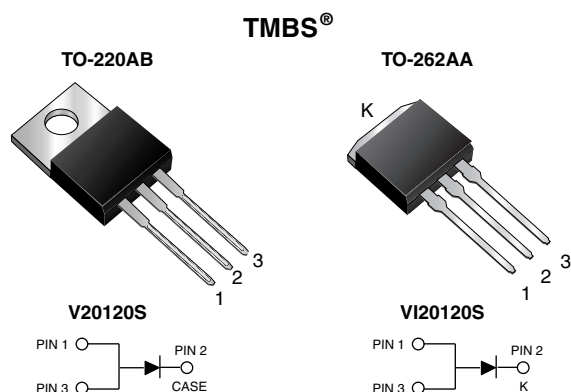


## High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.50\text{ V}$  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
- 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 DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

### PRIMARY CHARACTERISTICS

|                              |        |
|------------------------------|--------|
| $I_{F(AV)}$                  | 20 A   |
| $V_{RRM}$                    | 120 V  |
| $I_{FSM}$                    | 200 A  |
| $V_F$ at $I_F = 20\text{ A}$ | 0.73 V |
| $T_J$ max.                   | 150 °C |

### 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 AEC-Q101 qualified

**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 class 2 whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER  | SYMBOL         | V20120S       | VI20120S | 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 | $I_{FSM}$      | 200           |          | A          |
| Voltage rate of change (rated $V_R$ )  | dV/dt          | 10 000        |          | V/ $\mu$ s |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 40 to + 150 |          | °C         |

## V20120S, VI20120S



Vishay General Semiconductor

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|--|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage  | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.57 | -    | V    |
|  | I <sub>F</sub> = 10 A  |                         |                               | 0.71 | -    |      |
|  | I <sub>F</sub> = 20 A  |                         |                               | 0.99 | 1.12 |      |
|  | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.50 | -    |      |
|  | I <sub>F</sub> = 10 A  |                         |                               | 0.61 | -    |      |
|  | I <sub>F</sub> = 20 A  |                         |                               | 0.73 | 0.81 |      |
| Reverse current  | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 10   | -    | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                               | 6    | -    | mA   |
|  | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                               | -    | 300  | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                               | 14   | 30   | mA   |

## Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                  |         |          |      |
|---|------------------|---------|----------|------|
| PARAMETER   | SYMBOL           | V20120S | VI20120S | UNIT |
| Typical thermal resistance  | R <sub>θJC</sub> | 2.0     |          | °C/W |

| ORDERING INFORMATION (Example) |                               |                 |              |               |               |
|--------------------------------|-------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N                 | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V20120S-M3/4W                 | 1.88            | 4W           | 50/tube       | Tube          |
| TO-262AA                       | VI20120S-M3/4W                | 1.45            | 4W           | 50/tube       | Tube          |
| TO-220AB                       | V20120SHM3/4W <sup>(1)</sup>  | 1.88            | 4W           | 50/tube       | Tube          |
| TO-262AA                       | VI20120SHM3/4W <sup>(1)</sup> | 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)

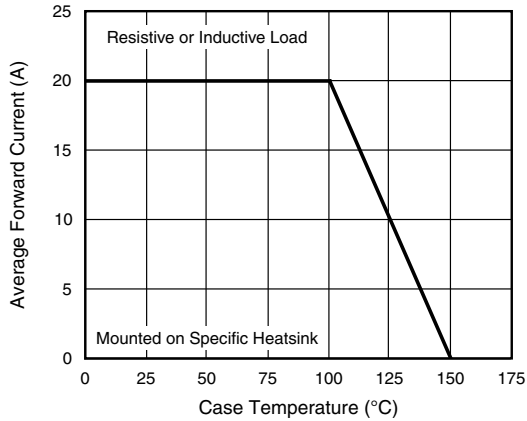


Fig. 1 - Maximum Forward Current Derating Curve

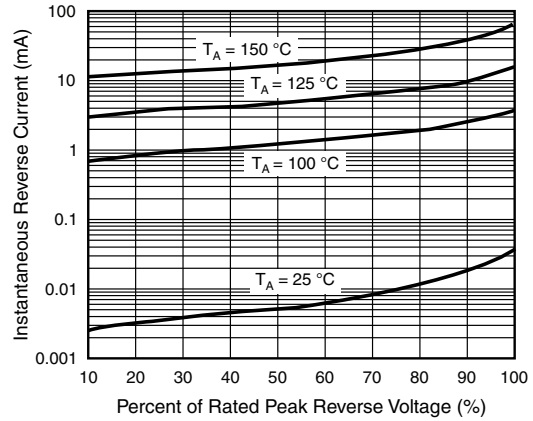


Fig. 4 - Typical Reverse Characteristics

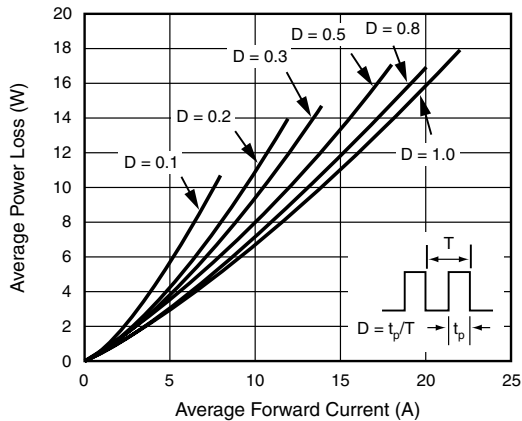


Fig. 2 - Forward Power Dissipation Characteristics

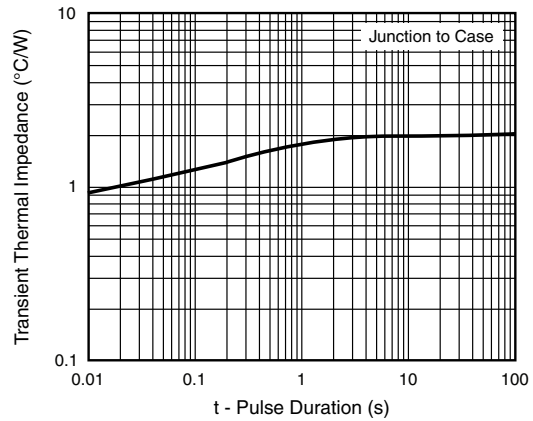


Fig. 5 - Typical Transient Thermal Impedance

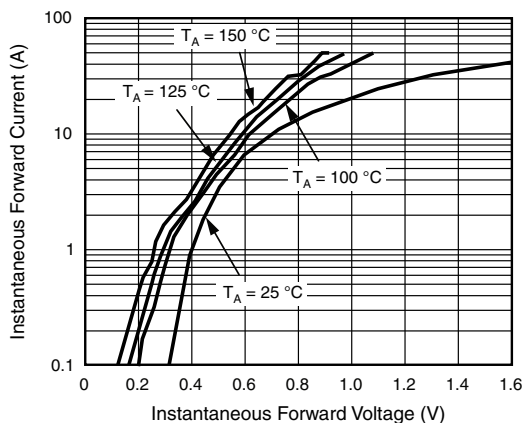


Fig. 3 - Typical Instantaneous Forward Characteristics

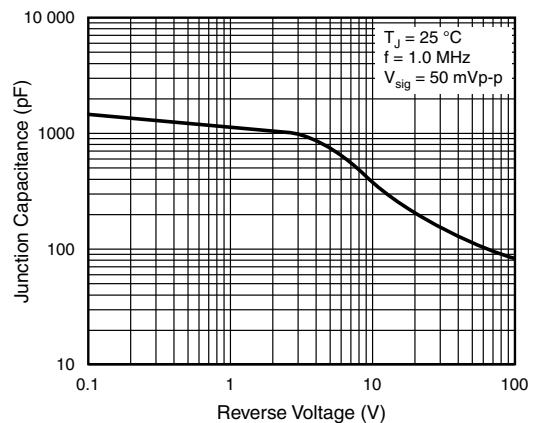


Fig. 6 - Typical Junction Capacitance

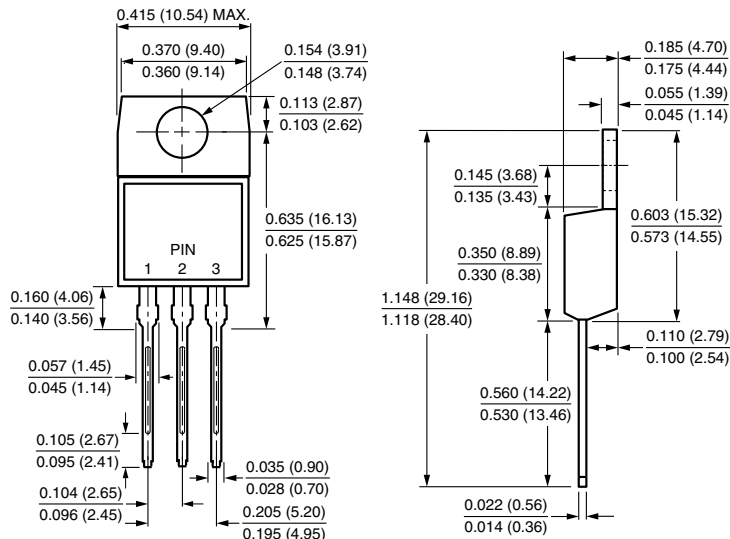
# V20120S, VI20120S

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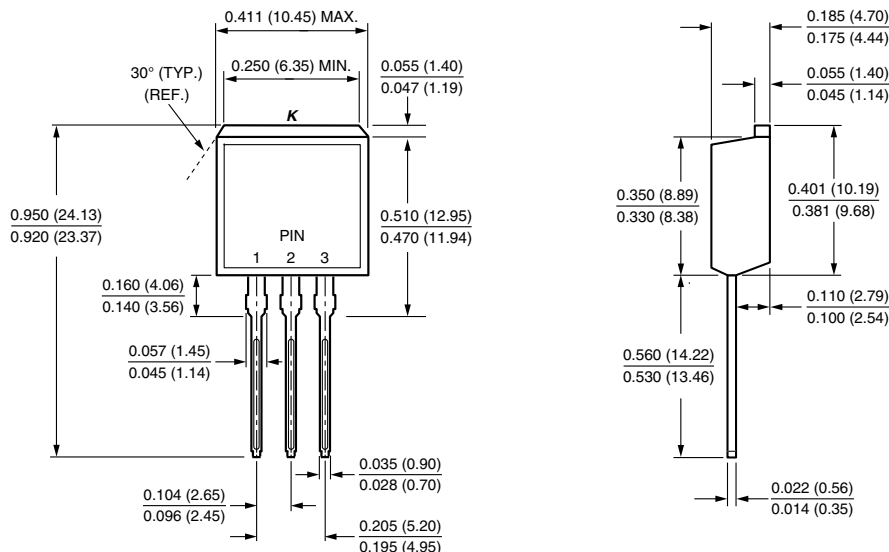


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-220AB



### TO-262AA





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