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Vishay Semiconductor/Diodes Division
VBT6045C-M3/8W

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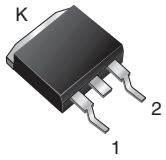
# VBT6045C-M3

Vishay General Semiconductor

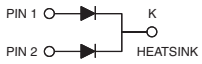
# Dual Low-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F$ = 0.33 V at $I_F$ = 10 A

**TMBS®**
**TO-263AB**




**VBT6045C**




## 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

RoHS COMPLIANT
HALOGEN FREE

## TYPICAL APPLICATIONS

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

| PRIMARY CHARACTERISTICS | |
|---|---|
| Package | TO-263AB |
| $I_{F(AV)}$ | 2 x 30 A |
| $V_{RRM}$ | 45 V |
| $I_{FSM}$ | 320 A |
| $V_F$ at $I_F$ = 30 A | 0.47 V |
| $T_J$ max. | 150 °C |
| Diode variation | Common cathode |

## 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

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | | SYMBOL | VBT6045C | UNIT |
|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 45 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ | 60 | A |
| | per diode | | 30 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | | $I_{FSM}$ | 320 | A |
| Operating junction and storage temperature range | | $T_J$, $T_{STG}$ | - 40 to + 150 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F$ = 10 A | $T_A$ = 25 °C | $V_F$ (1) | 0.44 | - | V |
| | $I_F$ = 15 A | | | 0.47 | - | |
| | $I_F$ = 30 A | | | 0.54 | 0.64 | |
| | $I_F$ = 10 A | $T_A$ = 125 °C | | 0.33 | - | |
| | $I_F$ = 15 A | | | 0.37 | - | |
| | $I_F$ = 30 A | | | 0.47 | 0.56 | |
| Reverse current per diode | $V_R$ = 45 V | $T_A$ = 25 °C | $I_R$ (2) | - | 3000 | µA |
| | | $T_A$ = 125 °C | | 18 | 50 | mA |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| PARAMETER | | SYMBOL | VBT64045C | UNIT |
| Typical thermal resistance | per diode | $R_{\theta JC}$ | 1.5 | °C/W |
| | per device | | 0.8 | |

| ORDERING INFORMATION (Example) | | | | | |
|---|---|---|---|---|---|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB | VBT6045C-M3/4W | 1.38 | 4W | 50/tube | Tube |
| TO-263AB | VBT6045C-M3/8W | 1.38 | 8W | 800/reel | Tape and reel |

## RATINGS AND CHARACTERISTICS CURVES

($T_A$ = 25 °C unless otherwise noted)

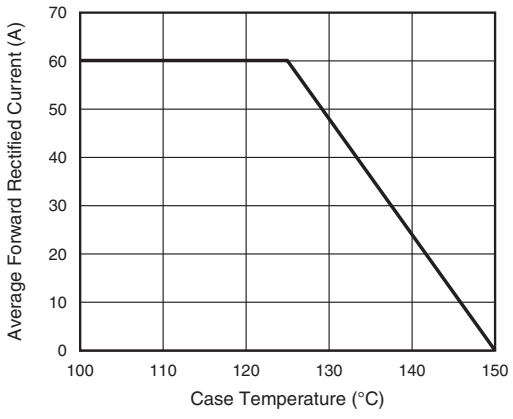



Fig. 1 - Maximum Forward Current Derating Curve

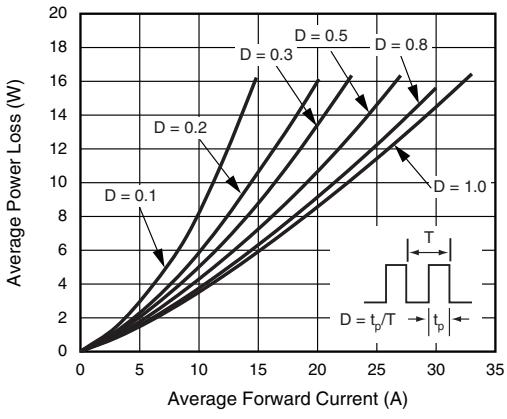



Fig. 2 - Forward Power Loss Characteristics Per Diode

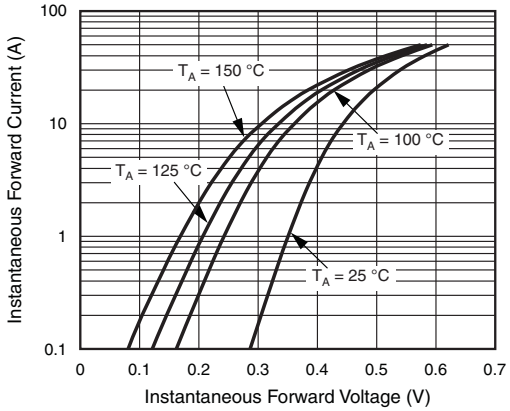



Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

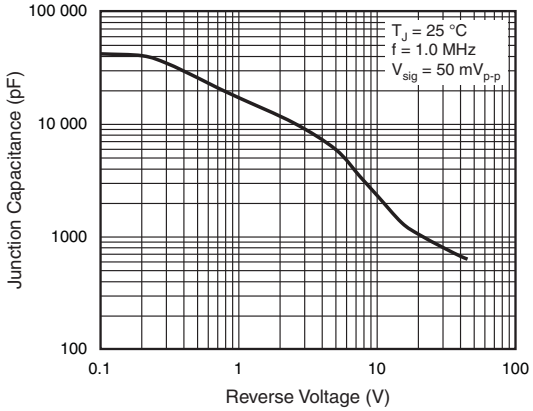



Fig. 5 - Typical Junction Capacitance Per Diode

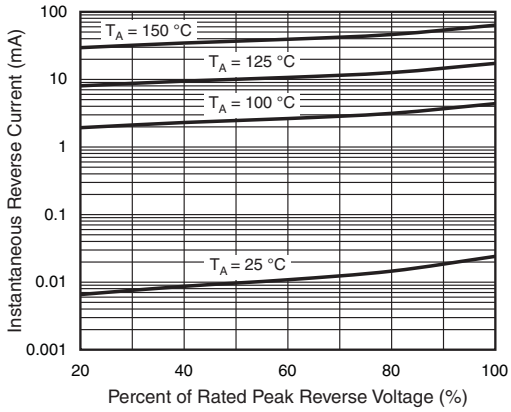



Fig. 4 - Typical Reverse Characteristics Per Diode

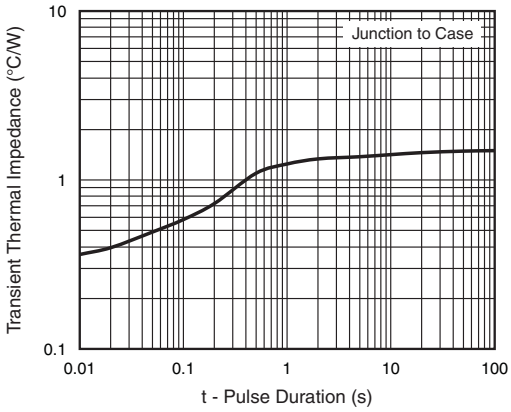
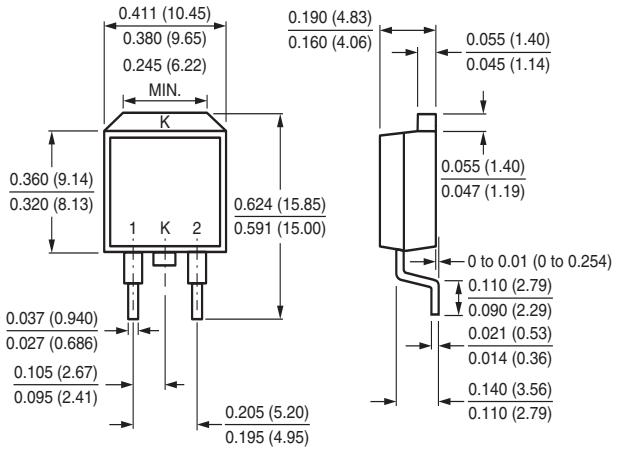


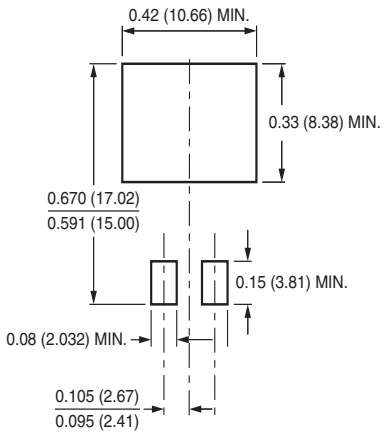

Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

### TO-263AB




### Mounting Pad Layout



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