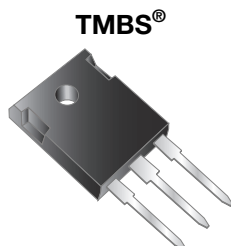




# Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.39\text{ V}$  at  $I_F = 5\text{ A}$



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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## TYPICAL APPLICATIONS

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

## PRIMARY CHARACTERISTICS

|                                 |          |
|---------------------------------|----------|
| $I_{F(AV)}$                     | 2 x 20 A |
| $V_{RRM}$                       | 100 V    |
| $I_{FSM}$                       | 300 A    |
| $E_{AS}$ at $L = 100\text{ mH}$ | 280 mJ   |
| $V_F$ at $I_F = 20\text{ A}$    | 0.61 V   |
| $T_J$ max.                      | 150 °C   |

## MECHANICAL DATA

**Case:** TO-3PW

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

## MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                                               | SYMBOL         | V40100PW      | UNIT             |
|-------------------------------------------------------------------------------------------------------------------------|----------------|---------------|------------------|
| Maximum repetitive peak reverse voltage                                                                                 | $V_{RRM}$      | 100           | V                |
| Maximum average forward rectified current (fig. 1)                                                                      | $I_{F(AV)}$    | 40            | A                |
|                                                                                                                         |                | 20            |                  |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode                            | $I_{FSM}$      | 300           | A                |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $L = 100\text{ mH}$ per diode                                 | $E_{AS}$       | 280           | mJ               |
| Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$ , 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$ per diode | $I_{RRM}$      | 1.0           | A                |
| Voltage rate of change (rated $V_R$ )                                                                                   | $dV/dt$        | 10 000        | V/ $\mu\text{s}$ |
| Operating junction and storage temperature range                                                                        | $T_J, T_{STG}$ | - 40 to + 150 | °C               |

## V40100PW

Vishay General Semiconductor



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                         |                         |                               |               |      |      |
|----------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------------|---------------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS         |                         | SYMBOL                        | TYP.          | MAX. | UNIT |
| Breakdown voltage                                                          | I <sub>R</sub> = 1.0 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub>               | 100 (minimum) | -    | V    |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.48          | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A   |                         |                               | 0.56          | -    |      |
|                                                                            | I <sub>F</sub> = 20 A   |                         |                               | 0.69          | 0.77 |      |
|                                                                            | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 125 °C |                               | 0.39          | -    |      |
|                                                                            | I <sub>F</sub> = 10 A   |                         |                               | 0.50          | -    |      |
|                                                                            | I <sub>F</sub> = 20 A   |                         |                               | 0.61          | 0.69 |      |
| Reverse current per diode                                                  | V <sub>R</sub> = 70 V   | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 23            | -    | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 11            | -    | mA   |
|                                                                            | V <sub>R</sub> = 100 V  | T <sub>A</sub> = 25 °C  |                               | -             | 1000 | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 29            | 80   | mA   |

## Notes

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |            |                 |          |                      |
|--------------------------------------------------------------------------------------|------------|-----------------|----------|----------------------|
| PARAMETER                                                                            |            | SYMBOL          | V40100PW | UNIT                 |
| Typical thermal resistance                                                           | per diode  | $R_{\theta JC}$ | 1.5      | $^{\circ}\text{C/W}$ |
|                                                                                      | per device |                 | 0.8      |                      |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-3PW                         | V40100PW-M3/4W | 4.5             | 4W           | 30/tube       | Tube          |

## RATINGS AND CHARACTERISTICS CURVES

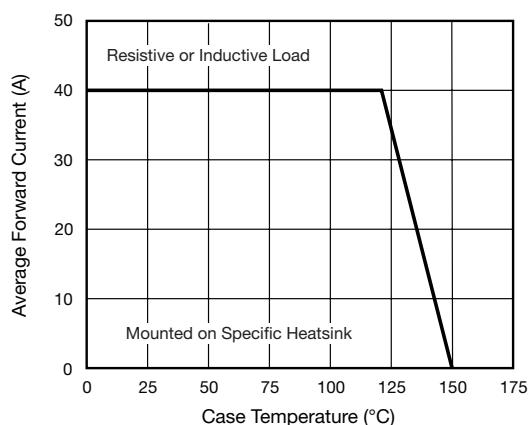
( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

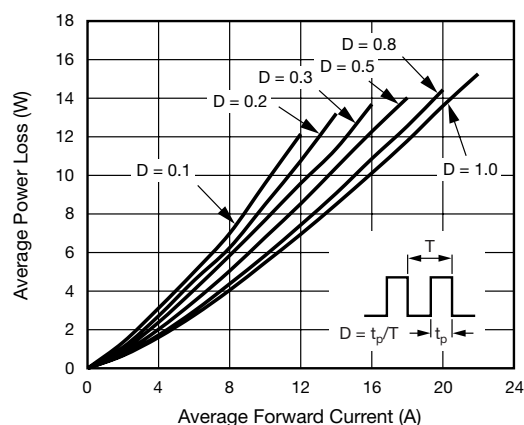


Fig. 2 - Forward Power Loss Characteristics Per Diode

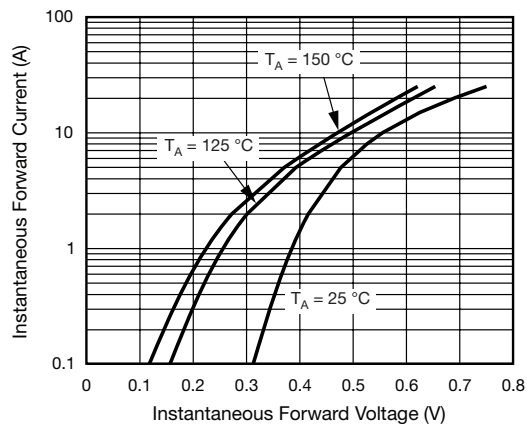


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

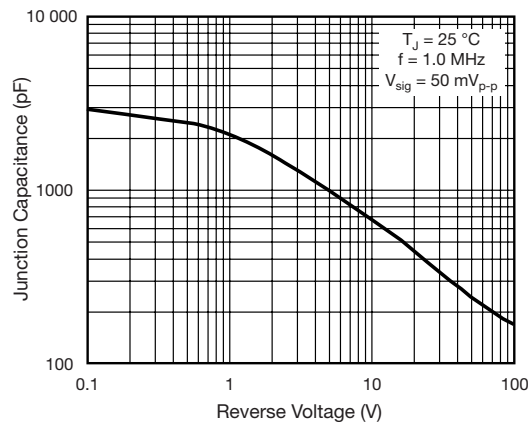


Fig. 5 - Typical Junction Capacitance Per Diode

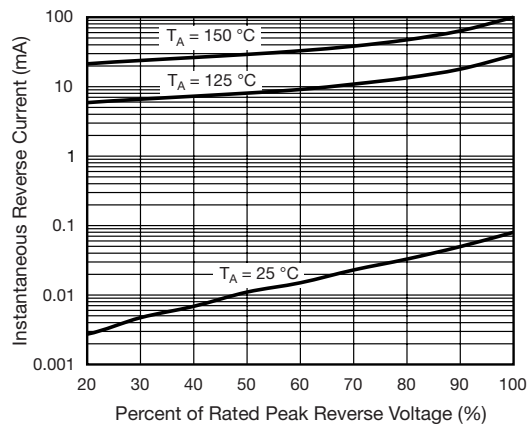


Fig. 4 - Typical Reverse Characteristics Per Diode

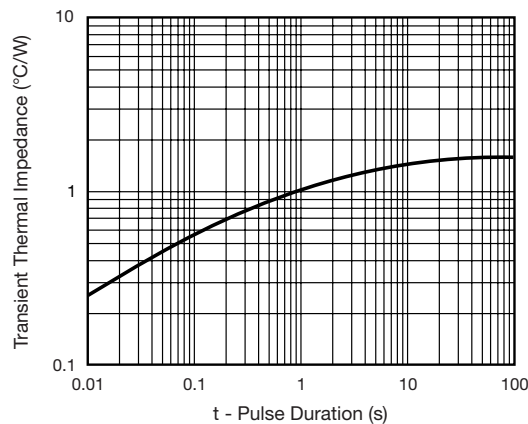
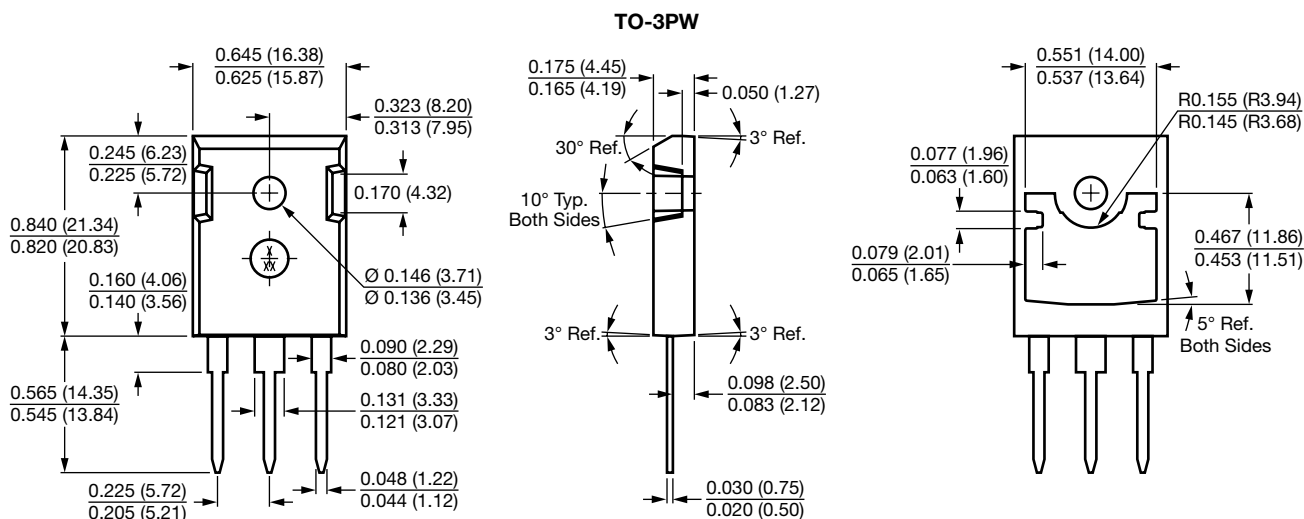


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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





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