

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



SMB (DO-214AA)

Cathode  Anode

LINKS TO ADDITIONAL RESOURCES



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



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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	4.0 A
V_{RRM}	100 V
I_{FSM}	80 A
E_{AS}	50 mJ
V_F at $I_F = 4.0$ A	0.61 V
T_J max.	150 °C
Package	SMB (DO-214AA)
Circuit configurations	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	VSSB410S	UNIT
Device marking code		V4B	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum DC forward current	$I_F^{(1)}$	4.0	A
	$I_F^{(2)}$	1.9	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	80	A
Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH	E_{AS}	50	mJ
Peak repetitive reverse current at $t_p = 2$ μs, 1 kHz, $T_J = 38$ °C ± 2 °C	I_{RRM}	1.0	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C

Notes

(1) Mounted on 14 mm x 14 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 1.0\text{ mA}$	$T_A = 25\text{ }^{\circ}\text{C}$	V_{BR}	100 (minimum)	-	V
Instantaneous forward voltage	$I_F = 4.0\text{ A}$	$T_A = 25\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	0.68	0.77	V
		$T_A = 125\text{ }^{\circ}\text{C}$		0.61	0.69	
Reverse current	$V_R = 70\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	1.5	-	μA
		$T_A = 125\text{ }^{\circ}\text{C}$		1.2	-	mA
	$V_R = 100\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$		7.0	250	μA
		$T_A = 125\text{ }^{\circ}\text{C}$		3.6	20	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	230	-	pF

Notes(1) Pulse test: 300 μs pulse width, 1 % duty cycle(2) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VSSB410S	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 14 mm x 14 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
VSSB410S-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
VSSB410S-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel

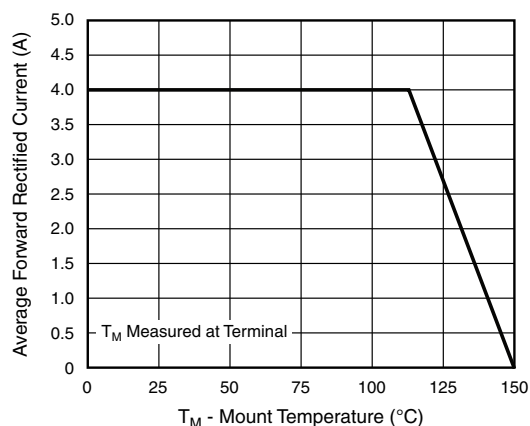
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

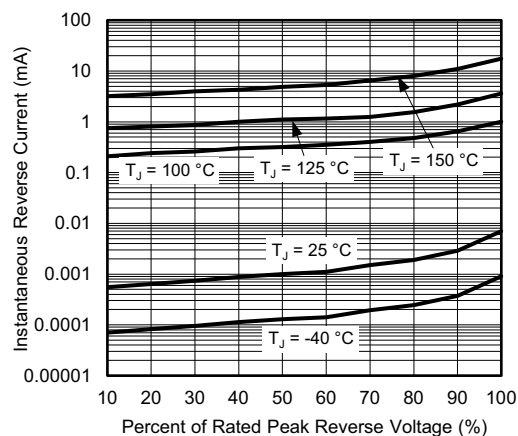


Fig. 4 - Typical Reverse Characteristics

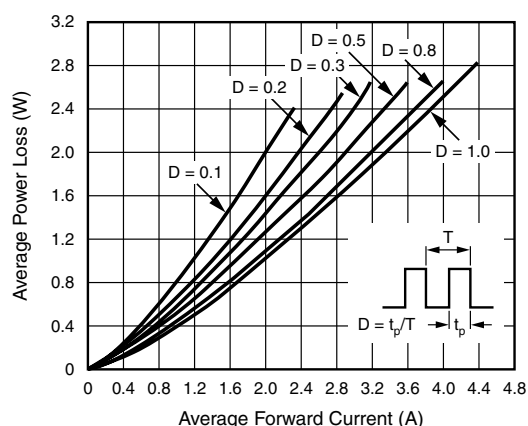


Fig. 2 - Forward Power Loss Characteristics

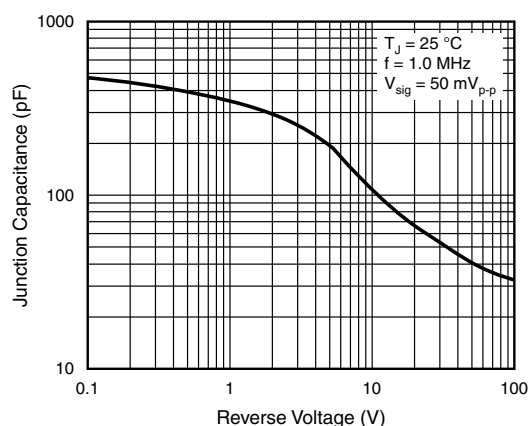


Fig. 5 - Typical Junction Capacitance

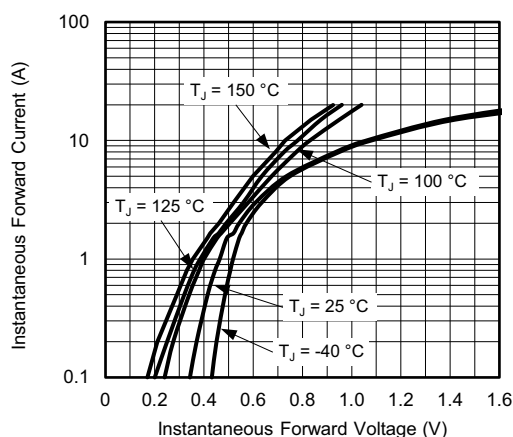


Fig. 3 - Typical Instantaneous Forward Characteristics

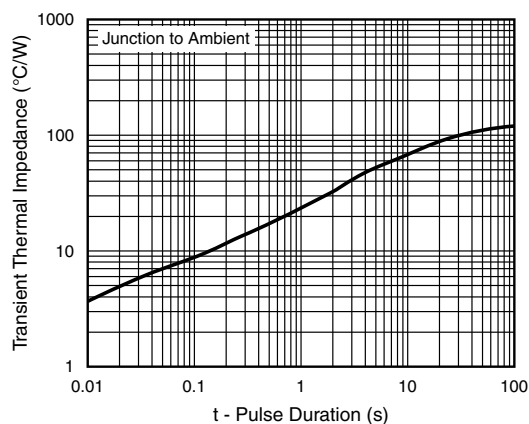
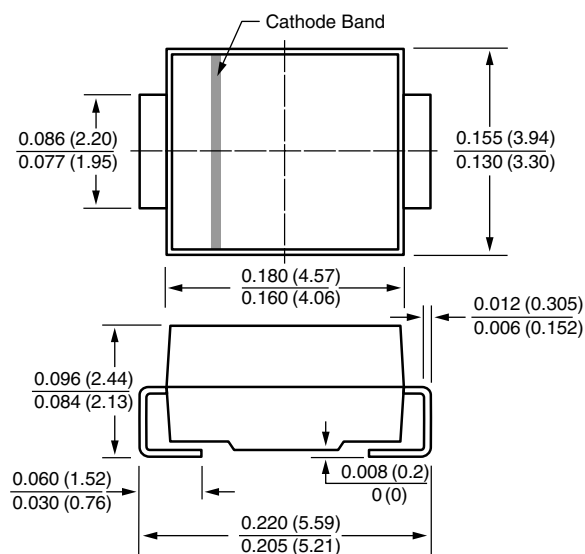
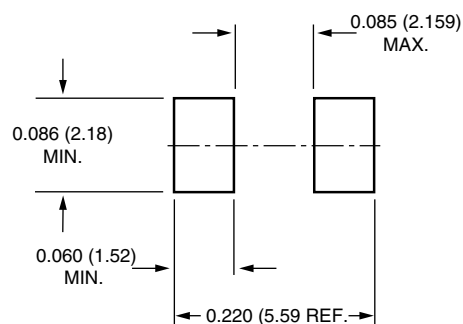


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMB (DO-214AA)

Mounting Pad Layout




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