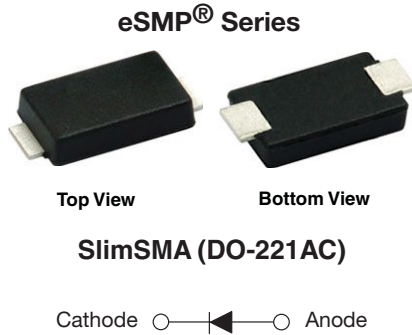


## Surface Mount ESD Capability Rectifiers



### FEATURES

- Very low profile - typical height of 0.95 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop, low leakage current
- ESD capability
- 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)



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

### DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

### TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive 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 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes the cathode end

| PRIMARY CHARACTERISTICS                  |                            |
|--|----------------------------|
| $I_{F(AV)}$                              | 2.0 A                      |
| $V_{RRM}$                                | 100 V, 200 V, 400 V, 600 V |
| $I_{FSM}$                                | 35 A                       |
| $V_F$ at $I_F = 2.0$ A ( $T_A = 125$ °C) | 0.86 V                     |
| $I_R$                                    | 5 $\mu$ A                  |
| $T_J$ max.                               | 175 °C                     |
| Package                                  | SlimSMA (DO-221AC)         |
| Circuit configuration                    | Single                     |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                           |                |             |         |         |         |      |
|---|----------------|-------------|---------|---------|---------|------|
| PARAMETER   | SYMBOL         | SE20AFB     | SE20AFD | SE20AFG | SE20AFJ | UNIT |
| Device marking code   |                | S2B         | S2D     | S2G     | S2J     |      |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 100         | 200     | 400     | 600     | V    |
| Maximum DC forward current  | $I_F^{(1)}$    | 2.0         |         |         |         | A    |
|   | $I_F^{(2)}$    | 1.3         |         |         |         |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 35          |         |         |         | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -55 to +175 |         |         |         | °C   |

#### Notes

(1) Mounted on 5.0 mm x 5.0 mm pad areas, 2 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |  |                                   |             |      |      |               |
|--|--|-----------------------------------|-------------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS  |                                   | SYMBOL      | TYP. | MAX. | UNIT          |
| Instantaneous forward voltage  | $I_F = 1.0\text{ A}$   | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.91 | -    | V             |
|  | $I_F = 2.0\text{ A}$   |                                   |             | 0.96 | 1.1  |               |
|  | $I_F = 1.0\text{ A}$   | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.79 | -    |               |
|  | $I_F = 2.0\text{ A}$   |                                   |             | 0.86 | 0.98 |               |
| Reverse current  | Rated $V_R$  | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 5.0  | $\mu\text{A}$ |
|  |  | $T_A = 125\text{ }^\circ\text{C}$ |             | 8    | 100  |               |
| Typical reverse recovery time  | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$ |                                   | $t_{rr}$    | 1.2  | -    | $\mu\text{s}$ |
| Typical junction capacitance   | 4.0 V, 1 MHz   |                                   | $C_J$       | 12   | -    | 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 noted) |                       |         |         |         |         |                    |
|---|-----------------------|---------|---------|---------|---------|--------------------|
| PARAMETER   | SYMBOL                | SE20AFB | SE20AFD | SE20AFG | SE20AFJ | UNIT               |
| Typical thermal resistance  | $R_{\theta JA}^{(1)}$ | 125     |         |         |         | $^\circ\text{C/W}$ |
|   | $R_{\theta JM}^{(2)}$ | 12      |         |         |         |                    |

**Notes**

- (1) Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
(2) Mounted on 5.0 mm x 5.0 mm pad areas, 2 oz. FR4 PCB;  $R_{\theta JM}$  - junction to mount

| <b>IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS</b><br>( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                                 |  |        |       |                 |
|---|---------------------------------|--|--------|-------|-----------------|
| STANDARD  | TEST TYPE                       | TEST CONDITIONS                                | SYMBOL | CLASS | VALUE           |
| AEC-Q101-001  | Human body model (contact mode) | $C = 100\text{ pF}$ , $R = 1.5\text{ k}\Omega$ | $V_C$  | H3B   | $> 8\text{ kV}$ |

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| SE20AFJ-M3/6A                         | 0.032           | 6A                     | 3500          | 7" diameter plastic tape and reel  |
| SE20AFJ-M3/6B                         | 0.032           | 6B                     | 14 000        | 13" diameter plastic tape and reel |
| SE20AFJHM3/6A <sup>(1)</sup>          | 0.032           | 6A                     | 3500          | 7" diameter plastic tape and reel  |
| SE20AFJHM3/6B <sup>(1)</sup>          | 0.032           | 6B                     | 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 noted)

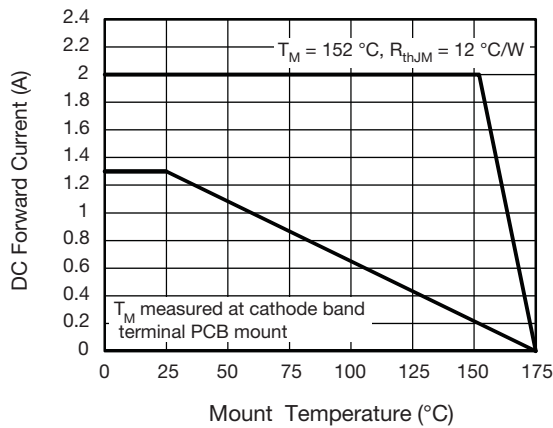


Fig. 1 - Maximum Forward Current Derating Curve

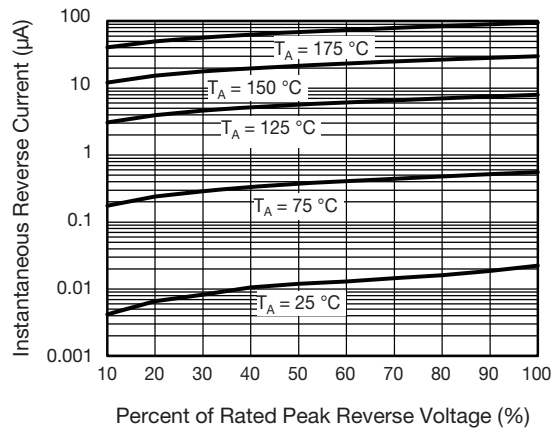


Fig. 4 - Typical Reverse Leakage Characteristics

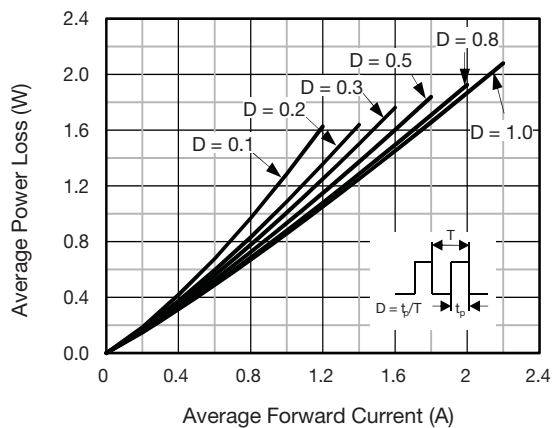


Fig. 2 - Forward Power Loss Characteristics

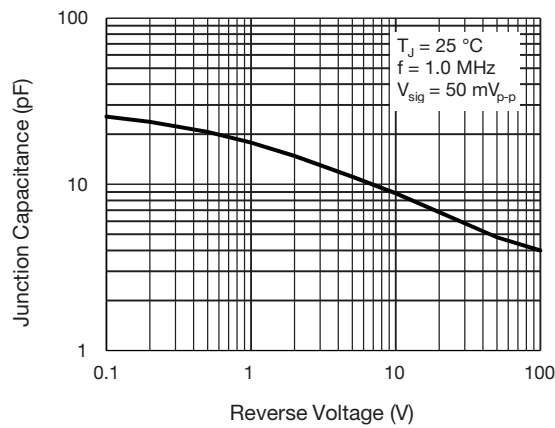


Fig. 5 - Typical Junction Capacitance

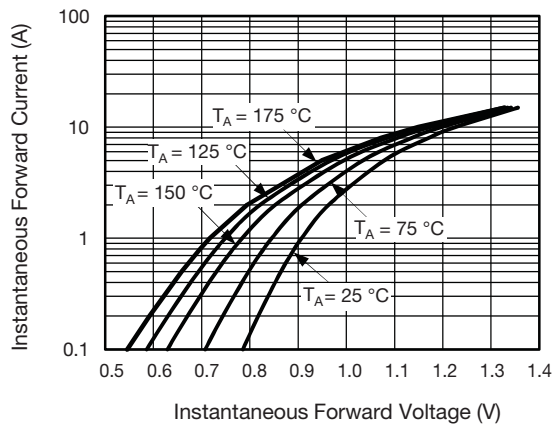


Fig. 3 - Typical Instantaneous Forward Characteristics

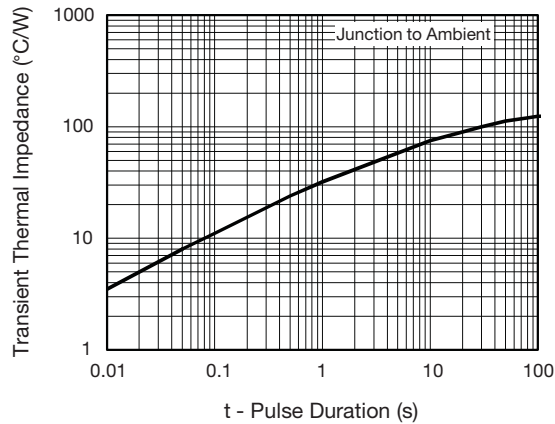


Fig. 6 - Typical Junction Capacitance

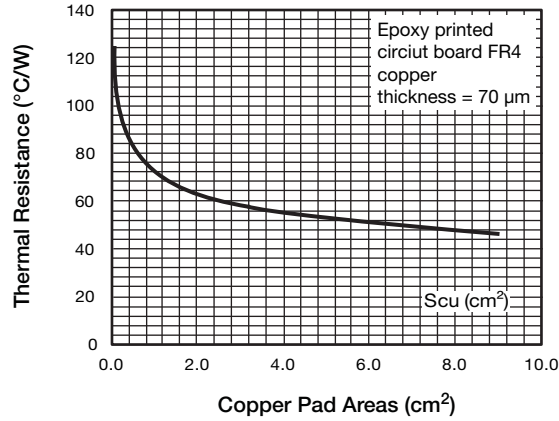
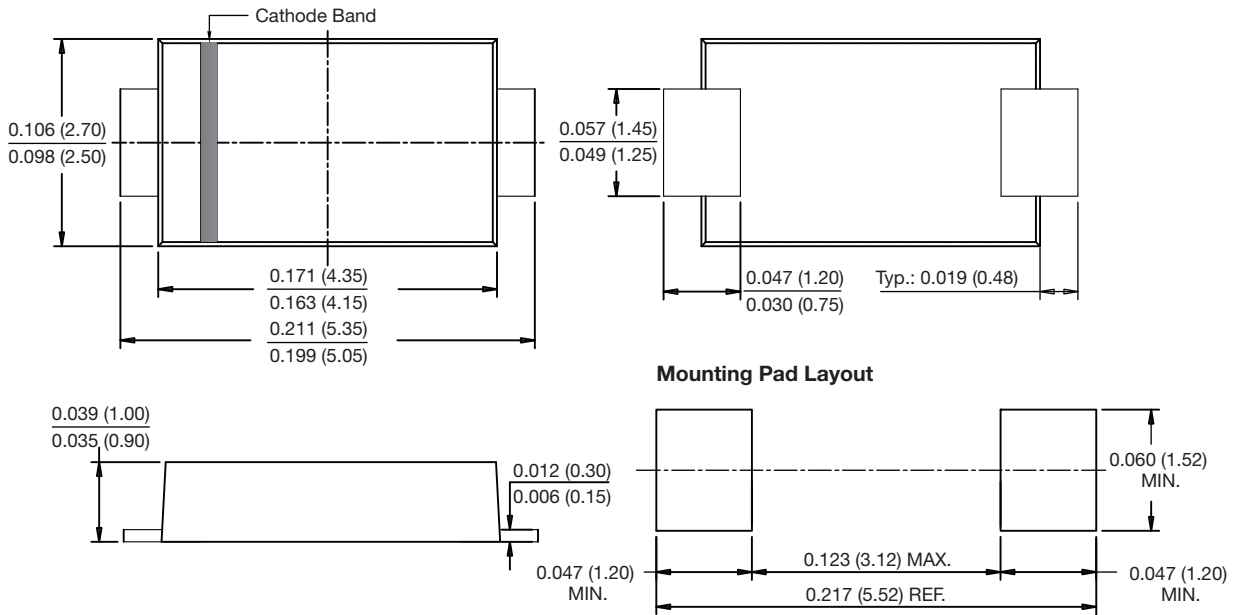


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

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

**DO-221AC (SlimSMA)**





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