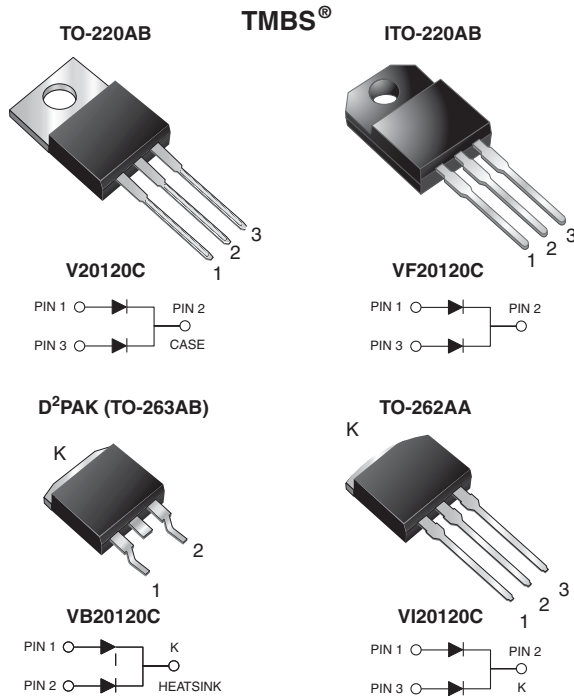


## Dual High Voltage Trench MOS Barrier Schottky Rectifier

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



### DESIGN SUPPORT TOOLS



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| 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   |
| $T_J$ max.                    | 150 °C   |
| Package                       | TO-220AB, ITO-220AB, D <sup>2</sup> PAK (TO-263AB), TO-262AA |
| Circuit configuration         | Common cathode   |

| 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 (fig. 1)  |                | per device |          | 20          |          | A                |
|   |                | per diode  |          | 10          |          |                  |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode                                | $I_{FSM}$      |            |          | 120         |          | A                |
| Non-repetitive avalanche energy at $T_J = 25 \text{ °C}$ , $L = 60 \text{ mH}$ per diode                                    | $E_{AS}$       |            |          | 80          |          | mJ               |
| Peak repetitive reverse current at $t_p = 2 \text{ } \mu\text{s}$ , 1 kHz, $T_J = 38 \text{ °C} \pm 2 \text{ °C}$ per diode | $I_{RRM}$      |            |          | 0.5         |          | A                |
| Voltage rate of change (rated $V_R$ )   | $dV/dt$        |            |          | 10 000      |          | V/ $\mu\text{s}$ |
| Isolation voltage (ITO-220AB only) 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               |

### FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB, ITO-220AB, and TO-262AA package)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** TO-220AB, ITO-220AB, D<sup>2</sup>PAK (TO-263AB), and TO-262AA

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade

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

E3 suffix meets JESD 201 class 1A whisker test

**Polarity:** as marked

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

| 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   | $I_F = 5\text{ A}$    | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.62          | -    | V             |
|   | $I_F = 10\text{ A}$   |                                   |             | 0.81          | 0.90 |               |
|   | $I_F = 5\text{ A}$    | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.54          | -    |               |
|   | $I_F = 10\text{ A}$   |                                   |             | 0.64          | 0.72 |               |
| Reverse current per diode   | $V_R = 90\text{ V}$   | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | 8             | -    | $\mu\text{A}$ |
|   |                       | $T_A = 125\text{ }^\circ\text{C}$ |             | 6             | -    | mA            |
|   | $V_R = 120\text{ V}$  | $T_A = 25\text{ }^\circ\text{C}$  |             | -             | 700  | $\mu\text{A}$ |
|   |                       | $T_A = 125\text{ }^\circ\text{C}$ |             | 14            | 45   | 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          |

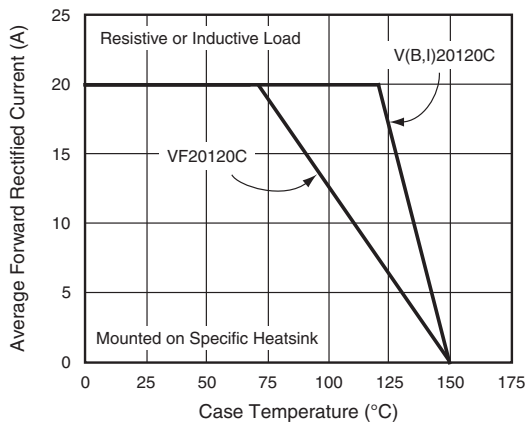
**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)**


Fig. 1 - Maximum Forward Current Derating Curve

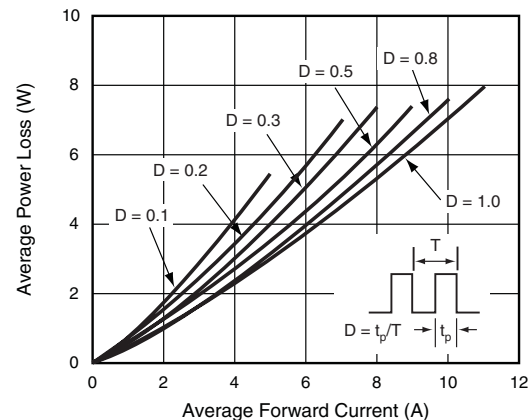


Fig. 2 - Forward Power Loss Characteristics Per Diode

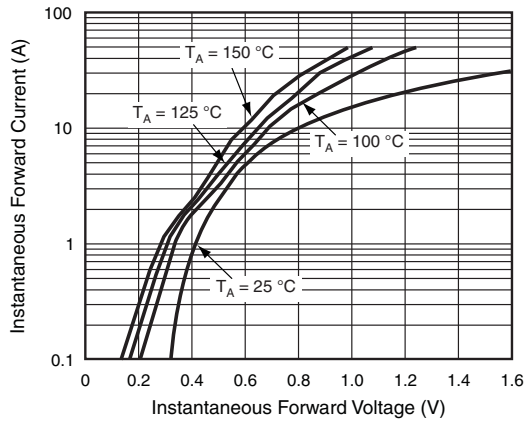


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

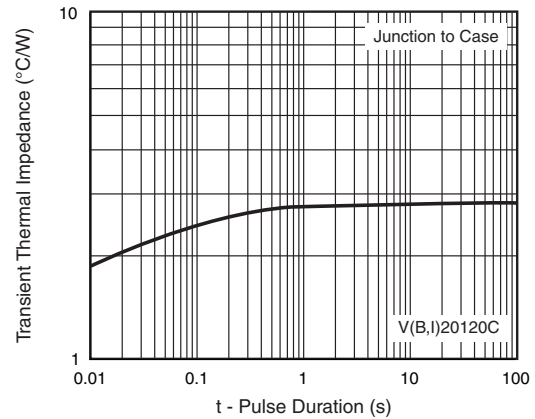


Fig. 6 - Typical Transient Thermal Impedance Per Diode

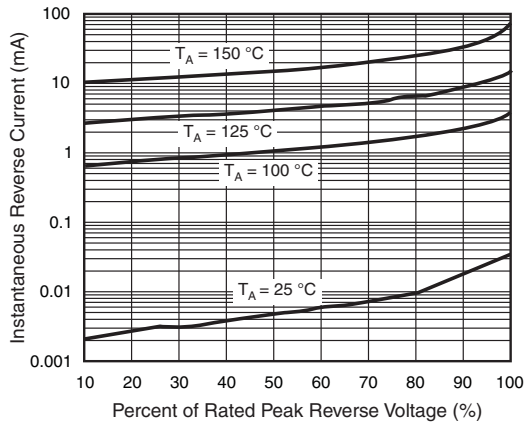


Fig. 4 - Typical Reverse Characteristics Per Diode

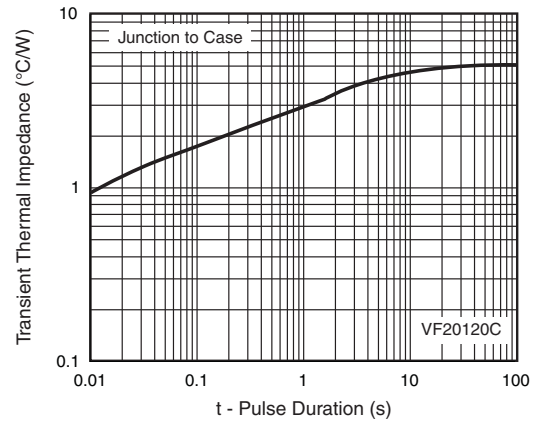


Fig. 7 - Typical Transient Thermal Impedance Per Diode

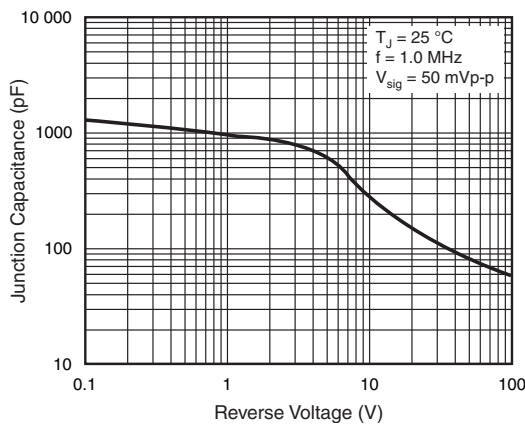
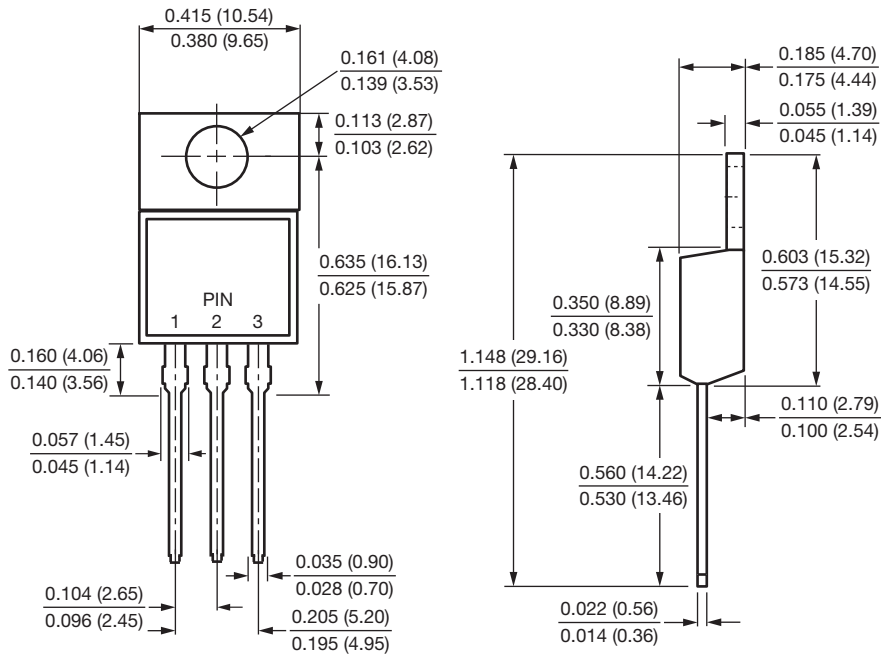


Fig. 5 - Typical Junction Capacitance Per Diode

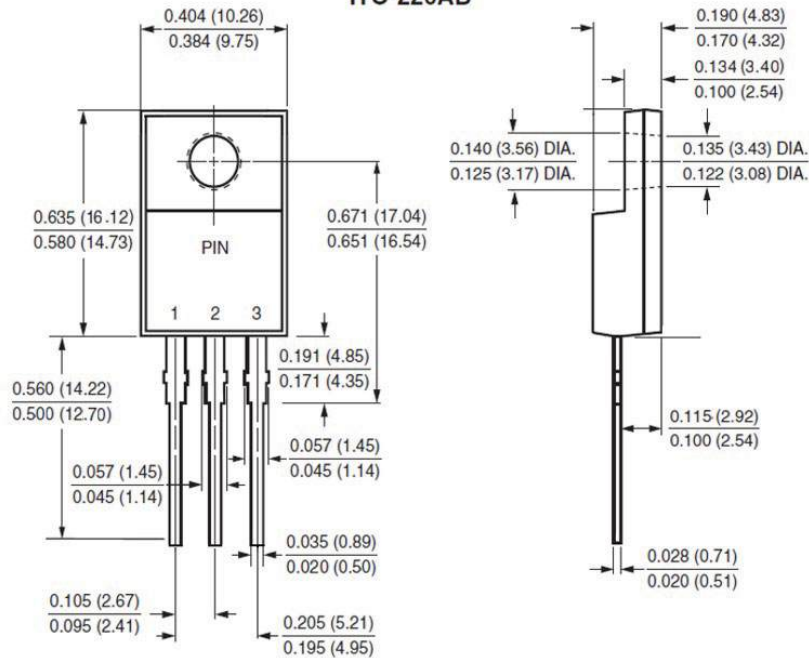


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

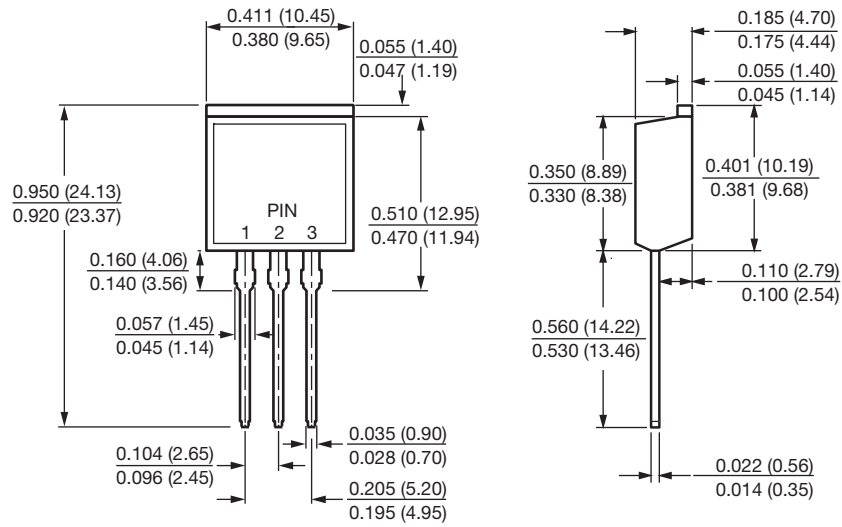
TO-220AB



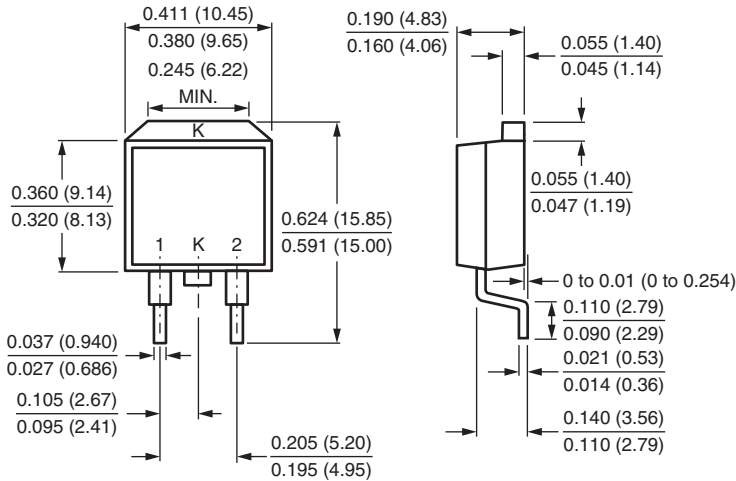
ITO-220AB



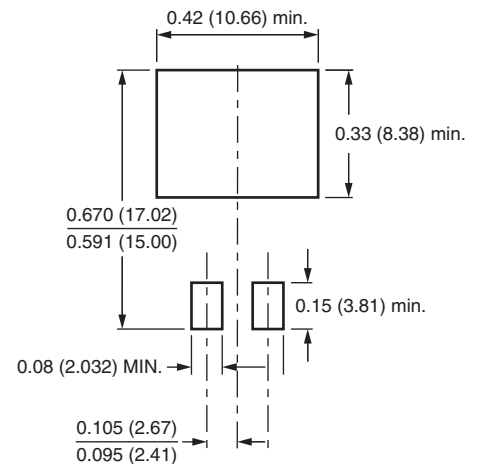
TO-262AA



D<sup>2</sup>PAK (TO-263AB)



Mounting Pad Layout





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