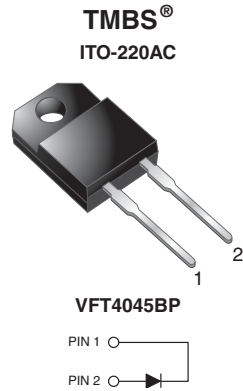


Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

 Ultra Low $V_F = 0.28\text{ V}$ at $I_F = 5\text{ A}$


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder bath temperature 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: ITO-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 | |
|---------------------------------|-----------|
| $I_{F(DC)}$ | 40 A |
| V_{RRM} | 45 V |
| I_{FSM} | 240 A |
| V_F at $I_F = 40\text{ A}$ | 0.51 V |
| T_{OP} max. (AC mode) | 150 °C |
| T_J max. (DC forward current) | 200 °C |
| Package | ITO-220AC |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | |
|--|----------------------------|-------------|------|
| PARAMETER | SYMBOL | VFT4045BP | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 45 | V |
| Maximum DC forward bypassing current (fig. 1) | $I_{F(DC)}$ ⁽¹⁾ | 40 | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 240 | A |
| Operating junction temperature range (AC mode) | T_{OP} | -40 to +150 | °C |
| Isolation voltage from thermal to heatsink $t = 1\text{ min}$ | V_{AC} | 1500 | V |
| 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 ($T_A = 25\text{ °C}$ unless otherwise noted) | | | | | |
|---|---------------------|----------------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 5\text{ A}$ | V_F ⁽¹⁾ | 0.41 | - | V |
| | $I_F = 20\text{ A}$ | | 0.50 | - | |
| | $I_F = 40\text{ A}$ | | 0.57 | 0.67 | |
| | $I_F = 5\text{ A}$ | | 0.28 | - | |
| | $I_F = 20\text{ A}$ | | 0.41 | - | |
| | $I_F = 40\text{ A}$ | | 0.51 | 0.63 | |
| Reverse current | $V_R = 45\text{ V}$ | I_R ⁽²⁾ | - | 3000 | μA |
| | | | 29 | 85 | mA |

Notes

⁽¹⁾ Pulse test: 300 μs 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 | VFT4045BP | UNIT |
| Typical thermal resistance | $R_{\theta JC}$ | 4.0 | $^\circ\text{C/W}$ |

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|-----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| ITO-220AC | VFT4045BP-M3/4W | 1.75 | 4W | 50/tube | Tube |

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

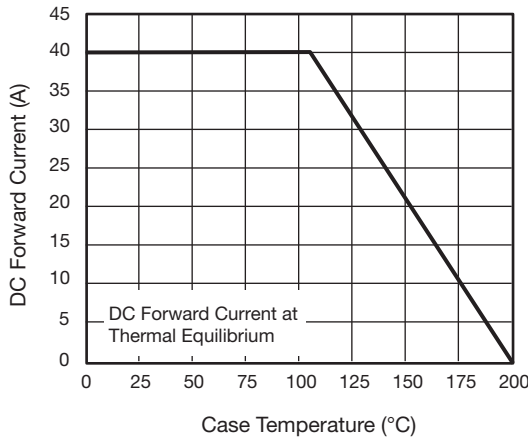


Fig. 1 - Maximum Forward Current Derating Curve

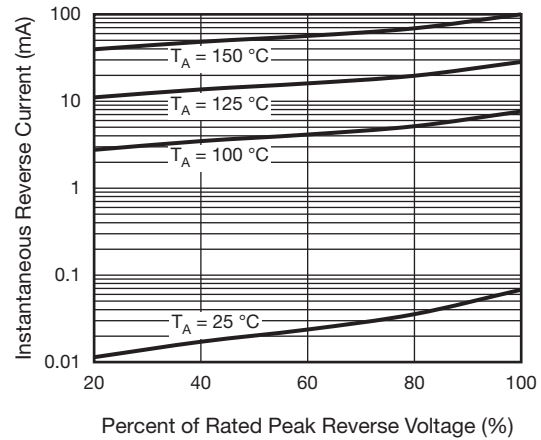


Fig. 3 - Typical Reverse Characteristics

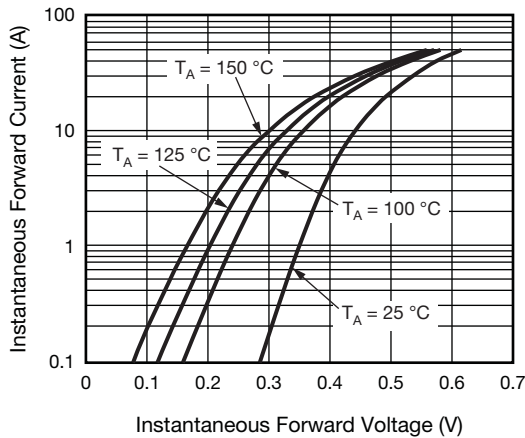


Fig. 2 - Typical Instantaneous Forward Characteristics

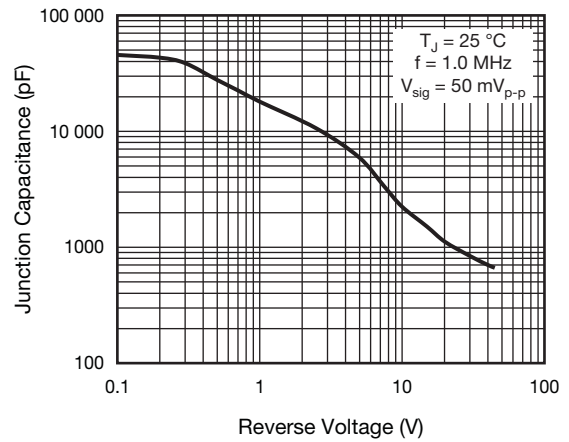


Fig. 4 - Typical Junction Capacitance

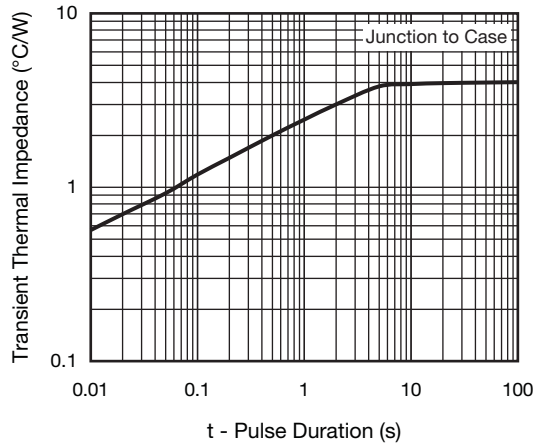
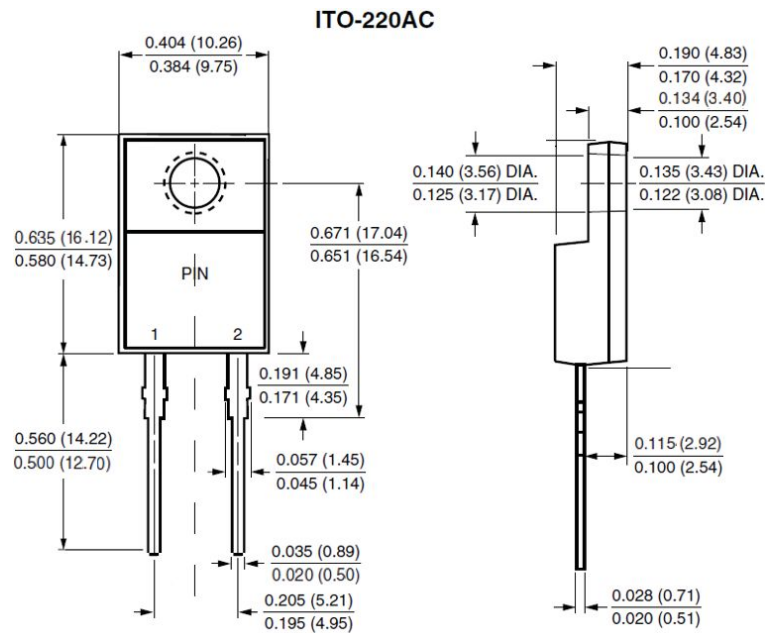


Fig. 5 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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