

Low V_F High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



DO-220AA (SMP)

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

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

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
- 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



RoHS
COMPLIANT
HALOGEN
FREE

AUTOMOTIVE
GRADE
Available

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 JESD22-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	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)	$I_{F(AV)}$	$T_L = 140$ °C: 1.0 $T_L = 135$ °C: 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/μs
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 150		°C

SS1P3L & SS1P4L

Vishay General Semiconductor



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

Notes:

(1) Pulse test: 300 μs 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 ⁽¹⁾	$R_{\theta JA}$	105		$^\circ\text{C/W}$
	$R_{\theta JL}$	15		
	$R_{\theta JC}$	20		

Note:

(1) 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. $R_{\theta JL}$ 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 ⁽¹⁾	0.024	84A	3000	7" diameter plastic tape and reel
SS1P3LHM3/85A ⁽¹⁾	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)

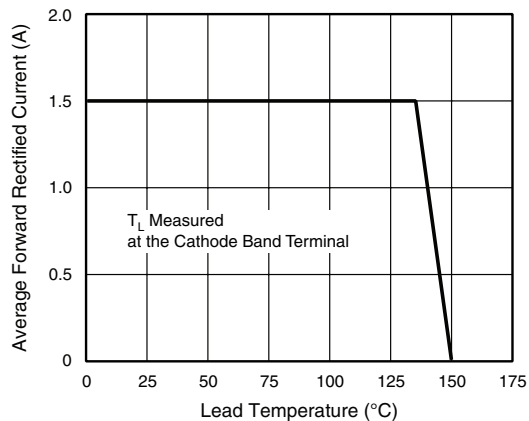


Figure 1. Maximum Forward Current Derating Curve

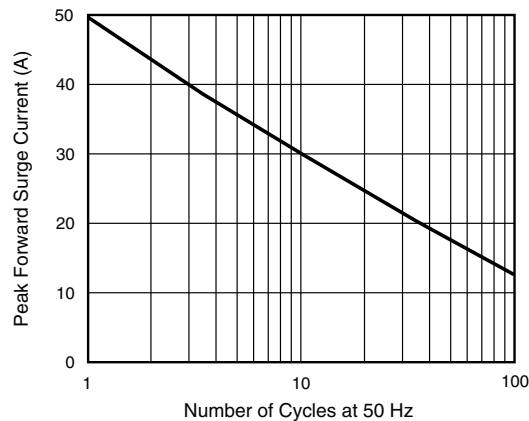


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

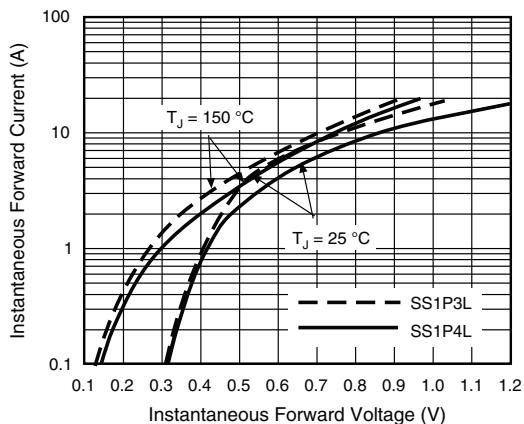


Figure 3. Typical Instantaneous Forward Characteristics

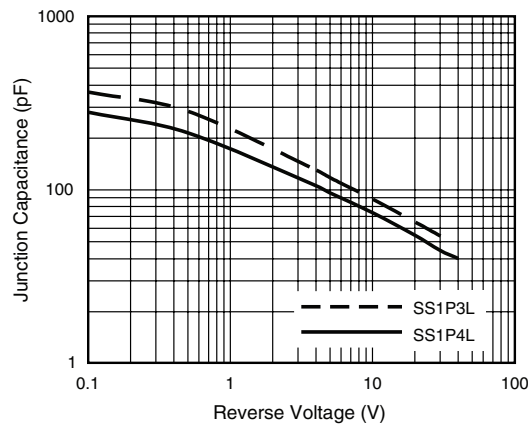


Figure 5. Typical Junction Capacitance

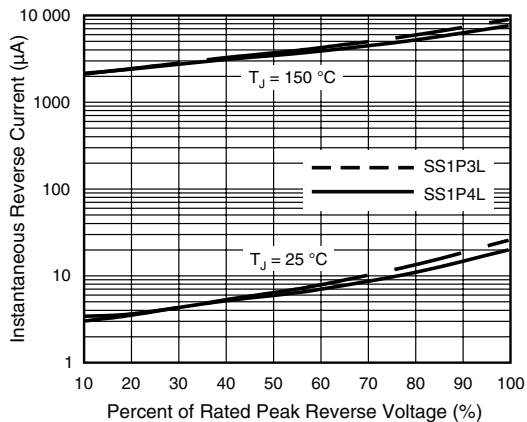


Figure 4. Typical Reverse Leakage Characteristics

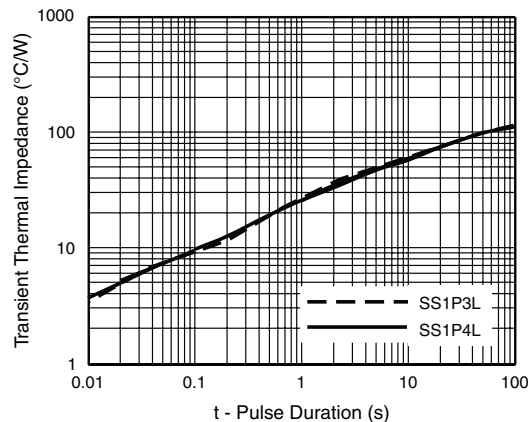
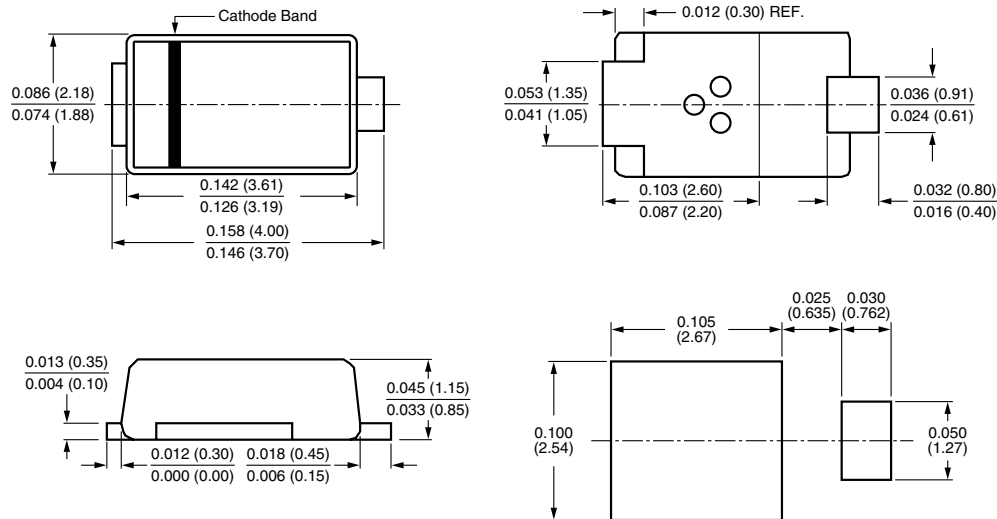


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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