

Vishay General Semiconductor

Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



SMB (DO-214AA)



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	3.0 A			
V _{RRM}	100 V			
I _{FSM}	80 A			
E _{AS}	50 mJ			
V _F at I _F = 3.0 A	0.56 V			
T _J max.	150 °C			
Package	SMB (DO-214AA)			
Circuit configuration	Single			

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 <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

MECHANICAL DATA

Case: SMB (DO-214AA)

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 _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSB310	UNIT	
Device marking code		V3B		
Maximum repetitive peak reverse voltage	V_{RRM}	100	V	
Maximum DC forward current	I _F ⁽¹⁾	3.0	A	
	I _F ⁽²⁾	1.9		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	80	А	
Non-repetitive avalanche energy at $T_J = 25$ °C, L = 60 mH	E _{AS}	50	mJ	
Peak repetitive reverse current at t_p = 2 μ s, 1 kHz, T_J = 38 °C \pm 2 °C	I _{RRM}	1.0	А	
Operating junction and storage temperature range	T _J , T _{STG}	-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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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Breakdown voltage	I _R = 1.0 mA	T _A = 25 °C	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage	I _F = 3.0 A	T _A = 25 °C	V _F (1)	0.62	0.70	V
	IF = 3.0 A	T _A = 125 °C	V F ('')	0.56	0.65	
Reverse current	V _R = 70 V	T _A = 25 °C	I _R ⁽²⁾	1.5	-	μA
	v _R = 70 v	T _A = 125 °C		1.2	-	mA
	V _R = 100 V	T _A = 25 °C	IR (-)	7.0	250	μA
	V _R = 100 V	T _A = 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 ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSB310	UNIT	
Typical thermal resistance	R _{0JA} (1)	120	°C/W	
	R _{0JM} (2)	15] C/W	

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 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	



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RATINGS AND CHARACTERISTICS CURVES (TA = 25 °C unless otherwise noted)

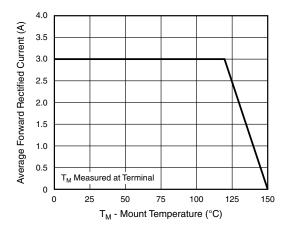
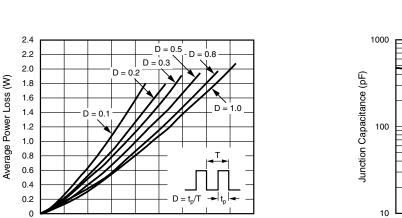


Fig. 1 - Maximum Forward Current Derating Curve



2.8 3.2

Average Forward Current (A)
Fig. 2 - Forward Power Loss Characteristics

1.6 2.0

0.4

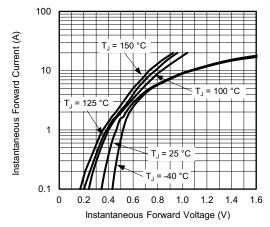


Fig. 3 - Typical Instantaneous Forward Characteristics

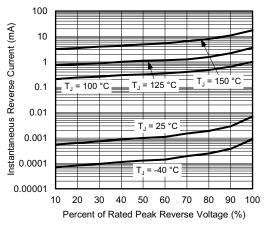


Fig. 4 - Typical Reverse Characteristics

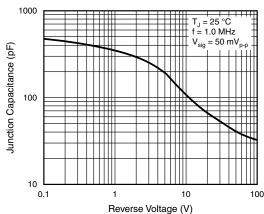


Fig. 5 - Typical Junction Capacitance

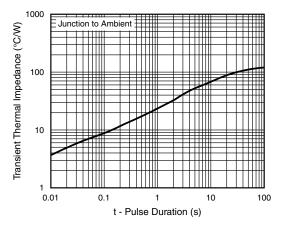


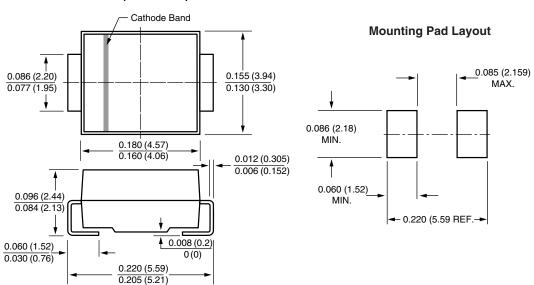
Fig. 6 - Typical Transient Thermal Impedance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMB (DO-214AA)





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