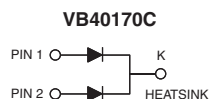
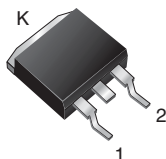


# Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.52 \text{ V}$  at  $I_F = 5 \text{ A}$

**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.

## 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

| PRIMARY CHARACTERISTICS       |          |
|-------------------------------|----------|
| $I_{F(AV)}$                   | 2 x 20 A |
| $V_{RRM}$                     | 170 V    |
| $I_{FSM}$                     | 200 A    |
| $V_F$ at $I_F = 20 \text{ A}$ | 0.68 V   |
| $T_J \text{ max.}$            | 175 °C   |

| MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)                    |                |               |            |
|------------------------------------------------------------------------------------|----------------|---------------|------------|
| PARAMETER                                                                          | SYMBOL         | VB40170C      | UNIT       |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 170           | 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 | $I_{FSM}$      | 200           | A          |
| Voltage rate of change (rated $V_R$ )                                              | $dV/dt$        | 10 000        | V/ $\mu$ s |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 40 to + 175 | °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                                                        | $I_F = 5\text{ A}$   | $V_F^{(1)}$                         | 0.66 | -    | V             |
|                                                                                                | $I_F = 10\text{ A}$  |                                     | 0.75 | -    |               |
|                                                                                                | $I_F = 20\text{ A}$  |                                     | 0.86 | 1.20 |               |
|                                                                                                | $I_F = 5\text{ A}$   | $T_A = 125\text{ }^{\circ}\text{C}$ | 0.52 | -    |               |
|                                                                                                | $I_F = 10\text{ A}$  |                                     | 0.59 | -    |               |
|                                                                                                | $I_F = 20\text{ A}$  |                                     | 0.68 | 0.76 |               |
| Reverse current per diode                                                                      | $V_R = 136\text{ V}$ | $T_A = 25\text{ }^{\circ}\text{C}$  | 1.3  | -    | $\mu\text{A}$ |
|                                                                                                |                      | $T_A = 125\text{ }^{\circ}\text{C}$ | 2.2  | -    | mA            |
|                                                                                                | $V_R = 170\text{ V}$ | $T_A = 25\text{ }^{\circ}\text{C}$  | -    | 250  | $\mu\text{A}$ |
|                                                                                                |                      | $T_A = 125\text{ }^{\circ}\text{C}$ | 4.2  | 50   | mA            |

**Notes**

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

(2) Pulse test: Pulse width  $\leq 20\text{ ms}$ 

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |            |      |
|---------------------------------------------------------------------------------------------|-----------------|------------|------|
| PARAMETER                                                                                   | SYMBOL          | VB40170C   | UNIT |
| Typical thermal resistance                                                                  | $R_{\theta JC}$ | per diode  | 1.2  |
|                                                                                             |                 | per device | 0.85 |

| <b>ORDERING INFORMATION</b> (Example) |                |                 |              |               |               |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB                              | VB40170C-E3/4W | 1.38            | 4W           | 50/tube       | Tube          |
| TO-263AB                              | VB40170C-E3/8W | 1.38            | 8W           | 800/reel      | Tape and reel |

**RATINGS AND CHARACTERISTICS CURVES**

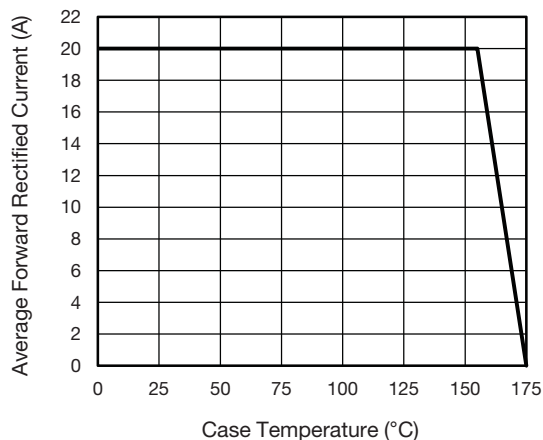
( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

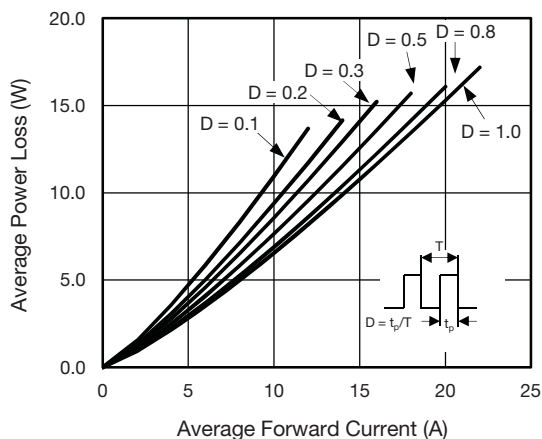


Fig. 2 - Forward Power Loss Characteristics Per Diode

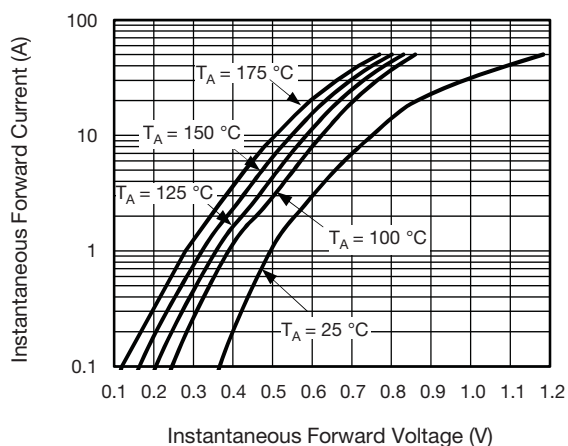


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

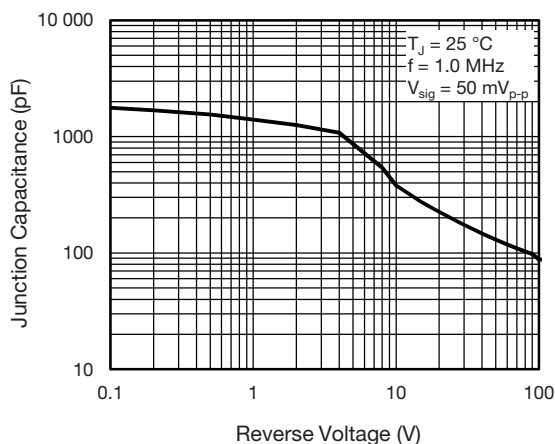


Fig. 5 - Typical Junction Capacitance Per Diode

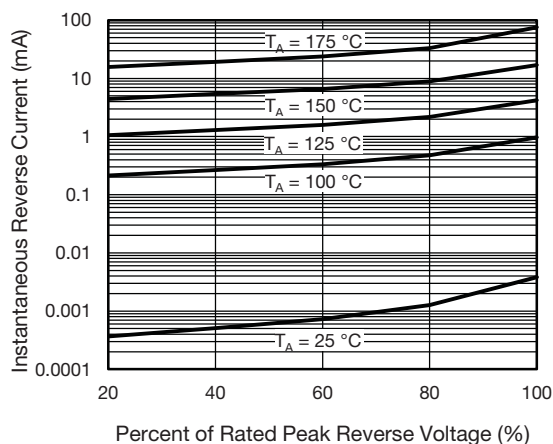


Fig. 4 - Typical Reverse Characteristics Per Diode

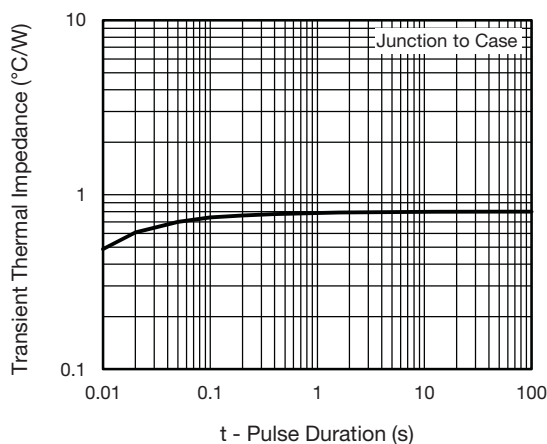
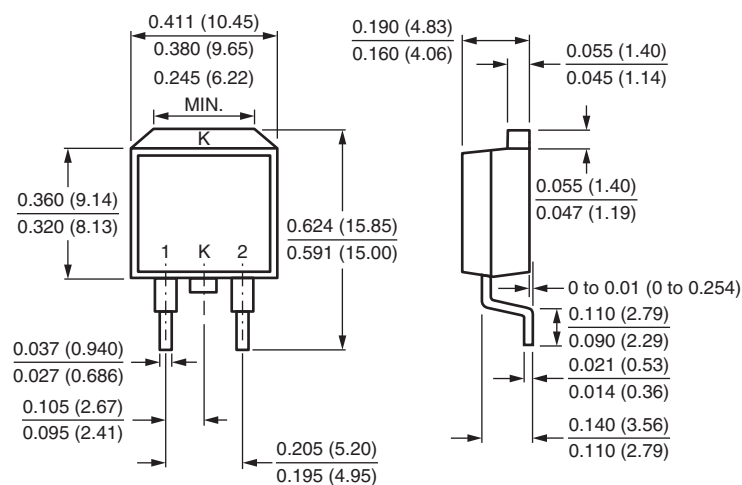
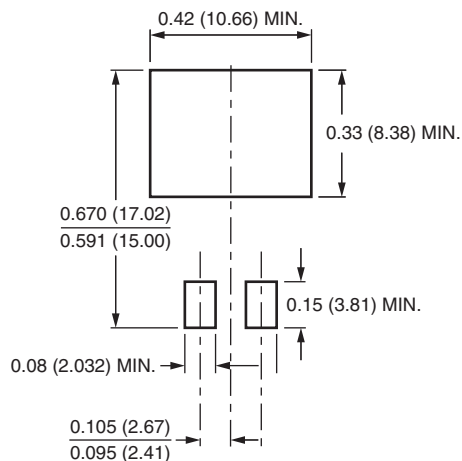


Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

**TO-263AB**

**Mounting Pad Layout**




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