AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN **FREE** 



## Vishay General Semiconductor

## Standard Avalanche Surface-Mount Rectifiers







### **ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	3.0 A				
V <sub>RRM</sub>	200 V, 400 V, 600 V				
I <sub>FSM</sub>	90 A				
E <sub>AS</sub>	20 mJ				
$V_F$ at $I_F = 3.0$ A $(T_A = 125  ^{\circ}\text{C})$	0.86 V				
T <sub>J</sub> max.	175 °C				
Package	SMB (DO-214AA)				
Circuit configuration	Single				

#### **FEATURES**

- Low profile package
- · Ideal for automated placement
- · Glass passivated chip junction
- · Controlled avalanche characteristics
- Low leakage current
- · High forward surge capability
- 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 www.vishay.com/doc?99912

#### **TYPICAL APPLICATIONS**

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, 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, and commercial grade

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

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

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

M3 sand 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	AS3BD	AS3BG	AS3BJ	UNIT
Device marking code			A3D	A3G	A3J	
Maximum repetitive peak reverse voltage		$V_{RRM}$	200	400	600	V
Maximum DC forward current (fig. 1)		I <sub>F</sub> <sup>(1)</sup>	3.0			А
		I <sub>F</sub> <sup>(2)</sup>	2.0			
Peak forward surge current 10 ms single half sine-wave, non-repetitive, cool junction		I <sub>FSM</sub>	90			А
Non-repetitive avalanche energy at T <sub>J</sub> = 25 °C	I <sub>AS</sub> = 2.0 A max.	_	20 30		- mJ	
	$I_{AS} = 1.0 A \text{ typ.}$	- E <sub>AS</sub>				
Operating junction and storage temperature range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +175			°C

#### Notes

<sup>(1)</sup> Mounted on 14 mm x 14 mm x 2 areas, 1 oz. FR4 PCB

<sup>(2)</sup> Free air, mounted on recommended 1.52 mm x 2.18 mm x 2 pad areas



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.90	-	V	
	I <sub>F</sub> = 3.0 A			0.98	1.05		
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.78	-		
	I <sub>F</sub> = 3.0 A			0.86	0.95		
Reverse current	V 600 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.5	20	μА	
	V <sub>R</sub> = 600 V	T <sub>A</sub> = 125 °C		40	150		
Typical junction capacitance per diode	Rated V <sub>R</sub> = 4.0 V, 1 MHz		CJ	40	ı	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 AS3BJ		UNIT		
Typical thormal registance	R <sub>eJA</sub> (1)	100	°C/W		
Typical thermal resistance	R <sub>0JM</sub> (2)	14	- C/W		

#### **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 x 2 areas, 1 oz. copper pad areas; R<sub>B,IM</sub> junction to mount

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
AS3BJ-M3/52T	0.096	52T	750	7" diameter plastic tape and reel		
AS3BJ-M3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel		
AS3BJHM3_A/H (1)	0.096	Н	750	7" diameter plastic tape and reel		
AS3BJHM3_A/I (1)	0.096	I	3200	13" diameter plastic tape and reel		

#### Note

(1) AEC-Q101 qualified

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

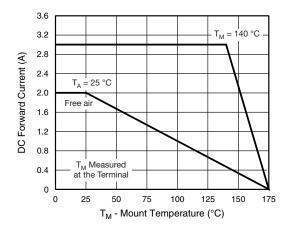


Fig. 1 - Maximum Forward Current Derating Curve

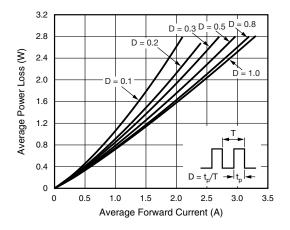


Fig. 2 - Forward Power Loss Characteristics



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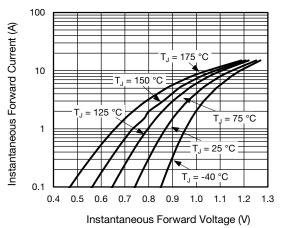


Fig. 3 - Typical Instantaneous Forward Characteristics

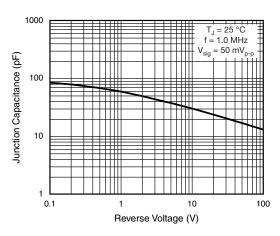


Fig. 5 - Typical Junction Capacitance

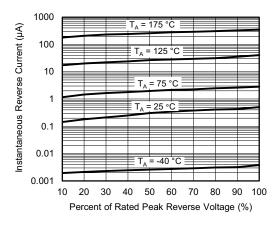


Fig. 4 - Typical Reverse Characteristics

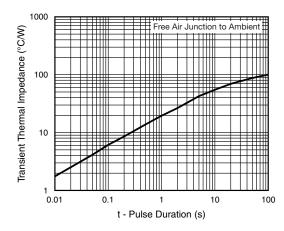
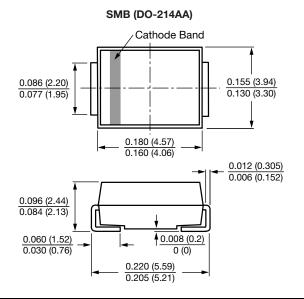
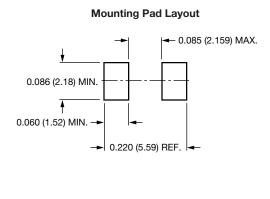


Fig. 6 - Typical Transient Thermal Impedance

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







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