

Surface-Mount TMBS[®] (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


RoHS
COMPLIANT

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-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

LINKS TO ADDITIONAL RESOURCES

[3D Models](#)

| PRIMARY CHARACTERISTICS | |
|-------------------------|----------------|
| $I_{F(AV)}$ | 3.0 A |
| V_{RRM} | 100 V |
| I_{FSM} | 60 A |
| E_{AS} | 24 mJ |
| V_F at $I_F = 3.0$ A | 0.62 V |
| T_J max. | 150 °C |
| Package | SMA (DO-214AC) |
| Circuit configurations | 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 |
| Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH | E_{AS} | 24 | mJ |
| Peak repetitive reverse current at $t_p = 2$ μ s, 1 kHz, $T_J = 38$ °C \pm 2 °C | I_{RRM} | 1.0 | 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 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 0.95 | - | mA |
| | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | 3.5 | 150 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 2.2 | 15 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 175 | - | pF |

Notes

- (1) Pulse test: 300 μs 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 PCB 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-E3/61T | 0.064 | 61T | 1800 | 7" diameter plastic tape and reel |
| VSSA310S-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)

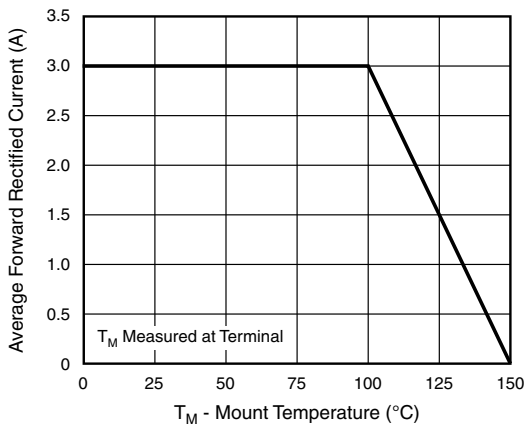


Fig. 1 - Maximum Forward Current Derating Curve

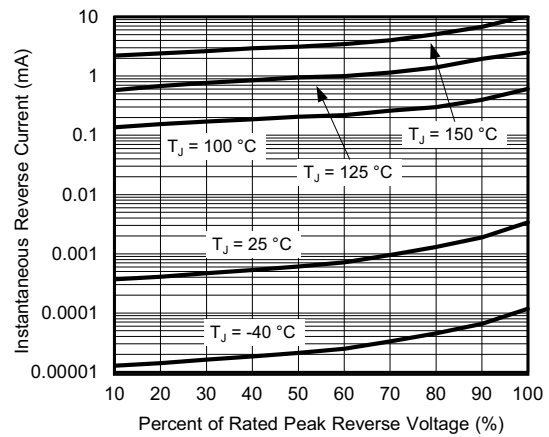


Fig. 4 - Typical Reverse Characteristics

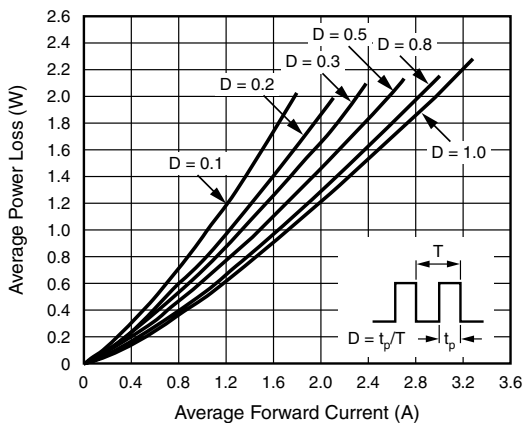


Fig. 2 - Forward Power Loss Characteristics

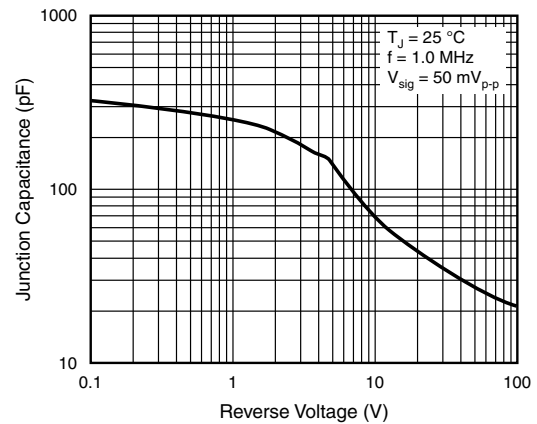


Fig. 5 - Typical Junction Capacitance

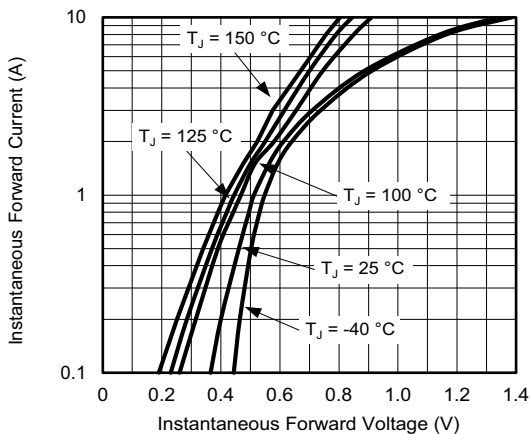


Fig. 3 - Typical Instantaneous Forward Characteristics

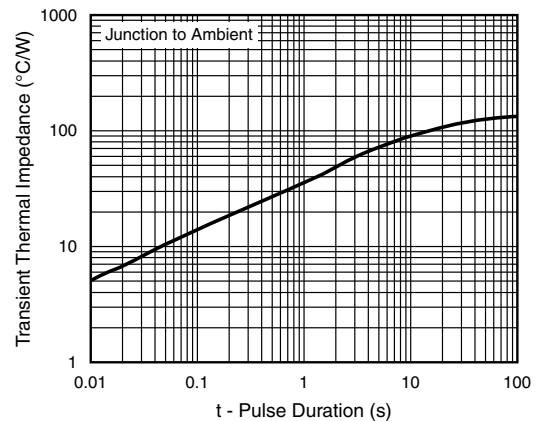
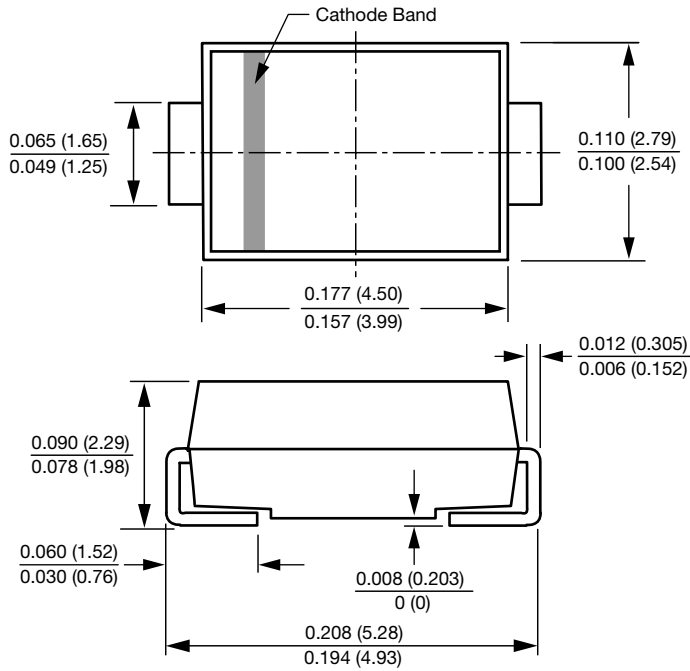


Fig. 6 - Typical Transient Thermal Impedance

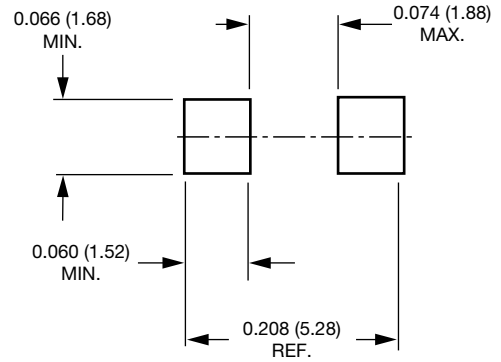


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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