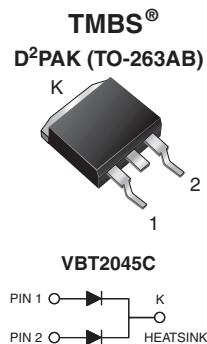


## Dual Low-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F$  = 0.33 V at  $I_F$  = 5.0 A



### DESIGN SUPPORT TOOLS


[click logo to get started](#)

### 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.

### MECHANICAL DATA

**Case:** D2PAK (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

| PRIMARY CHARACTERISTICS |                  |
|-------------------------|------------------|
| $I_{F(AV)}$             | 2 x 10 A         |
| $V_{RRM}$               | 45 V             |
| $I_{FSM}$               | 160 A            |
| $V_F$ at $I_F$ = 10 A   | 0.41 V           |
| $T_J$ max.              | 150 °C           |
| Package                 | D2PAK (TO-263AB) |
| Circuit configuration   | Common cathode   |

| MAXIMUM RATINGS ( $T_A$ = 25 °C unless otherwise noted)                               |                   |             |      |
|---|-------------------|-------------|------|
| PARAMETER   | SYMBOL            | VBT2045C    | UNIT |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$         | 45          | V    |
| Maximum average forward rectified current<br>(fig. 1)                                 | $I_{F(AV)}$       | 20          | A    |
| per device<br>per diode   |                   | 10          |      |
| Peak forward surge current 8.3 ms single half sine-wave<br>superimposed on rated load | $I_{FSM}$         | 160         | A    |
| Operating junction and storage temperature range                                      | $T_J$ , $T_{STG}$ | -40 to +150 | °C   |

| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                      |                           |                      |      |      |               |  |
|--|----------------------|---------------------------|----------------------|------|------|---------------|--|
| PARAMETER  | TEST CONDITIONS      |                           | SYMBOL               | TYP. | MAX. | UNIT          |  |
| Instantaneous forward voltage per diode  | $I_F = 5 \text{ A}$  | $T_A = 25^\circ\text{C}$  | $V_F$ <sup>(1)</sup> | 0.44 | -    | V             |  |
|  | $I_F = 10 \text{ A}$ |                           |                      | 0.49 | 0.58 |               |  |
|  | $I_F = 5 \text{ A}$  | $T_A = 125^\circ\text{C}$ |                      | 0.33 | -    |               |  |
|  | $I_F = 10 \text{ A}$ |                           |                      | 0.41 | 0.52 |               |  |
| Reverse current per diode  | $V_R = 45 \text{ V}$ | $T_A = 25^\circ\text{C}$  | $I_R$ <sup>(2)</sup> | -    | 2000 | $\mu\text{A}$ |  |
|  |                      | $T_A = 125^\circ\text{C}$ |                      | 10   | 30   | $\text{mA}$   |  |

**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> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                       |                 |  |  |      |
|---|-----------------------|-----------------|--|--|------|
| PARAMETER   | SYMBOL                | <b>VBT2045C</b> |  |  | UNIT |
| Typical thermal resistance  | $R_{\theta\text{JC}}$ | per diode       |  |  | 3.0  |
|   |                       | per device      |  |  | 2.0  |
| $^\circ\text{C/W}$  |                       |                 |  |  |      |

| <b>ORDERING INFORMATION</b> (Example) |                |                 |              |               |               |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB                              | VBT2045C-E3/4W | 1.38            | 4W           | 50/tube       | Tube          |
| TO-263AB                              | VBT2045C-E3/8W | 1.38            | 8W           | 800/reel      | Tape and reel |

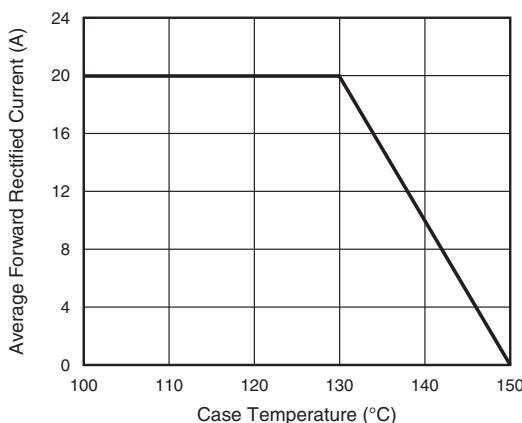
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

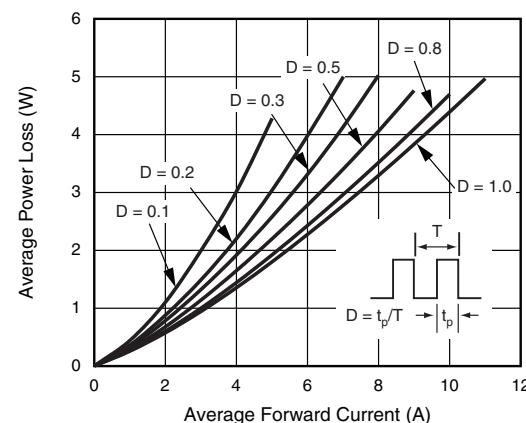


Fig. 2 - Forward Power Loss Characteristics Per Diode

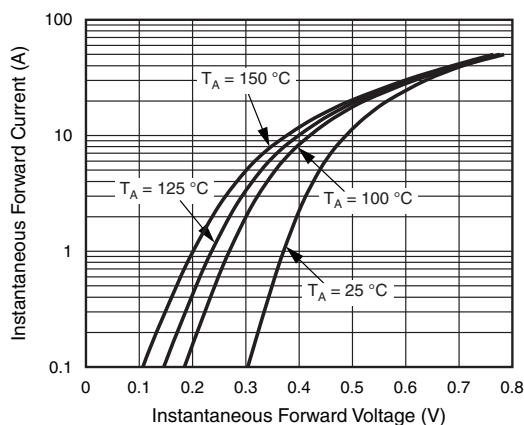


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

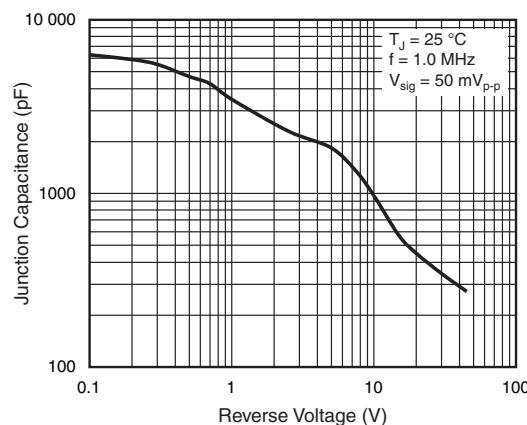


Fig. 5 - Typical Junction Capacitance Per Diode

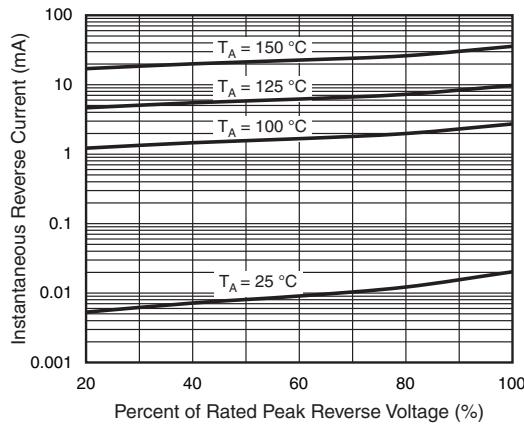


Fig. 4 - Typical Reverse Characteristics Per Diode

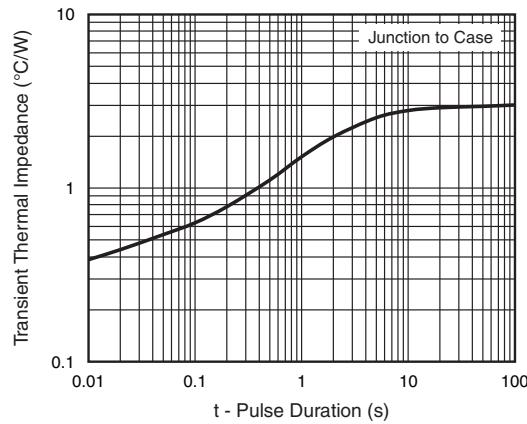
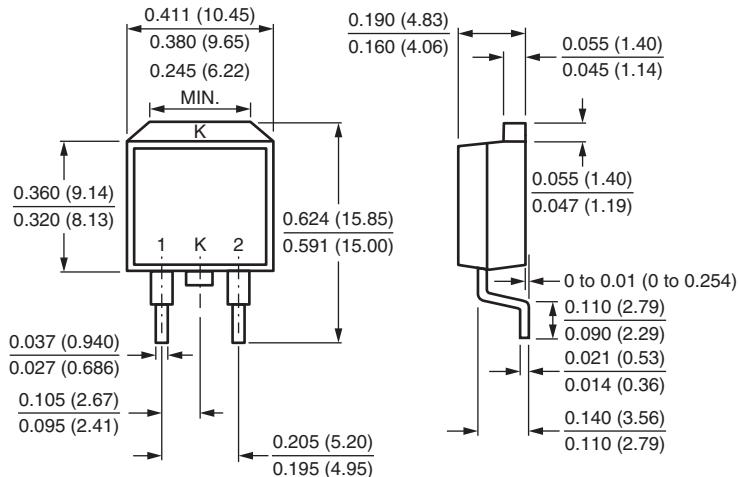


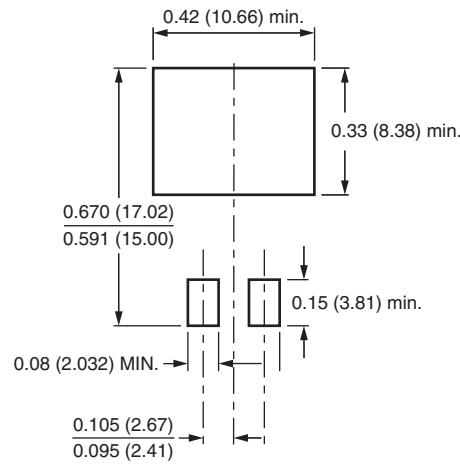
Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

##### D<sup>2</sup>PAK (TO-263AB)



##### Mounting Pad Layout



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