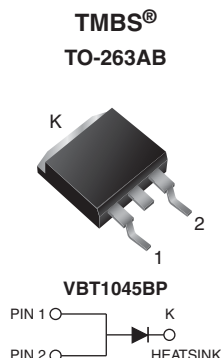


## Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low  $V_F = 0.41\text{ V}$  at  $I_F = 5\text{ A}$



### 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
- Compliant to RoHS Directive 2011/65/EU



**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         |        |
|---------------------------------|--------|
| $I_{F(DC)}$                     | 10 A   |
| $V_{RRM}$                       | 45 V   |
| $I_{FSM}$                       | 100 A  |
| $V_F$ at $I_F = 10\text{ A}$    | 0.52 V |
| $T_{OP}$ max. (AC mode)         | 150 °C |
| $T_J$ max. (DC forward current) | 200 °C |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                       |                   |               |      |
|--------------------------------------------------------------------------------------|-------------------|---------------|------|
| PARAMETER                                                                            | SYMBOL            | VBT1045BP     | UNIT |
| Maximum repetitive peak reverse voltage                                              | $V_{RRM}$         | 45            | V    |
| Maximum DC forward bypassing current (fig. 1)                                        | $I_{F(DC)}^{(1)}$ | 10            | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load   | $I_{FSM}$         | 100           | A    |
| Operating junction temperature range (AC mode)                                       | $T_{OP}$          | - 40 to + 150 | °C   |
| Junction temperature in DC forward current without reverse bias, $t \leq 1\text{ h}$ | $T_J^{(2)}$       | $\leq 200$    | °C   |

#### Notes

(1) With heatsink

(2) Meets the requirements of IEC 61215 ed.2 bypass diode thermal test

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

| PARAMETER                     | TEST CONDITIONS     | SYMBOL      | TYP. | MAX. | UNIT          |
|-------------------------------|---------------------|-------------|------|------|---------------|
| Instantaneous forward voltage | $I_F = 5\text{ A}$  | $V_F^{(1)}$ | 0.50 | -    | V             |
|                               | $I_F = 10\text{ A}$ |             | 0.57 | 0.68 |               |
|                               | $I_F = 5\text{ A}$  |             | 0.41 | -    |               |
|                               | $I_F = 10\text{ A}$ |             | 0.52 | 0.64 |               |
| Reverse current               | $V_R = 45\text{ V}$ | $I_R^{(2)}$ | -    | 500  | $\mu\text{A}$ |
|                               |                     |             | 5    | 15   | mA            |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL          | VBT1045BP | UNIT                 |
|----------------------------|-----------------|-----------|----------------------|
| Typical thermal resistance | $R_{\theta JC}$ | 3.0       | $^{\circ}\text{C/W}$ |

**ORDERING INFORMATION** (Example)

| PACKAGE  | PREFERRED P/N   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------|-----------------|-----------------|--------------|---------------|---------------|
| TO-263AB | VBT1045BP-E3/4W | 1.37            | 4W           | 50/tube       | Tube          |
| TO-263AB | VBT1045BP-E3/8W | 1.37            | 8W           | 800/reel      | Tape and reel |

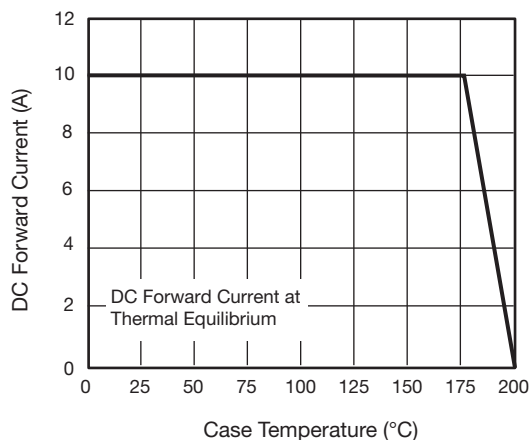
**RATINGS AND CHARACTERISTICS CURVES**( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

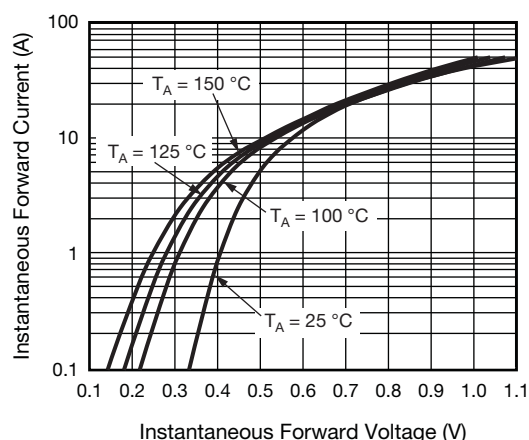
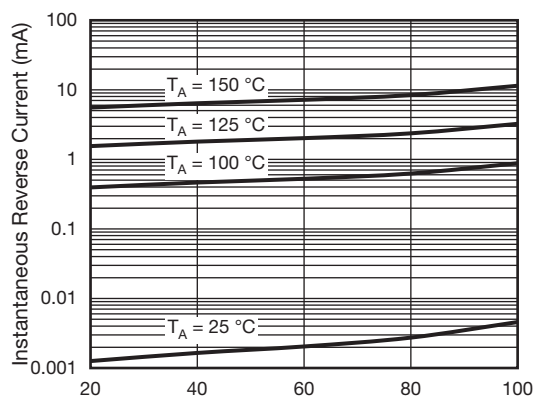


Fig. 2 - Typical Instantaneous Forward Characteristics



Percent of Rated Peak Reverse Voltage (%)

Fig. 3 - Typical Reverse Characteristics

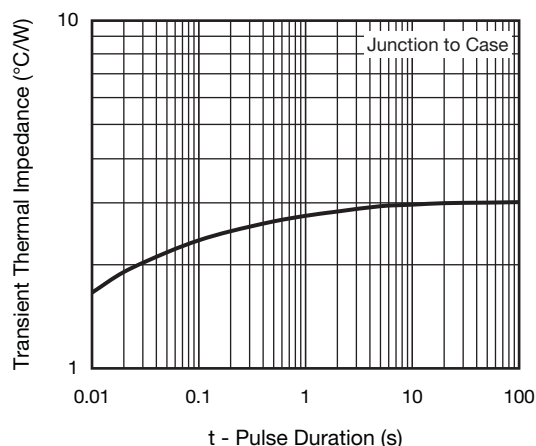


Fig. 5 - Typical Transient Thermal Impedance

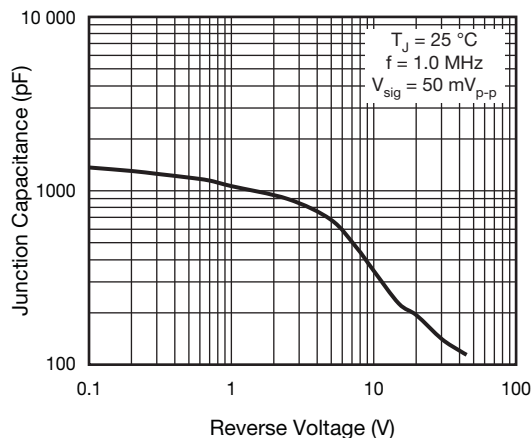
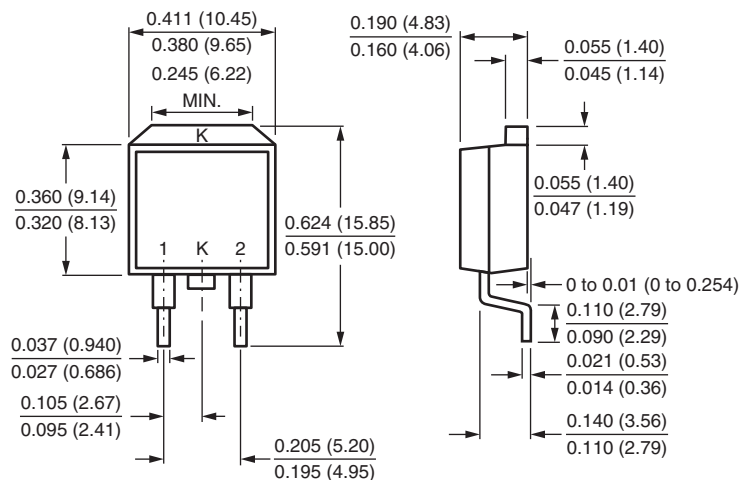


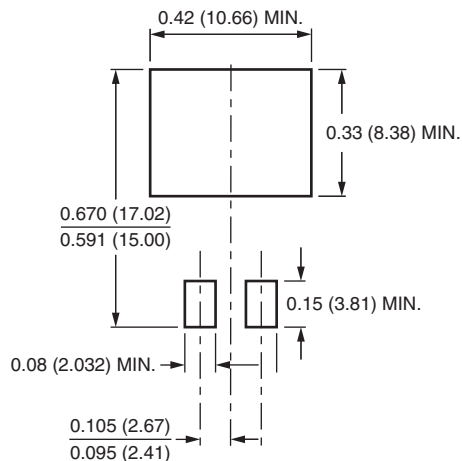
Fig. 4 - Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-263AB



### Mounting Pad Layout





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- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
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