

Surface Mount Trench MOS Barrier Schottky Rectifier



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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in high frequency converters, freewheeling diodes, DC/DC converters and polarity protection applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

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

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

M3 suffix meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|--------|
| $I_{F(AV)}$ | 5.0 A |
| V_{RRM} | 200 V |
| I_{FSM} | 100 A |
| V_F at $I_F = 5.0$ A | 0.67 V |
| T_J max. | 150 °C |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | |
|---|----------------|---------------|------------|
| PARAMETER | SYMBOL | VSSC520S | UNIT |
| Device marking code | | V5D | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | V |
| Maximum DC forward current | $I_F^{(1)}$ | 5.0 | A |
| | $I_F^{(2)}$ | 2.2 | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | A |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | V/ μ s |
| Operating junction and storage temperature range | T_J, T_{STG} | - 40 to + 150 | °C |

Notes

(1) Units mounted on PCB with 25 mm x 25 mm copper pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended PCB 1 oz. pad area

| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|--|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 5.0 A | T _A = 25 °C | V _F ⁽¹⁾ | 1.19 | 1.70 | V |
| | | T _A = 125 °C | | 0.67 | 0.75 | |
| Reverse current per diode | V _R = 180 V | T _A = 25 °C | I _R ⁽²⁾ | 2.0 | - | μA |
| | | T _A = 125 °C | | 2.0 | - | mA |
| | V _R = 200 V | T _A = 25 °C | | 4 | 200 | μA |
| | | T _A = 125 °C | | 3.2 | 25 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 280 | - | pF |

Notes

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

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | |
|---|---------------------------------|----------|------|
| PARAMETER | SYMBOL | VSSC520S | UNIT |
| Typical thermal resistance | R _{θJA} ⁽¹⁾ | 95 | °C/W |
| | R _{θJM} ⁽²⁾ | 9 | |

Notes

- (1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance R_{θJA} - junction to ambient
- (2) Units mounted on PCB with 25 mm x 25 mm copper pad areas; thermal resistance R_{θJM} - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| VSSC520S-M3/57T | 0.235 | 57T | 850 | 7" diameter plastic tape and reel |
| VSSC520S-M3/9AT | 0.235 | 9AT | 3500 | 13" diameter plastic tape and reel |

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

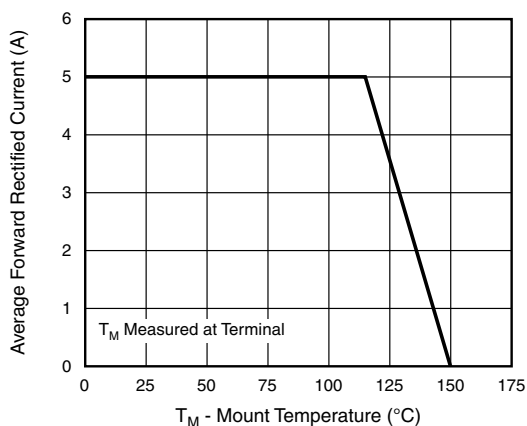


Fig. 1 - Maximum Forward Current Derating Curve

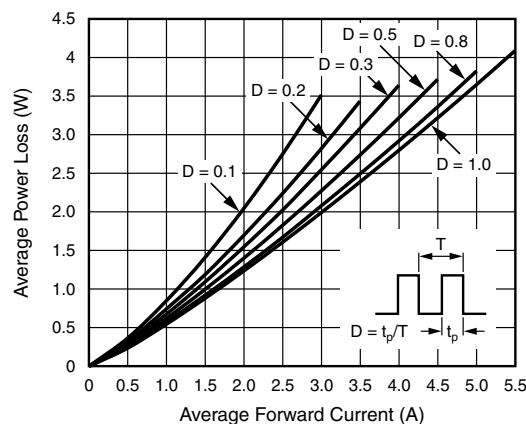


Fig. 2 - Forward Power Loss Characteristics

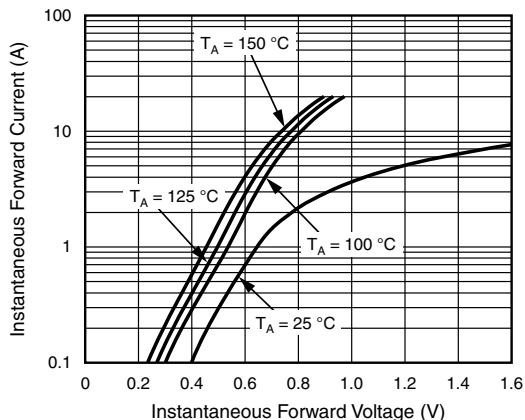


Fig. 3 - Typical Instantaneous Forward Characteristics

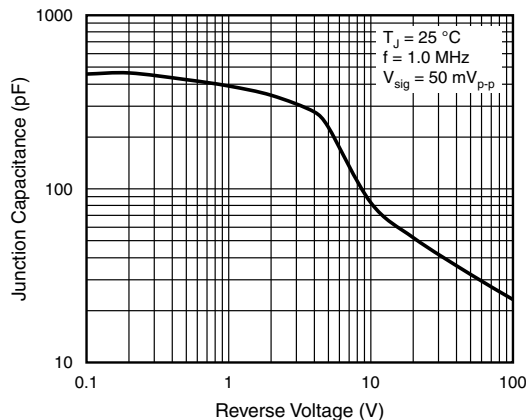


Fig. 5 - Typical Junction Capacitance

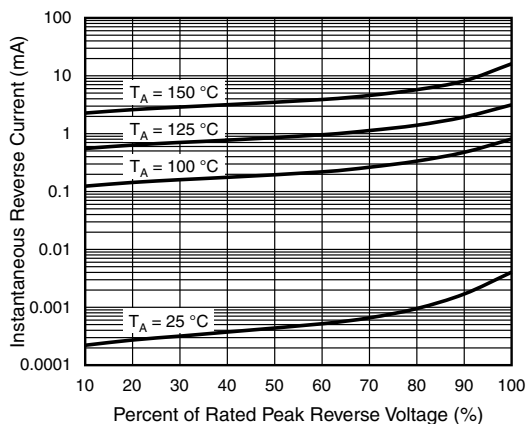


Fig. 4 - Typical Reverse Characteristics

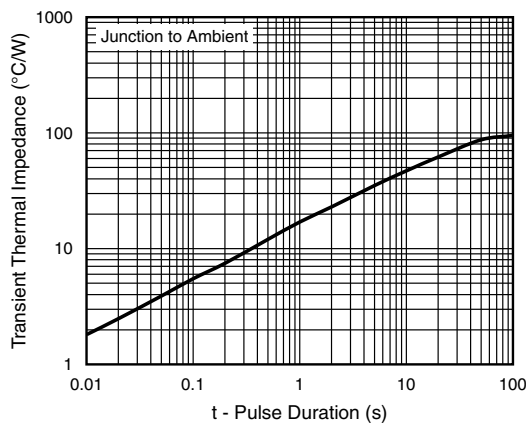
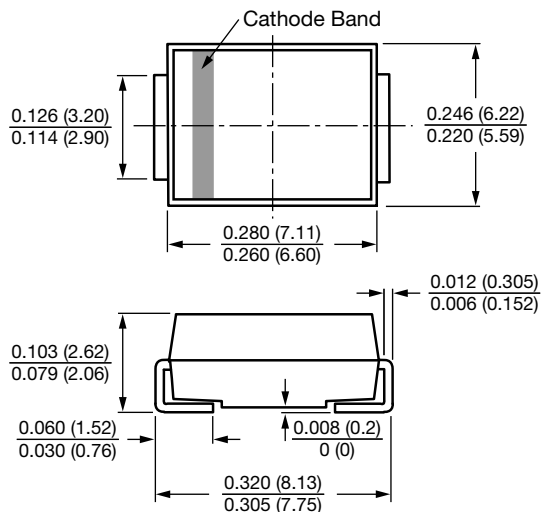


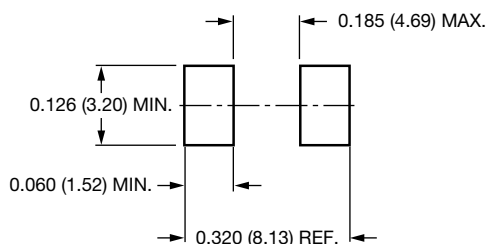
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AB (SMC)



Mounting Pad Layout





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