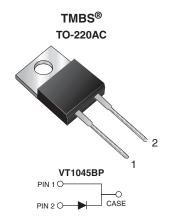
HALOGEN FREE



Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

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



| PRIMARY CHARACTERISTCS | | | | |
|--|--------|--|--|--|
| I _{F(DC)} | 10 A | | | |
| V_{RRM} | 45 V | | | |
| I _{FSM} | 100 A | | | |
| V _F at I _F = 10 A | 0.52 V | | | |
| T _{OP} max. (AC mode) | 150 °C | | | |
| T _J max. (DC forward current) | 200 °C | | | |

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

• Compliant to RoHS Directive 2011/65/EU

Halogen-free according to IEC 61249-2-21 definition

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-220AC

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 °C unless otherwise noted) | | | | |
|--|-------------------------------|---------------|------|--|
| PARAMETER | SYMBOL | VT1045BP | UNIT | |
| Maximum repetitive peak reverse voltage | V _{RRM} | 45 | V | |
| Maximum DC forward bypassing current (fig. 1) | I _{F(DC)} (1) | 10 | А | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I _{FSM} | 100 | А | |
| Operating junction temperature range (AC mode) | T _{OP} | - 40 to + 150 | °C | |
| Junction temperature in DC forward current without reverse bias, $t \le 1 \text{ h}$ | T _J ⁽²⁾ | ≤ 200 | °C | |

Notes

- (1) With heatsink
- (2) Meets the requirements of IEC 61215 ed.2 bypass diode thermal test



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| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | |
|--|-----------------------|-------------------------|---------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 5 A | T _A = 25 °C | - V _F ⁽¹⁾ | 0.50 | = | V |
| | I _F = 10 A | | | 0.57 | 0.68 | |
| | I _F = 5 A | T _A = 125 °C | | 0.41 | = | |
| | I _F = 10 A | | | 0.52 | 0.64 | |
| Reverse current | V _R = 45 V | T _A = 25 °C | I _R ⁽²⁾ | - | 500 | μΑ |
| | | T _A = 125 °C | | 5 | 15 | 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 | VT1045BP | UNIT |
| Typical thermal resistance | $R_{	heta JC}$ | 3.0 | °C/W |

| ORDERING INFORMATION (Example) | | | | | | | |
|--------------------------------|----------------|-----------------|--------------|---------------|---------------|--|--|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE | | |
| TO-220AC | VT1045BP-M3/4W | 1.87 | 4W | 50/tube | Tube | | |

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

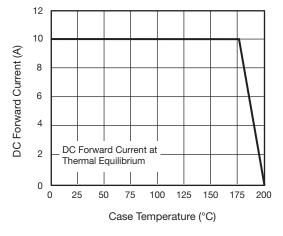


Fig. 1 - Maximum Forward Current Derating Curve

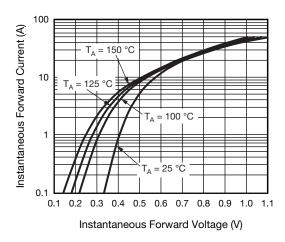
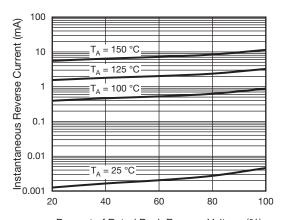


Fig. 2 - Typical Instantaneous Forward Characteristics



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Percent of Rated Peak Reverse Voltage (%) Fig. 3 - Typical Reverse Characteristics

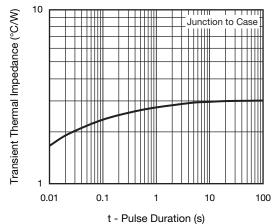


Fig. 5 - Typical Transient Thermal Impedance

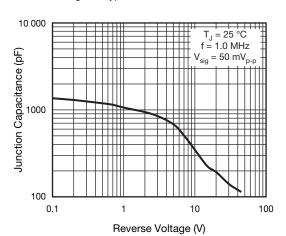
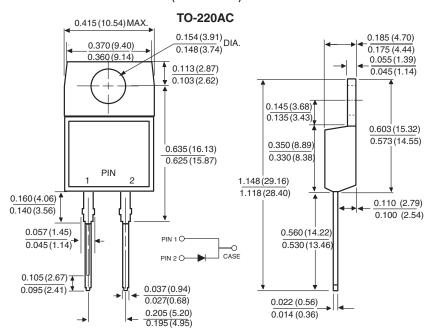


Fig. 4 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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