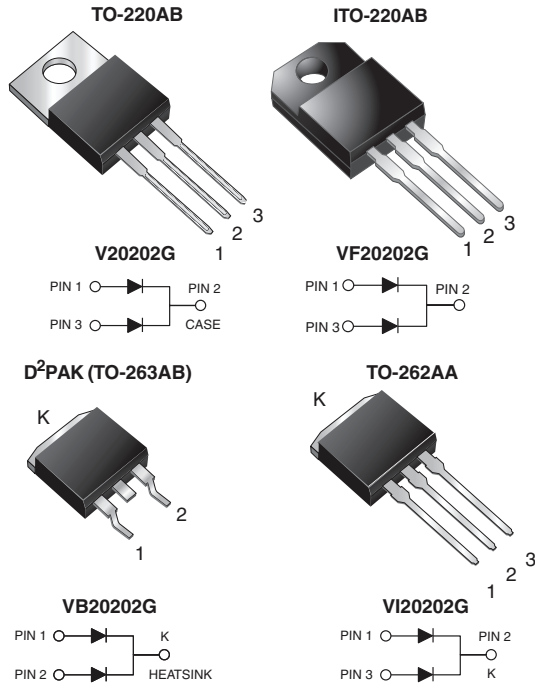


# Dual High Voltage TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier

 Ultra Low  $V_F = 0.61\text{ V}$  at  $I_F = 5\text{ A}$ 


## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                                |  |
|--|--|
| $I_{F(AV)}$  | 2 x 10 A   |
| $V_{RRM}$  | 200 V  |
| $I_{FSM}$  | 130 A  |
| $V_F$ at $I_F = 10\text{ A}$ ( $T_A = 125\text{ °C}$ ) | 0.71 V   |
| $T_J$ max.   | 175 °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         | V20202G    | VF20202G  | VB20202G    | VI20202G | UNIT       |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      |            |           | 200         |          | V          |
| Maximum average forward rectified current (fig. 1)   |                | per device | per diode | 20          |          | A          |
|  |                |            |           | 10          |          |            |
| Maximum DC reverse voltage   | $V_{DC}$       |            |           | 160         |          | V          |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$      |            |           | 130         |          | A          |
| Voltage rate of change (rated $V_R$ )  | dV/dt          |            |           | 10 000      |          | V/ $\mu$ 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 +175 |          | °C         |

## FEATURES

- Trench MOS Schottky technology Gen 2
- 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 D<sup>2</sup>PAK (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  
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, ITO-220AB, D<sup>2</sup>PAK (TO-263AB), and TO-262AA

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - 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

**Polarity:** as marked

**Mounting Torque:** 10 in-lbs max.



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                |      |      |      |
|--|------------------------|-------------------------|----------------|------|------|------|
| PARAMETER  | TEST CONDITIONS        |                         | SYMBOL         | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode <sup>(1)</sup>                     | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> | 0.76 | -    | V    |
|  | I <sub>F</sub> = 10 A  |                         |                | 0.84 | 0.92 |      |
|  | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                | 0.61 | -    |      |
|  | I <sub>F</sub> = 10 A  |                         |                | 0.71 | 0.8  |      |
| Reverse current per diode <sup>(2)</sup>                                   | V <sub>R</sub> = 160 V | T <sub>A</sub> = 25 °C  | I <sub>R</sub> | 0.3  | -    | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                | 0.5  | -    | mA   |
|  | V <sub>R</sub> = 200 V | T <sub>A</sub> = 25 °C  |                | -    | 150  | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                | 1.5  | 8    | mA   |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |            |                                    |         |          |          |          |      |
|---|------------|------------------------------------|---------|----------|----------|----------|------|
| PARAMETER   |            | SYMBOL                             | V20202G | VF20202G | VB20202G | VI20202G | UNIT |
| Typical thermal resistance  | per diode  | R <sub>θJC</sub>                   | 2.8     | 5.0      | 2.8      |          | °C/W |
|   | per device | R <sub>θJC</sub>                   | 1.6     | 3.5      | 1.6      |          |      |
|   | per device | R <sub>θJA</sub> <sup>(1)(2)</sup> | 52      | 60       | 52       |          |      |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP<sub>D</sub>/dT<sub>J</sub> < 1/R<sub>θJA</sub>
- (2) Free air, without heatsink

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V20202G-M3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| ITO-220AB                      | VF20202G-M3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| D <sup>2</sup> PAK (TO-263AB)  | VB20202G-M3/4W | 1.39            | 4W           | 50/tube       | Tube          |
| D <sup>2</sup> PAK (TO-263AB)  | VB20202G-M3/8W | 1.39            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                       | VI20202G-M3/4W | 1.45            | 4W           | 50/tube       | Tube          |



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

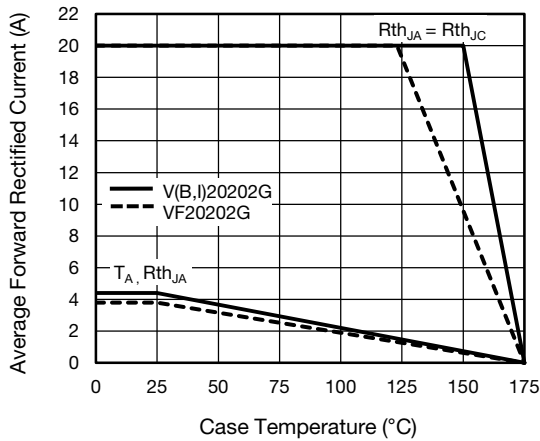


Fig. 1 - Maximum Forward Current Derating Curve (D = Duty Cycle = 0.5)

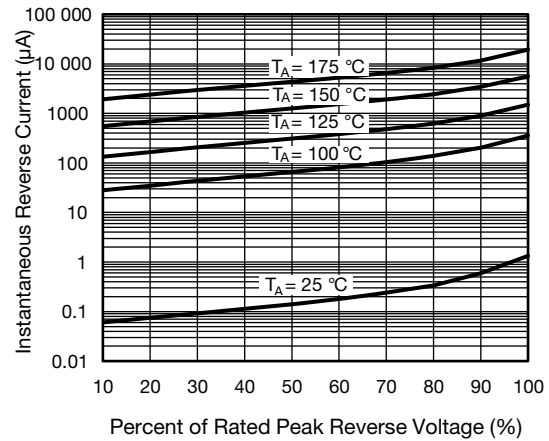


Fig. 4 - Typical Reverse Characteristics Per Diode

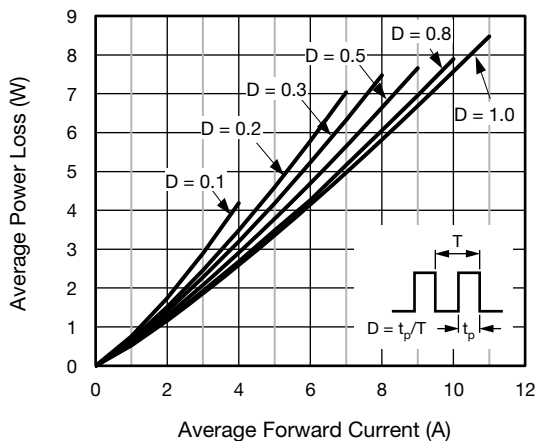


Fig. 2 - Forward Power Loss Characteristics Per Diode

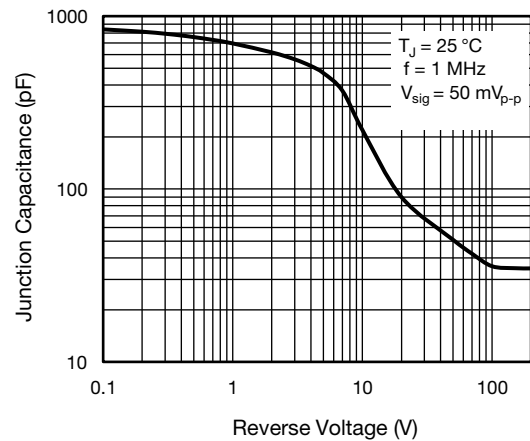


Fig. 5 - Typical Junction Capacitance Per Diode

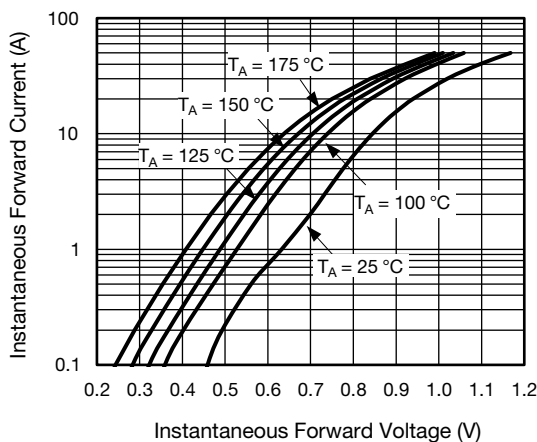


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

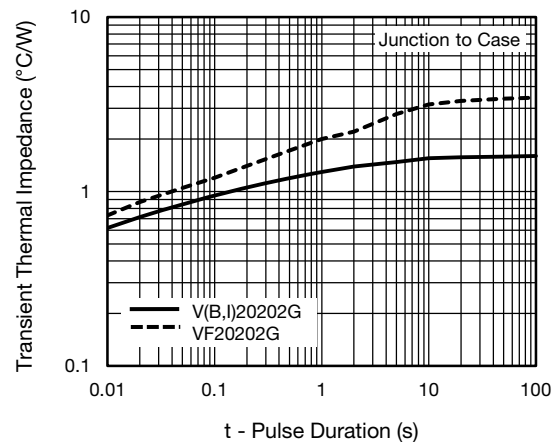
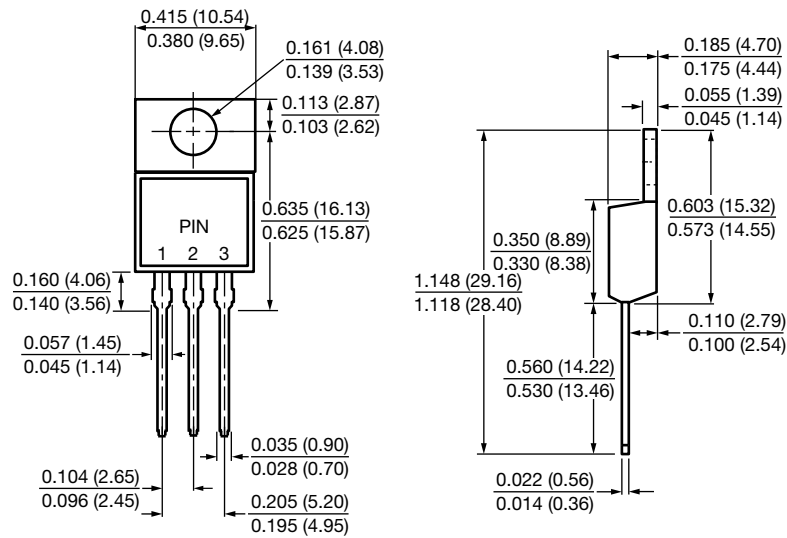


Fig. 6 - Typical Transient Thermal Impedance Per Device

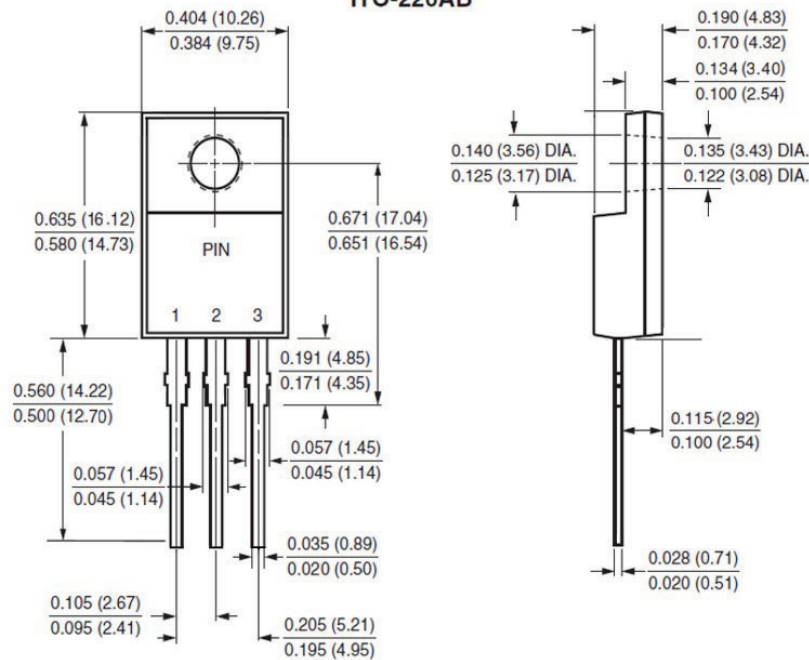


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

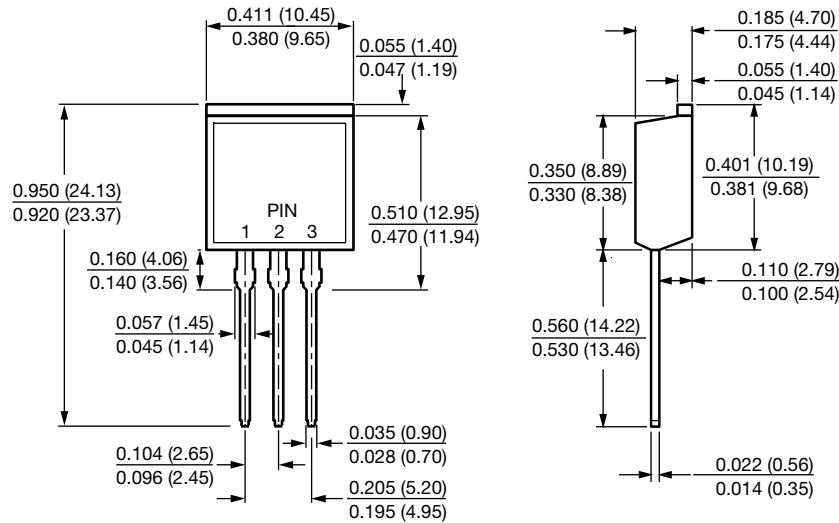
#### TO-220AB



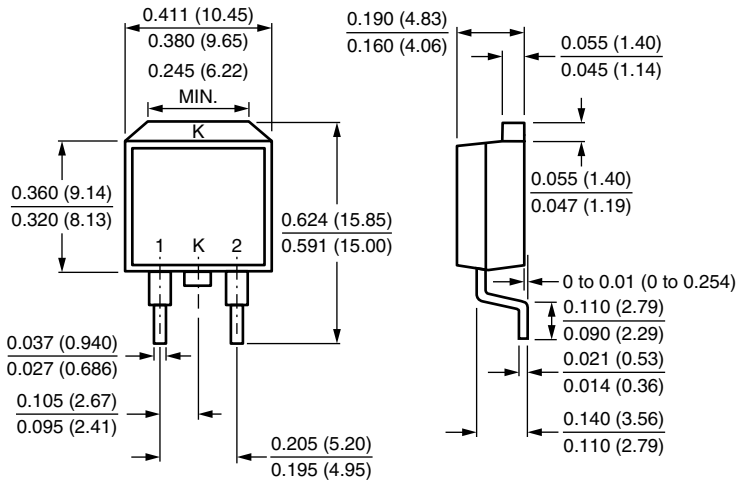
#### ITO-220AB



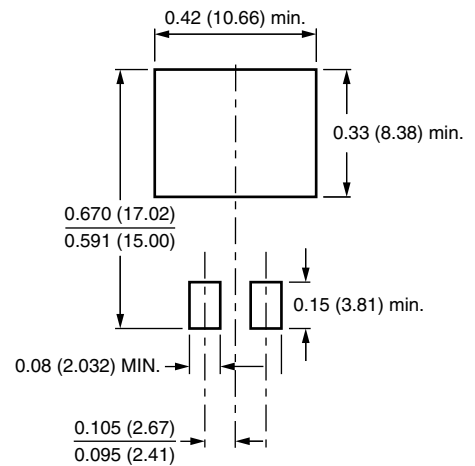
TO-262AA



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



Mounting Pad Layout





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