AUTOMOTIVE GRADE

COMPLIANT

HALOGEN FREE



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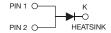
Vishay General Semiconductor

High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.48 \text{ V}$ at $I_F = 5 \text{ A}$



SlimDPAK (TO-252AE)



LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | | | |
|--|---------------------|--|--|
| I _{F(AV)} | 10 A | | |
| V_{RRM} | 100 V | | |
| I _{FSM} | 180 A | | |
| V_F at $I_F = 10 \text{ A} (T_J = 125 ^{\circ}\text{C})$ | 0.58 V | | |
| T _J max. | 175 °C | | |
| Package | SlimDPAK (TO-252AE) | | |
| Circuit configuration | Single | | |

FEATURES

- Very low profile typical height of 1.3 mm
- Trench MOS Schottky technology
- · Ideal for automated placement
- · 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 available
 - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SlimDPAK (TO-252AE)

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 JESD 22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

| MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted) | | | | |
|--|-----------------------------------|-------------|------|--|
| PARAMETER | SYMBOL | V10PWM10 | UNIT | |
| Device marking code | | V10PWM10 | | |
| Maximum repetitive peak reverse voltage | V _{RRM} | 100 | V | |
| Maximum average forward rectified current (Fig. 1) | I _{F(AV)} ⁽¹⁾ | 10 | A | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I _{FSM} | 180 | А | |
| Operating junction temperature range | T _J ⁽²⁾ | -40 to +175 | °C | |
| Storage temperature range | T _{STG} | -55 to +175 | °C | |

Notes

⁽¹⁾ With infinite heatsink

⁽²⁾ The heat generated must be less than the thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta,JA}$



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| ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted) | | | | | | |
|---|------------------------|-------------------------|-------------------------------|-------|------|------|
| PARAMETER | TEST CO | TEST CONDITIONS | | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 5.0 A | T _J = 25 °C | V _F ⁽¹⁾ | 0.56 | - | V |
| | I _F = 10 A | | | 0.67 | 0.75 | |
| | I _F = 5.0 A | T _J = 125 °C | | 0.48 | - | |
| | I _F = 10 A | | | 0.58 | 0.66 | |
| Reverse current | V _R = 70 V | T _J = 25 °C | I _R ⁽²⁾ | 0.001 | - | mA |
| | V _R = 70 V | T _J = 125 °C | | 1.5 | - | |
| | V _R = 100 V | T _J = 25 °C | | - | 0.12 | |
| | V _R = 100 V | T _J = 125 °C | | 3 | 12 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | CJ | 1200 | - | pF |

Notes

 $^{(1)}$ Pulse test: 300 μ s pulse width, 1 % duty cycle

(2) Pulse test: pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | |
|---|--------------------------|-----|-------|--|
| PARAMETER SYMBOL V10PWM10 UNI | | | | |
| Typical thermal resistance | R ₀ JA (1)(2) | 65 | °C/W | |
| Typical trieffial resistance | R _{0JM} (3) | 2.5 | C/ VV | |

Notes

- $^{(1)}$ The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
- $^{(2)}$ Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ junction to ambient
- $^{(3)}$ Mounted on infinite heat sink; thermal resistance $R_{\theta JM}$ junction-to-mount

| ORDERING INFORMATION (Example) | | | | | |
|--------------------------------|---------------------------------------|---|---------------|------------------------------------|--|
| PREFERRED P/N | EFERRED P/N UNIT WEIGHT (g) PREFERRED | | BASE QUANTITY | DELIVERY MODE | |
| V10PWM10-M3/I | 0.20 | I | 4500 | 13" diameter plastic tape and reel | |
| V10PWM10HM3/I (1) | 0.20 | I | 4500 | 13" diameter plastic tape and reel | |

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

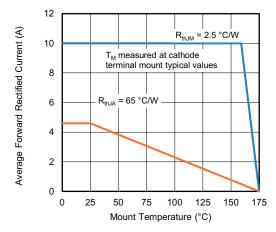


Fig. 1 - Maximum Forward Current Derating Curve

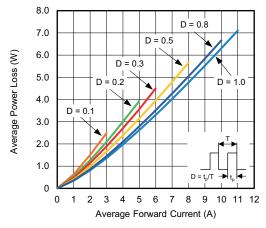


Fig. 2 - Forward Power Loss Characteristics

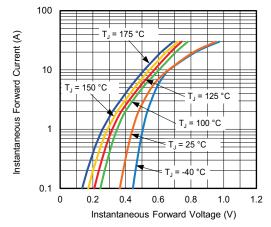


Fig. 3 - Typical Instantaneous Forward Characteristics

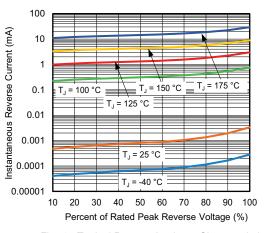


Fig. 4 - Typical Reverse Leakage Characteristics

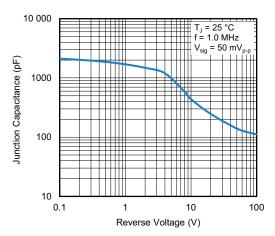


Fig. 5 - Typical Junction Capacitance

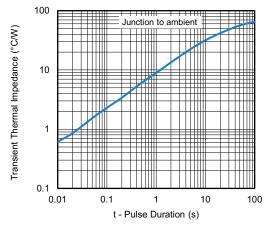


Fig. 6 - Typical Transient Thermal Impedance



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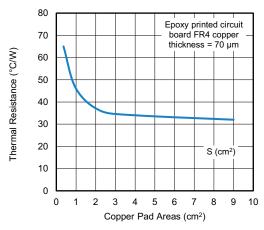
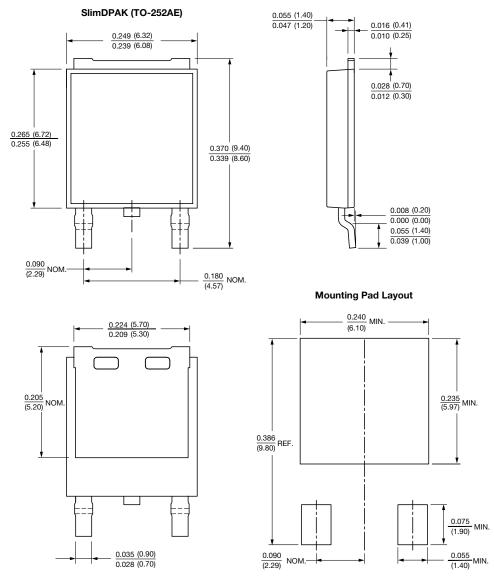


Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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