# V40100G, VF40100G, VB40100G & VI40100G

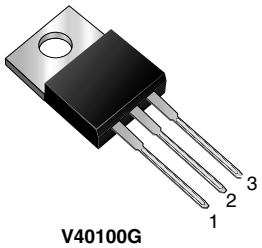
Vishay General Semiconductor

## Dual High-Voltage Trench MOS Barrier Schottky Rectifier

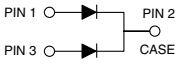
Ultra Low $V_F$ = 0.42 V at $I_F$ = 5 A

TMBS®

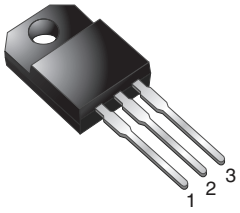
TO-220AB



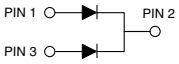

V40100G



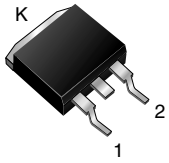

ITO-220AB



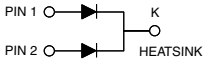

VF40100G



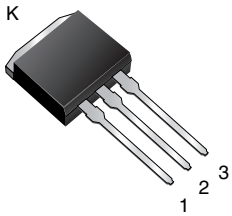

TO-263AB



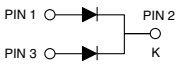

VB40100G




TO-262AA




VI40100G




| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2 x 20 A |
| $V_{RRM}$ | 100 V |
| $I_{FSM}$ | 200 A |
| $V_F$ at $I_F$ = 20 A | 0.67 V |
| $T_J$ max. | 150 °C |

### 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, ITO-220AB and TO-262AA package)
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

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, ITO-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

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

| PARAMETER | SYMBOL | V40100G | VF40100G | VB40100G | VI40100G | UNIT |
|---|---|---|---|---|---|---|
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 100 | | | | V |
| Maximum average forward rectified current (fig. 1) per device<br>per diode | $I_{F(AV)}$ | 40<br>20 | | | | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$ | 200 | | | | 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 |
| Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min | $V_{AC}$ | 1500 | | | | V |
| 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 | $I_R$ = 1.0 mA | $T_A$ = 25 °C | $V_{BR}$ | 100 (minimum) | - | V |
| Instantaneous forward voltage per diode (1) | $I_F$ = 5 A<br>$I_F$ = 10 A<br>$I_F$ = 20 A | $T_A$ = 25 °C | $V_F$ | 0.49<br>0.59<br>0.75 | -<br>-<br>0.81 | |
| | $I_F$ = 5 A<br>$I_F$ = 10 A<br>$I_F$ = 20 A | $T_A$ = 125 °C | | 0.42<br>0.54<br>0.67 | -<br>-<br>0.73 | |
| Reverse current per diode (2) | $V_R$ = 70 V | $T_A$ = 25 °C<br>$T_A$ = 125 °C | $I_R$ | 12<br>8 | -<br>- | µA<br>mA |
| | $V_R$ = 100 V | $T_A$ = 25 °C<br>$T_A$ = 125 °C | | 55<br>21 | 500<br>35 | µA<br>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** | **V40100G** | **VF40100G** | **VB40100G** | **VI40100G** | **UNIT** |
| Typical thermal resistance per diode | $R_{\theta JC}$ | 2.0 | 5.0 | 2.0 | 2.0 | °C/W |

| ORDERING INFORMATION (Example) | | | | | |
|---|---|---|---|---|---|
| **PACKAGE** | **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| TO-220AB | V40100G-E3/4W | 1.88 | 4W | 50/tube | Tube |
| ITO-220AB | VF40100G-E3/4W | 1.75 | 4W | 50/tube | Tube |
| TO-263AB | VB40100G-E3/4W | 1.39 | 4W | 50/tube | Tube |
| TO-263AB | VB40100G-E3/8W | 1.39 | 8W | 800/reel | Tape and reel |
| TO-262AA | VI40100G-E3/4W | 1.46 | 4W | 50/tube | Tube |

## RATINGS AND CHARACTERISTICS CURVES

($T_A$ = 25 °C unless otherwise noted)

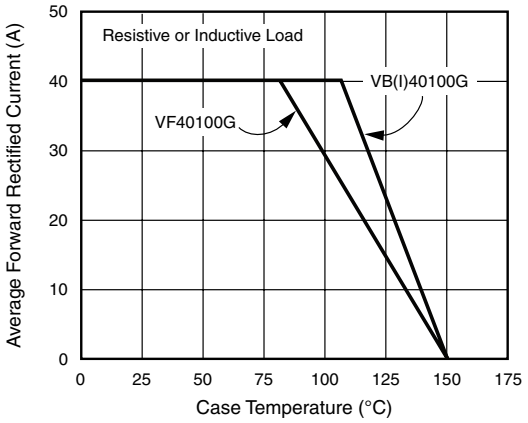



Figure 1. Maximum Forward Current Derating Curve

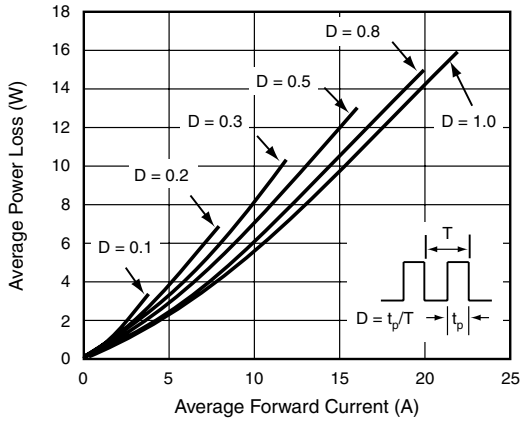



Figure 2. Forward Power Loss Characteristics



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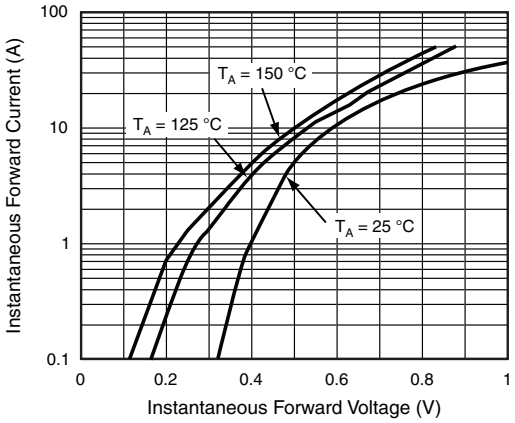



Figure 3. Typical Instantaneous Forward Characteristics

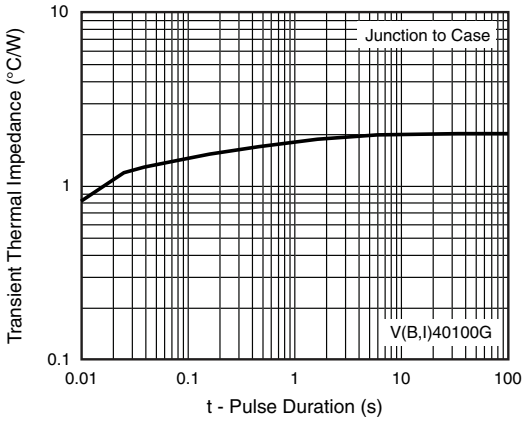



Figure 6. Typical Transient Thermal Impedance

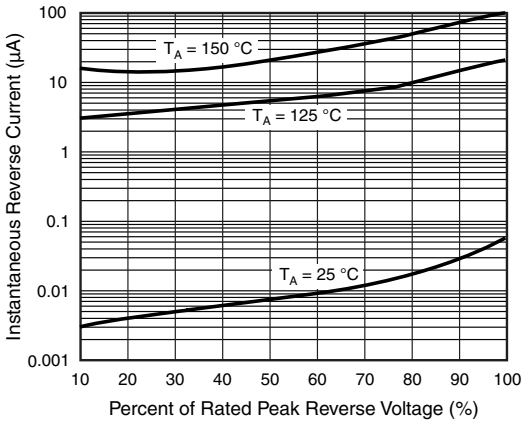



Figure 4. Typical Reverse Characteristics

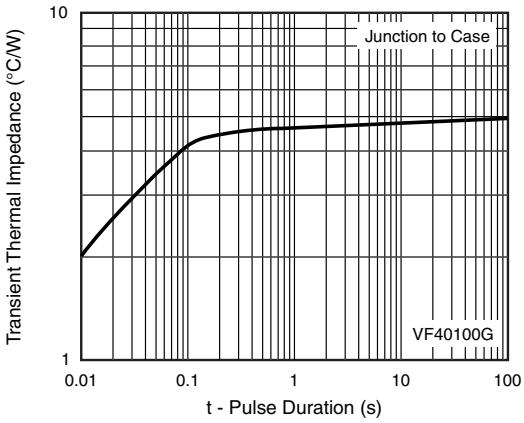



Figure 7. Typical Transient Thermal Impedance

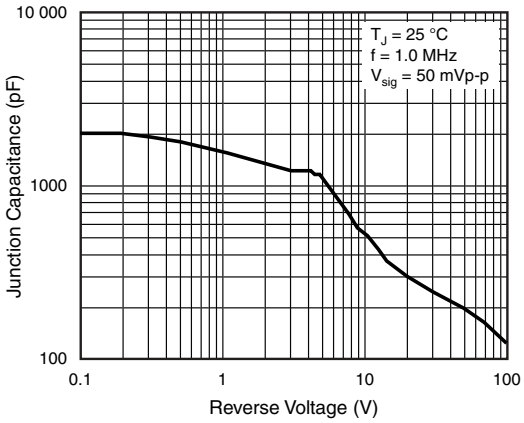
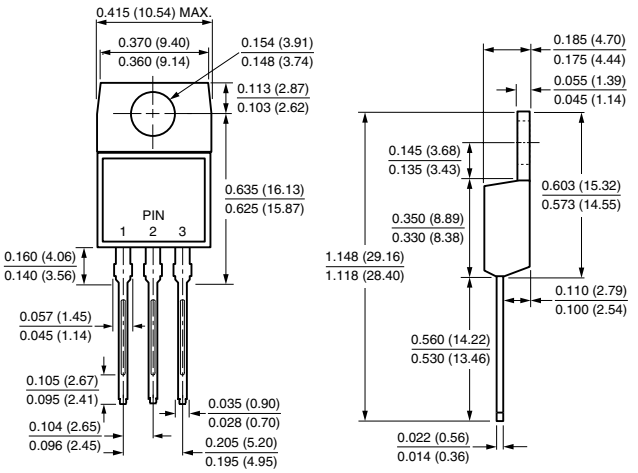


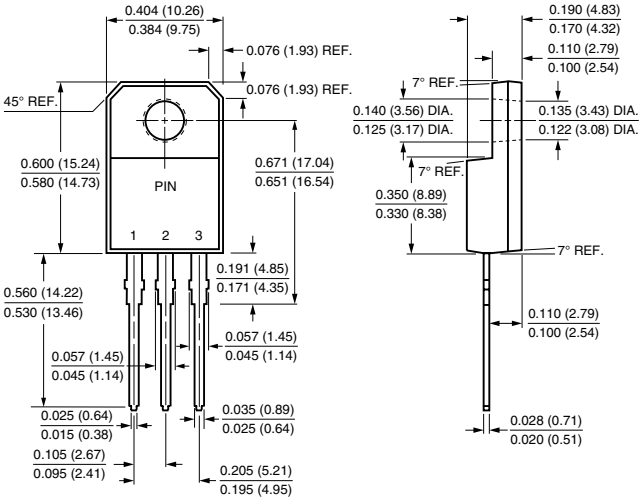

Figure 5. Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-220AB




### ITO-220AB

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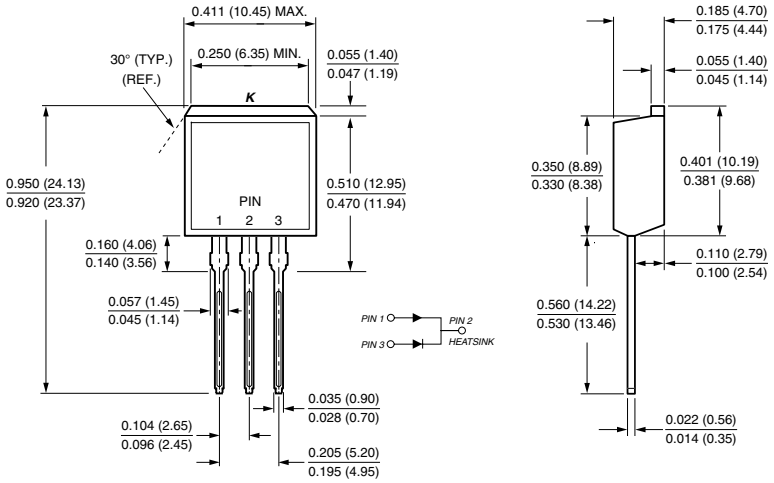


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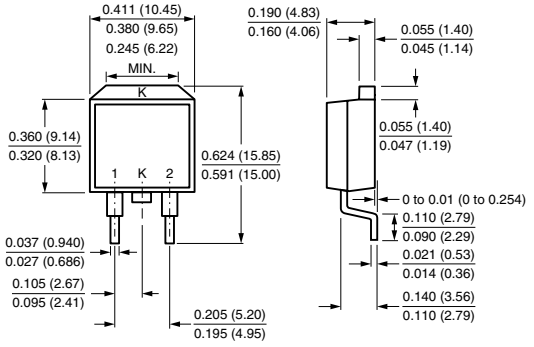
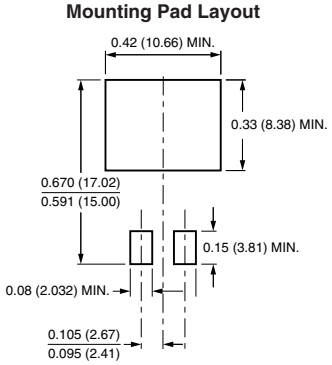



### Mounting Pad Layout



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