

# High Current Density Surface Mount Schottky Rectifier

## eSMP® Series



**DO-220AA (SMP)**

**AUTOMOTIVE  
GRADE**  
Available



**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)

## TYPICAL APPLICATIONS

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

## 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 cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
$V_{RRM}$	50 V, 60 V
$I_{FSM}$	45 A
$E_{AS}$	11.25 mJ
$V_F$ at $I_F = 3.0$ A	0.61 V
$T_J$ max.	150 °C
Package	DO-220AA (SMP)
Diode variations	Single die

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)				
PARAMETER	SYMBOL	SS3P5	SS3P6	UNIT
Device marking code		35	36	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	60	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	3.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	45		A
Non-repetitive avalanche energy at $T_J = 25$ °C, $I_{AS} = 1.5$ A, $L = 10$ mH	$E_{AS}$	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	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage	I <sub>F</sub> = 3 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.71	0.78	V
		T <sub>J</sub> = 125 °C		0.61	0.65	
Maximum reverse current at rated V <sub>R</sub>		T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	100	μA
		T <sub>J</sub> = 125 °C		2.0	10	mA
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	80		pF

**Notes**

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

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	SS3P4	UNIT
Typical thermal resistance <sup>(1)</sup>	$R_{\theta JA}^{(1)}$	115	$^{\circ}\text{C/W}$
	$R_{\theta JL}^{(1)}$	15	
	$R_{\theta JC}^{(1)}$	20	

**Note**

(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 15 mm x 15 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
SS3P6-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS3P6-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS3P6HM3/84A <sup>(1)</sup>	0.024	84A	3000	7" diameter plastic tape and reel
SS3P6HM3/85A <sup>(1)</sup>	0.024	85A	10 000	13" diameter plastic tape and reel

**Note**

(1) Automotive grade

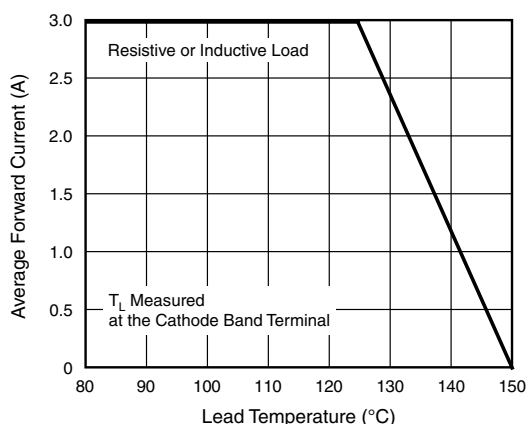
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Forward Current Derating Curve

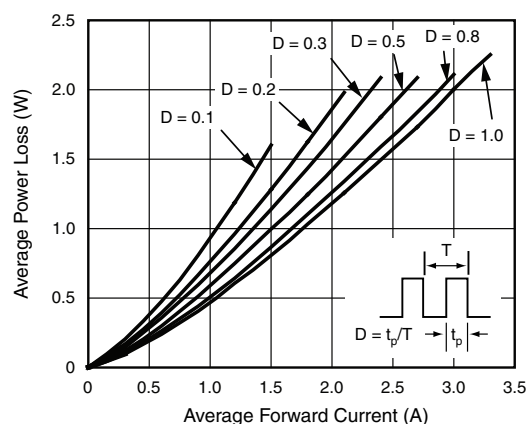


Fig. 2 - Forward Power Loss Characteristics

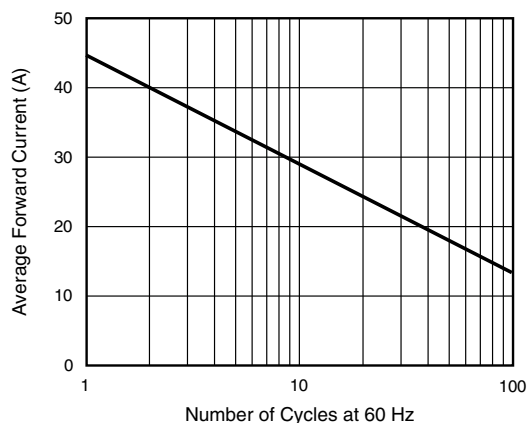


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

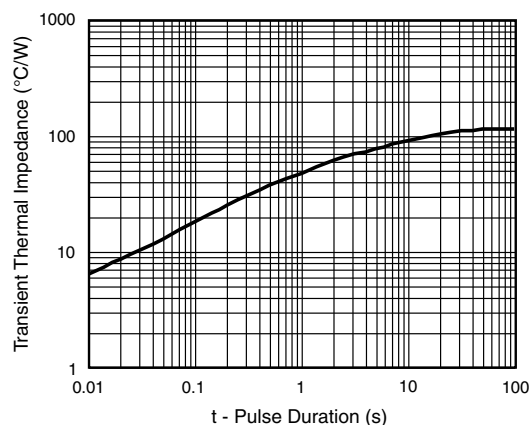


Fig. 6 - Typical Transient Thermal Impedance

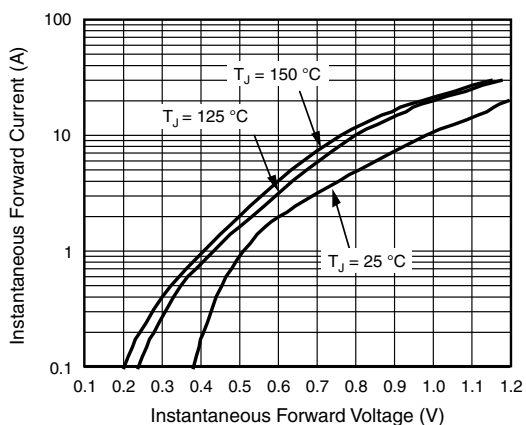


Fig. 4 - Typical Instantaneous Forward Characteristics

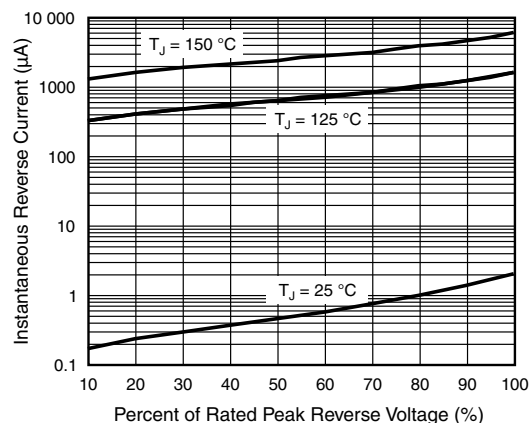


Fig. 7 - Typical Reverse Leakage Characteristics

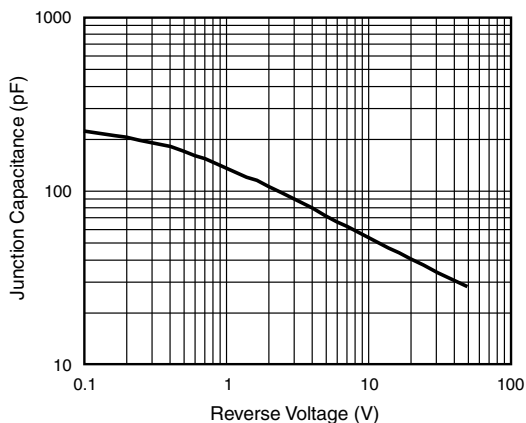
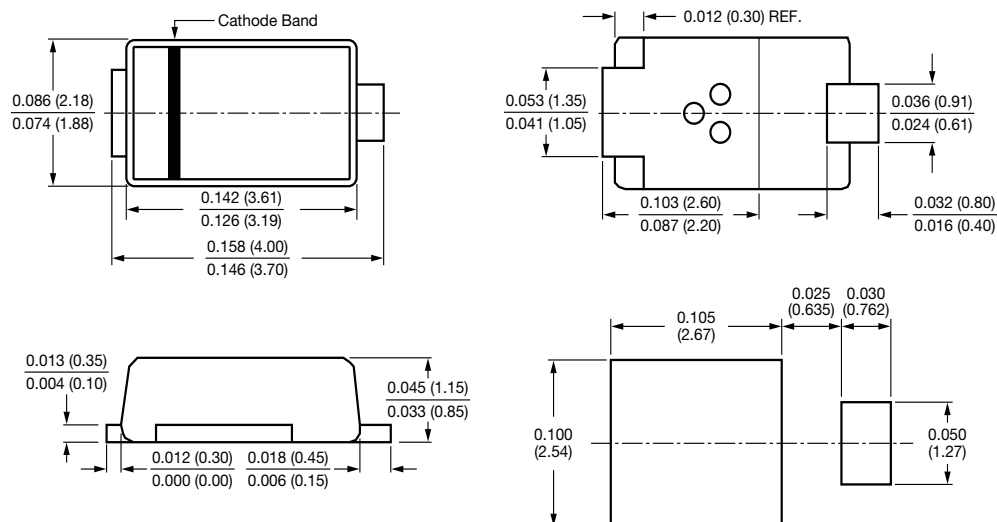


Fig. 5 - Typical Junction Capacitance

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

## DO-220AA (SMP)





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