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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



High Current Density Surface Mount Glass Passivated Fast Switching 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
- Glass passivated pellet chip junction
- Fast switching for high efficiency
- Low thermal resistance
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
- Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

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 AEC-Q101 qualified

 Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified
("X" denotes revision code e.g. A, B,....)

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

M3 and HM3 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}	100 V, 200 V, 400 V, 600 V
I_{FSM}	30 A
t_{rr}	150 ns, 250 ns
I_R	1 μ A
V_F	1.3 V
T_J max.	150 °C
Package	DO-220AA (SMP)
Diode variation	Single die

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	RS1PB	RS1PD	RS1PG	RS1PJ	UNIT
Device marking code		RB	RD	RG	RJ	
Maximum repetitive peak reverse voltage	V_{RRM}	100	200	400	600	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
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150				°C

ELECTRICAL CHARACTERISTICS ($T_A = 25$ °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	RS1PB	RS1PD	RS1PG	RS1PJ	UNIT
Maximum instantaneous forward voltage	$I_F = 1.0$ A	V_F (1)	1.3				V
Maximum reverse current at rated V_R voltage	$T_A = 25$ °C	I_R (2)	1.0				μ A
	$T_A = 125$ °C		60				
Maximum reverse recovery time	$I_F = 0.5$ A, $I_R = 1.0$ A, $I_{rr} = 0.25$ A	t_{rr}	150			250	ns
Typical junction capacitance	4.0 V, 1 MHz	C_J	9				pF

Notes

 (1) Pulse test: 300 μ s pulse width, 1 % duty cycle

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



THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	RS1PB	RS1PD	RS1PG	RS1PJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	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 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	
RS1PB-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel	
RS1PB-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel	
RS1PBHM3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel	
RS1PBHM3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel	
RS1PBHM3/H (1)	0.024	H	3000	7" diameter plastic tape and reel	
RS1PBHM3/I (1)	0.024	I	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)

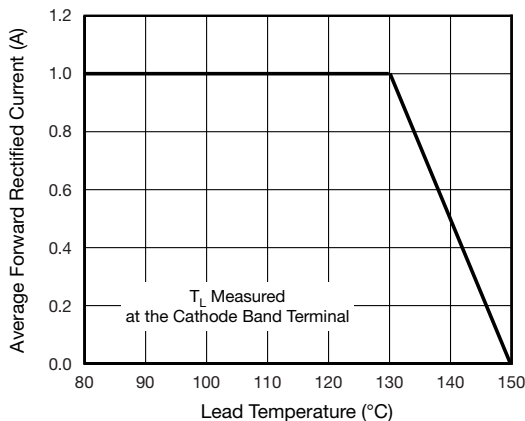


Fig. 1 - Maximum Forward Current Derating Curve

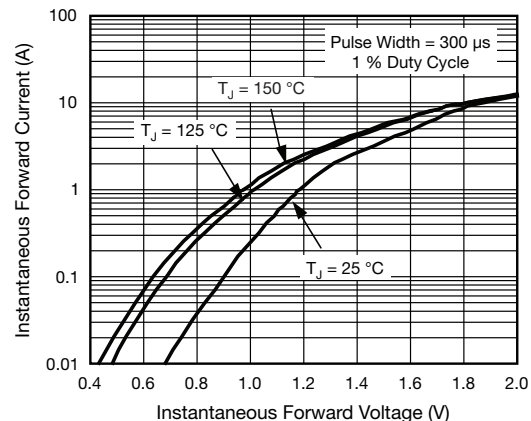


Fig. 3 - Typical Instantaneous Forward Characteristics

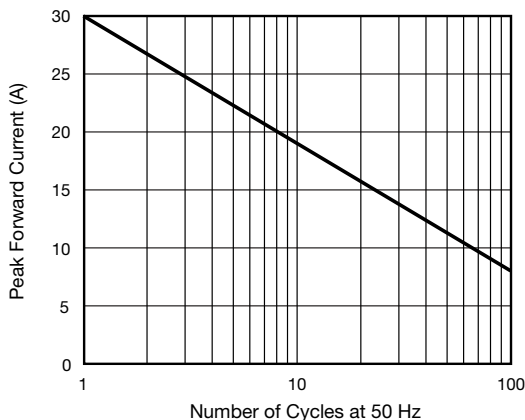


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

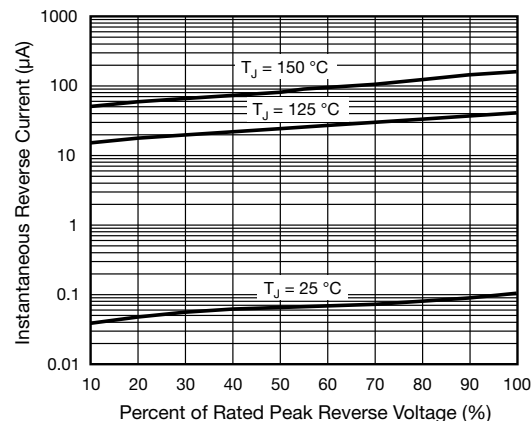


Fig. 4 - Typical Reverse Characteristics

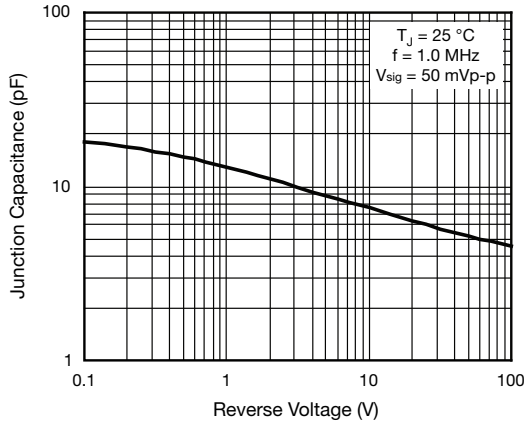


Fig. 5 - Typical Junction Capacitance

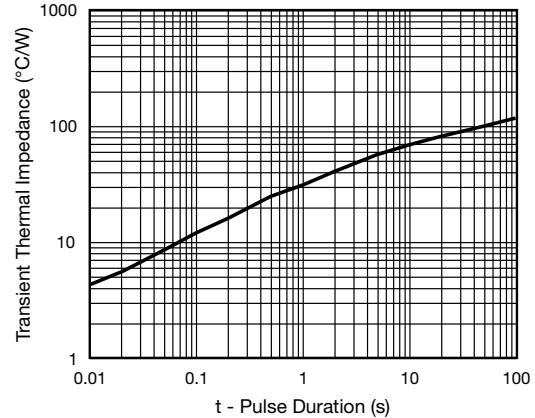
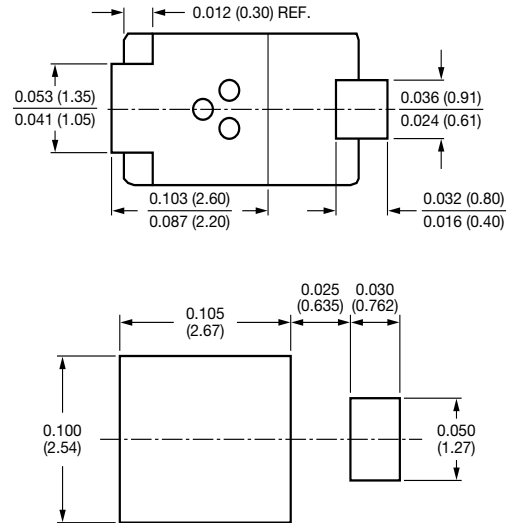
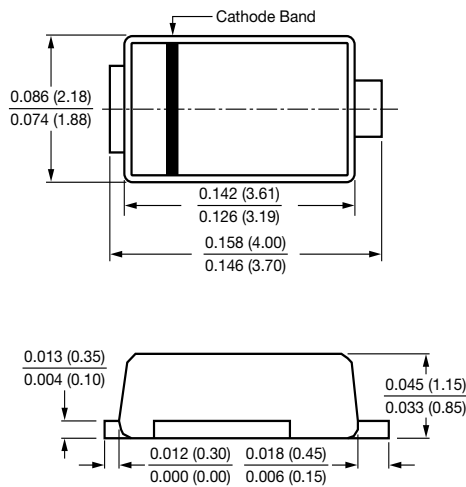


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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