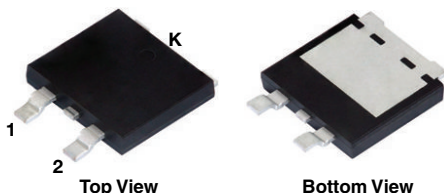


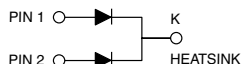
# Dual Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.29\text{ V}$  at  $I_F = 5\text{ A}$

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



**V30DL50C**



## 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
- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- 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 15 A            |
| $V_{RRM}$                    | 50 V                |
| $I_{FSM}$                    | 300 A               |
| $V_F$ at $I_F = 15\text{ A}$ | 0.42 V              |
| $T_J$ max.                   | 150 °C              |
| Package                      | TO-263AC (SMPD)     |
| Diode variations             | Dual common cathode |

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** As marked

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

| PARAMETER                                                                         | SYMBOL         | V30DL50C    | UNIT |
|-----------------------------------------------------------------------------------|----------------|-------------|------|
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 50          | V    |
| Maximum average forward rectified current<br>(fig. 1)                             | $I_{F(AV)}$    | 30          | A    |
|                                                                                   |                | 15          |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 300         | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -40 to +150 | °C   |

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

| PARAMETER                               | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
|-----------------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| Instantaneous forward voltage per diode | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.39 | -    | V    |
|                                         | I <sub>F</sub> = 7.5 A |                         |                               | 0.42 | -    |      |
|                                         | I <sub>F</sub> = 15 A  |                         |                               | 0.49 | 0.57 |      |
|                                         | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.29 | -    |      |
|                                         | I <sub>F</sub> = 7.5 A |                         |                               | 0.33 | -    |      |
|                                         | I <sub>F</sub> = 15 A  |                         |                               | 0.42 | 0.50 |      |
| Reverse current per diode               | V <sub>R</sub> = 50 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -    | 1800 | μA   |
|                                         |                        | T <sub>A</sub> = 125 °C |                               | 25   | 60   | mA   |
| Typical junction capacitance            | 4.0 V, 1 MHz           | T <sub>A</sub> = 25 °C  | C <sub>J</sub>                | 2800 | -    | pF   |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL     | V30DL50C                 | UNIT |
|----------------------------|------------|--------------------------|------|
| Typical thermal resistance | per diode  | $R_{\theta JC}$          | 1.7  |
|                            | per device |                          | 0.9  |
|                            | 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, without heatsink

**ORDERING INFORMATION** (Example)

| PACKAGE                        | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|--------------------------------|---------------|-----------------|--------------|---------------|------------------------------------|
| TO-263AC (SMPD)                | V30DL50C-M3/I | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |
| TO-263AC (SMPD) <sup>(1)</sup> | V30DL50CHM3/I | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

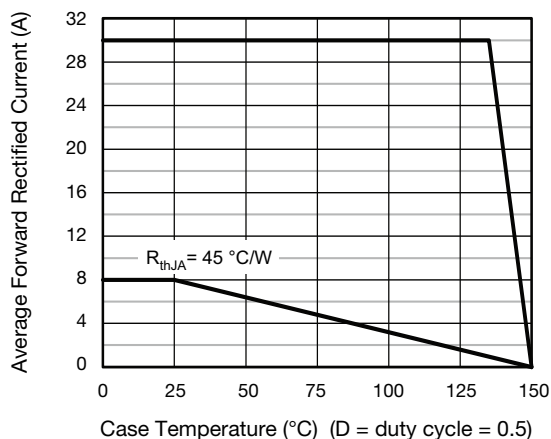
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

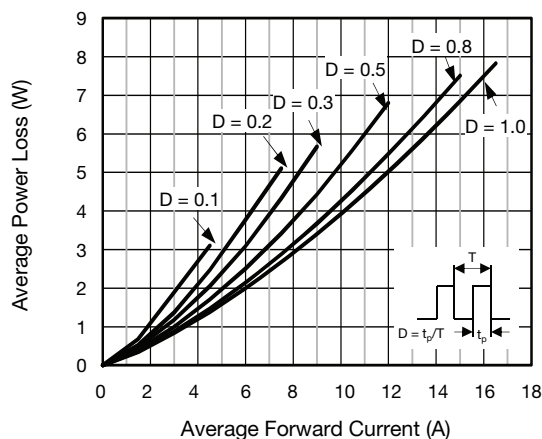


Fig. 2 - Forward Power Loss Characteristics Per Diode

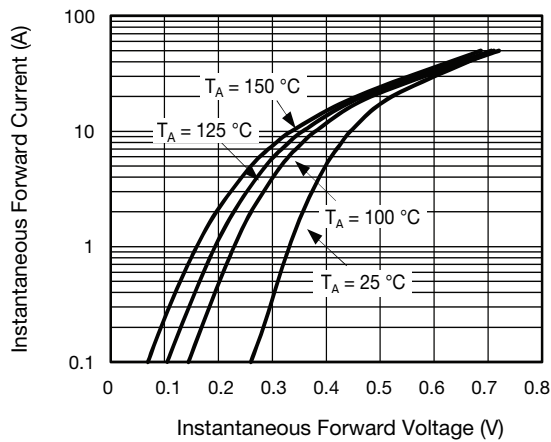


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

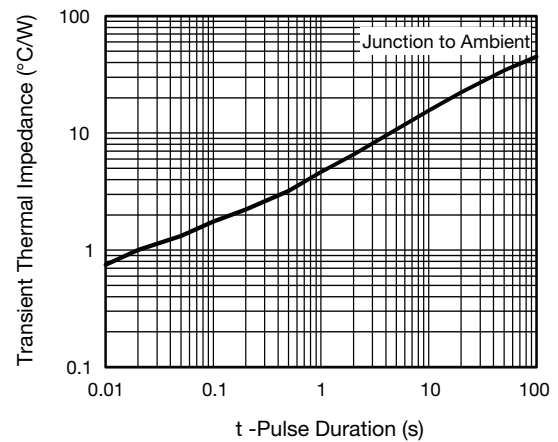


Fig. 6 - Typical Transient Thermal Impedance Per Device

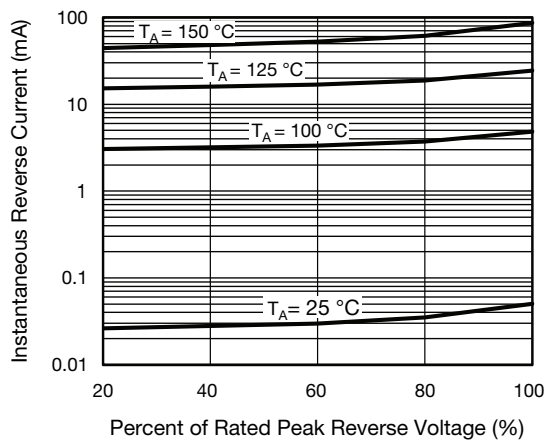


Fig. 4 - Typical Reverse Characteristics Per Diode

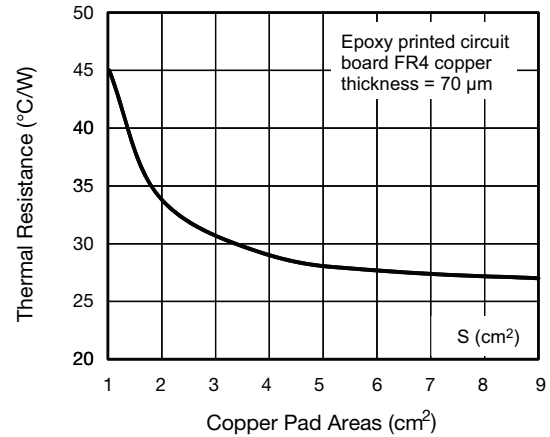


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

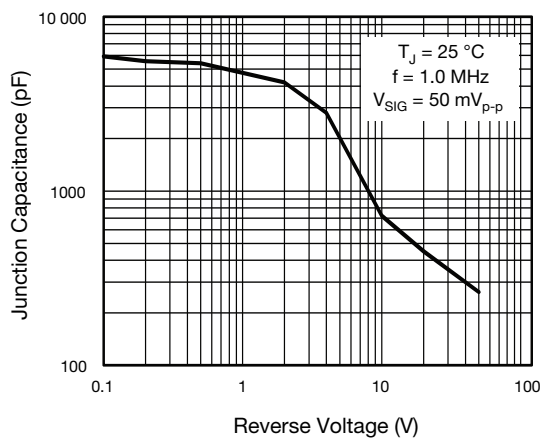
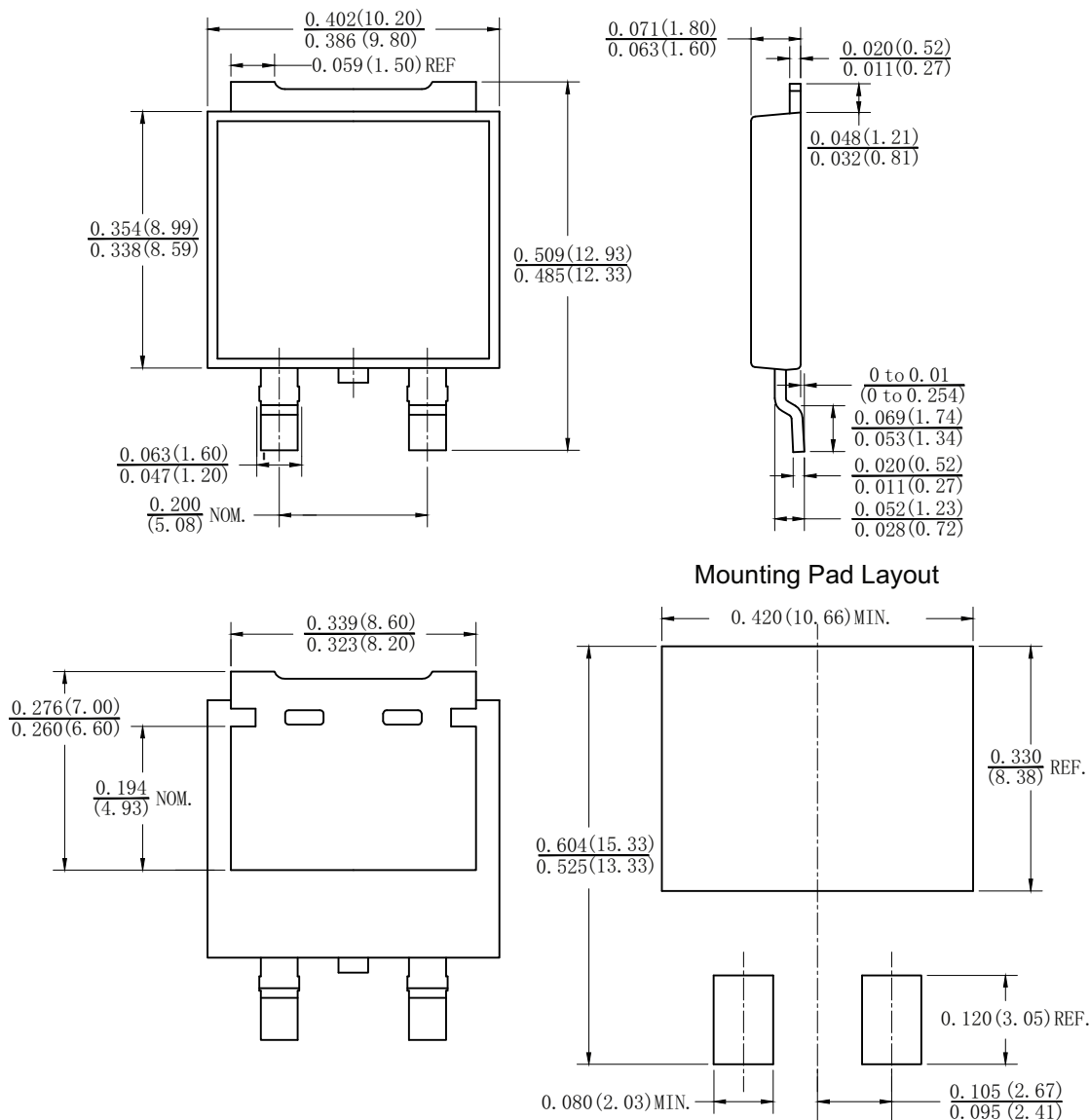


Fig. 5 - Typical Junction Capacitance Per Diode



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-263AC (SMPD)





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