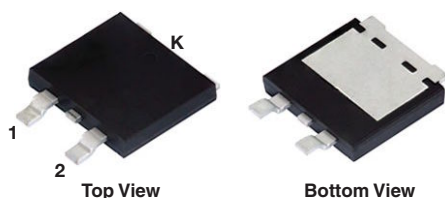


# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.51\text{ V}$  at  $I_F = 5.0\text{ A}$

## eSMP® Series SMPD (TO-263AC)



## DESIGN SUPPORT TOOLS AVAILABLE


[3D Models](#)

| PRIMARY CHARACTERISTICS                                |                        |
|--------------------------------------------------------|------------------------|
| $I_{F(AV)}$                                            | $2 \times 10\text{ A}$ |
| $V_{RRM}$                                              | 100 V                  |
| $I_{FSM}$                                              | 120 A                  |
| $V_F$ at $I_F = 10\text{ A}$ ( $T_A = 125\text{ °C}$ ) | 0.63 V                 |
| $T_J$ max.                                             | 150 °C                 |
| Package                                                | SMPD (TO-263AC)        |
| Circuit configuration                                  | Common cathode         |

## FEATURES

- Trench MOS Schottky technology
- Very low profile - typical height of 1.7 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available:  
- Automotive ordering code: base P/NHM3
- 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 in commercial, industrial, and automotive application.

## MECHANICAL DATA

**Case:** SMPD (TO-263AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meet JESD 201 class 2 whisker test

**Polarity:** as marked

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                 |             |      |
|------------------------------------------------------------------------------------|-----------------|-------------|------|
| PARAMETER                                                                          | SYMBOL          | V20D100C    | UNIT |
| Device marking code                                                                |                 | V20D100C    |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$       | 100         | V    |
| Maximum average forward rectified current<br>(fig. 1)                              | $I_{F(AV)}$ (1) | 20          | A    |
|                                                                                    |                 | 10          |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$       | 120         | A    |
| Operating junction temperature range                                               | $T_J$ (2)       | -40 to +150 | °C   |
| Storage temperature range                                                          | $T_{STG}$       | -55 to +150 |      |

## Notes

(1) Mounted on infinite heatsink

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$

| <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                                                        | $I_F = 5\text{ A}$                  | $V_F^{(1)}$ | 0.56 | -    | V    |
|                                                                                                | $I_F = 10\text{ A}$                 |             | 0.71 | 0.79 |      |
|                                                                                                | $I_F = 5\text{ A}$                  |             | 0.51 | -    |      |
|                                                                                                | $I_F = 10\text{ A}$                 |             | 0.63 | 0.71 |      |
| Reverse current at rated $V_R$ per diode                                                       | $V_R = 70\text{ V}$                 | $I_R^{(2)}$ | 0.01 | -    | mA   |
|                                                                                                | $T_A = 25\text{ }^{\circ}\text{C}$  |             | 4    | -    |      |
|                                                                                                | $T_A = 125\text{ }^{\circ}\text{C}$ |             | -    | 0.3  |      |
|                                                                                                | $V_R = 100\text{ V}$                |             | 9    | 20   |      |
| Typical junction capacitance                                                                   | 4.0 V, 1 MHz                        | $C_J$       | 900  | -    | pF   |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
(2) Pulse test: Pulse width  $\leq 5\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                          |          |                      |
|---------------------------------------------------------------------------------------------|--------------------------|----------|----------------------|
| PARAMETER                                                                                   | SYMBOL                   | V20D100C | UNIT                 |
| Typical thermal resistance per device                                                       | $R_{\theta JC}^{(1)}$    | 1.8      | $^{\circ}\text{C/W}$ |
|                                                                                             | $R_{\theta JA}^{(2)(3)}$ | 48       |                      |

**Notes**

- (1) Mounted on infinite heatsink  
(2) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$   
(3) Free air, without heatsink

| <b>ORDERING INFORMATION</b> (Example) |                 |              |               |                                    |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V20D100C-M3/I                         | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |
| V20D100CHM3/I <sup>(1)</sup>          | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

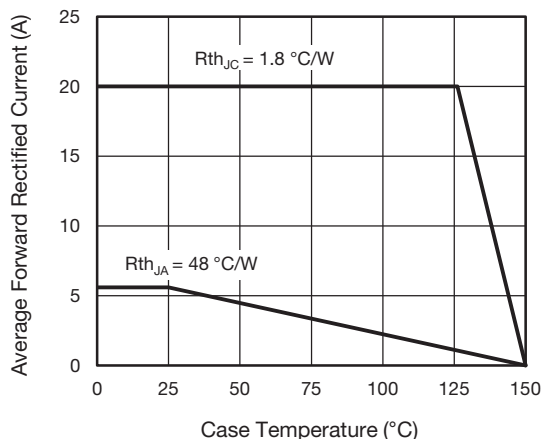
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

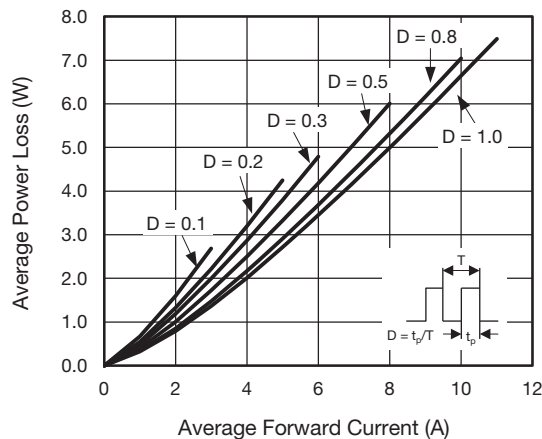


Fig. 2 - Average Power Loss Characteristics

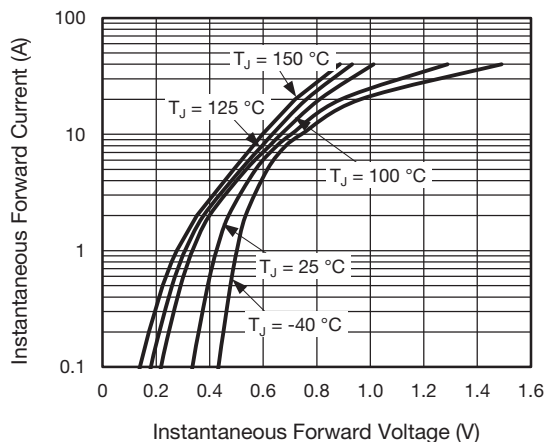


Fig. 3 - Typical Instantaneous Forward Characteristics

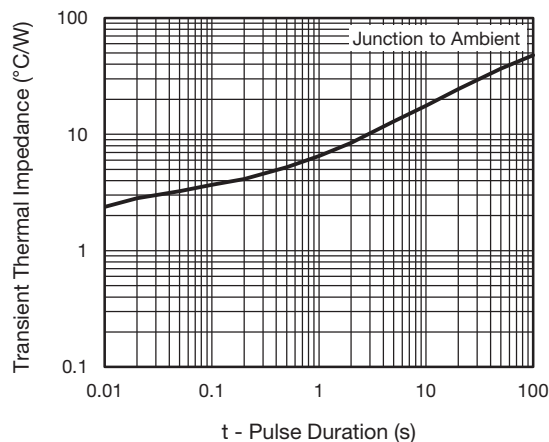


Fig. 6 - Typical Transient Thermal Impedance

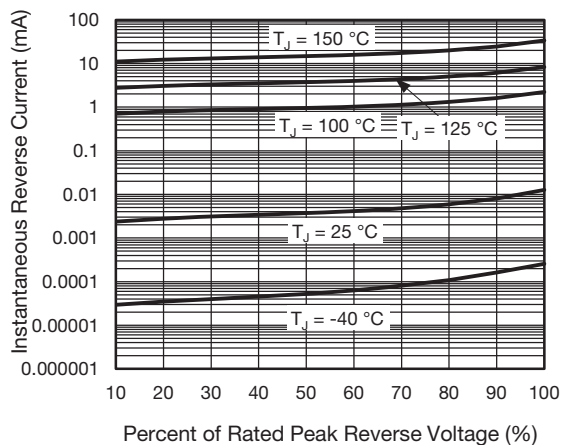


Fig. 4 - Typical Reverse Leakage Characteristics

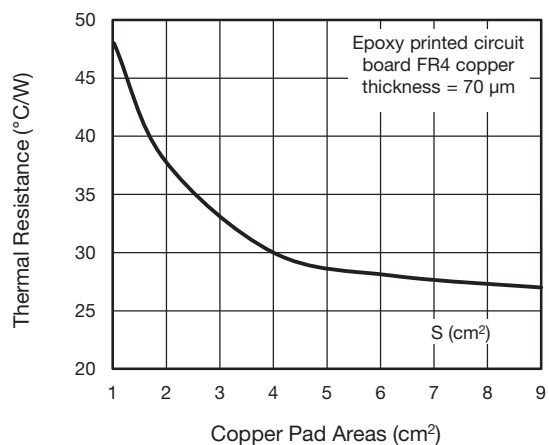


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

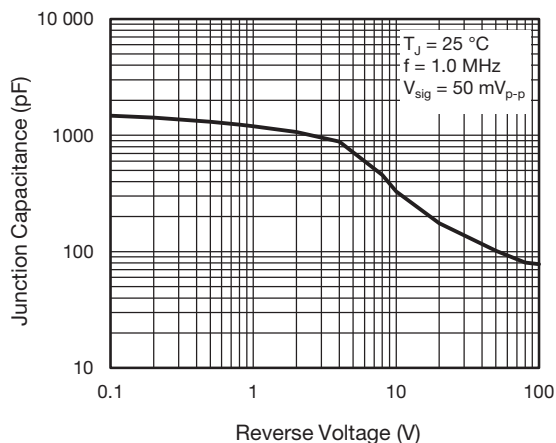
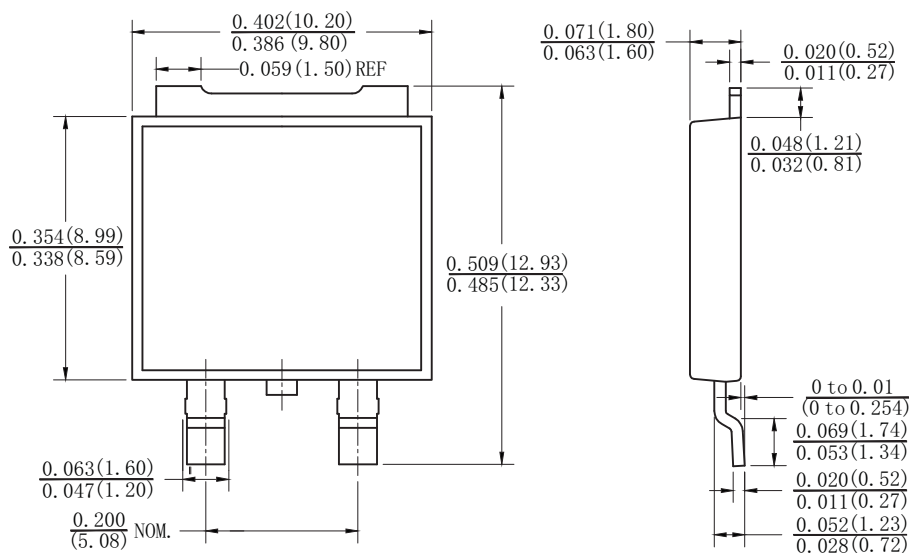
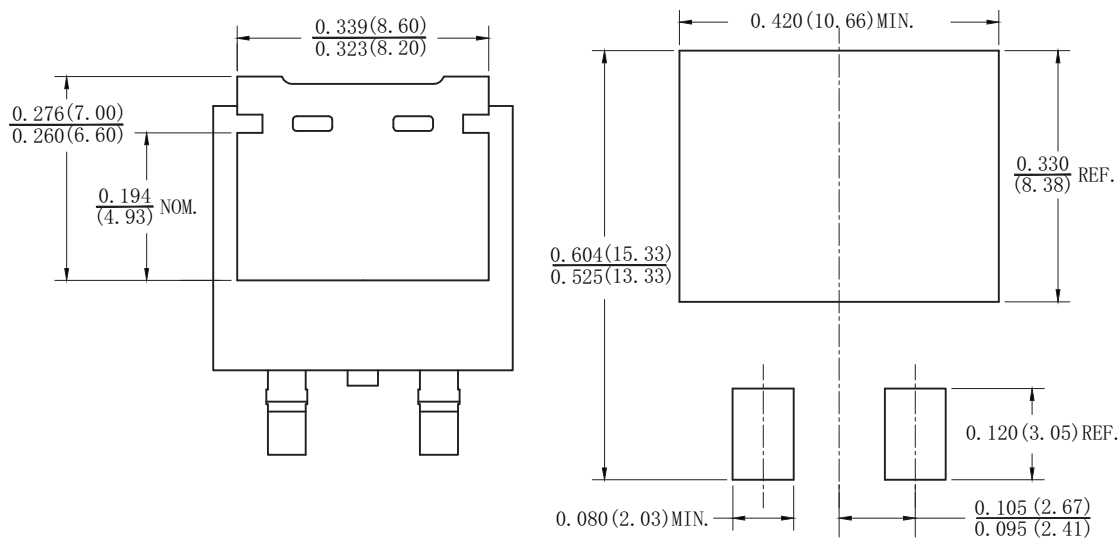


Fig. 5 - Typical Junction Capacitance

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

**SMPD (TO-263AC)**

**Mounting Pad Layout**




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