

# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier


**SMA (DO-214AC)**

 Cathode  Anode

**FEATURES**

- Low profile package
- Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- 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

**LINKS TO ADDITIONAL RESOURCES**

[3D Models](#)
**TYPICAL APPLICATIONS**

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

**PRIMARY CHARACTERISTICS**

|                        |                |
|------------------------|----------------|
| $I_{F(AV)}$            | 2.0 A          |
| $V_{RRM}$              | 100 V          |
| $I_{FSM}$              | 60 A           |
| $E_{AS}$               | 24 mJ          |
| $V_F$ at $I_F = 2.0$ A | 0.56 V         |
| $T_J$ max.             | 150 °C         |
| Package                | SMA (DO-214AC) |
| Circuit configurations | Single         |

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

 Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-E3 - RoHS-compliant, commercial grade

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 2 whisker test

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

**MAXIMUM RATINGS** ( $T_A = 25$  °C unless otherwise noted)

| PARAMETER   | SYMBOL         | VSSA210     | UNIT |
|---|----------------|-------------|------|
| Device marking code   |                | V2B         |      |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 100         | V    |
| Maximum DC forward current  | $I_F^{(1)}$    | 2.0         | A    |
|   | $I_F^{(2)}$    | 1.7         |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 60          | A    |
| Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH                     | $E_{AS}$       | 24          | mJ   |
| Peak repetitive reverse current at $t_p = 2$ μs, 1 kHz, $T_J = 38$ °C ± 2 °C      | $I_{RRM}$      | 1.0         | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -40 to +150 | °C   |

**Notes**
<sup>(1)</sup> Mounted on 8 mm x 8 mm pad areas, 1 oz. FR4 PCB

<sup>(2)</sup> 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          |
| Breakdown voltage  | $I_R = 1.0\text{ mA}$ | $T_A = 25\text{ }^\circ\text{C}$  | $V_{BR}$    | 100 (minimum) | -    | V             |
| Instantaneous forward voltage  | $I_F = 2.0\text{ A}$  | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.61          | 0.70 |               |
|  |                       | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.56          | 0.65 |               |
| 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          | -    | 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   | 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  $\leq 40\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                       |         |                    |
|---|-----------------------|---------|--------------------|
| PARAMETER   | SYMBOL                | VSSA210 | 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 PCB with 8 mm x 8 mm copper pad areas.  $R_{\theta JM}$  - junction to mount

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| VSSA210-E3/61T                        | 0.064           | 61T                    | 1800          | 7" diameter plastic tape and reel  |
| VSSA210-E3/5AT                        | 0.064           | 5AT                    | 7500          | 13" diameter plastic tape and reel |

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

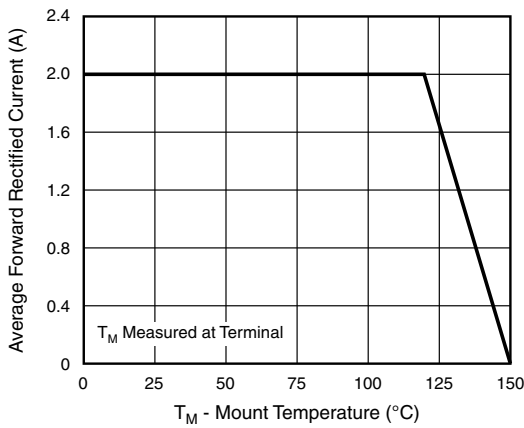


Fig. 1 - Maximum Forward Current Derating Curve

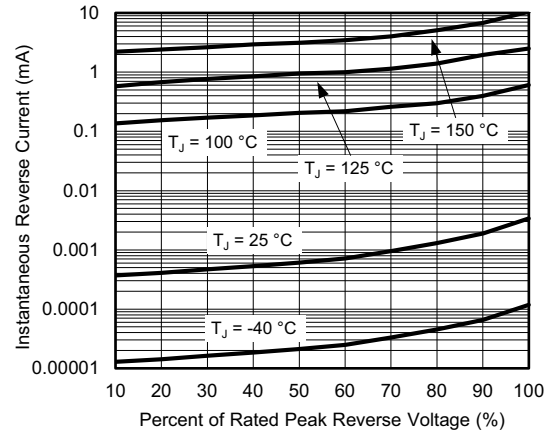


Fig. 4 - Typical Reverse Characteristics

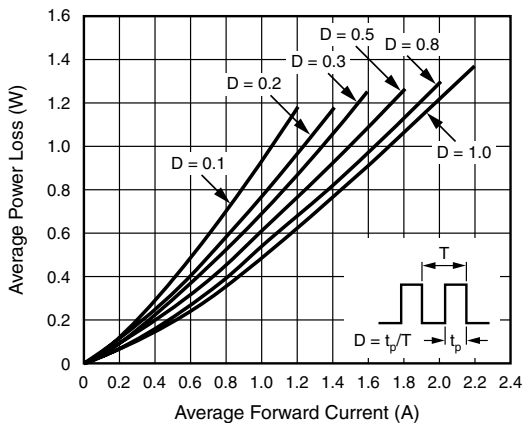


Fig. 2 - Forward Power Loss Characteristics

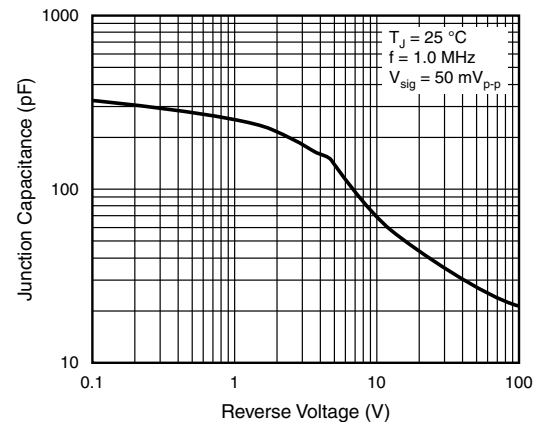


Fig. 5 - Typical Junction Capacitance

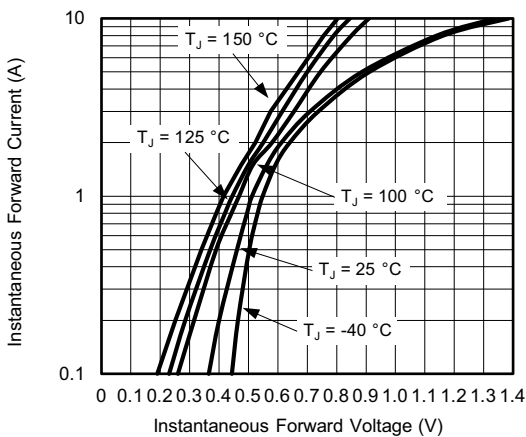


Fig. 3 - Typical Instantaneous Forward Characteristics

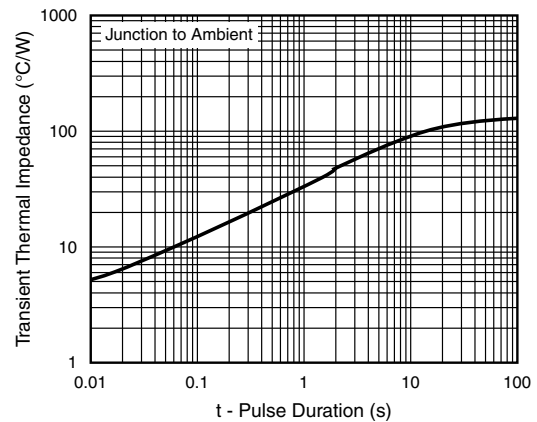
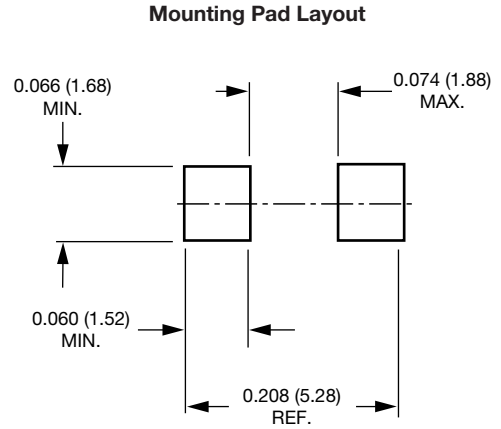
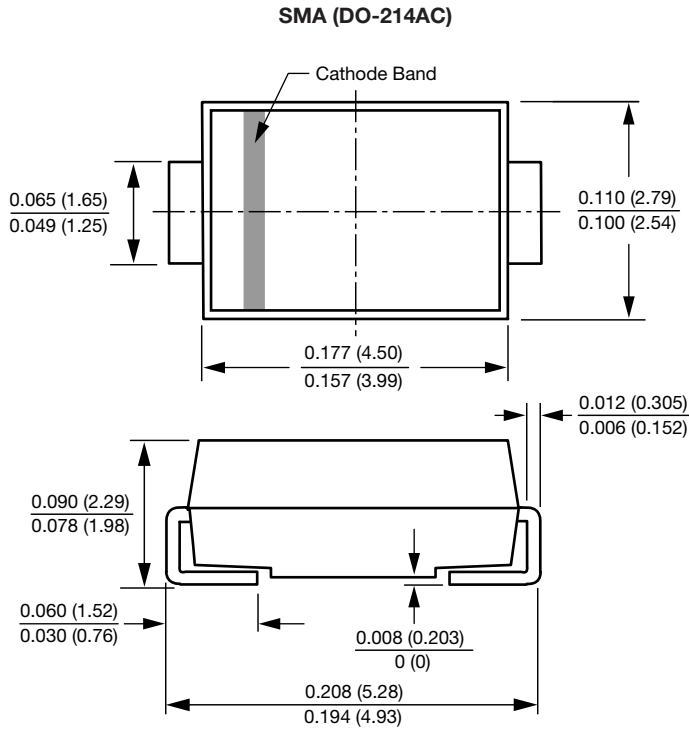


Fig. 6 - Typical Transient Thermal Impedance



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





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