



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



SMA (DO-214AC)

Cathode  Anode

## 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)

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

| PARAMETER                     | TEST CONDITIONS       |                                     | SYMBOL      | TYP.          | MAX. | UNIT          |
|-------------------------------|-----------------------|-------------------------------------|-------------|---------------|------|---------------|
| Breakdown voltage             | $I_R = 1.0\text{ mA}$ | $T_A = 25\text{ }^{\circ}\text{C}$  | $V_{BR}$    | 100 (minimum) | -    | V             |
| Instantaneous forward voltage | $I_F = 3.0\text{ A}$  | $T_A = 25\text{ }^{\circ}\text{C}$  | $V_F^{(1)}$ | 0.71          | 0.80 | V             |
|                               |                       | $T_A = 125\text{ }^{\circ}\text{C}$ |             | 0.62          | 0.70 |               |
| Reverse current               | $V_R = 70\text{ V}$   | $T_A = 25\text{ }^{\circ}\text{C}$  | $I_R^{(2)}$ | 1.0           | -    | $\mu\text{A}$ |
|                               |                       | $T_A = 125\text{ }^{\circ}\text{C}$ |             | 0.95          | -    | $\text{mA}$   |
|                               | $V_R = 100\text{ V}$  | $T_A = 25\text{ }^{\circ}\text{C}$  |             | 3.5           | 150  | $\mu\text{A}$ |
|                               |                       | $T_A = 125\text{ }^{\circ}\text{C}$ |             | 2.2           | 15   | $\text{mA}$   |
| Typical junction capacitance  | 4.0 V, 1 MHz          |                                     | $C_J$       | 175           | -    | 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 noted)

| PARAMETER                  | SYMBOL                | VSSA310S | UNIT                 |
|----------------------------|-----------------------|----------|----------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 135      | $^{\circ}\text{C/W}$ |
|                            | $R_{\theta JM}^{(2)}$ | 25       |                      |

**Notes**(1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient(2) Units mounted on P.C.B. with 10 mm x 10 mm copper pad areas;  $R_{\theta JM}$  - 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

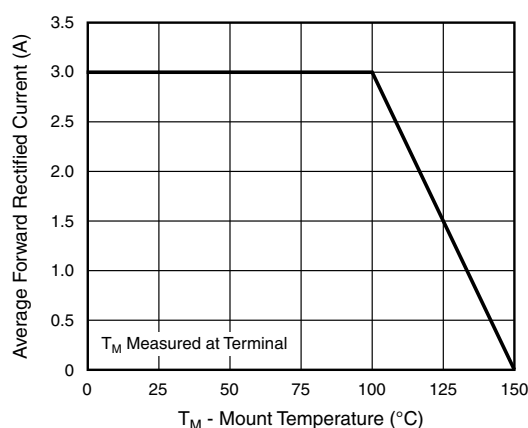
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

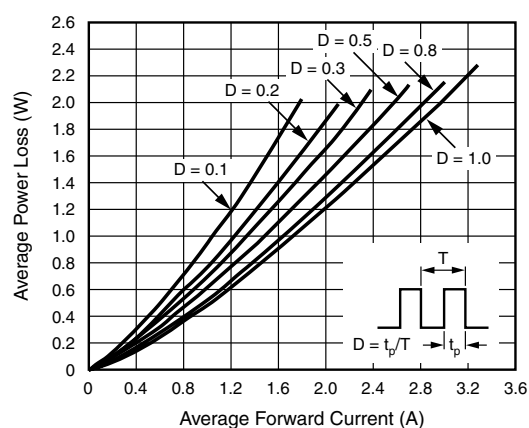


Fig. 2 - Forward Power Loss Characteristics

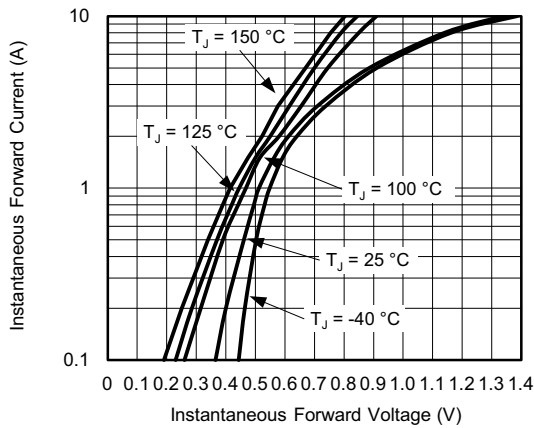


Fig. 3 - Typical Instantaneous Forward Characteristics

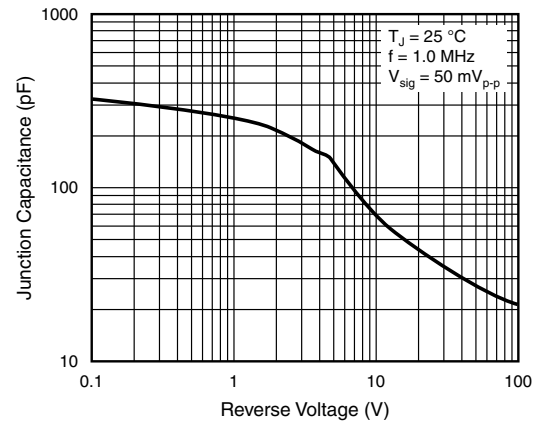


Fig. 5 - Typical Junction Capacitance

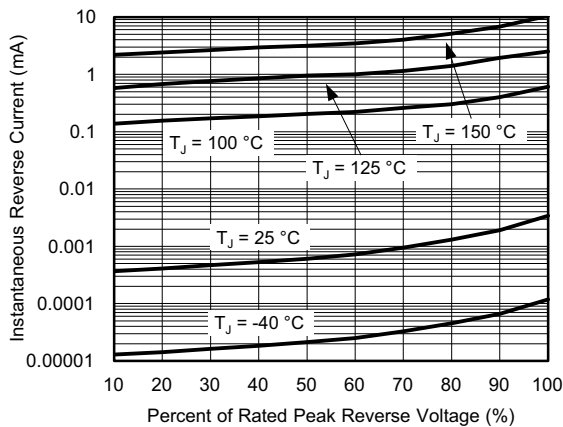


Fig. 4 - Typical Reverse Characteristics

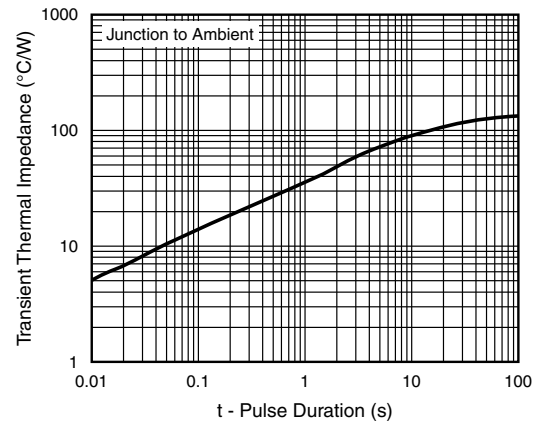
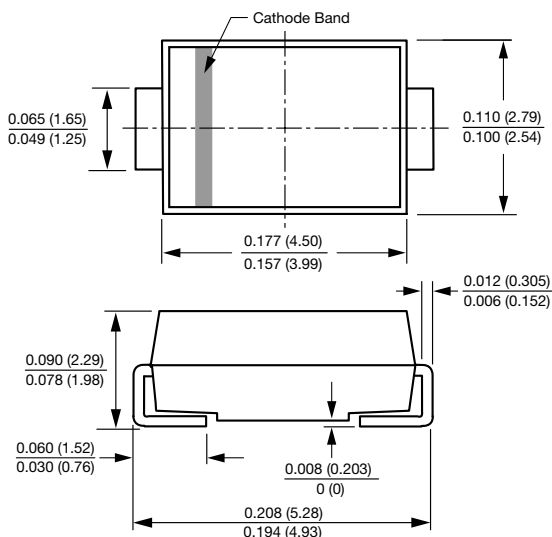
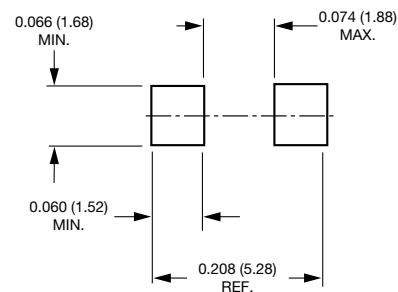


Fig. 6 - Typical Transient Thermal Impedance

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

**SMA (DO-214AC)**

**Mounting Pad Layout**




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