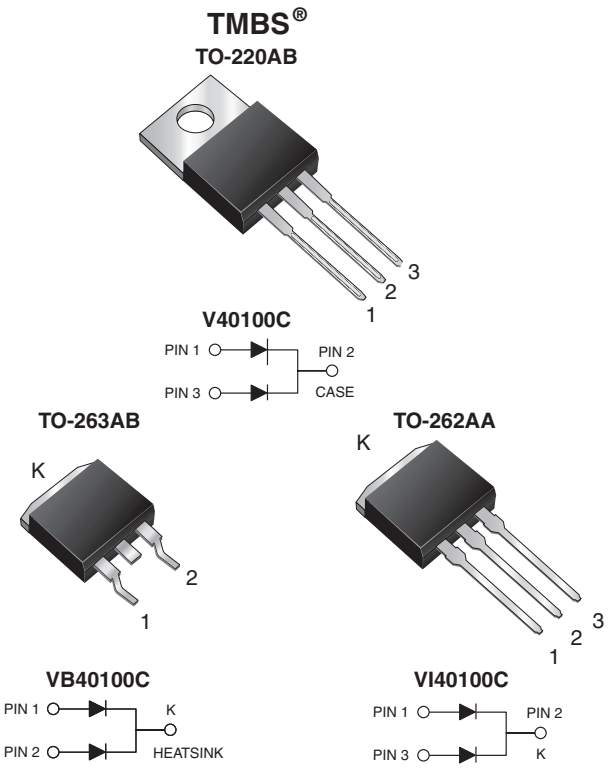
# V40100C, VB40100C, VI40100C

Vishay General Semiconductor

## Dual High-Voltage Trench MOS barrier Schottky Rectifier

Ultra Low $V_F$ = 0.38 V at $I_F$ = 5 A




### FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AB, TO-263AB and TO-262AA package)
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb e3 RoHS COMPLIANT

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** TO-220AB, TO-263AB and TO-262AA

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 |
| $V_{RRM}$ | 100 V |
| $I_{FSM}$ | 250 A |
| $V_F$ at $I_F$ = 20 A | 0.61 V |
| $T_J$ max. | 150 °C |

**MAXIMUM RATINGS** ($T_A$ = 25 °C unless otherwise noted)

| PARAMETER | | SYMBOL | V40100C | VB40100C | VI40100C | UNIT |
|---|---|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 100 | | | 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 per diode | | $I_{FSM}$ | 250 | | | A |
| Non-repetitive avalanche energy at $T_J$ = 25 °C, L = 90 mH per diode | | $E_{AS}$ | 230 | | | mJ |
| Peak repetitive reverse current at $t_p$ = 2 µs, 1 kHz, $T_J$ = 38 °C ± 2 °C per diode | | $I_{RRM}$ | 1.0 | | | 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 + 150 | | | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Breakdown voltage (2) | $I_R$ = 1.0 mA | $T_A$ = 25 °C | $V_{BR}$ | 100 (minimum) | - | V |
| | $I_R$ = 10 mA | | | 105 (minimum) | - | |
| Instantaneous forward voltage per diode (1) | $I_F$ = 5 A | $T_A$ = 25 °C | $V_F$ | 0.47 | - | V |
| | $I_F$ = 10 A | | | 0.54 | - | |
| | $I_F$ = 20 A | | | 0.67 | 0.73 | |
| | $I_F$ = 5 A | $T_A$ = 125 °C | | 0.38 | - | |
| | $I_F$ = 10 A | | | 0.45 | - | |
| | $I_F$ = 20 A | | | 0.61 | 0.67 | |
| Reverse current at rated $V_R$ per diode (2) | $V_R$ = 70 V | $T_A$ = 25 °C | $I_R$ | 9 | - | μA |
| | | $T_A$ = 125 °C | | 10 | - | mA |
| | $V_R$ = 100 V | $T_A$ = 25 °C | | - | 1000 | μA |
| | | $T_A$ = 125 °C | | 21 | 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 °C unless otherwise noted) | | | | | |
|---|---|---|---|---|---|
| PARAMETER | SYMBOL | V40100C | VB40100C | VI40100C | UNIT |
| Typical thermal resistance per diode | $R_{\theta JC}$ | 2.0 | 2.0 | 2.0 | °C/W |

| ORDERING INFORMATION (Example) | | | | | |
|---|---|---|---|---|---|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB | V40100C-E3/4W | 1.85 | 4W | 50/tube | Tube |
| TO-263AB | VB40100C-E3/4W | 1.39 | 4W | 50/tube | Tube |
| TO-263AB | VB40100C-E3/8W | 1.39 | 8W | 800/reel | Tube |
| TO-262AA | VI40100C-M3/4W | 1.46 | 4W | 50/tube | Tube |

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

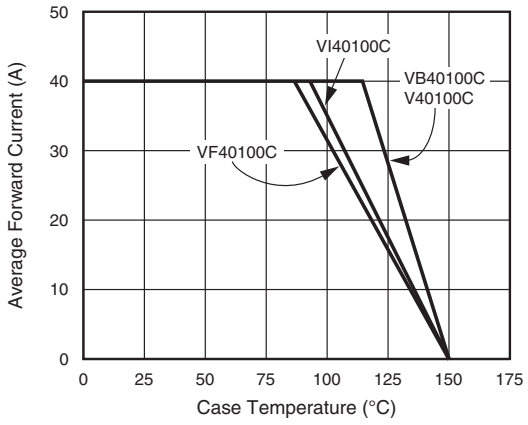



Fig. 1 - Forward Current Derating Curve

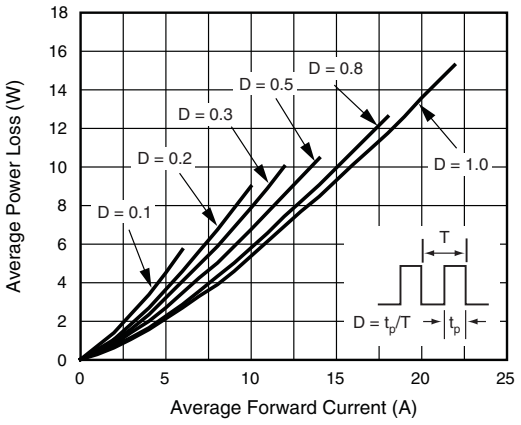



Fig. 2 - Forward Power Loss Characteristics Per Diode

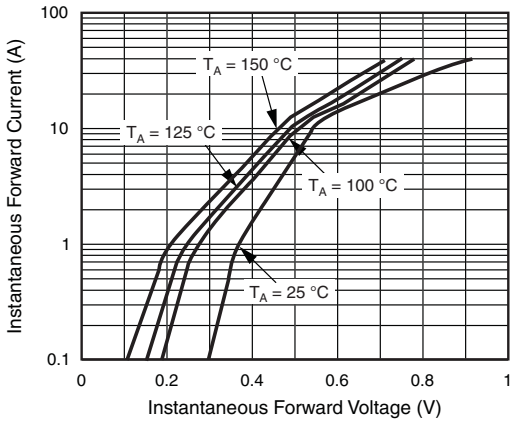



Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

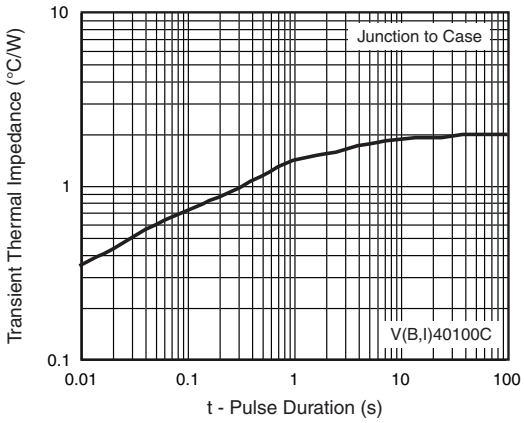



Fig. 6 - Typical Transient Thermal Impedance Per Diode

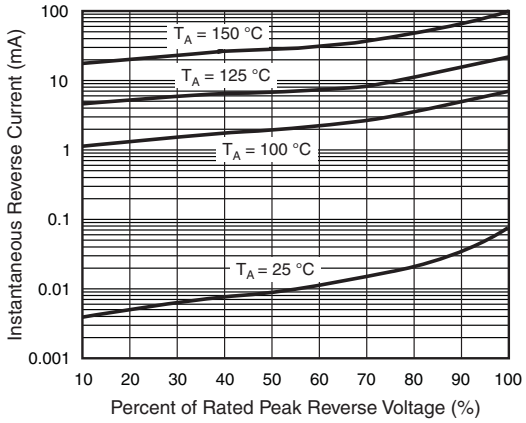



Fig. 4 - Typical Reverse Characteristics Per Diode

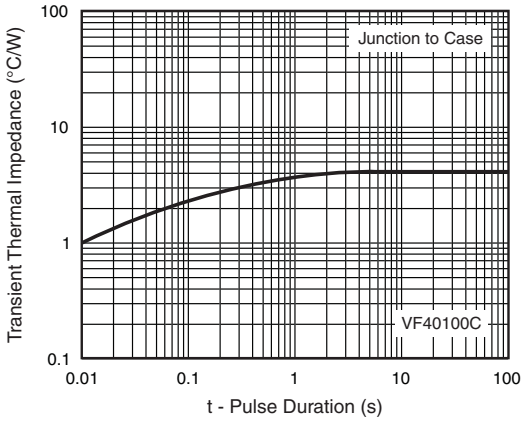



Fig. 7 - Typical Transient Thermal Impedance Per Diode

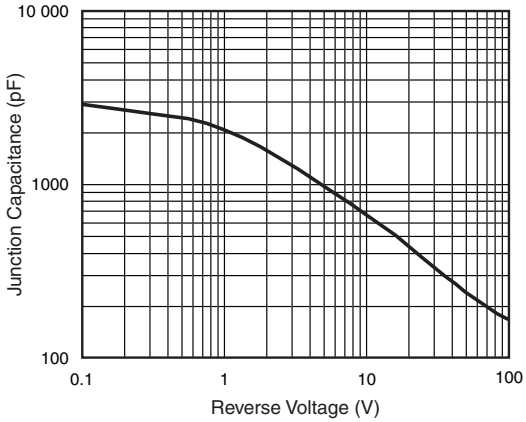
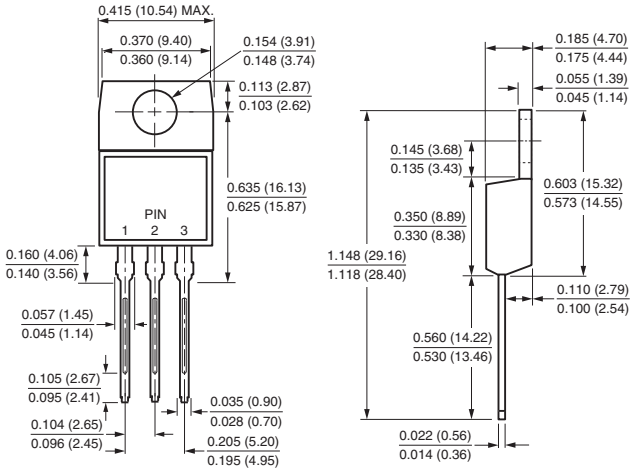


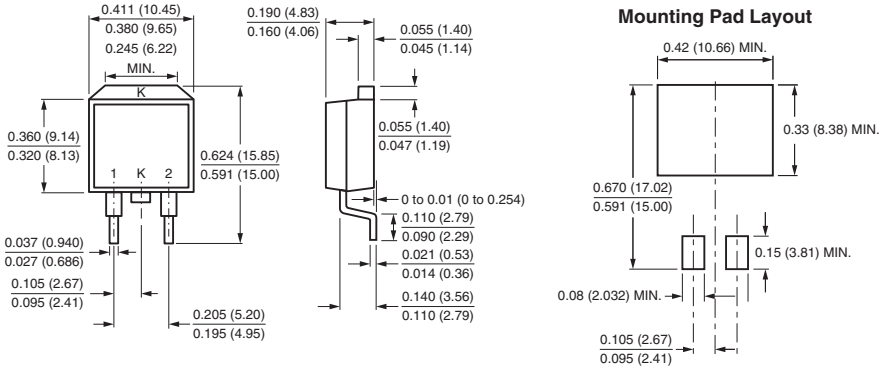

Fig. 5 - Typical Junction Capacitance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

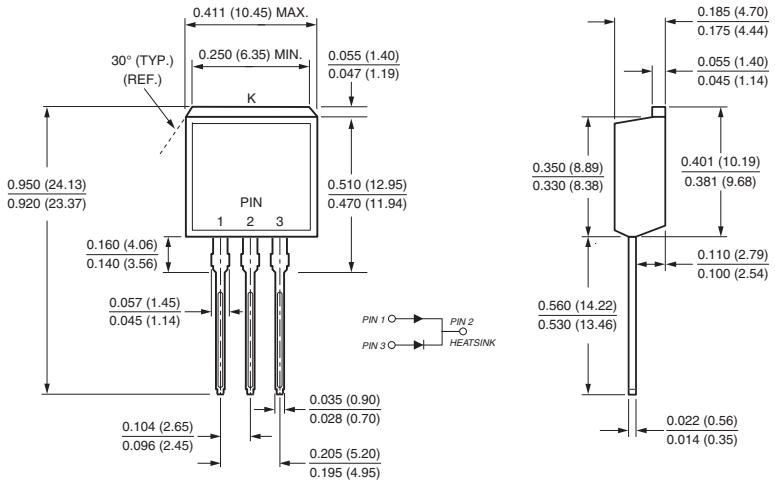
### TO-220AB




### TO-263AB




### TO-262AA



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