

# ANTREX Electronics

Electronic Components Sourcing Information

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## Product Reference Information

**Part Number:** VF20120S-M3/4W  
**Manufacturer:** Vishay General Semiconductor - Diodes Division  
**Package:** TO-220-3 Full Pack, Isolated Tab  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/vishay-general-semiconductor-diodes-division/vf20120s-m3-4w.html>

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## Contact Information

Email: [info@antrexco.com](mailto:info@antrexco.com)

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New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

### Note:

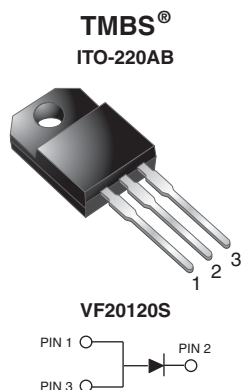
This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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# High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.50\text{ V}$  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

|                              |           |
|------------------------------|-----------|
| $I_{F(AV)}$                  | 20 A      |
| $V_{RRM}$                    | 120 V     |
| $I_{FSM}$                    | 200 A     |
| $V_F$ at $I_F = 20\text{ A}$ | 0.73 V    |
| $T_J$ max.                   | 150 °C    |
| Package                      | ITO-220AB |
| Diode variation              | Single    |

## 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         | VF20120S    | UNIT       |
|------------------------------------------------------------------------------------|----------------|-------------|------------|
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 120         | V          |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | 20          | A          |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 200         | A          |
| Voltage rate of change (rated $V_R$ )                                              | $dV/dt$        | 10 000      | V/ $\mu$ s |
| Isolation voltage from terminal to heatsink $t = 1\text{ min}$                     | $V_{AC}$       | 1500        | V          |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -55 to +150 | °C         |

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.57 | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                               | 0.71 | -    |      |
|                                                                            | I <sub>F</sub> = 20 A  |                         |                               | 0.99 | 1.12 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.50 | -    |      |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                               | 0.61 | -    |      |
|                                                                            | I <sub>F</sub> = 20 A  |                         |                               | 0.73 | 0.81 |      |
| Reverse current                                                            | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 10   | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 6    | -    | mA   |
|                                                                            | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                               | -    | 300  | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 14   | 30   | 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          | VF20120S | UNIT                 |
| Typical thermal resistance                                                                  | $R_{\theta JC}$ | 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                             | VF20120S-M3/4W | 1.75            | 4W           | 50/tube       | Tube          |

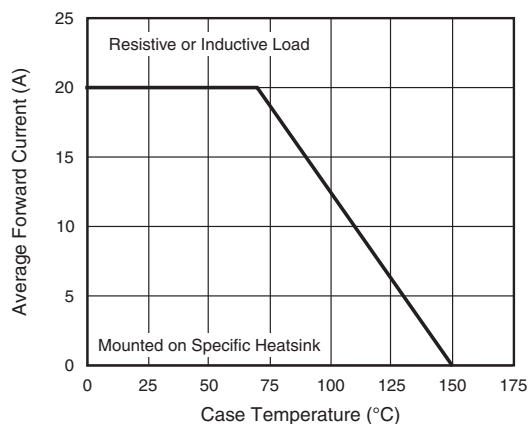
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

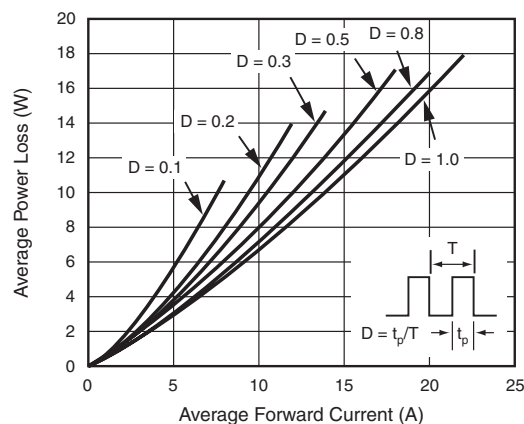


Fig. 2 - Forward Power Dissipation Characteristics

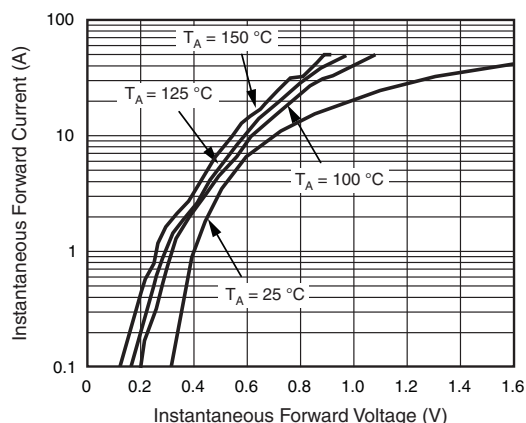


Fig. 3 - Typical Instantaneous Forward Characteristics

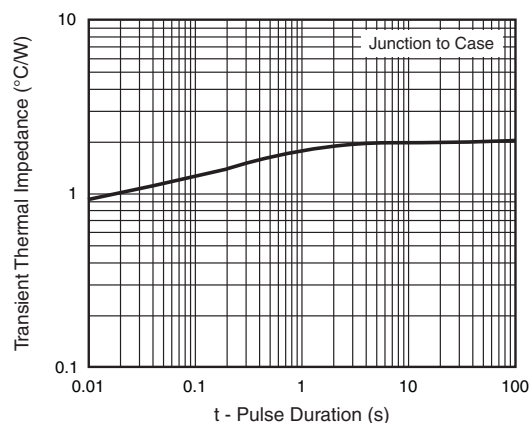


Fig. 5 - Typical Transient Thermal Impedance

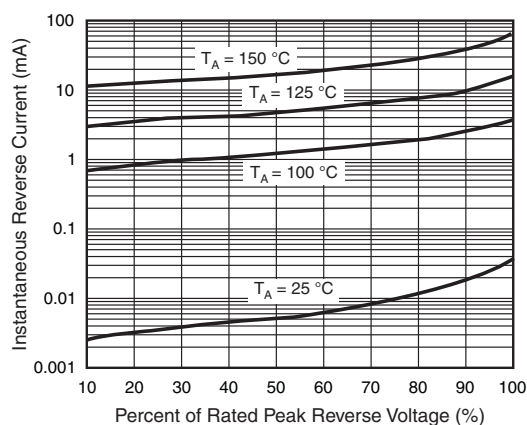


Fig. 4 - Typical Reverse Characteristics

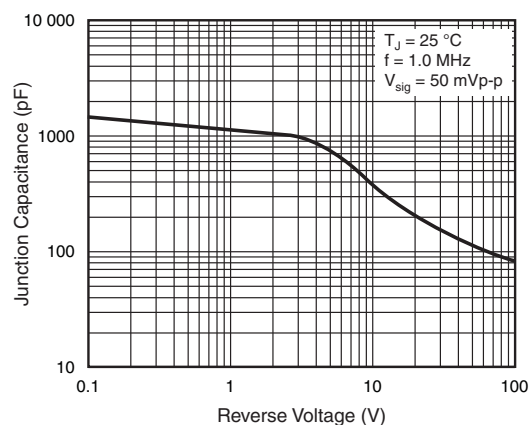
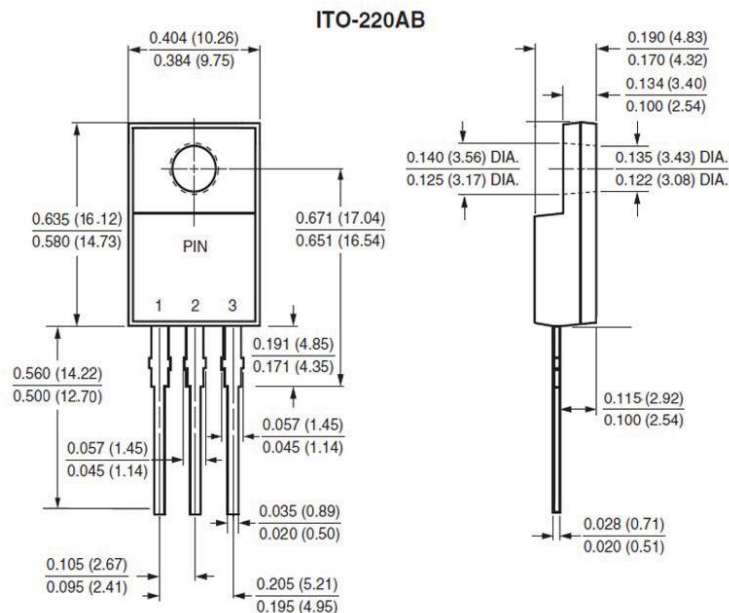


Fig. 6 - Typical Junction Capacitance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)




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