

# Surface Mount Trench MOS Barrier Schottky Rectifier



## 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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

## 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

M3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
$V_{RRM}$	200 V
$I_{FSM}$	40 A
$V_F$ at $I_F = 4.0$ A	0.71 V
$T_J$ max.	150 °C
Package	DO-214AA (SMB)
Diode variation	Single die

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VSSB420S	UNIT
Device marking code		V4D	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V
Maximum DC forward current	$I_F^{(1)}$	4.0	A
	$I_F^{(2)}$	1.8	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	40	A
Voltage rate of change (rated $V_R$ )	dV/dt	10 000	V/ $\mu$ s
Operating junction and storage temperature range	$T_J, T_{STG}$	-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

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 4.0\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	1.44	1.90	V
		$T_A = 125\text{ }^\circ\text{C}$		0.71	0.80	
Reverse current per diode	$V_R = 180\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	3	-	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		0.7	-	mA
	$V_R = 200\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		4	150	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		1.1	10	mA
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	120	-	pF

**Notes**

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VSSB420S	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	120	$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	15	

**Notes**

- (1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
 (2) Units mounted on PCB with 20 mm x 20 mm copper pad areas; thermal resistance  $R_{\theta JM}$  - junction to mount

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	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

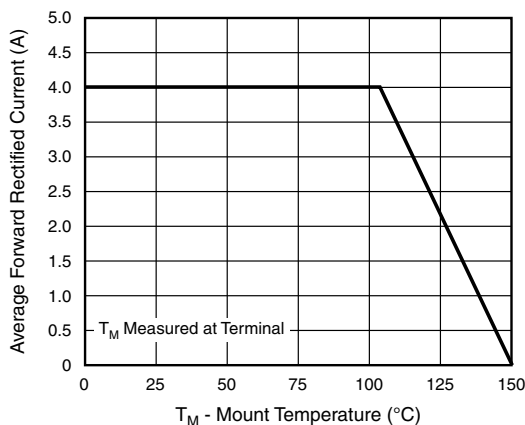
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

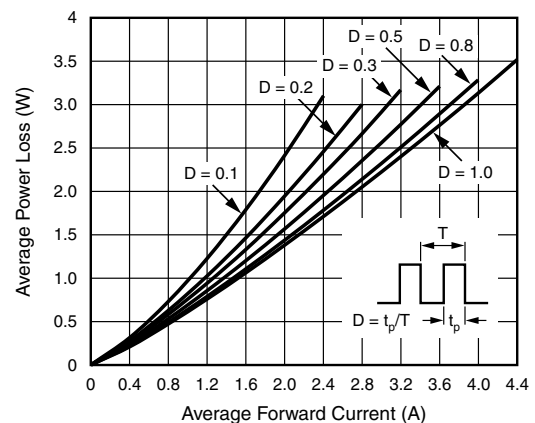


Fig. 2 - Forward Power Loss Characteristics

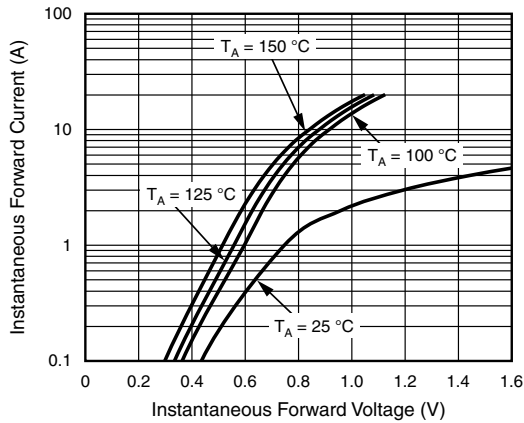


Fig. 3 - Typical Instantaneous Forward Characteristics

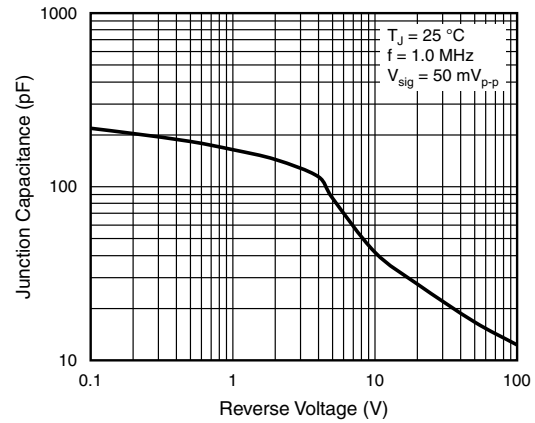


Fig. 5 - Typical Junction Capacitance

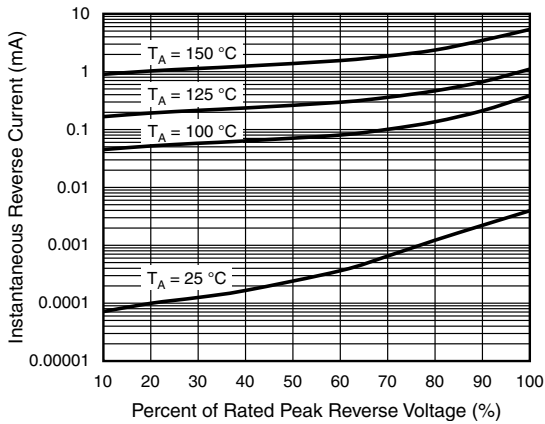


Fig. 4 - Typical Reverse Characteristics

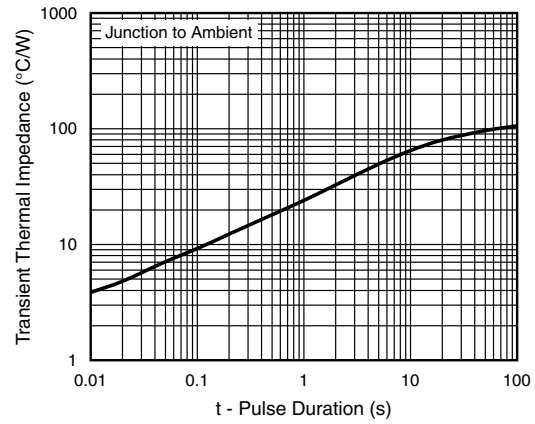
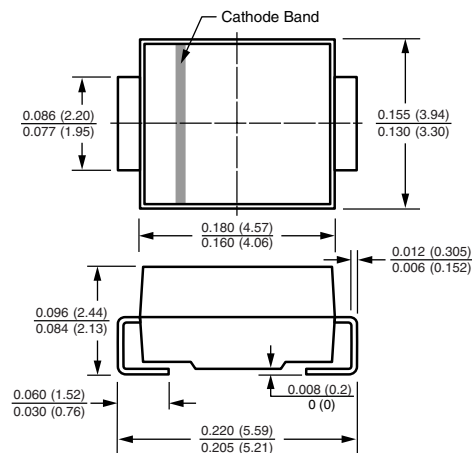


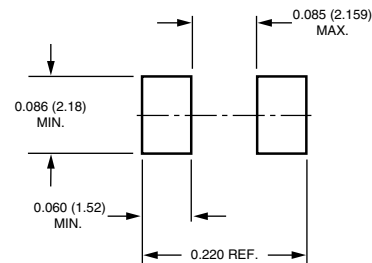
Fig. 6 - Typical Transient Thermal Impedance

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

**DO-214AA (SMB)**



**Mounting Pad Layout**





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