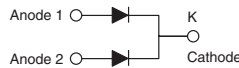
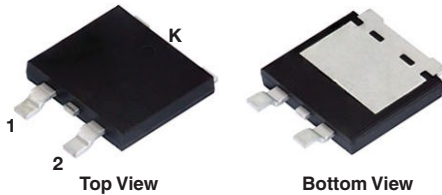


Dual Low-Voltage TMBS[®] (Trench MOS Barrier Schottky) Rectifier

 Ultra Low $V_F = 0.34 \text{ V}$ 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} | 45 V |
| I_{FSM} | 120 A |
| V_F at $I_F = 10 \text{ A}$ ($T_A = 125 \text{ °C}$) | 0.40 V |
| T_J max. | 150 °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 | V20D45C | UNIT |
| Device marking code | | V20D45C | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 45 | 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 +150 | °C |
| Storage temperature range | T_{STG} | -55 to +150 | |

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 | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.44 | - | V |
| | $I_F = 10\text{ A}$ | | | 0.49 | 0.57 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.34 | - | |
| | $I_F = 10\text{ A}$ | | | 0.40 | 0.50 | |
| Reverse current at rated V_R per diode | $V_R = 45\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | - | 1 | mA | |
| | | $T_A = 125\text{ }^\circ\text{C}$ | 10 | 20 | | |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 1900 | - | 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 | V20D45C | UNIT |
| Typical thermal resistance per device | $R_{\theta JC}^{(1)}$ | 1.8 | $^\circ\text{C/W}$ |
| | $R_{\theta JA}^{(2)(3)}$ | 48 | |

Notes

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

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V20D45C-M3/I | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |
| V20D45CHM3/I ⁽¹⁾ | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

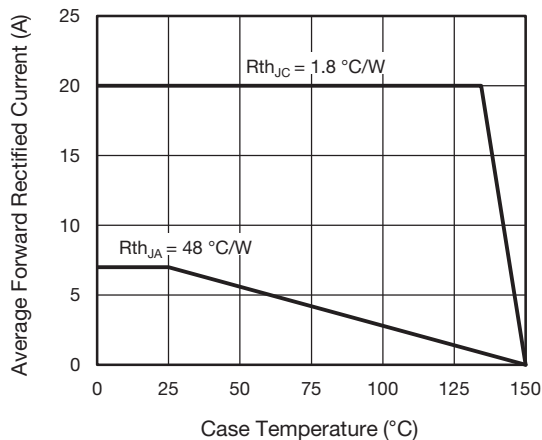
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

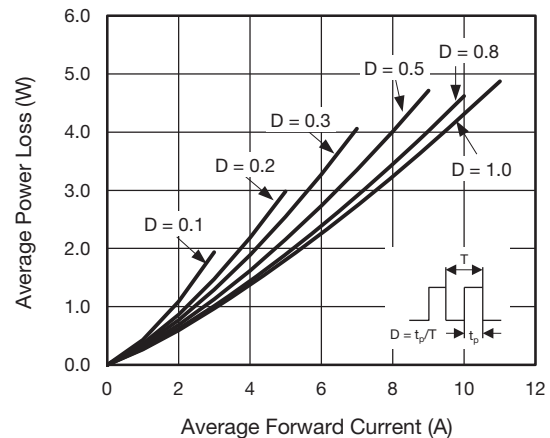


Fig. 2 - Average Power Loss Characteristics

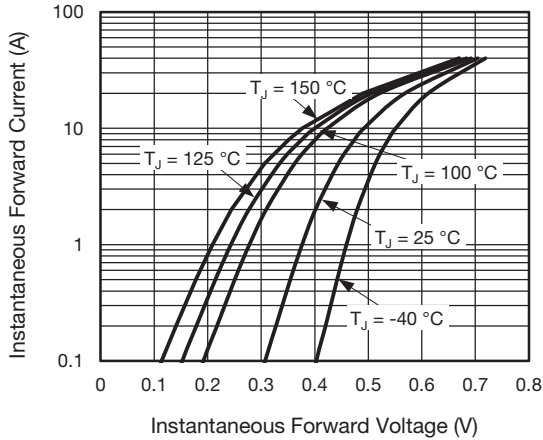


Fig. 3 - Typical Instantaneous Forward Characteristics

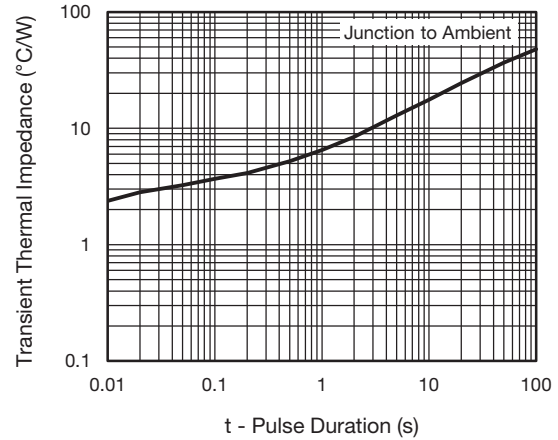


Fig. 6 - Typical Transient Thermal Impedance

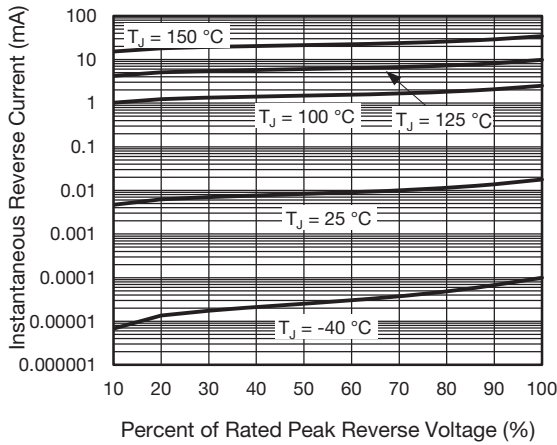


Fig. 4 - Typical Reverse Leakage Characteristics

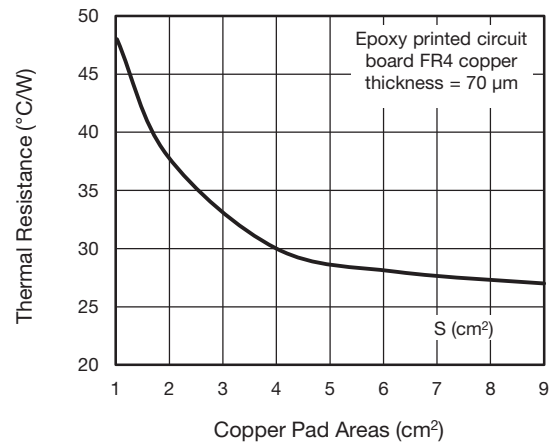


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

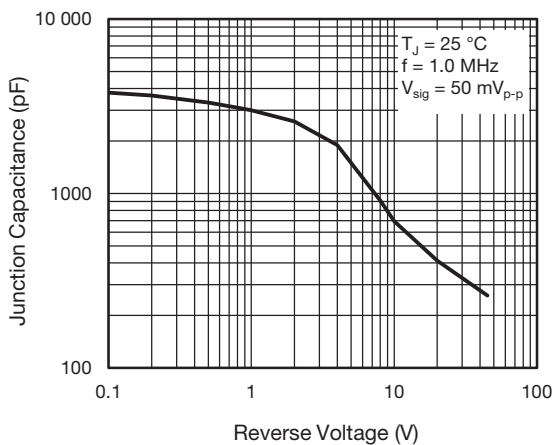
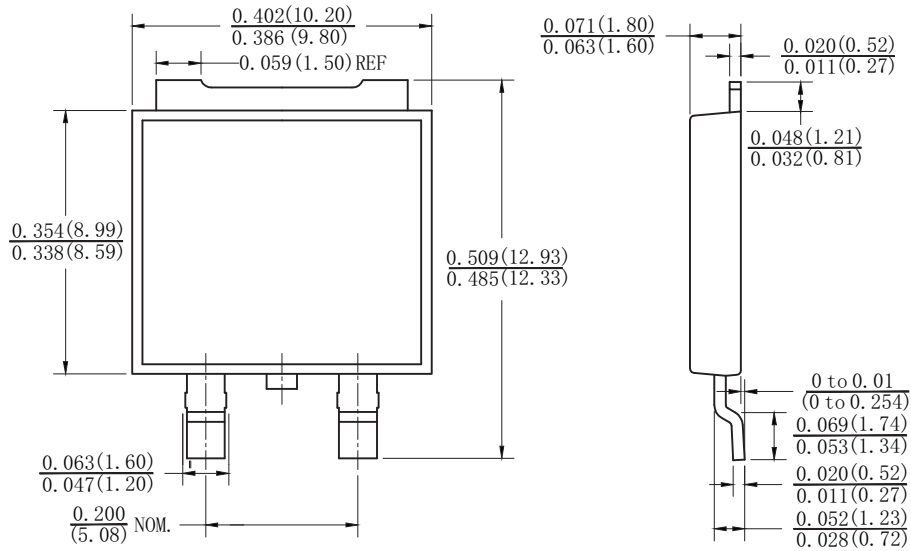


Fig. 5 - Typical Junction Capacitance

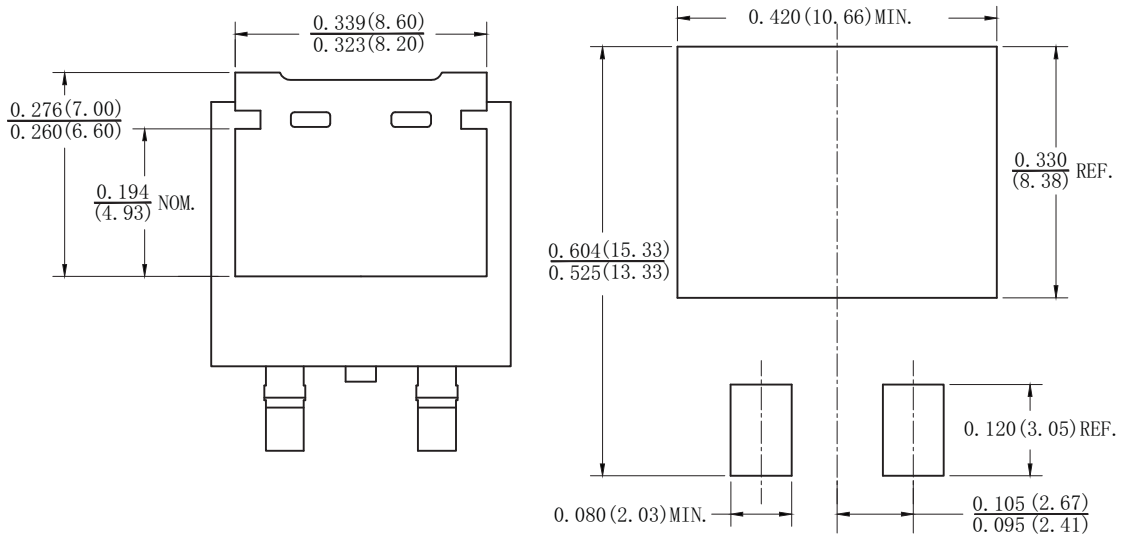


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD (TO-263AC)



Mounting Pad Layout





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