# VSSA310S-M3, VSSA310SHM3

Vishay General Semiconductor

AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN

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



**SMA (DO-214AC)** 

Cathode O Anode

### **ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	3.0 A		
$V_{RRM}$	100 V		
I <sub>FSM</sub>	60 A		
V <sub>F</sub> at I <sub>F</sub> = 3.0 A	0.62 V		
T <sub>J</sub> max.	150 °C		
Package	SMA (DO-214AC)		
Circuit configuration	Single		

### **FEATURES**

- Low profile package
- · Ideal for automated placement
- Trench MOS Schottky technology
- · Low power losses, high efficiency
- Low forward voltage drop
- AEC-Q101 qualified available
  - Automotive ordering code; base P/NHM3
- 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">www.vishay.com/doc?99912</a>

### **TYPICAL APPLICATIONS**

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

### **MECHANCIAL DATA**

Case: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 gualified

("\_X" denotes revision code e.g. A, B,....)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

J-STD-002 and JESD 22-B102

M3 and HM3 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	A	
	I <sub>F</sub> <sup>(2)</sup>	1.7		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	60	Α	
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

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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CON	DITIONS	SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I <sub>R</sub> = 1.0 mA	T <sub>A</sub> = 25 °C	$V_{BR}$	100 (minimum)	-	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	-	μΑ
	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	μΑ
	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	=	pF

#### Notes

(1) Pulse test: 300 µs 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 registeres	R <sub>θJA</sub> <sup>(1)</sup>	135	°C/W	
Typical thermal resistance	R <sub>0JM</sub> (2)	25	C/VV	

#### **Notes**

- (1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance R<sub>0JA</sub> junction to ambient
- (2) Units mounted on P.C.B. with 10 mm x 10 mm copper pad areas; R<sub>0JM</sub> junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
VSSA310S-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
VSSA310S-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
VSSA310SHM3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel
VSSA310SHM3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel

### Note

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

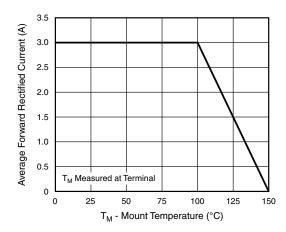


Fig. 1 - Maximum Forward Current Derating Curve

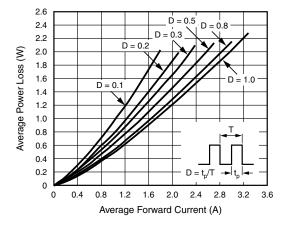


Fig. 2 - Forward Power Loss Characteristics

<sup>(1)</sup> AEC-Q101 qualified

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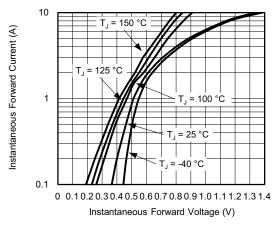


Fig. 3 - Typical Instantaneous Forward Characteristics

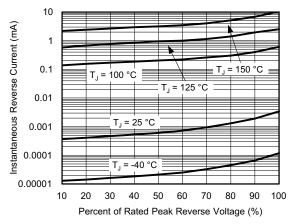


Fig. 4 - Typical Reverse Characteristics

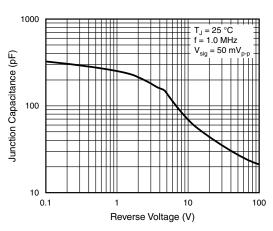


Fig. 5 - Typical Junction Capacitance

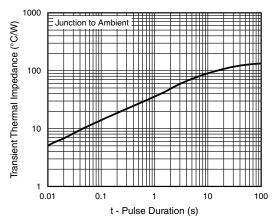
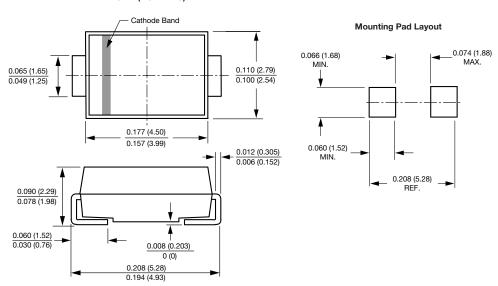


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)





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