

# Surface-Mount Schottky Barrier Rectifier


**SMB-1 (DO-214AA)**

Cathode  Anode

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |                  |
|-------------------------|------------------|
| $I_{F(AV)}$             | 2.0 A            |
| $V_{RRM}$               | 40 V             |
| $I_{FSM}$               | 75 A             |
| $V_F$                   | 0.5 V            |
| $T_J \text{ max.}$      | 150 °C           |
| Package                 | SMB-1 (DO-214AA) |
| Circuit configuration   | Single           |

## FEATURES

- Guardring for overvoltage protection
- Low power losses, high efficiency
- Low forward voltage drop
- 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](http://www.vishay.com/doc?99912)


**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:** SMB-1 (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

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

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                   |             |      |
|------------------------------------------------------------------------------------|-------------------|-------------|------|
| PARAMETER                                                                          | SYMBOL            | SS24        | UNIT |
| Device marking code                                                                |                   | S4          |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$         | 40          | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}^{(1)}$ | 2.0         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 75          | A    |
| Operating junction temperature range                                               | $T_J^{(2)}$       | -55 to +150 | °C   |
| Storage temperature range                                                          | $T_{STG}$         | -55 to +150 | °C   |

### Notes

(1) Free air, mounted on FR4 PCB, 2 oz., standard footprint

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

| ELECTRICAL CHARACTERISTICS ( $T_J = 25\text{ °C}$ unless otherwise noted) |                      |                       |             |      |      |
|---------------------------------------------------------------------------|----------------------|-----------------------|-------------|------|------|
| PARAMETER                                                                 | TEST CONDITIONS      |                       | SYMBOL      | MAX. | UNIT |
| Instantaneous forward voltage                                             | $I_F = 2.0\text{ A}$ | $T_J = 25\text{ °C}$  | $V_F^{(1)}$ | 0.5  | V    |
| Reverse current                                                           | $V_R = 40\text{ V}$  | $T_J = 25\text{ °C}$  | $I_R^{(2)}$ | 0.4  | mA   |
|                                                                           |                      | $T_J = 100\text{ °C}$ |             | 10   |      |

### Notes

(1) Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

(2) Pulse test: pulse width  $\leq 5\text{ ms}$

**THERMAL - MECHANICAL SPECIFICATIONS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

| PARAMETER          | SYMBOL                   | TYP. | UNIT                 |
|--------------------|--------------------------|------|----------------------|
| Thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 90   | $^{\circ}\text{C/W}$ |
|                    | $R_{\theta JM}^{(3)}$    | 9    |                      |

**Notes**

- (1) The heat generated must be less than the 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                      |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| SS24-M3/IA                  | 0.096           | IA                     | 3200          | 13" diameter plastic tape and reel |
| SS24HM3_A/IA <sup>(1)</sup> | 0.096           | IA                     | 3200          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

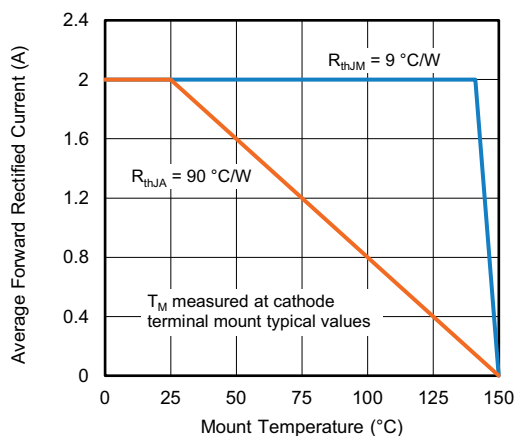
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

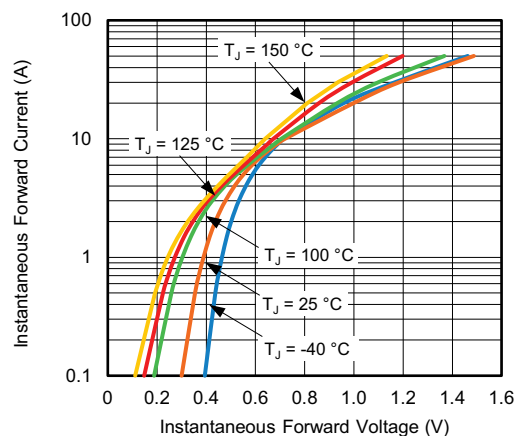


Fig. 3 - Typical Instantaneous Forward Characteristics

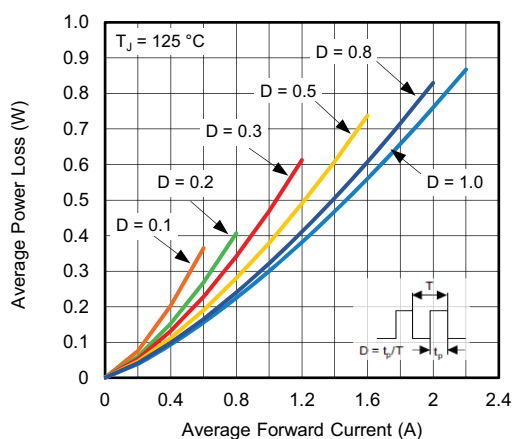


Fig. 2 - Forward Power Loss Characteristics

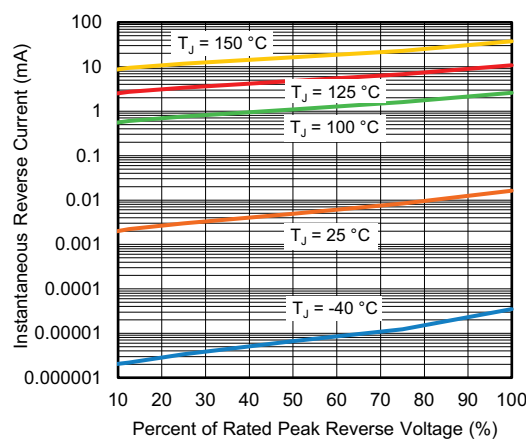


Fig. 4 - Typical Reverse Characteristics

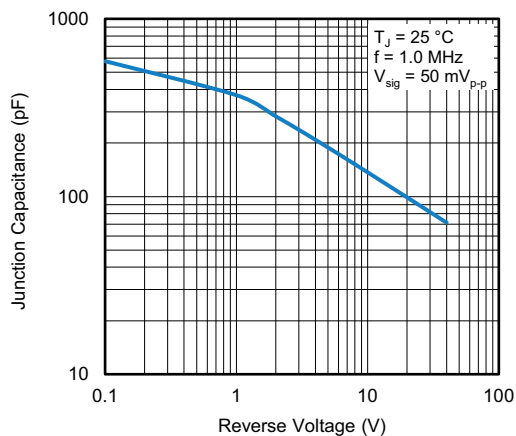


Fig. 5 - Typical Junction Capacitance

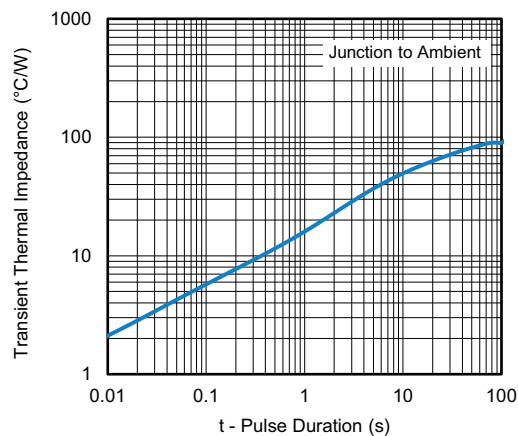
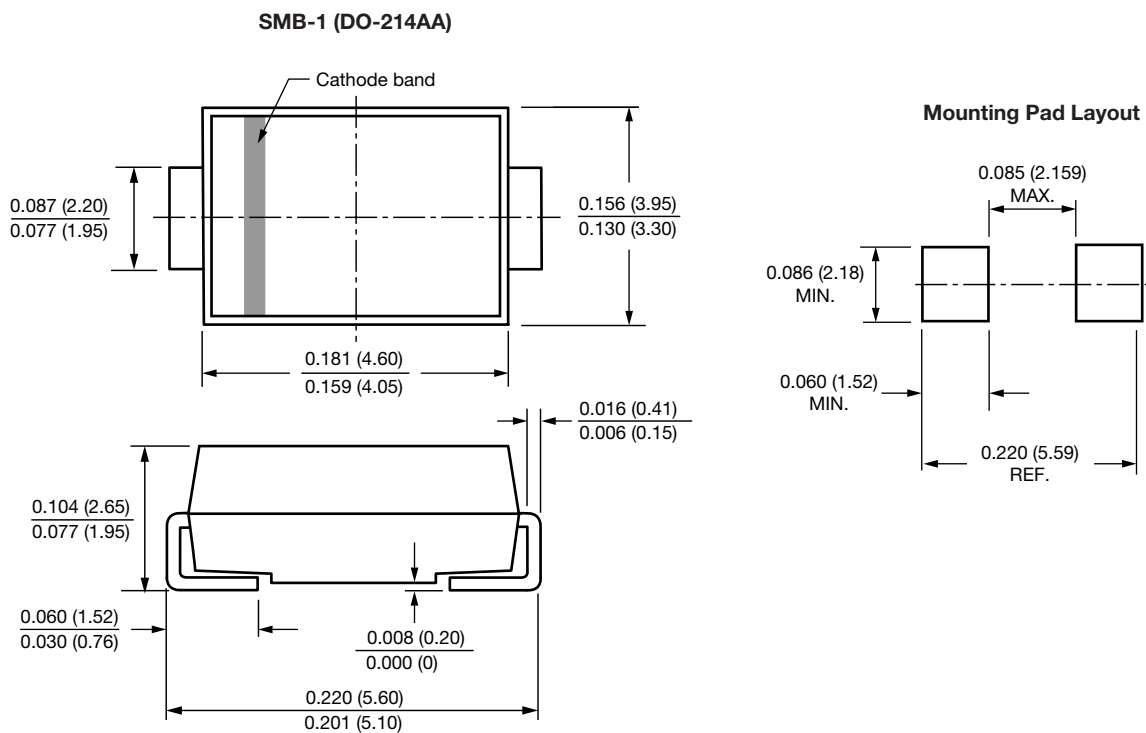


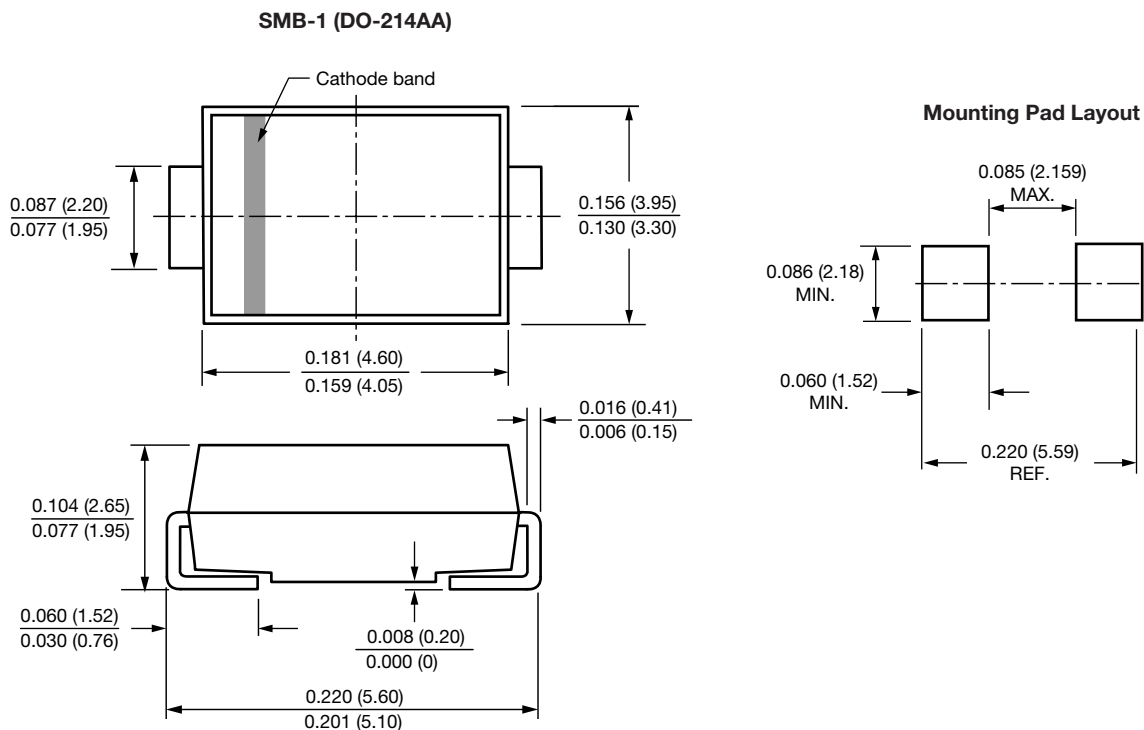
Fig. 6 - Typical Transient Thermal Impedance

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

**LINKS TO RELATED DOCUMENTS**

|                          |                                                                        |
|--------------------------|------------------------------------------------------------------------|
| Dimensions               | <a href="http://www.vishay.com/doc?97362">www.vishay.com/doc?97362</a> |
| Part marking information | <a href="http://www.vishay.com/doc?98657">www.vishay.com/doc?98657</a> |
| Packaging information    | <a href="http://www.vishay.com/doc?98659">www.vishay.com/doc?98659</a> |

## SMB-1 (DO-214AA)

**DIMENSIONS** in inches (millimeters)





## Disclaimer

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