

## High Current Density Surface-Mount Glass Passivated Rectifiers

**eSMP® Series**

**SMP (DO-220AA)**

 Cathode  —  Anode

**LINKS TO ADDITIONAL RESOURCES**


PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	100 V, 200 V, 400 V, 600 V, 800 V, 1000 V
$I_R$	1 $\mu$ A
$V_F$	0.95 V
$T_J$ max.	150 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

**FEATURES**

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- Low thermal resistance
- 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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE  
Available

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**
**TYPICAL APPLICATIONS**

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive applications.

**MECHANICAL DATA**

**Case:** SMP (DO-220AA)

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 automotive grade

**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** ( $T_A = 25\text{ °C}$  unless otherwise noted)

PARAMETER	SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT
Device marking code		SB	SD	SG	SJ	SK	SM	
Max. repetitive peak reverse voltage	$V_{RRM}$	100	200	400	600	800	1000	V
Max. RMS voltage	$V_{RMS}$	70	140	280	420	560	700	V
Max. DC blocking voltage	$V_{DC}$	100	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	1.0						A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30						A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150						°C



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT
Max. instantaneous forward voltage	$I_F = 1.0\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	1.1					V	
	$I_F = 1.0\text{ A}$	$T_J = 125\text{ }^\circ\text{C}$		0.95						
Max. reverse current	Rated $V_R$	$T_J = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	1.0			1.0		$\mu\text{A}$	
		$T_J = 125\text{ }^\circ\text{C}$		50			100			
Typical reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$t_{rr}$	1.8					$\mu\text{s}$	
Typical junction capacitance time	4.0 V, 1 MHz		$C_J$	6.0					pF	

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width  $\leq 40\text{ ms}$

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)									
PARAMETER	SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT	
Typical thermal resistance	$R_{\theta JA}^{(1)}$	105					$^\circ\text{C/W}$		
	$R_{\theta JL}^{(1)}$	15							
	$R_{\theta JC}^{(1)}$	20							

**Note**

- (1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 5.0 mm x 5.0 mm copper pad areas.  $R_{\theta JL}$  is measured at the terminal of cathode band.  $R_{\theta JC}$  is measured at the top center of the body

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
S1PJ-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
S1PJ-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
S1PJHM3/84A <sup>(1)</sup>	0.024	84A	3000	7" diameter plastic tape and reel
S1PJHM3/85A <sup>(1)</sup>	0.024	85A	10 000	13" diameter plastic tape and reel

**Note**

- (1) Automotive grade

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

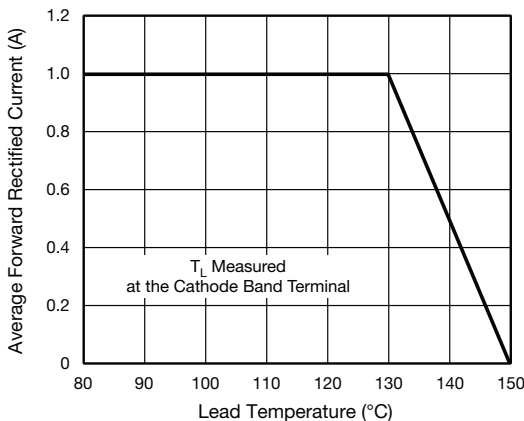


Fig. 1 - Max. Forward Current Derating Curve

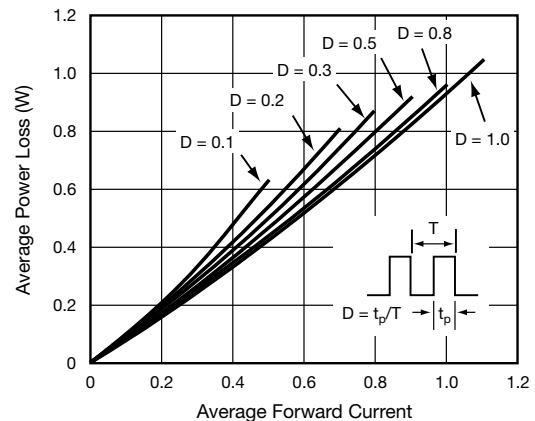


Fig. 2 - Forward Power Loss Characteristics

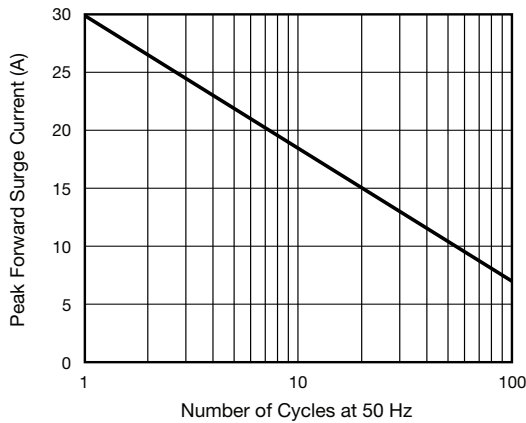


Fig. 3 - Max. Non-Repetitive Peak Forward Surge Current

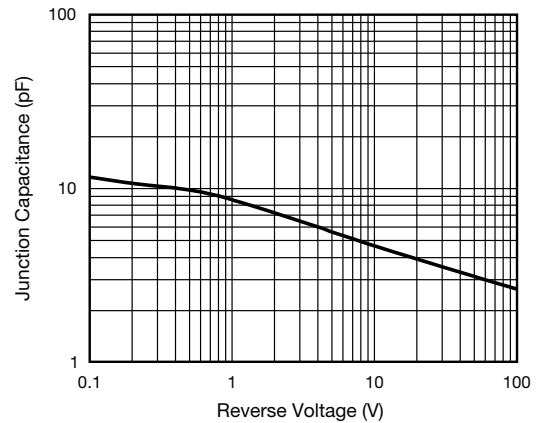


Fig. 6 - Typical Junction Capacitance

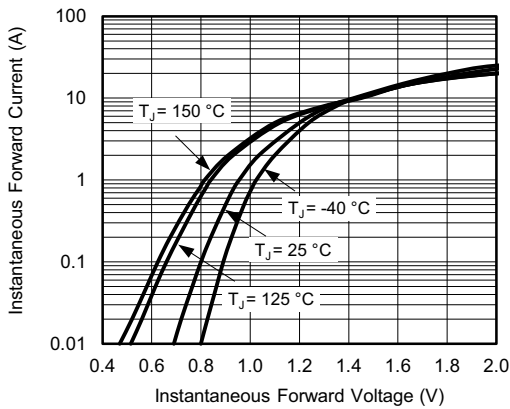


Fig. 4 - Typical Instantaneous Forward Characteristics

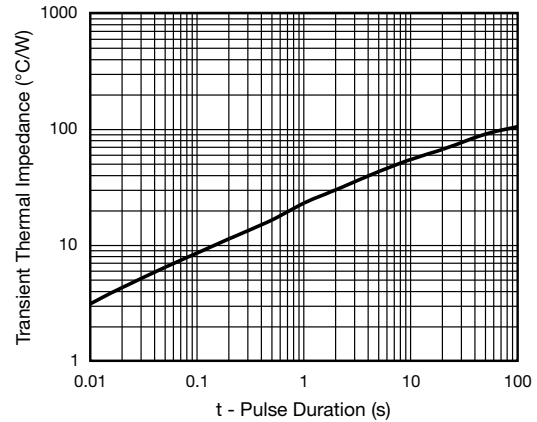


Fig. 7 - Typical Transient Thermal Impedance

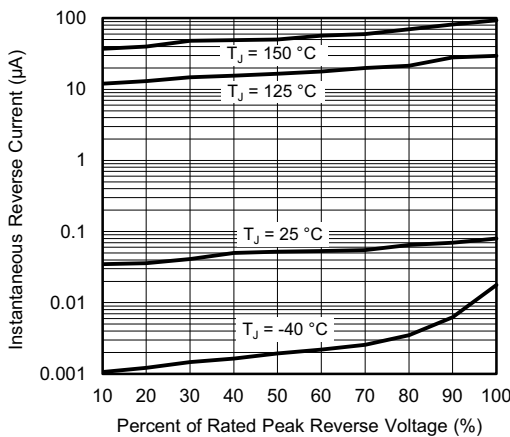
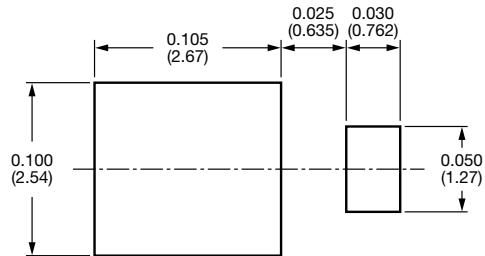
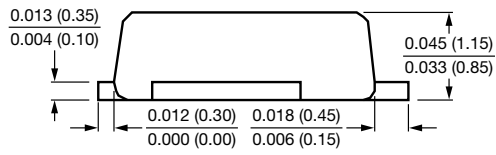
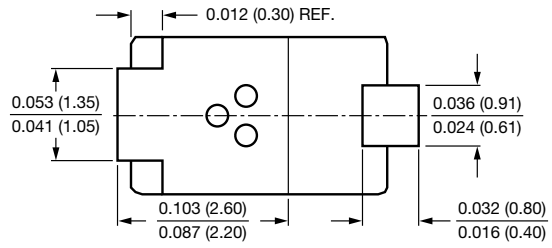
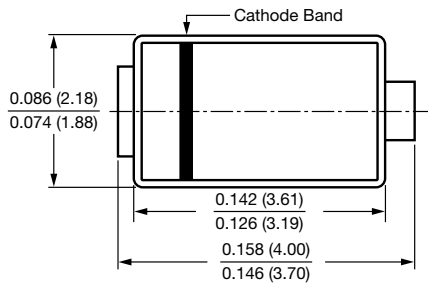


Fig. 5 - Typical Reverse Leakage Characteristics



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### SMP (DO-220AA)





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