

# Dual Low-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.30\text{ V}$  at  $I_F = 5.0\text{ A}$



## 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            |
| $V_{RRM}$                    | 45 V                |
| $I_{FSM}$                    | 200 A               |
| $V_F$ at $I_F = 15\text{ A}$ | 0.40 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 2 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         | V30D45C     | UNIT |
|---|----------------|-------------|------|
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 45          | V    |
| Maximum average forward rectified current (fig. 1)                                | $I_{F(AV)}$    | per device  | 30   |
|   |                | per diode   | 15   |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 200         | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -40 to +150 | °C   |

| <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  | $I_F = 5.0\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.42 | -    | V             |
|  | $I_F = 7.5\text{ A}$ |                                   |             | 0.44 | -    |               |
|  | $I_F = 15\text{ A}$  |                                   |             | 0.49 | 0.57 |               |
|  | $I_F = 5.0\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.30 | -    |               |
|  | $I_F = 7.5\text{ A}$ |                                   |             | 0.33 | -    |               |
|  | $I_F = 15\text{ A}$  |                                   |             | 0.40 | 0.48 |               |
| Reverse current per diode  | $V_R = 45\text{ V}$  | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 1500 | $\mu\text{A}$ |
|  |                      | $T_A = 125\text{ }^\circ\text{C}$ |             | 12   | 50   | mA            |

**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                   | V30D45C | UNIT               |
| Typical thermal resistance  | per diode  | $R_{\theta JC}$          | 1.6     | $^\circ\text{C/W}$ |
|   | 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

| <b>ORDERING INFORMATION</b> (Example) |                  |                 |              |               |                                    |
|---------------------------------------|------------------|-----------------|--------------|---------------|------------------------------------|
| PACKAGE                               | PREFERRED P/N    | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| TO-263AC (SMPD)                       | V30D45C-M3/I     | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |
| TO-263AC (SMPD)                       | V30D45CHM3/I (1) | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

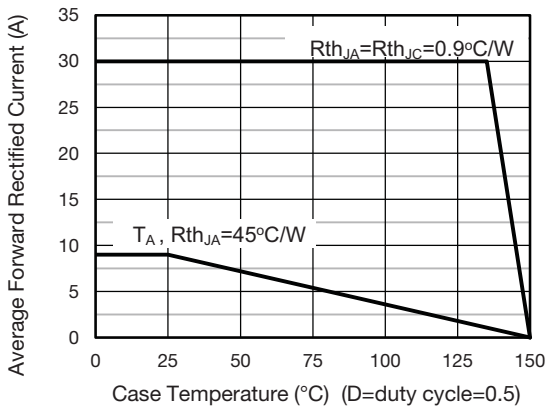
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

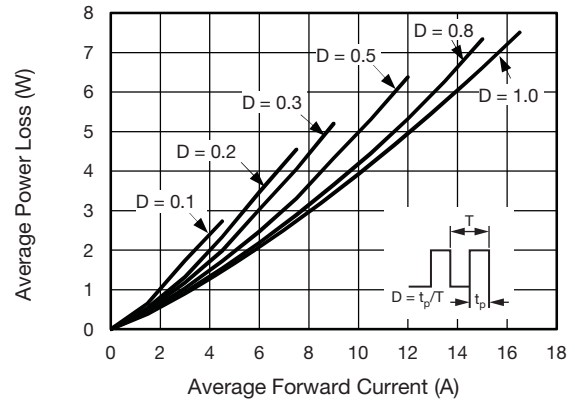


Fig. 2 - Forward Power Loss Characteristics Per Diode

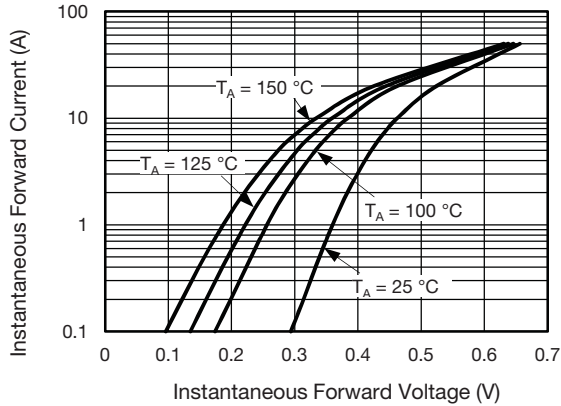


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

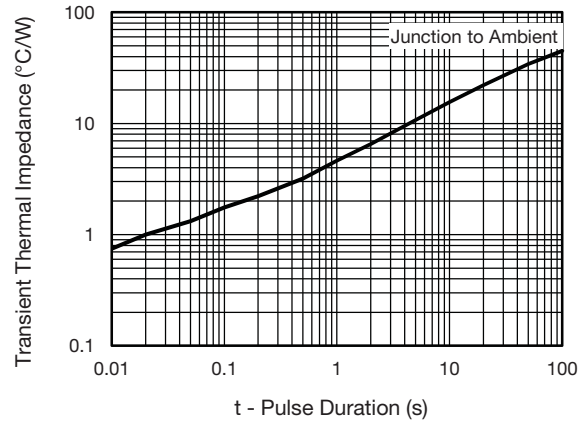


Fig. 6 - Typical Transient Thermal Impedance Per Diode

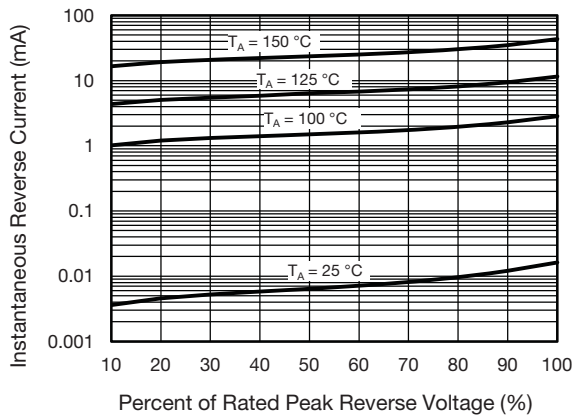


Fig. 4 - Typical Reverse Characteristics Per Diode

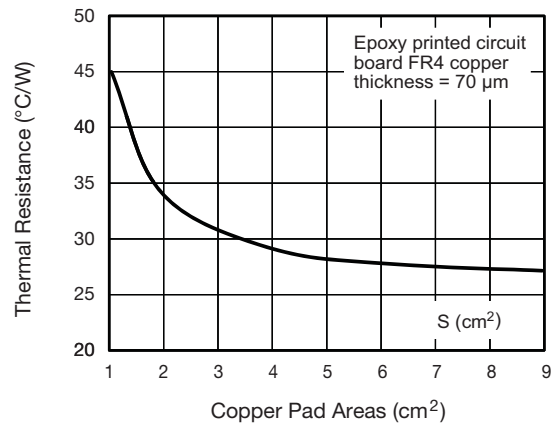


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

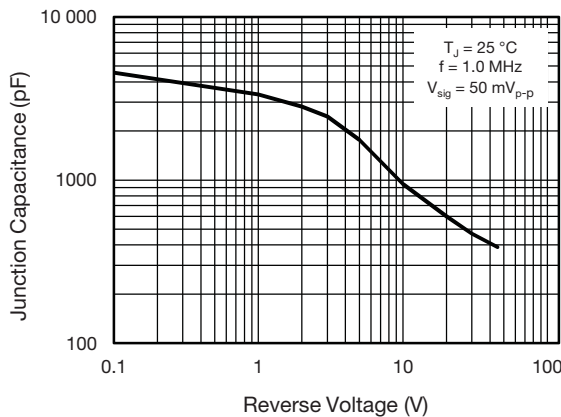
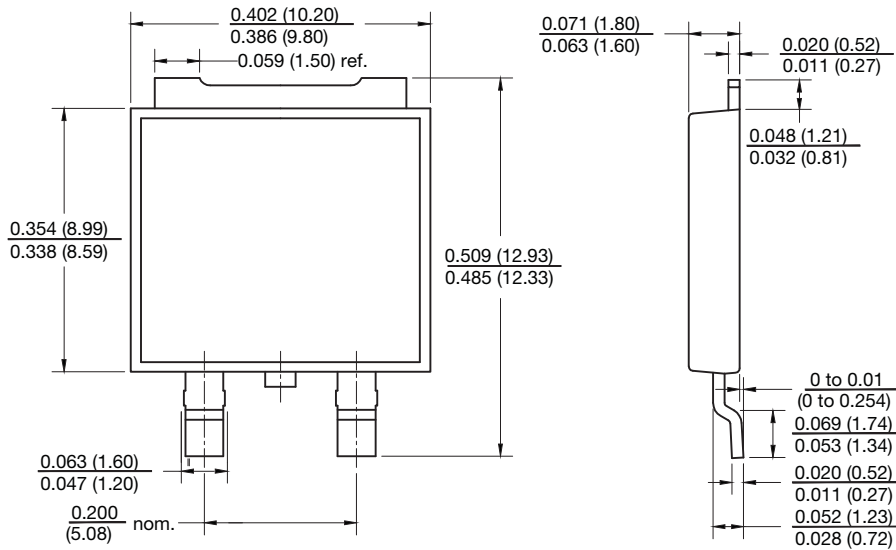


Fig. 5 - Typical Junction Capacitance Per Diode

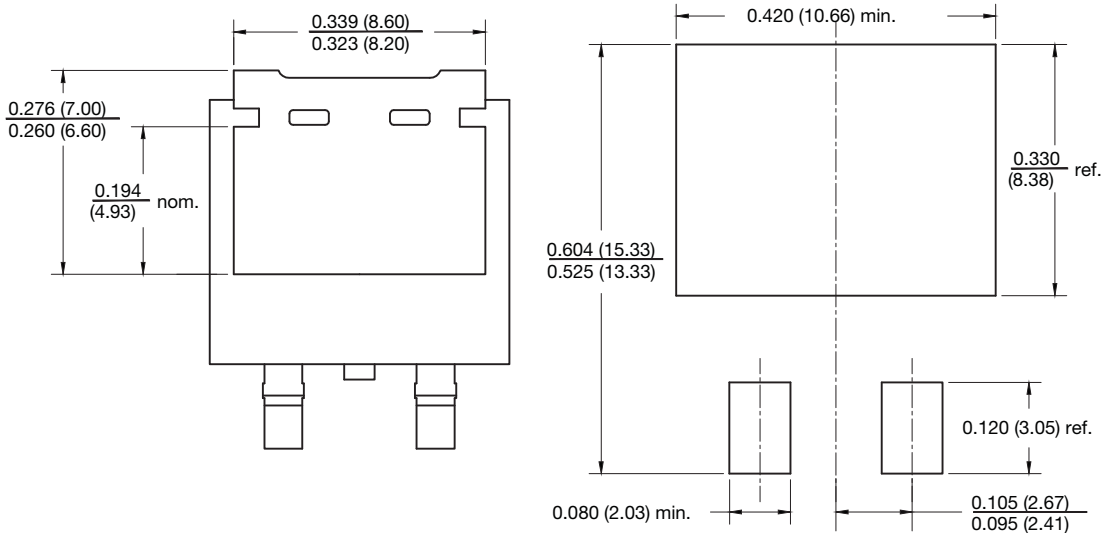


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AC (SMPD)



Mounting Pad Layout





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