

## Vishay General Semiconductor

## **Dual High-Voltage Trench MOS Barrier Schottky Rectifier**

Ultra Low  $V_F = 0.43 \text{ V}$  at  $I_F = 5 \text{ A}$ 



PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	2 x 30 A				
V <sub>RRM</sub>	120 V				
I <sub>FSM</sub>	300 A				
V <sub>F</sub> at I <sub>F</sub> = 30 A (T <sub>A</sub> = 125 °C)	0.69 V				
T <sub>J</sub> max.	175 °C				
Package	TO-220AB				
Diode variations	riations Common cathode				

#### **FEATURES**

- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses

• High efficiency operation

RoHS COMPLIANT HALOGEN

- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### TYPICAL APPLICATIONS

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

### **MECHANICAL DATA**

Case: TO-220AB

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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER		SYMBOL	V60M120C	UNIT	
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V		
Maximum average forward rectified current (fig. 1)	per device	I <sub>F(AV)</sub>	60	A	
	per diode		30		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I <sub>FSM</sub>	300		
Voltage rate of change (rated V <sub>R</sub> )		dV/dt	10 000	V/µs	
Operating junction and storage temperature range		T <sub>J</sub> , T <sub>STG</sub>	-40 to +175	°C	



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ELECTRICAL CHARACTERISTICS							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.51	-	V	
	I <sub>F</sub> = 15 A			0.68	-		
	$I_F = 30 \text{ A}$			0.86	0.97		
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.43	-		
	I <sub>F</sub> = 15 A			0.58	-		
	$I_F = 30 \text{ A}$			0.69	0.77		
Reverse current per diode	V <sub>R</sub> = 90 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> (2)	75	-	μA	
		T <sub>A</sub> = 125 °C		6.4	-	mA	
	V <sub>R</sub> = 120 V	T <sub>A</sub> = 25 °C		ī	500	μA	
		T <sub>A</sub> = 125 °C		10	35	mA	

#### **Notes**

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

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER		SYMBOL	V60M120C	UNIT	
Typical thermal resistance (1)	per diode	R <sub>θJA</sub> (2)	1.0	°C/W	
	per device		0.7		
	per device		52	7	

#### **Notes**

 $^{(1)}$  The heat generated must be less than the thermal conductivity from junction-to-ambient  $dP_D/dT_J < 1/R_{\theta JA}$ 

(2) Free air, without heatsink

ORDERING INFORMATION (Example)						
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
TO-220AB	V60M120C-M3/4W	1.89	4W	50/tube	Tube	

### RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

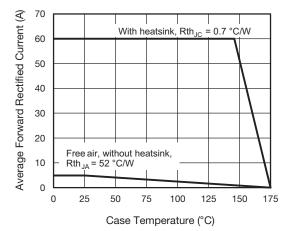


Fig. 1 - Maximum Forward Current Derating Curve (D = Duty Cycle = 0.5)

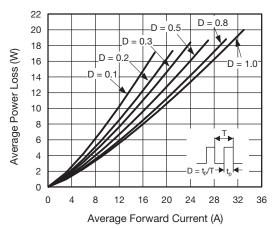


Fig. 2 - Forward Power Loss Characteristics Per Diode



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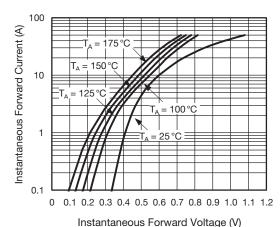


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

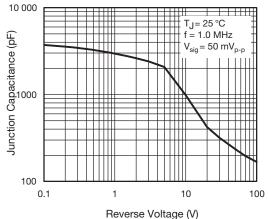


Fig. 5 - Typical Junction Capacitance Per Diode

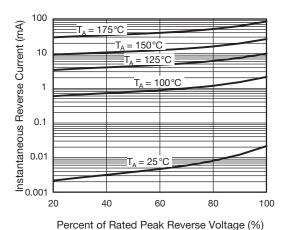


Fig. 4 - Typical Reverse Characteristics Per Diode

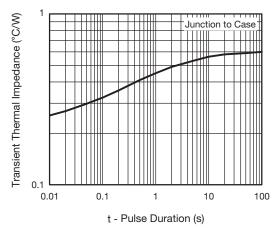


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

#### TO-220AB 0.415 (10.54) 0.380 (9.65) 0.161 (4.08) 0.185 (4.70) 0.175 (4.44) 0.139 (3.53) 0.055 (1.39) 0.113 (2.87) 0.045 (1.14) 0.103 (2.62) 0.603 (15.32) 0.635 (16.13) 0.573 (14.55) 0.625 (15.87) PIN 0.350 (8.89) 0.330 (8.38) 0.160 (4.06) 1.148 (29.16) 0.140 (3.56) 1.118 (28.40) 0.110 (2.79) 0.100 (2.54) 0.057 (1.45) 0.045 (1.14) 0.560 (14.22) 0.530 (13.46) 0.035 (0.90) 0.028 (0.70) 0.104 (2.65) 0.022 (0.56) 0.096 (2.45) 0.205 (5.20) 0.014 (0.36) 0.195 (4.95)



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