



## High Current Density Surface Mount Glass-Passivated Rectifiers

### eSMP™ Series



DO-220AA (SMP)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	100 V to 1000 V
$I_R$	1 $\mu$ A
$V_F$	0.95 V
$T_J$ max.	150 °C

### TYPICAL APPLICATIONS

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

### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**
- Find out more about Vishay's Automotive Grade Product requirements at: [www.vishay.com/applications](http://www.vishay.com/applications)



### MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free and RoHS compliant, commercial grade

Base P/NHM3 - halogen-free and RoHS compliant, 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 ( $T_A = 25$ °C unless otherwise noted)								
PARAMETER	SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT
Device marking code		SB	SD	SG	SJ	SK	SM	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	200	400	600	800	1000	V
Maximum RMS voltage	$V_{RMS}$	70	140	280	420	560	700	V
Maximum 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

# S1PB thru S1PM

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ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	I <sub>F</sub> = 1.0 A	T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C	V <sub>F</sub>	1.1 0.95						V
Maximum reverse current <sup>(2)</sup>	Rated V <sub>R</sub>	T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C	I <sub>R</sub>	1.0 50			1.0 100			μA
Typical reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	1.8						μs
Typical junction capacitance time	4.0 V, 1 MHz		C <sub>J</sub>	6.0						pF

**Notes:**

<sup>(1)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	S1PB	S1PD	S1PG	S1PJ	S1PK	S1PM	UNIT	
Typical thermal resistance <sup>(1)</sup>	R <sub>θJA</sub> R <sub>θJL</sub> R <sub>θJC</sub>	105 15 20							°C/W

**Note:**

<sup>(1)</sup> Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 mm x 5.0 mm copper pad areas. R<sub>θJC</sub> is measured at the terminal of cathode band. R<sub>θJC</sub> is measured at the top center of the body

ORDERING INFORMATION (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:**

<sup>(1)</sup> Automotive grade

## RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

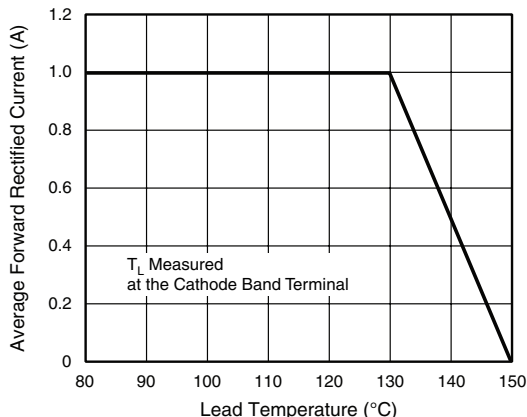


Figure 1. Maximum Forward Current Derating Curve

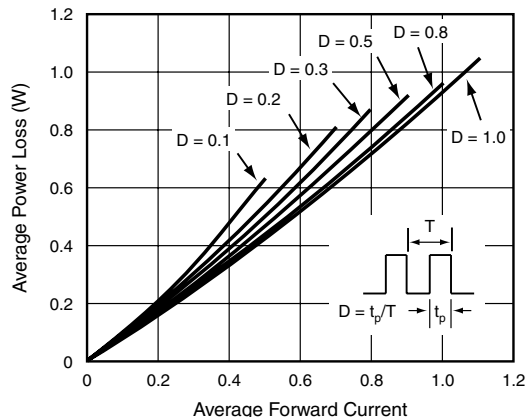


Figure 2. Forward Power Loss Characteristics

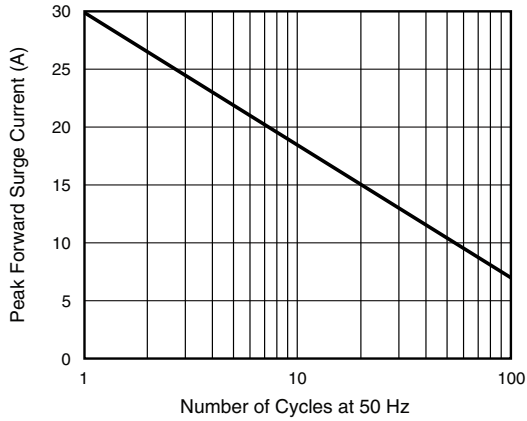


Figure 3. Maximum Non-Repetitive Peak Forward Surge Current

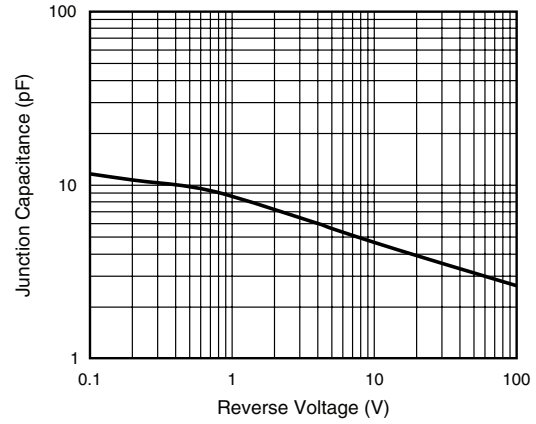


Figure 6. Typical Junction Capacitance

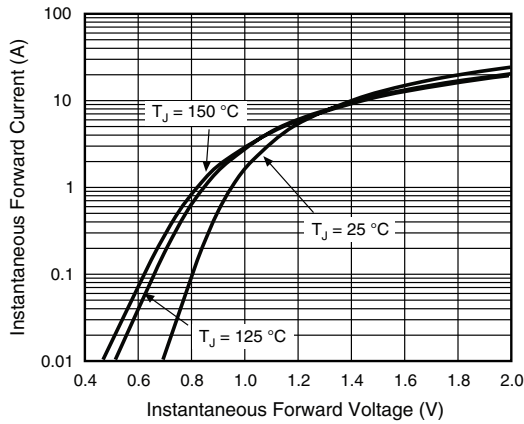


Figure 4. Typical Instantaneous Forward Characteristics

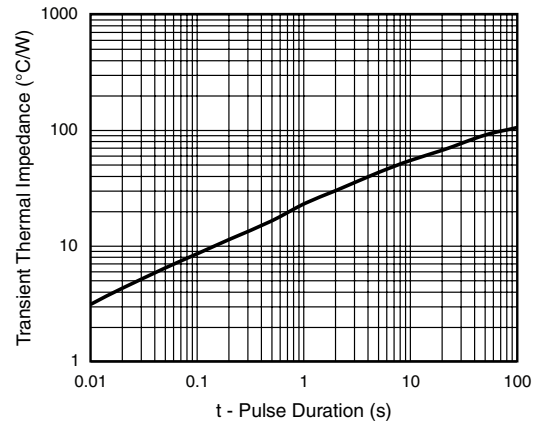


Figure 7. Typical Transient Thermal Impedance

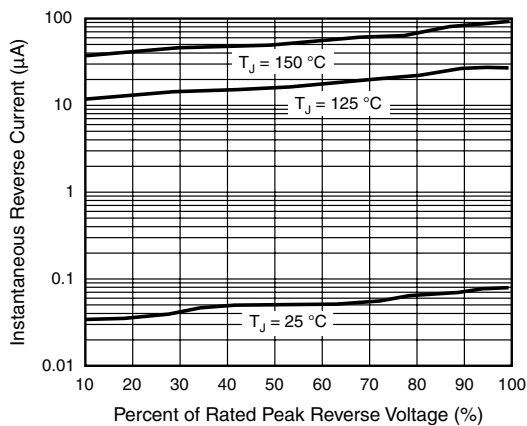


Figure 5. Typical Reverse Leakage Characteristics

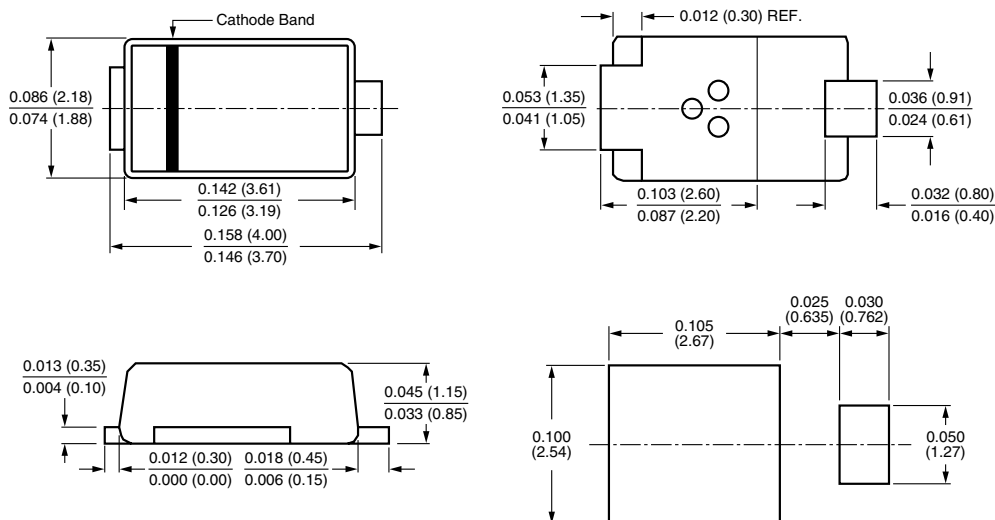
# S1PB thru S1PM

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-220AA (SMP)





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