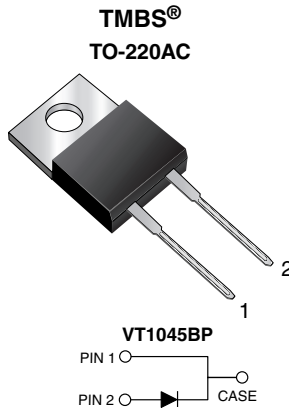


Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

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


RoHS
COMPLIANT
HALOGEN
FREE

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

PRIMARY CHARACTERISTICS

| | |
|---------------------------------|------------|
| $I_{F(AV)}$ | 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 |
| Package | TO-220AC |
| Diode variation | Single die |

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ 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 | 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, $t \leq 1\text{ h}$ | $T_J^{(2)}$ | ≤ 200 | °C |

Notes

⁽¹⁾ With heatsink

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



| 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 | μA |
| | | 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 _{θJC} | 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)

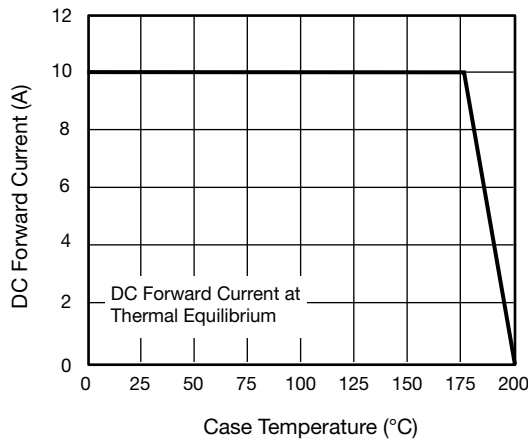


Fig. 1 - Maximum Forward Current Derating Curve

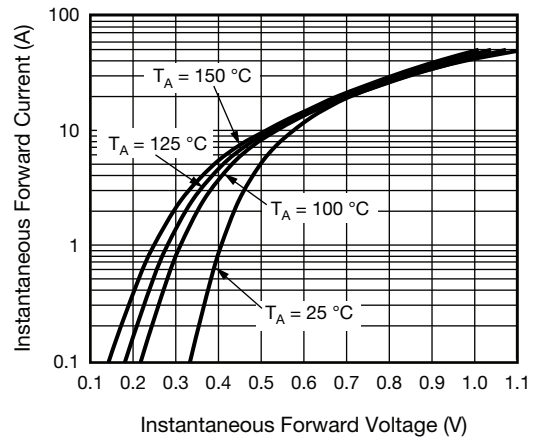
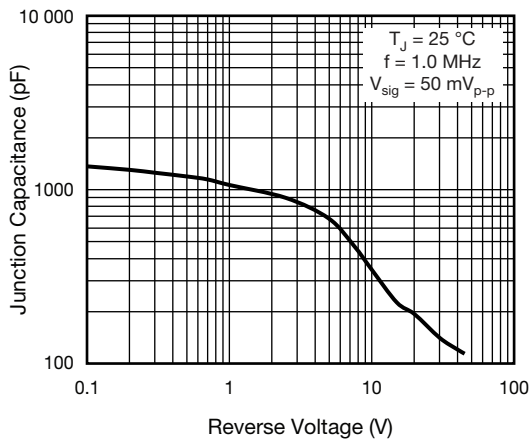
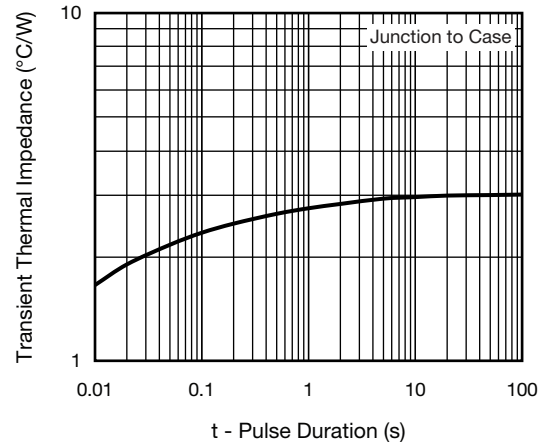
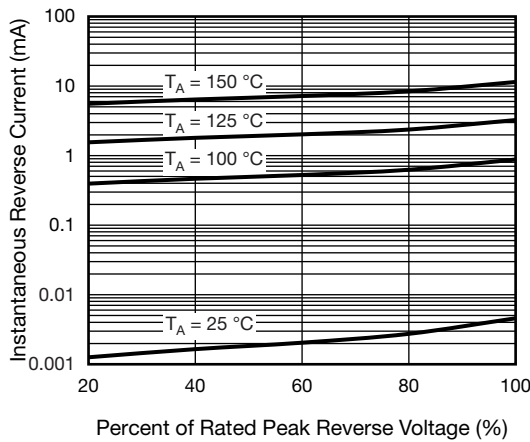
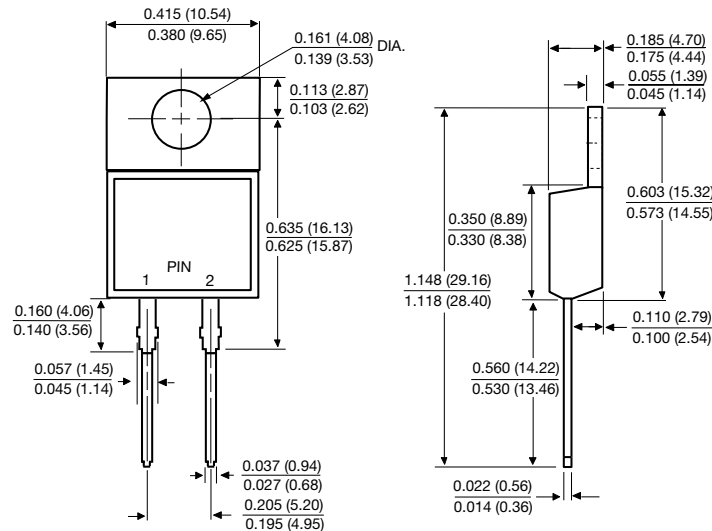


Fig. 2 - Typical Instantaneous Forward Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AC





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