VFT3045CBP

Vishay General Semiconductor

Trench MOS Barrier Schottky Rectifier for PV Solar Cell Bypass Protection

Ultra Low $V_F = 0.30$ V at $I_F = 5.0$ A



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| PRIMARY CHARACTERISTICS | | | | | |
|--|----------------|--|--|--|--|
| I _{F(AV)} | 2 x 15 A | | | | |
| V _{RRM} | 45 V | | | | |
| I _{FSM} | 200 A | | | | |
| V_F at $I_F = 15 A$ | 0.39 V | | | | |
| T _{OP} max. (AC mode) | 150 °C | | | | |
| T _J max. (DC forward current) | 200 °C | | | | |
| Package | ITO-220AB | | | | |
| Circuit configuration | Common cathode | | | | |

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
- T_{.1} 200 °C max. in solar bypass mode application
- 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-220AB

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 | VFT3045CBP | UNIT | | |
| Maximum repetitive peak reverse voltage | V _{RRM} | 45 | V | | |
| Maximum average forward restified aurrent (fig. 1) per device | I (1) | 30 | А | | |
| Maximum average forward rectified current (fig. 1) per diode | I _{F(AV)} ⁽¹⁾ | 15 | | | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | I _{FSM} | 200 | А | | |
| Isolation voltage from terminal to heatsink, t = 1 min | V _{AC} | 1500 | V | | |
| Operating junction and storage temperature range (AC mode) | T _{OP} , T _{STG} | -40 to +150 | °C | | |
| 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 ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | | | | |
|---|------------------------|---|-------------------------------|------|------|------|--|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT | |
| Instantaneous forward voltage per diode | I _F = 5 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.42 | - | V | |
| | I _F = 7.5 A | | | 0.44 | - | | |
| | I _F = 15 A | | | 0.49 | 0.57 | | |
| | I _F = 5 A | T _A = 125 °C | | 0.30 | - | | |
| | I _F = 7.5 A | | | 0.33 | - | | |
| | I _F = 15 A | | | 0.39 | 0.48 | | |
| Reverse current per diode | V _B = 45 V | T _A = 25 °C T _A = 125 °C | I _R ⁽²⁾ | - | 2000 | μA | |
| | v _R = 43 V | | | 17 | 50 | mA | |

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

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

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BoHS

COMPLIANT HALOGEN

FREE



Vishay General Semiconductor

| THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted) | | | | | | |
|--|------------|---------------------|------------|------|--|--|
| PARAMETER | | SYMBOL | VFT3045CBP | UNIT | | |
| Typical thermal resistance | per diode | $R_{	ext{	heta}JC}$ | 6.0 | °C/W | | |
| | per device | | 4.0 | 0/11 | | |

| ORDERING INFORMATION (Example) | | | | | | | |
|--------------------------------|------------------|-----------------|--------------|---------------|---------------|--|--|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE | | |
| ITO-220AB | VFT3045CBP-M3/4W | 1.76 | 4W | 50/tube | Tube | | |

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

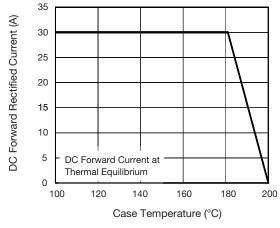


Fig. 1 - Maximum Forward Current Derating Curve

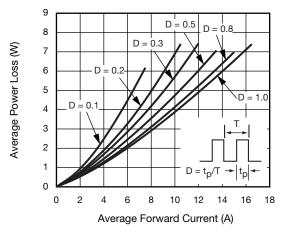


Fig. 2 - Forward Power Loss Characteristics Per Diode

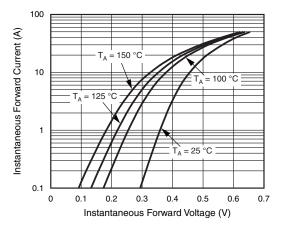


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

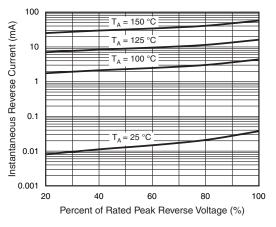
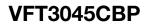


Fig. 4 - Typical Reverse Characteristics Per Diode

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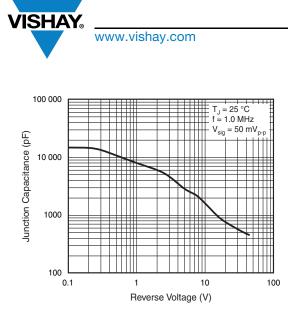


Fig. 5 - Typical Junction Capacitance Per Diode

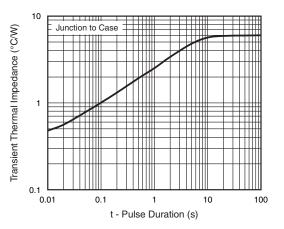
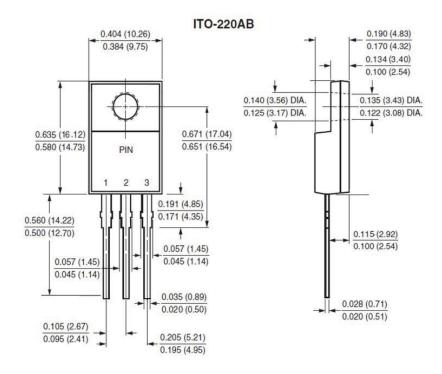


Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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