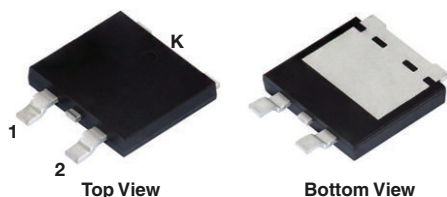


# Dual Low-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.35\text{ V}$  at  $I_F = 5.0\text{ A}$

## eSMP® Series SMPD (TO-263AC)



## 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**

## LINKS TO ADDITIONAL RESOURCES



## 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.

## PRIMARY CHARACTERISTICS

|                                                        |                 |
|--------------------------------------------------------|-----------------|
| $I_{F(AV)}$                                            | 2 x 30 A        |
| $V_{RRM}$                                              | 60 V            |
| $I_{FSM}$                                              | 320 A           |
| $V_F$ at $I_F = 30\text{ A}$ ( $T_J = 125\text{ °C}$ ) | 0.57 V          |
| $T_J$ max.                                             | 175 °C          |
| Package                                                | SMPD (TO-263AC) |
| Circuit configuration                                  | Common cathode  |

## 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            | V60DM63C    | UNIT |
|----------------------------------------------------------------------------------------------|-------------------|-------------|------|
| Device marking code                                                                          |                   | V60DM63C    |      |
| Maximum repetitive peak reverse voltage                                                      | $V_{RRM}$         | 60          | V    |
| Maximum average forward rectified current<br>per device<br>(fig. 1)<br>per diode             | $I_{F(AV)}^{(1)}$ | 60<br>30    | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$         | 320         | A    |
| Operating junction temperature range                                                         | $T_J^{(2)}$       | -40 to +175 | °C   |
| Storage temperature range                                                                    | $T_{STG}$         | -55 to +175 |      |

## Notes

(1) Mounted on infinite heatsink

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

**ELECTRICAL CHARACTERISTICS** ( $T_J = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                                         | TEST CONDITIONS       |                         | SYMBOL                        | TYP. | MAX.  | UNIT |
|---------------------------------------------------|-----------------------|-------------------------|-------------------------------|------|-------|------|
| Instantaneous forward voltage per diode           | I <sub>F</sub> = 5 A  | T <sub>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.47 | -     | V    |
|                                                   | I <sub>F</sub> = 15 A |                         |                               | 0.55 | -     |      |
|                                                   | I <sub>F</sub> = 30 A |                         |                               | 0.63 | 0.70  |      |
|                                                   | I <sub>F</sub> = 5 A  | T <sub>J</sub> = 125 °C |                               | 0.35 | -     |      |
|                                                   | I <sub>F</sub> = 15 A |                         |                               | 0.46 | -     |      |
|                                                   | I <sub>F</sub> = 30 A |                         |                               | 0.57 | 0.63  |      |
| Reverse current at rated V <sub>R</sub> per diode | V <sub>R</sub> = 60 V | T <sub>J</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 0.055 | mA   |
|                                                   |                       | T <sub>J</sub> = 125 °C |                               | 3    | 10    |      |
| Typical junction capacitance per diode            | 4.0 V, 1 MHz          |                         | C <sub>J</sub>                | 4400 | -     | pF   |

**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                   | V60DM63C | UNIT                 |
|---------------------------------------|--------------------------|----------|----------------------|
| Typical thermal resistance per device | $R_{\theta JC}^{(1)}$    | 0.8      | $^{\circ}\text{C/W}$ |
|                                       | $R_{\theta JA}^{(2)(3)}$ | 50       |                      |

**Notes**

(1) Mounted on infinite heatsink

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

(3) Free air, without heatsink

**ORDERING INFORMATION** (Example)

| PREFERRED P/N                | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|------------------------------|-----------------|--------------|---------------|------------------------------------|
| V60DM63C-M3/I                | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |
| V60DM63CHM3/I <sup>(1)</sup> | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

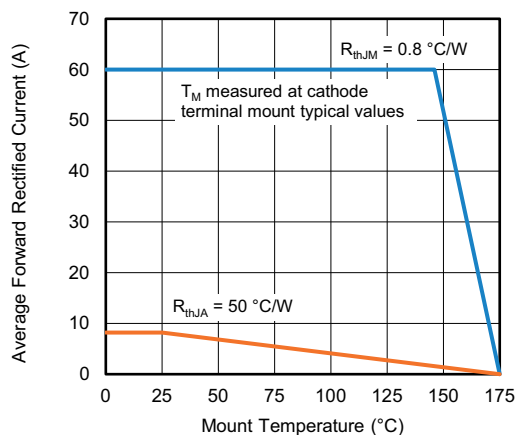
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

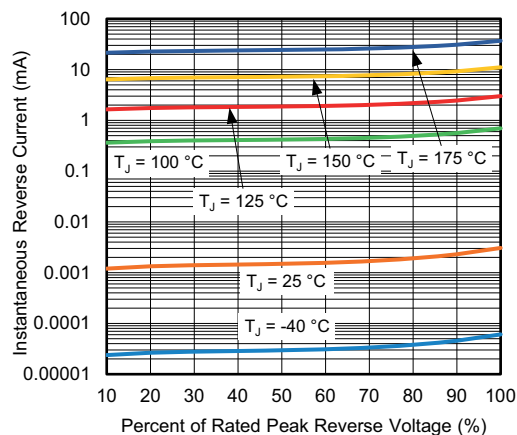


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

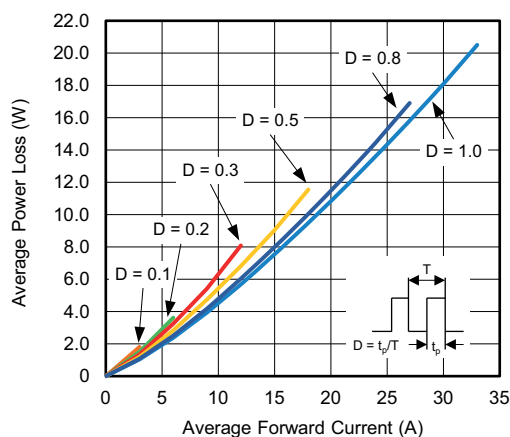


Fig. 2 - Average Power Loss Characteristics Per Diode

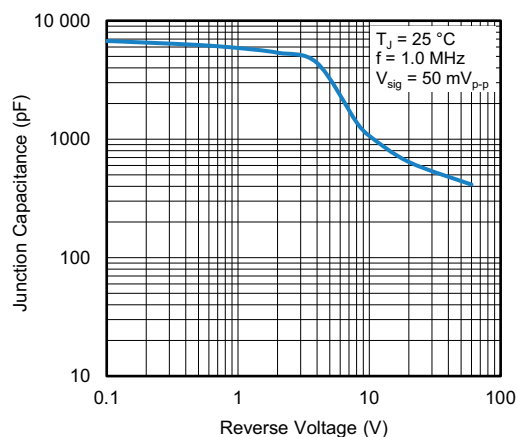


Fig. 5 - Typical Junction Capacitance Per Diode

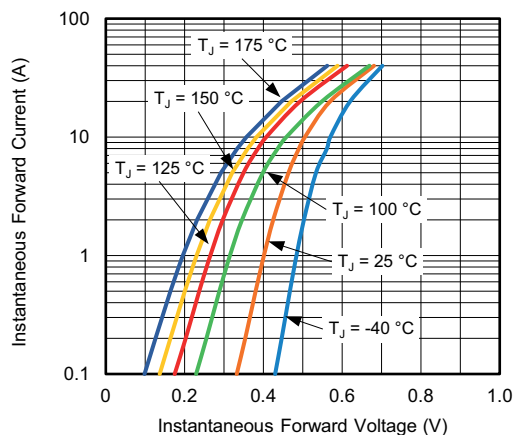


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

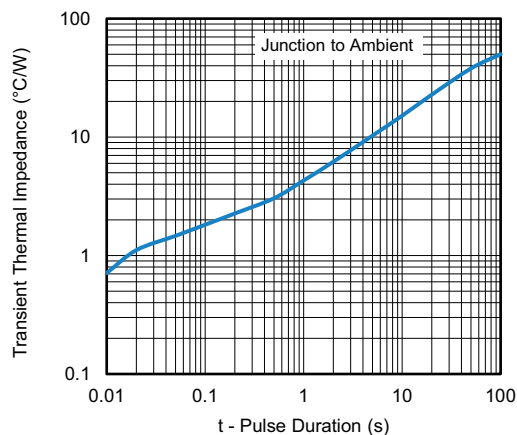


Fig. 6 - Typical Transient Thermal Impedance

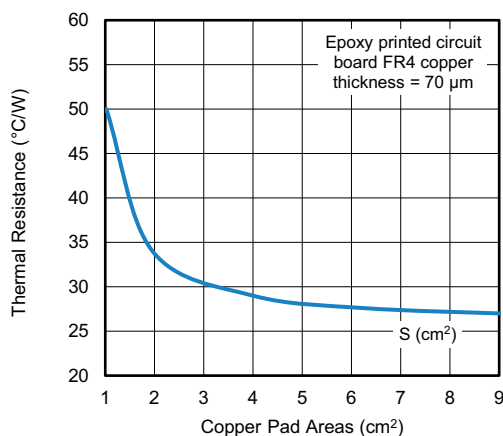
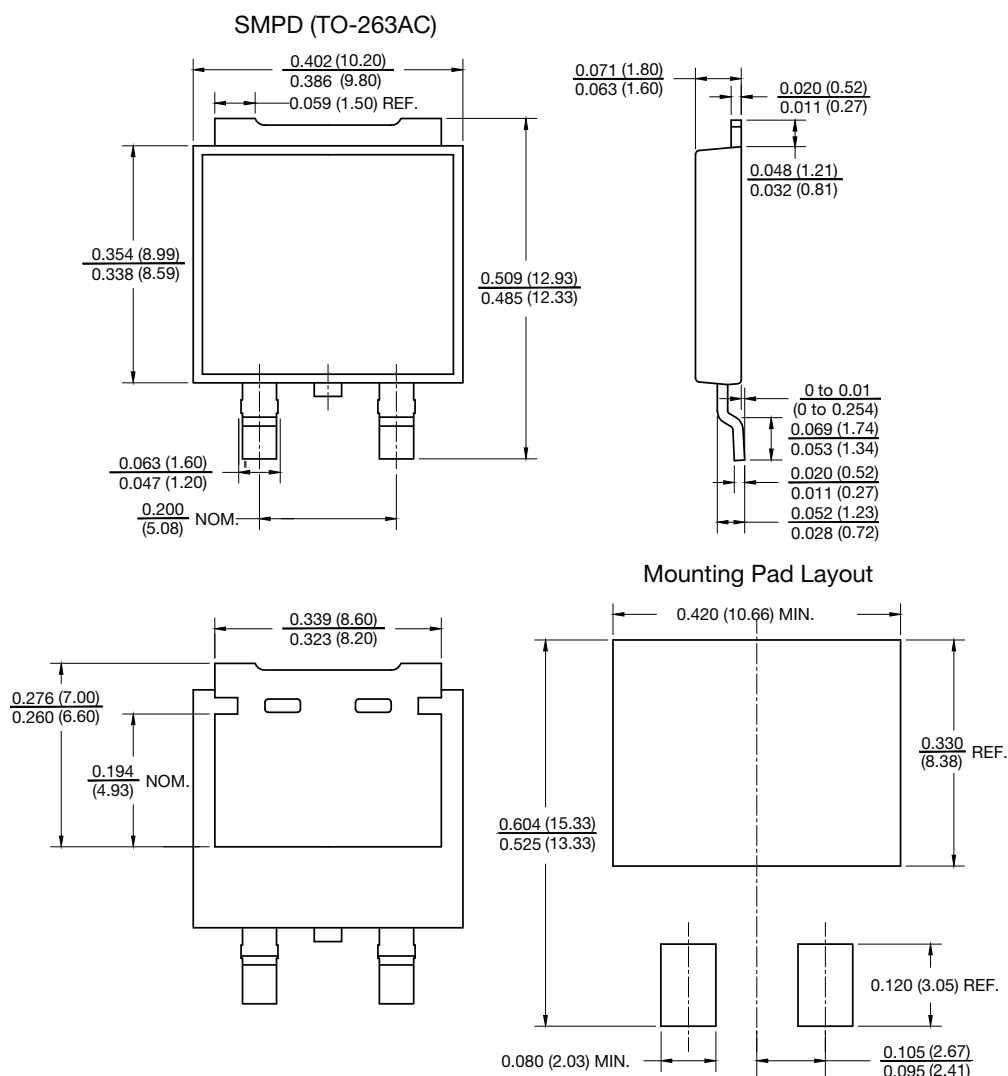


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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