VFT1045BP

Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.41$ V at $I_F = 5$ A



www.vishay.com

| PRIMARY CHARACTERISTICS | | | | | |
|--|-----------|--|--|--|--|
| 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 | | | | |
| Package | ITO-220AC | | | | |
| Circuit configuration | Single | | | | |

FEATURES

- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses
- High efficiency operation



HALOGEN

FREE

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

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

| MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | | |
|---|-----------------------------------|-------------|------|--|--|
| PARAMETER | SYMBOL | VFT1045BP | 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 | | |
| Isolation voltage from termal to heatsink t = 1 min | V _{AC} | 1500 | V | | |
| Junction temperature in DC forward current without reverse bias, $t \leq 1 \ h$ | 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 CO | TEST CONDITIONS | | TYP. | MAX. | UNIT | |
| Instantaneous forward voltage | I _F = 5 A | T _A = 25 °C | VF ⁽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 _B = 45 V | T _A = 25 °C | I _R ⁽²⁾ | - | 500 | μA | |
| | v _R = 45 V | T _A = 125 °C | | 5 | 15 | mA | |

Notes

 $^{(1)}\,$ Pulse test: 300 μs pulse width, 1 % duty cycle

⁽²⁾ Pulse test: Pulse width \leq 40 ms

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For technical questions within your region: <u>DiodesAmericas@vishay.com</u>, <u>DiodesAsia@vishay.com</u>, <u>DiodesEurope@vishay.com</u> THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT <u>www.vishay.com/doc?91000</u>

VFT1045BP



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| THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | |
|--|---------------------|-----|------|--|
| PARAMETER | SYMBOL VFT1045BP | | | |
| Typical thermal resistance | $R_{	ext{	heta}JC}$ | 5.5 | °C/W | |

| ORDERING INFORMATION (Example) | | | | | | |
|--------------------------------|-----------------|-----------------|--------------|---------------|---------------|--|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE | |
| ITO-220AC | VFT1045BP-M3/4W | 1.75 | 4W | 50/tube | Tube | |

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

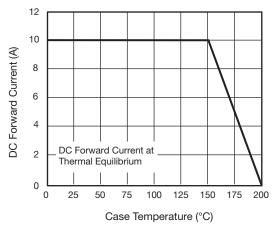
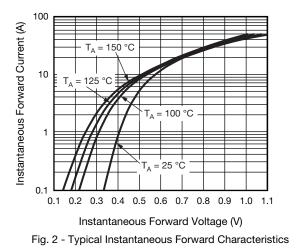
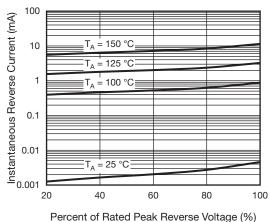
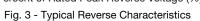
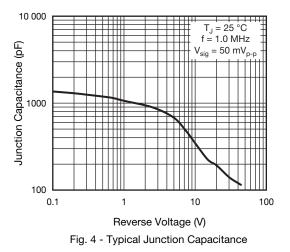


Fig. 1 - Maximum Forward Current Derating Curve













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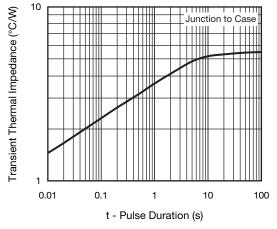
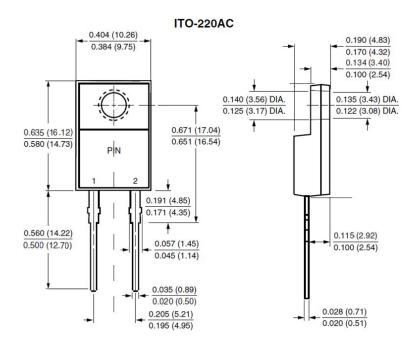


Fig. 5 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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