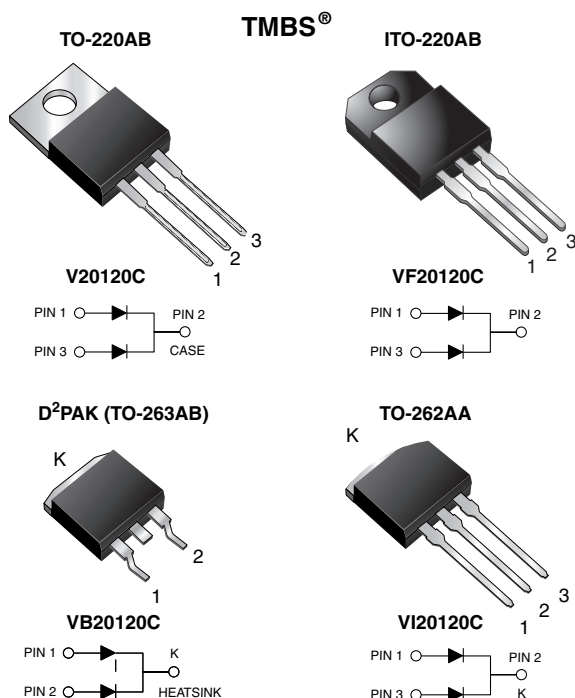




## Dual High Voltage Trench MOS Barrier Schottky Rectifier

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



### LINKS TO ADDITIONAL RESOURCES



| 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                                          |
| Package                       | TO-220AB, ITO-220AB, D²PAK (TO-263AB), TO-262AA |
| Circuit configuration         | Common cathode                                  |

| MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)                                         |                                   |                    |          |          |          |      |
|---------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------|----------|----------|----------|------|
| PARAMETER                                                                                               | SYMBOL                            | V20120C            | VF20120C | VB20120C | VI20120C | UNIT |
| Maximum repetitive peak reverse voltage                                                                 | V <sub>RRM</sub>                  | 120                |          |          |          | V    |
| Maximum average forward rectified current (fig. 1)                                                      | per device                        | I <sub>F(AV)</sub> | 20       |          |          | A    |
|                                                                                                         | per diode                         |                    | 10       |          |          |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode            | I <sub>FSM</sub>                  | 120                |          |          |          | A    |
| Non-repetitive avalanche energy at T <sub>J</sub> = 25 °C, L = 60 mH per diode                          | E <sub>AS</sub>                   | 80                 |          |          |          | mJ   |
| Peak repetitive reverse current at t <sub>p</sub> = 2 μs, 1 kHz,T <sub>J</sub> = 38 °C ± 2 °C per diode | I <sub>RRM</sub>                  | 0.5                |          |          |          | 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 +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 D²PAK (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, D²PAK (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 <sub>A</sub> = 25 °C unless otherwise noted) |                         |                         |                               |               |      |      |
|----------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------------|---------------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS         |                         | SYMBOL                        | TYP.          | MAX. | UNIT |
| Breakdown voltage                                                          | I <sub>R</sub> = 1.0 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub>               | 120 (minimum) | -    | V    |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.62          | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A   |                         |                               | 0.81          | 0.90 |      |
|                                                                            | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 125 °C |                               | 0.54          | -    |      |
|                                                                            | I <sub>F</sub> = 10 A   |                         |                               | 0.64          | 0.72 |      |
| Reverse current per diode                                                  | V <sub>R</sub> = 90 V   | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 8             | -    | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 6             | -    | mA   |
|                                                                            | V <sub>R</sub> = 120 V  | T <sub>A</sub> = 25 °C  |                               | -             | 700  | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °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          |
| D <sup>2</sup> PAK (TO-263AB)  | VB20120C-E3/4W | 1.37            | 4W           | 50/tube       | Tube          |
| D <sup>2</sup> PAK (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)

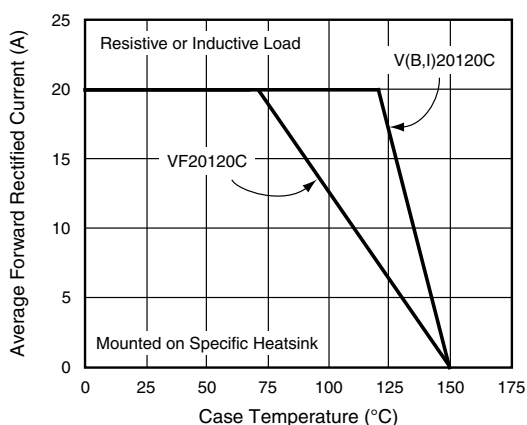


Fig. 1 - Maximum Forward Current Derating Curve

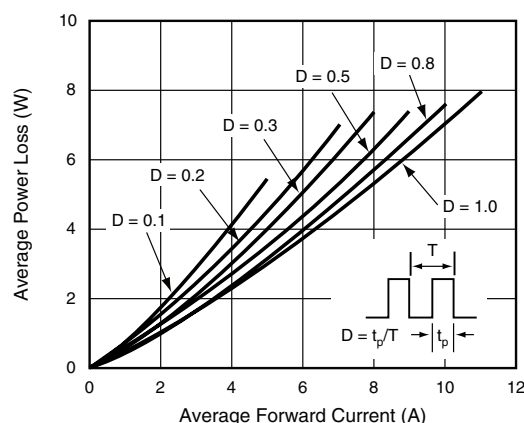


Fig. 2 - Forward Power Loss Characteristics Per Diode

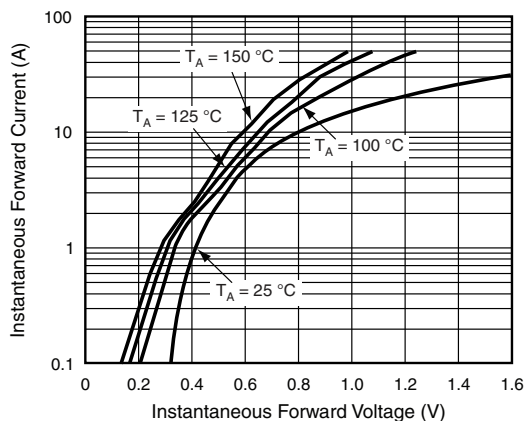


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

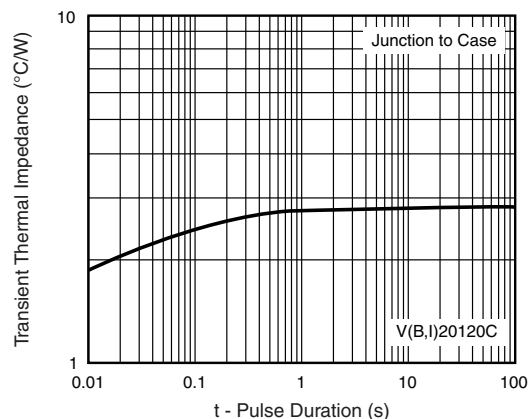


Fig. 6 - Typical Transient Thermal Impedance Per Diode

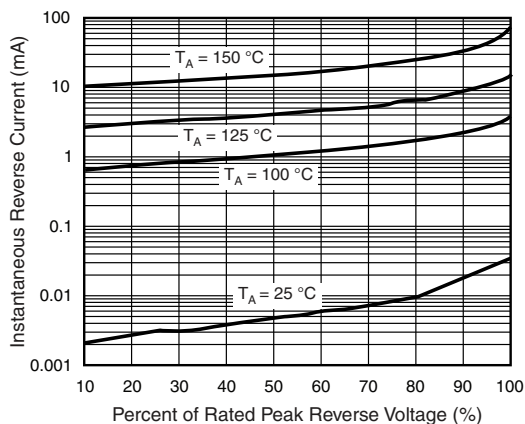


Fig. 4 - Typical Reverse Characteristics Per Diode

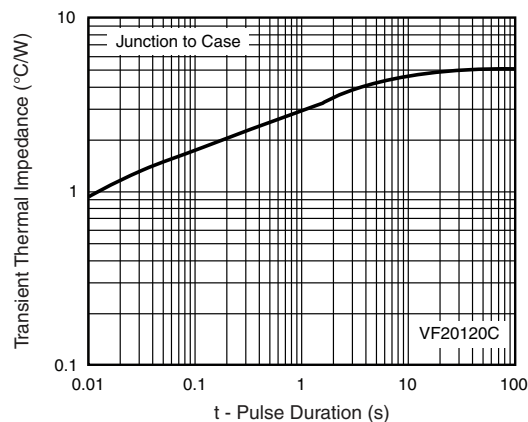


Fig. 7 - Typical Transient Thermal Impedance Per Diode

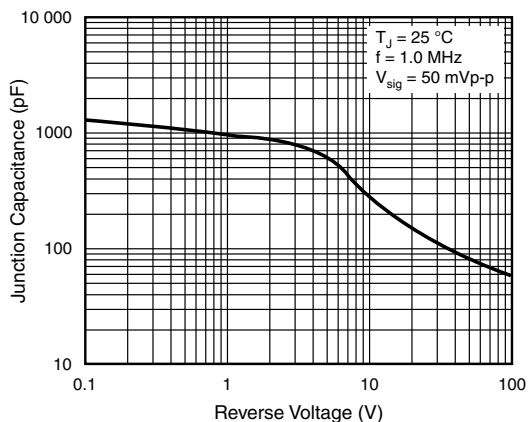
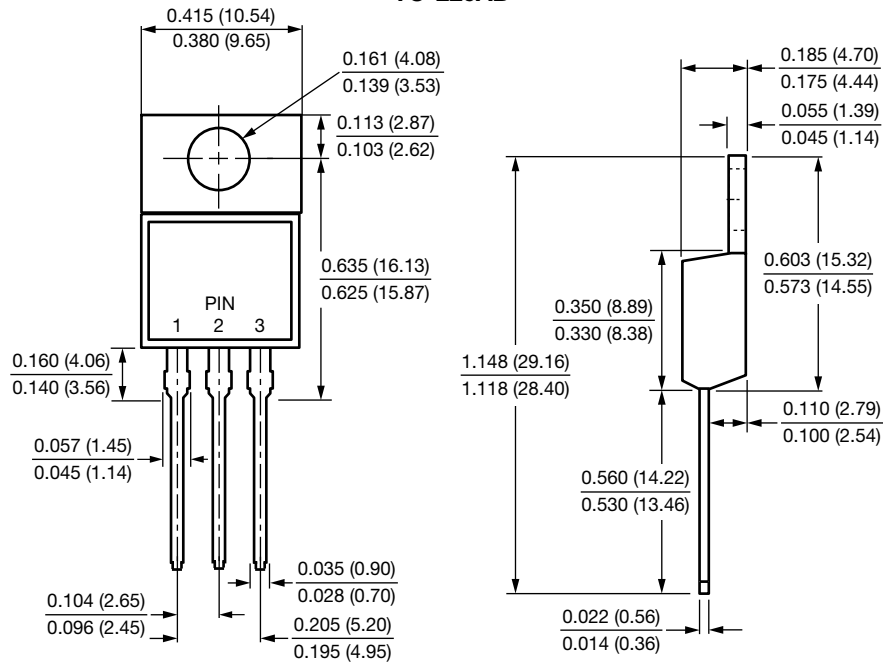


Fig. 5 - Typical Junction Capacitance Per Diode

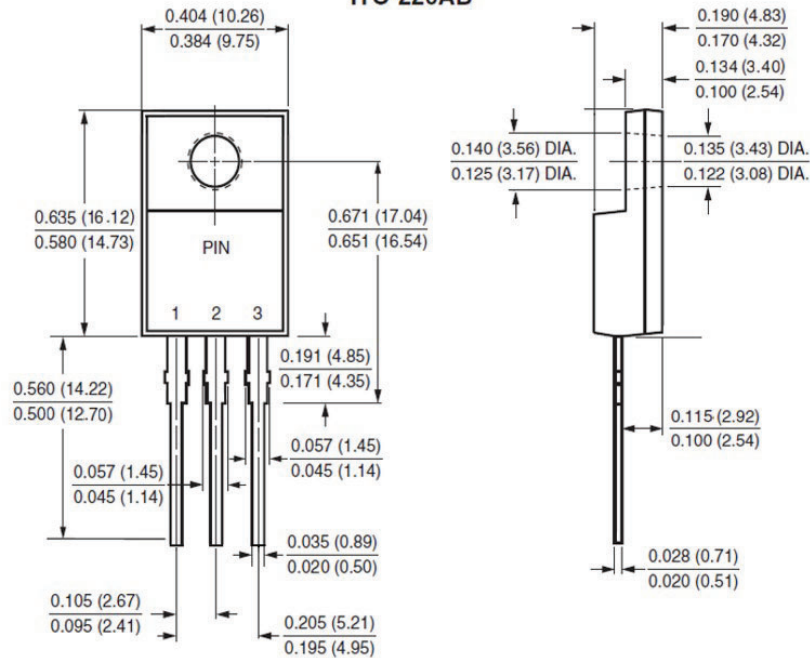


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-220AB

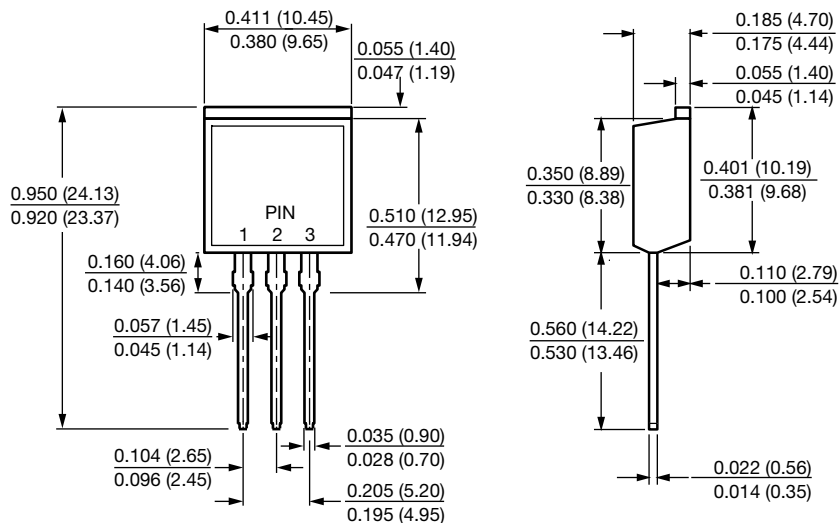


### ITO-220AB

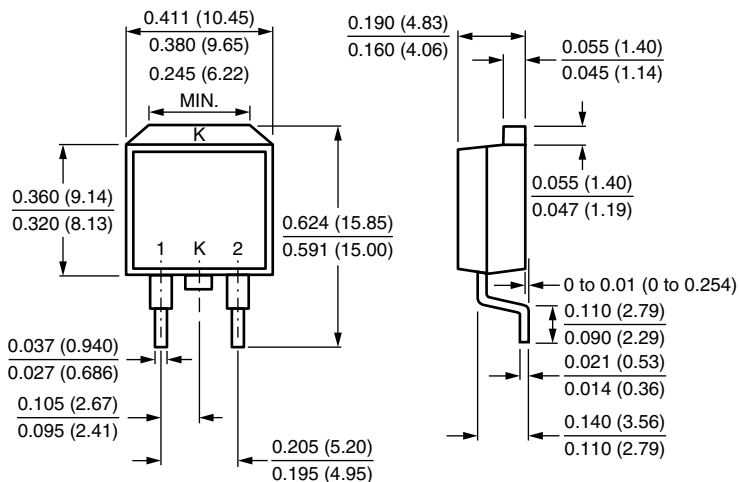




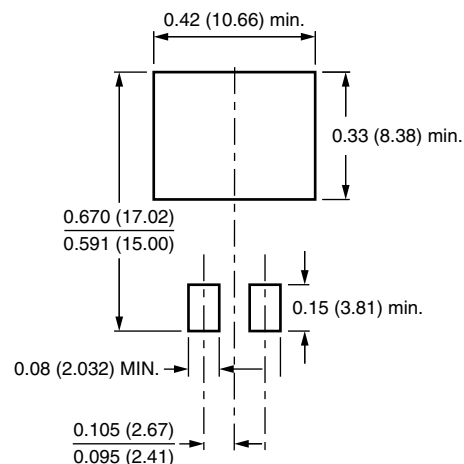
## TO-262AA



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



## Mounting Pad Layout





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