

## Vishay General Semiconductor

# **Surface Mount Trench MOS Barrier Schottky Rectifier**



**DO-214AA (SMB)** 

PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	3.0 A		
$V_{RRM}$	100 V		
I <sub>FSM</sub>	80 A		
E <sub>AS</sub>	50 mJ		
V <sub>F</sub> at I <sub>F</sub> = 3.0 A	0.56 V		
T <sub>J</sub> max.	150 °C		
Package	DO-214AA (SMB)		
Diode variations	Single die		

#### **FEATURES**

- Low profile package
- · Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- 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 low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

### **MECHANICAL DATA**

Case: DO-214AA (SMB)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Terminals: Matte tin plated leads, solderable per

J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 2 whisker test **Polarity:** Color band denotes the cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSB310	UNIT	
Device marking code		V3B		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	100	V	
Maximum DC forward current	I <sub>F</sub> <sup>(1)</sup>	3.0		
	I <sub>F</sub> <sup>(2)</sup>	1.9	A	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	80	А	
Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH	E <sub>AS</sub>	50	mJ	
Peak repetitive reverse current at $t_p$ = 2 $\mu$ s, 1 kHz, $T_J$ = 38 °C ± 2 °C	I <sub>RRM</sub>	1.0	А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-40 to +150	°C	

#### Notes

- (1) Mounted on 10 mm x 10 mm pad areas, 1 oz. FR4 PCB
- (2) Free air, mounted on recommended copper pad area



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<b>ELECTRICAL CHARACTERISTICS</b> (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	$V_{BR}$	100 (minimum)	-	V
Instantaneous forward voltage	L = 3 0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.62	0.70	- V
	I <sub>F</sub> = 3.0 A	T <sub>A</sub> = 125 °C		0.56	0.65	
Reverse current	V <sub>R</sub> = 70 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	1.5	-	μA
		T <sub>A</sub> = 125 °C		1.2	-	mA
	$V_{\rm P} = 100  {\rm V}$	T <sub>A</sub> = 25 °C		7.0	250	μA
		T <sub>A</sub> = 125 °C		3.6	20	mA
Typical junction capacitance	4.0 V, 1 MHz		CJ	230	=	pF

#### **Notes**

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

(2) Pulse test: Pulse width  $\leq$  40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSB310	UNIT	
Typical thermal resistance	R <sub>0JA</sub> (1)	120	°C/W	
	R <sub>0JM</sub> (2)	15	C/VV	

#### **Notes**

 $^{(1)}$  Free air, mounted on recommended PCB 1 oz. pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient

Units mounted on PCB with 10 mm x 10 mm copper pad areas.  $R_{\theta JM}$  - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N UNIT WEIGHT (g) PREFERRED PACKAGE CODE		BASE QUANTITY	DELIVERY MODE	
VSSB310-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
VSSB310-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel

### **RATINGS AND CHARACTERISTICS CURVES**

(T<sub>A</sub> = 25 °C unless otherwise curves)

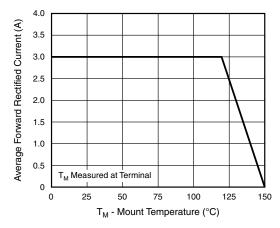


Fig. 1 - Maximum Forward Current Derating Curve

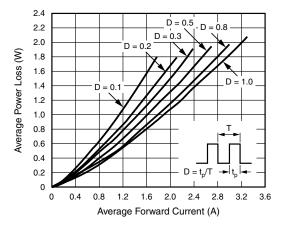


Fig. 2 - Forward Power Loss Characteristics



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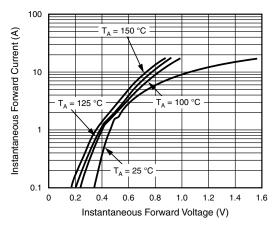


Fig. 3 - Typical Instantaneous Forward Characteristics

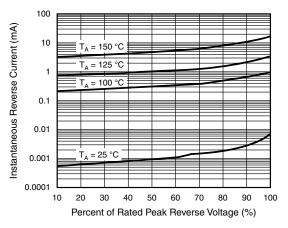


Fig. 4 - Typical Reverse Characteristics

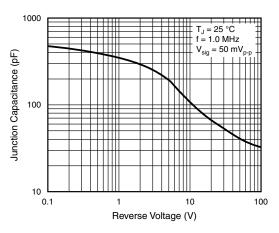


Fig. 5 - Typical Junction Capacitance

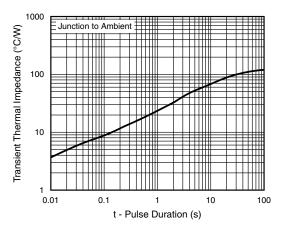
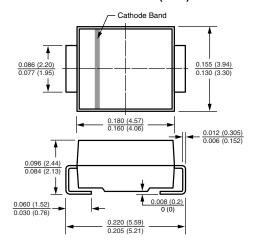


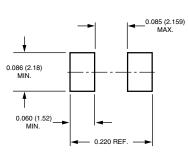
Fig. 6 - Typical Transient Thermal Impedance

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

## DO-214AA (SMB)



## **Mounting Pad Layout**





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