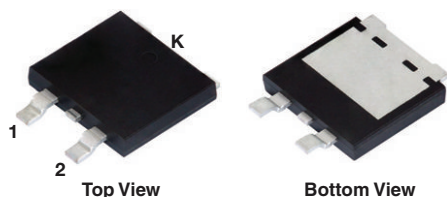


# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.36\text{ V}$  at  $I_F = 5\text{ A}$

**eSMP® Series**  
**SMPD (TO-263AC)**



## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                                |                 |
|--------------------------------------------------------|-----------------|
| $I_{F(AV)}$                                            | 2 x 30 A        |
| $V_{RRM}$                                              | 100 V           |
| $I_{FSM}$                                              | 320 A           |
| $V_F$ at $I_F = 30\text{ A}$ ( $T_A = 125\text{ °C}$ ) | 0.66 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 meets JESD 201 class 2 whisker test

**Polarity:** as marked

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                    |                |             |            |
|-----------------------------------------------------------------------------------|----------------|-------------|------------|
| PARAMETER                                                                         | SYMBOL         | V60D100C    | UNIT       |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 100         | V          |
| Maximum average forward rectified current<br>(fig. 1)                             | $I_{F(AV)}$    | 60          | A          |
|                                                                                   |                | 30          |            |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 320         | A          |
| Voltage rate 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         |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.45 | -    | V    |
|                                                                            | I <sub>F</sub> = 15 A  |                         |                               | 0.62 | -    |      |
|                                                                            | I <sub>F</sub> = 30 A  |                         |                               | 0.75 | 0.81 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.36 | -    |      |
|                                                                            | I <sub>F</sub> = 15 A  |                         |                               | 0.54 | -    |      |
|                                                                            | I <sub>F</sub> = 30 A  |                         |                               | 0.66 | 0.73 |      |
| Reverse current at rated V <sub>R</sub> per diode                          | V <sub>R</sub> = 70 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 12   | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 11   | -    | mA   |
|                                                                            | V <sub>R</sub> = 100 V | T <sub>A</sub> = 25 °C  |                               | -    | 1000 | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 27   | 85   | mA   |

**Notes**

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

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |            |                          |          |                      |
|--------------------------------------------------------------------------------------|------------|--------------------------|----------|----------------------|
| PARAMETER                                                                            |            | SYMBOL                   | V60D100C | UNIT                 |
| Typical thermal resistance                                                           | per diode  | $R_{\theta JC}^{(3)}$    | 1.8      | $^{\circ}\text{C/W}$ |
|                                                                                      | per device | $R_{\theta JC}^{(3)}$    | 0.95     |                      |
|                                                                                      | per device | $R_{\theta JM}^{(2)}$    | 3        |                      |
|                                                                                      | per device | $R_{\theta JA}^{(1)(2)}$ | 45       |                      |

**Notes**

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$   
 (2) Free air mounted on recommended pad size 2 OZ. FR4 PCB; thermal resistance  $R_{\theta JA}$  - junction to ambient; thermal resistance  $R_{\theta JM}$  - junction  
 (3) Thermal resistance  $R_{\theta JC}$  - junction to K (heatsink). Mounted on infinite heatsink

| ORDERING INFORMATION (Example) |                              |                 |              |               |                                    |
|--------------------------------|------------------------------|-----------------|--------------|---------------|------------------------------------|
| PACKAGE                        | PREFERRED P/N                | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| SMPD (TO-263AC)                | V60D100C-M3/I                | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |
| SMPD (TO-263AC)                | V60D100CHM3/I <sup>(1)</sup> | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

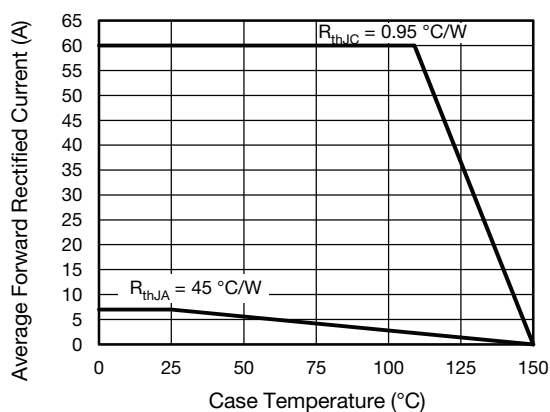
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

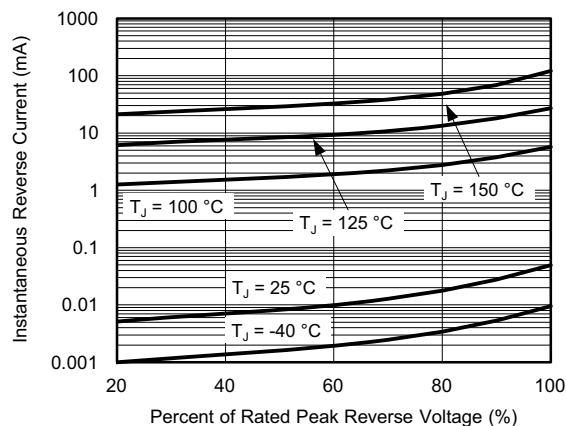


Fig. 4 - Typical Reverse Characteristics Per Diode

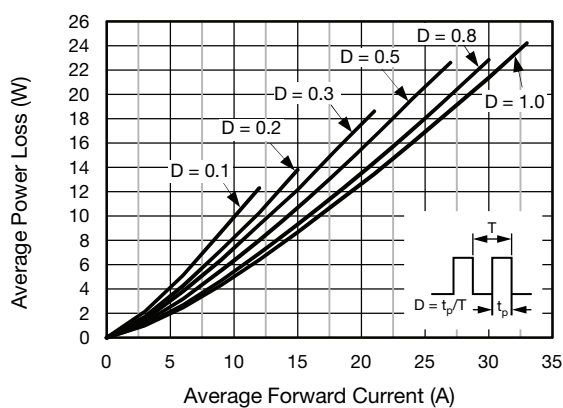


Fig. 2 - Forward Power Loss Characteristics Per Diode

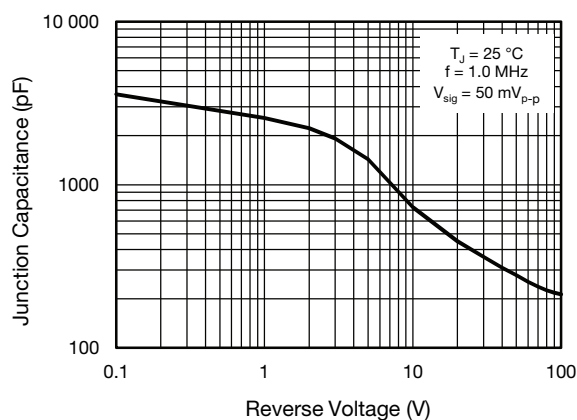


Fig. 5 - Typical Junction Capacitance Per Diode

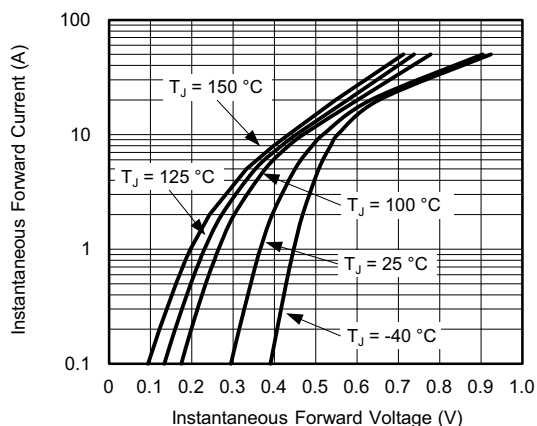


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

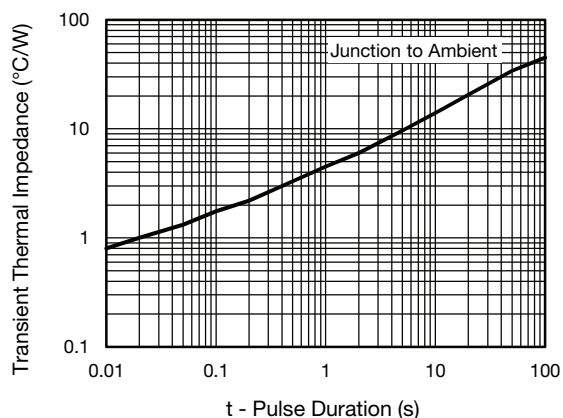


Fig. 6 - Typical Transient Thermal Impedance Per Device

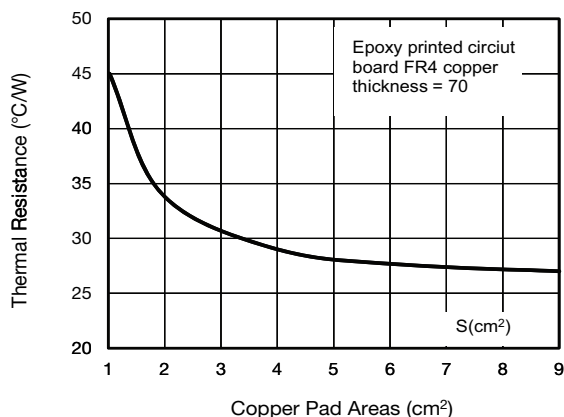
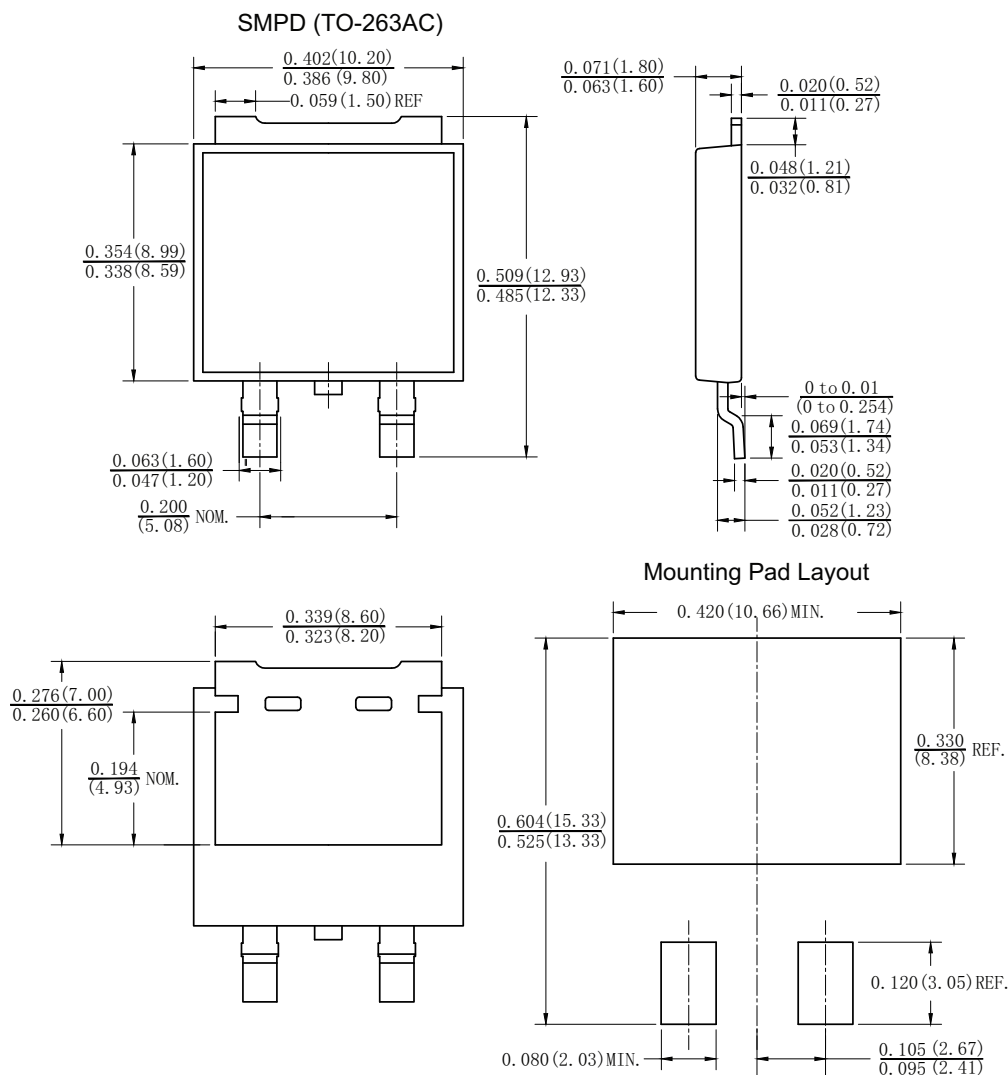


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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