

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


**SMB (DO-214AA)**

Cathode  Anode

**RoHS**  
COMPLIANT

## 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.

## 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

### 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	$I_F$ <sup>(1)</sup>	3.0	A
	$I_F$ <sup>(2)</sup>	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 $\pm 2$ °C	$I_{RRM}$	1.0	A
Operating junction and storage temperature range	$T_J$ , $T_{STG}$	-40 to +150	°C

#### Notes

<sup>(1)</sup> Mounted on 10 mm x 10 mm pad areas, 1 oz. FR4 PCB

<sup>(2)</sup> Free air, mounted on recommended copper pad area

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

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 1.0 \text{ mA}$	$T_A = 25^\circ\text{C}$	$V_{BR}$	100 (minimum)	-	V
Instantaneous forward voltage	$I_F = 3.0 \text{ A}$	$T_A = 25^\circ\text{C}$	$V_F$ <sup>(1)</sup>	0.62	0.70	V
		$T_A = 125^\circ\text{C}$		0.56	0.65	
Reverse current	$V_R = 70 \text{ V}$	$T_A = 25^\circ\text{C}$	$I_R$ <sup>(2)</sup>	1.5	-	$\mu\text{A}$
		$T_A = 125^\circ\text{C}$		1.2	-	mA
	$V_R = 100 \text{ V}$	$T_A = 25^\circ\text{C}$		7.0	250	$\mu\text{A}$
		$T_A = 125^\circ\text{C}$		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** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	VSSB310	UNIT
Typical thermal resistance	$R_{\theta JA}$ <sup>(1)</sup>	120	$^\circ\text{C/W}$
	$R_{\theta JM}$ <sup>(2)</sup>	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 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

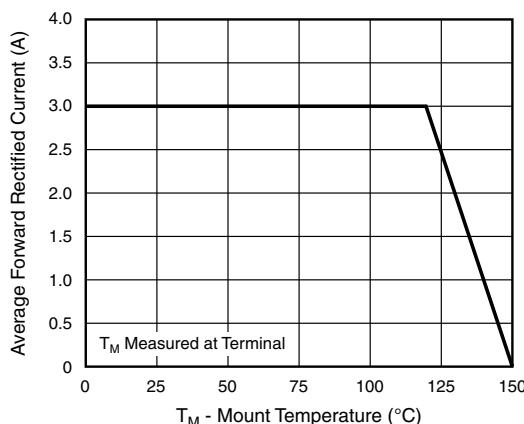
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

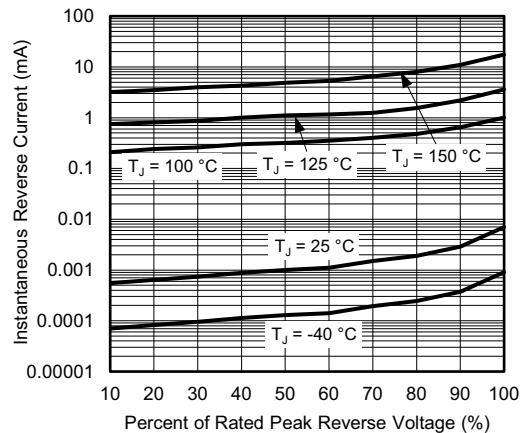


Fig. 4 - Typical Reverse Characteristics

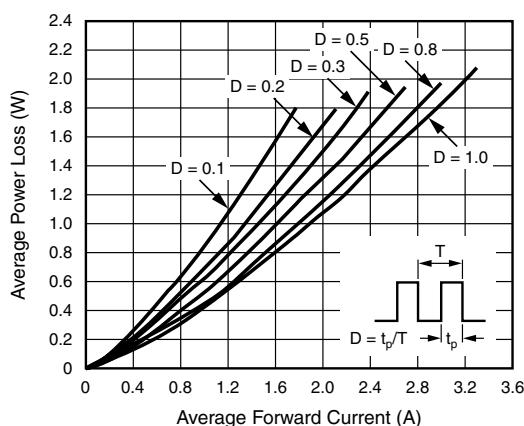


Fig. 2 - Forward Power Loss Characteristics

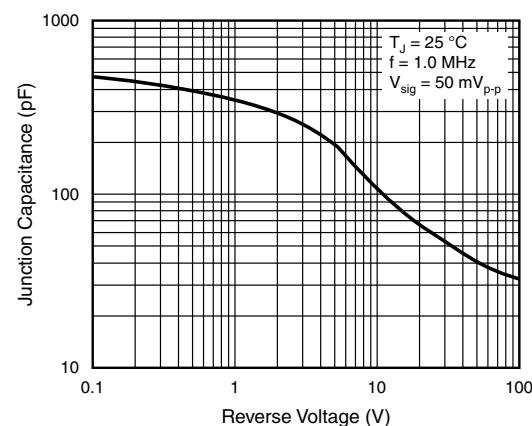


Fig. 5 - Typical Junction Capacitance

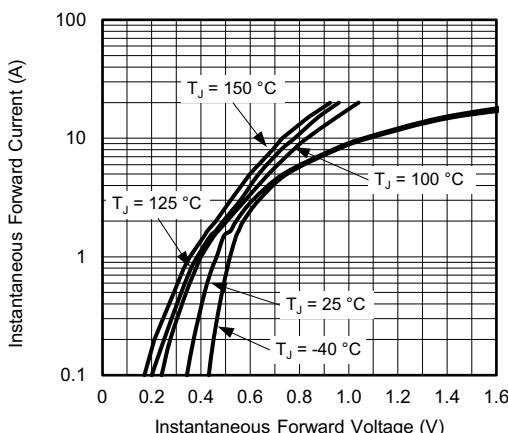


Fig. 3 - Typical Instantaneous Forward Characteristics

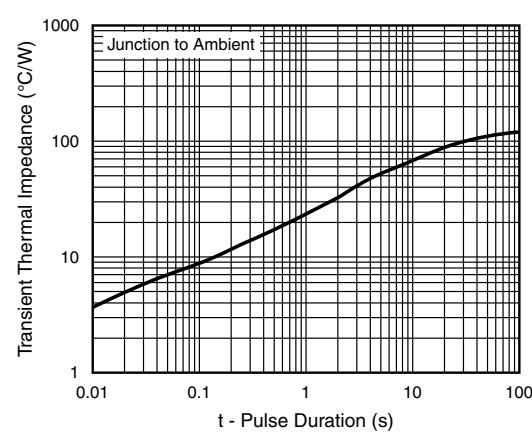
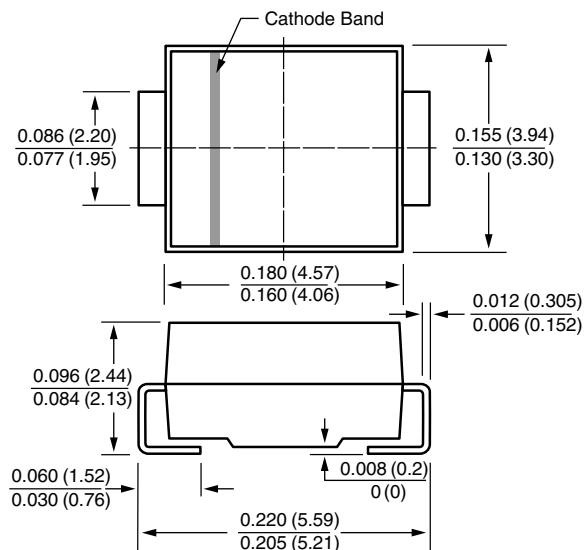
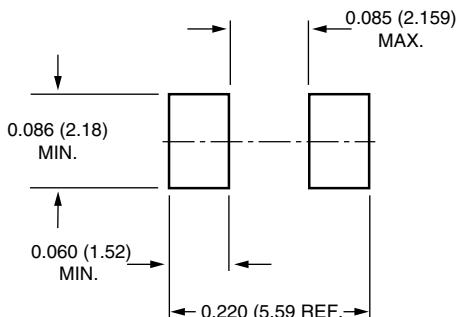


Fig. 6 - Typical Transient Thermal Impedance

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

**SMB (DO-214AA)**

**Mounting Pad Layout**


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