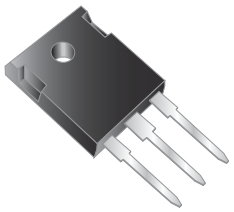
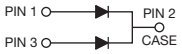
# Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F$ = 0.43 V at $I_F$ = 10 A

TMBS®



TO-3PW




## FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

HALOGEN FREE

## TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters and reverse battery protection.

## MECHANICAL DATA

**Case:** TO-3PW

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2 x 40 A |
| $V_{RRM}$ | 100 V |
| $I_{FSM}$ | 450 A |
| $E_{AS}$ at L = 180 mH | 700 mJ |
| $V_F$ at $I_F$ = 40 A | 0.64 V |
| $T_J$ max. | 150 °C |
| Package | TO-3PW |
| Diode variations | Dual common cathode |

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **V80100PW** | **UNIT** |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 100 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ | 80 | A |
| | per diode | | 40 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | | $I_{FSM}$ | 450 | A |
| Non-repetitive avalanche energy at $T_J$ = 25 °C, L = 180 mH per diode | | $E_{AS}$ | 700 | mJ |
| Peak repetitive reverse current at $t_p$ = 2 µs, 1 kHz, $T_J$ = 38 °C ± 2 °C per diode | | $I_{RRM}$ | 1.0 | A |
| Voltage rate of change (rated $V_R$) | | dV/dt | 10 000 | V/µs |
| Operating junction and storage temperature range | | $T_J$, $T_{STG}$ | -40 to +150 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Breakdown voltage | $I_R$ = 1.0 mA | $T_A$ = 25 °C | $V_{BR}$ | 100 (minimum) | - | V |
| Instantaneous forward voltage per diode | $I_F$ = 10 A | $T_A$ = 25 °C | $V_F$ (1) | 0.49 | - | V |
| | $I_F$ = 20 A | | | 0.59 | - | |
| | $I_F$ = 40 A | | | 0.76 | 0.84 | |
| | $I_F$ = 10 A | $T_J$ = 125 °C | | 0.43 | - | |
| | $I_F$ = 20 A | | | 0.55 | - | |
| | $I_F$ = 40 A | | | 0.64 | 0.76 | |
| Reverse current per diode | $V_R$ = 80 V | $T_A$ = 25 °C | $I_R$ (2) | 38 | - | µA |
| | | $T_A$ = 125 °C | | 17 | - | mA |
| | $V_R$ = 100 V | $T_A$ = 25 °C | | 85 | 1000 | µA |
| | | $T_A$ = 125 °C | | 33 | 76 | mA |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **V80100PW** | **UNIT** |
| Typical thermal resistance | per diode | $R_{\theta JC}$ | 1.5 | °C/W |
| | per device | | 0.8 | |

| ORDERING INFORMATION (Example) | | | | | |
|---|---|---|---|---|---|
| **PACKAGE** | **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| TO-3PW | V80100PW-M3/4W | 4.5 | 4W | 30/tube | Tube |

## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

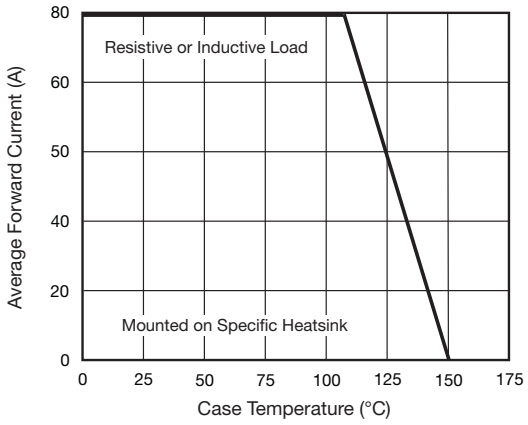



Fig. 1 - Forward Current Derating Curve

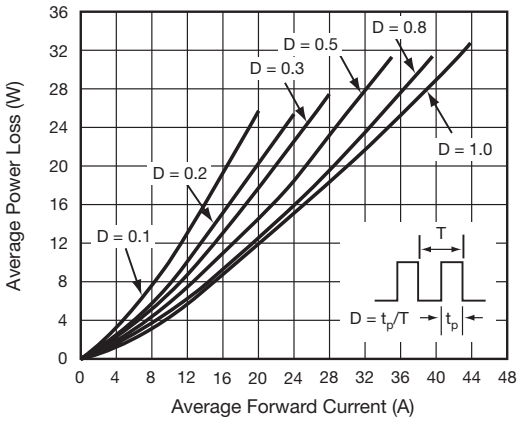



Fig. 2 - Forward Power Loss Characteristics Per Diode

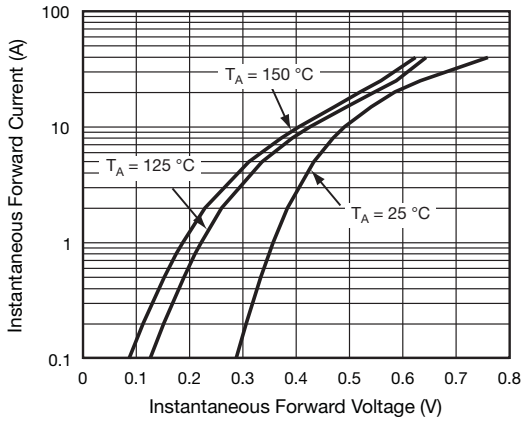



Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

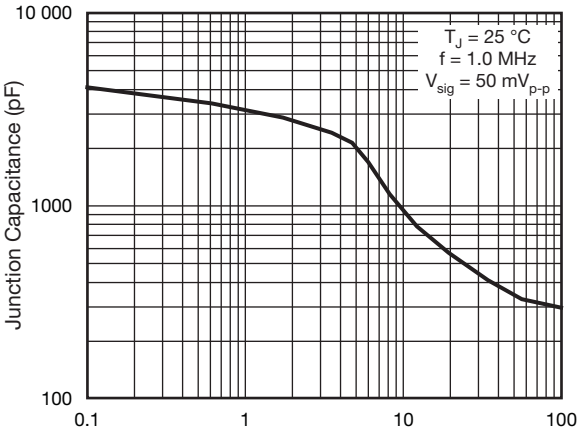



Fig. 5 - Typical Junction Capacitance Per Diode

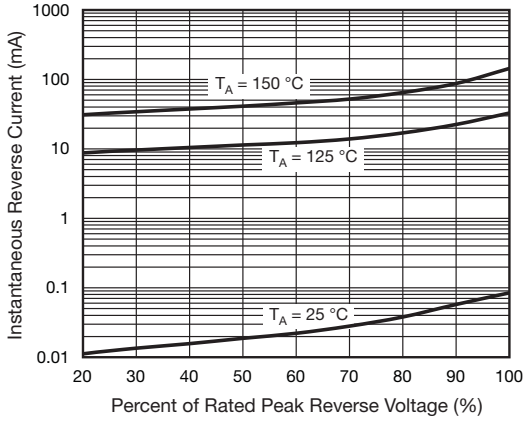



Fig. 4 - Typical Reverse Characteristics Per Diode

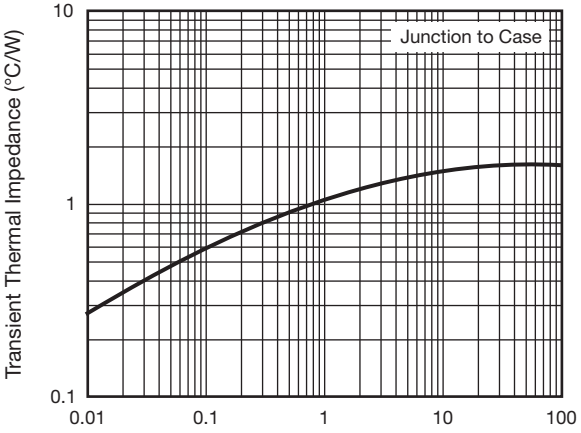
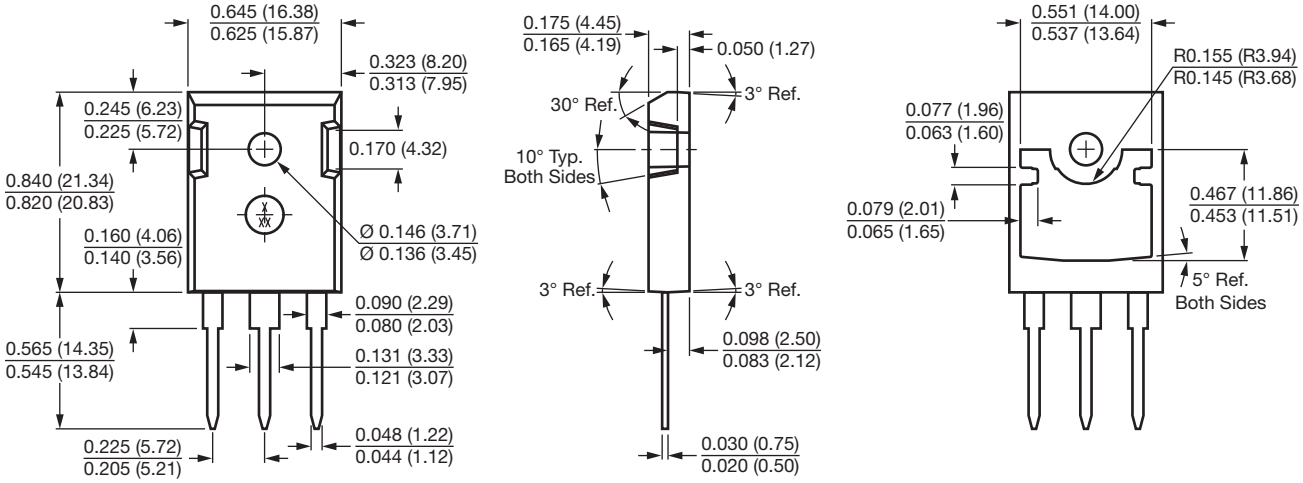



Fig. 6 - Typical Transient Thermal Impedance Per Diode

## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**TO-3PW**



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