HALOGEN FREE



## Vishay General Semiconductor

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



**DO-214AA (SMB)** 

PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	4.0 A		
V <sub>RRM</sub>	200 V		
I <sub>FSM</sub>	40 A		
V <sub>F</sub> at I <sub>F</sub> = 4.0 A	0.71 V		
T <sub>J</sub> max.	150 °C		
Package	DO-214AA (SMB)		
Diode variation	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">www.vishay.com/doc?99912</a>

#### TYPICAL APPLICATIONS

For use in high frequency converters, freewheeling diodes, 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-M3 - halogen-free and RoHS-compliant, commercial grade

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

0-31D-002 and 0E3D 22-B102

M3 suffix meets JESD 201 class 2 whisker test **Polarity:** Color band denotes the cathode end

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSB420S	UNIT	
Device marking code		V4D		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	200	V	
Maximum DC forward current	I <sub>F</sub> <sup>(1)</sup>	4.0		
	I <sub>F</sub> <sup>(2)</sup>	1.8	A	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	40	А	
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 +150	°C	

#### Notes

- (1) Units mounted on PCB with 20 mm x 20 mm pad areas
- (2) Free air, mounted on recommended PCB 1 oz. 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
Instantaneous forward voltage	I <sub>F</sub> = 4.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	1.44	1.90	- V
		T <sub>A</sub> = 125 °C		0.71	0.80	
Reverse current per diode	V <sub>R</sub> = 180 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> (2)	3	-	μA
		T <sub>A</sub> = 125 °C		0.7	-	mA
	V <sub>R</sub> = 200 V	T <sub>A</sub> = 25 °C		4	150	μΑ
		T <sub>A</sub> = 125 °C		1.1	10	mA
Typical junction capacitance	4.0 V, 1 MHz		CJ	120	-	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	VSSB420S	UNIT	
Typical they make registered	R <sub>0JA</sub> (1)	120	°C/W	
Typical thermal resistance	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 20 mm x 20 mm copper pad areas; thermal resistance  $R_{\theta JM}$  junction to mount

ORDERING INFORMATION (Example)					
PREFERRED P/N UNIT WEIGHT (g) PREFERRED PACKAGE C		PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
VSSB420S-M3/52T	0.096	52T	750	7" diameter plastic tape and reel	
VSSB420S-M3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel	

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

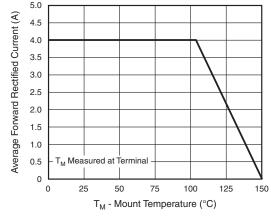


Fig. 1 - Maximum Forward Current Derating Curve

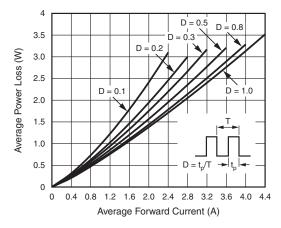


Fig. 2 - Forward Power Loss Characteristics



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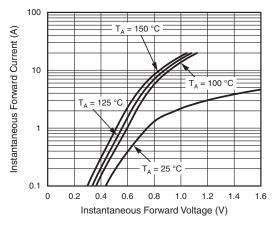


Fig. 3 - Typical Instantaneous Forward Characteristics

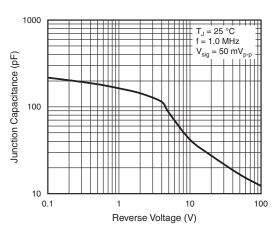


Fig. 5 - Typical Junction Capacitance

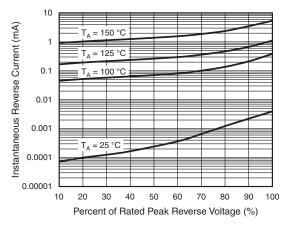


Fig. 4 - Typical Reverse Characteristics

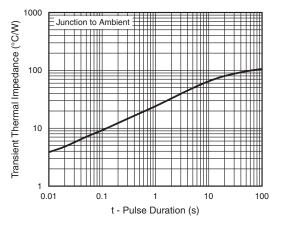
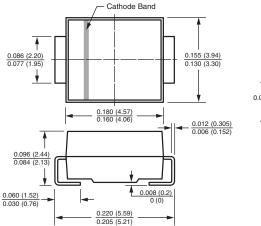


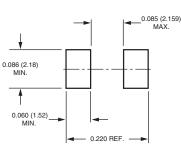
Fig. 6 - Typical Transient Thermal Impedance

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AA (SMB)



# Mounting Pad Layout





## **Legal Disclaimer Notice**

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