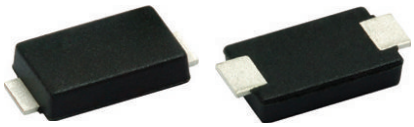
Surface-Mount Glass Passivated Rectifier

eSMP® Series



Top View **Bottom View**

SlimSMA (DO-221AC)

Cathode ○—▶|—○ Anode

FEATURES

- Very low profile - typical height of 0.95 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, and industrial applications

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3 A
V_{RRM}	400 V, 600 V
I_{FSM}	50 A
I_R	10 µA
V_F at I_F = 3 A (125 °C)	0.9
T_J max.	175 °C
Package	SlimSMA (DO-221AC)
Circuit configuration	Single

MECHANICAL DATA

Case: SlimSMA (DO-221AC)
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

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 and HM3 suffix meet JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	S3AFG	S3AFJ	UNIT
Device marking code		3G	3J	
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Maximum average forward rectified current	$I_{F(AV)}$ (1)	3		A
	$I_{F(AV)}$ (2)	1.3		A
Peak forward surge current 10 ms single half sine-wave	I_{FSM}	50		A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175		°C

Notes

(1) Mounted on 20 mm x 20 mm pad areas, 2 oz. FR4 PCB
(2) Free air, mounted on recommended copper pad area

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 1.5 A	T_J = 25 °C	V_F (1)	0.93	-	V
	I_F = 3.0 A			1	1.1	
	I_F = 1.5 A	T_J = 125 °C		0.81	-	
	I_F = 3.0 A			0.9	-	
Max. reverse current	Rated V_R	T_J = 25 °C	I_R (2)	-	10	µA
		T_J = 125 °C		-	100	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	2.7	-	µs
Typical junction capacitance	4.0 V, 1 MHz		C_J	28	-	pF

Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise specified)				
PARAMETER	**SYMBOL**	**S3AFG**	**S3AFJ**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	130		°C/W
	$R_{\theta JM}$ (3)	7.3		

Notes

(1) The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

(2) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint

(3) Thermal resistance junction-to-mount to follow JEDEC® 51-14, transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
S3AFJ-M3/I	0.0307	I	14 000	13" diameter plastic tape and reel
S3AFJHM3/I (1)	0.0307	I	14 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise specified)

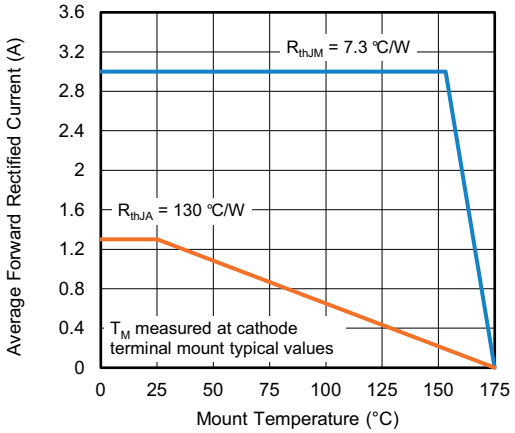


Fig. 1 - Forward Current Derating Curve

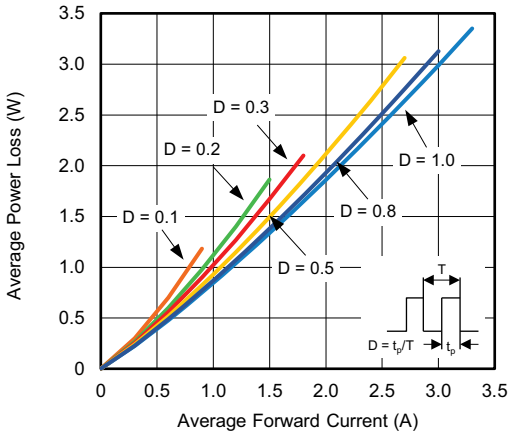


Fig. 2 - Forward Power Loss Characteristics

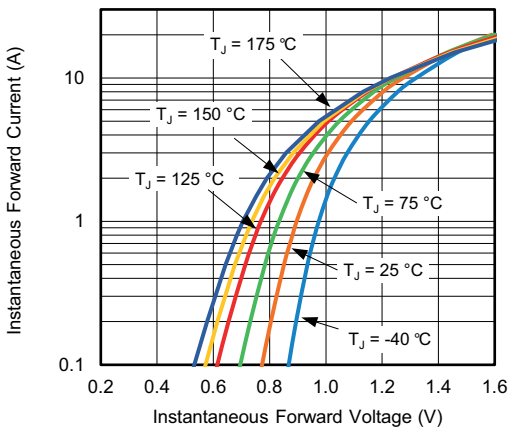


Fig. 3 - Typical Instantaneous Forward Characteristics

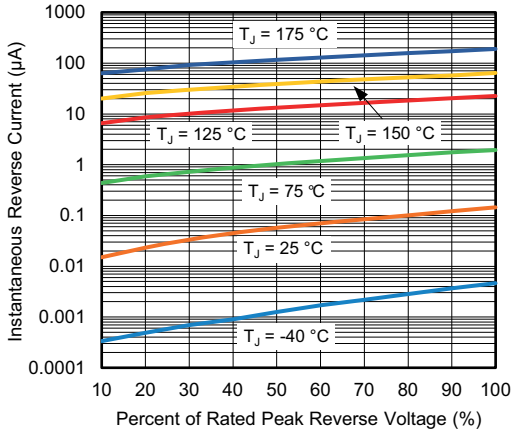


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

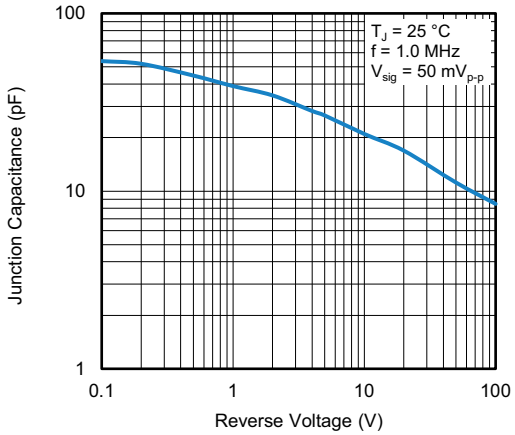


Fig. 5 - Typical Junction Capacitance

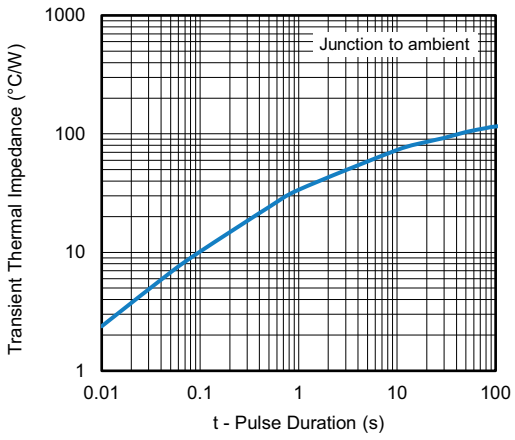
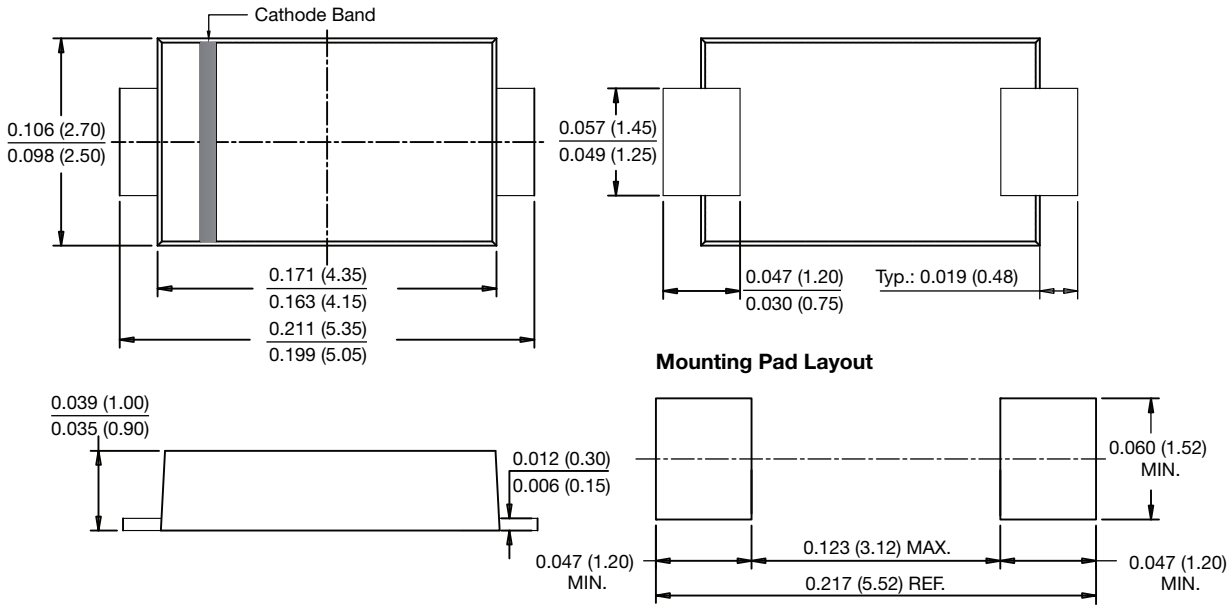


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)



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