

# 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](http://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	-	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$		1.2	-	mA
	$V_R = 100\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$		7.0	250	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$		3.6	20	mA
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	230	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  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

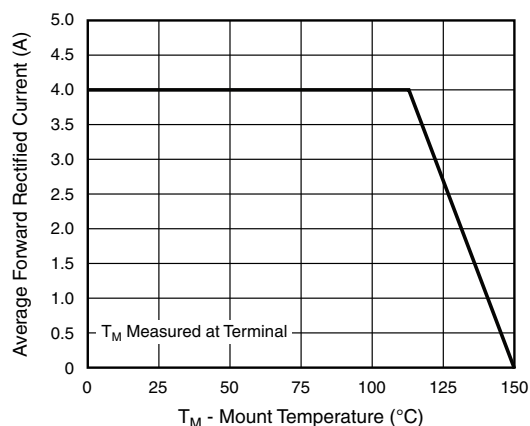
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

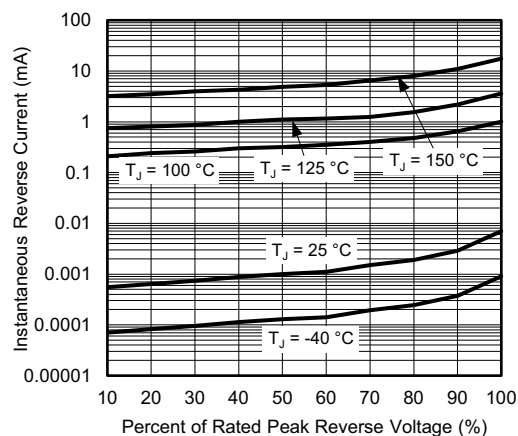


Fig. 4 - Typical Reverse Characteristics

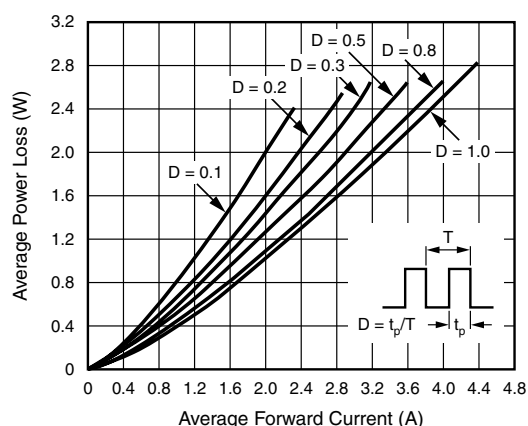


Fig. 2 - Forward Power Loss Characteristics

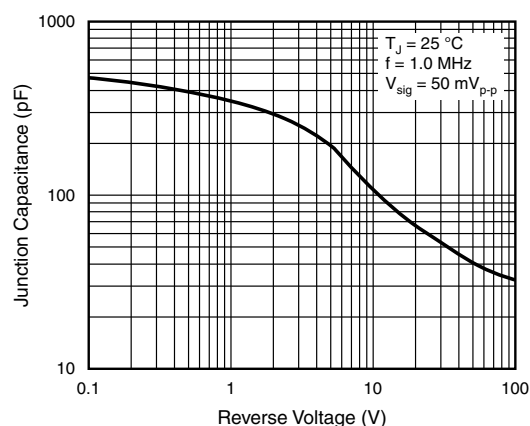


Fig. 5 - Typical Junction Capacitance

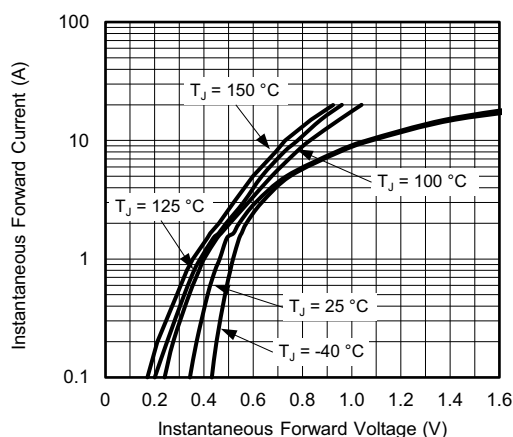


Fig. 3 - Typical Instantaneous Forward Characteristics

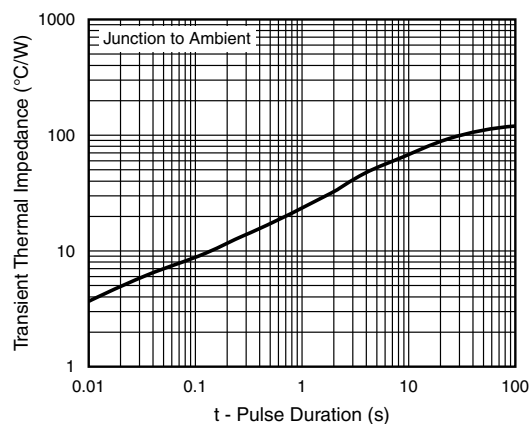
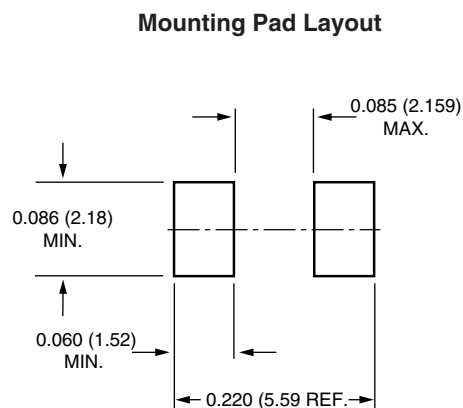
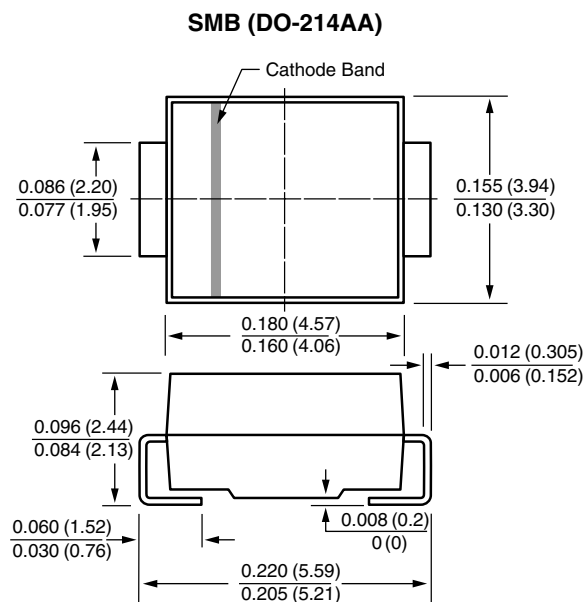


Fig. 6 - Typical Transient Thermal Impedance

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




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