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Vishay General Semiconductor

# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier



Anode O Cathode

### LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                  |                 |  |  |  |
|--|-----------------|--|--|--|
| I <sub>F(AV)</sub>                       | 8.0 A           |  |  |  |
| V <sub>RRM</sub>                         | 200 V           |  |  |  |
| I <sub>FSM</sub>                         | 100 A           |  |  |  |
| $V_F$ at $I_F$ = 8.0 A ( $T_A$ = 125 °C) | 0.70 V          |  |  |  |
| T <sub>J</sub> max.                      | 175 °C          |  |  |  |
| Package                                  | SMPA (DO-221BC) |  |  |  |
| Circuit configuration                    | Single          |  |  |  |

### **FEATURES**

- Very low profile typical height of 0.95 mm
- Trench MOS Schottky technology
- Low power losses, high efficiency
- · Low forward voltage drop
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
- Automotive ordering code: P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

### **TYPICAL APPLICATIONS**

For use in high frequency inverters, freewheeling, DC/DC converters, and polarity protection in commercial and automotive applications.

## **MECHANICAL DATA**

Case: SMPA (DO-221BC) 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 JESD22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

| <b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)                |                                   |             |      |  |
|---|-----------------------------------|-------------|------|--|
| PARAMETER   | SYMBOL                            | V8PA22      | UNIT |  |
| Device marking code   |                                   | V822        |      |  |
| Maximum repetitive peak reverse voltage   | V <sub>RRM</sub>                  | 200         | V    |  |
| Maximum DC forward current  | I <sub>F(AV)</sub> <sup>(1)</sup> | 8.0         | — A  |  |
|   | I <sub>F(AV)</sub> <sup>(2)</sup> | 2.4         |      |  |
| Peak forward surge current 8.3 ms single half sine-wave<br>superimposed on rated load | I <sub>FSM</sub>                  | 100         | А    |  |
| Operating junction temperature range  | T <sub>J</sub> <sup>(3)</sup>     | -40 to +175 | °C   |  |
| Storage temperature range   | T <sub>STG</sub>                  | -40 to +175 | °C   |  |

Notes

<sup>(1)</sup> Mounted on 3 cm x 3 cm copper pad area PCB

<sup>(2)</sup> Free air, mounted on recommended copper pad area

<sup>(3)</sup> The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{BJA}$ 





HALOGEN

FREE

**V8PA22** 



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| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted) |                         |   |                               |       |      |      |
|---|-------------------------|---|-------------------------------|-------|------|------|
| PARAMETER   | TEST CO                 | TEST CONDITIONS                                   |                               | TYP.  | MAX. | UNIT |
| Instantaneous forward voltage   | I <sub>F</sub> = 4.0 A  | - T <sub>A</sub> = 25 °C                          | V <sub>F</sub> <sup>(1)</sup> | 0.77  | -    | V    |
|   | I <sub>F</sub> = 8.0 A  |   |                               | 0.84  | 0.92 |      |
|   | $I_{F} = 4.0 \text{ A}$ | - T <sub>A</sub> = 125 °C                         |                               | 0.62  | -    |      |
|   | I <sub>F</sub> = 8.0 A  |   |                               | 0.70  | 0.78 |      |
| Reverse current   | V - 160 V               | T <sub>A</sub> = 25 °C                            | I <sub>R</sub> (2)            | 0.001 | -    | mA   |
|   | v <sub>R</sub> = 160 v  | T <sub>A</sub> = 25 °C<br>T <sub>A</sub> = 125 °C |                               | 0.5   | -    |      |
|   | V 200.V                 | T <sub>A</sub> = 25 °C<br>T <sub>A</sub> = 125 °C |                               | -     | 0.10 |      |
|   | $v_{\rm R} = 200 v$     | T <sub>A</sub> = 125 °C                           |                               | 1.0   | 7.0  |      |
| Typical junction capacitance  | 4.0 V, 1 M⊦             | 4.0 V, 1 MHz                                      |                               | 400   | -    | pF   |

Notes

<sup>(1)</sup> Pulse test: 300 µs pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width  $\leq$  5 ms

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25$ °C unless otherwise specified) |                                 |     |      |  |
|--|---------------------------------|-----|------|--|
| PARAMETER SYMBOL V8PA22 UNI  |                                 |     |      |  |
| Typical thermal resistance   | R <sub>0JA</sub> (1)(2)         | 100 | °C/W |  |
|  | R <sub>0JM</sub> <sup>(3)</sup> | 5   | 0/10 |  |

#### Notes

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

<sup>(2)</sup> Free air, mounted on recommended copper pad area; thermal resistance R<sub>0JA</sub> - junction to ambient

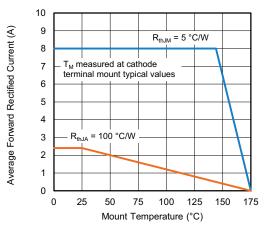
 $^{(3)}$  Units mounted on 3 cm x 3 cm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |  |  |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|--|--|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |  |  |
| V8PA22-M3/H                    | 0.032           | Н                      | 3500          | 7" diameter plastic tape and reel  |  |  |
| V8PA22-M3/I                    | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |  |  |
| V8PA22HM3/H <sup>(1)</sup>     | 0.032           | Н                      | 3500          | 7" diameter plastic tape and reel  |  |  |
| V8PA22HM3/I <sup>(1)</sup>     | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |  |  |

Note

(1) AEC-Q101 qualified

## **RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25$ °C unless otherwise specified)





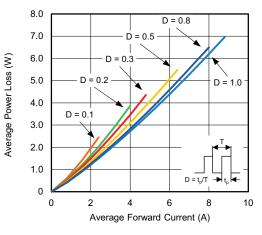


Fig. 2 - Forward Power Loss Characteristics

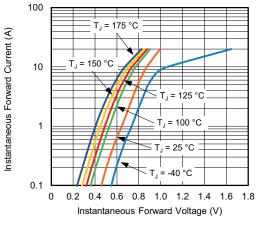
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Fig. 3 - Typical Instantaneous Forward Characteristics

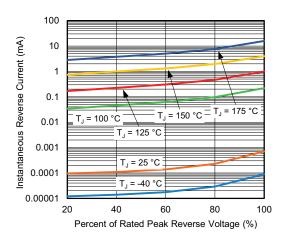


Fig. 4 - Typical Reverse Leakage Characteristics

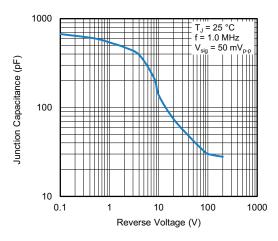


Fig. 5 - Typical Junction Capacitance

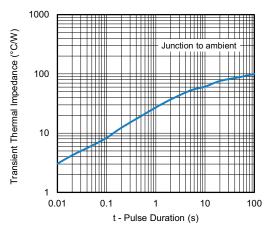


Fig. 6 - Typical Transient Thermal Impedance

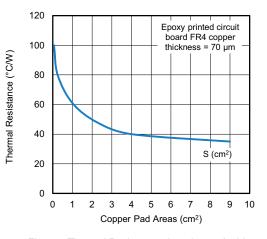


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

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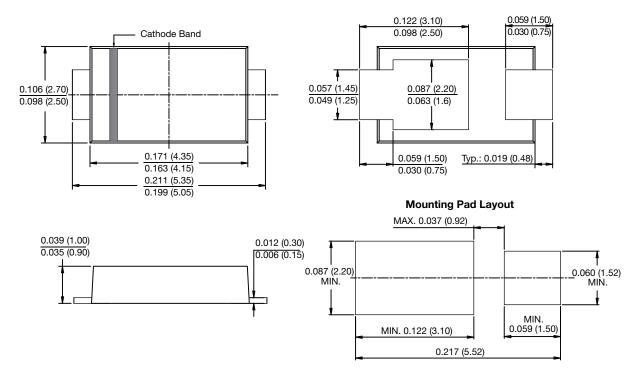
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## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

/ISHAY

SMPA (DO-221BC)





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