



## Surface Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



SMA (DO-214AC)



### ADDITIONAL RESOURCES



### FEATURES

- Low profile package
- Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- AEC-Q101 qualified available  
- Automotive ordering code; base P/NHM3
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

### MECHANICAL DATA

**Case:** SMA (DO-214AC)

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

M3 and HM3 suffix meets JESD 201 class 2 whisker test

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

| PRIMARY CHARACTERISTICS |                |
|-------------------------|----------------|
| $I_{F(AV)}$             | 3.0 A          |
| $V_{RRM}$               | 100 V          |
| $I_{FSM}$               | 60 A           |
| $V_F$ at $I_F = 3.0$ A  | 0.62 V         |
| $T_J$ max.              | 150 °C         |
| Package                 | SMA (DO-214AC) |
| Circuit configuration   | Single         |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                           |                |             |      |
|---|----------------|-------------|------|
| PARAMETER   | SYMBOL         | VSSA310S    | UNIT |
| Device marking code   |                | V3B         |      |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 100         | V    |
| Maximum DC forward current  | $I_F^{(1)}$    | 3.0         | A    |
|   | $I_F^{(2)}$    | 1.7         |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 60          | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -40 to +150 | °C   |

### Notes

(1) Mounted on 10 mm x 10 mm pad areas, 1 oz. FR4 PCB

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



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                         |                         |                               |               |      |      |
|--|-------------------------|-------------------------|-------------------------------|---------------|------|------|
| PARAMETER  | TEST CONDITIONS         |                         | SYMBOL                        | TYP.          | MAX. | UNIT |
| Breakdown voltage  | I <sub>R</sub> = 1.0 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub>               | 100 (minimum) | -    | V    |
| Instantaneous forward voltage  | I <sub>F</sub> = 3.0 A  | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.71          | 0.80 | V    |
|  |                         | T <sub>A</sub> = 125 °C |                               | 0.62          | 0.70 |      |
| Reverse current  | V <sub>R</sub> = 70 V   | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 1.0           | -    | μA   |
|  |                         | T <sub>A</sub> = 125 °C |                               | 0.95          | -    | mA   |
|  | V <sub>R</sub> = 100 V  | T <sub>A</sub> = 25 °C  |                               | 3.5           | 150  | μA   |
|  |                         | T <sub>A</sub> = 125 °C |                               | 2.2           | 15   | mA   |
| Typical junction capacitance   | 4.0 V, 1 MHz            |                         | C <sub>J</sub>                | 175           | -    | pF   |

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                 |          |      |
|---|---------------------------------|----------|------|
| PARAMETER   | SYMBOL                          | VSSA310S | UNIT |
| Typical thermal resistance  | R <sub>θJA</sub> <sup>(1)</sup> | 135      | °C/W |
|   | R <sub>θJM</sub> <sup>(2)</sup> | 25       |      |

**Notes**

- (1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance R<sub>θJA</sub> - junction to ambient
- (2) Units mounted on P.C.B. with 10 mm x 10 mm copper pad areas; R<sub>θJM</sub> - junction to mount

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| VSSA310S-M3/61T                | 0.064           | 61T                    | 1800          | 7" diameter plastic tape and reel  |
| VSSA310S-M3/5AT                | 0.064           | 5AT                    | 7500          | 13" diameter plastic tape and reel |
| VSSA310SHM3_A/H <sup>(1)</sup> | 0.064           | H                      | 1800          | 7" diameter plastic tape and reel  |
| VSSA310SHM3_A/I <sup>(1)</sup> | 0.064           | I                      | 7500          | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)**

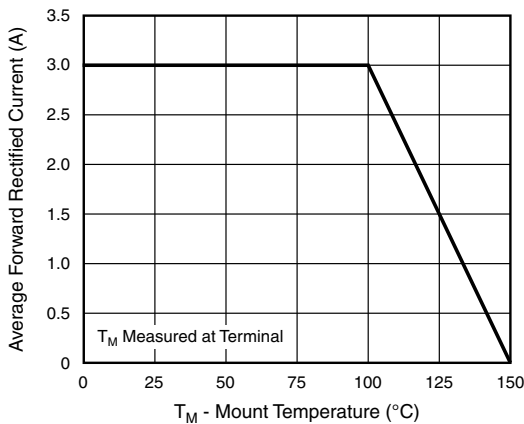


Fig. 1 - Maximum Forward Current Derating Curve

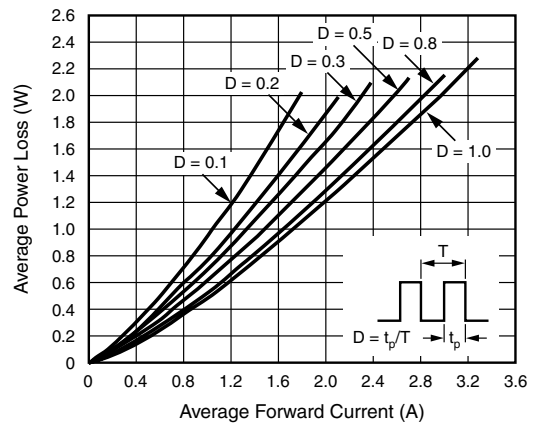


Fig. 2 - Forward Power Loss Characteristics

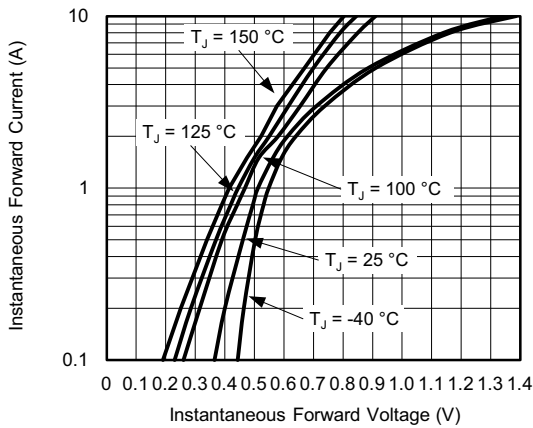


Fig. 3 - Typical Instantaneous Forward Characteristics

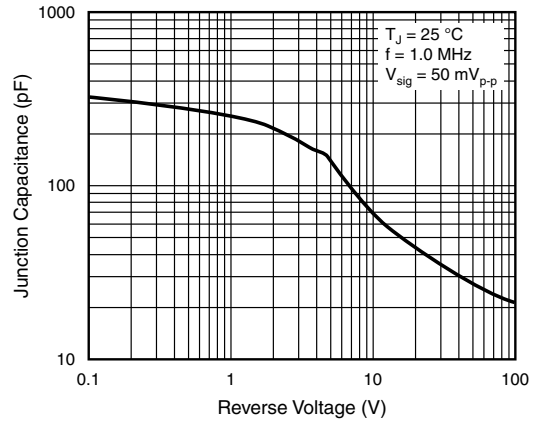


Fig. 5 - Typical Junction Capacitance

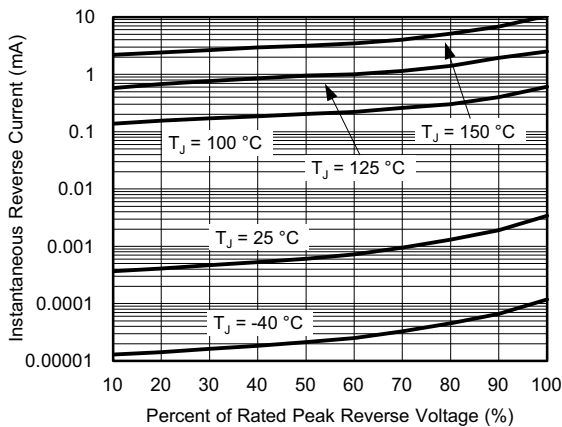


Fig. 4 - Typical Reverse Characteristics

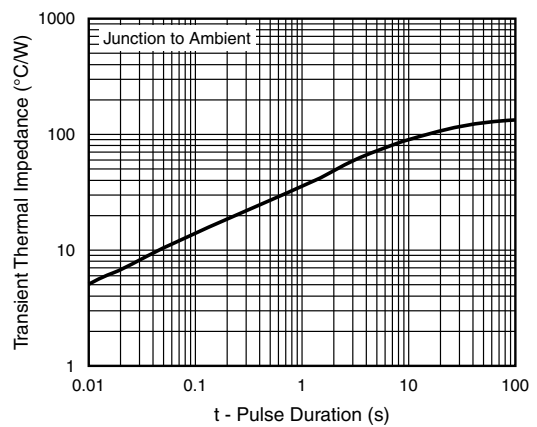
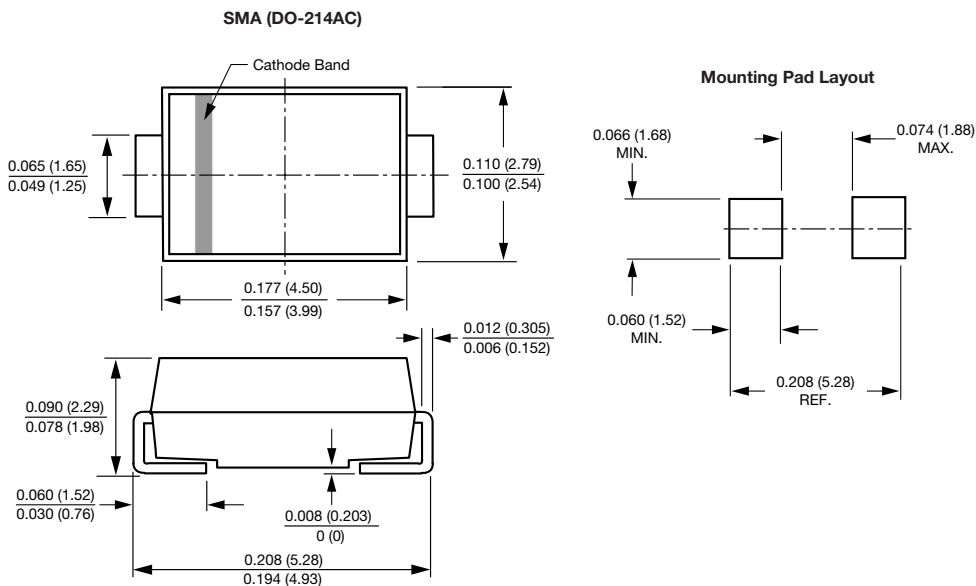


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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