

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



**SMA (DO-214AC)** 



#### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	3.0 A		
V <sub>RRM</sub>	100 V		
I <sub>FSM</sub>	60 A		
E <sub>AS</sub>	24 mJ		
$V_F$ at $I_F = 3.0$ A	0.62 V		
T <sub>J</sub> max.	150 °C		
Package	SMA (DO-214AC)		
Circuit configurations	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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **TYPICAL APPLICATIONS**

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

#### **MECHANICAL DATA**

Case: SMA (DO-214AC)

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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSA310S	UNIT	
Device marking code		V3B		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	100	V	
Maximum DC forward current	I <sub>F</sub> <sup>(1)</sup>	3.0	Α	
	I <sub>F</sub> <sup>(2)</sup>	1.7		
ak forward surge current 10 ms single half sine-wave perimposed on rated load		60	А	
Non-repetitive avalanche energy at T <sub>J</sub> = 25 °C, L = 60 mH	E <sub>AS</sub>	24	mJ	
Peak repetitive reverse current at $t_p$ = 2 $\mu$ s, 1 kHz, $T_J$ = 38 °C $\pm$ 2 °C	I <sub>RRM</sub>	1.0	А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-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



<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I <sub>R</sub> = 1.0 mA	T <sub>A</sub> = 25 °C	$V_{BR}$	100 (minimum)	1	V
Instantaneous forward voltage	I <sub>E</sub> = 3.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.71	0.80	V
	IF = 3.0 A	T <sub>A</sub> = 125 °C		0.62	0.70	
Reverse current	V <sub>R</sub> = 70 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	1.0	-	μA
	v <sub>R</sub> = 70 v	T <sub>A</sub> = 125 °C		0.95	-	mA
	V <sub>R</sub> = 100 V	T <sub>A</sub> = 25 °C		3.5	150	μA
	V <sub>R</sub> = 100 V	T <sub>A</sub> = 125 °C		2.2	15	mA
Typical junction capacitance	4.0 V, 1 MHz		CJ	175	1	pF

#### **Notes**

 $^{(1)}\,$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	VSSA310S	UNIT	
Typical thermal resistance	R <sub>0JA</sub> (1)	135	°C/W	
	R <sub>0JM</sub> (2)	25		

#### **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 BAS		BASE QUANTITY	DELIVERY MODE		
VSSA310S-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel	
VSSA310S-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel	



### RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

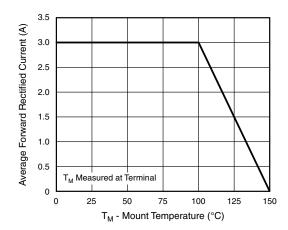
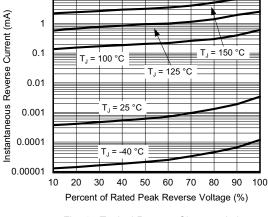


Fig. 1 - Maximum Forward Current Derating Curve



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Fig. 4 - Typical Reverse Characteristics

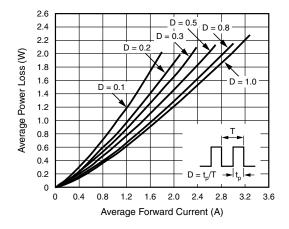


Fig. 2 - Forward Power Loss Characteristics

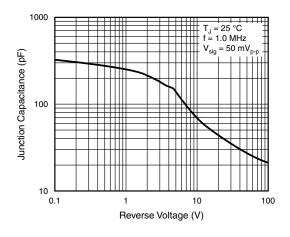


Fig. 5 - Typical Junction Capacitance

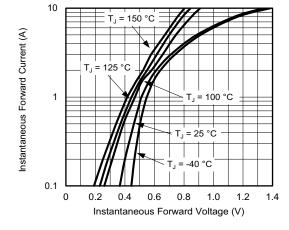


Fig. 3 - Typical Instantaneous Forward Characteristics

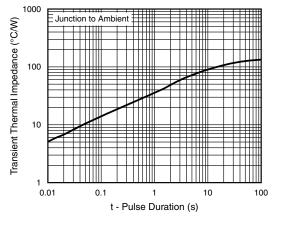
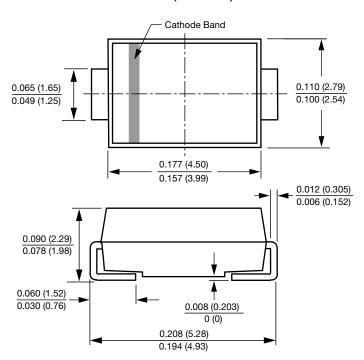


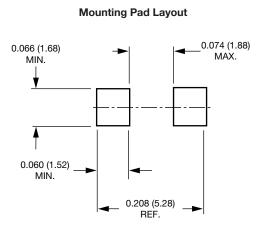
Fig. 6 - Typical Transient Thermal Impedance



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

#### SMA (DO-214AC)







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