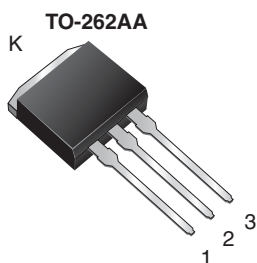
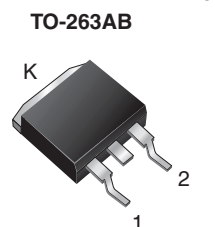
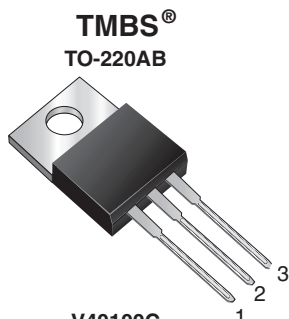




# Dual High-Voltage Trench MOS barrier Schottky Rectifier

Ultra Low  $V_F = 0.38\text{ V}$  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, TO-263AB and TO-262AA package)
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS  
COMPLIANT

## TYPICAL APPLICATIONS

For use in high frequency converters, switching power supplies, freewheeling diodes, OR-ing diode, dc-to-dc converters and reverse battery protection.

## MECHANICAL DATA

**Case:** TO-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    |
| $I_{FSM}$                    | 250 A    |
| $V_F$ at $I_F = 20\text{ A}$ | 0.61 V   |
| $T_J$ max.                   | 150 °C   |

## MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                                               | SYMBOL         | V40100C       | VB40100C | VI40100C | UNIT             |
|-------------------------------------------------------------------------------------------------------------------------|----------------|---------------|----------|----------|------------------|
| Maximum repetitive peak reverse voltage                                                                                 | $V_{RRM}$      | 100           |          |          | V                |
| Maximum average forward rectified current<br>(fig. 1)                                                                   | $I_{F(AV)}$    | 40            |          |          | A                |
|                                                                                                                         |                | 20            |          |          |                  |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode                            | $I_{FSM}$      | 250           |          |          | 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/ $\mu\text{s}$ |
| 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 <sup>(2)</sup>                                           | I <sub>R</sub> = 1.0 mA | T <sub>A</sub> = 25 °C  | V <sub>BR</sub> | 100 (minimum) | -    | V    |
|                                                                            | I <sub>R</sub> = 10 mA  |                         |                 | 105 (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**(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          | V40100C | VB40100C | VI40100C | UNIT                 |
| Typical thermal resistance per diode                                                 | $R_{\theta JC}$ | 2.0     | 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          |
| TO-263AB                       | VB40100C-E3/4W | 1.39            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VB40100C-E3/8W | 1.39            | 8W           | 800/reel      | Tube          |
| TO-262AA                       | VI40100C-M3/4W | 1.46            | 4W           | 50/tube       | Tube          |

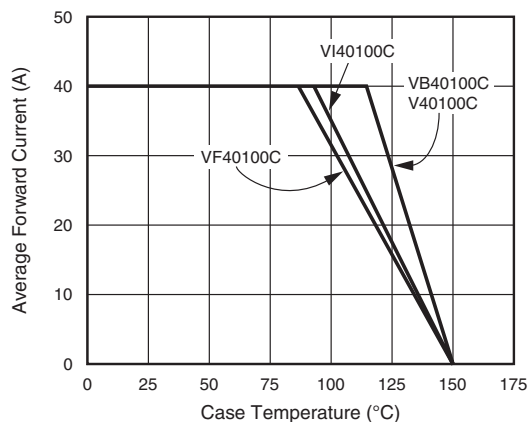
**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)**

Fig. 1 - Forward Current Derating Curve

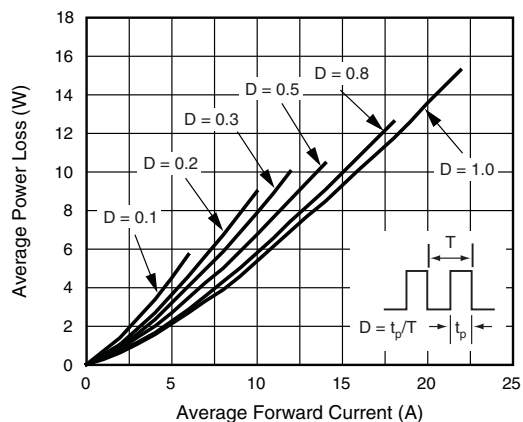


Fig. 2 - Forward Power Loss Characteristics Per Diode

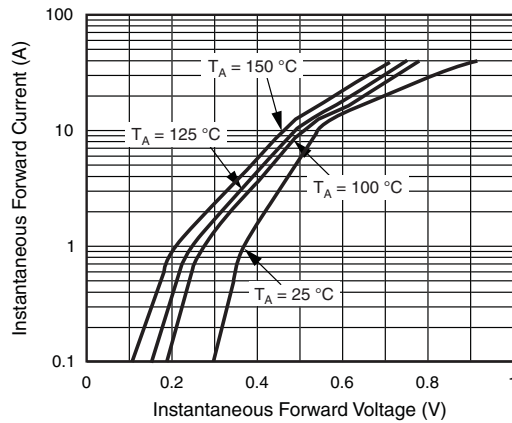


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

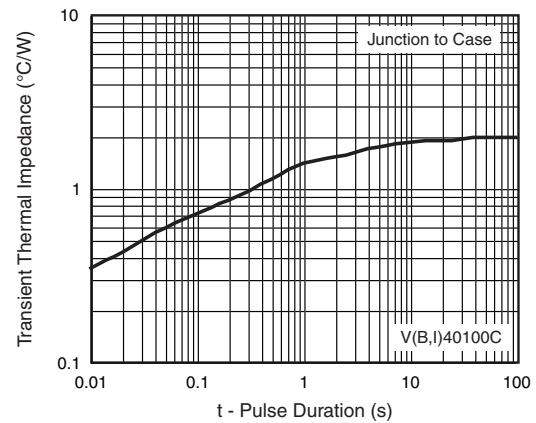


Fig. 6 - Typical Transient Thermal Impedance Per Diode

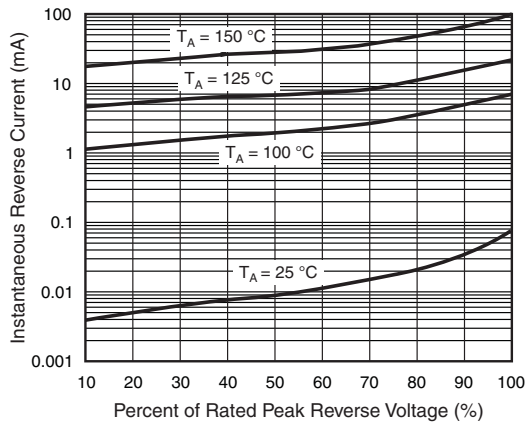


Fig. 4 - Typical Reverse Characteristics Per Diode

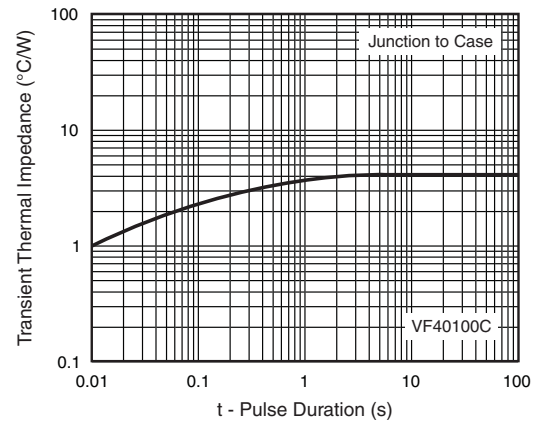


Fig. 7 - Typical Transient Thermal Impedance Per Diode

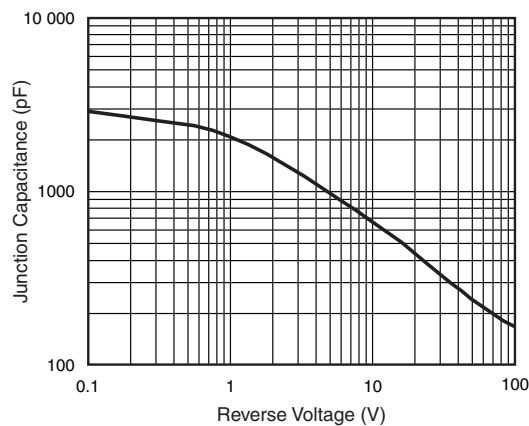
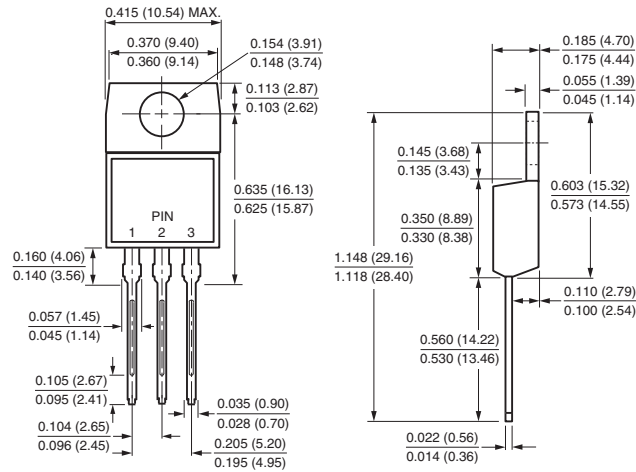


Fig. 5 - Typical Junction Capacitance Per Diode

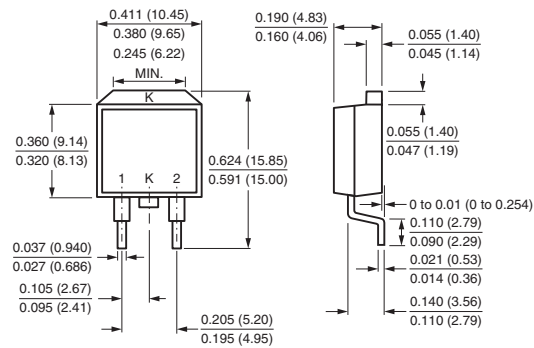


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

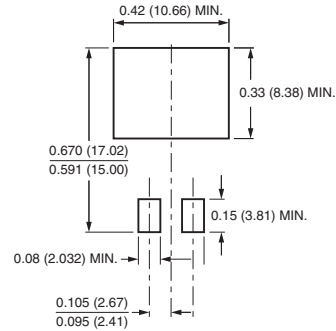
TO-220AB



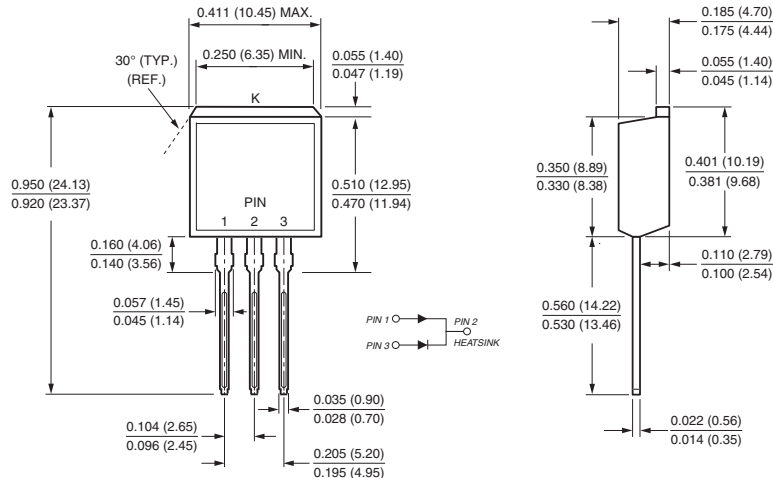
TO-263AB



Mounting Pad Layout



TO-262AA





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