

# High Current Density Surface-Mount Schottky Barrier Rectifiers

**eSMP® Series**

**SMP (DO-220AA)**

Cathode Anode

**LINKS TO ADDITIONAL RESOURCES**

**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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
 COMPLIANT  
 HALOGEN  
 FREE

**TYPICAL APPLICATIONS**

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

**Note**

- These devices are not AEC-Q101 qualified

**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

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 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
$I_{FSM}$	30 A
$E_{AS}$	10 mJ
$V_F$	0.40 V, 0.45 V
$T_J$ max.	150 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	SS1P3	SS1P4	UNIT
Device marking code		13	14	
Maximum repetitive peak reverse voltage	$V_{RRM}$	30	40	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30		A
Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $I_{AS} = 1.5\text{ A}$ , $L = 10\text{ mH}$	$E_{AS}$	10		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 ( $T_A = 25\text{ °C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	SS1P3	SS1P4	UNIT
Maximum instantaneous forward voltage	$I_F = 1.0\text{ A}$	$V_F^{(1)}$	$T_J = 25\text{ °C}$	0.50	V
			$T_J = 125\text{ °C}$	0.40	
Maximum reverse current at rated $V_R$		$I_R^{(2)}$	$T_J = 25\text{ °C}$	150	
			$T_J = 125\text{ °C}$	15	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	70		pF

**Notes**

(1) Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq$  40 ms

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)				
PARAMETER	SYMBOL	SS1P3	SS1P4	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	105		$^\circ\text{C/W}$
	$R_{\theta JL}$ (1)	15		
	$R_{\theta JC}$ (1)	25		

**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
SS1P3-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

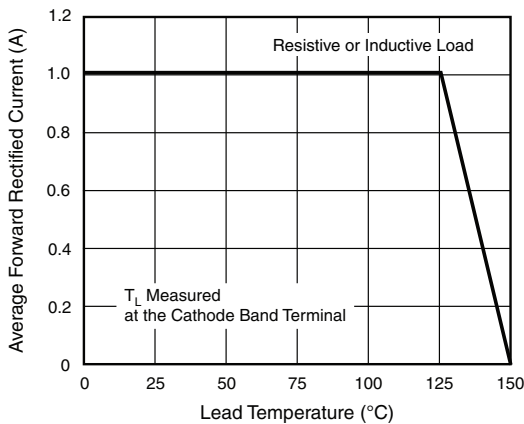
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

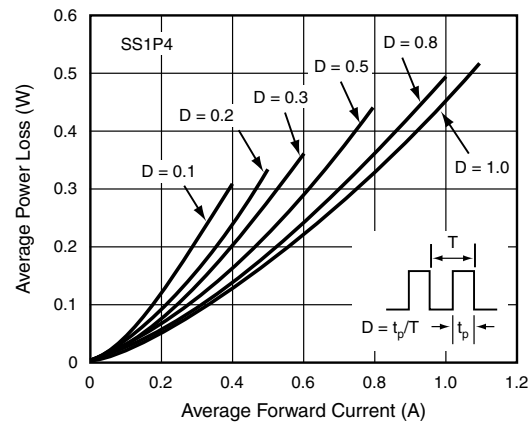


Fig. 3 - Forward Power Loss Characteristics

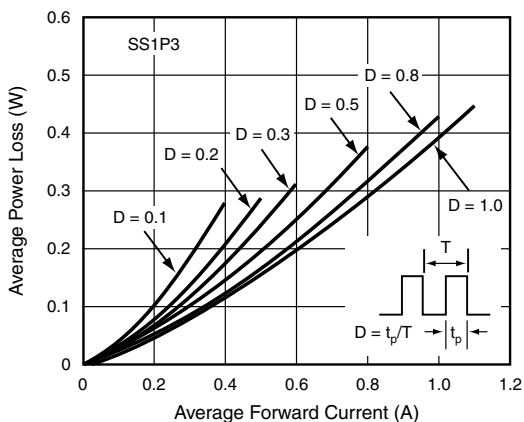


Fig. 2 - Forward Power Loss Characteristics

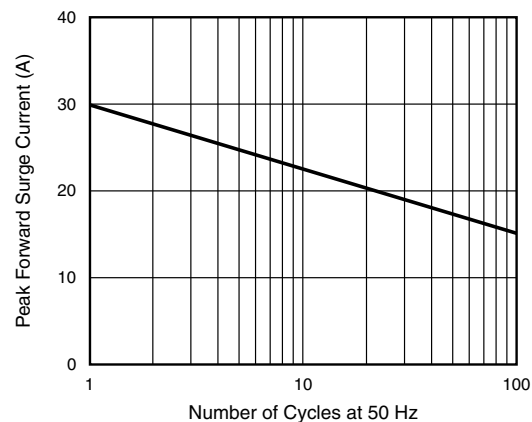


Fig. 4 - Typical Instantaneous Forward Characteristics

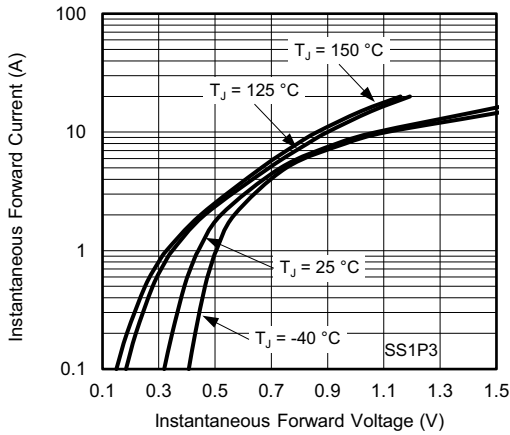


Fig. 5 - Typical Instantaneous Forward Characteristics

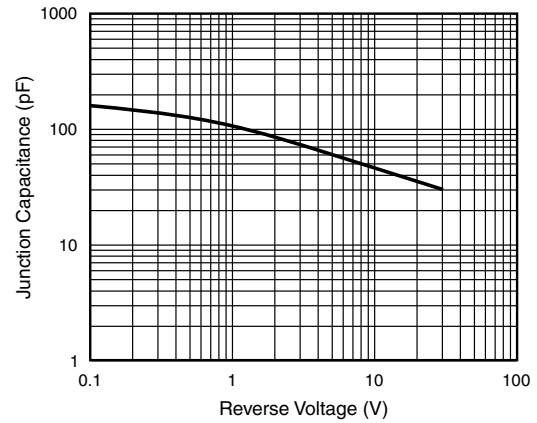


Fig. 8 - Typical Junction Capacitance

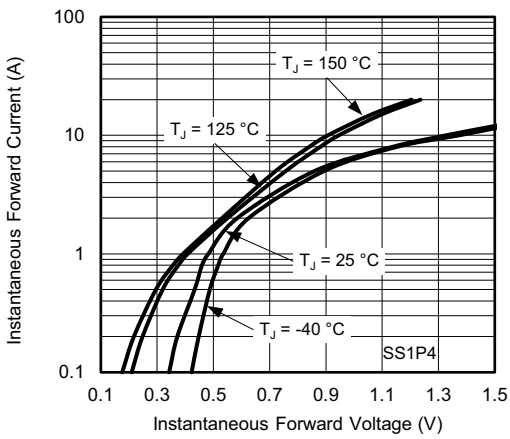


Fig. 6 - Typical Instantaneous Forward Characteristics

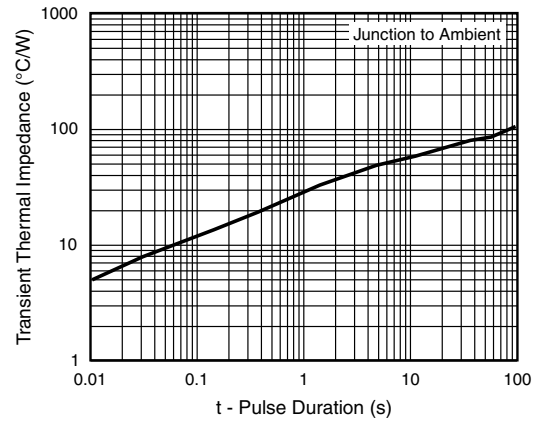


Fig. 9 - Typical Transient Thermal Impedance

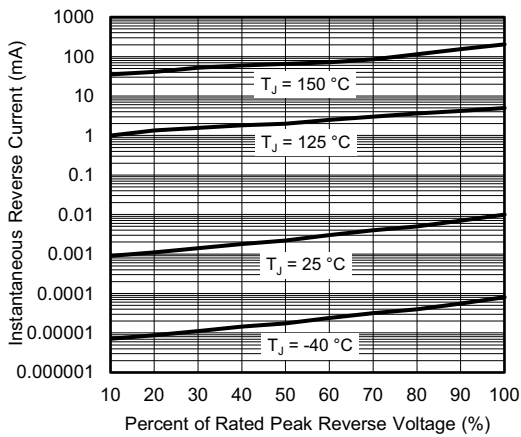
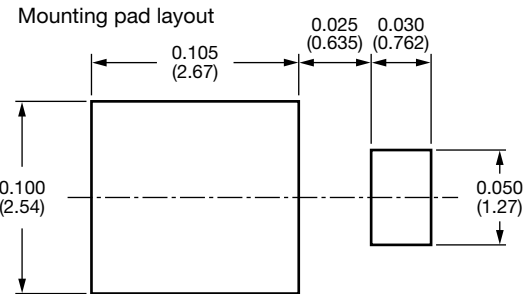
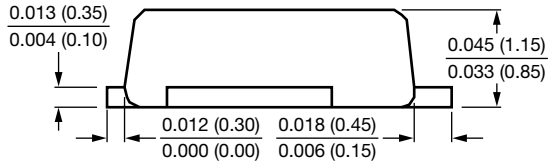
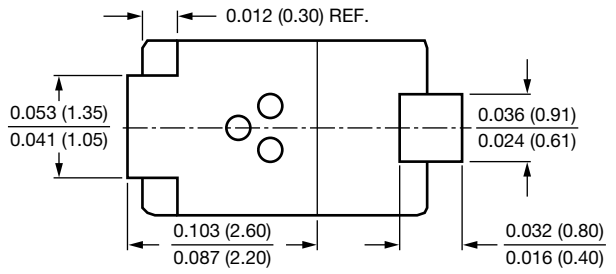
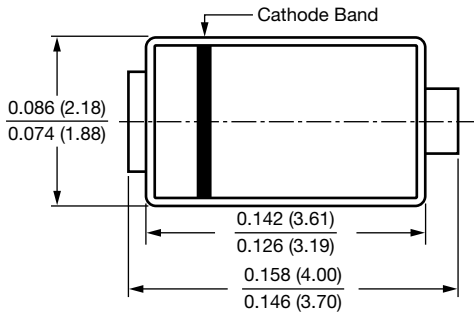


Fig. 7 - Typical Reverse Leakage Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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