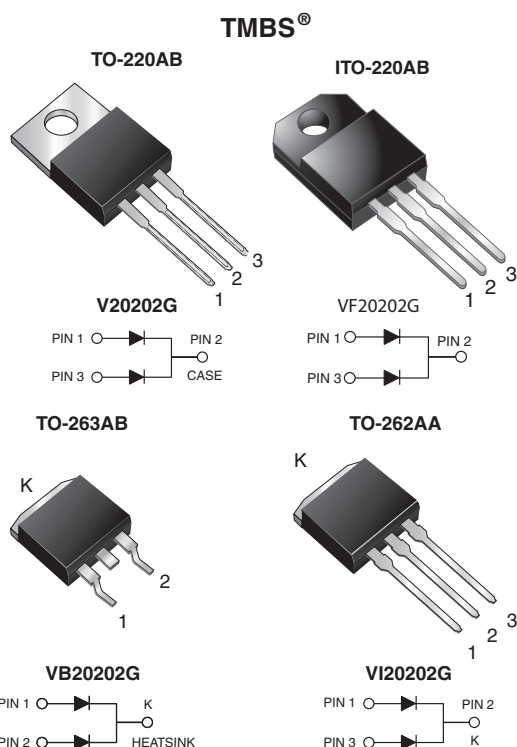


## Dual High Voltage Trench MOS Barrier Schottky Rectifier

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



### FEATURES

- Trench MOS Schottky technology generation 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 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, 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.

### 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,<br>TO-263AB, TO-262AA |
| Diode variations                                       | 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 <sub>RRM</sub>                  | 200         |          |          |          | V    |
| Maximum average forward rectified current (fig. 1) <div>per device</div> <div>per diode</div> | I <sub>F(AV)</sub>                | 20          |          |          |          | A    |
|                                                                                               |                                   | 10          |          |          |          |      |
| Maximum DC reverse voltage                                                                    | V <sub>DC</sub>                   | 160         |          |          |          | V    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode  | I <sub>FSM</sub>                  | 130         |          |          |          | A    |
| Voltage rate of change (rated V <sub>R</sub> )                                                | dV/dt                             | 10 000      |          |          |          | V/μs |
| Isolation voltage (ITO-220AB only) from terminal to heatsink, t = 1 min                       | V <sub>AC</sub>                   | 1500        |          |          |          | V    |
| Operating junction and storage temperature range                                              | T <sub>J</sub> , T <sub>STG</sub> | -40 to +175 |          |          |          | °C   |



| 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**<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle<sup>(2)</sup> Pulse test: Pulse width  $\leq 5\text{ ms}$ 

| 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**<sup>(1)</sup> The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ <sup>(2)</sup> Free air, without heatsink

| <b>ORDERING INFORMATION</b> (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          |
| TO-263AB                              | VB20202G-M3/4W | 1.39            | 4W           | 50/tube       | Tube          |
| 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 ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

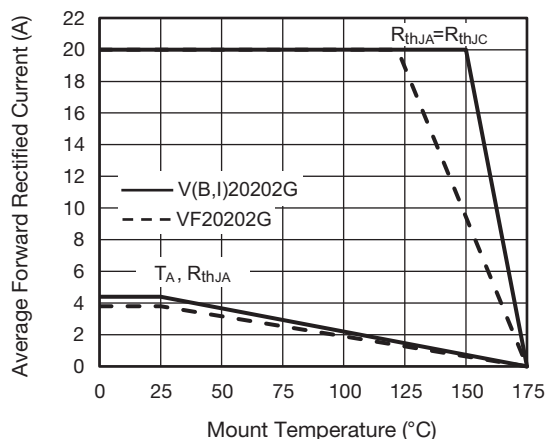


Fig. 1 - Maximum Forward Current Derating Curve  
(D = Duty Cycle = 0.5)

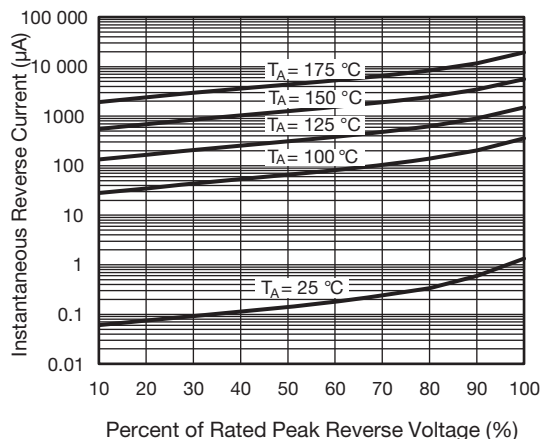


Fig. 4 - Typical Reverse Characteristics Per Diode

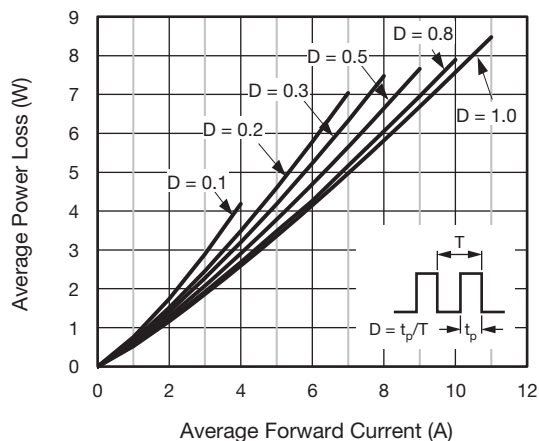


Fig. 2 - Forward Power Loss Characteristics Per Diode

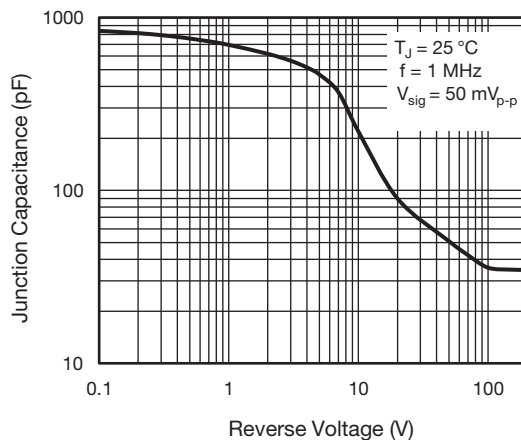


Fig. 5 - Typical Junction Capacitance Per Diode

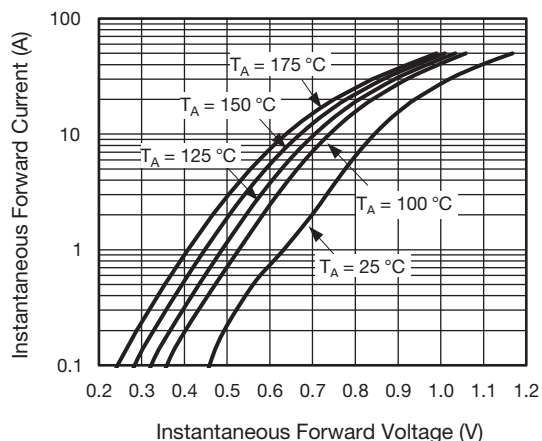


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

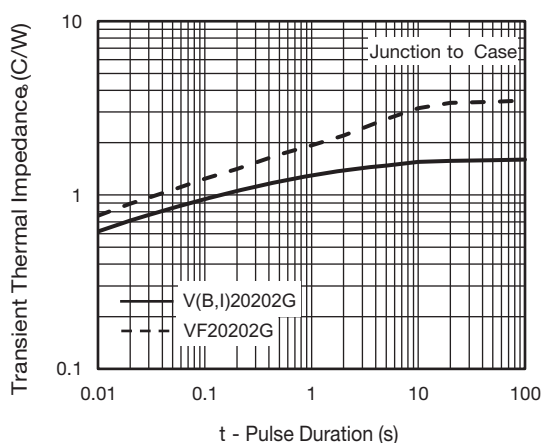
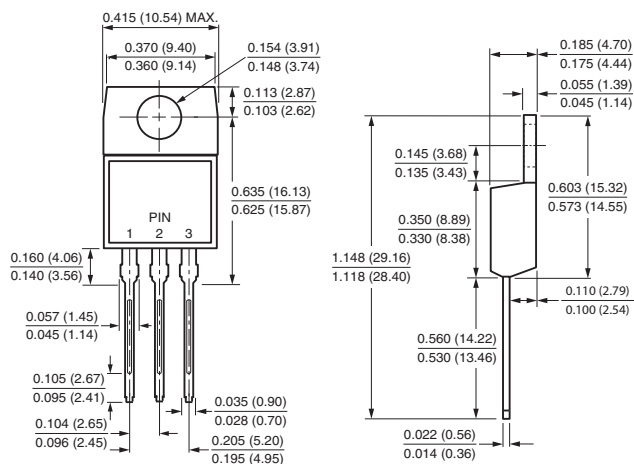


Fig. 6 - Typical Transient Thermal Impedance Per Device

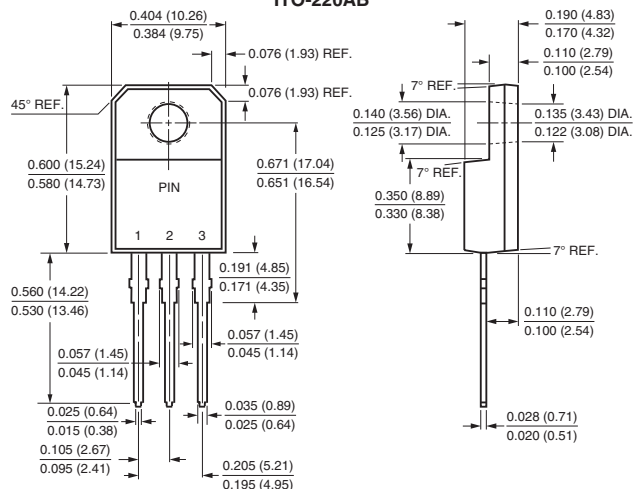


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

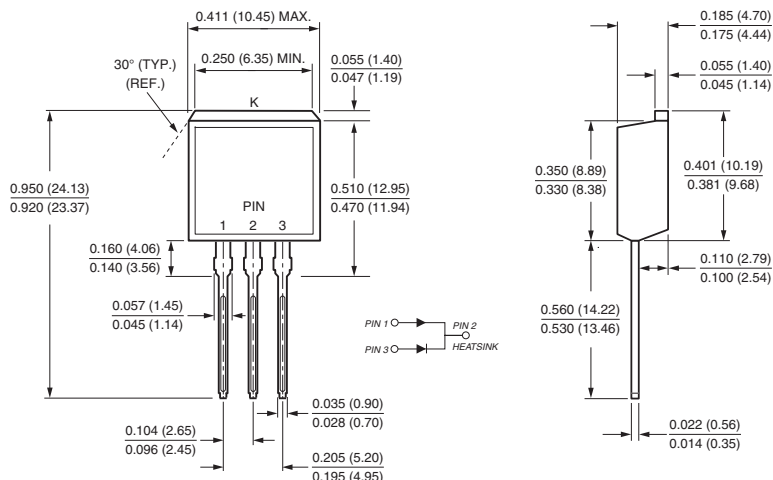
TO-220AB



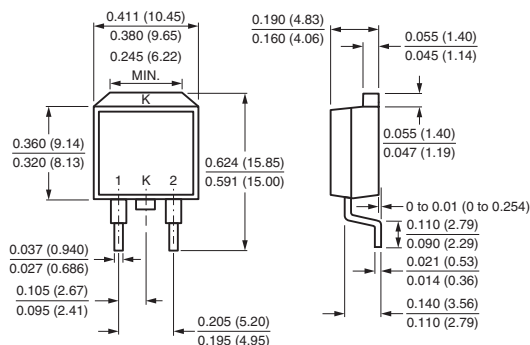
ITO-220AB



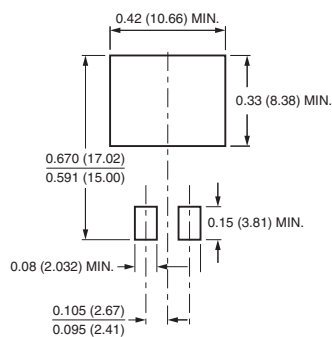
TO-262AA



TO-263AB



Mounting Pad Layout





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