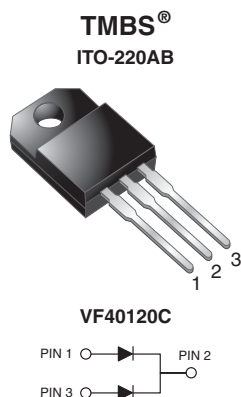


# Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.43\text{ V}$  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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

## PRIMARY CHARACTERISTICS

|                              |                     |
|------------------------------|---------------------|
| $I_{F(AV)}$                  | 2 x 20 A            |
| $V_{RRM}$                    | 120 V               |
| $I_{FSM}$                    | 250 A               |
| $V_F$ at $I_F = 20\text{ A}$ | 0.63 V              |
| $T_J$ max.                   | 150 °C              |
| Package                      | ITO-220AB           |
| Diode variation              | Dual common cathode |

## 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 ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                                                                          | SYMBOL         | VF40120C    | UNIT       |
|------------------------------------------------------------------------------------|----------------|-------------|------------|
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 120         | V          |
| Maximum average forward rectified current<br>(fig. 1)                              | $I_{F(AV)}$    | 40          | A          |
| per device                                                                         |                | 20          |            |
| per diode                                                                          |                |             |            |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 250         | A          |
| Voltage rating of change (rated $V_R$ )                                            | $dV/dt$        | 10 000      | V/ $\mu$ s |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -40 to +150 | °C         |

| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                      |                                     |      |      |               |
|------------------------------------------------------------------------------------------------|----------------------|-------------------------------------|------|------|---------------|
| PARAMETER                                                                                      | TEST CONDITIONS      | SYMBOL                              | TYP. | MAX. | UNIT          |
| Instantaneous forward voltage per diode                                                        | $I_F = 5\text{ A}$   | $V_F^{(1)}$                         | 0.50 | -    | V             |
|                                                                                                | $I_F = 10\text{ A}$  |                                     | 0.60 | -    |               |
|                                                                                                | $I_F = 20\text{ A}$  |                                     | 0.78 | 0.88 |               |
|                                                                                                | $I_F = 5\text{ A}$   | $T_A = 125\text{ }^{\circ}\text{C}$ | 0.43 | -    |               |
|                                                                                                | $I_F = 10\text{ A}$  |                                     | 0.53 | -    |               |
|                                                                                                | $I_F = 20\text{ A}$  |                                     | 0.63 | 0.71 |               |
| Reverse current per diode                                                                      | $V_R = 90\text{ V}$  | $T_A = 25\text{ }^{\circ}\text{C}$  | 19   | -    | $\mu\text{A}$ |
|                                                                                                |                      | $T_A = 125\text{ }^{\circ}\text{C}$ | 10   | -    | mA            |
|                                                                                                | $V_R = 120\text{ V}$ | $T_A = 25\text{ }^{\circ}\text{C}$  | -    | 500  | $\mu\text{A}$ |
|                                                                                                |                      | $T_A = 125\text{ }^{\circ}\text{C}$ | 22   | 45   | mA            |

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                 |          |                      |
|---------------------------------------------------------------------------------------------|-----------------|----------|----------------------|
| PARAMETER                                                                                   | SYMBOL          | VF40120C | UNIT                 |
| Typical thermal resistance per diode                                                        | $R_{\theta JC}$ | 4.0      | $^{\circ}\text{C/W}$ |

| <b>ORDERING INFORMATION</b> (Example) |                |                 |              |               |               |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| ITO-220AB                             | VF40120C-M3/4W | 1.76            | 4W           | 50/tube       | Tube          |

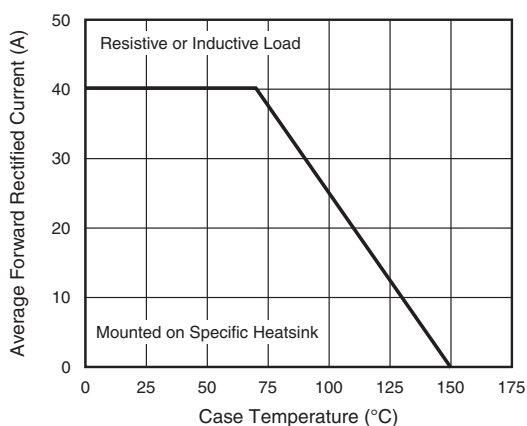
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

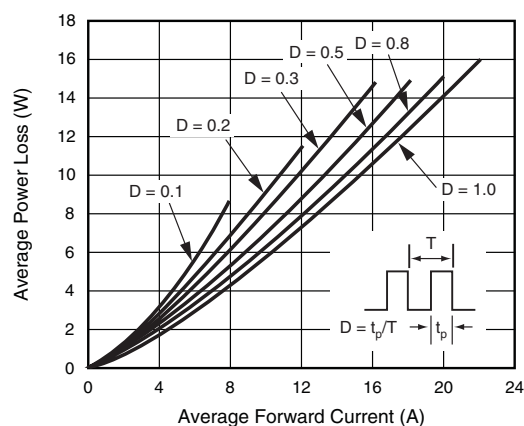


Fig. 2 - Forward Power Loss Characteristics Per Diode

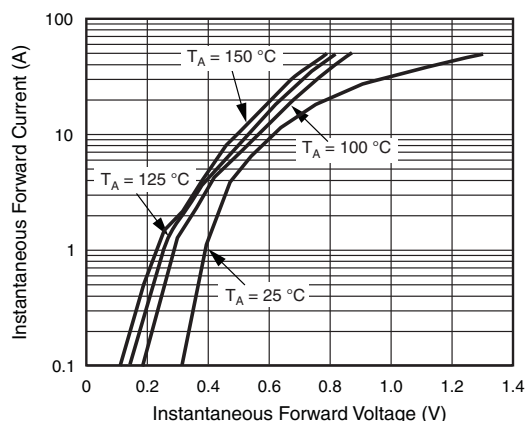


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

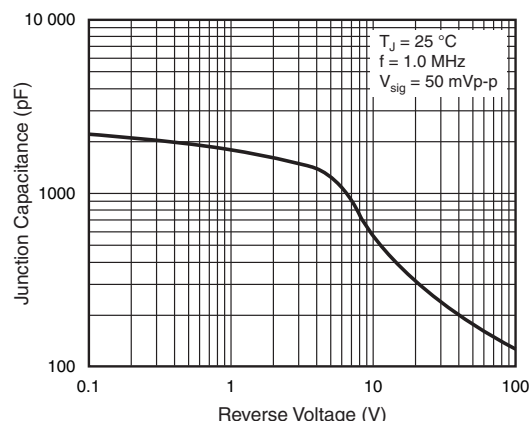


Fig. 5 - Typical Junction Capacitance Per Diode

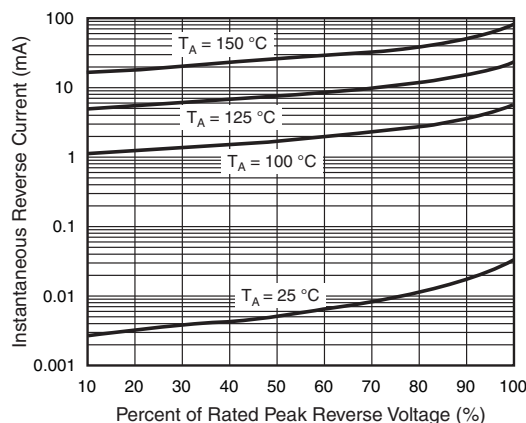


Fig. 4 - Typical Reverse Characteristics Per Diode

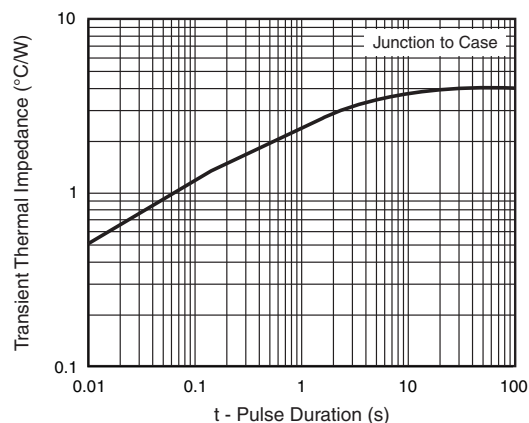
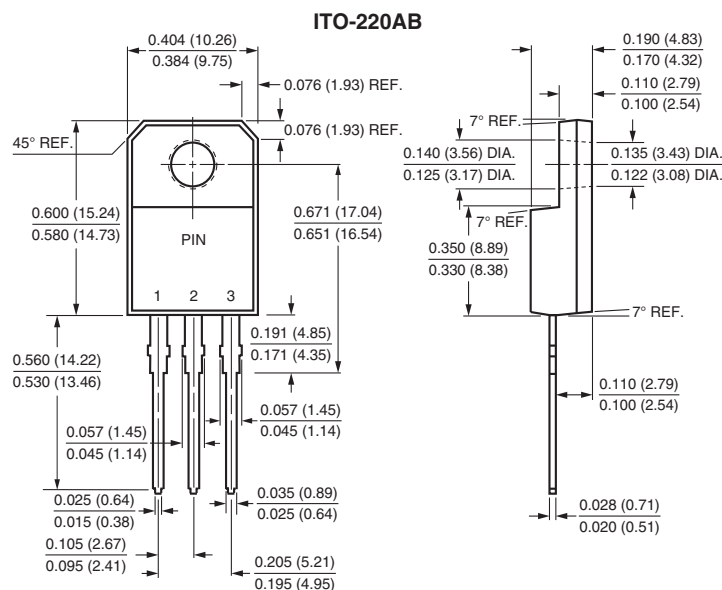


Fig. 6 - Typical Transient Thermal Impedance Per Diode

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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