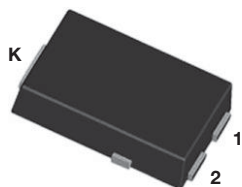


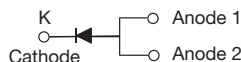
# High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.60\text{ V}$  at  $I_F = 4\text{ A}$

## TMBS® eSMP® Series



### SMPC (TO-277A)



## DESIGN SUPPORT TOOLS

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| PRIMARY CHARACTERISTICS       |                |
|-------------------------------|----------------|
| $I_{F(AV)}$                   | 8.0 A          |
| $V_{RRM}$                     | 200 V          |
| $I_{FSM}$                     | 150 A          |
| $V_F$ at $I_F = 8.0\text{ A}$ | 0.68 V         |
| $T_J$ max.                    | 150 °C         |
| Package                       | SMPC (TO-277A) |
| Circuit configuration         | Single         |

## 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
- 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 low voltage high frequency inverters, freewheeling, DC/DC converters and polarity protection applications.

## MECHANICAL DATA

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

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

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                    |                |             |            |
|-----------------------------------------------------------------------------------|----------------|-------------|------------|
| PARAMETER                                                                         | SYMBOL         | V8P20       | UNIT       |
| Device marking code                                                               |                | V820        |            |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 200         | V          |
| Maximum average forward rectified current (fig. 1)                                | $I_F^{(1)}$    | 8.0         | A          |
|                                                                                   | $I_F^{(2)}$    | 2.2         |            |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 150         | 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         |

## Notes

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

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



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 4 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.80 | -    | V    |
|                                                                            | I <sub>F</sub> = 8 A   |                         |                               | 0.95 | 1.40 |      |
|                                                                            | I <sub>F</sub> = 4 A   | T <sub>A</sub> = 125 °C |                               | 0.60 | -    |      |
|                                                                            | I <sub>F</sub> = 8 A   |                         |                               | 0.68 | 0.76 |      |
| Reverse current                                                            | V <sub>R</sub> = 180 V | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 2.0  | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 2.1  | -    | mA   |
|                                                                            | V <sub>R</sub> = 200 V | T <sub>A</sub> = 25 °C  |                               | 6.4  | 250  | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 3.4  | 20   | mA   |

**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                | V8P20 | UNIT                 |
| Typical thermal resistance                                                           | $R_{\theta JA}^{(1)}$ | 80    | $^{\circ}\text{C/W}$ |
|                                                                                      | $R_{\theta JM}^{(2)}$ | 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 Al PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V8P20-M3/86A                   | 0.10            | 86A                    | 1500          | 7" diameter plastic tape and reel  |
| V8P20-M3/87A                   | 0.10            | 87A                    | 6500          | 13" diameter plastic tape and reel |

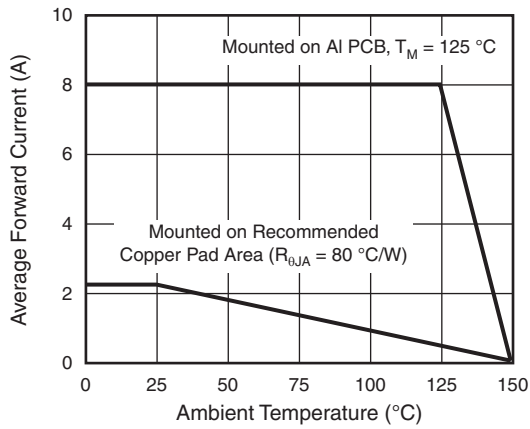
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

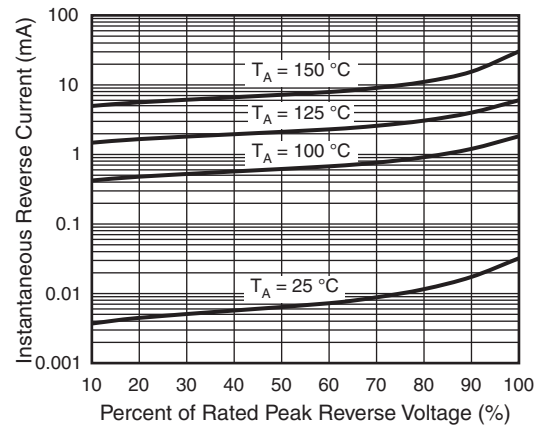


Fig. 4 - Typical Reverse Characteristics

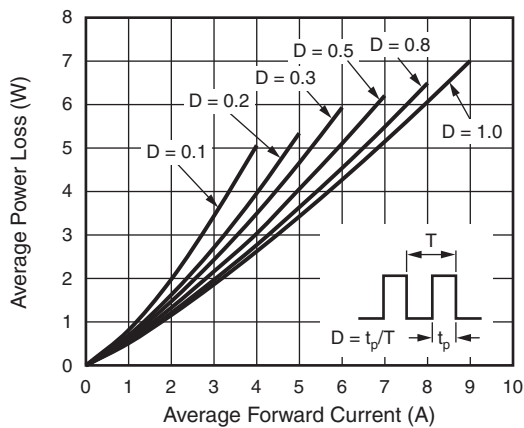


Fig. 2 - Forward Power Loss Characteristics

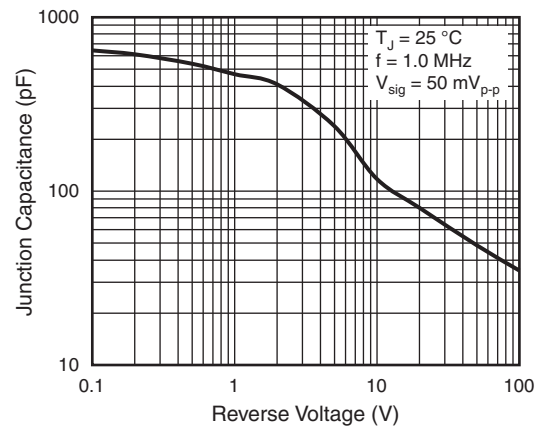


Fig. 5 - Typical Junction Capacitance

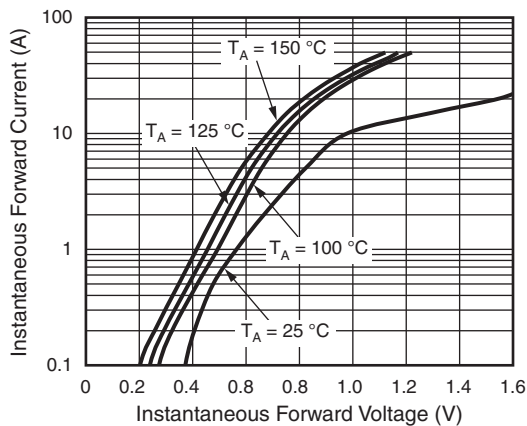


Fig. 3 - Typical Instantaneous Forward Characteristics

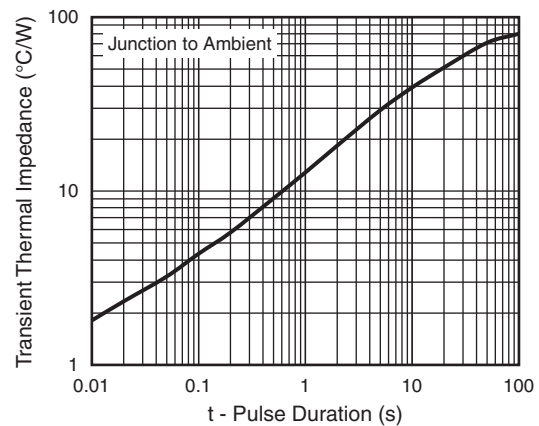


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)




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