

High Current Density Surface Mount Schottky Barrier Rectifier

eSMP® Series



DO-220AA (SMP)

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2.0 A
V_{RRM}	20 V, 30 V, 40 V
I_{FSM}	50 A
E_{AS}	11.25 mJ
V_F	0.50 V
T_J max.	150 °C
Package	DO-220AA (SMP)
Diode variations	Single

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

AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

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

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	SS2P2	SS2P3	SS2P4	UNIT
Device marking code		22	23	24	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50			A
Non-repetitive avalanche energy at $I_{AS} = 1.5\text{ A}$, $L = 10\text{ mH}$, $T_J = 25\text{ °C}$	E_{AS}	11.25			mJ
Voltage rate of change (rated V_R)	dV/dt	10 000			V/ μ 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	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage	$I_F = 2\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	0.50	0.55	V
	$I_F = 2\text{ A}$	$T_J = 125\text{ }^{\circ}\text{C}$		0.43	0.50	
Maximum reverse current at rated V_R voltage		$T_J = 25\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	-	150	μA
		$T_J = 125\text{ }^{\circ}\text{C}$		8	15	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	110		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	SS2P2	SS2P3	SS2P4	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	115			°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 6.0 mm x 6.0 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
SS2P4-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS2P4-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS2P4HM3/84A ⁽¹⁾	0.024	84A	3000	7" diameter plastic tape and reel
SS2P4HM3/85A ⁽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)

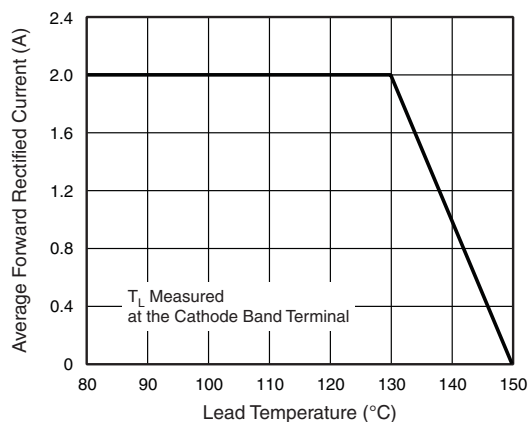


Fig. 1 - Forward Current Derating Curve

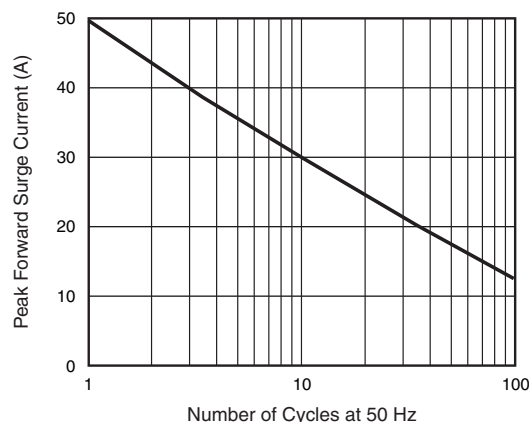


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

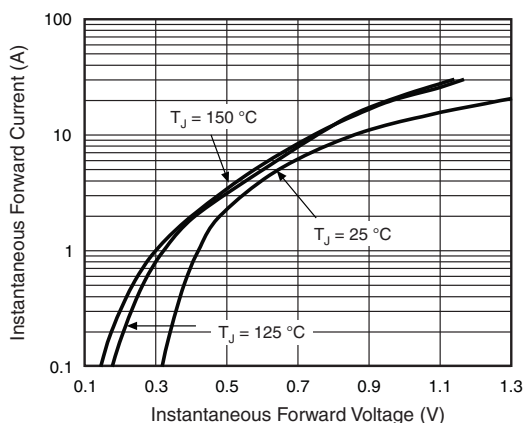


Fig. 3 - Typical Instantaneous Forward Characteristics

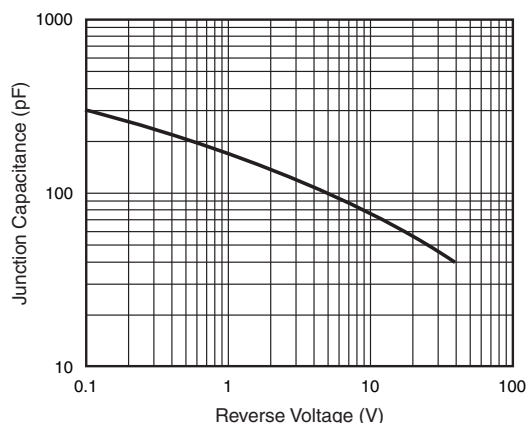


Fig. 5 - Typical Junction Capacitance

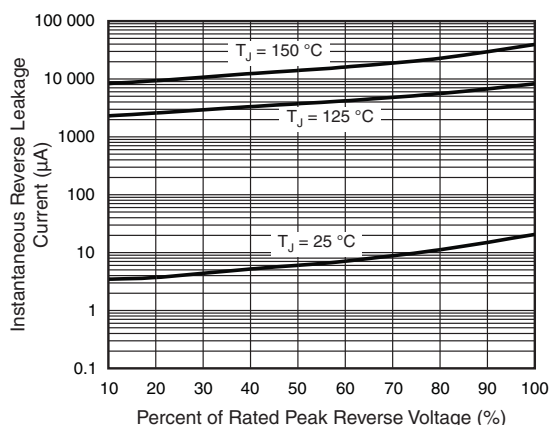


Fig. 4 - Typical Reverse Leakage Characteristics

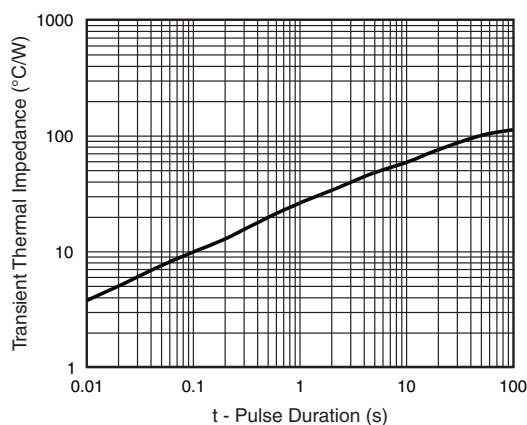
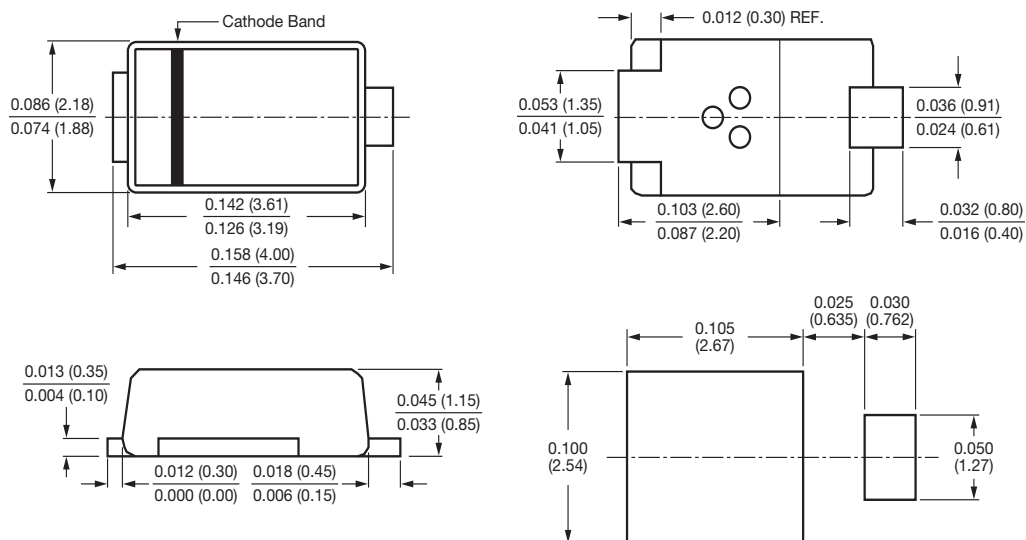


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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