

Surface Mount Trench MOS Barrier Schottky Rectifier


DO-214AA (SMB)
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
 HALOGEN
FREE
TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-214AA (SMB)

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-M3 - RoHS-compliant, commercial grade

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

M3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|----------------|
| $I_{F(AV)}$ | 4.0 A |
| V_{RRM} | 100 V |
| I_{FSM} | 80 A |
| E_{AS} | 50 mJ |
| V_F at $I_F = 4.0$ A | 0.61 V |
| T_J max. | 150 °C |
| Package | DO-214AA (SMB) |
| Diode variation | Single die |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|---------------------------------------------------------------------------------------|----------------|-------------|------|
| PARAMETER | SYMBOL | VSSB410S | UNIT |
| Device marking code | | V4B | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | V |
| Maximum DC forward current | $I_F^{(1)}$ | 4.0 | A |
| | $I_F^{(2)}$ | 1.9 | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 80 | A |
| Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH | E_{AS} | 50 | 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 14 mm x 14 mm pad areas, 1 oz. FR4 P.C.B.

(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 | $I_F = 4.0\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.68 | 0.77 | V |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 0.61 | 0.69 | |
| Reverse current | $V_R = 70\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 1.5 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 1.2 | - | mA |
| | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | 7.0 | 250 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 3.6 | 20 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 230 | - | 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 | VSSB410S | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 120 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 15 | |

Notes

- (1) Free air, mounted on recommended P.C.B. 1 oz. pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient
 (2) Units mounted on P.C.B. with 14 mm x 14 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 |
| VSSB410S-M3/52T | 0.096 | 52T | 750 | 7" diameter plastic tape and reel |
| VSSB410S-M3/5BT | 0.096 | 5BT | 3200 | 13" diameter plastic tape and reel |

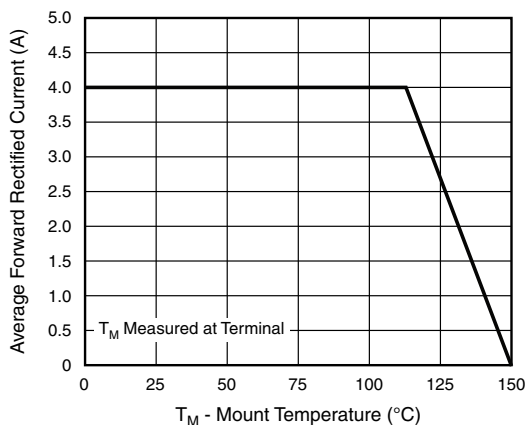
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

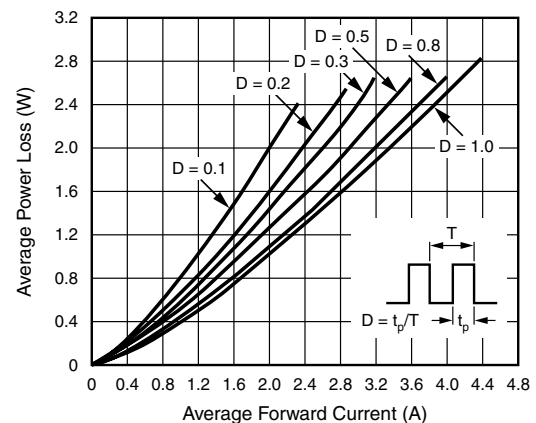


Fig. 2 - Forward Power Loss Characteristics



Fig. 3 - Typical Instantaneous Forward Characteristics

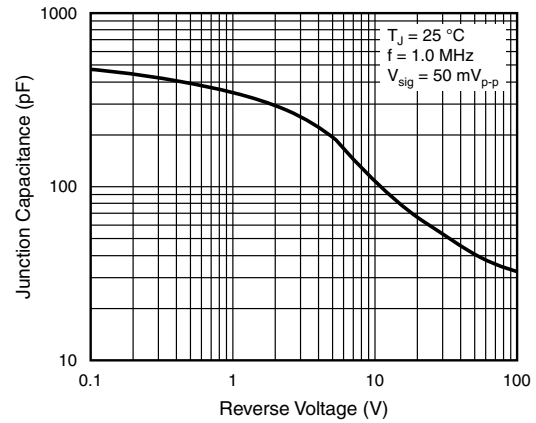


Fig. 5 - Typical Junction Capacitance

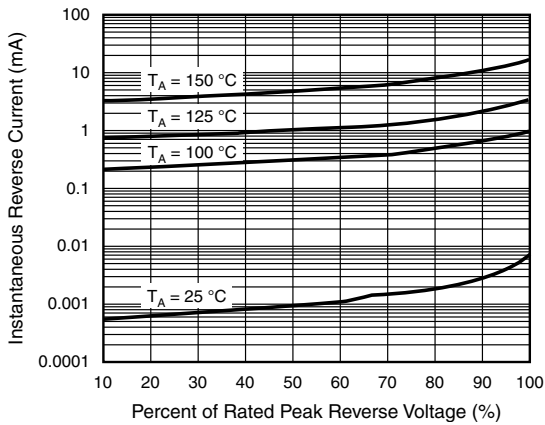


Fig. 4 - Typical Reverse Characteristics

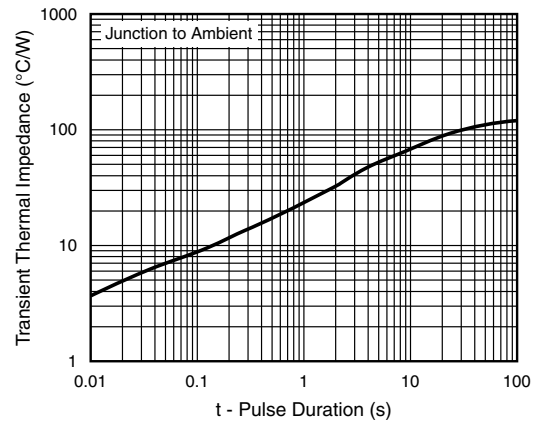
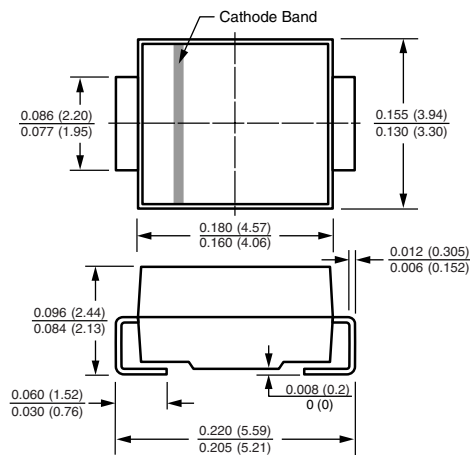


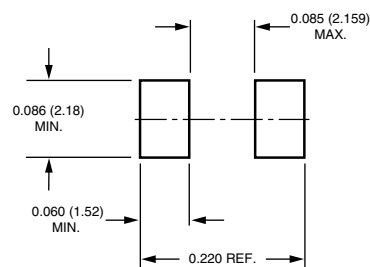
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



Mounting Pad Layout





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