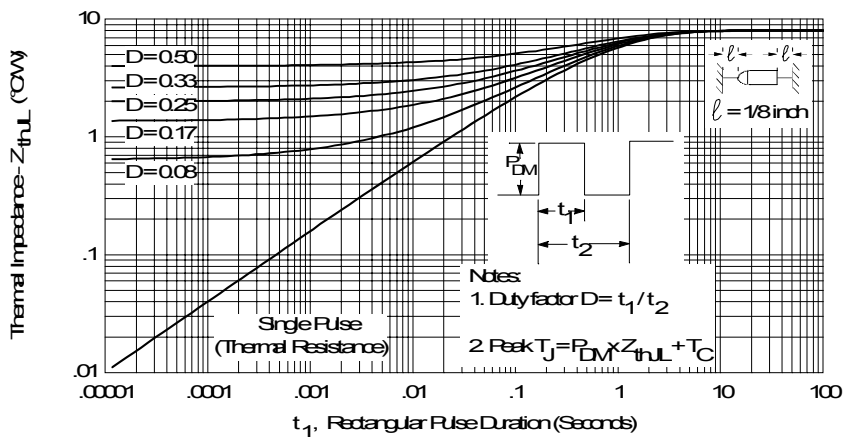


Fig. 4 - Maximum Thermal Impedance Z_{thL} Characteristics

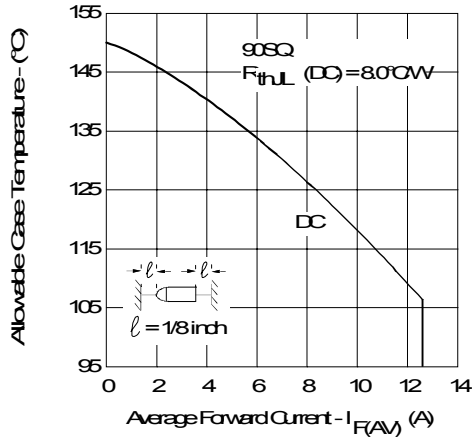


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

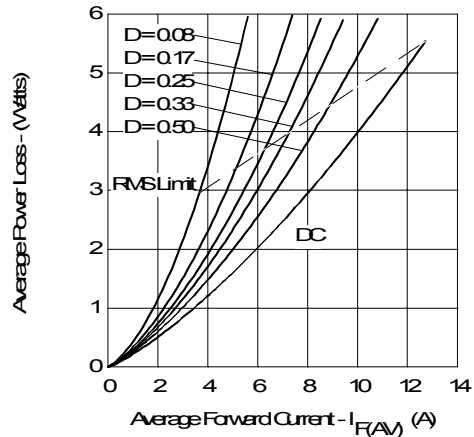


Fig. 6 - Forward Power Loss Characteristics

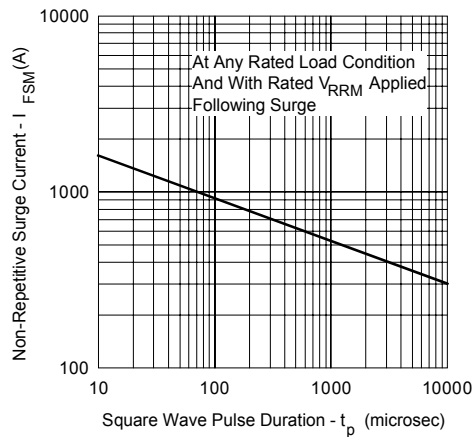


Fig. 7 - Maximum Non-Repetitive Surge Current

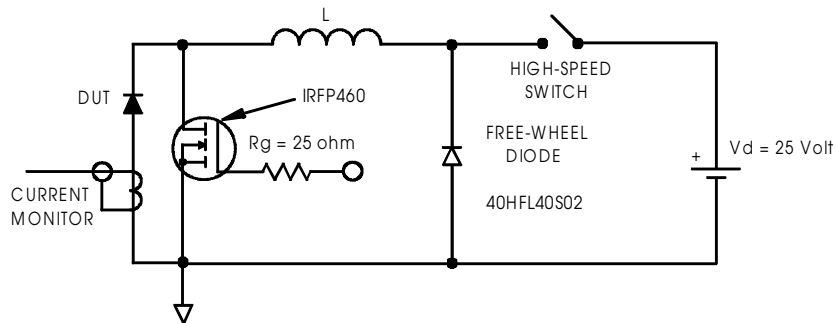


Fig. 8 - Unclamped Inductive Test Circuit

Ordering Information Table

Device Code

| | | | |
|-----------|----------|----------|------------|
| 90 | S | Q | 045 |
| ① | ② | ③ | ④ |

1 - Essential Part Number (current x10)
2 - S = DO-204AR
3 - Q = Schottky Q Series
4 - Voltage Rating

| |
|-----------|
| 035 = 35V |
| 040 = 40V |
| 045 = 45V |

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.