

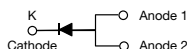
# High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.31\text{ V}$  at  $I_F = 5\text{ A}$

**TMBS® eSMP® Series**



**TO-277A (SMPC)**



## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- 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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**AUTOMOTIVE  
GRADE**  
Available



**RoHS  
COMPLIANT  
HALOGEN  
FREE**

## TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling, and polarity protection applications.

## MECHANICAL DATA

**Case:** TO-277A (SMPC)

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 automotive grade

**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

| PRIMARY CHARACTERISTICS      |                |
|------------------------------|----------------|
| $I_{F(AV)}$                  | 15 A           |
| $V_{RRM}$                    | 45 V           |
| $I_{FSM}$                    | 210 A          |
| $V_F$ at $I_F = 15\text{ A}$ | 0.42 V         |
| $T_J$ max.                   | 150 °C         |
| Package                      | TO-277A (SMPC) |
| Diode variations             | Single die     |

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                    |                |             |      |
|-----------------------------------------------------------------------------------|----------------|-------------|------|
| PARAMETER                                                                         | SYMBOL         | V15P45      | UNIT |
| Device marking code                                                               |                | V1545       |      |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 45          | V    |
| Maximum DC forward current                                                        | $I_F^{(1)}$    | 15          | A    |
|                                                                                   | $I_F^{(2)}$    | 4.8         |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 210         | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -40 to +150 | °C   |

## Notes

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB

(2) Free air, mounted on recommended copper pad area



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                      |             |      |      |               |
|------------------------------------------------------------------------------------------------|----------------------|-------------|------|------|---------------|
| PARAMETER                                                                                      | TEST CONDITIONS      | SYMBOL      | TYP. | MAX. | UNIT          |
| Instantaneous forward voltage                                                                  | $I_F = 5.0\text{ A}$ | $V_F^{(1)}$ | 0.40 | -    | V             |
|                                                                                                | $I_F = 7.5\text{ A}$ |             | 0.45 | -    |               |
|                                                                                                | $I_F = 15\text{ A}$  |             | 0.49 | 0.58 |               |
|                                                                                                | $I_F = 5.0\text{ A}$ |             | 0.31 | -    |               |
|                                                                                                | $I_F = 7.5\text{ A}$ |             | 0.34 | -    |               |
|                                                                                                | $I_F = 15\text{ A}$  |             | 0.42 | 0.51 |               |
| Reverse current                                                                                | $V_R = 45\text{ V}$  | $I_R^{(2)}$ | -    | 1500 | $\mu\text{A}$ |
|                                                                                                |                      |             | 15   | 50   | mA            |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
 (2) Pulse test: Pulse width  $\leq 40\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                       |        |                      |
|---------------------------------------------------------------------------------------------|-----------------------|--------|----------------------|
| PARAMETER                                                                                   | SYMBOL                | V15P45 | UNIT                 |
| Typical thermal resistance                                                                  | $R_{\theta JA}^{(1)}$ | 75     | $^{\circ}\text{C/W}$ |
|                                                                                             | $R_{\theta JM}^{(2)}$ | 4      |                      |

**Notes**

- (1) Free air, mounted on recommended copper pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
 (2) Mounted on 30 mm x 30 mm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V15P45-M3/86A                         | 0.10            | 86A                    | 1500          | 7" diameter plastic tape and reel  |
| V15P45-M3/87A                         | 0.10            | 87A                    | 6500          | 13" diameter plastic tape and reel |
| V15P45HM3/86A <sup>(1)</sup>          | 0.10            | 86A                    | 1500          | 7" diameter plastic tape and reel  |
| V15P45HM3/87A <sup>(1)</sup>          | 0.10            | 87A                    | 6500          | 13" diameter plastic tape and reel |

**Note**

- (1) Automotive grade

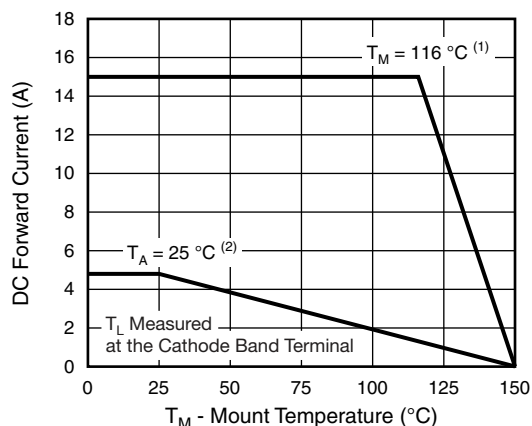
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

**Notes**

- (1) Mounted on 30 mm x 30 mm aluminum PCB;  $T_M$  measured at the terminal of cathode band ( $R_{\theta JM} = 4\text{ }^{\circ}\text{C/W}$ )  
 (2) Free air, mounted on recommended copper pad area ( $R_{\theta JA} = 75\text{ }^{\circ}\text{C/W}$ )

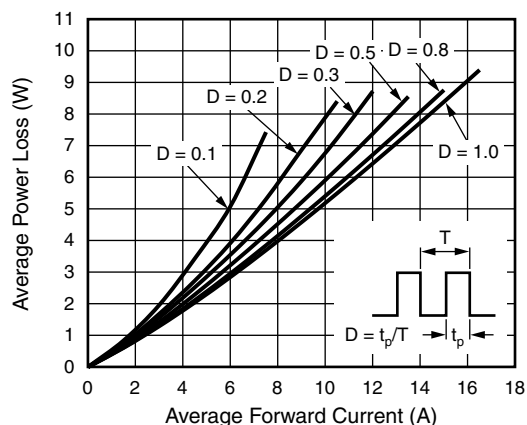


Fig. 2 - Forward Power Loss Characteristics Per Diode

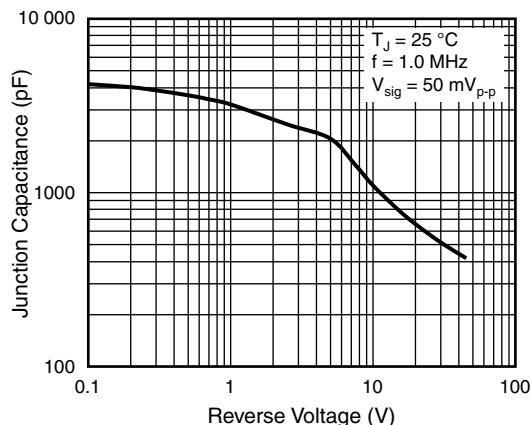


Fig. 5 - Typical Junction Capacitance

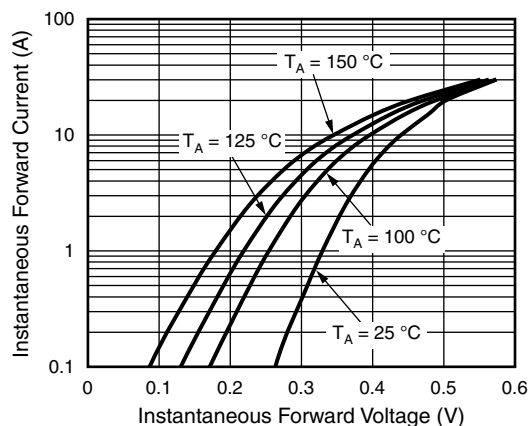


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

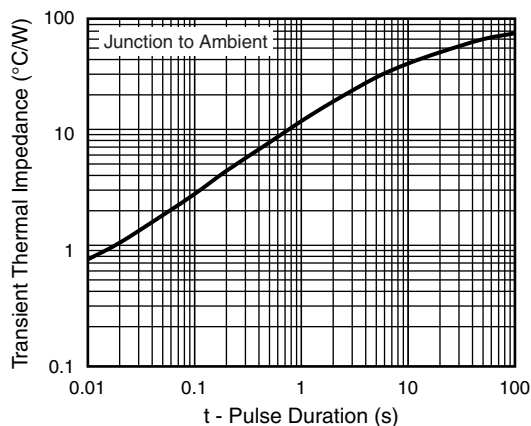


Fig. 6 - Typical Transient Thermal Impedance Per Diode

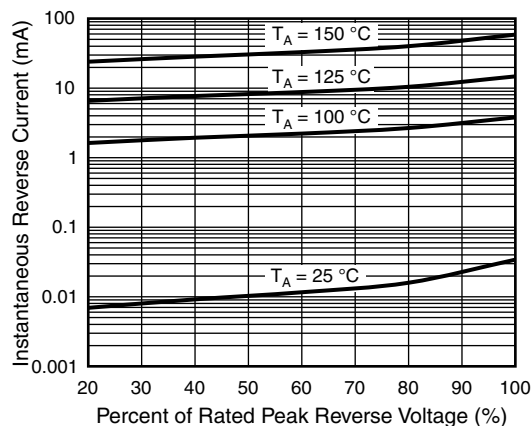
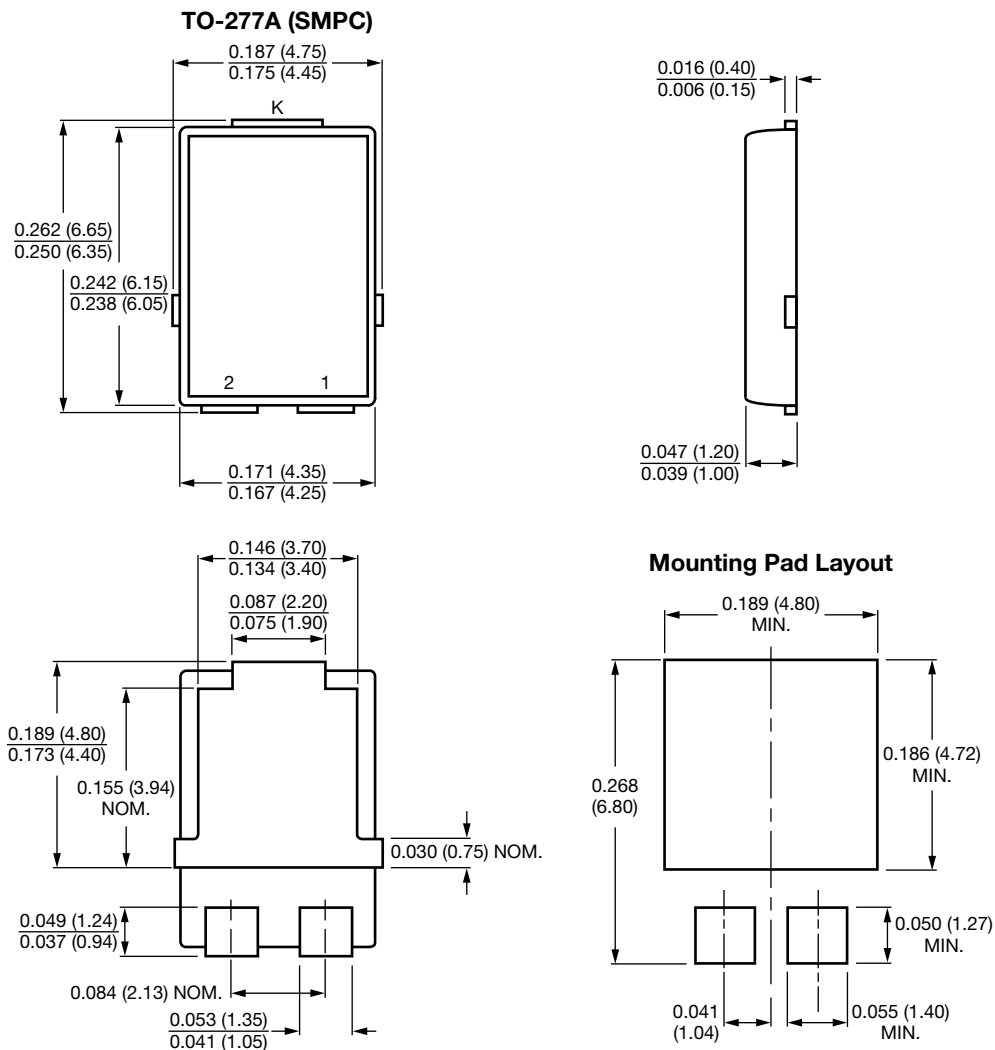


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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#### Как с нами связаться

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