



# 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 25 A
$V_{RRM}$	100 V
$I_{FSM}$	300 A
$E_{AS}$ at $L = 100\text{ mH}$	280 mJ
$V_F$ at $I_F = 25\text{ A}$	0.66 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	V50100PW	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	50	A
		25	
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

## V50100PW

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	-	
	I <sub>F</sub> = 25 A			0.76	0.84	
	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	-	
	I <sub>F</sub> = 25 A			0.66	0.74	
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	V50100PW	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	V50100PW-M3/4W	4.5	4W	30/tube	Tube

## RATINGS AND CHARACTERISTICS CURVES

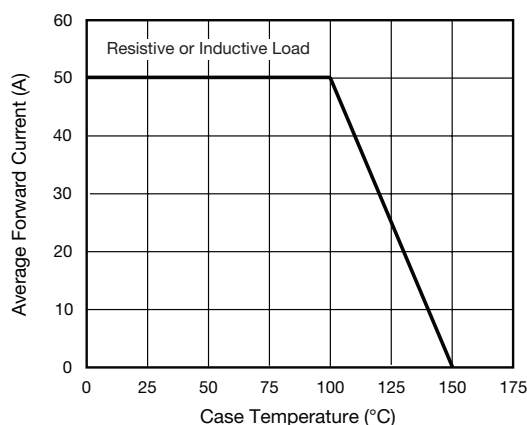
 $(T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

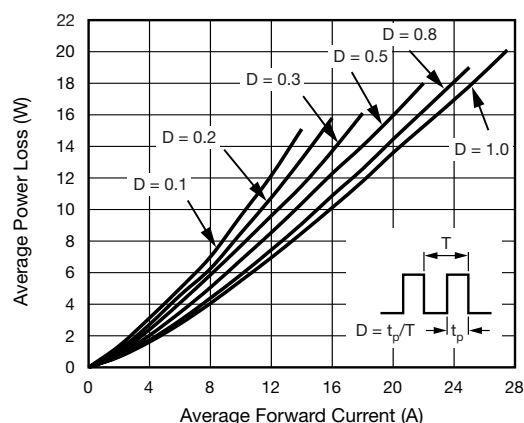


Fig. 2 - Forward Power Loss Characteristics Per Diode

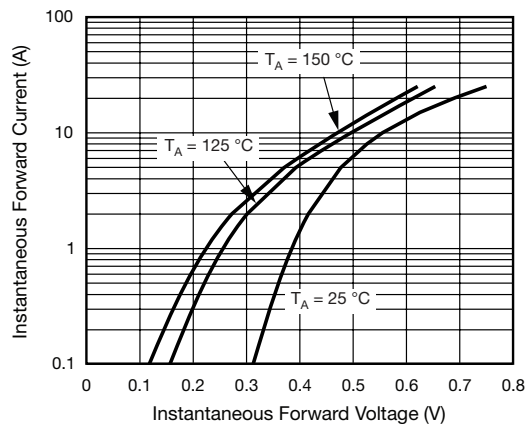


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

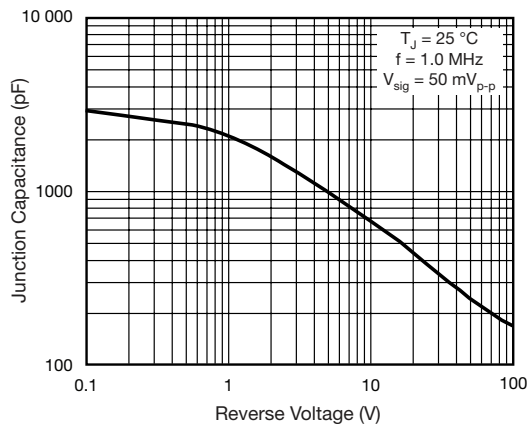


Fig. 5 - Typical Junction Capacitance Per Diode

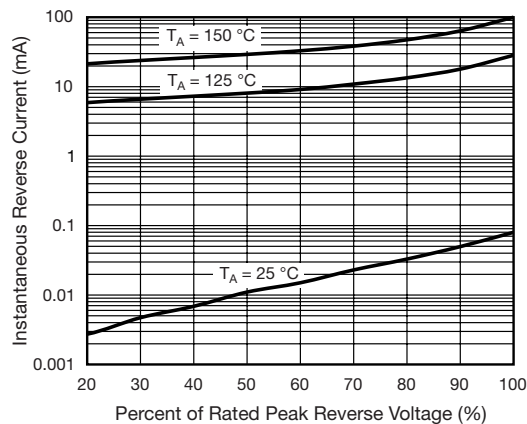


Fig. 4 - Typical Reverse Characteristics Per Diode

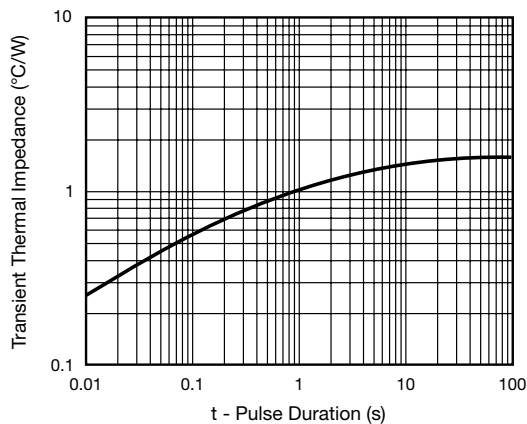
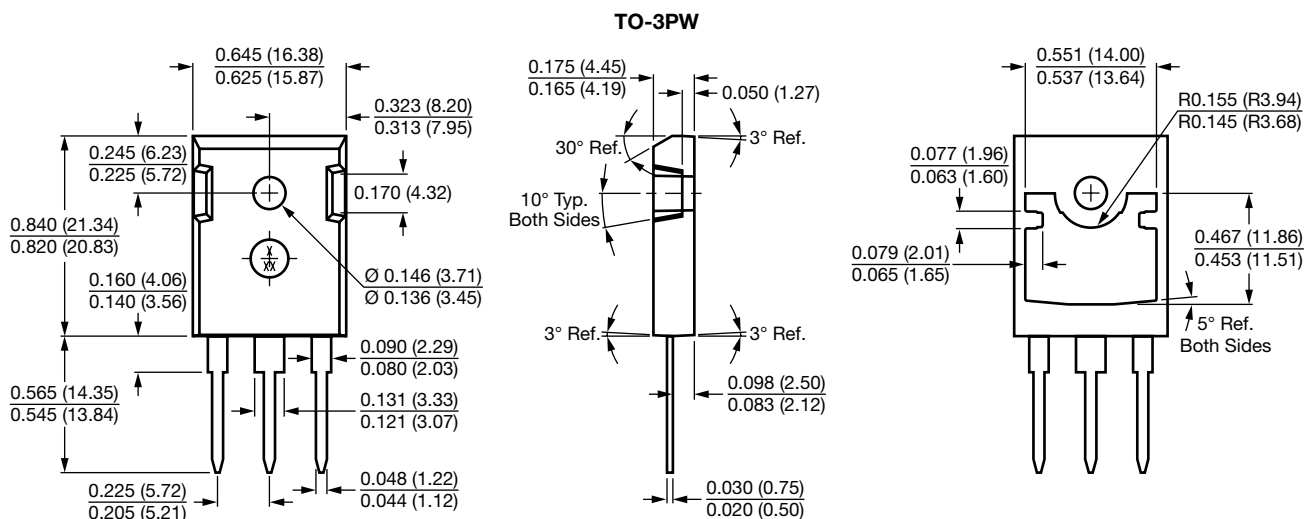


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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





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