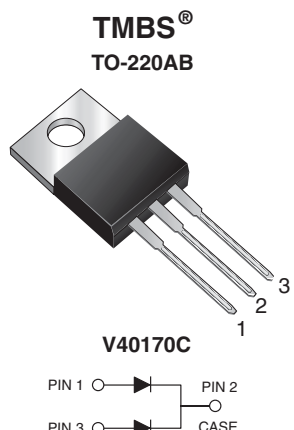


# Dual High-Voltage Trench MOS Barrier Schottky Rectifier

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
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://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.

## MECHANICAL DATA

**Case:** TO-220AB

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       |                |
|-------------------------------|----------------|
| $I_{F(AV)}$                   | 2 x 20 A       |
| $V_{RRM}$                     | 170 V          |
| $I_{FSM}$                     | 200 A          |
| $V_F$ at $I_F = 20 \text{ A}$ | 0.68 V         |
| $T_J \text{ max.}$            | 175 °C         |
| Package                       | TO-220AB       |
| Circuit configuration         | Common cathode |

| MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)                    |                |             |            |
|------------------------------------------------------------------------------------|----------------|-------------|------------|
| PARAMETER                                                                          | SYMBOL         | V40170C     | UNIT       |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 170         | V          |
| Maximum average forward rectified current<br>(fig. 1)                              | $I_{F(AV)}$    | 40          | A          |
| per device                                                                         |                | 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/ $\mu$ s |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -40 to +175 | °C         |

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.66 | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                               | 0.75 | -    |      |
|                                                                            | I <sub>F</sub> = 20 A  |                         |                               | 0.86 | 1.20 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.52 | -    |      |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                               | 0.59 | -    |      |
|                                                                            | I <sub>F</sub> = 20 A  |                         |                               | 0.68 | 0.76 |      |
| Reverse current per diode                                                  | V <sub>R</sub> = 136 V | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 1.3  | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 2.2  | -    | mA   |
|                                                                            | V <sub>R</sub> = 170 V | T <sub>A</sub> = 25 °C  |                               | -    | 250  | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 4.2  | 50   | mA   |

## Notes

(1) Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 20 \text{ ms}$

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

| PARAMETER                  |            | SYMBOL          | V40170C | UNIT                 |
|----------------------------|------------|-----------------|---------|----------------------|
| Typical thermal resistance | per diode  | $R_{\theta JC}$ | 1.2     | $^{\circ}\text{C/W}$ |
|                            | per device |                 | 0.85    |                      |

**ORDERING INFORMATION** (Example)

| PACKAGE  | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------|---------------|-----------------|--------------|---------------|---------------|
| TO-220AB | V40170C-M3/4W | 1.85            | 4W           | 50/tube       | Tube          |

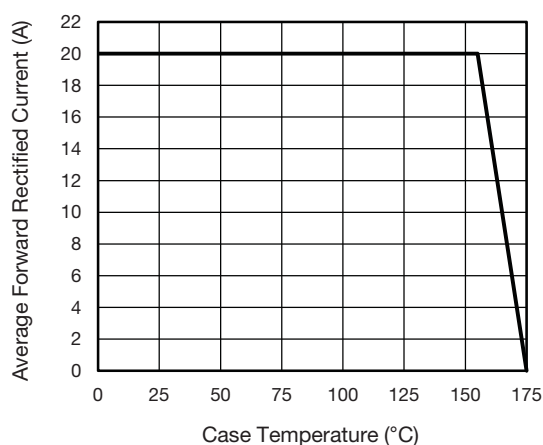
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

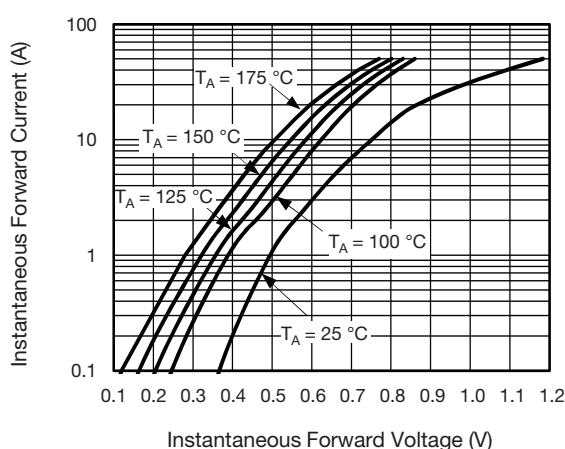


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

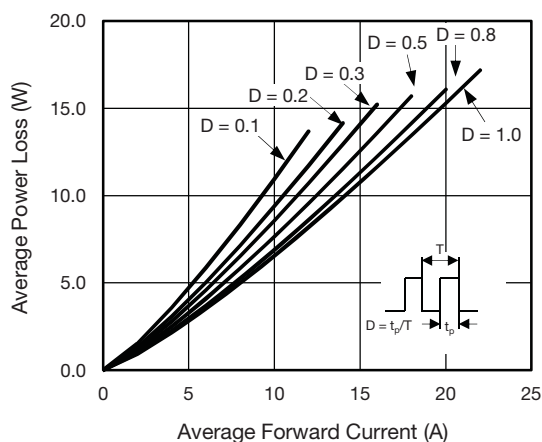


Fig. 2 - Forward Power Loss Characteristics Per Diode

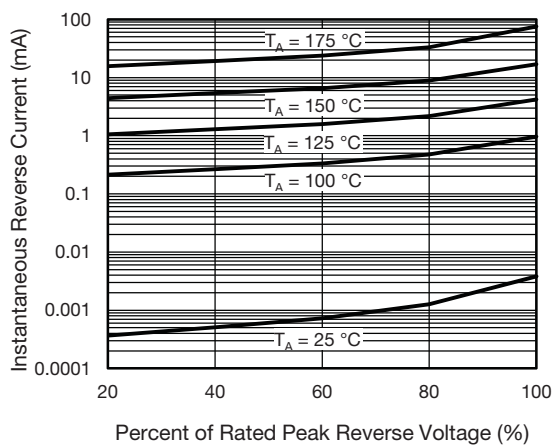


Fig. 4 - Typical Reverse Characteristics Per Diode

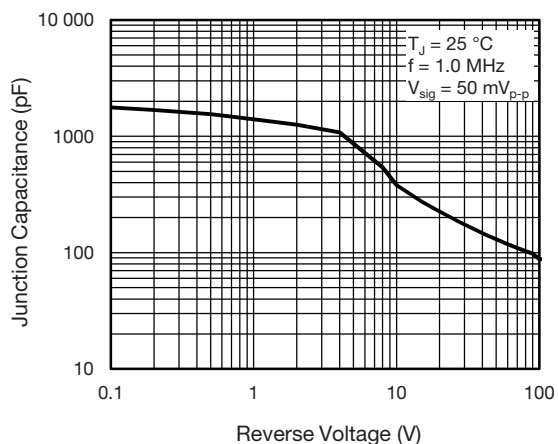


Fig. 5 - Typical Junction Capacitance Per Diode

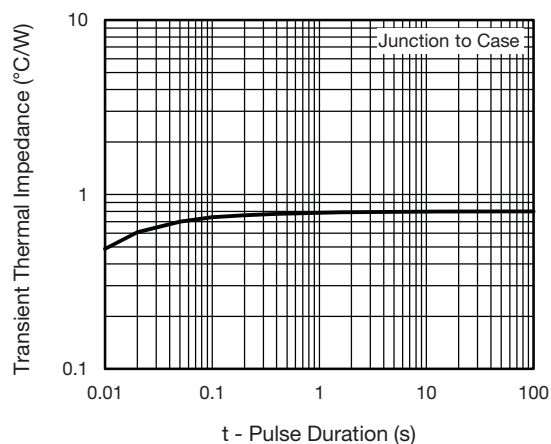
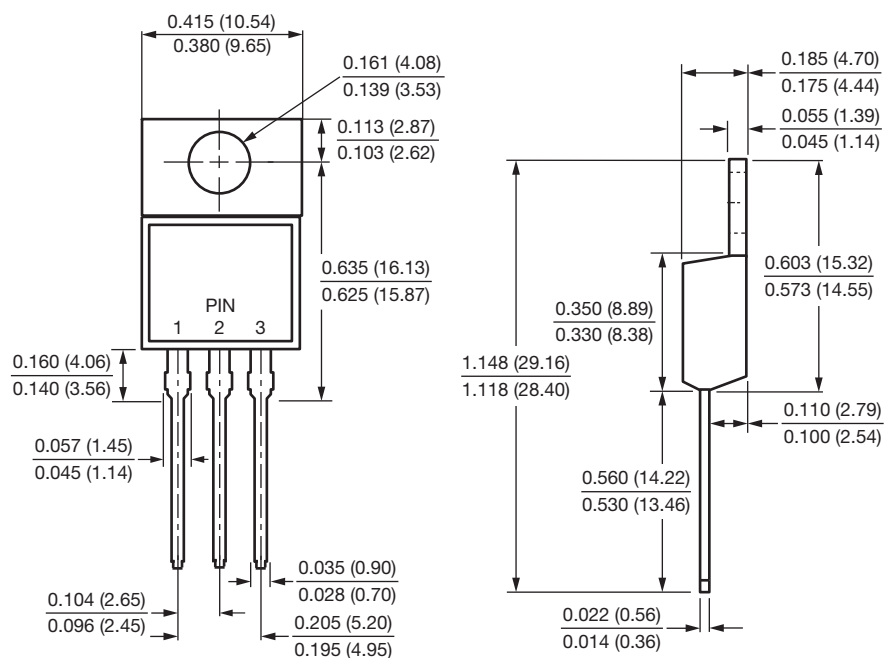


Fig. 6 - Typical Transient Thermal Impedance Per Device

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

**TO-220AB**




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