# High Performance Schottky Rectifier, 100 A



PowerTab®




## FEATURES

- 175 °C max. operating junction temperature
- High frequency operation
- Low forward voltage drop
- Continuous high current operation
- Guard ring for enhanced ruggedness and long term reliability
- Screw mounting only
- Designed and qualified according to JEDEC®-JESD 47
- PowerTab® package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

## DESCRIPTION

The VS-100BGQ100 Schottky rectifier 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, reverse battery protection, and redundant power subsystems.

| PRODUCT SUMMARY | |
|---|---|
| Package | PowerTab® |
| $I_{F(AV)}$ | 100 A |
| $V_R$ | 100 V |
| $V_F$ at $I_F$ | 0.82 V |
| $I_{RM}$ | 180 mA at 125 °C |
| $T_J$ max. | 175 °C |
| Diode variation | Single die |
| $E_{AS}$ | 9 mJ |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rectangular waveform | 100 | A |
| | $T_C$ | 124 | °C |
| $V_{RRM}$ | | 100 | V |
| $I_{FSM}$ | $t_p$ = 5 µs sine | 6300 | A |
| $V_F$ | 100 $A_{pk}$ (typical) | 0.77 | V |
| | $T_J$ | 125 | °C |
| $T_J$ | Range | -55 to +175 | °C |

| VOLTAGE RATINGS | | | |
|---|---|---|---|
| PARAMETER | SYMBOL | 100BGQ100 | UNITS |
| Maximum DC reverse voltage | $V_R$ | 100 | V |
| Maximum working peak reverse voltage | $V_{RWM}$ | | |

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current | $I_{F(AV)}$ | 50 % duty cycle at $T_C$ = 124 °C, rectangular waveform | | 100 | A |
| Maximum peak one cycle non-repetitive surge current | $I_{FSM}$ | 5 µs sine or 3 µs rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied | 6300 | A |
| | | 10 ms sine or 6 ms rect. pulse | | 800 | |
| Non-repetitive avalanche energy | $E_{AS}$ | $T_J$ = 25 °C, $I_{AS}$ = 2 A, L = 4.5 mH | | 9 | mJ |
| Repetitive avalanche current | $I_{AR}$ | Current decaying linearly to zero in 1 µs<br>Frequency limited by $T_J$ maximum $V_A$ = 1.5 x $V_R$ typical | | 2 | A |


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## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | | UNITS |
|---|---|---|---|---|---|---|
| | | | | TYP. | MAX. | |
| Forward voltage drop | $V_{FM}$ (1) | 50 A | $T_J$ = 25 °C | 0.83 | 0.86 | V |
| | | 100 A | | 1.01 | 1.08 | |
| | | 50 A | $T_J$ = 125 °C | 0.66 | 0.7 | |
| | | 100 A | | 0.77 | 0.82 | |
| Reverse leakage current | $I_{RM}$ (1) | $T_J$ = 25 °C | $V_R$ = Rated $V_R$ | 22 | 300 | µA |
| | | $T_J$ = 125 °C | | 14 | 18 | mA |
| Maximum junction capacitance | $C_T$ | $V_R$ = 5 $V_{DC}$, (test signal range 100 kHz to 1 MHz) 25 °C | | 1320 | | pF |
| Typical series inductance | $L_S$ | Measured from tab to mounting plane | | 3.5 | | 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 | | $T_J$, $T_{Stg}$ | | -55 to +175 | °C |
| Maximum thermal resistance, junction to case | | $R_{thJC}$ | DC operation | 0.50 | °C/W |
| Typical thermal resistance, case to heatsink | | $R_{thCS}$ | Mounting surface, smooth and greased | 0.30 | |
| Approximate weight | | | | 5 | g |
| | | | | 0.18 | oz. |
| Mounting torque | minimum | | | 1.2 (10) | N · m (lbf · in) |
| | maximum | | | 2.4 (20) | |
| Marking device | | | Case style PowerTab® | 100BGQ100 | |


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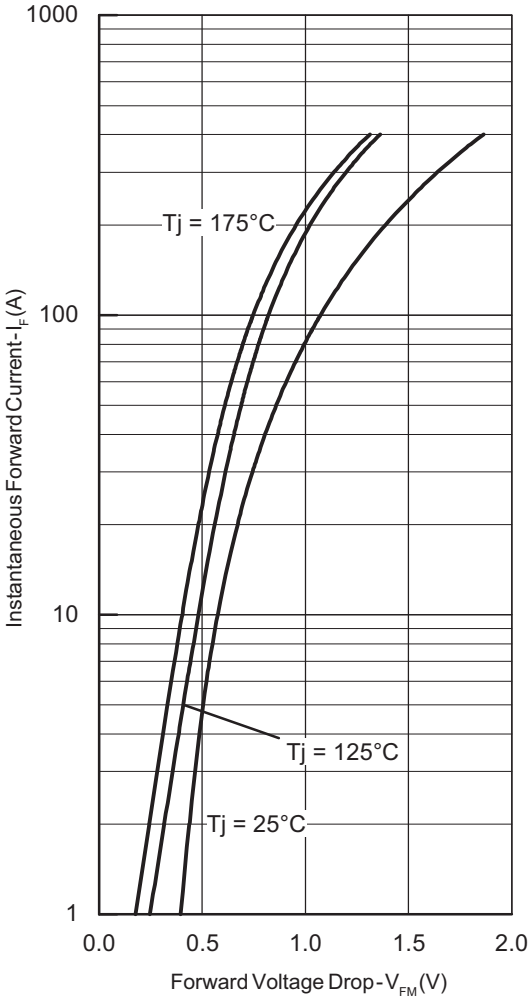



Fig. 1 - Maximum Forward Voltage Drop Characteristics

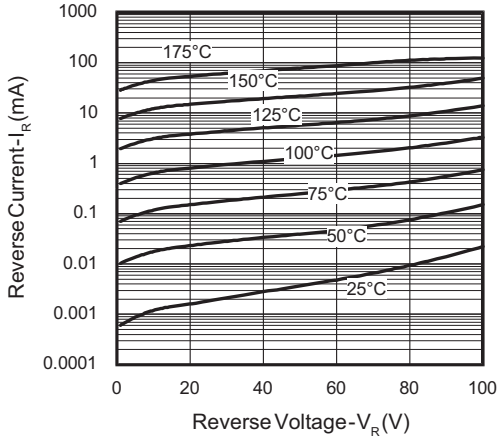



Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

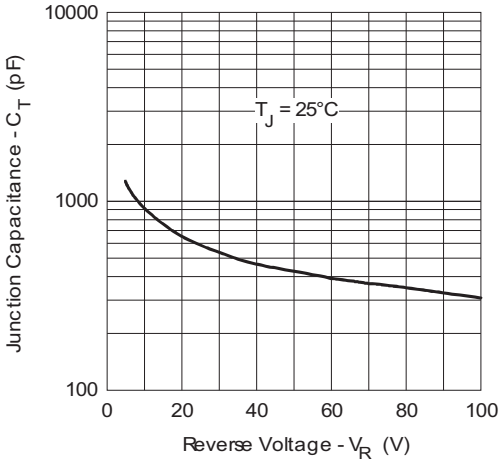



Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

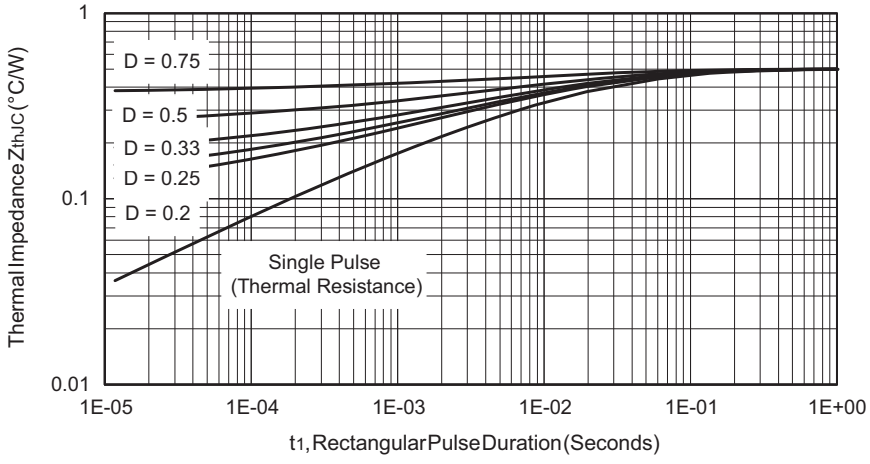



Fig. 4 - Maximum Thermal Impedance $Z_{thJC}$ Characteristics


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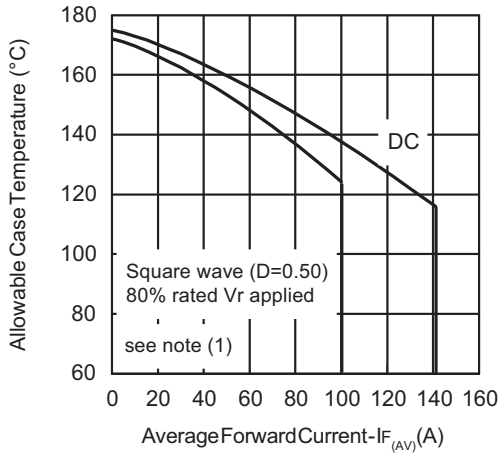



Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

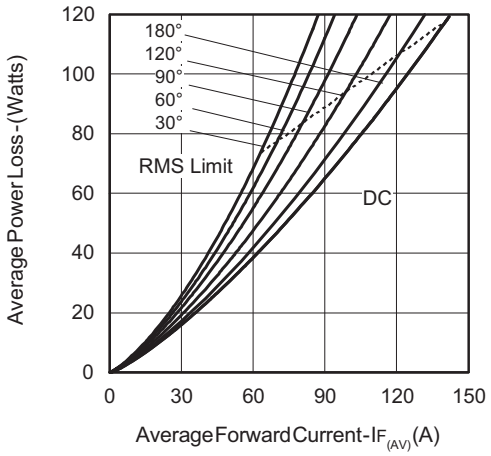



Fig. 6 - Forward Power Loss Characteristics

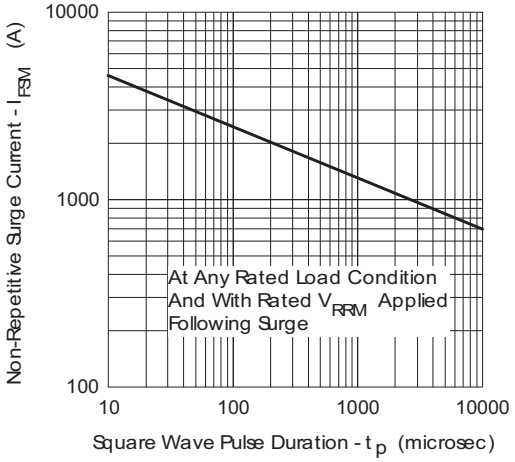



Fig. 7 - Maximum Non-Repetitive Surge Current

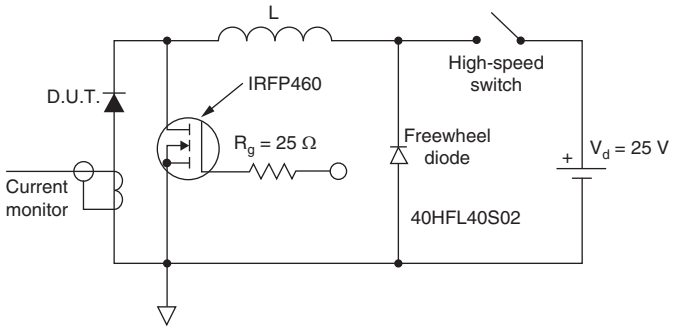



Fig. 8 - Unclamped Inductive Test Circuit

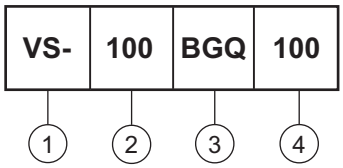
**Note**

(1) 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 $V_R$


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## ORDERING INFORMATION TABLE

**Device code**



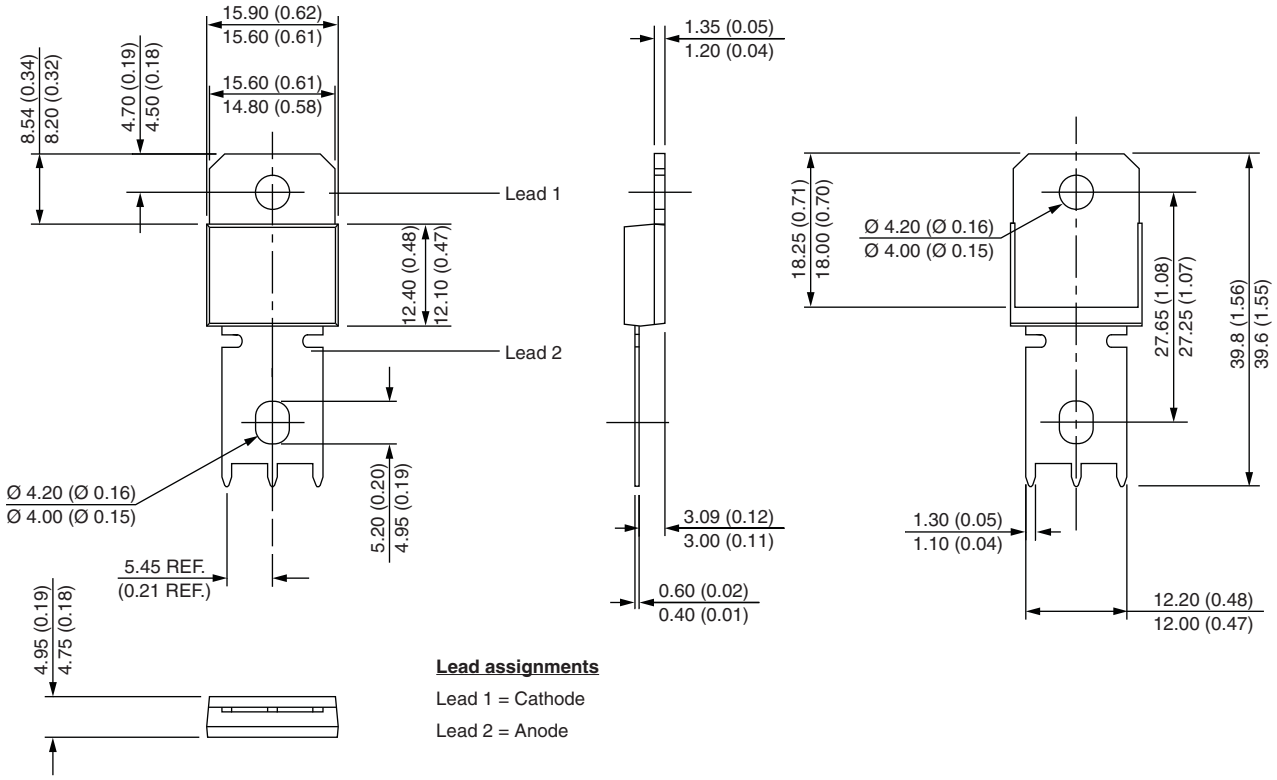

1 - Vishay Semiconductors product
2 - Current rating
3 - Essential part number
4 - Voltage code = $V_{RRM}$

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | www.vishay.com/doc?95240 |
| Part marking information | www.vishay.com/doc?95370 |
| Application note | www.vishay.com/doc?95179 |


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## PowerTab®

**DIMENSIONS** in millimeters (inches)




**Lead assignments**

Lead 1 = Cathode

Lead 2 = Anode



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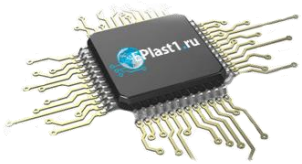
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**Телефон:** 8 (812) 309 58 32 (многоканальный)
**Факс:** 8 (812) 320-02-42
**Электронная почта:** org@eplast1.ru
**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.