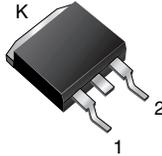
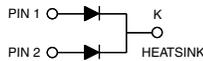


# Dual Low-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low  $V_F = 0.33\text{ V}$  at  $I_F = 5.0\text{ A}$ 
**TMBS®**  
**TO-263AB**

**VBT2045C**

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**
**FEATURES**

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- AEC-Q101 qualified available  
- Automotive ordering code: base P/NHM3
- 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)

**TYPICAL APPLICATIONS**

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

**MECHANICAL DATA**
**Case:** TO-263AB

 Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** As marked

| PRIMARY CHARACTERISTICS      |                |
|------------------------------|----------------|
| Package                      | TO-263AB       |
| $I_{F(AV)}$                  | 2 x 10 A       |
| $V_{RRM}$                    | 45 V           |
| $I_{FSM}$                    | 160 A          |
| $V_F$ at $I_F = 10\text{ A}$ | 0.41 V         |
| $T_J$ max.                   | 150 °C         |
| Diode variations             | Common cathode |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                |             |      |
|--|----------------|-------------|------|
| PARAMETER  | SYMBOL         | VBT2045C    | UNIT |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 45          | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | per device  | 20   |
|  |                | per diode   | 10   |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 160         | A    |
| 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 |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 25 °C  | V <sub>F</sub> (1) | 0.44 | -    | V    |
|  | I <sub>F</sub> = 10 A |                         |                    | 0.49 | 0.58 |      |
|  | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 125 °C |                    | 0.33 | -    |      |
|  | I <sub>F</sub> = 10 A |                         |                    | 0.41 | 0.52 |      |
| Reverse current per diode  | V <sub>R</sub> = 45 V | T <sub>A</sub> = 25 °C  | I <sub>R</sub> (2) | -    | 2000 | μA   |
|  |                       | T <sub>A</sub> = 125 °C |                    | 10   | 30   | 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           | VBT2045C | UNIT |
| Typical thermal resistance  | per diode  | R <sub>θJC</sub> | 3.0      | °C/W |
|   | per device |                  | 2.0      |      |

| ORDERING INFORMATION (Example) |                   |                 |              |               |               |
|--------------------------------|-------------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N     | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB                       | VBT2045C-M3/4W    | 1.38            | 4W           | 50/tube       | Tube          |
| TO-263AB                       | VBT2045C-M3/8W    | 1.38            | 8W           | 800/reel      | Tape and reel |
| TO-263AB                       | VBT2045CHM3/I (1) | 1.38            | I            | 800/reel      | Tape and reel |

**Note**

- (1) AEC-Q101 qualified

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

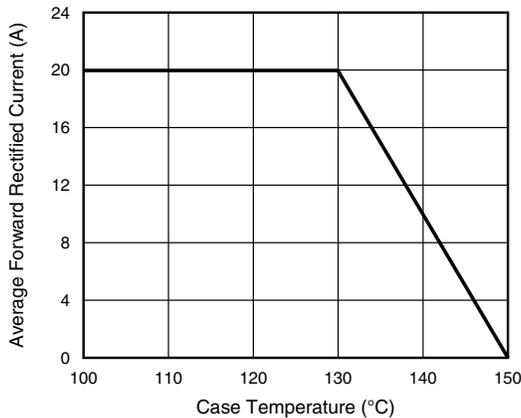


Fig. 1 - Maximum Forward Current Derating Curve

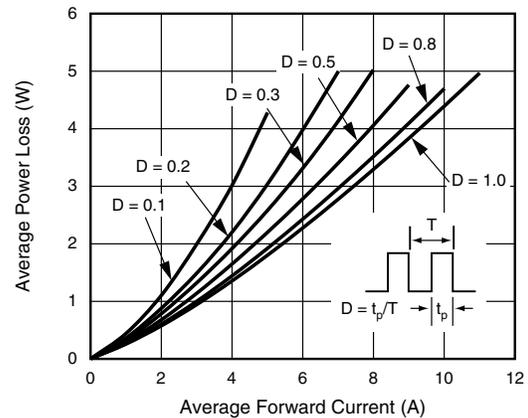


Fig. 2 - Forward Power Loss Characteristics Per Diode

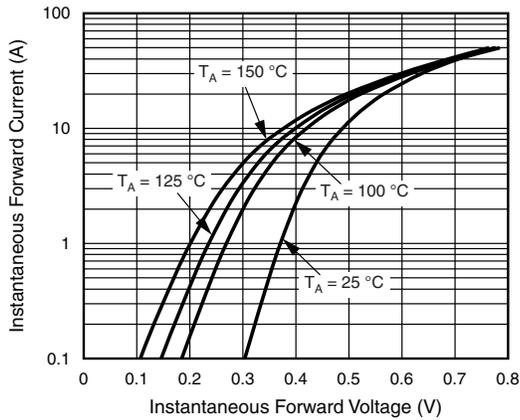


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

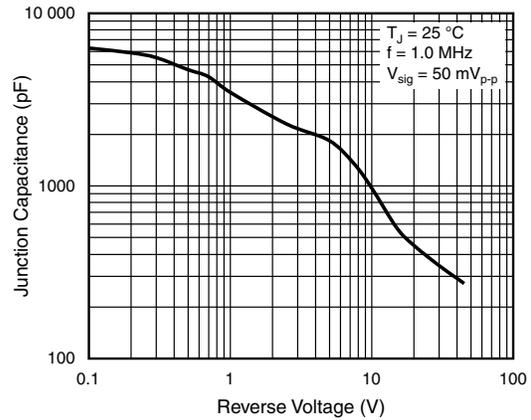


Fig. 5 - Typical Junction Capacitance Per Diode

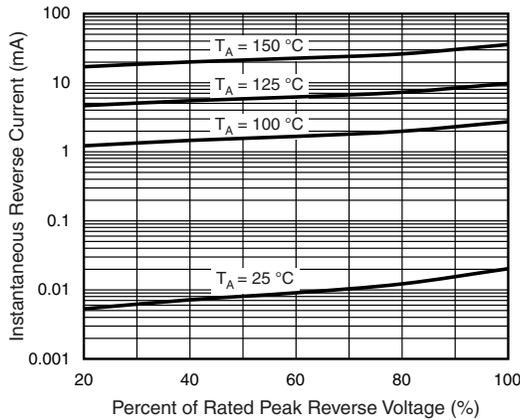


Fig. 4 - Typical Reverse Characteristics Per Diode

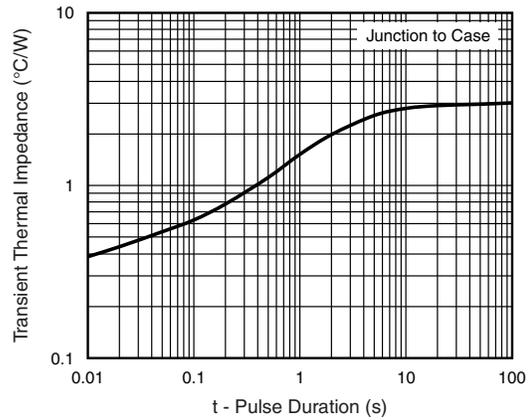
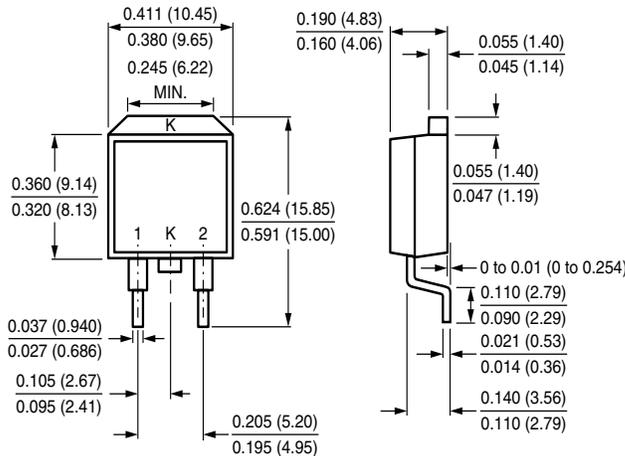


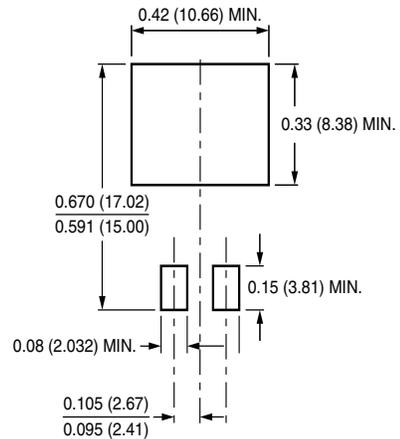
Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

**TO-263AB**



**Mounting Pad Layout**





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