

High Performance Schottky Rectifier, 100 A


PowerTab®


FEATURES

- 150 °C max. operating junction temperature
- High frequency operation
- Ultralow 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



RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



3D Models

| PRIMARY CHARACTERISTICS | |
|-------------------------|------------------|
| $I_{F(AV)}$ | 100 A |
| V_R | 45 V |
| V_F at I_F | 0.71 V |
| I_{RM} | 320 mA at 125 °C |
| T_J max. | 150 °C |
| E_{AS} | 36 mJ |
| Package | PowerTab® |
| Circuit configuration | Single |

DESCRIPTION

The VS-100BGQ045 Schottky rectifier has been optimized for ultra low forward voltage drop specifically for low voltage output in high current AC/DC power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MECHANICAL DATA

Case: PowerTab®

Molding compound meets UL 94 V-0 flammability rating

Terminal: nickel plated, screwable

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|-----------------------------------|-------------------------------|-------------|-------|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rectangular waveform | 100 | A |
| | T_C | 97 | °C |
| V_{RRM} | | 45 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 4400 | A |
| V_F | 100 A _{pk} (typical) | 0.65 | V |
| | T_J | 150 | °C |
| T_J | Range | -55 to +150 | °C |

| VOLTAGE RATINGS | | | |
|--------------------------------------|-----------|-----------|-------|
| PARAMETER | SYMBOL | 100BGQ045 | UNITS |
| Maximum DC reverse voltage | V_R | 45 | 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 = 97 °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 | 4400 | A |
| | | 10 ms sine or 6 ms rect. pulse | | 830 | |
| Non-repetitive avalanche energy | E _{AS} | T _J = 25 °C, I _{AS} = 6 A, L = 2 mH | | 36 | 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 | | 6 | A |

**ELECTRICAL SPECIFICATIONS**

| PARAMETER | SYMBOL | TEST CONDITIONS | | TYP. | MAX. | UNITS |
|--------------------------------|----------------|---|-------------------------------------|--------|------|------------------|
| Forward voltage drop | $V_{FM}^{(1)}$ | 50 A | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.54 | 0.58 | V |
| | | 100 A | | 0.69 | 0.77 | |
| | | 50 A | $T_J = 150\text{ }^{\circ}\text{C}$ | 0.48 | 0.52 | |
| | | 100 A | | 0.65 | 0.71 | |
| Reverse leakage current | $I_{RM}^{(1)}$ | $T_J = 150\text{ }^{\circ}\text{C}$, $V_R = 45\text{ V}$ | | 650 | 1000 | mA |
| | | $T_J = 25\text{ }^{\circ}\text{C}$ | $V_R = \text{Rated } V_R$ | 0.3 | 1 | |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | | 180 | 320 | |
| Maximum junction capacitance | C_T | $V_R = 5\text{ V}_{DC}$, (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ | | 2700 | | 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 +150 | °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 |
| Mounting torque | minimum | | 1.2 (10) | N · m (lbf · in) |
| | maximum | | 2.4 (20) | |
| Marking device | | Case style PowerTab® | 100BGQ045 | |

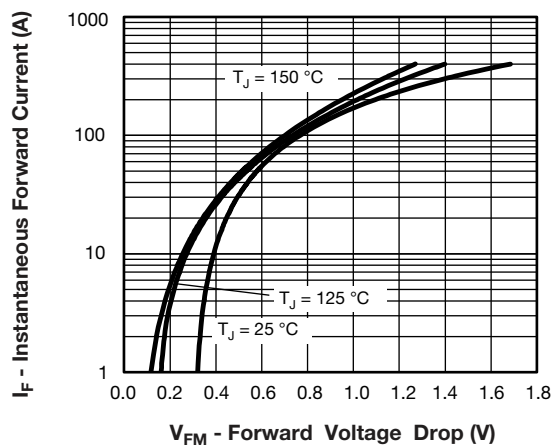


Fig. 1 - Maximum Forward Voltage Drop Characteristics

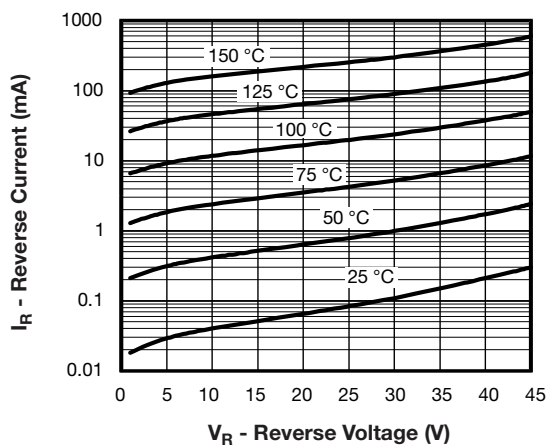


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

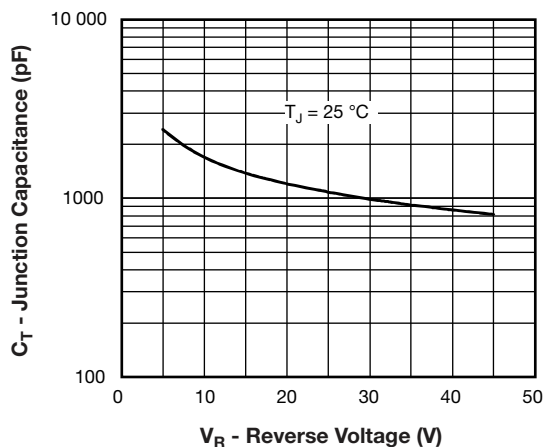
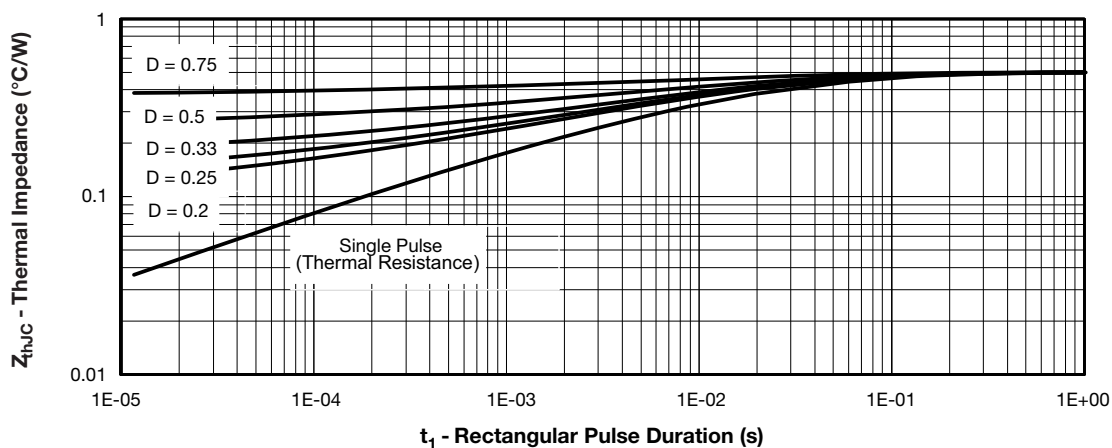


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

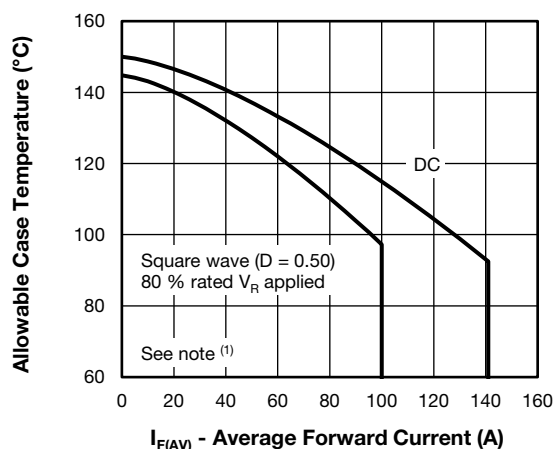


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

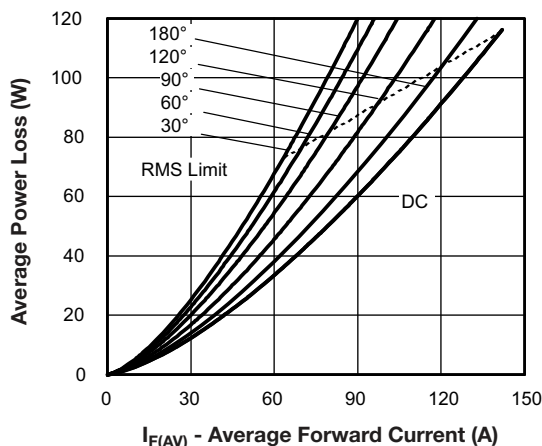


Fig. 6 - Forward Power Loss Characteristics

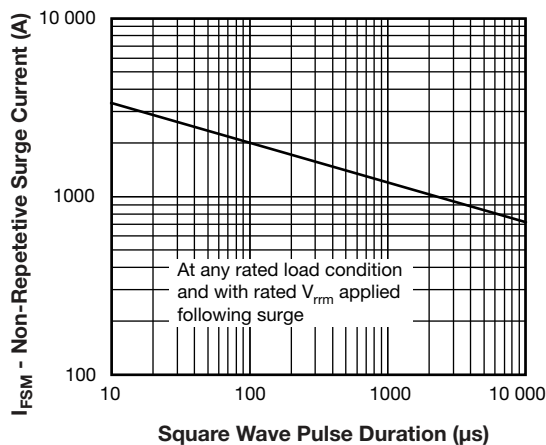


Fig. 7 - Maximum Non-Repetitive Surge Current

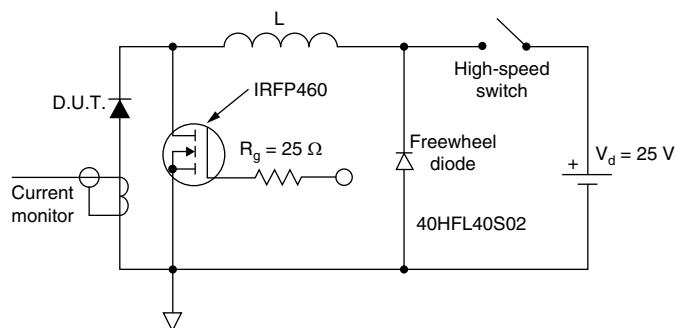


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 P_{dREV} = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R



ORDERING INFORMATION TABLE

| | | | | | |
|-------------|------------|------------|------------|------------|------------|
| Device code | VS- | 100 | BGQ | 045 | -N4 |
| | ① | ② | ③ | ④ | ⑤ |

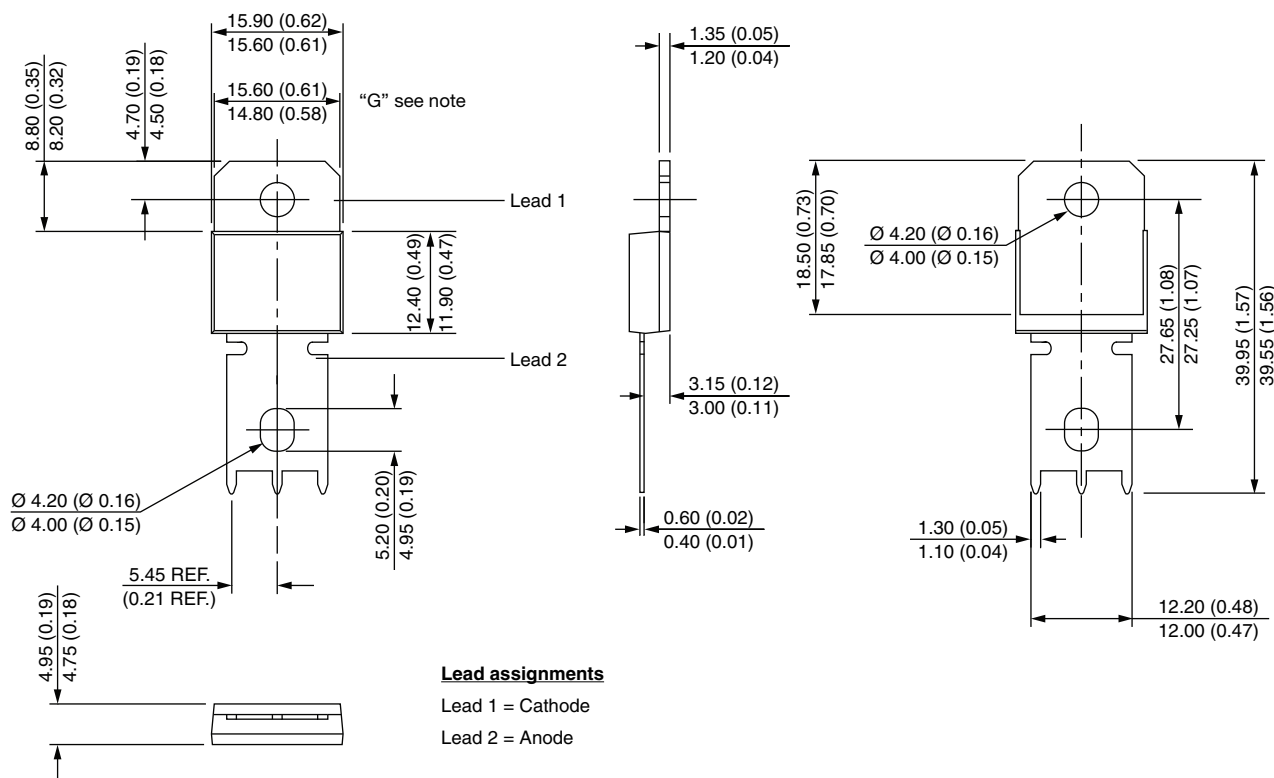
- | | | |
|----------|---|--|
| 1 | - | Vishay Semiconductors product |
| 2 | - | Current rating (100 = 100 A) |
| 3 | - | Essential part number |
| 4 | - | Voltage rating (045 = 45 V) |
| 5 | - | Environmental digit: -N4 = Halogen-free, RoHS compliant, and totally lead (Pb)-free |

| ORDERING INFORMATION (Example) | | |
|---------------------------------------|---------------|-------------------------|
| PREFERRED P/N | BASE QUANTITY | PACKAGING DESCRIPTION |
| VS-100BGQ045-N4 | 25/tube | Antistatic plastic tube |

| LINKS TO RELATED DOCUMENTS | |
|-----------------------------------|--|
| Dimensions | www.vishay.com/doc?95240 |
| Part marking information | www.vishay.com/doc?95467 |
| Application note | www.vishay.com/doc?95179 |

PowerTab®

DIMENSIONS in millimeters (inches)



Note:

Outline conform to JEDEC® TO-275, except for dimension "G" only



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