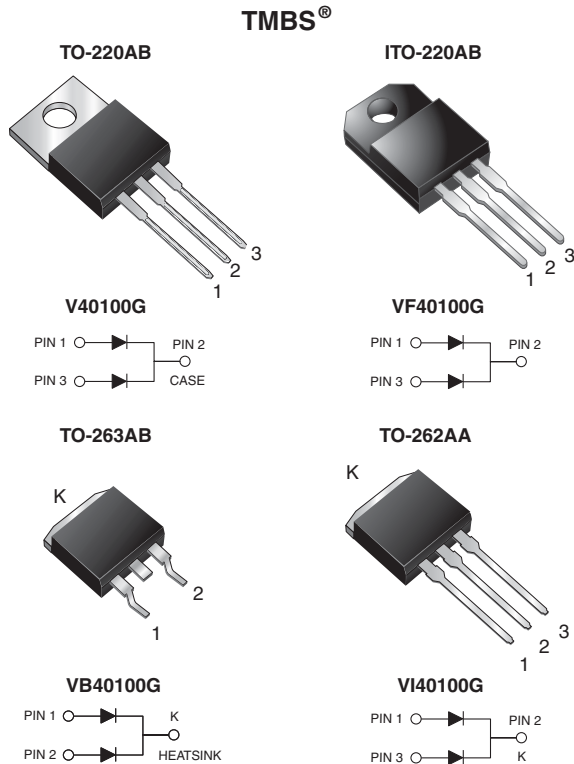


## Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.42\text{ V}$  at  $I_F = 5\text{ A}$



### 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 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, 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

### PRIMARY CHARACTERISTICS

|                              |  |
|------------------------------|--|
| $I_{F(AV)}$                  | 2 x 20 A                                   |
| $V_{RRM}$                    | 100 V                                      |
| $I_{FSM}$                    | 200 A                                      |
| $V_F$ at $I_F = 20\text{ A}$ | 0.67 V                                     |
| $T_J$ max.                   | 150 °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         | V40100G     | VF40100G | VB40100G | VI40100G | UNIT             |   |
|---|----------------|-------------|----------|----------|----------|------------------|---|
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 100         |          |          |          | V                |   |
| Maximum average forward rectified current (fig. 1)  | $I_{F(AV)}$    | per device  |          |          |          | 40               | A |
|   |                | per diode   |          |          |          | 20               |   |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode                            | $I_{FSM}$      | 200         |          |          |          | A                |   |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $L = 90\text{ mH}$ per diode                                  | $E_{AS}$       | 230         |          |          |          | mJ               |   |
| Peak repetitive reverse current at $t_p = 2\text{ }\mu\text{s}$ , 1 kHz, $T_J = 38\text{ °C} \pm 2\text{ °C}$ per diode | $I_{RRM}$      | 1.0         |          |          |          | A                |   |
| Voltage rate of change (rated $V_R$ )   | dV/dt          | 10 000      |          |          |          | V/ $\mu\text{s}$ |   |
| 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 +150 |          |          |          | °C               |   |



| 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> | 100 min. | -    | V    |
| Instantaneous forward voltage per diode <sup>(1)</sup>                     | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 25 °C  | V <sub>F</sub>  | 0.49     | -    |      |
|  | I <sub>F</sub> = 10 A   |                         |                 | 0.59     | -    |      |
|  | I <sub>F</sub> = 20 A   |                         |                 | 0.75     | 0.81 |      |
|  | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 125 °C |                 | 0.42     | -    |      |
|  | I <sub>F</sub> = 10 A   |                         |                 | 0.54     | -    |      |
|  | I <sub>F</sub> = 20 A   |                         |                 | 0.67     | 0.73 |      |
| Reverse current per diode <sup>(2)</sup>                                   | V <sub>R</sub> = 70 V   | T <sub>A</sub> = 25 °C  | I <sub>R</sub>  | 12       | -    | μA   |
|  |                         | T <sub>A</sub> = 125 °C |                 | 8        | -    | mA   |
|  | V <sub>R</sub> = 100 V  | T <sub>A</sub> = 25 °C  |                 | 55       | 500  | μA   |
|  |                         | T <sub>A</sub> = 125 °C |                 | 21       | 35   | mA   |

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                  |         |          |          |          |      |
|---|------------------|---------|----------|----------|----------|------|
| PARAMETER   | SYMBOL           | V40100G | VF40100G | VB40100G | VI40100G | UNIT |
| Typical thermal resistance per diode                                    | R <sub>θJC</sub> | 2.0     | 5.0      | 2.0      | 2.0      | °C/W |

| ORDERING INFORMATION (Example) |                |                 |              |               |               |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V40100G-E3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| ITO-220AB                      | VF40100G-E3/4W | 1.75            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB40100G-E3/4W | 1.39            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB40100G-E3/8W | 1.39            | 8W           | 800/reel      | Tape and reel |
| TO-262AA                       | VI40100G-E3/4W | 1.46            | 4W           | 50/tube       | Tube          |

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)**

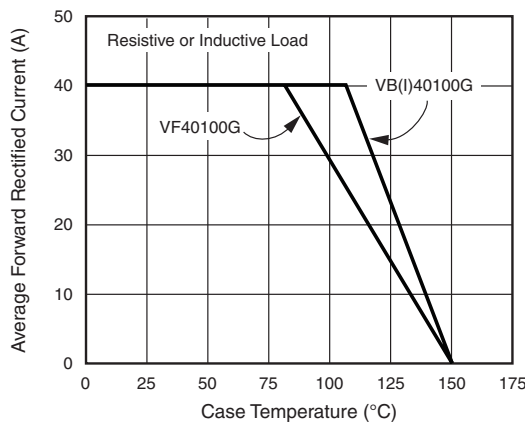


Fig. 1 - Maximum Forward Current Derating Curve

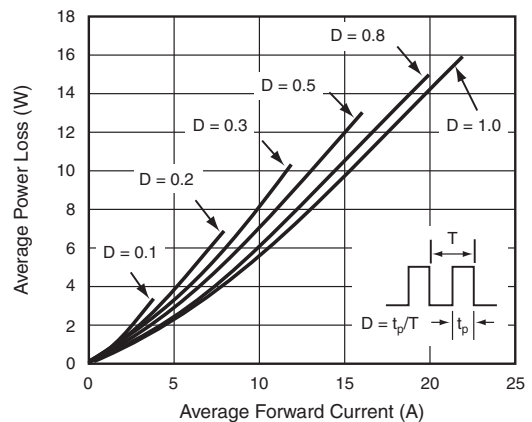


Fig. 2 - Forward Power Loss Characteristics

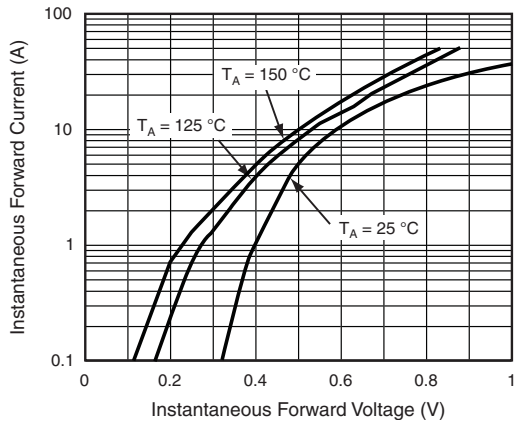


Fig. 3 - Typical Instantaneous Forward Characteristics

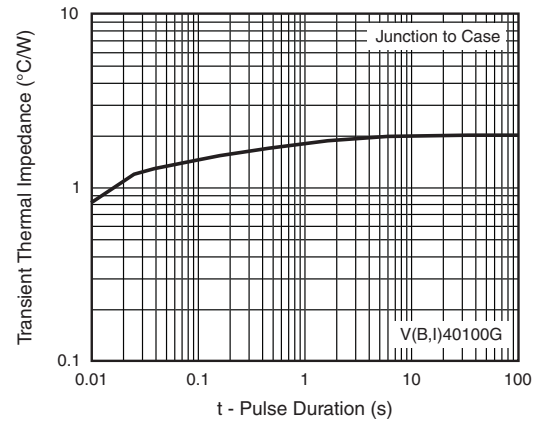


Fig. 6 - Typical Transient Thermal Impedance

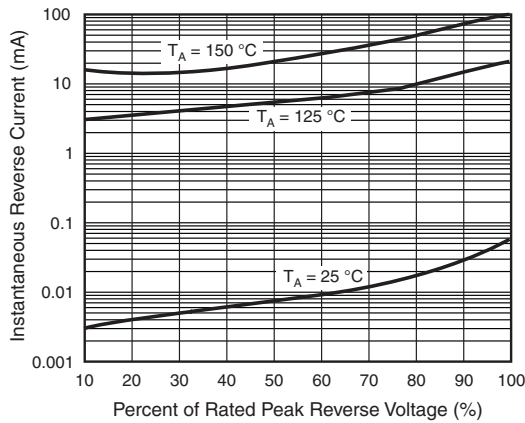


Fig. 4 - Typical Reverse Characteristics

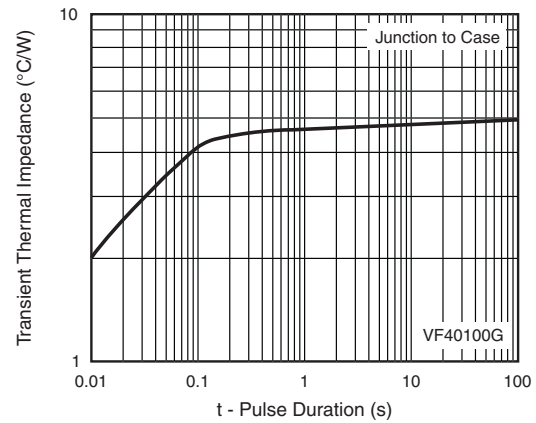


Fig. 7 - Typical Transient Thermal Impedance

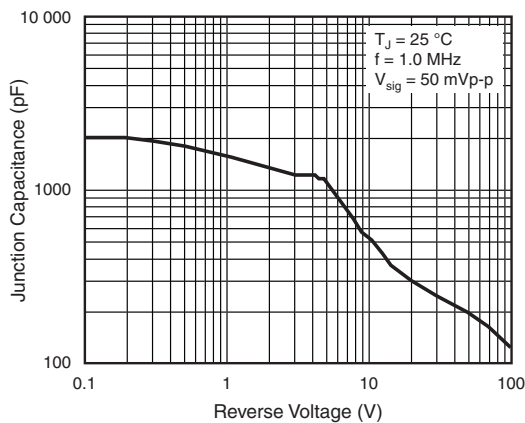
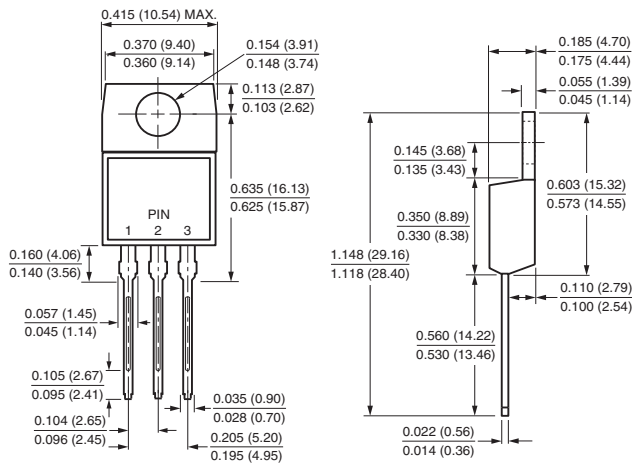


Fig. 5 - Typical Junction Capacitance

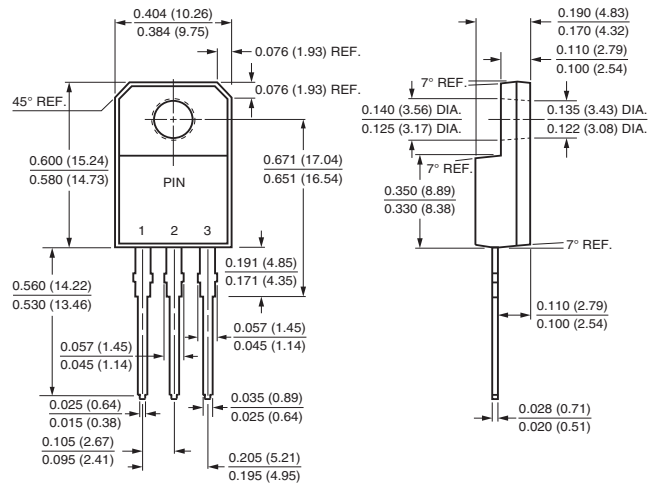


## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

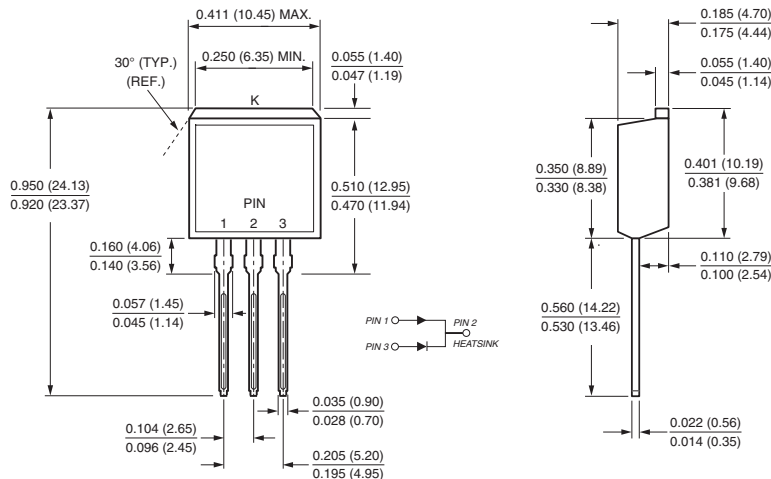
### TO-220AB



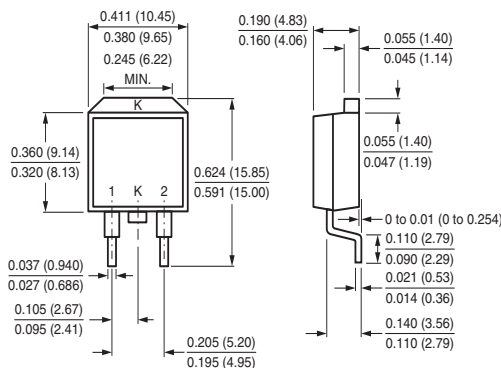
### ITO-220AB



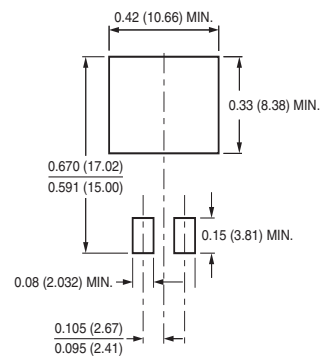
### TO-262AA



### TO-263AB



### Mounting Pad Layout





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