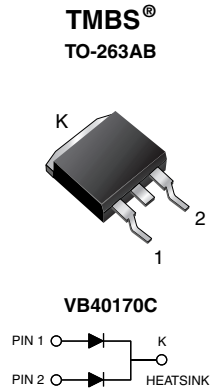


Dual High Voltage Trench MOS Barrier Schottky Rectifier

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


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
- AEC-Q101 qualified available
 - Automotive ordering code: base PN/HM3
- 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 | |
|-------------------------------|----------------|
| $I_{F(AV)}$ | 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 max. | 175 °C |
| Package | TO-263AB |
| Diode variations | Common cathode |

MECHANICAL DATA

Case: 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

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

E3, M3, and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

| 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 (fig. 1) | $I_{F(AV)}$ | per device | 40 |
| | | 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/ μ s |
| Operating junction and storage temperature range | T_J, T_{STG} | -40 to +175 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------------|-----------------------------------|-------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 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 | $V_R = 136\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 1.3 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 2.2 | - | mA |
| | $V_R = 170\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 250 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 4.2 | 50 | mA |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | |
|---|------------|-----------------------|----------|--------------------|
| PARAMETER | | SYMBOL | VB40170C | UNIT |
| Typical thermal resistance | per diode | $R_{\theta JC}^{(1)}$ | 1.2 | $^\circ\text{C/W}$ |
| | 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 |
| TO-263AB | VB40170CHM3/I ⁽¹⁾ | 1.38 | I | 800/reel | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

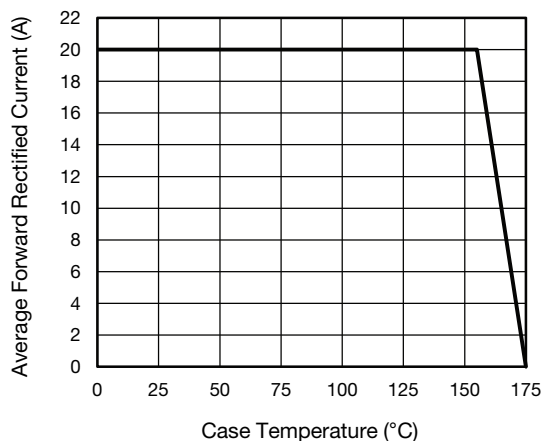
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

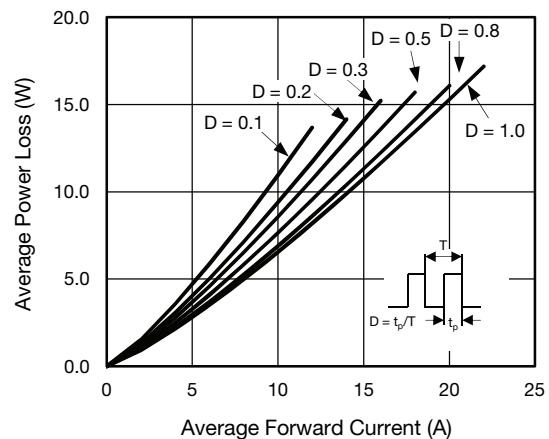


Fig. 2 - Forward Power Loss Characteristics Per Diode

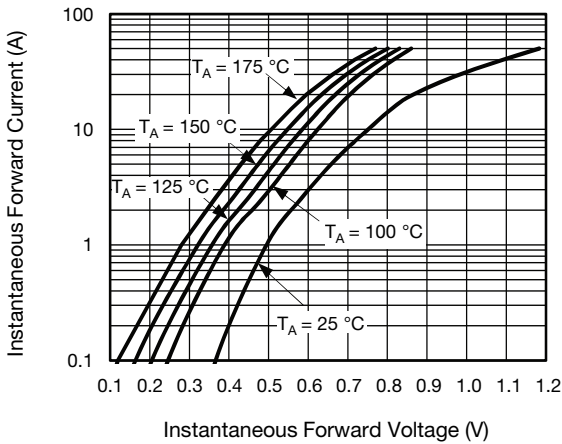


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

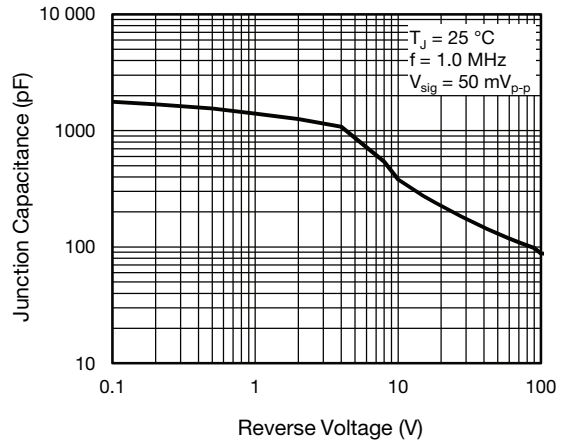


Fig. 5 - Typical Junction Capacitance Per Diode

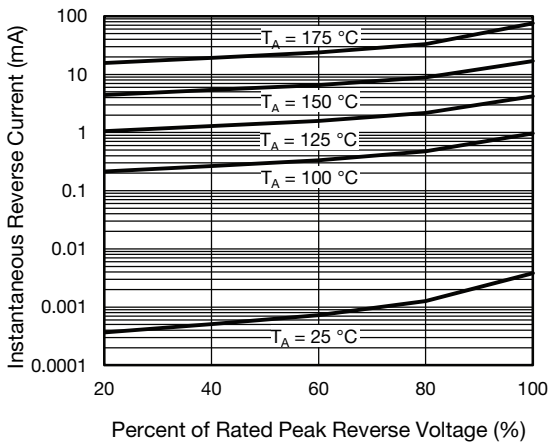


Fig. 4 - Typical Reverse Characteristics Per Diode

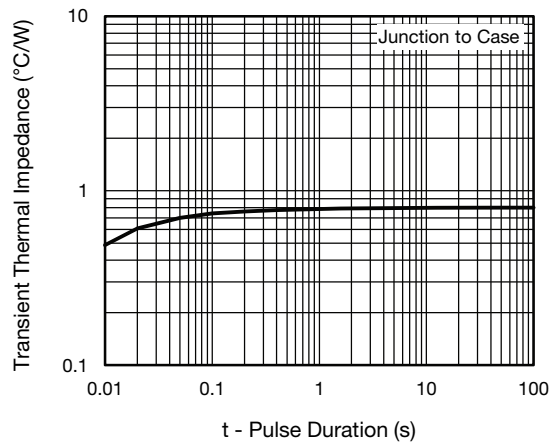
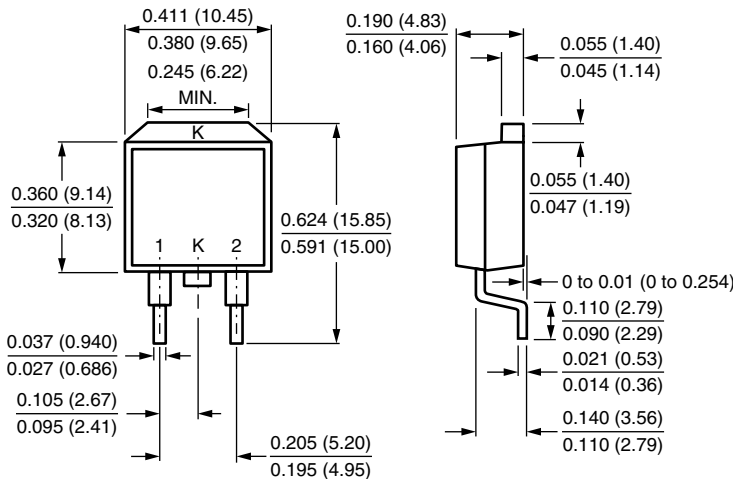


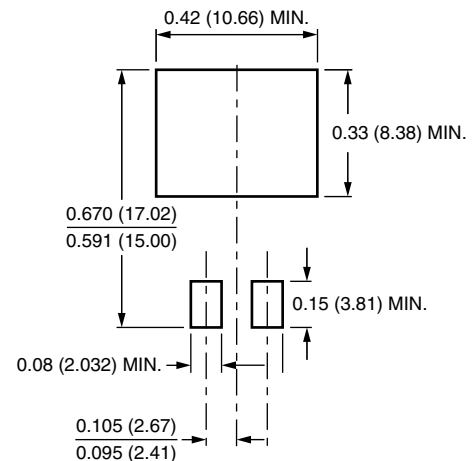
Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AB



Mounting Pad Layout





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