

## SE20AFB, SE20AFD, SE20AFG, SE20AFJ

Vishay General Semiconductor

AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN

FREE

# **Surface-Mount ESD Capability Rectifiers**



SlimSMA (DO-221AC)

**Bottom View** 

Cathode O Anode

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

Top View



PRIMARY CHARACTERISTICS				
2.0 A				
100 V, 200 V, 400 V, 600 V				
35 A				
0.86 V				
5 μΑ				
175 °C				
SlimSMA (DO-221AC)				
Single				

#### **FEATURES**

- Very low profile typical height of 0.95 mm
- · Ideal for automated placement
- Oxide planar chip junction
- · Low forward voltage drop, low leakage current
- ESD capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive applications.

#### **MECHANICAL DATA**

Case: SlimSMA (DO-221AC)

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

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 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	SE20AFB	SE20AFD	SE20AFG	SE20AFJ	UNIT
Device marking code S2B S2D S2G S2J				S2J		
Maximum repetitive peak reverse voltage V <sub>RRM</sub> 100 200 400 600				600	V	
Mariana DO formada mad	I <sub>F</sub> <sup>(1)</sup>	2.0				^
Maximum DC forward current	I <sub>F</sub> <sup>(2)</sup>	1.3				Α
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	35			Α	
Operating junction and storage temperature range T <sub>J</sub> , T <sub>STG</sub> -55 to +175					°C	

#### Notes

- (1) Mounted on 5.0 mm x 5.0 mm pad areas, 2 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 CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage		0.91	-			
	I <sub>F</sub> = 2.0 A	1 <sub>A</sub> = 25 C	V <sub>F</sub> <sup>(1)</sup>	0.96	1.1	V
	I <sub>F</sub> = 1.0 A	- T <sub>A</sub> = 125 °C	V <sub>F</sub> ···	0.79	-	
	I <sub>F</sub> = 2.0 A			0.86	0.98	
Reverse current	Data d V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	=	5.0	
	Rated V <sub>R</sub>	T <sub>A</sub> = 125 °C	T <sub>A</sub> = 125 °C	8	100	μΑ
Typical 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>	1.2	-	μs
Typical junction capacitance	4.0 V, 1 MHz		CJ	12	-	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 SE20AFB SE20AFG SE20AFJ					UNIT		
Typical thermal registance	R <sub>0JA</sub> (1)	125			°C/W		
Typical thermal resistance	R <sub>0JM</sub> (2)	12			C/VV		

#### Notes

 $^{(1)}$  Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

 $<sup>^{(2)}</sup>$  Mounted on 5.0 mm x 5.0 mm pad areas, 2 oz. FR4 PCB;  $R_{\theta JM}$  - junction to mount

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS (T <sub>A</sub> = 25 °C unless otherwise noted)							
STANDARD TEST TYPE TEST CONDITIONS SYMBOL CLASS VALUE							
AEC-Q101-001 Human body model (contact mode) $C = 100 \text{ pF}, R = 1.5 \text{ k}\Omega$ $V_C$ H3B $> 8 \text{ kV}$							

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
SE20AFJ-M3/6A	0.032	6A	3500	7" diameter plastic tape and reel		
SE20AFJ-M3/6B	0.032	6B	14 000	13" diameter plastic tape and reel		
SE20AFJHM3/6A (1)	0.032	6A	3500	7" diameter plastic tape and reel		
SE20AFJHM3/6B (1)	0.032	6B	14 000	13" diameter plastic tape and reel		

#### Note

(1) AEC-Q101 qualified



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

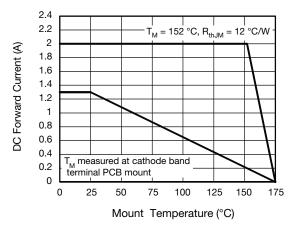


Fig. 1 - Maximum Forward Current Derating Curve

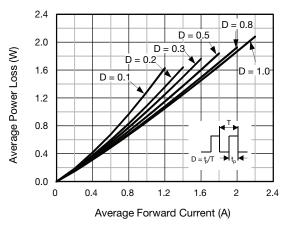


Fig. 2 - Forward Power Loss Characteristics

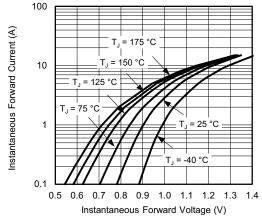


Fig. 3 - Typical Instantaneous Forward Characteristics

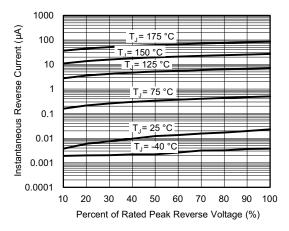


Fig. 4 - Typical Reverse Leakage Characteristics

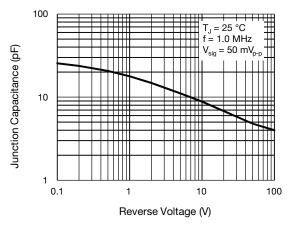


Fig. 5 - Typical Junction Capacitance

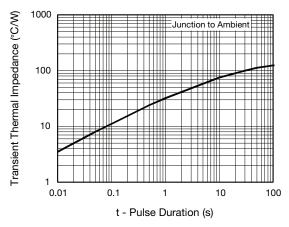


Fig. 6 - Typical Junction Capacitance

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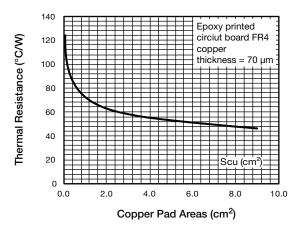
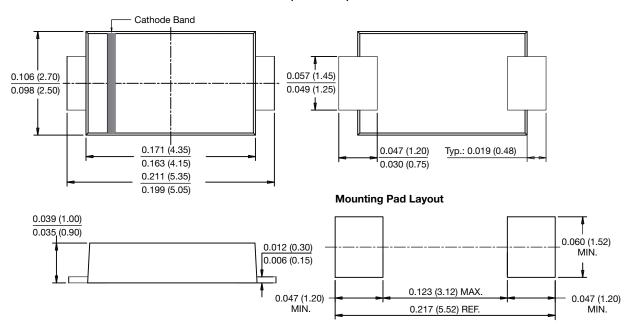


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

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

#### SlimSMA (DO-221AC)





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