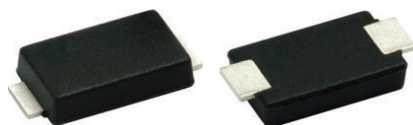


# Surface-Mount Glass Passivated Rectifier

## eSMP® Series



Top View

Bottom View

### SlimSMA (DO-221AC)

Cathode  Anode

## LINKS TO ADDITIONAL RESOURCES



3D Models

## PRIMARY CHARACTERISTICS

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

## 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## TYPICAL APPLICATIONS

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

## 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** ( $T_J = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                     | TEST CONDITIONS                                                        | SYMBOL      | TYP. | MAX. | UNIT          |
|-------------------------------|------------------------------------------------------------------------|-------------|------|------|---------------|
| Instantaneous forward voltage | $I_F = 1.5\text{ A}$                                                   | $V_F^{(1)}$ | 0.93 | -    | V             |
|                               | $I_F = 3.0\text{ A}$                                                   |             | 1    | 1.1  |               |
|                               | $I_F = 1.5\text{ A}$                                                   |             | 0.81 | -    |               |
|                               | $I_F = 3.0\text{ A}$                                                   |             | 0.9  | -    |               |
| Max. reverse current          | Rated $V_R$                                                            | $I_R^{(2)}$ | -    | 10   | $\mu\text{A}$ |
|                               |                                                                        |             | -    | 100  |               |
| Typical reverse recovery time | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$ | $t_{rr}$    | 2.7  | -    | $\mu\text{s}$ |
| Typical junction capacitance  | 4.0 V, 1 MHz                                                           | $C_J$       | 28   | -    | pF            |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  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 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 <sup>(1)</sup> | 0.0307          | I                      | 14 000        | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

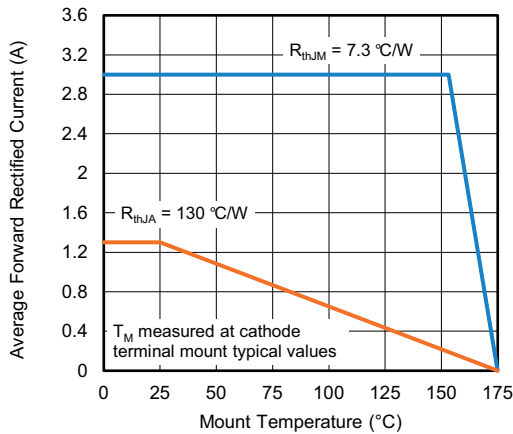
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Forward Current Derating Curve

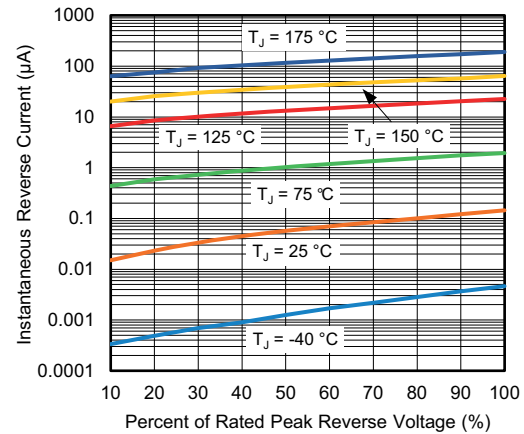


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

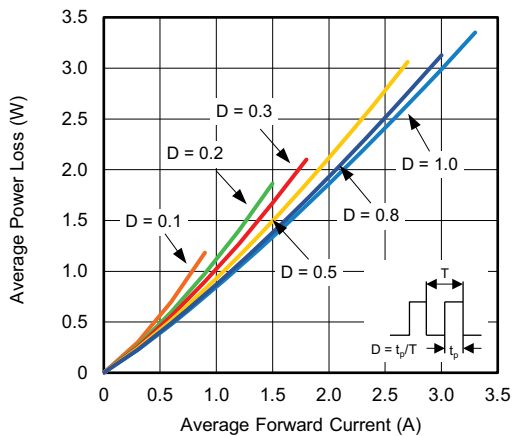


Fig. 2 - Forward Power Loss Characteristics

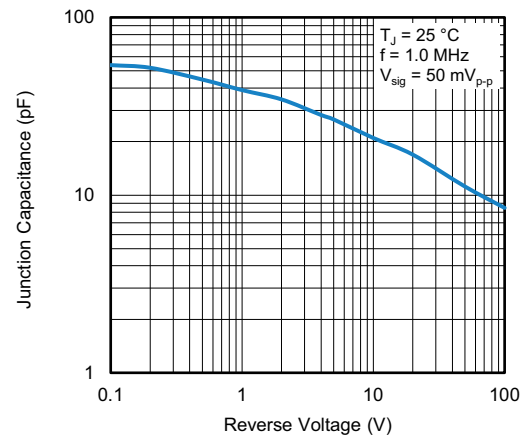


Fig. 5 - Typical Junction Capacitance

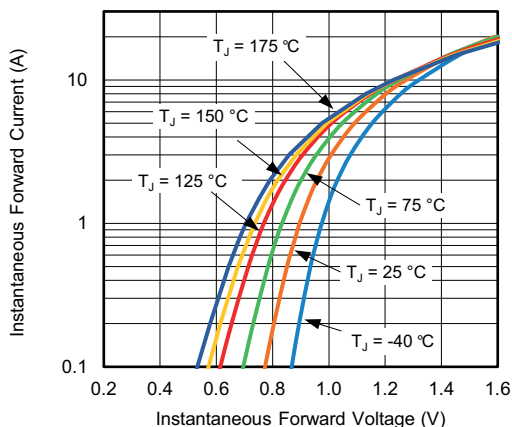


Fig. 3 - Typical Instantaneous Forward Characteristics

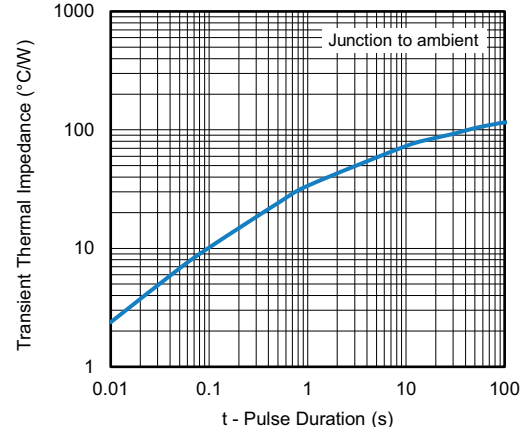
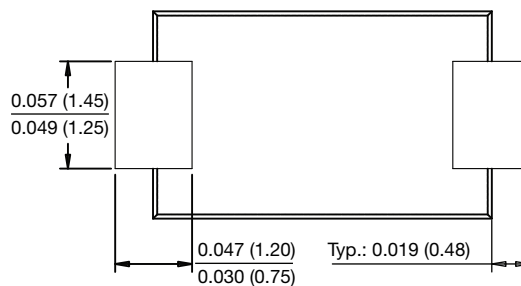
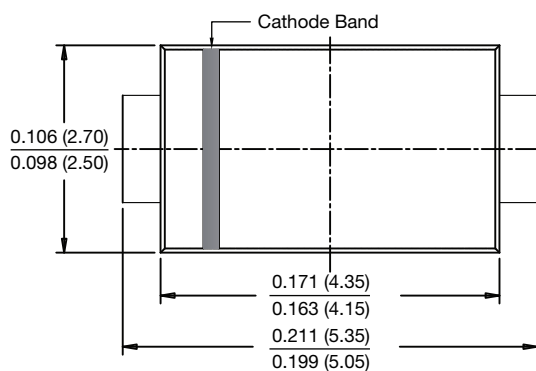


Fig. 6 - Typical Transient Thermal Impedance

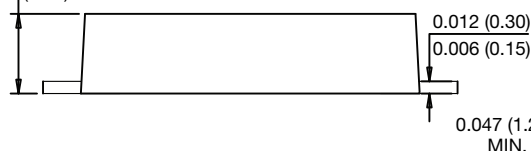


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

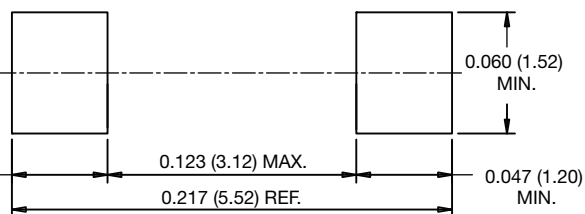
**SlimSMA (DO-221AC)**



0.039 (1.00)  
0.035 (0.90)



**Mounting Pad Layout**





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