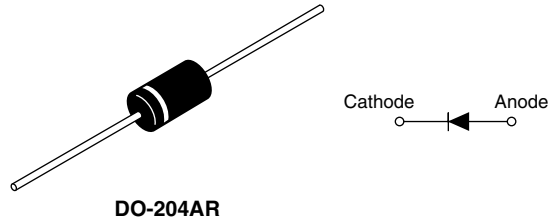


Schottky Rectifier, 9 A



FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free plating
- Designed and qualified for industrial level



PRODUCT SUMMARY

| | |
|-------------|---------------|
| $I_{F(AV)}$ | 9 A |
| V_R | 30/35/40/45 V |

DESCRIPTION

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, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---|-------------|------------------|
| $I_{F(AV)}$ | Rectangular waveform | 9 | A |
| V_{RRM} | Range | 30 to 45 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 2150 | A |
| V_F | 9 Apk, $T_J = 125 \text{ }^\circ\text{C}$ | 0.42 | V |
| T_J | Range | - 55 to 150 | $^\circ\text{C}$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 90SQ030 | 90SQ035 | 90SQ040 | 90SQ045 | UNITS |
|--------------------------------------|-----------|---------|---------|---------|---------|-------|
| Maximum DC reverse voltage | V_R | 30 | 35 | 40 | 45 | V |
| Maximum working peak reverse voltage | V_{RWM} | | | | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS | | |
|--|---|--|---|-------|---|--------------------------------|
| Maximum average forward current See fig. 5 | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 69 \text{ }^\circ\text{C}$, rectangular waveform | 9 | A | | |
| Maximum peak one cycle non-repetitive surge current See fig. 7 | I_{FSM} | <table border="1"> <tr> <td>5 μs sine or 3 μs rect. pulse</td> <td rowspan="2">Following any rated load condition and with rated V_{RRM} applied</td> </tr> <tr> <td>10 ms sine or 6 ms rect. pulse</td> </tr> </table> | 5 μs sine or 3 μs rect. pulse | | Following any rated load condition and with rated V_{RRM} applied | 10 ms sine or 6 ms rect. pulse |
| 5 μs sine or 3 μs rect. pulse | Following any rated load condition and with rated V_{RRM} applied | | | | | |
| 10 ms sine or 6 ms rect. pulse | | | | | | |
| Non-repetitive avalanche energy | E_{AS} | $T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 1.8 \text{ A}$, $L = 7.4 \text{ mH}$ | 12 | mJ | | |
| Repetitive avalanche current | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by, T_J maximum $V_A = 1.5 \times V_R$ typical | 1.8 | A | | |

| ELECTRICAL SPECIFICATIONS | | | | | |
|---|----------------|--|-----------------------------------|--------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop See fig. 1 | $V_{FM}^{(1)}$ | 9 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.48 | V |
| | | 18 A | | 0.57 | |
| | | 9 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.42 | |
| | | 18 A | | 0.52 | |
| Maximum reverse leakage current See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 1.75 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 70 | |
| Maximum junction capacitance | C_T | $V_R = 5 V_{DC}$, (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$ | | 900 | pF |
| Typical series inductance | L_S | Measured lead to lead 5 mm from body | | 10.0 | nH |
| Maximum voltage rate of change | dV/dt | Rated V_R | | 10 000 | V/ μ s |

Note

(1) Pulse width < 300 μ s, duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | |
|--|----------------|--|--|-------------|---------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | | - 55 to 150 | $^\circ\text{C}$ |
| Maximum thermal resistance, junction to lead | R_{thJL} | DC operation; see fig. 4 1/8" lead length | | 8.0 | $^\circ\text{C}/\text{W}$ |
| Typical thermal resistance, junction to air | R_{thJA} | | | 44 | |
| Approximate weight | | | | 1.4 | g |
| | | | | 0.049 | oz. |
| Marking device | | Case style DO-204AR (JEDEC) | | 90SQ030 | |
| | | | | 90SQ035 | |
| | | | | 90SQ040 | |
| | | | | 90SQ045 | |

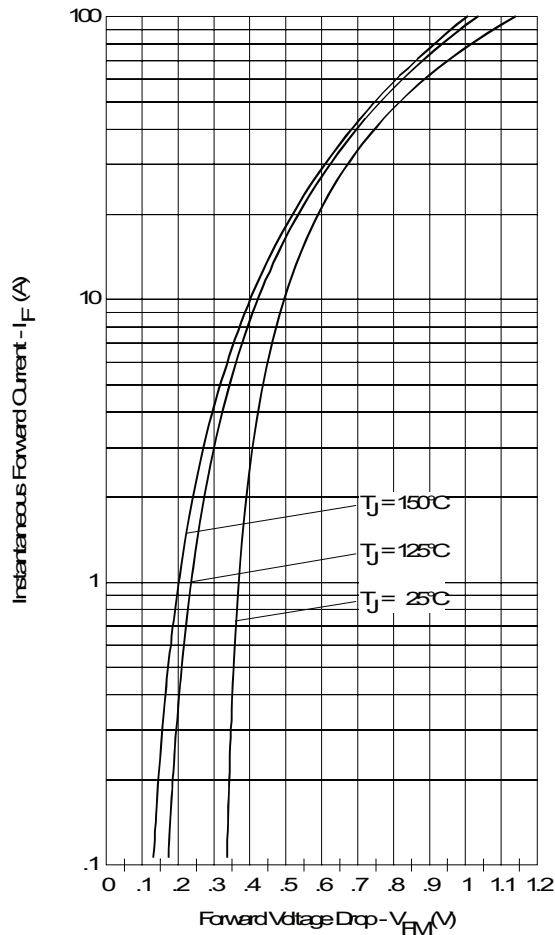


Fig. 1 - Maximum Forward Voltage Drop Characteristics

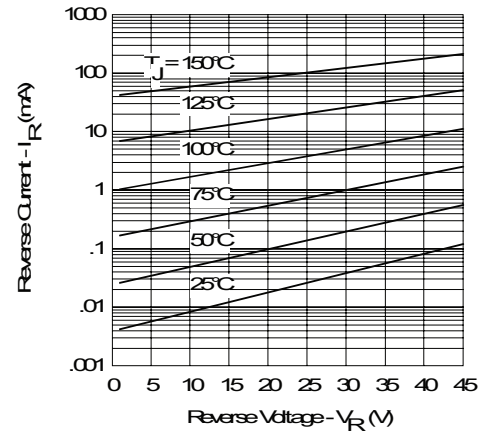


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

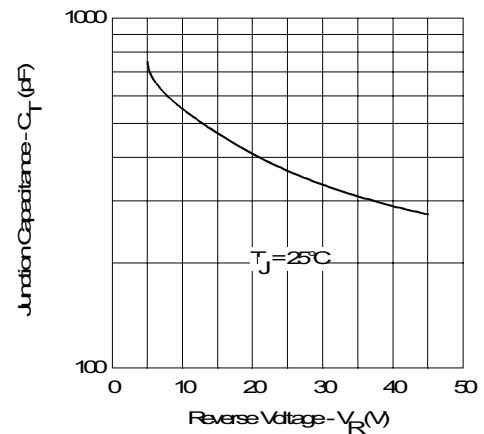


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

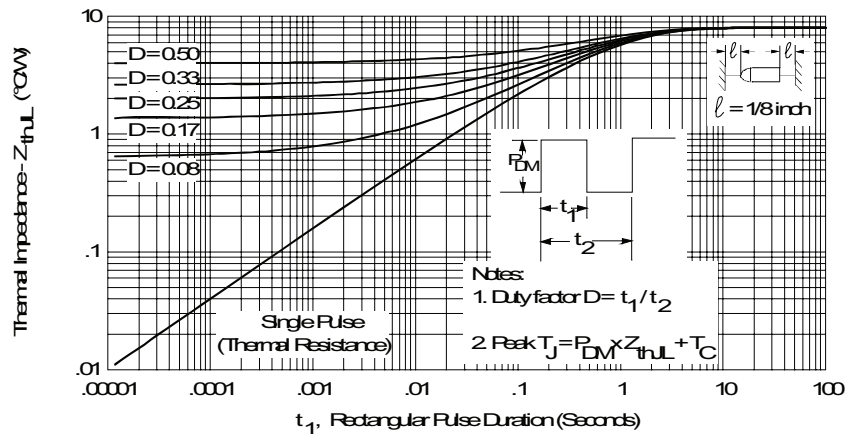


Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics

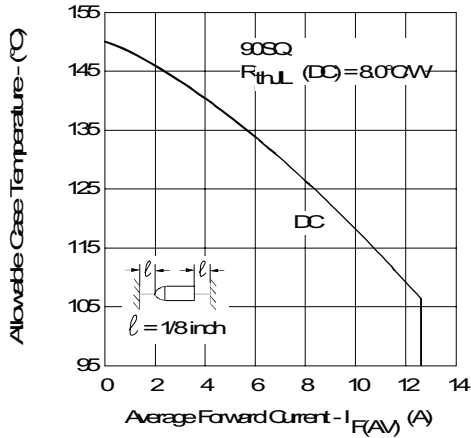


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

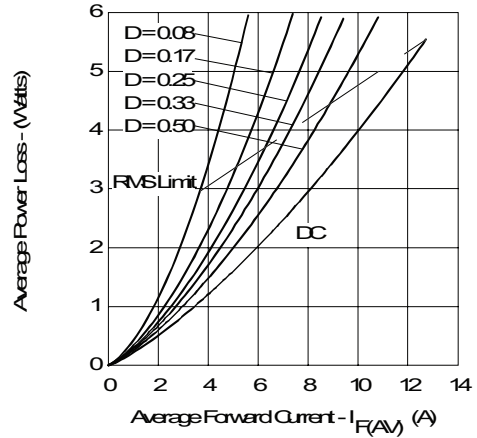


Fig. 6 - Forward Power Loss Characteristics

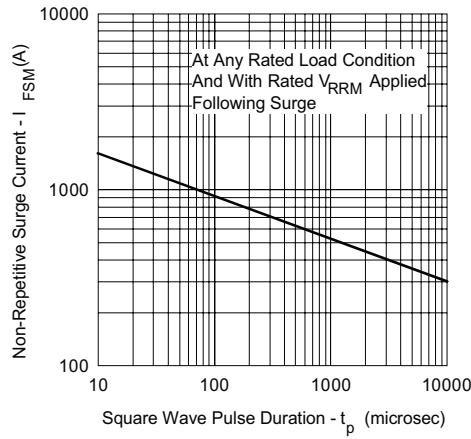


Fig. 7 - Maximum Non-Repetitive Surge Current

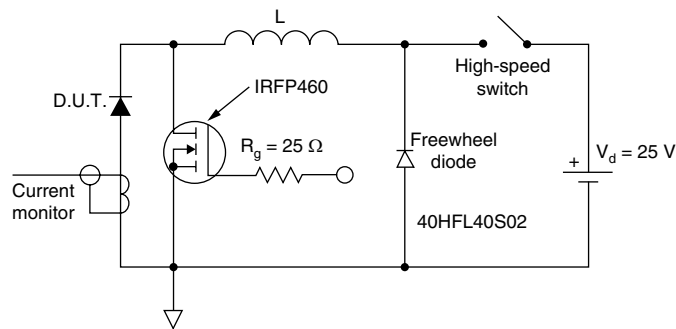
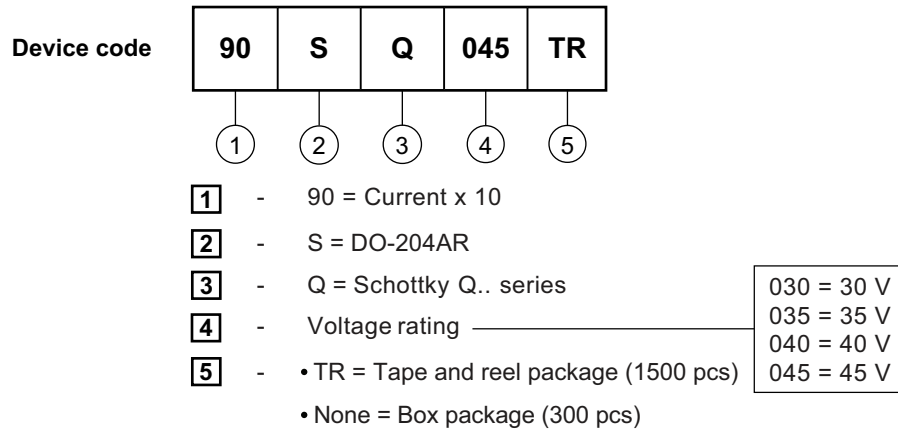


Fig. 8 - Unclamped Inductive Test Circuit



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