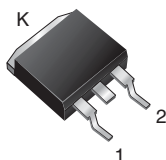


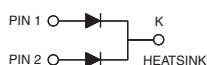
# Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.52 \text{ V}$  at  $I_F = 5 \text{ A}$

TMBS®  
TO-263AB



VB30M120C



## 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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

## TYPICAL APPLICATIONS

For use in solar cell junction box as a bypass diode for protection, using DC forward current without reverse bias.

## MECHANICAL DATA

**Case:** TO-263AB

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 15 A       |
| $V_{RRM}$                     | 120 V          |
| $I_{FSM}$                     | 150 A          |
| $V_F$ at $I_F = 15 \text{ A}$ | 0.68 V         |
| $T_J \text{ max.}$            | 150 °C         |
| Package                       | TO-263AB       |
| Diode variations              | Common cathode |

## MAXIMUM RATINGS ( $T_A = 25 \text{ °C}$ unless otherwise noted)

| PARAMETER                                                                                    | SYMBOL         | VB30M120C   | UNIT       |
|----------------------------------------------------------------------------------------------|----------------|-------------|------------|
| Maximum repetitive peak reverse voltage                                                      | $V_{RRM}$      | 120         | V          |
| Maximum average forward rectified current (fig. 1)                                           | $I_{F(AV)}$    | 30          | A          |
|                                                                                              |                | 15          |            |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$      | 150         |            |
| 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 per diode                                    | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.60 | -    | V    |
|                                                                            | I <sub>F</sub> = 7.5 A |                         |                               | 0.67 | -    |      |
|                                                                            | I <sub>F</sub> = 15 A  |                         |                               | 0.87 | 0.98 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.52 | -    |      |
|                                                                            | I <sub>F</sub> = 7.5 A |                         |                               | 0.57 | -    |      |
|                                                                            | I <sub>F</sub> = 15 A  |                         |                               | 0.68 | 0.76 |      |
| Reverse current per diode                                                  | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 3.5  | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 2    | -    | mA   |
|                                                                            | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                               | -    | 800  | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 5    | 27   | mA   |

**Notes**

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

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

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |           |                      |
|---------------------------------------------------------------------------------------------|-----------------|-----------|----------------------|
| PARAMETER                                                                                   | SYMBOL          | VB30M120C | UNIT                 |
| Typical thermal resistance per diode                                                        | $R_{\theta JC}$ | 2.2       | $^{\circ}\text{C/W}$ |

| <b>ORDERING INFORMATION</b> (Example) |                 |                 |              |               |               |
|---------------------------------------|-----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-263AB                              | VB30M120C-E3/4W | 1.37            | 4W           | 50/tube       | Tube          |
| TO-263AB                              | VB30M120C-E3/8W | 1.37            | 8W           | 800/reel      | Tape and reel |

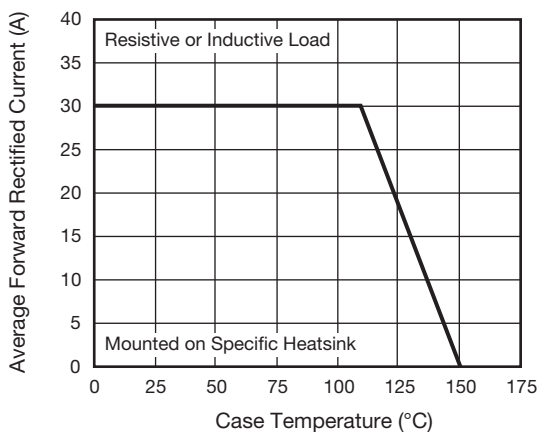
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

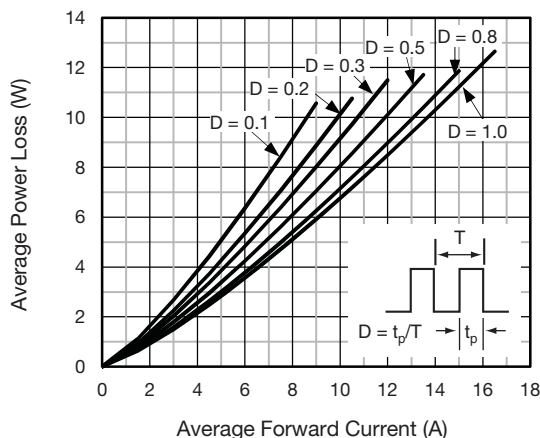


Fig. 2 - Forward Power Loss Characteristics Per Diode

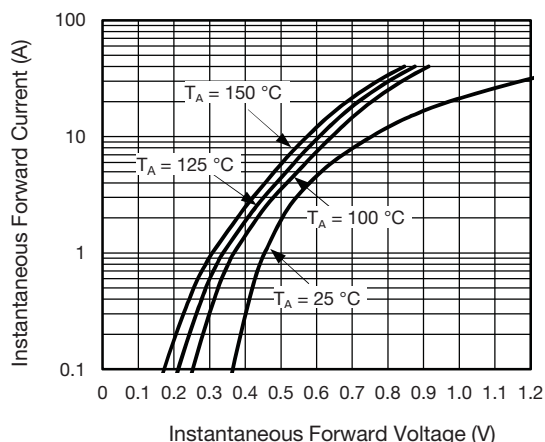


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

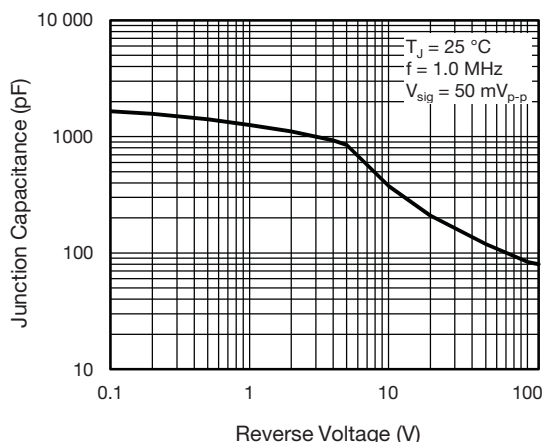


Fig. 5 - Typical Junction Capacitance Per Diode

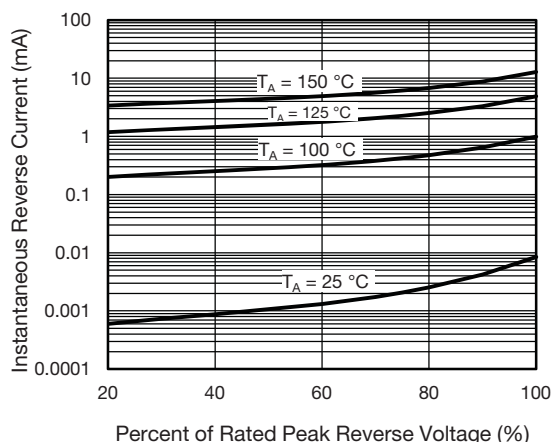


Fig. 4 - Typical Reverse Characteristics Per Diode

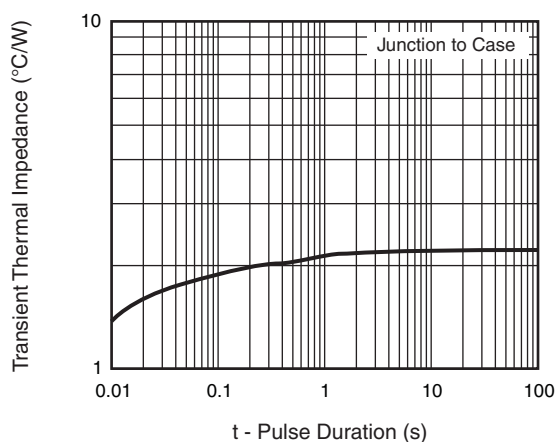
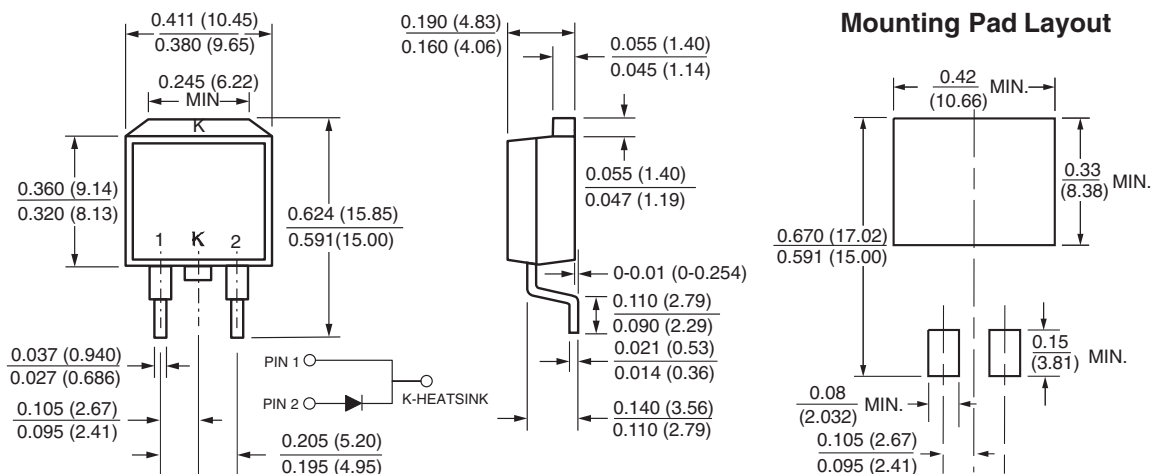


Fig. 6 - Typical Transient Thermal Impedance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-263AB





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