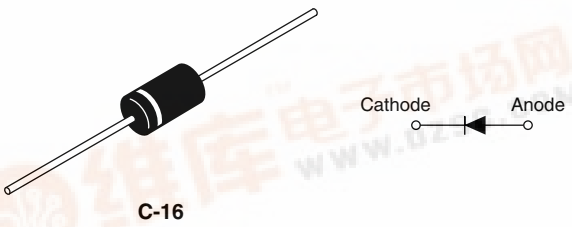
# Schottky Rectifier, 3.3 A




C-16

## FEATURES

- Low profile, axial leaded outline
- High frequency operation
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation forenhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long termreliability
- Lead (Pb)-free plating
- Designed and qualified for industrial level

RoHS COMPLIANT

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 3.3 A |
| $V_R$ | 90/100 V |

## DESCRIPTION

The 31DQ..G axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. 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 | 3.3 | A |
| $V_{RRM}$ | | 90/100 | V |
| $I_{FSM}$ | $t_p$ = 5 µs sine | 370 | A |
| $V_F$ | 3 Apk, $T_J$ = 25 °C | 0.85 | V |
| $T_J$ | | - 40 to 150 | °C |

| VOLTAGE RATINGS | | | | |
|---|---|---|---|---|
| PARAMETER | SYMBOL | 31DQ09G | 31DQ10G | UNITS |
| Maximum DC reverse voltage | $V_R$ | 90 | 100 | V |
| Maximum working peak reverse voltage | $V_{RWM}$ | | | |

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current See fig. 4 | $I_{F(AV)}$ | 50 % duty cycle at $T_C$ = 53.4 °C, rectangular waveform | | 3.3 | A |
| Maximum peak one cycle non-repetitive surge current, $T_J$ = 25 °C See fig. 6 | $I_{FSM}$ | 5 µs sine or 3 µs rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied | 370 | |
| | | 10 ms sine or 6 ms rect. pulse | | 60 | |
| Non-repetitive avalanche energy | $E_{AS}$ | $T_J$ = 25 °C, $I_{AS}$ = 1 A, 18 µs square pulse | | 3.0 | mJ |
| Repetitive avalanche current | $I_{AR}$ | Current decaying linearly to zero in 1 µs Frequency limited by $T_J$ maximum $V_A$ = 1.5 x $V_R$ typical | | 0.5 | A |

## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
|---|---|---|---|---|---|
| Maximum forward voltage drop See fig. 1 | $V_{FM}$ (1) | 3 A | $T_J$ = 25 °C | 0.85 | V |
| | | 6 A | | 0.97 | |
| | | 3 A | $T_J$ = 125 °C | 0.69 | |
| | | 6 A | | 0.80 | |
| Maximum reverse leakage current See fig. 2 | $I_{RM}$ (1) | $T_J$ = 25 °C | $V_R$ = Rated $V_R$ | 0.1 | mA |
| | | $T_J$ = 125 °C | | 3 | |
| Typical junction capacitance | $C_T$ | $V_R$ = 5 $V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C | | 110 | pF |
| Typical series inductance | $L_S$ | Measured lead to lead 5 mm from package body | | 9.0 | nH |
| Maximum voltage rate of charge | dV/dt | Rated $V_R$ | | 10 000 | V/µs |

**Note**

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

## THERMAL - MECHANICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Maximum junction and storage temperature range | $T_J$, $T_{Stg}$ | | - 40 to 150 | °C |
| Maximum thermal resistance, junction to ambient | $R_{thJA}$ | DC operation Without cooling fin | 80 | °C/W |
| Typical thermal resistance, junction to lead | $R_{thJL}$ | DC operation | 34 | |
| Approximate weight | | | 1.2 | g |
| | | | 0.042 | oz. |
| Marking device | | Case style C-16 | 31DQ09G | |
| | | | 31DQ10G | |

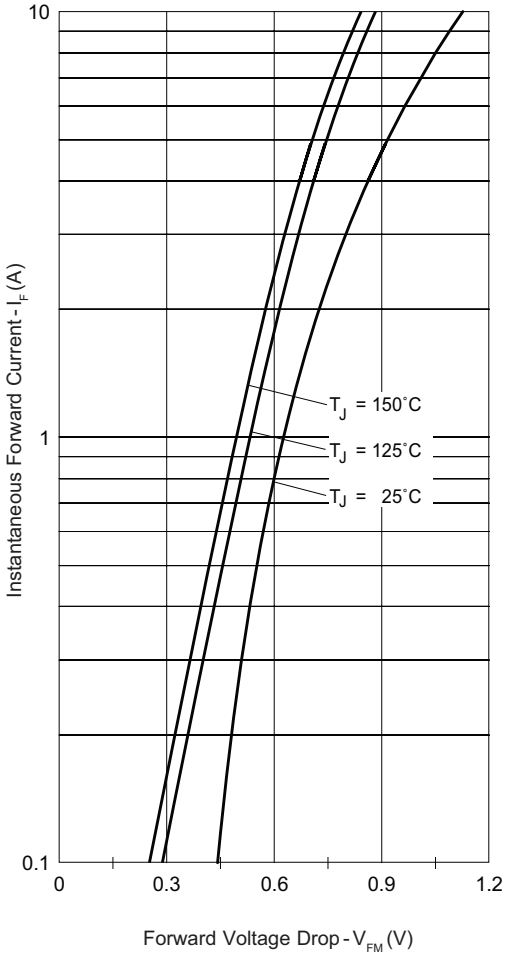



Fig. 1 - Maximum Forward Voltage Drop Characteristics

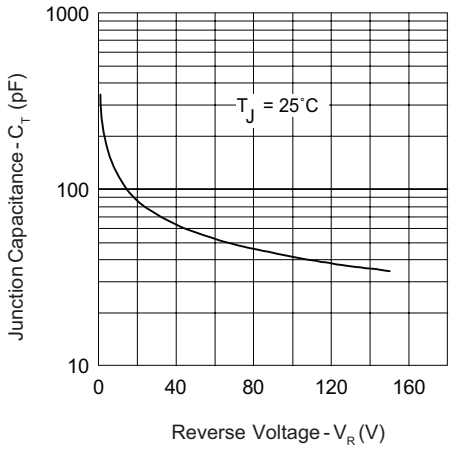



Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

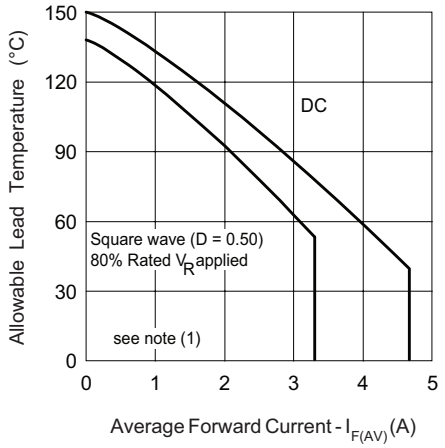



Fig. 4 - Maximum Allowable Lead Temperature vs. Average Forward Current

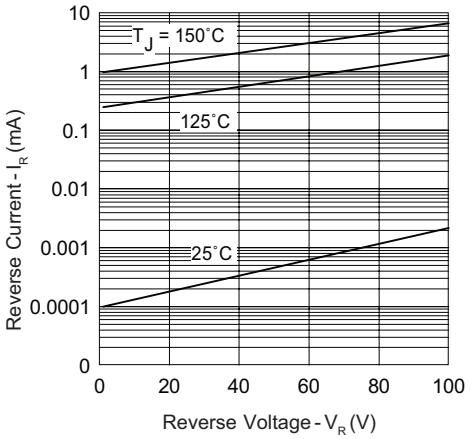



Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

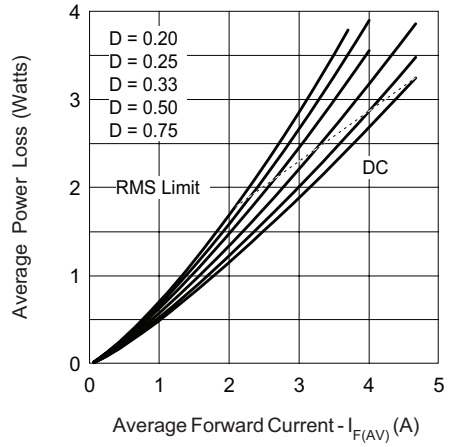



Fig. 5 - Forward Power Loss Characteristics

**Note**

(6) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at ($I_{F(AV)}$/D) (see fig. 6); $Pd_{REV}$ = Inverse power loss = $V_{R1} \times I_R$ (1 - D); $I_R$ at $V_{R1}$ = 80 % rated $V_R$

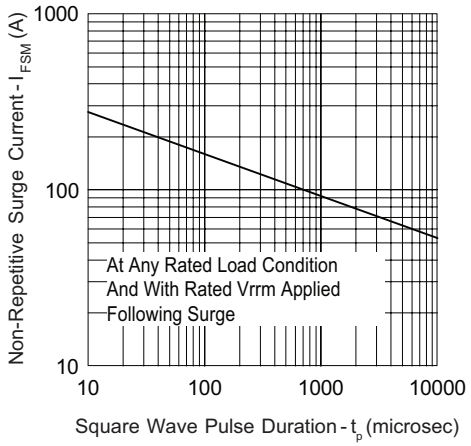



Fig. 6 - Maximum Non-Repetitive Surge Current

## ORDERING INFORMATION TABLE

**Device code**

| 31 | D | Q | 10 | G | TR | - |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1 - 31 = 3.3 A (axial and small packages - current is x 10)

2 - D = DO-41 package

3 - Q = Schottky Q.. series

4 - 10 = Voltage ratings (09 = 90 V, 10 = 100 V)

5 - G = Schottky generation

6 - • None = Box package (500 pcs)
• TR = Tape and reel package (1200 pcs)

7 - • None = Standard production
• PbF = Lead (Pb)-free

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | http://www.vishay.com/doc?95242 |
| Part marking information | http://www.vishay.com/doc?95304 |
| Packaging information | http://www.vishay.com/doc?95309 |
| SPICE model | http://www.vishay.com/doc?95300 |

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