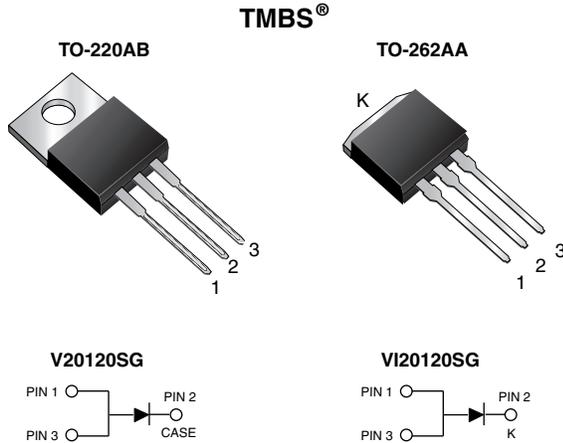


High-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low $V_F = 0.54 \text{ V}$ at $I_F = 5 \text{ A}$


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder bath temperature 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
FREE

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

MECHANICAL DATA

Case: TO-220AB and TO-262AA

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

Base P/NHM3 - halogen-free, RoHS-compliant, and 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, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

| PRIMARY CHARACTERISTICS | |
|-------------------------------|--------------------|
| $I_{F(AV)}$ | 20 A |
| V_{RRM} | 120 V |
| I_{FSM} | 150 A |
| V_F at $I_F = 20 \text{ A}$ | 0.78 V |
| $T_J \text{ max.}$ | 150 °C |
| Package | TO-220AB, TO-262AA |
| Diode variation | Single die |

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | |
|--|----------------|-------------|-----------|------------|
| PARAMETER | SYMBOL | V20120SG | VI20120SG | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 20 | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 150 | | A |
| Voltage rate of change (rated V_F) | dV/dt | 10 000 | | V/ μ s |
| Operating junction and storage temperature range | T_J, T_{STG} | -40 to +150 | | °C |



ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
|-------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| Instantaneous forward voltage | I _F = 5 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.62 | - | V |
| | I _F = 10 A | | | 0.81 | - | |
| | I _F = 20 A | | | 1.20 | 1.33 | |
| | I _F = 5 A | T _A = 125 °C | | 0.54 | - | |
| | I _F = 10 A | | | 0.65 | - | |
| | I _F = 20 A | | | 0.78 | 0.88 | |
| Reverse current | V _R = 90 V | T _A = 25 °C | I _R ⁽²⁾ | 10 | - | μA |
| | | T _A = 125 °C | | 7 | - | mA |
| | V _R = 120 V | T _A = 25 °C | | - | 250 | μA |
| | | T _A = 125 °C | | 12 | 25 | mA |

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 | V20120SG | VI20120SG | UNIT |
|----------------------------|------------------|----------|-----------|------|
| Typical thermal resistance | R _{θJC} | 2.2 | | °C/W |

ORDERING INFORMATION (Example)

| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------|--------------------------------|-----------------|--------------|---------------|---------------|
| TO-220AB | V20120SG-M3/4W | 1.88 | 4W | 50/tube | Tube |
| TO-262AA | VI20120SG-M3/4W | 1.45 | 4W | 50/tube | Tube |
| TO-220AB | V20120SGHM3/4W ⁽¹⁾ | 1.88 | 4W | 50/tube | Tube |
| TO-262AA | VI20120SGHM3/4W ⁽¹⁾ | 1.45 | 4W | 50/tube | Tube |

Note

- (1) AEC-Q101 qualified

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

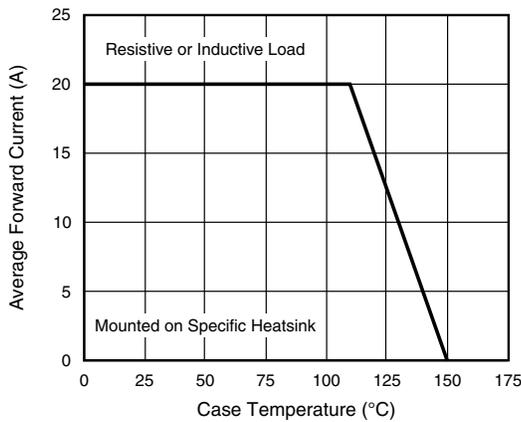


Fig. 1 - Maximum Forward Current Derating Curve

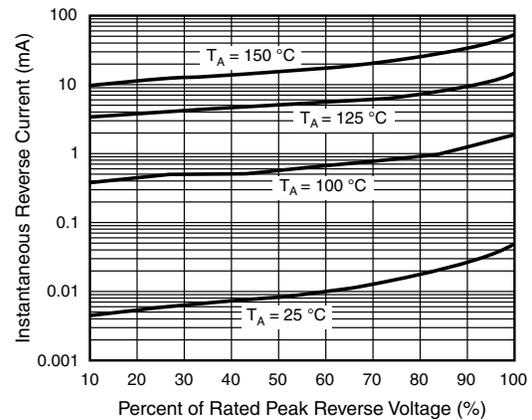


Fig. 4 - Typical Reverse Characteristics

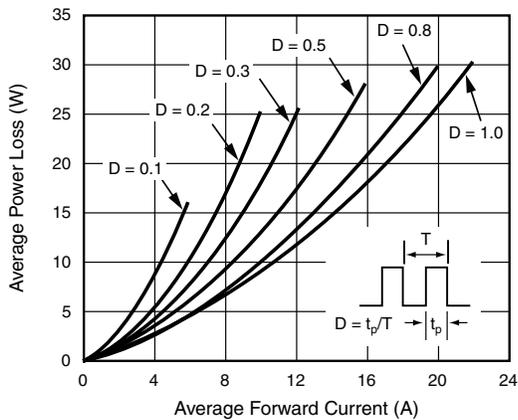


Fig. 2 - Forward Power Dissipation Characteristics

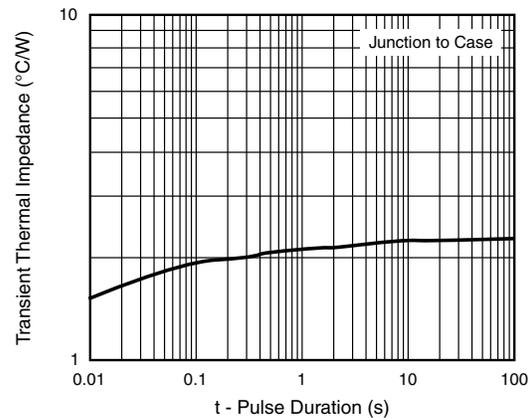


Fig. 5 - Typical Transient Thermal Impedance

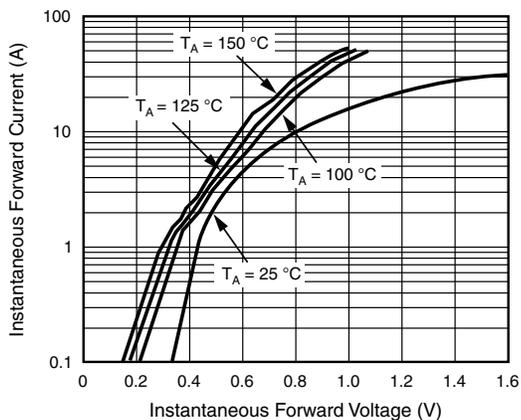


Fig. 3 - Typical Instantaneous Forward Characteristics

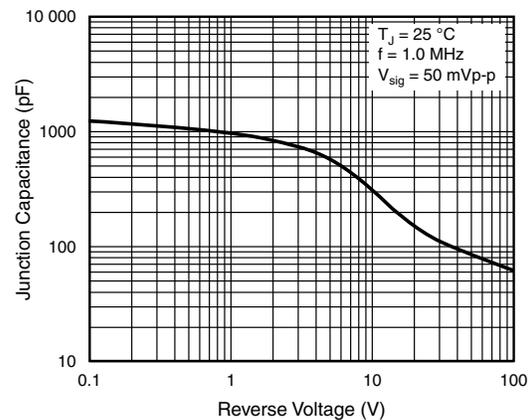
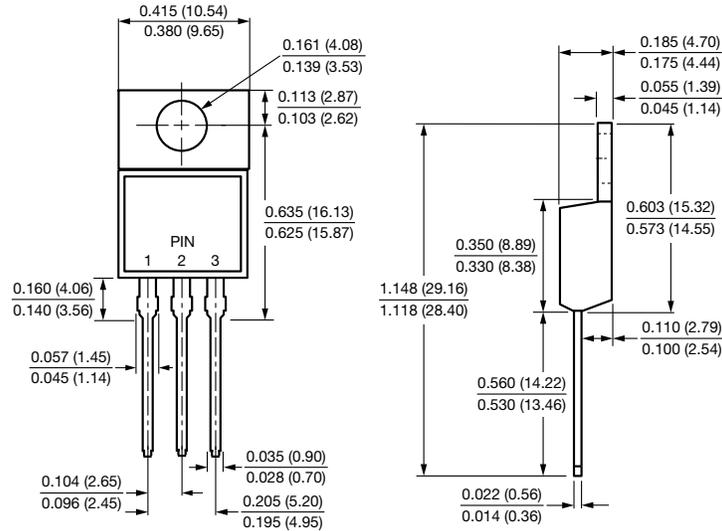


Fig. 6 - Typical Junction Capacitance

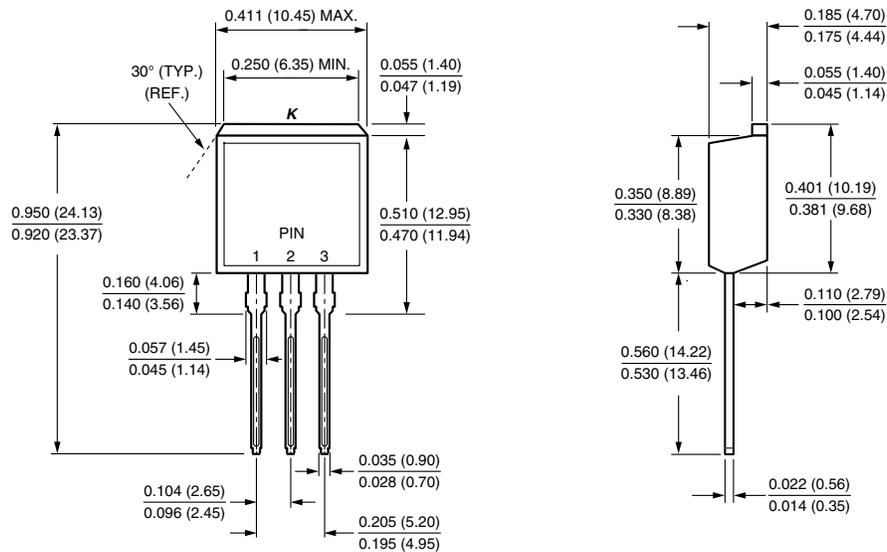


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



TO-262AA





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