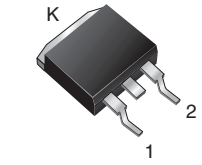
# Dual High Voltage Trench MOS Barrier Schottky Rectifier

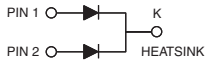
Ultra Low $V_F$ = 0.52 V at $I_F$ = 5 A

TMBS®

D²PAK (TO-263AB)




VB40170C




## 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 Available

## 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
Base P/N-M3 - halogen-free, RoHS-compliant

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 and M3 suffix meet JESD 201 class 2 whisker test

**Polarity:** as marked

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

## DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2 x 20 A |
| $V_{RRM}$ | 170 V |
| $I_{FSM}$ | 200 A |
| $V_F$ at $I_F$ = 20 A | 0.68 V |
| $T_J$ max. | 175 °C |
| Package | D²PAK (TO-263AB) |
| Circuit configuration | Common cathode |

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| PARAMETER | | SYMBOL | VB40170C | UNIT |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 170 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ | 40 | A |
| | per diode | | 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/µs |
| Operating junction and storage temperature range | | $T_J$, $T_{STG}$ | -40 to +175 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F$ = 5 A | $T_A$ = 25 °C | $V_F$ (1) | 0.66 | - | V |
| | $I_F$ = 10 A | | | 0.75 | - | |
| | $I_F$ = 20 A | | | 0.86 | 1.20 | |
| | $I_F$ = 5 A | $T_A$ = 125 °C | | 0.52 | - | |
| | $I_F$ = 10 A | | | 0.59 | - | |
| | $I_F$ = 20 A | | | 0.68 | 0.76 | |
| Reverse current per diode | $V_R$ = 136 V | $T_A$ = 25 °C | $I_R$ (2) | 1.3 | - | µA |
| | | $T_A$ = 125 °C | | 2.2 | - | mA |
| | $V_R$ = 170 V | $T_A$ = 25 °C | | - | 250 | µA |
| | | $T_A$ = 125 °C | | 4.2 | 50 | mA |

**Notes**

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

(2) Pulse test: pulse width ≤ 5 ms



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| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| PARAMETER | | SYMBOL | VB40170C | UNIT |
| Typical thermal resistance | per diode | $R_{\theta JC}$ (1) | 1.2 | °C/W |
| | per device | | 0.85 | |

**Note**

(1) Mounted on infinite heat sink; thermal resistance $R_{\theta JC}$ - junction-to-case

| ORDERING INFORMATION (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 |
| TO-263AB | VB40170C-M3/I | 1.38 | I | 800/reel | 13" diameter plastic tape and reel |

## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

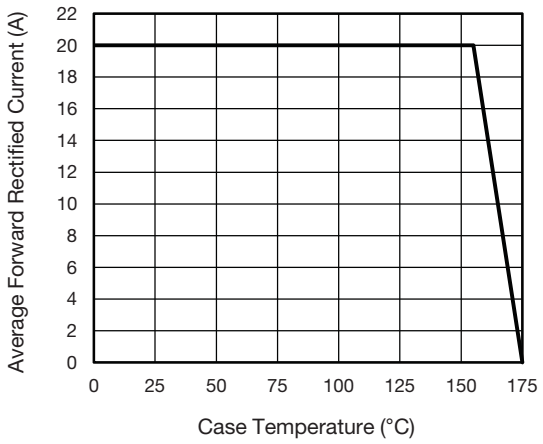



Fig. 1 - Maximum Forward Current Derating Curve

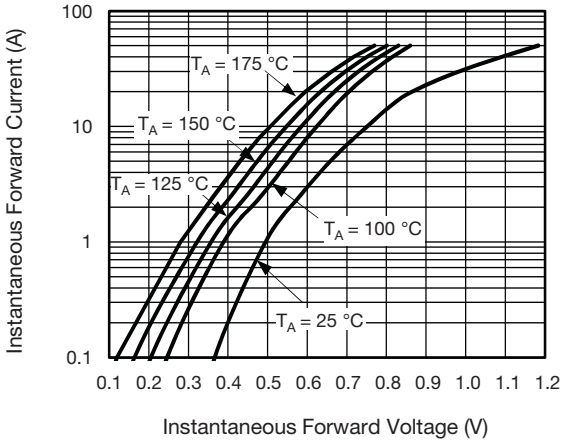



Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

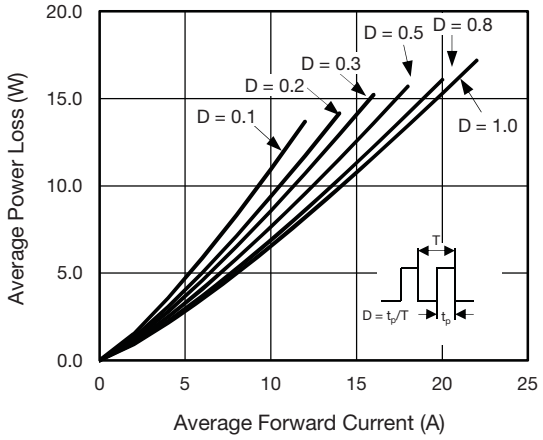



Fig. 2 - Forward Power Loss Characteristics Per Diode

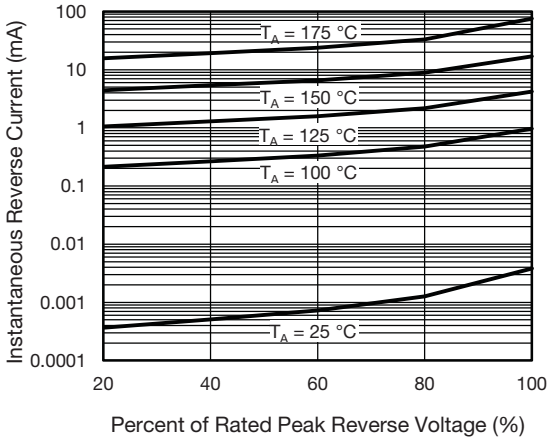



Fig. 4 - Typical Reverse Characteristics Per Diode


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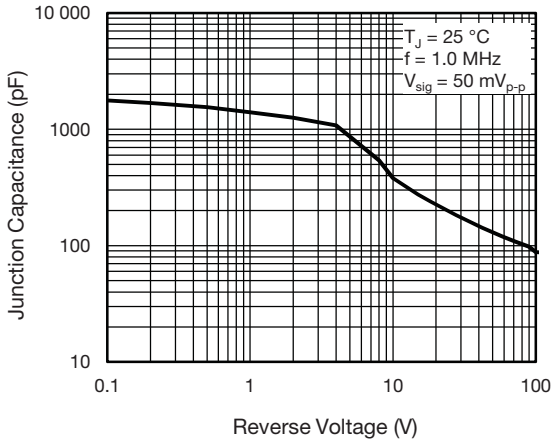



Fig. 5 - Typical Junction Capacitance Per Diode

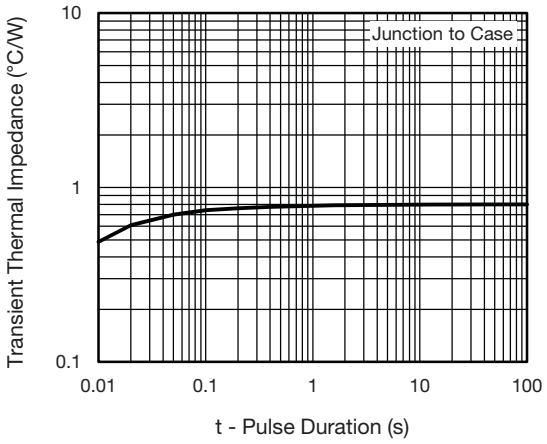
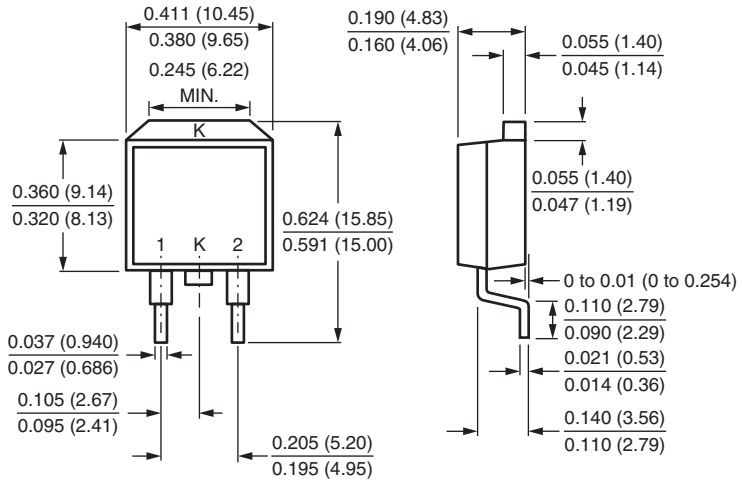


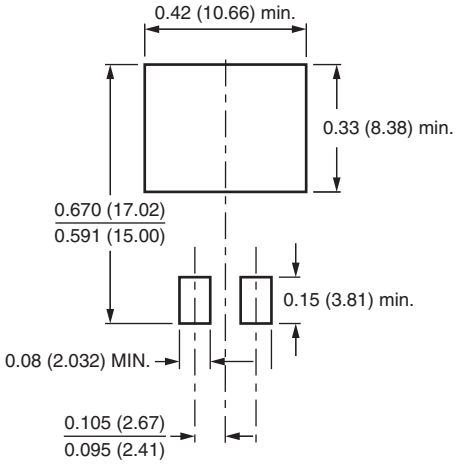

Fig. 6 - Typical Transient Thermal Impedance Per Diode

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

### $D^2PAK$ (TO-263AB)




### Mounting Pad Layout





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