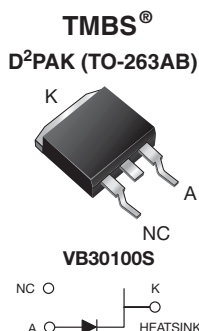


# High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.39\text{ V}$  at  $I_F = 5\text{ A}$



## DESIGN SUPPORT TOOLS

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| PRIMARY CHARACTERISTICS      |                               |
|------------------------------|-------------------------------|
| $I_{F(AV)}$                  | 30 A                          |
| $V_{RRM}$                    | 100 V                         |
| $I_{FSM}$                    | 250 A                         |
| $V_F$ at $I_F = 30\text{ A}$ | 0.69 V                        |
| $T_J$ max.                   | 150 °C                        |
| Package                      | D <sup>2</sup> PAK (TO-263AB) |
| Circuit configuration        | Common cathode                |

## 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
- 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 converters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters, and reverse battery protection.

## MECHANICAL DATA

**Case:** D<sup>2</sup>PAK (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

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                |             |            |
|------------------------------------------------------------------------------------|----------------|-------------|------------|
| PARAMETER                                                                          | SYMBOL         | VB30100S    | UNIT       |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 100         | V          |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | 30          | A          |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 250         | 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 +150 | °C         |

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                |      |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|----------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL         | TYP. | MAX. | UNIT |
| Instantaneous forward voltage <sup>(1)</sup>                               | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> | 0.47 | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                | 0.55 | -    |      |
|                                                                            | I <sub>F</sub> = 30 A  |                         |                | 0.80 | 0.91 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                | 0.39 | -    |      |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                | 0.49 | -    |      |
|                                                                            | I <sub>F</sub> = 30 A  |                         |                | 0.69 | 0.78 |      |
| Reverse current <sup>(2)</sup>                                             | V <sub>R</sub> = 70 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> | 27   | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                | 11   | -    | mA   |
|                                                                            | V <sub>R</sub> = 100 V | T <sub>A</sub> = 25 °C  |                | 70   | 1000 | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                | 23   | 45   | mA   |

## Notes

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

<sup>(2)</sup> Pulse test: Pulse width  $\leq 40\text{ ms}$


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

| PARAMETER                  | SYMBOL          | VB30100S | UNIT                 |
|----------------------------|-----------------|----------|----------------------|
| Typical thermal resistance | $R_{\theta JC}$ | 2.0      | $^{\circ}\text{C/W}$ |

**ORDERING INFORMATION** (Example)

| PACKAGE  | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------|----------------|-----------------|--------------|---------------|---------------|
| TO-263AB | VB30100S-M3/4W | 1.380           | 4W           | 50/tube       | Tube          |
| TO-263AB | VB30100S-M3/8W | 1.380           | 8W           | 800/reel      | Tape and reel |

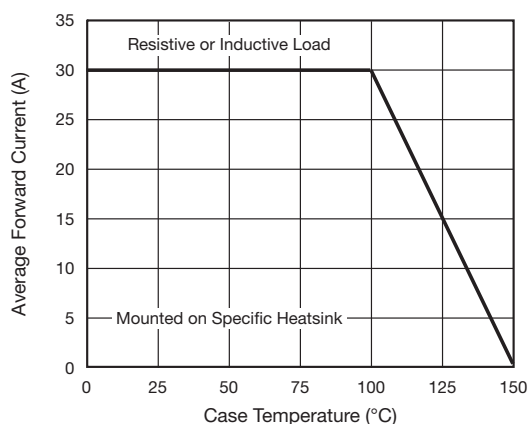
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

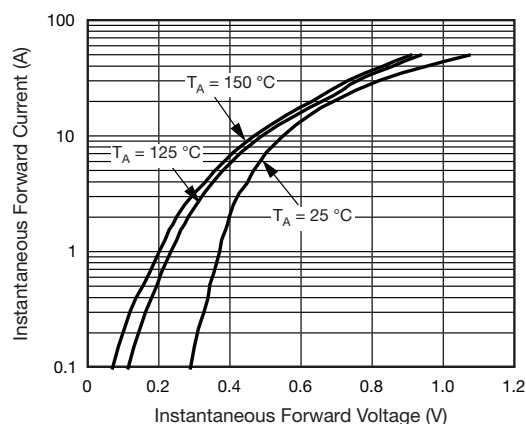


Fig. 3 - Typical Instantaneous Forward Characteristics

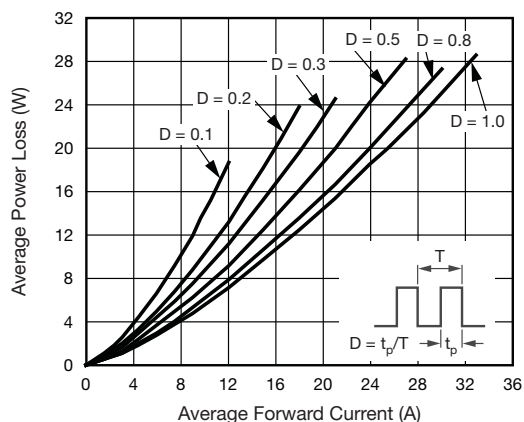


Fig. 2 - Forward Power Loss Characteristics

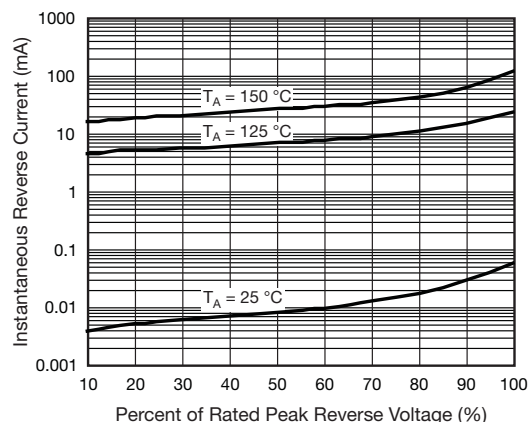


Fig. 4 - Typical Reverse Characteristics

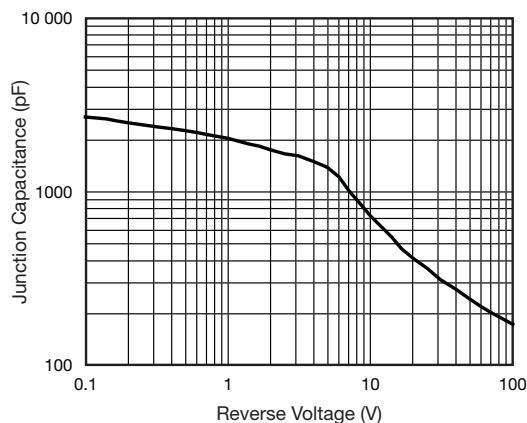


Fig. 5 - Typical Junction Capacitance

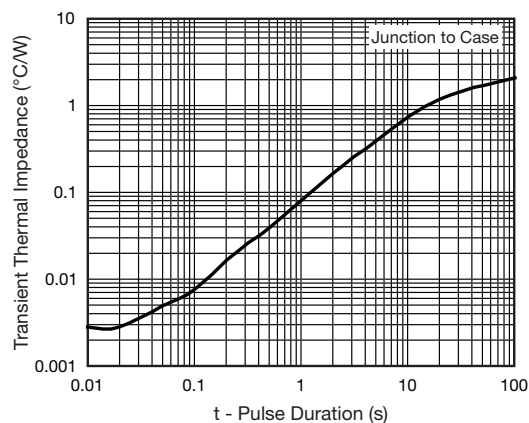
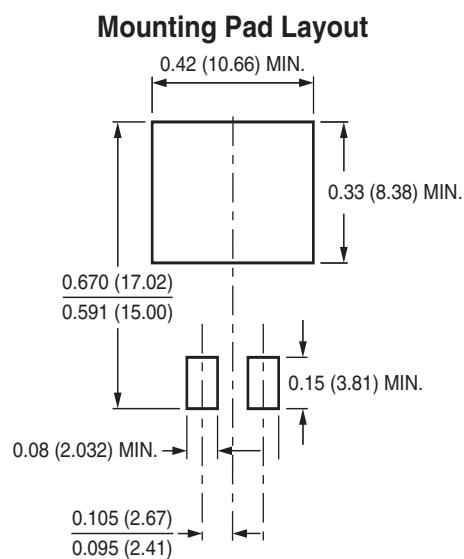
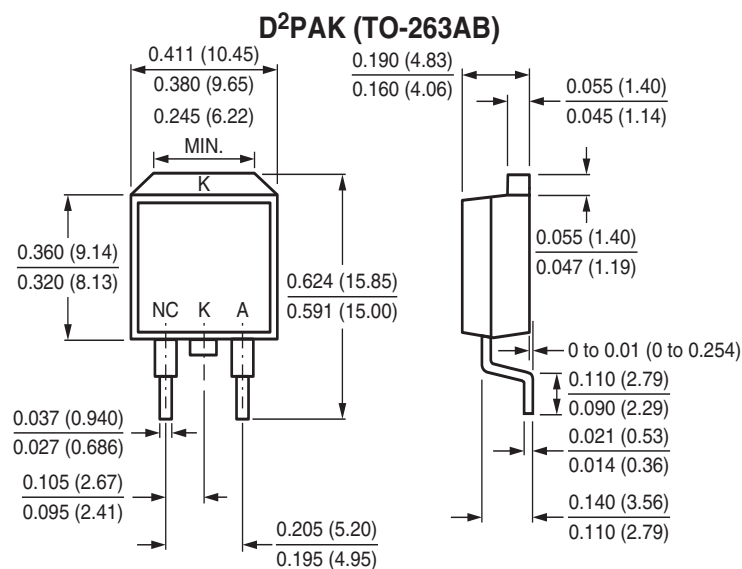


Fig. 6 - Typical Transient Thermal Impedance

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




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