

Schottky Rectifier, 2.1 A



SMA



FEATURES

- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level



Available

RoHS*
 COMPLIANT

PRODUCT SUMMARY

| | |
|-------------|-------|
| $I_{F(AV)}$ | 2.1 A |
| V_R | 60 V |

DESCRIPTION

The 10MQ060NPbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|------------------------------|-------------|------------|
| $I_{F(AV)}$ | DC | 2.1 | A |
| V_{RRM} | | 60 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 40 | A |
| V_F | 1.5 Apk, $T_J = 125^\circ C$ | 0.63 | V |
| T_J | Range | - 55 to 150 | $^\circ C$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 10MQ060NPbF | UNITS |
|--------------------------------------|-----------|-------------|-------|
| Maximum DC reverse voltage | V_R | 60 | 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 $T_L = 120^\circ C$, rectangular waveform On PC board 9 mm ² island (0.013 mm thick copper pad area) | 1.5 | A |
| Maximum peak one cycle non-repetitive surge current See fig. 6 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 40 | A |
| | | 10 ms sine or 6 ms rect. pulse | 10 | |
| Non-repetitive avalanche energy | E_{AS} | $T_J = 25^\circ C$, $I_{AS} = 1 A$, $L = 4 mH$ | 2.0 | mJ |
| Repetitive avalanche current | I_{AR} | | 1.0 | A |

* Pb containing terminations are not RoHS compliant, exemptions may apply

| ELECTRICAL SPECIFICATIONS | | | | | |
|---|----------------|---|-----------------------------------|--------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop See fig. 1 | $V_{FM}^{(1)}$ | 1 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.63 | V |
| | | 1.5 A | | 0.71 | |
| | | 1 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.57 | |
| | | 1.5 A | | 0.63 | |
| Maximum reverse leakage current See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 0.5 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 7.5 | |
| Threshold voltage | $V_{F(TO)}$ | $T_J = T_J \text{ maximum}$ | | 0.45 | V |
| Forward slope resistance | r_t | | | 86.8 | m Ω |
| Typical junction capacitance | C_T | $V_R = 10\text{ V}_{DC}$, $T_J = 25\text{ }^\circ\text{C}$, test signal = 1 MHz | | 31 | pF |
| Typical series inductance | L_S | Measured lead to lead 5 mm from package body | | 2.0 | nH |
| Maximum voltage rate of change | 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 | $T_J^{(1)}$, T_{Stg} | | | - 55 to 150 | $^\circ\text{C}$ |
| Maximum thermal resistance, junction to ambient | R_{thJA} | DC operation | | 80 | $^\circ\text{C/W}$ |
| Approximate weight | | | | 0.07 | g |
| | | | | 0.002 | oz. |
| Marking device | | Case style SMA (similar D-64) | | V1H | |

Note(1) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink

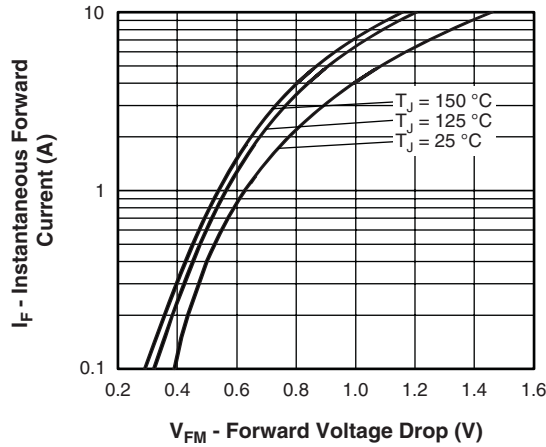


Fig. 1 - Maximum Forward Voltage Drop Characteristics

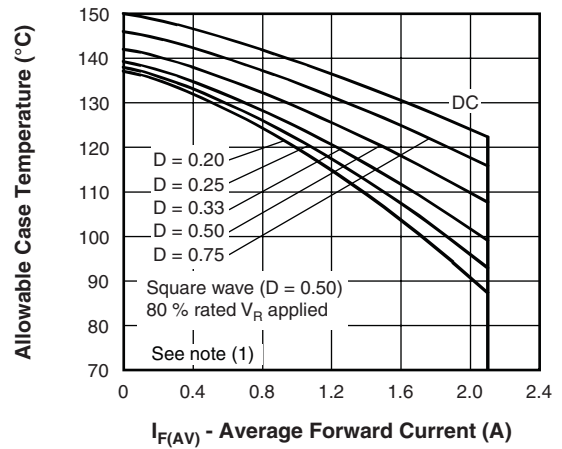


Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature

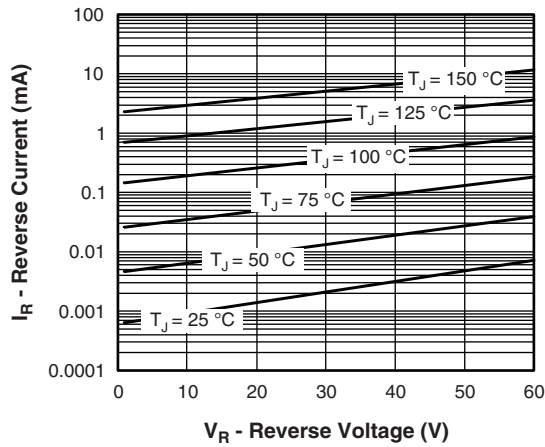


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

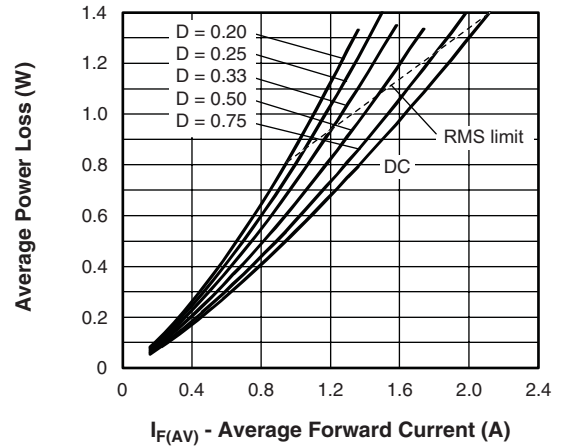


Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current

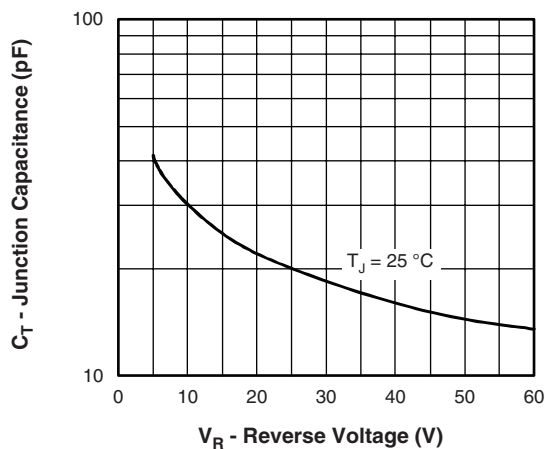


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

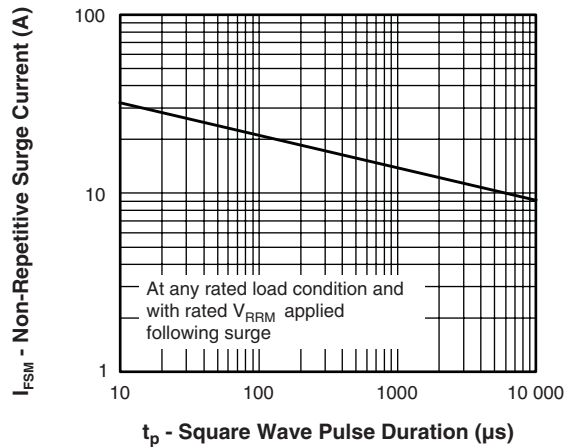


Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

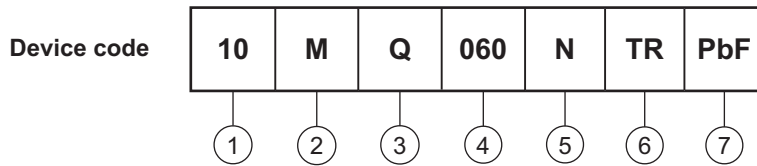
Note

(1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_{R1} (1 - D)$; I_{R1} at $V_{R1} = 80\%$ rated V_R



ORDERING INFORMATION TABLE



- 1** - Current rating
- 2** - M = SMA
- 3** - Q = Schottky "Q" series
- 4** - Voltage rating (060 = 60 V)
- 5** - N = New SMA
- 6** -
 - None = Box (1000 pieces)
 - TR = Tape and reel (7500 pieces)
- 7** -
 - None = Standard production
 - PbF = Lead (Pb)-free

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95018 |
| Part marking information | http://www.vishay.com/doc?95029 |
| Packaging information | http://www.vishay.com/doc?95034 |



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