

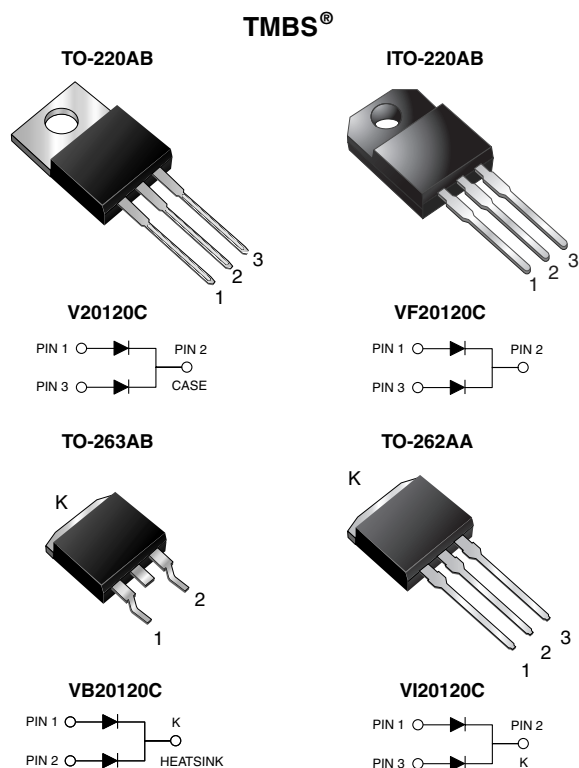


# New Product V20120C, VF20120C, VB20120C & VI20120C

Vishay General Semiconductor

## Dual 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
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder dip 260 °C, 40 s (for TO-220AB, ITO-220AB and TO-262AA package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** TO-220AB, ITO-220AB, TO-263AB and TO-262AA

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

**Polarity:** As marked

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

### PRIMARY CHARACTERISTICS

|                               |          |
|-------------------------------|----------|
| $I_{F(AV)}$                   | 2 x 10 A |
| $V_{RRM}$                     | 120 V    |
| $I_{FSM}$                     | 120 A    |
| $V_F$ at $I_F = 10 \text{ A}$ | 0.64 V   |
| $T_J \text{ max.}$            | 150 °C   |

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

| PARAMETER                                                                                       | SYMBOL         | V20120C       | VF20120C | VB20120C | VI20120C | UNIT |
|-------------------------------------------------------------------------------------------------|----------------|---------------|----------|----------|----------|------|
| Maximum repetitive peak reverse voltage                                                         | $V_{RRM}$      | 120           |          |          |          | V    |
| Maximum average forward rectified current<br>(Fig. 1)                                           | $I_{F(AV)}$    | 20<br>10      |          |          |          | A    |
| Peak forward surge current 8.3 ms single half sine-wave<br>superimposed on rated load per diode | $I_{FSM}$      | 120           |          |          |          | A    |
| Isolation voltage (ITO-220AB only)<br>from terminal to heatsink $t = 1 \text{ min}$             | $V_{AC}$       | 1500          |          |          |          | V    |
| Operating junction and storage temperature range                                                | $T_J, T_{STG}$ | - 40 to + 150 |          |          |          | °C   |

| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                       |                                                                           |          |               |           |                              |
|-----------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------|----------|---------------|-----------|------------------------------|
| PARAMETER                                                                               | TEST CONDITIONS       |                                                                           | SYMBOL   | TYP.          | MAX.      | UNIT                         |
| Breakdown voltage                                                                       | $I_R = 1.0\text{ mA}$ | $T_A = 25\text{ }^{\circ}\text{C}$                                        | $V_{BR}$ | 120 (minimum) | -         | V                            |
| Instantaneous forward voltage per diode <sup>(1)</sup>                                  | $I_F = 5\text{ A}$    | $T_A = 25\text{ }^{\circ}\text{C}$                                        | $V_F$    | 0.62          | -         | V                            |
|                                                                                         | $I_F = 10\text{ A}$   | $T_A = 25\text{ }^{\circ}\text{C}$                                        |          | 0.81          | 0.90      |                              |
|                                                                                         | $I_F = 5\text{ A}$    | $T_A = 125\text{ }^{\circ}\text{C}$                                       |          | 0.54          | -         |                              |
|                                                                                         | $I_F = 10\text{ A}$   | $T_A = 125\text{ }^{\circ}\text{C}$                                       |          | 0.64          | 0.72      |                              |
| Reverse current per diode <sup>(2)</sup>                                                | $V_R = 90\text{ V}$   | $T_A = 25\text{ }^{\circ}\text{C}$<br>$T_A = 125\text{ }^{\circ}\text{C}$ | $I_R$    | 8<br>6        | -<br>-    | $\mu\text{A}$<br>$\text{mA}$ |
|                                                                                         | $V_R = 120\text{ V}$  | $T_A = 25\text{ }^{\circ}\text{C}$<br>$T_A = 125\text{ }^{\circ}\text{C}$ |          | -<br>14       | 700<br>45 | $\mu\text{A}$<br>$\text{mA}$ |

**Notes:**

(1) Pulse test: 300  $\mu\text{s}$  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          | V20120C | VF20120C | VB20120C | VI20120C | UNIT                 |
| Typical thermal resistance per diode                                                 | $R_{\theta JC}$ | 2.8     | 5.0      | 2.8      | 2.8      | $^{\circ}\text{C/W}$ |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V20120C-E3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| ITO-220AB                      | VF20120C-E3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB20120C-E3/4W | 1.37            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB20120C-E3/8W | 1.37            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                       | VI20120C-E3/4W | 1.45            | 4W           | 50/tube       | Tube          |

## RATINGS AND CHARACTERISTICS CURVES

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

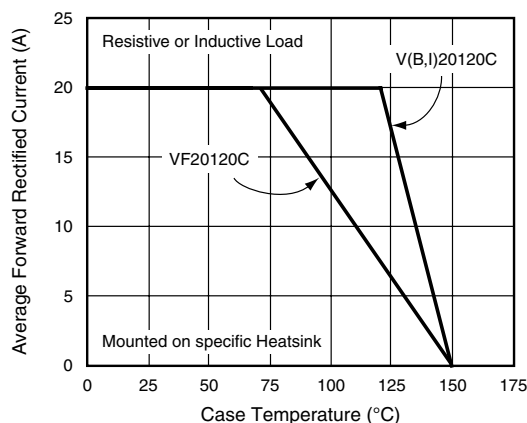


Figure 1. Maximum Forward Current Derating Curve

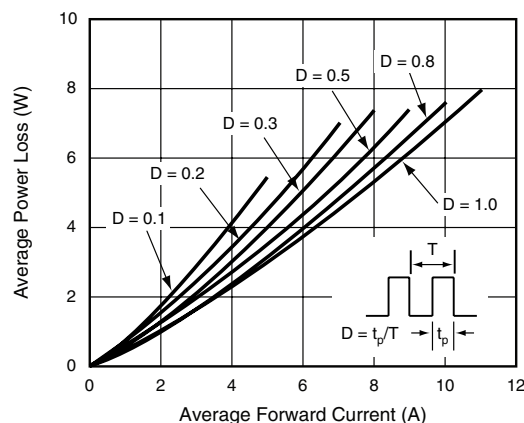


Figure 2. Forward Power Loss Characteristics Per Diode



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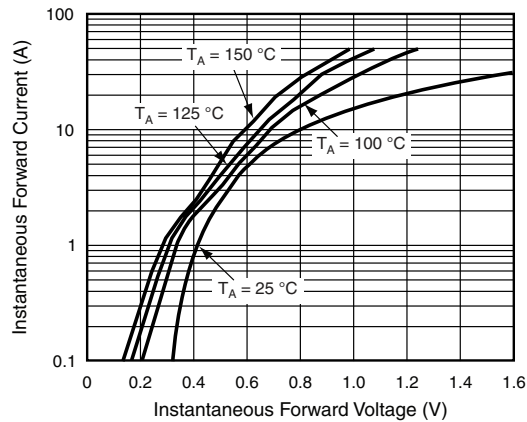


Figure 3. Typical Instantaneous Forward Characteristics Per Diode

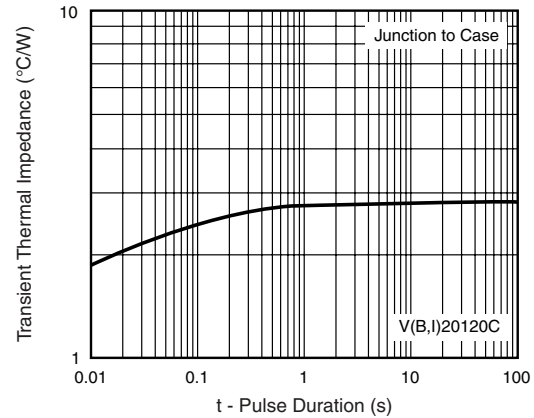


Figure 6. Typical Transient Thermal Impedance Per Diode

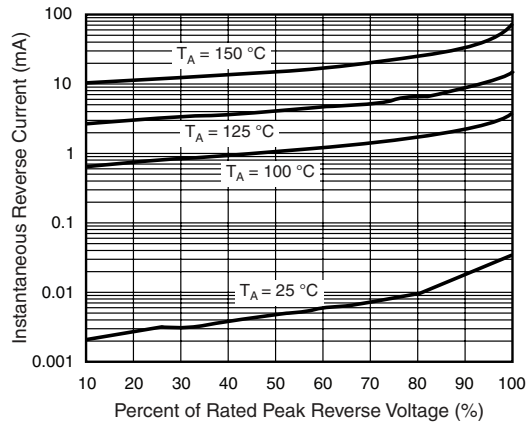


Figure 4. Typical Reverse Characteristics Per Diode

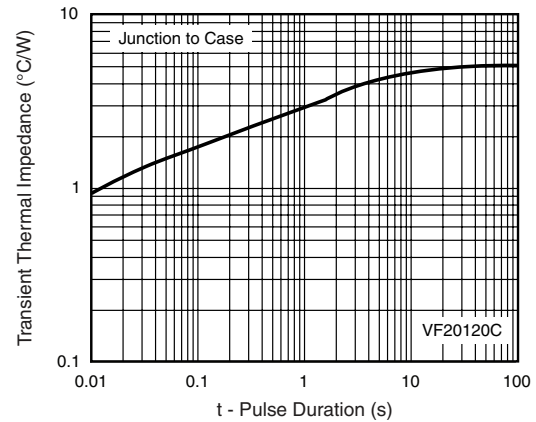


Figure 7. Typical Transient Thermal Impedance Per Diode

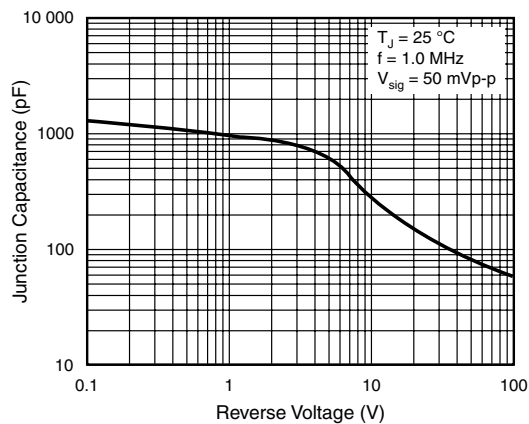
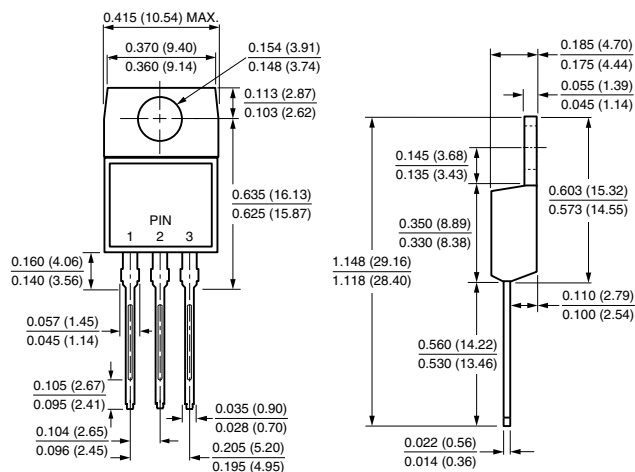


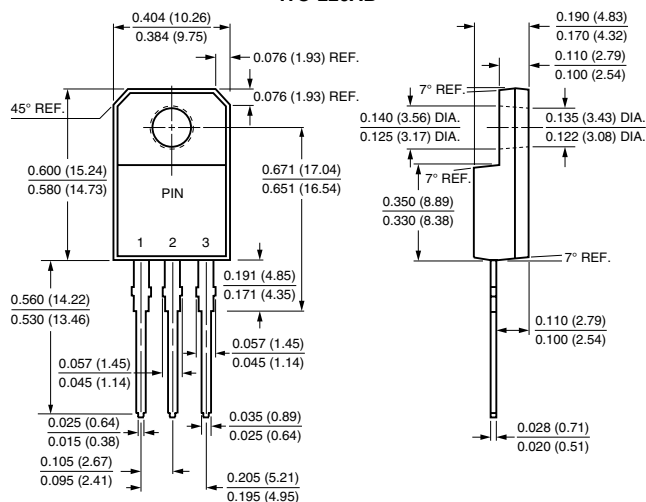
Figure 5. Typical Junction Capacitance Per Diode

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

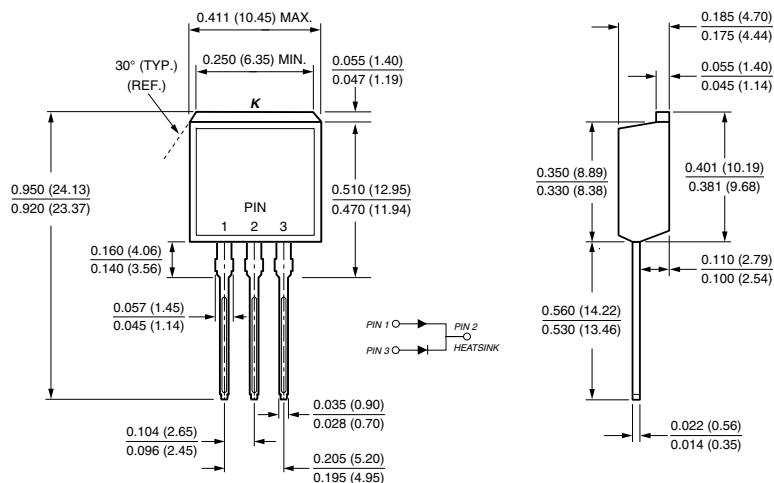
TO-220AB



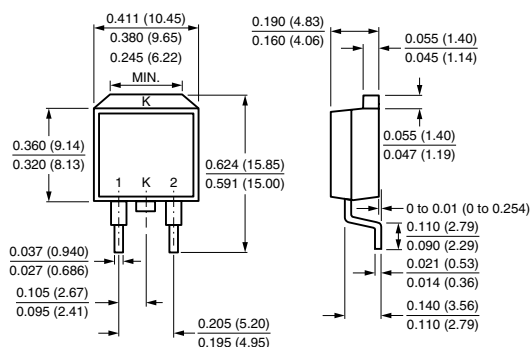
**ITO-220AB**



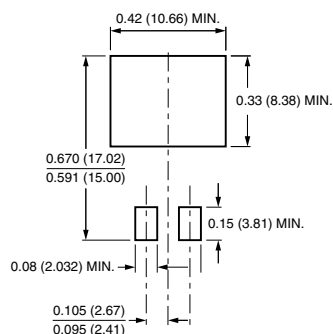
TO-262AA



TO-263AB



### Mounting Pad Layout





### Disclaimer

All product specifications and data are subject to change without notice.

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