

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

## eSMP® Series



**SMP (DO-220AA)**

Cathode  Anode

## 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 available
- 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**

## LINKS TO ADDITIONAL RESOURCES



## 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	SMP (DO-220AA)
Circuit configuration	Single

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection 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 2 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	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)	$I_{F(AV)}$	1.0 1.5		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50		A
Non-repetitive avalanche energy at $I_{AS} = 1.5$ A, $L = 10$ mH, $T_J = 25$ °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** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	SS1P3L	SS1P4L	UNIT
Maximum instantaneous forward voltage	$I_F = 1.0\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	0.45	0.48	V
	$I_F = 1.0\text{ A}$	$T_J = 125\text{ }^{\circ}\text{C}$		0.35	0.38	
Maximum reverse current at rated $V_R$		$T_J = 25\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	200	150	$\mu\text{A}$
		$T_J = 125\text{ }^{\circ}\text{C}$		20	15	mA
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	110	130	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	SS1P3L	SS1P4L	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	105		°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**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

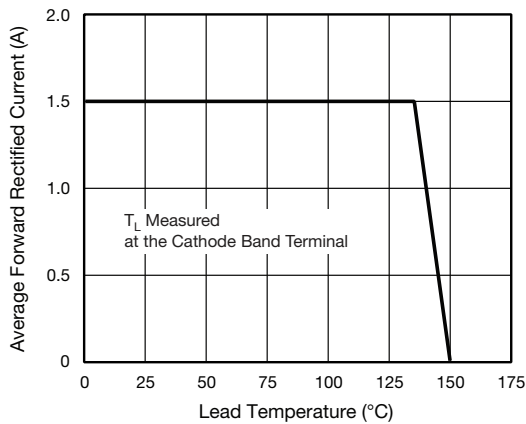
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

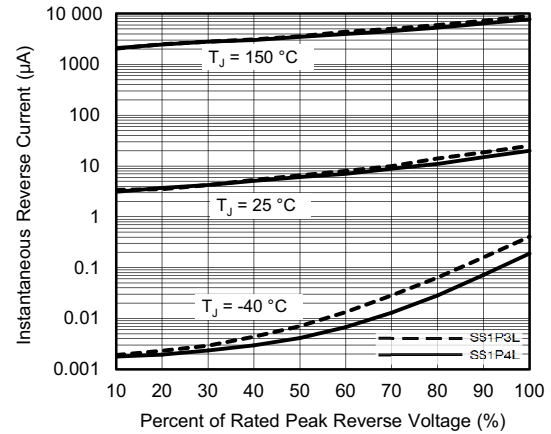


Fig. 4 - Typical Reverse Leakage Characteristics

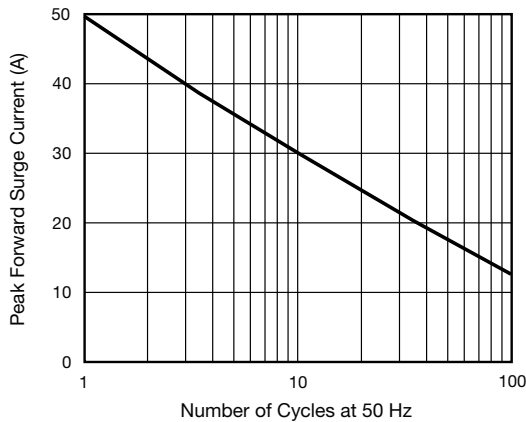


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

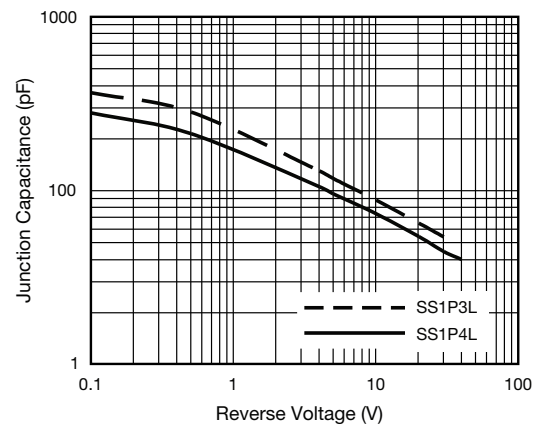


Fig. 5 - Typical Junction Capacitance

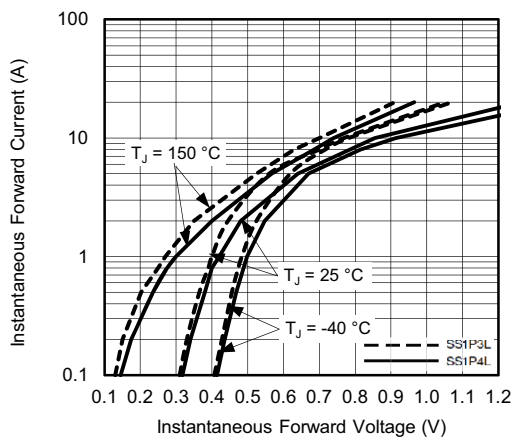


Fig. 3 - Typical Instantaneous Forward Characteristics

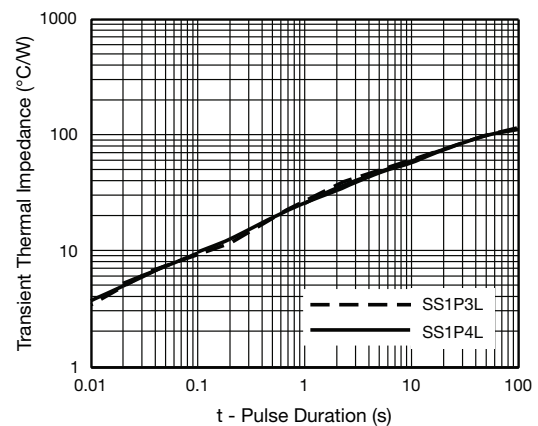
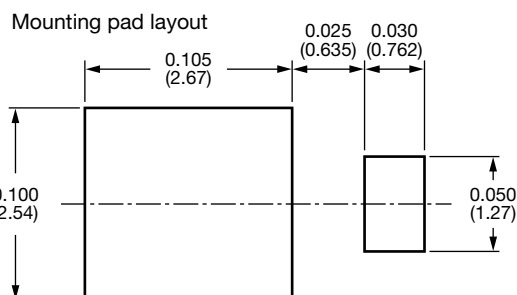
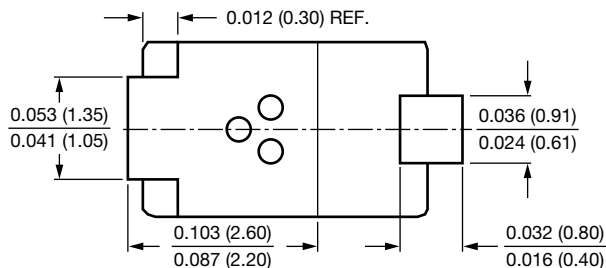
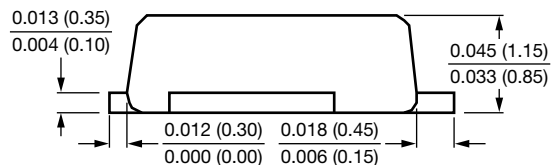
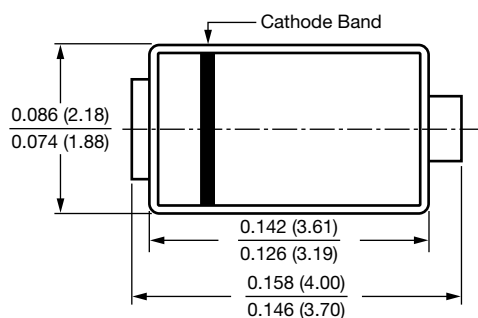


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMP (DO-220AA)





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