

## Low $V_F$ High Current Density Surface Mount Schottky Barrier Rectifiers

 eSMP<sup>®</sup> Series

**DO-220AA (SMP)**

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**

### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- 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)

### MECHANICAL DATA

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

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

**Polarity:** Color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	30 V, 40 V
$I_{FSM}$	50 A
$E_{AS}$	11.25 mJ
$V_F$	0.35 V, 0.38 V
$T_J$ max.	150 °C
Package	DO-220AA
Diode variations	Single

### TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	SS1P3L	SS1P4L	UNIT
Device marking code		13L	14L	
Maximum repetitive peak reverse voltage	$V_{RRM}$	30	40	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	$T_L = 140\text{ °C}$	1.0	A
		$T_L = 135\text{ °C}$	1.5	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50		A
Non-repetitive avalanche energy at $I_{AS} = 1.5\text{ A}$ , $L = 10\text{ mH}$ , $T_J = 25\text{ °C}$	$E_{AS}$	11.25		mJ
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000		V/ $\mu$ s
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150		°C



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	SS1P3L	SS1P4L	UNIT
Maximum instantaneous forward voltage	I <sub>F</sub> = 1.0 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.45	0.48	V
	I <sub>F</sub> = 1.0 A	T <sub>J</sub> = 125 °C		0.35	0.38	
Maximum reverse current at rated V <sub>R</sub>			I <sub>R</sub> <sup>(2)</sup>	200	150	μA
				20	15	mA
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	110	130	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	SS1P3L	SS1P4L	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	105		°C/W
	R <sub>θJL</sub> <sup>(1)</sup>	15		
	R <sub>θJC</sub> <sup>(1)</sup>	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<sub>θJL</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
SS1P3L-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3L-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS1P3LHM3/84A <sup>(1)</sup>	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3LHM3/85A <sup>(1)</sup>	0.024	85A	10 000	13" diameter plastic tape and reel

**Note**

- (1) Automotive grade

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

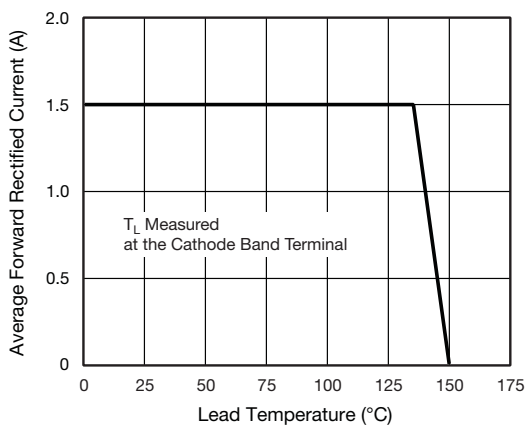


Fig. 1 - Maximum Forward Current Derating Curve

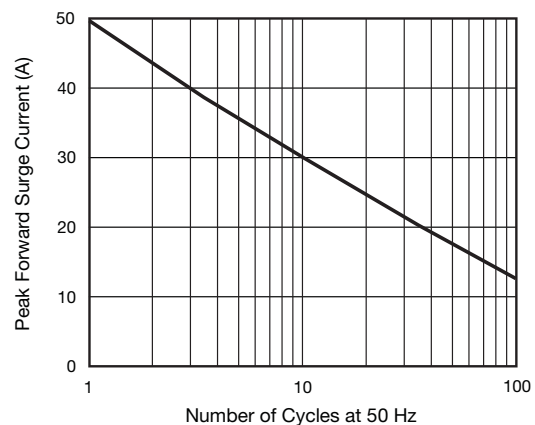


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

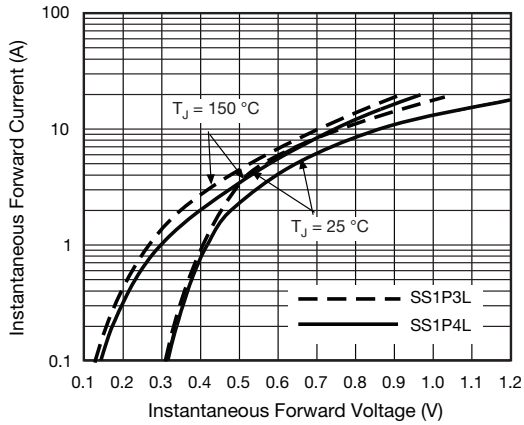


Fig. 3 - Typical Instantaneous Forward Characteristics

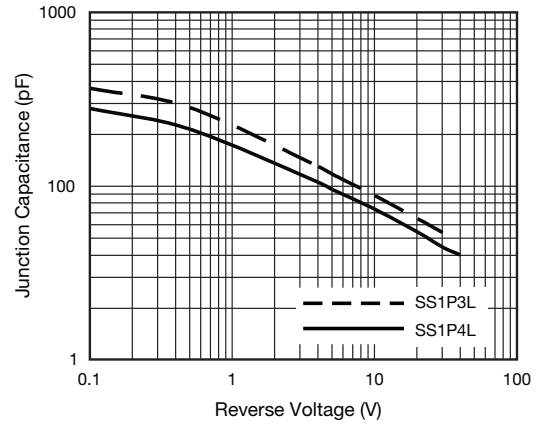


Fig. 5 - Typical Junction Capacitance

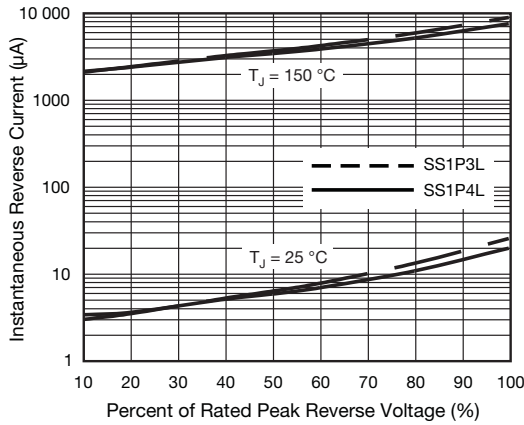


Fig. 4 - Typical Reverse Leakage Characteristics

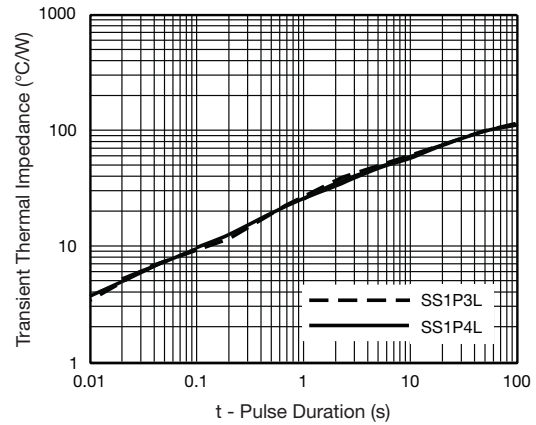
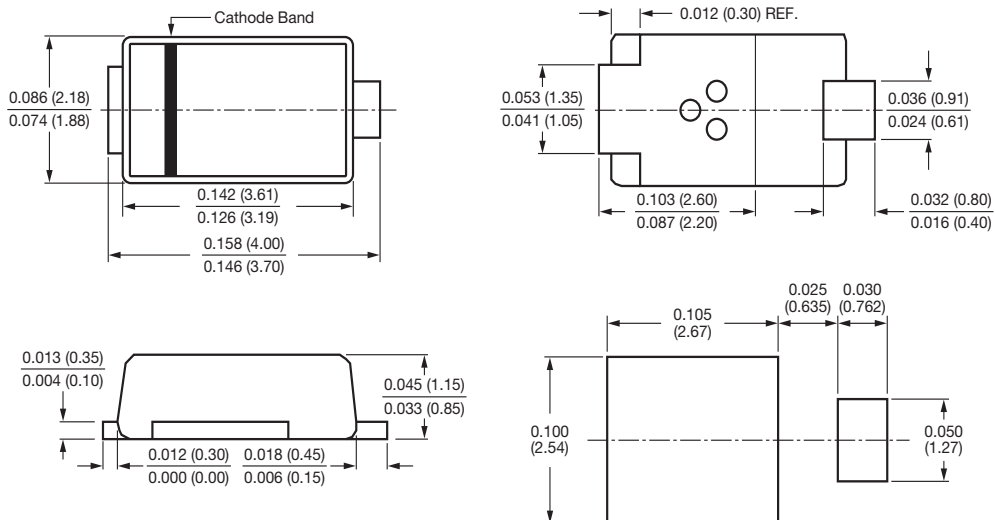


Fig. 6 - Typical Transient Thermal Impedance

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

**DO-220AA (SMP)**





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