AUTOMOTIVE

COMPLIANT HALOGEN

FREE



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## Vishay General Semiconductor

## **Surface-Mount Ultrafast Plastic Rectifier**



**SMB (DO-214AA)** 

Cathode O Anode

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



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	2.0 A		
V <sub>RRM</sub>	600 V		
I <sub>FSM</sub>	90 A		
t <sub>rr</sub>	30 ns		
V <sub>F</sub> at I <sub>F</sub>	1.0 V		
T <sub>J</sub> max.	150 °C		
Package	SMB (DO-214AA)		
Circuit configuration	Single		

#### **FEATURES**

- Glass passivated pellet chip junction
- · Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- · High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- 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 high frequency rectification, and freewheeling application in switching mode converters and inverters for consumer, computer, and telecommunication.

#### **MECHANICAL DATA**

Case: SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	USB260	UNIT	
Device marking code		U60		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	600	V	
Maximum RMS voltage	V <sub>RMS</sub>	420	V	
Maximum DC blocking voltage	$V_{DC}$	600	V	
Maximum average forward rectified current (fig. 1)		2.0	Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		90	Α	
Non-repetitive avalanche energy at $I_{AS}$ = 2.0 A, L = 10 mH, $T_{J}$ = 25 °C		20	mJ	
Operating junction and storage temperature range		-55 to +150	°C	



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 10 \mu A$	T <sub>J</sub> = 25 °C	$V_{BR}$	600 (mi	nimum)	V
Instantaneous forward voltage	I <sub>F</sub> = 1 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	1.25	i	V
	I <sub>F</sub> = 2.0 A	T <sub>J</sub> = 25 °C		1.5	1.6	
		T <sub>J</sub> = 125 °C		1.0	1.1	
Maximum reverse current	V <sub>R</sub> = 600 V	T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	5.0	μА
	v <sub>R</sub> = 600 v	T <sub>J</sub> = 125 °C		30	100	
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		t <sub>rr</sub>	30		ns
Typical junction capacitance	4.0 V, 1 MHz		CJ	45		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 USB260			
Typical thermal resistance	R <sub>0JA</sub> (1)	45	°C/W	
Typical thermal resistance	R <sub>0</sub> JL (1)	10		

#### Note

(1) Units mounted on PCB with 2.0" x 2.0" copper pad areas

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
USB260-M3/52T	0.096	52T	750	7" diameter plastic tape and reel	
USB260-M3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel	
USB260HM3/52T	0.096	52T	750	7" diameter plastic tape and reel	
USB260HM3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel	



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

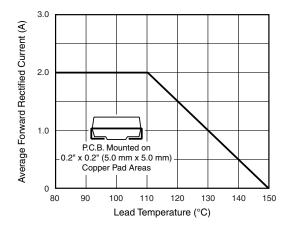


Fig. 1 - Maximum Forward Current Derating Curve

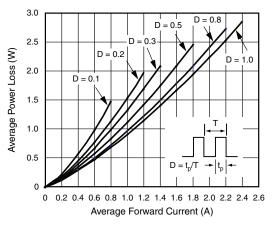


Fig. 2 - Forward Power Loss Characteristics

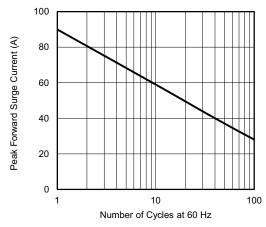


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

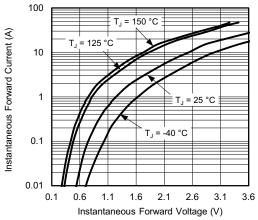


Fig. 4 - Typical Instantaneous Forward Characteristics

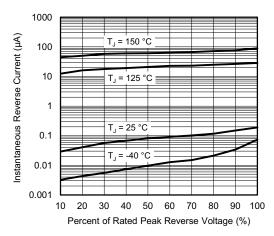


Fig. 5 - Typical Reverse Leakage Characteristics

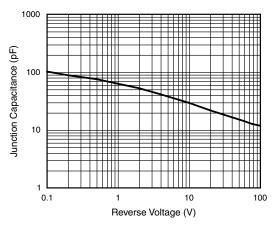


Fig. 6 - Typical Junction Capacitance





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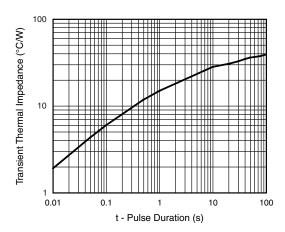
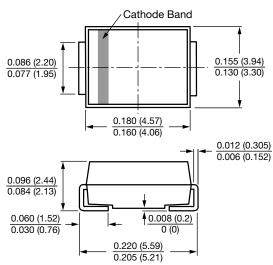


Fig. 7 - Typical Transient Thermal Impedance

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

## SMB (DO-214AA)



# Mounting Pad Layout 0.085 (2.159) MAX. 0.086 (2.18) MIN. 0.060 (1.52) MIN. 0.220 (5.59) REF.



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