

Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

 Ultra Low $V_F = 0.60\text{ V}$ at $I_F = 5.0\text{ A}$

eSMP® Series SMPD (TO-263AC)



DESIGN SUPPORT TOOLS AVAILABLE


[3D Models](#)

| PRIMARY CHARACTERISTICS | |
|--|-----------------|
| $I_{F(AV)}$ | 2 x 10 A |
| V_{RRM} | 150 V |
| I_{FSM} | 120 A |
| V_F at $I_F = 10\text{ A}$ ($T_A = 125\text{ °C}$) | 0.69 V |
| T_J max. | 175 °C |
| Package | SMPD (TO-263AC) |
| Circuit configuration | Common cathode |

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
- 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 www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE
Available

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 in commercial, industrial, and automotive application.

MECHANICAL DATA

Case: SMPD (TO-263AC)

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 meet JESD 201 class 2 whisker test

Polarity: as marked

| MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted) | | | |
|--|------------|-------------|------|
| PARAMETER | SYMBOL | V20DM150C | UNIT |
| Device marking code | | V20DM150C | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 150 | V |
| Maximum average forward rectified current (fig. 1) | per device | 20 | A |
| | per diode | 10 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 120 | A |
| Operating junction temperature range | T_J (2) | -40 to +175 | °C |
| Storage temperature range | T_{STG} | -55 to +175 | |

Notes

(1) Mounted on infinite heatsink

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



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------------|-----------------------------------|-------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.81 | - | V |
| | $I_F = 10\text{ A}$ | | | 1.15 | 1.24 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.6 | - | |
| | $I_F = 10\text{ A}$ | | | 0.69 | 0.75 | |
| Reverse current at rated V_R per diode | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.01 | - | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 1.5 | - | |
| | $V_R = 150\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 0.15 | |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 3 | 10 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 530 | - | pF |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | |
|---|--------------------------|-----------|--------------------|
| PARAMETER | SYMBOL | V20DM150C | UNIT |
| Typical thermal resistance per device | $R_{\theta JC}^{(1)}$ | 2.0 | $^\circ\text{C/W}$ |
| | $R_{\theta JA}^{(1)(3)}$ | 58 | |

Notes

- (1) Mounted on infinite heatsink
(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$ - junction-to-ambient
(3) Free air, without heatsink

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V20DM150C-M3/I | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |
| V20DM150CHM3/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)

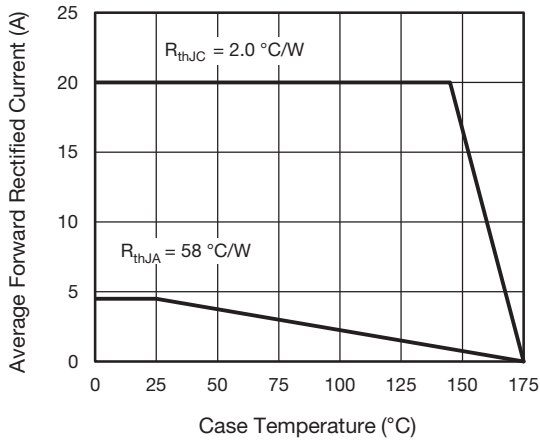


Fig. 1 - Maximum Forward Current Derating Curve

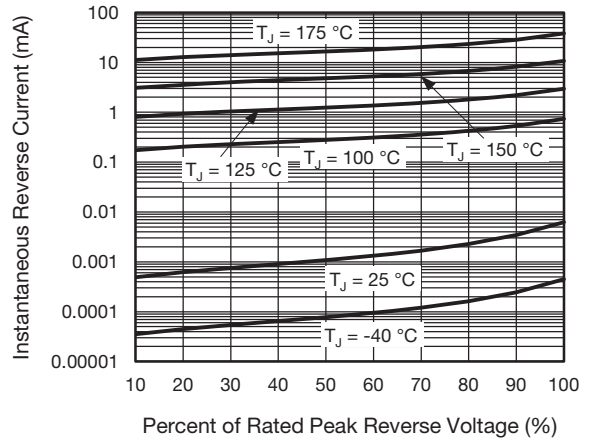


Fig. 4 - Typical Reverse Leakage Characteristics

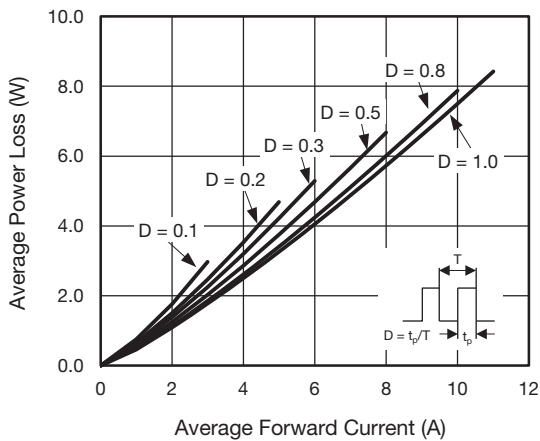


Fig. 2 - Average Power Loss Characteristics

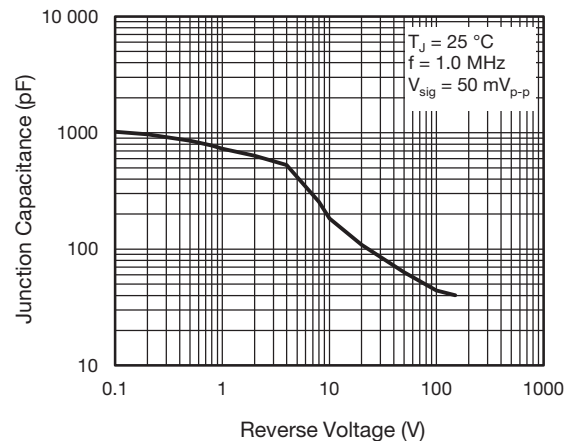


Fig. 5 - Typical Junction Capacitance

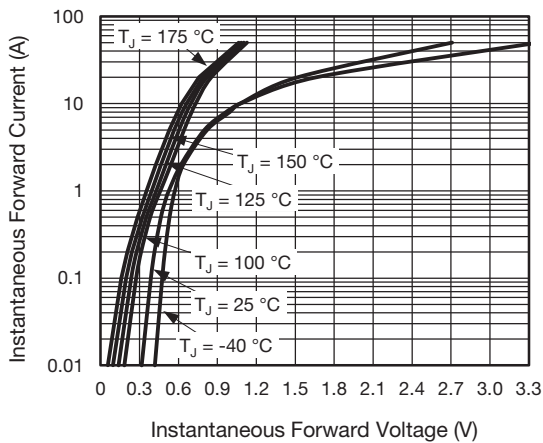


Fig. 3 - Typical Instantaneous Forward Characteristics

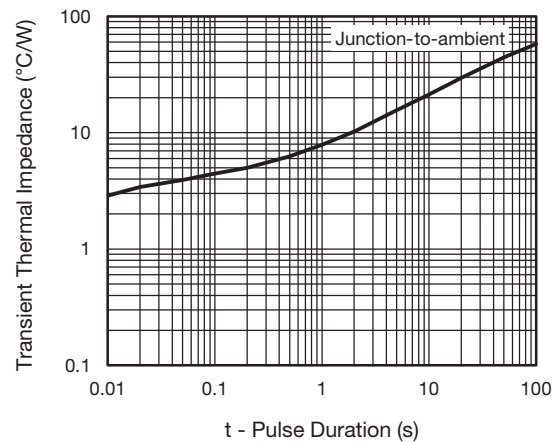


Fig. 6 - Typical Transient Thermal Impedance

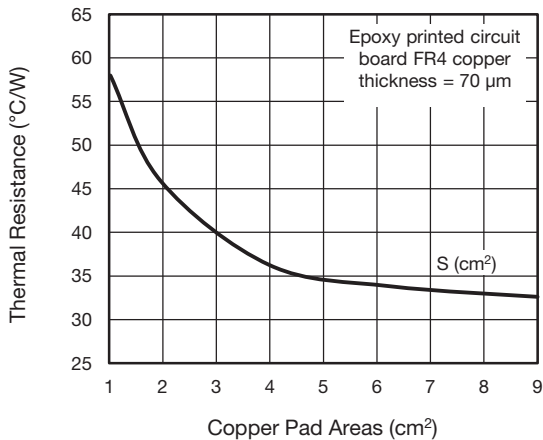
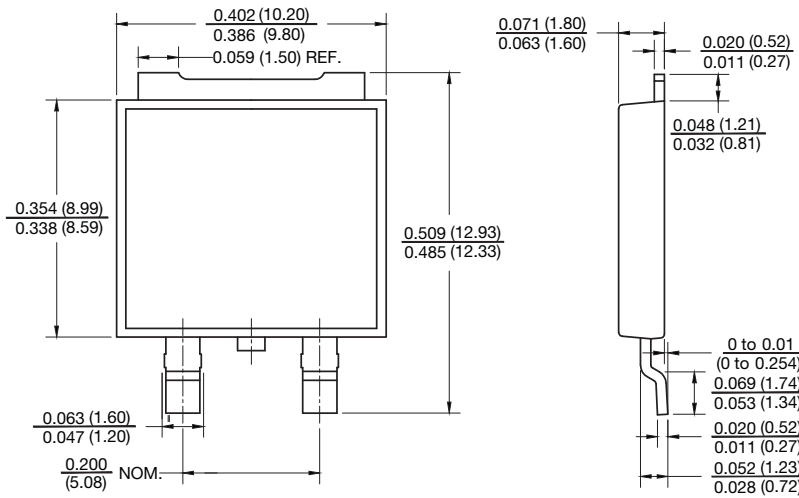


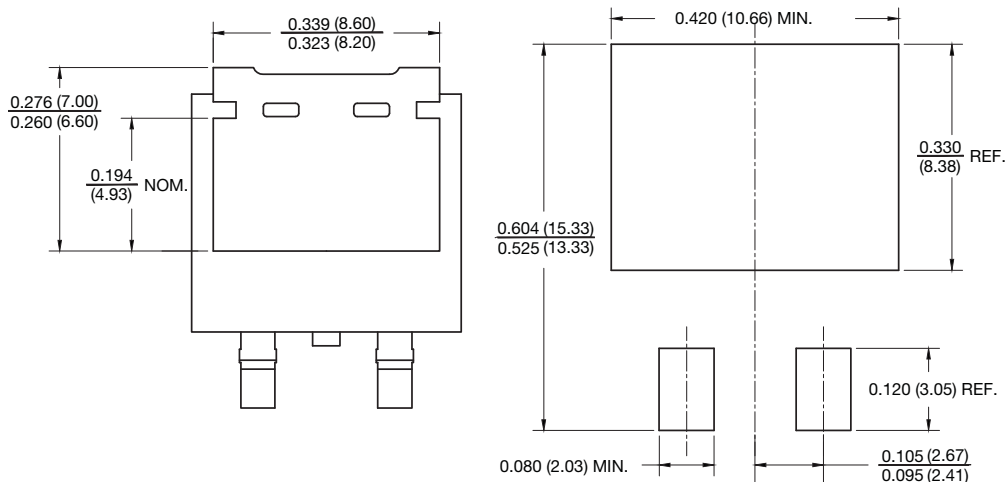
Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD (TO-263AC)



Mounting Pad Layout





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