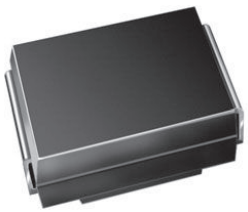
Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



SMB (DO-214AA)

Cathode ○—▶—○ Anode

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

RoHS COMPLIANT
HALOGEN FREE

TYPICAL APPLICATIONS

For use in high frequency converters, freewheeling diodes, 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-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

LINKS TO ADDITIONAL RESOURCES

3D Models

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	SMB (DO-214AA)
Circuit configuration	Single

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/µs
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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 4.0 A	T_A = 25 °C	V_F (1)	1.44	1.90	V
		T_A = 125 °C		0.71	0.80	
Reverse current per diode	V_R = 180 V	T_A = 25 °C	I_R (2)	3	-	µA
		T_A = 125 °C		0.7	-	mA
	V_R = 200 V	T_A = 25 °C		4	150	µA
		T_A = 125 °C		1.1	10	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	120	-	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**	**VSSB420S**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	120	°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

ORDERING INFORMATION (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 °C unless otherwise noted)

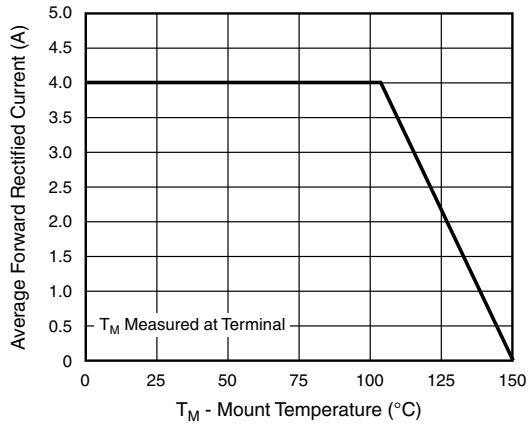


Fig. 1 - Maximum Forward Current Derating Curve

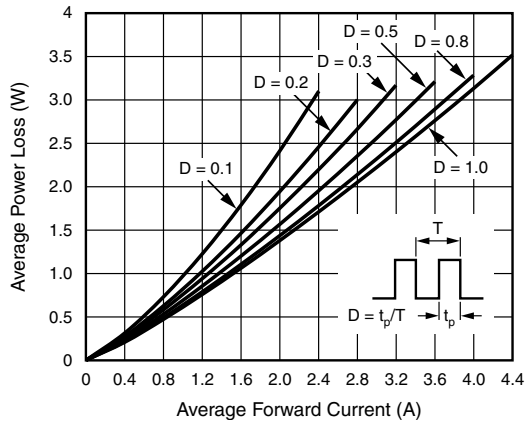


Fig. 2 - Forward Power Loss Characteristics

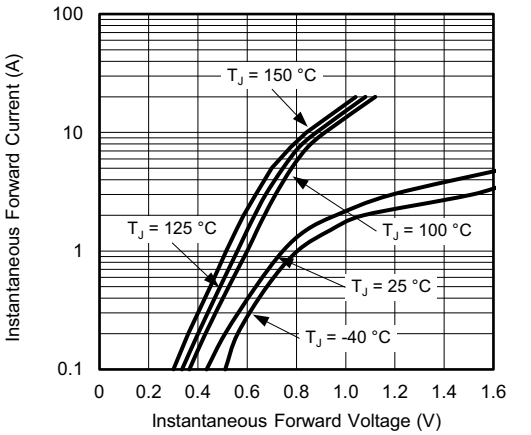


Fig. 3 - Typical Instantaneous Forward Characteristics

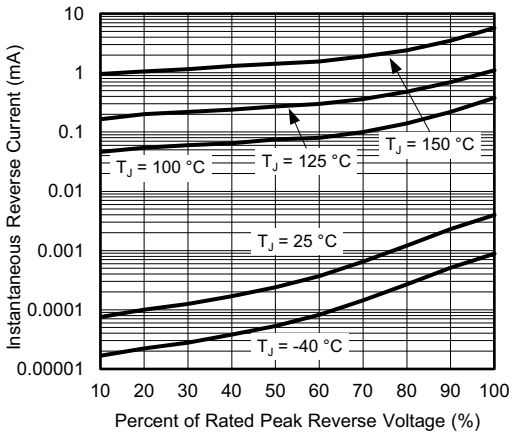


Fig. 4 - Typical Reverse Characteristics

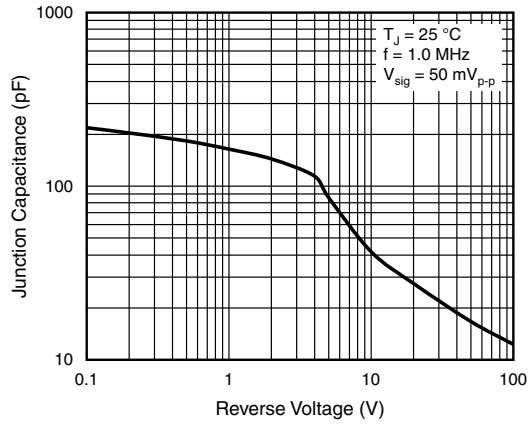


Fig. 5 - Typical Junction Capacitance

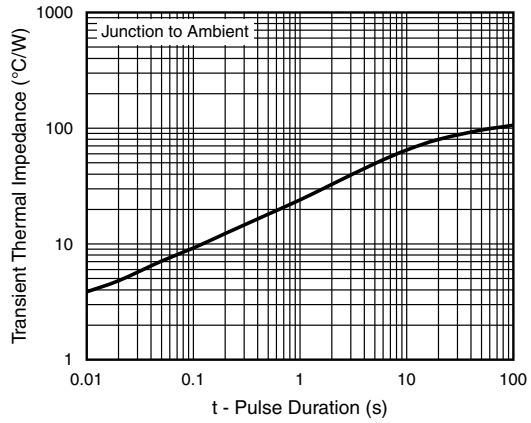
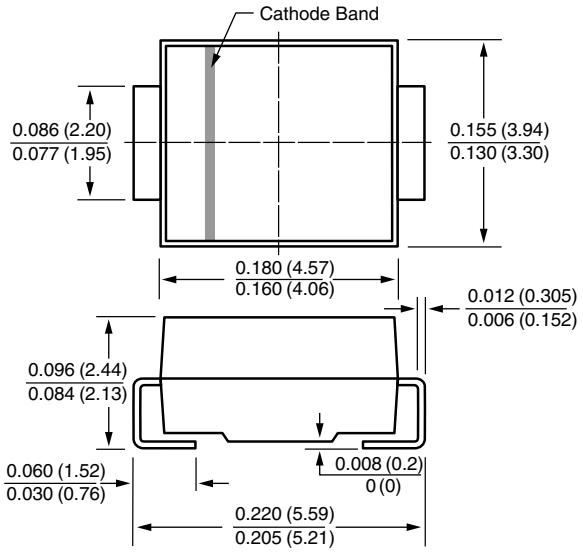


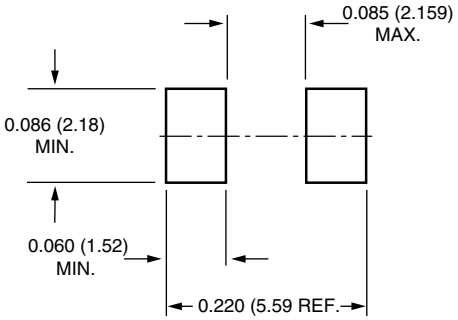
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMB (DO-214AA)



Mounting Pad Layout



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