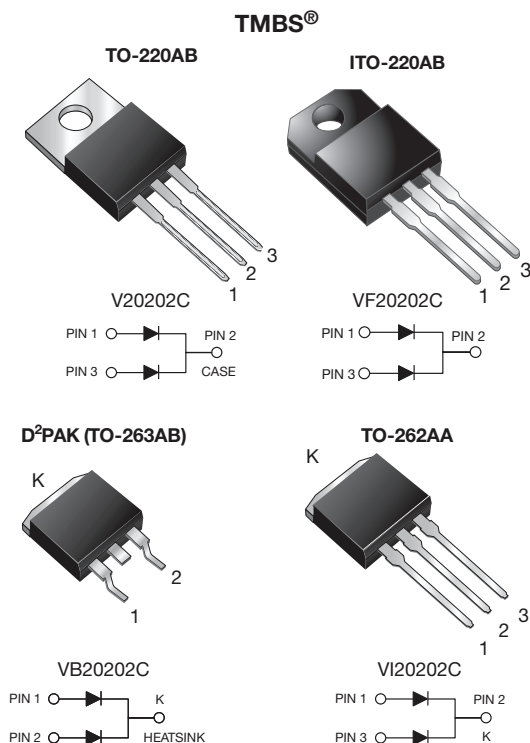


## Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.59 \text{ V}$  at  $I_F = 5 \text{ A}$



### 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-220-AB, 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.

### PRIMARY CHARACTERISTICS

|                                                          |                                                              |
|----------------------------------------------------------|--------------------------------------------------------------|
| $I_{F(AV)}$                                              | 2 x 10 A                                                     |
| $V_{RRM}$                                                | 200 V                                                        |
| $I_{FSM}$                                                | 150 A                                                        |
| $V_F$ at $I_F = 10 \text{ A}$ ( $T_A = 125 \text{ °C}$ ) | 0.68 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                            | V20202C            | VF20202C | VB20202C | VI20202C | UNIT |
|----------------------------------------------------------------------------------------------|-----------------------------------|--------------------|----------|----------|----------|------|
| Maximum repetitive peak reverse voltage                                                      | V <sub>RRM</sub>                  | 200                |          |          |          | V    |
| Maximum average forward rectified current<br>(fig. 1)                                        | per device                        | I <sub>F(AV)</sub> | 20       |          |          | A    |
|                                                                                              | per diode                         |                    | 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>                  | 150                |          |          |          | A    |
| Voltage rate of change (rated V <sub>R</sub> )                                               | dV/dt                             | 10 000             |          |          |          | V/μs |
| Isolation voltage (ITO-220AB only)<br>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> | 0.75 | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                | 0.81 | 0.90 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                | 0.59 | -    |      |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                | 0.68 | 0.76 |      |
| Reverse current per diode <sup>(2)</sup>                                   | V <sub>R</sub> = 160 V | T <sub>A</sub> = 25 °C  | I <sub>R</sub> | 0.4  | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                | 0.8  | -    | mA   |
|                                                                            | V <sub>R</sub> = 200 V | T <sub>A</sub> = 25 °C  |                | -    | 150  | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                | 1.6  | 10   | mA   |

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

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |            |                                    |         |          |          |          |      |
|-------------------------------------------------------------------------|------------|------------------------------------|---------|----------|----------|----------|------|
| PARAMETER                                                               |            | SYMBOL                             | V20202C | VF20202C | VB20202C | VI20202C | UNIT |
| Typical thermal resistance                                              | per diode  | R <sub>θJC</sub>                   | 2.2     | 4.5      | 2.2      |          | °C/W |
|                                                                         | per device | R <sub>θJC</sub>                   | 1.3     | 3.2      | 1.3      |          |      |
|                                                                         | 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:  $dP_D/dT_J < 1/R_{\theta JA}$ 

(2) Free air, without heatsink

| <b>ORDERING INFORMATION</b> (Example) |                |                 |              |               |               |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                              | V20202C-M3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| ITO-220AB                             | VF20202C-M3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| D <sup>2</sup> PAK (TO-263AB)         | VB20202C-M3/4W | 1.37            | 4W           | 50/tube       | Tube          |
| D <sup>2</sup> PAK (TO-263AB)         | VB20202C-M3/8W | 1.37            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                              | VI20202C-M3/4W | 1.45            | 4W           | 50/tube       | Tube          |



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

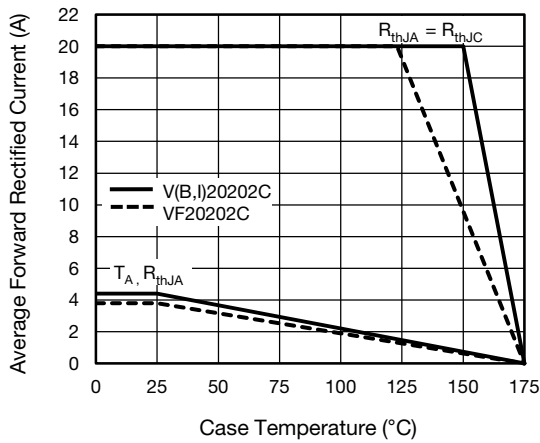


Fig. 1 - Maximum Forward Current Derating Curve  
(D = Duty Cycle = 0.5)

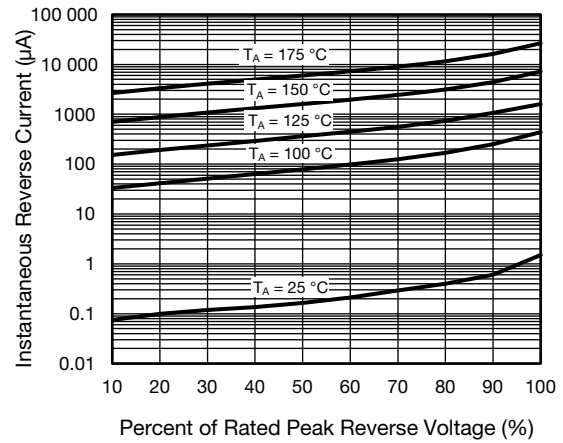


Fig. 4 - Typical Reverse Characteristics Per Diode

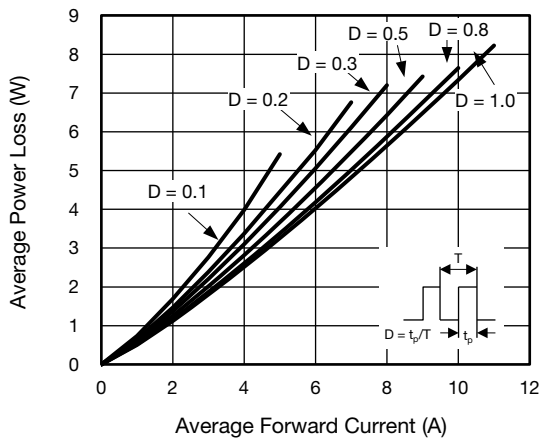


Fig. 2 - Forward Power Loss Characteristics Per Diode

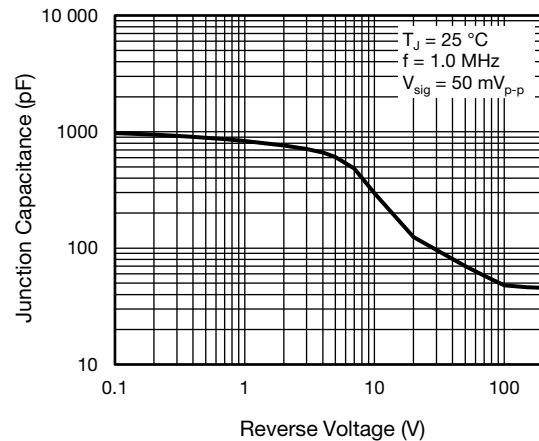


Fig. 5 - Typical Junction Capacitance Per Diode

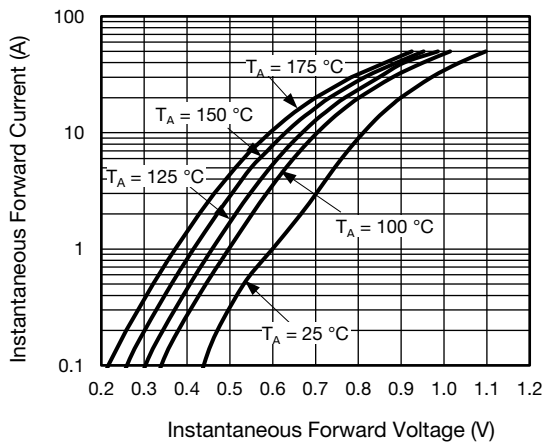


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

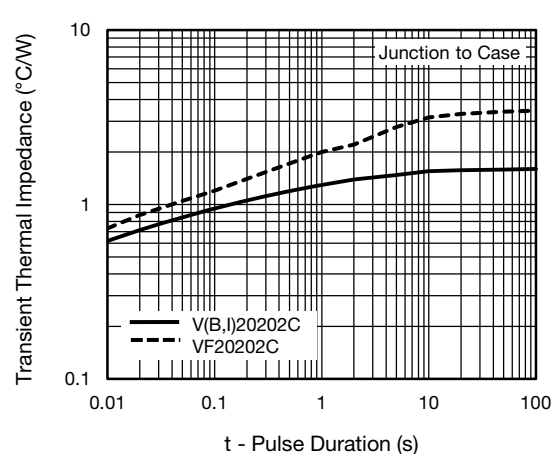
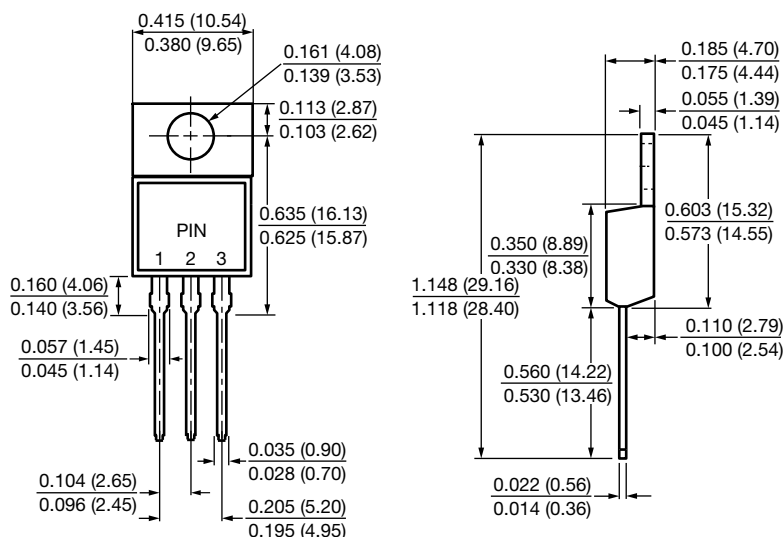


Fig. 6 - Typical Transient Thermal Impedance Per Device

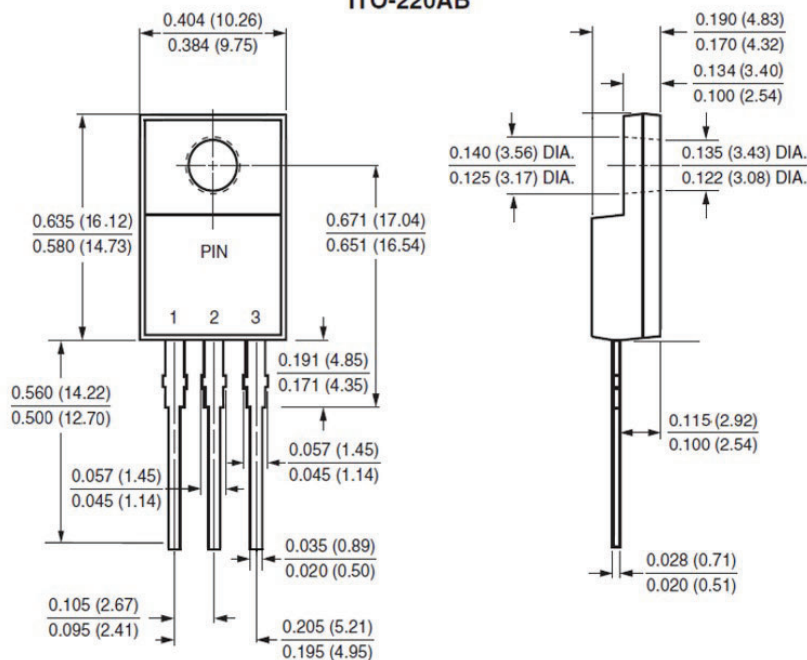


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-220AB

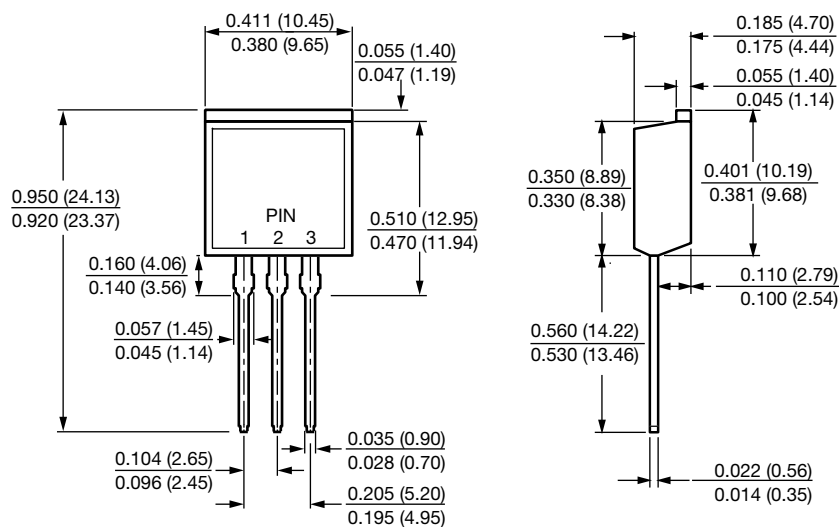


### ITO-220AB

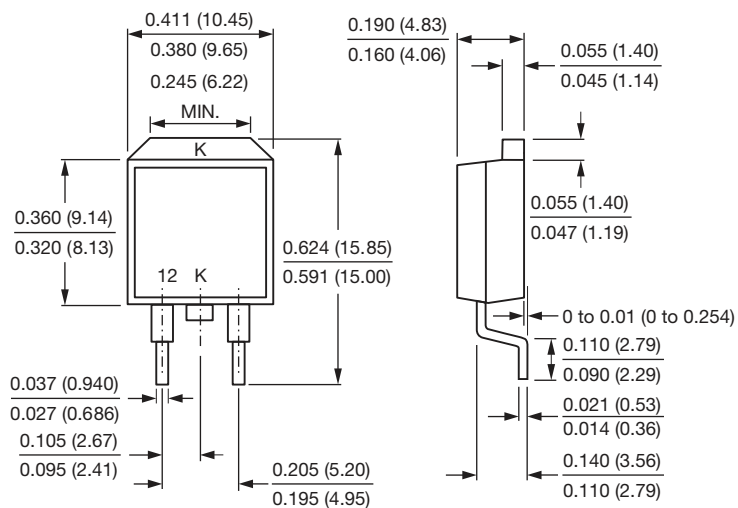




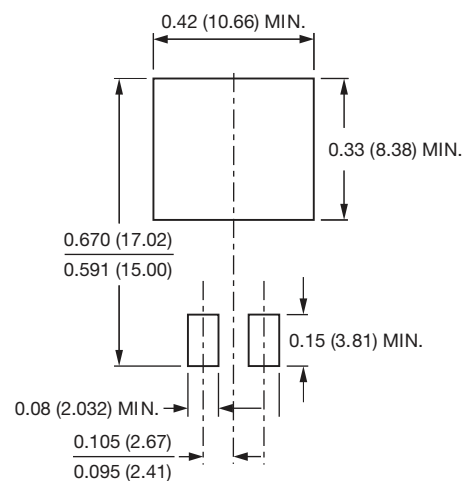
## TO-262AA



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



## Mounting Pad Layout





## Disclaimer

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