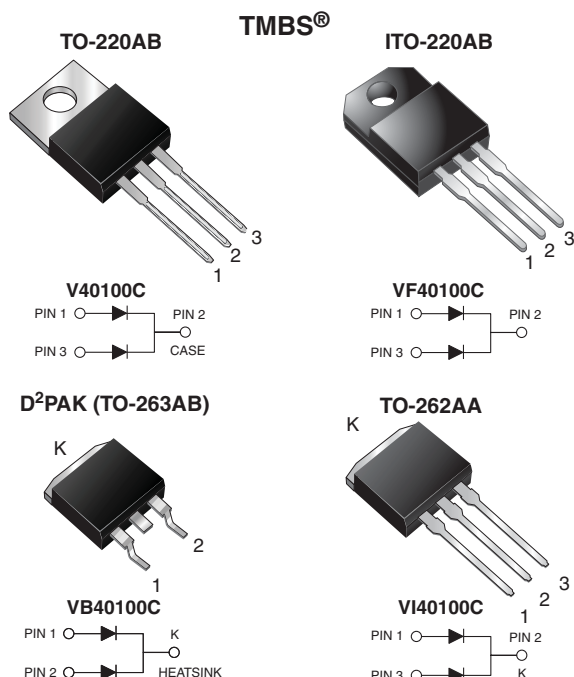




## Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.38 \text{ V}$  at  $I_F = 5 \text{ A}$



### DESIGN SUPPORT TOOLS



[click logo to get started](#)

| PRIMARY CHARACTERISTICS       |                                                 |
|-------------------------------|-------------------------------------------------|
| $I_{F(AV)}$                   | 2 x 20 A                                        |
| $V_{RRM}$                     | 100 V                                           |
| $I_{FSM}$                     | 250 A                                           |
| $V_F$ at $I_F = 20 \text{ A}$ | 0.61 V                                          |
| $T_J$ max.                    | 150 °C                                          |
| Package                       | TO-220AB, ITO-220AB, D²PAK (TO-263AB), TO-262AA |
| Circuit configuration         | Common cathode                                  |

### FEATURES

- Trench MOS Schottky technology
- 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)
- Low thermal resistance
- 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

| MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)                                          |                                               |             |          |          |          |      |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------|----------|----------|----------|------|
| PARAMETER                                                                                                | SYMBOL                                        | V40100C     | VF40100C | VB40100C | VI40100C | UNIT |
| Maximum repetitive peak reverse voltage                                                                  | V <sub>RRM</sub>                              | 100         |          |          |          | V    |
| Maximum average forward rectified current (fig. 1)                                                       | per device<br>I <sub>F(AV)</sub><br>per diode | 40          |          |          |          | A    |
|                                                                                                          |                                               | 20          |          |          |          |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode             | I <sub>FSM</sub>                              | 250         |          |          |          | A    |
| Non-repetitive avalanche energy at T <sub>J</sub> = 25 °C, L = 90 mH per diode                           | E <sub>AS</sub>                               | 230         |          |          |          | 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>                              | 1.0         |          |          |          | A    |
| Voltage rate of change (rated V <sub>R</sub> )                                                           | dV/dt                                         | 10 000      |          |          |          | V/μs |
| Operating junction and storage temperature range                                                         | T <sub>J</sub> , T <sub>STG</sub>             | -40 to +150 |          |          |          | °C   |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                         |                         |                 |                  |      |      |
|----------------------------------------------------------------------------|-------------------------|-------------------------|-----------------|------------------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS         |                         | SYMBOL          | TYP.             | MAX. | UNIT |
| Breakdown voltage <sup>(2)</sup>                                           | I <sub>R</sub> = 1.0 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub> | 100<br>(minimum) | -    | V    |
|                                                                            | I <sub>R</sub> = 10 mA  |                         |                 | 105<br>(minimum) | -    |      |
| Instantaneous forward voltage per diode <sup>(1)</sup>                     | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 25 °C  | V <sub>F</sub>  | 0.47             | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A   |                         |                 | 0.54             | -    |      |
|                                                                            | I <sub>F</sub> = 20 A   |                         |                 | 0.67             | 0.73 |      |
|                                                                            | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 125 °C |                 | 0.38             | -    |      |
|                                                                            | I <sub>F</sub> = 10 A   |                         |                 | 0.45             | -    |      |
|                                                                            | I <sub>F</sub> = 20 A   |                         |                 | 0.61             | 0.67 |      |
| Reverse current at rated V <sub>R</sub> per diode <sup>(2)</sup>           | V <sub>R</sub> = 70 V   | T <sub>A</sub> = 25 °C  | I <sub>R</sub>  | 9                | -    | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                 | 10               | -    | mA   |
|                                                                            | V <sub>R</sub> = 100 V  | T <sub>A</sub> = 25 °C  |                 | -                | 1000 | μA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                 | 21               | 45   | mA   |

## Notes

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

<sup>(2)</sup> Pulse test: Pulse width  $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |         |          |          |          |                      |
|--------------------------------------------------------------------------------------|-----------------|---------|----------|----------|----------|----------------------|
| PARAMETER                                                                            | SYMBOL          | V40100C | VF40100C | VB40100C | VI40100C | UNIT                 |
| Typical thermal resistance per diode                                                 | $R_{\theta JC}$ | 2.0     | 4.0      | 2.0      | 2.0      | $^{\circ}\text{C/W}$ |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V40100C-E3/4W  | 1.85            | 4W           | 50/tube       | Tube          |
| ITO-220AB                      | VF40100C-E3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB40100C-E3/4W | 1.39            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB40100C-E3/8W | 1.39            | 8W           | 800/tube      | Tape and reel |
| TO-262AA                       | VI40100C-E3/4W | 1.46            | 4W           | 50/tube       | Tube          |

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

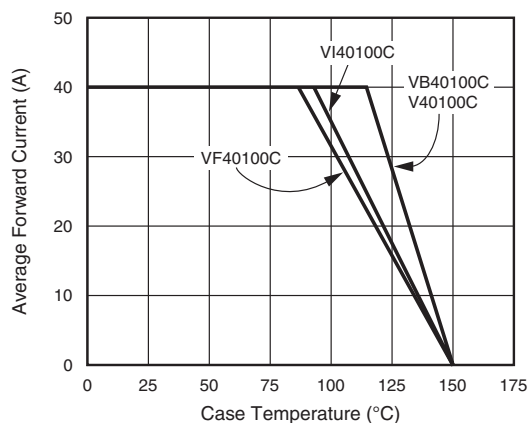


Fig. 1 - Forward Current Derating Curve

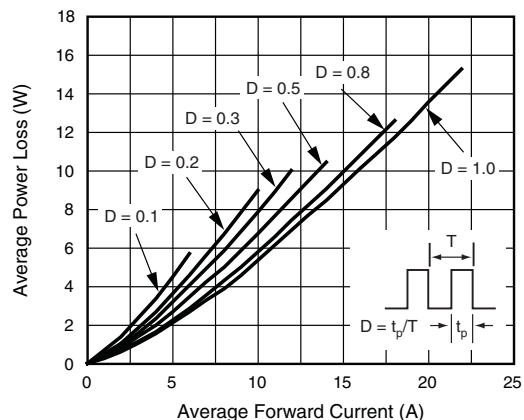


Fig. 2 - Forward Power Loss Characteristics Per Diode

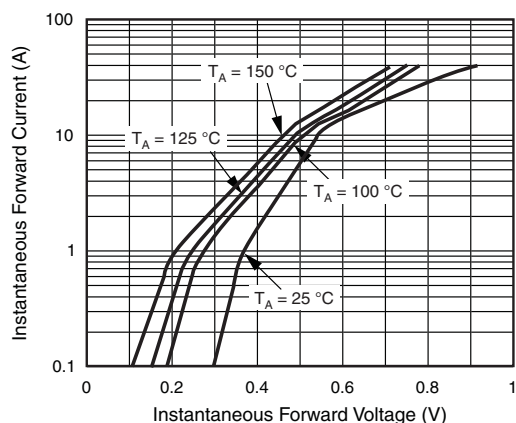


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

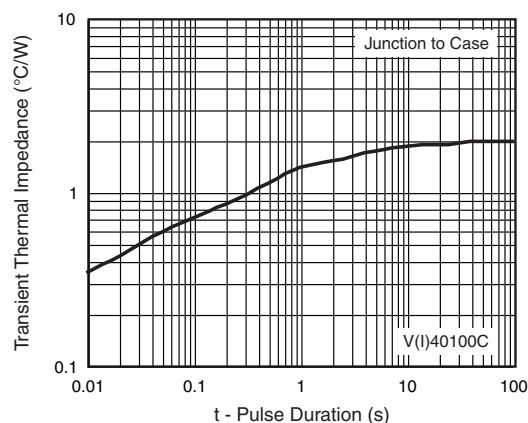


Fig. 6 - Typical Transient Thermal Impedance Per Diode

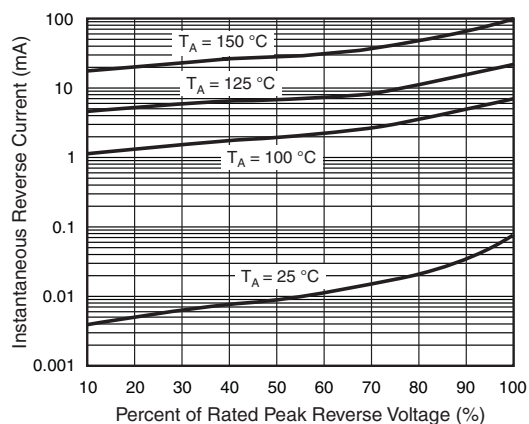


Fig. 4 - Typical Reverse Characteristics Per Diode

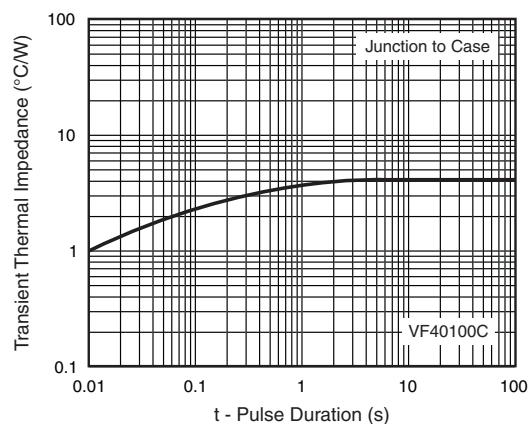


Fig. 7 - Typical Transient Thermal Impedance Per Diode

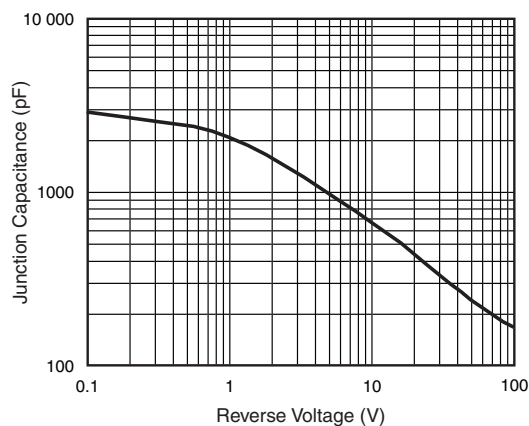
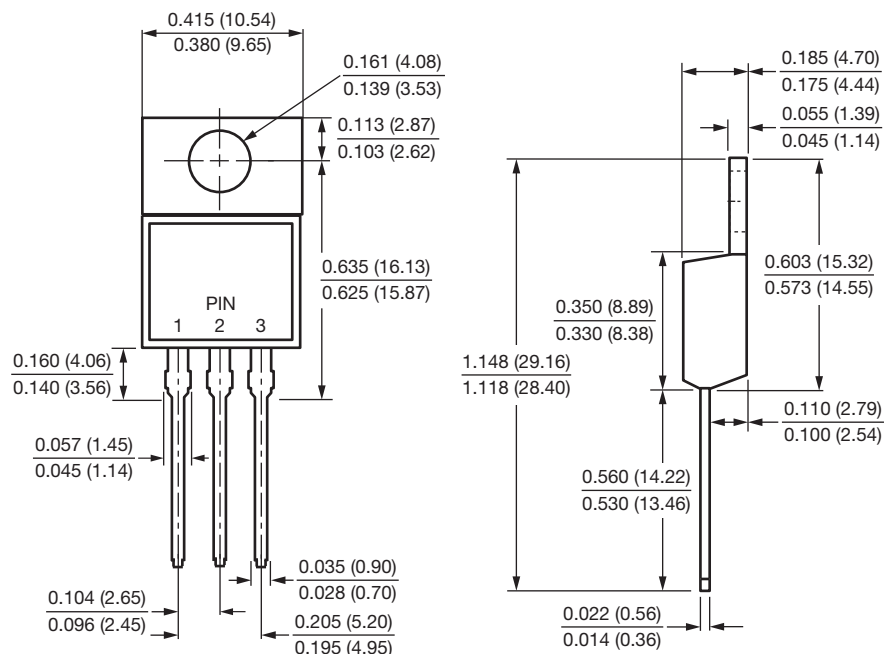


Fig. 5 - Typical Junction Capacitance Per Diode

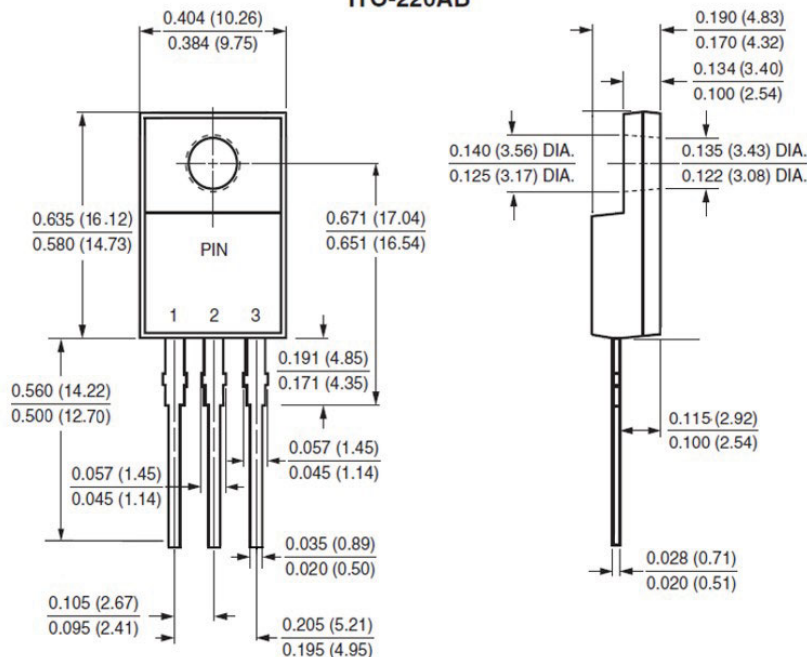


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

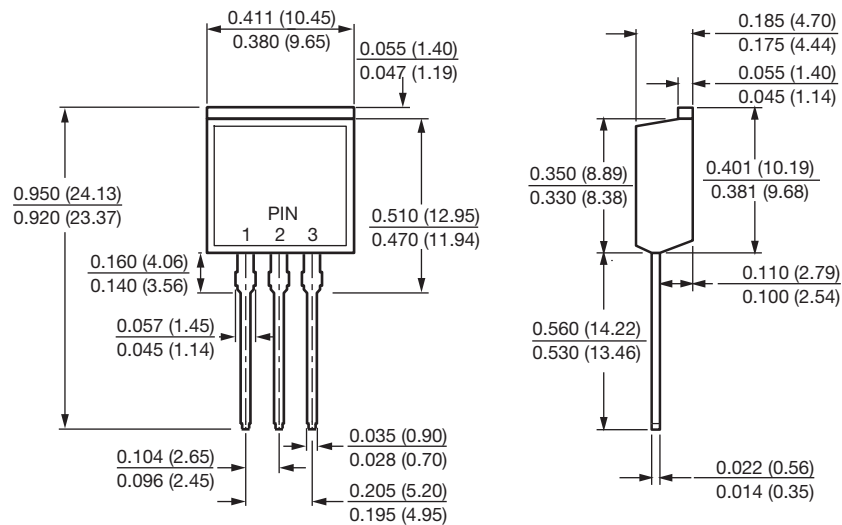


ITO-220AB

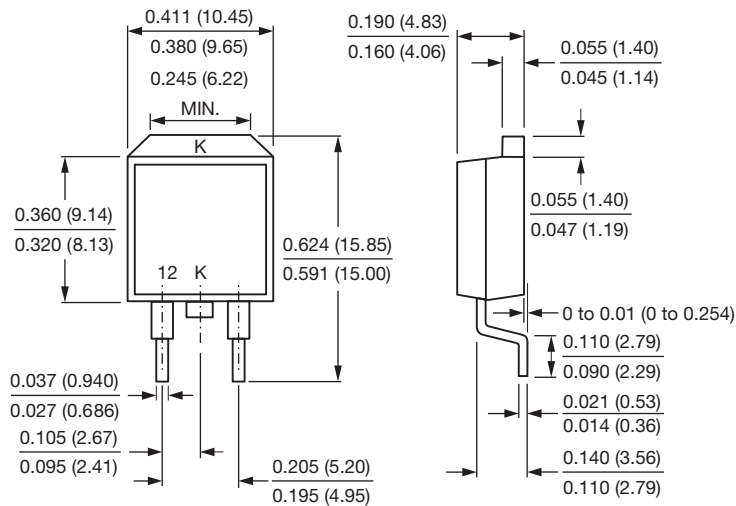




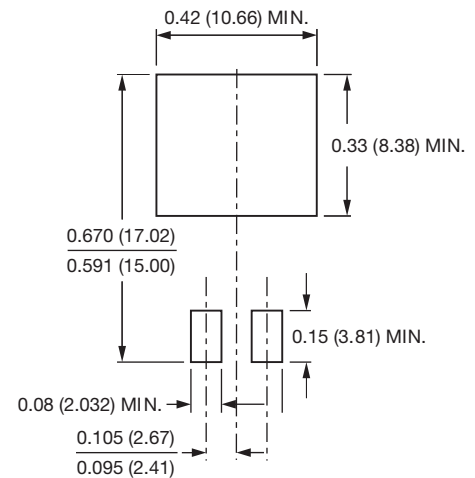
## TO-262AA



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



## Mounting Pad Layout





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