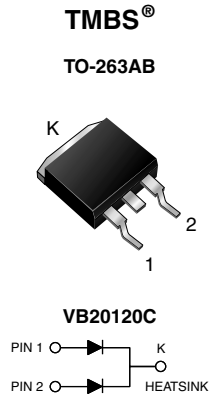


Dual High-Voltage Trench MOS Barrier Schottky Rectifier

 Ultra Low $V_F = 0.54 \text{ V}$ 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
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

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

| PRIMARY CHARACTERISTICS | |
|-------------------------------|----------------|
| Package | TO-263AB |
| $I_{F(AV)}$ | 2 x 10 A |
| V_{RRM} | 120 V |
| I_{FSM} | 120 A |
| V_F at $I_F = 10 \text{ A}$ | 0.64 V |
| T_J max. | 150 °C |
| Diode variation | Common cathode |

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | |
|--|----------------|---------------|------|
| PARAMETER | SYMBOL | VB20120C | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | per device | 20 |
| | | per diode | 10 |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 120 | A |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | |
| Operating junction and storage temperature range | T_J, T_{STG} | - 40 to + 150 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | | | |
|--|-----------------------|------------------------|--------|----------------------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode ⁽¹⁾ | $I_F = 5 \text{ A}$ | $T_A = 25 \text{ °C}$ | V_F | 0.62 | - | V |
| | | | | $I_F = 10 \text{ A}$ | 0.81 | 0.90 |
| | $I_F = 5 \text{ A}$ | $T_A = 125 \text{ °C}$ | | 0.54 | - | |
| | | | | $I_F = 10 \text{ A}$ | 0.65 | 0.72 |
| Reverse current per diode ⁽²⁾ | $V_R = 90 \text{ V}$ | $T_A = 25 \text{ °C}$ | I_R | 8 | - | μA |
| | | $T_A = 125 \text{ °C}$ | | 6 | - | mA |
| | $V_R = 120 \text{ V}$ | $T_A = 25 \text{ °C}$ | | - | 700 | μA |
| | | $T_A = 125 \text{ °C}$ | | 14 | 45 | mA |

Notes

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

⁽²⁾ Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | |
|---|-----------------|----------|--------------------|
| PARAMETER | SYMBOL | VB20120C | UNIT |
| Typical thermal resistance per diode | $R_{\theta JC}$ | 2.8 | $^\circ\text{C/W}$ |

| ORDERING INFORMATION (Example) | | | | | |
|---------------------------------------|-----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB | VB20120SC-M3/4W | 1.38 | 4W | 50/tube | Tube |
| TO-263AB | VB20120SC-M3/8W | 1.38 | 8W | 800/reel | Tape and reel |

RATINGS AND CHARACTERISTICS CURVES

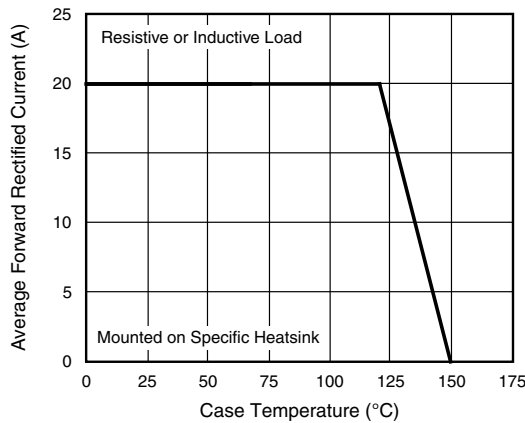
 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

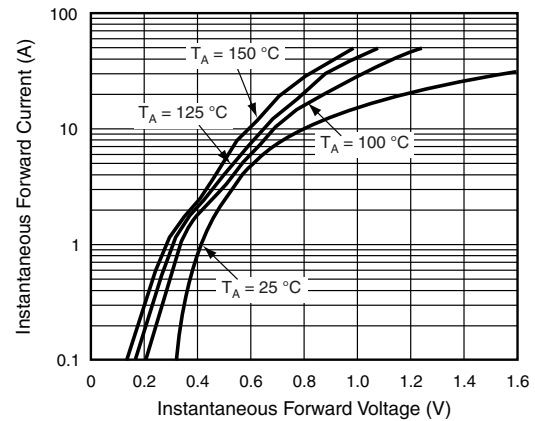


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

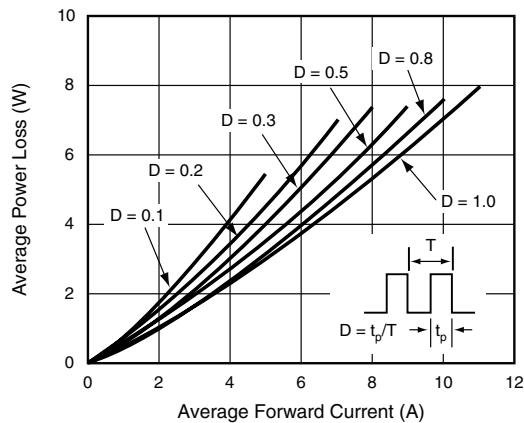


Fig. 2 - Forward Power Loss Characteristics Per Diode

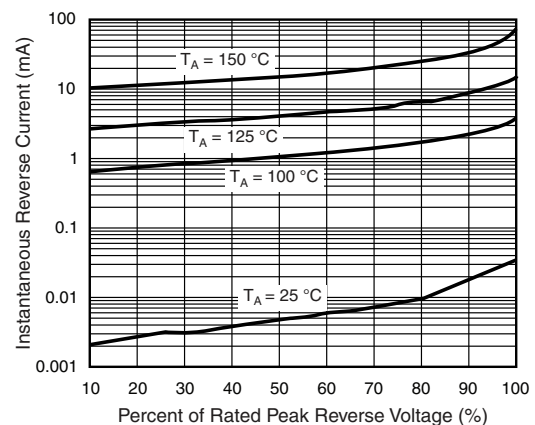


Fig. 4 - Typical Reverse Characteristics Per Diode

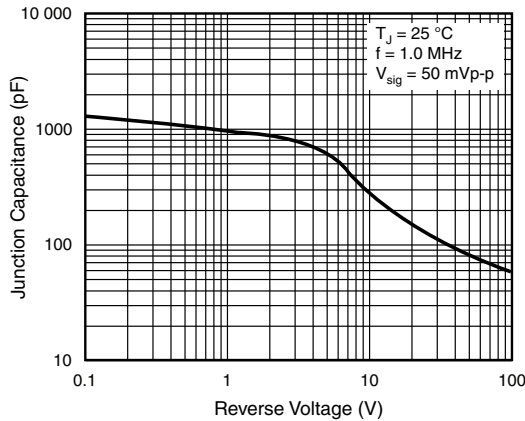


Fig. 5 - Typical Junction Capacitance Per Diode

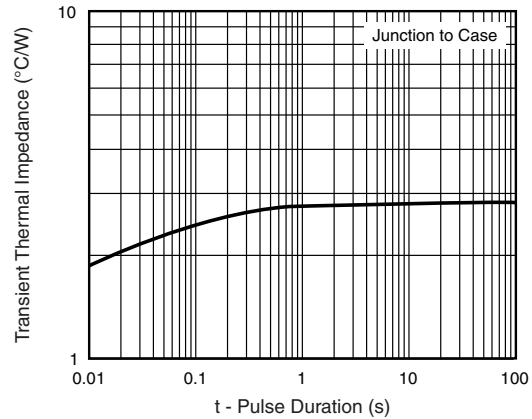
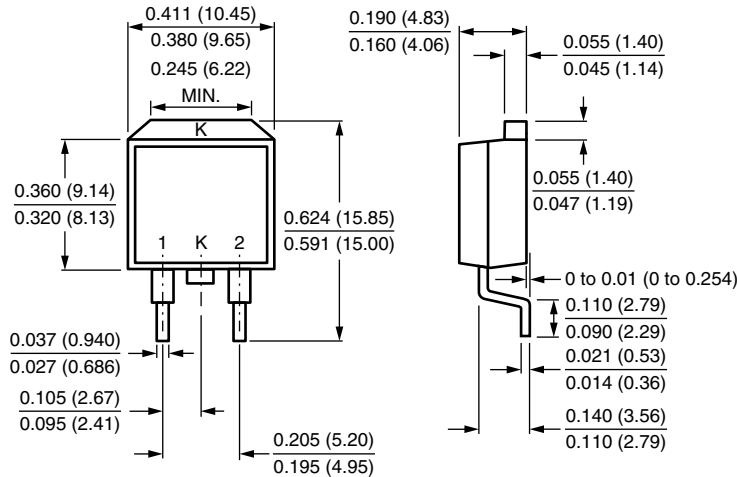


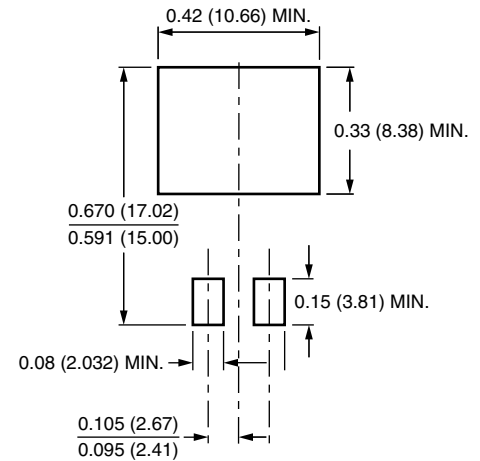
Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AB



Mounting Pad Layout





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