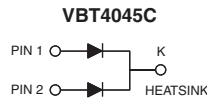
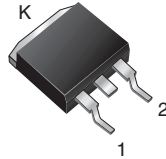


# Dual Low-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.28\text{ V}$  at  $I_F = 5.0\text{ A}$ 
**TMBS®**  
 TO-263AB


## 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
- 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 DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

| PRIMARY CHARACTERISTICS      |                |
|------------------------------|----------------|
| $I_{F(AV)}$                  | 2 x 20 A       |
| $V_{RRM}$                    | 45 V           |
| $I_{FSM}$                    | 240 A          |
| $V_F$ at $I_F = 20\text{ A}$ | 0.41 V         |
| $T_J$ max.                   | 150 °C         |
| Package                      | TO-263AB       |
| Diode variations             | Common cathode |

## MECHANICAL DATA

**Case:** TO-263AB

 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 ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                |             |      |
|--|----------------|-------------|------|
| PARAMETER  | SYMBOL         | VBT4045C    | UNIT |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 45          | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | per device  | 40   |
|  |                | per diode   | 20   |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 240         | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -40 to +150 | °C   |

| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                     |                                   |             |      |      |               |
|--|---------------------|-----------------------------------|-------------|------|------|---------------|
| PARAMETER  | TEST CONDITIONS     | SYMBOL                            | TYP.        | MAX. | UNIT |               |
| Instantaneous forward voltage per diode  | $I_F = 5\text{ A}$  | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.41 | -    | V             |
|  | $I_F = 10\text{ A}$ |                                   |             | 0.44 | -    |               |
|  | $I_F = 20\text{ A}$ |                                   |             | 0.50 | 0.58 |               |
|  | $I_F = 5\text{ A}$  | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.28 | -    |               |
|  | $I_F = 10\text{ A}$ |                                   |             | 0.33 | -    |               |
|  | $I_F = 20\text{ A}$ |                                   |             | 0.41 | 0.50 |               |
| Reverse current per diode  | $V_R = 45\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 3000 | $\mu\text{A}$ |
|  |                     | $T_A = 125\text{ }^\circ\text{C}$ |             | 18   | 50   | mA            |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
 (2) Pulse test: Pulse width  $\leq 40\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |            |                 |          |                    |
|---|------------|-----------------|----------|--------------------|
| PARAMETER   |            | SYMBOL          | VBT4045C | UNIT               |
| Typical thermal resistance  | per diode  | $R_{\theta JC}$ | 1.5      | $^\circ\text{C/W}$ |
|   | per device |                 | 0.8      |                    |

| <b>ORDERING INFORMATION</b> (Example) |                |                 |              |               |               |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB                              | VBT4045C-E3/4W | 1.38            | 4W           | 50/tube       | Tube          |
| TO-263AB                              | VBT4045C-E3/8W | 1.38            | 8W           | 800/reel      | Tape and reel |

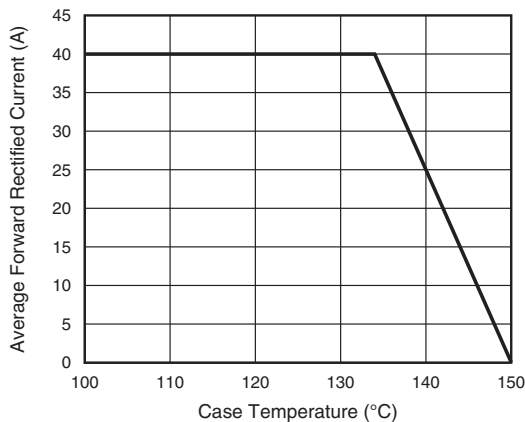
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

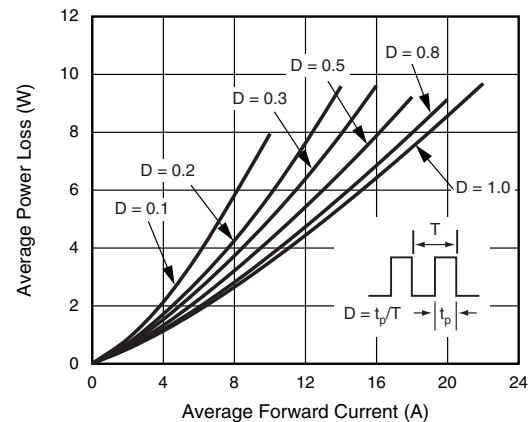


Fig. 2 - Forward Power Loss Characteristics Per Diode

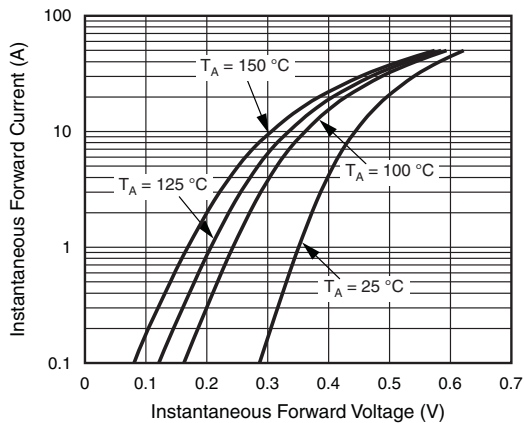


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

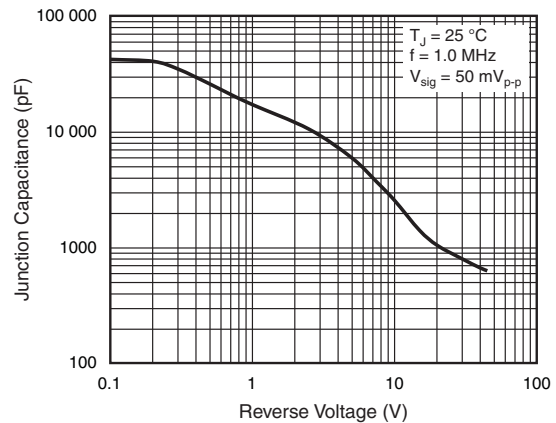


Fig. 5 - Typical Junction Capacitance Per Diode

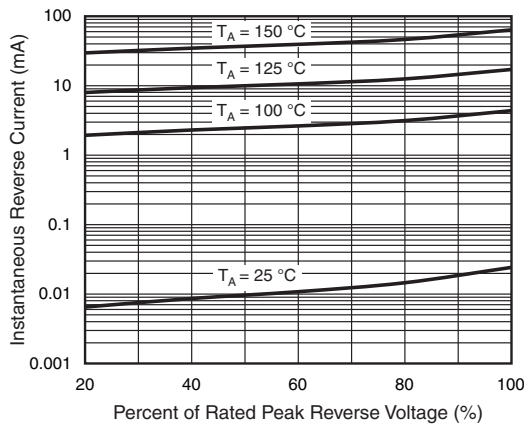


Fig. 4 - Typical Reverse Characteristics Per Diode

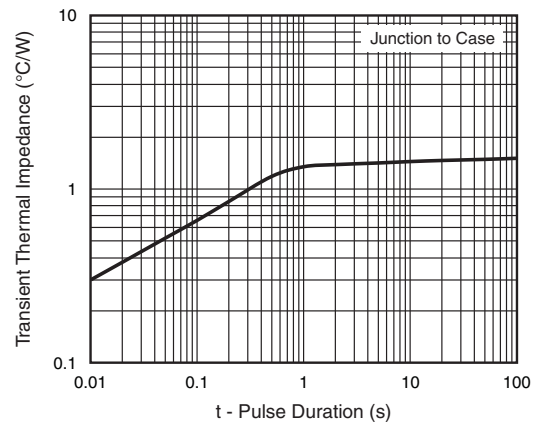
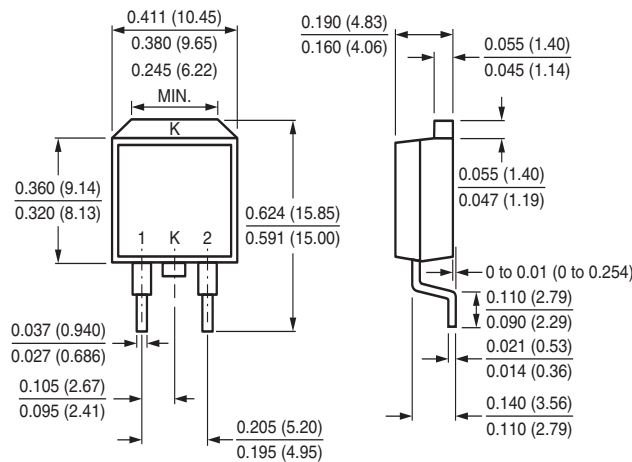


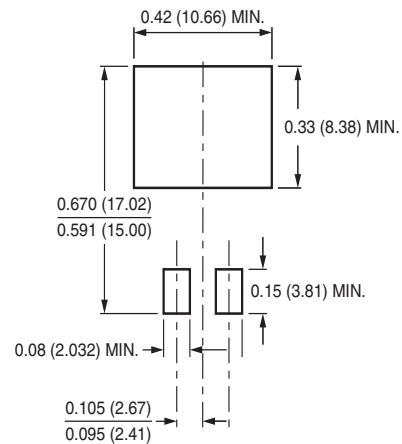
Fig. 6 - Typical Transient Thermal Impedance Per Diode

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**TO-263AB**



**Mounting Pad Layout**





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