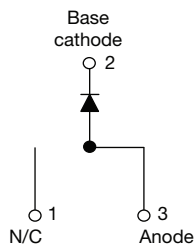


High Performance Schottky Rectifier, 8 A


D²PAK (TO-263AB)


FEATURES

- 175 °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
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

| | |
|----------------------------------|-------------------------------|
| I _{F(AV)} | 8 A |
| V _R | 80 V, 100 V |
| V _F at I _F | 0.58 V |
| I _{RM} | 7 mA at 125 °C |
| T _J max. | 175 °C |
| E _{AS} | 7.5 mJ |
| Package | D ² PAK (TO-263AB) |
| Circuit configuration | Single |

DESCRIPTION

The VS-8TQ... Schottky rectifier series 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, freewheeling diodes, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|--------------------|---|-------------|-------|
| I _{F(AV)} | Rectangular waveform | 8 | A |
| V _{RRM} | Range | 80/100 | V |
| I _{FSM} | t _p = 5 μs sine | 850 | A |
| V _F | 8 A _{pk} , T _J = 125 °C | 0.58 | V |
| T _J | Range | -55 to +175 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | VS-8TQ080S-M3 | VS-8TQ100S-M3 | UNITS |
|--------------------------------------|------------------|---------------|---------------|-------|
| Maximum DC reverse voltage | V _R | 80 | 100 | 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 = 157 °C, rectangular waveform | 8 | A |
| Maximum peak one cycle non-repetitive surge current See fig. 7 | I _{FSM} | 5 μs sine or 3 μs rect. pulse | 850 | A |
| | | 10 ms sine or 6 ms rect. pulse | 230 | |
| Non-repetitive avalanche energy | E _{AS} | T _J = 25 °C, I _{AS} = 0.50 A, L = 60 mH | 7.50 | 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 | 0.50 | A |

**ELECTRICAL SPECIFICATIONS**

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS | |
|---|----------------|--|-------------------------------------|--------|------------|--|
| Maximum forward voltage drop See fig. 1 | $V_{FM}^{(1)}$ | 8 A | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.72 | V | |
| | | 16 A | | 0.88 | | |
| | | 8 A | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.58 | | |
| | | 16 A | | 0.69 | | |
| Maximum reverse leakage current See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | $V_R = \text{Rated } V_R$ | 0.55 | mA | |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | | 7 | | |
| Maximum junction capacitance | C_T | $V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$ | | 500 | pF | |
| Typical series inductance | L_S | Measured lead to lead 5 mm from package body | | 8 | 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 +175 | °C |
| Maximum thermal resistance, junction to case | R _{thJC} | DC operation See fig. 4 | 2.0 | °C/W |
| Typical thermal resistance, case to heatsink | R _{thCS} | Mounting surface, smooth, and greased | 0.50 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Mounting torque | minimum | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | 12 (10) | |
| Marking device | | Case style D ² PAK (TO-263AB) | 8TQ080S | |
| | | | 8TQ100S | |

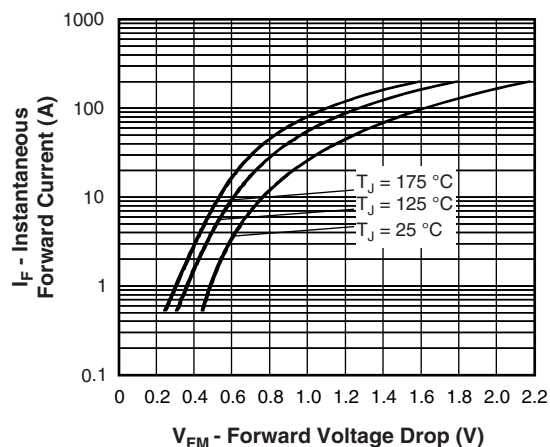


Fig. 1 - Maximum Forward Voltage Drop Characteristics

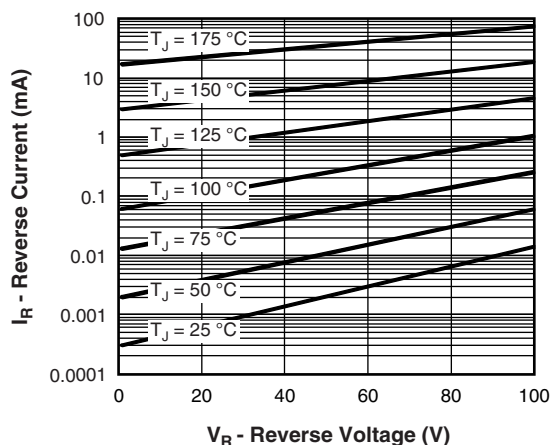


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

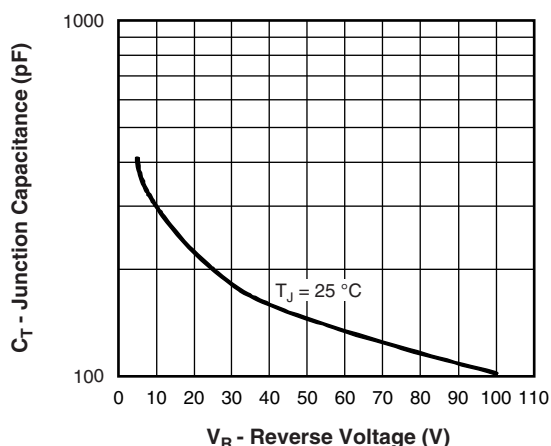


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

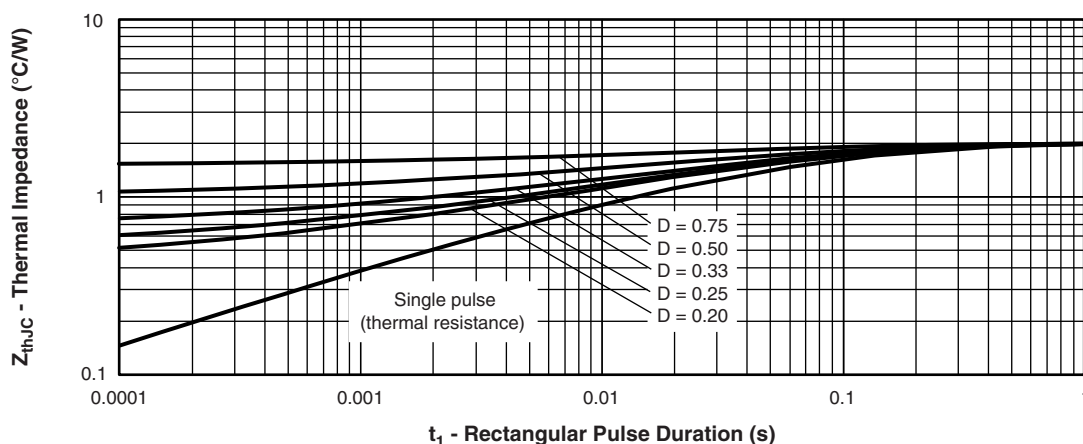
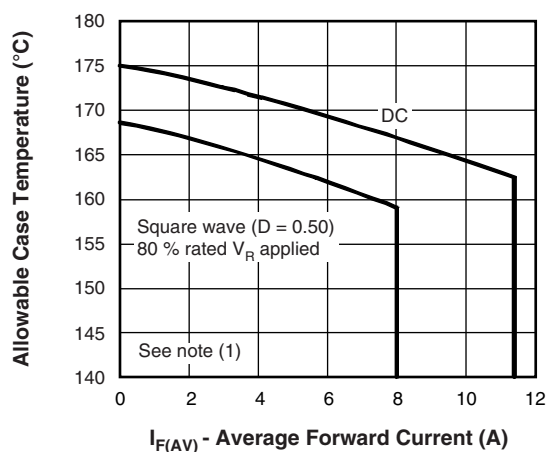

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics


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

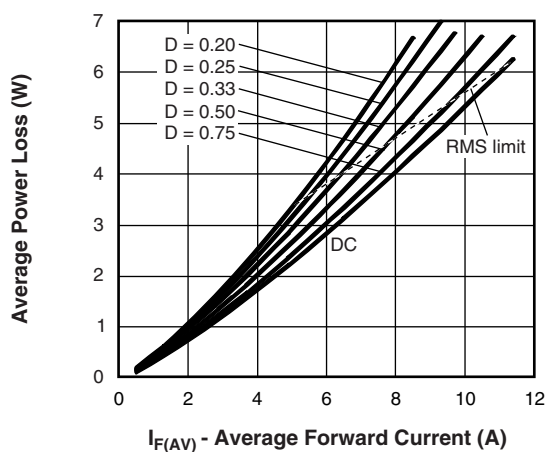


Fig. 6 - Forward Power Loss Characteristics

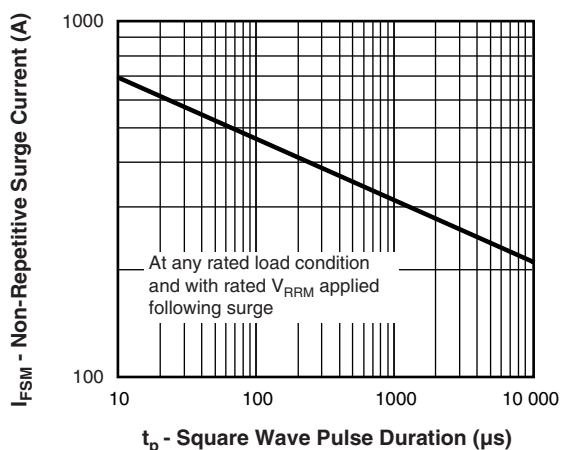


Fig. 7 - Maximum Non-Repetitive Surge Current

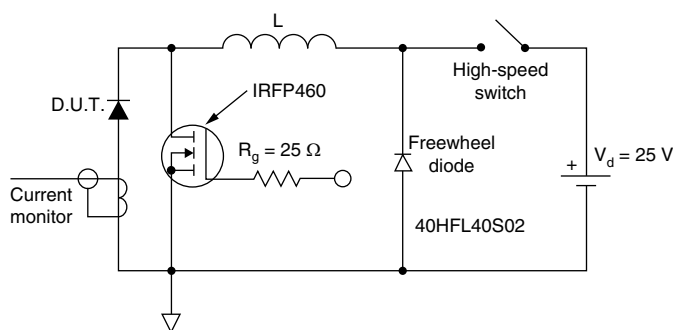


Fig. 8 - Unclamped Inductive Test Circuit

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- | 8 | T | Q | 100 | S | TRL | -M3 |
|-------------|-----|---|---|---|-----|---|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

- | | |
|---|--|
| 1 | - Vishay Semiconductors product |
| 2 | - Current rating (8 A) |
| 3 | - Circuit configuration: T = TO-220 |
| 4 | - Schottky "Q" series |
| 5 | - Voltage ratings |
| 6 | - S = D ² PAK (TO-263AB) |
| 7 | - <ul style="list-style-type: none"> • None = tube • TRL = tape and reel (left oriented) • TRR = tape and reel (right oriented) |
| 8 | - -M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free |

| |
|-------------|
| 080 = 80 V |
| 100 = 100 V |

**ORDERING INFORMATION**

| PREFERRED P/N | QUANTITY PER T/R | MINIMUM ORDER QUANTITY | PACKAGING DESCRIPTION |
|------------------|------------------|------------------------|--------------------------|
| VS-8TQ080S-M3 | 50 | 1000 | Antistatic plastic tubes |
| VS-8TQ080STRR-M3 | 800 | 800 | 13" diameter reel |
| VS-8TQ080STRL-M3 | 800 | 800 | 13" diameter reel |
| VS-8TQ100S-M3 | 50 | 1000 | Antistatic plastic tubes |
| VS-8TQ100STRR-M3 | 800 | 800 | 13" diameter reel |
| VS-8TQ100STRL-M3 | 800 | 800 | 13" diameter reel |

LINKS TO RELATED DOCUMENTS

| | |
|--------------------------|--|
| Dimensions | www.vishay.com/doc?96164 |
| Part marking information | www.vishay.com/doc?95444 |
| Packaging information | www.vishay.com/doc?96424 |
| SPICE model | www.vishay.com/doc?96227 |



D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.06 | 4.83 | 0.160 | 0.190 | |
| A1 | 0.00 | 0.254 | 0.000 | 0.010 | |
| b | 0.51 | 0.99 | 0.020 | 0.039 | |
| b1 | 0.51 | 0.89 | 0.020 | 0.035 | 4 |
| b2 | 1.14 | 1.78 | 0.045 | 0.070 | |
| b3 | 1.14 | 1.73 | 0.045 | 0.068 | 4 |
| c | 0.38 | 0.74 | 0.015 | 0.029 | |
| c1 | 0.38 | 0.58 | 0.015 | 0.023 | 4 |
| c2 | 1.14 | 1.65 | 0.045 | 0.065 | |
| D | 8.51 | 9.65 | 0.335 | 0.380 | 2 |

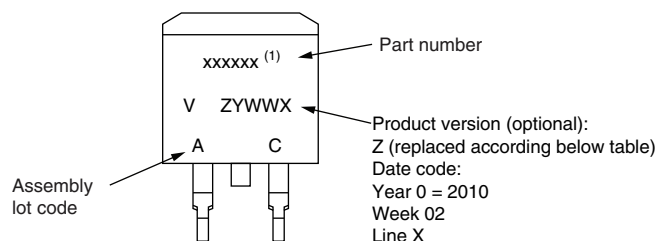
| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| D1 | 6.86 | 8.00 | 0.270 | 0.315 | 3 |
| E | 9.65 | 10.67 | 0.380 | 0.420 | 2, 3 |
| E1 | 7.90 | 8.80 | 0.311 | 0.346 | 3 |
| e | 2.54 BSC | | 0.100 BSC | | |
| H | 14.61 | 15.88 | 0.575 | 0.625 | |
| L | 1.78 | 2.79 | 0.070 | 0.110 | |
| L1 | - | 1.65 | - | 0.066 | 3 |
| L2 | 1.27 | 1.78 | 0.050 | 0.070 | |
| L3 | 0.25 BSC | | 0.010 BSC | | |
| L4 | 4.78 | 5.28 | 0.188 | 0.208 | |

Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch
- (7) Outline conforms to JEDEC® outline TO-263AB



D²PAK



Example: This is a xxxxxx ⁽¹⁾ with assembly lot code AC, assembled on WW 02, 2010

Note

⁽¹⁾ If part number contain "H" as last digit, product is AEC-Q101 qualified

| ENVIRONMENTAL NAMING CODE (Z) | PRODUCT DEFINITION |
|-------------------------------|--|
| A | Termination lead (Pb)-free |
| B | Totally lead (Pb)-free |
| E | RoHS-compliant and termination lead (Pb)-free |
| F | RoHS-compliant and totally lead (Pb)-free |
| M | Halogen-free, RoHS-compliant, and termination lead (Pb)-free |
| N | Halogen-free, RoHS-compliant, and totally lead (Pb)-free |
| G | Green |



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