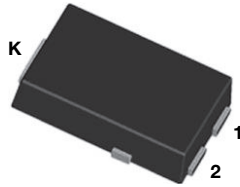
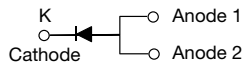


High Current Density Surface Mount TMBS[®] (Trench MOS Barrier Schottky) Rectifier

 Ultra Low $V_F = 0.29\text{ V}$ at $I_F = 5\text{ A}$
eSMP[®] Series

SMPC (TO-277A)

**RoHS
COMPLIANT
HALOGEN
FREE**
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

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling, 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 2 whisker test

PRIMARY CHARACTERISTICS

| | |
|--|----------------|
| $I_{F(AV)}$ | 20 A |
| V_{RRM} | 50 V |
| I_{FSM} | 240 A |
| V_F at $I_F = 20\text{ A}$ ($T_A = 125\text{ °C}$) | 0.46 V |
| T_J max. | 150 °C |
| Package | SMPC (TO-277A) |
| Circuit configuration | Single |

LINKS TO ADDITIONAL RESOURCES

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER | SYMBOL | V20PL50 | UNIT |
|--|----------------|-------------|------|
| Device marking code | | 20L5 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | V |
| Maximum average forward rectified current (fig. 1) | $I_F^{(1)}$ | 20 | A |
| | $I_F^{(2)}$ | 5.5 | |
| Maximum DC reverse voltage | V_{DC} | 40 | V |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 240 | A |
| 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|----------------------|-----------------------------------|-------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 5.0\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.40 | - | V |
| | $I_F = 10\text{ A}$ | | | 0.45 | - | |
| | $I_F = 20\text{ A}$ | | | 0.51 | 0.59 | |
| | $I_F = 5.0\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.29 | - | |
| | $I_F = 10\text{ A}$ | | | 0.36 | - | |
| | $I_F = 20\text{ A}$ | | | 0.46 | 0.54 | |
| Reverse current | $V_R = 40\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.02 | - | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 15 | - | |
| | $V_R = 50\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 3 | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 20 | 60 | |

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 | V20PL50 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 68 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(3)}$ | 4 | |

Notes

- (1) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
(3) Mounted on 30 mm x 30 mm 2 oz. pad PCB; thermal resistance $R_{\theta JM}$ - junction to mount measured at cathode side

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V20PL50-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| V20PL50-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)

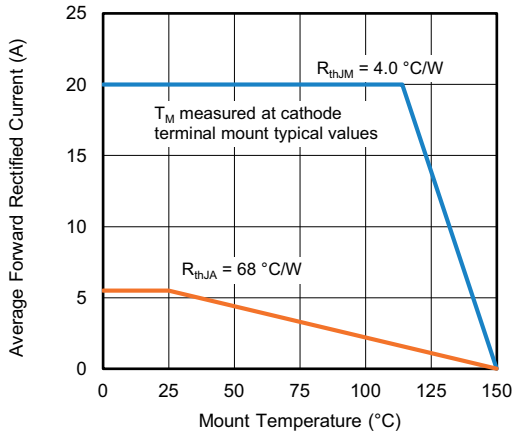


Fig. 1 - Maximum Forward Current Derating Curve

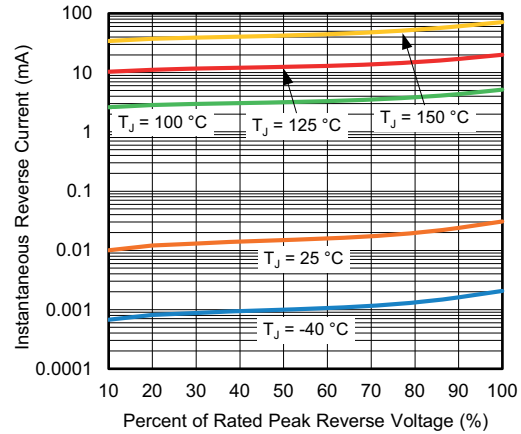


Fig. 4 - Typical Reverse Leakage Characteristics

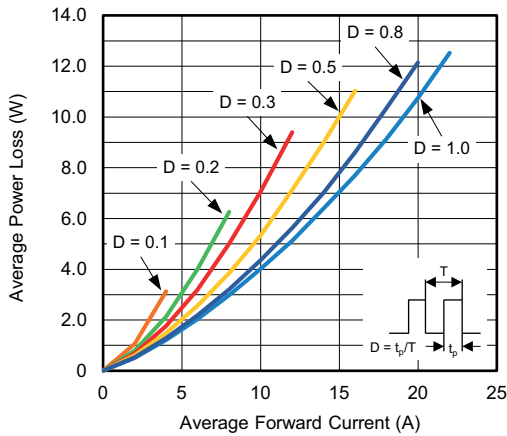


Fig. 2 - Forward Power Loss Characteristics

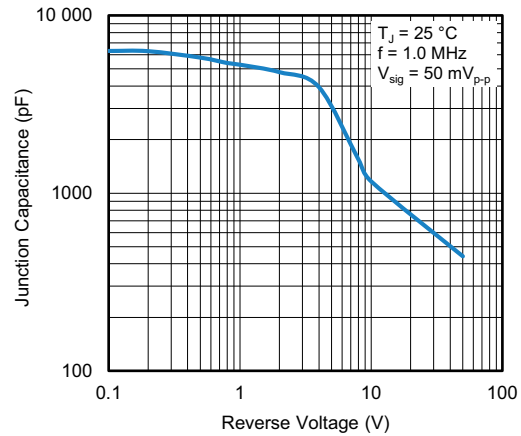


Fig. 5 - Typical Junction Capacitance

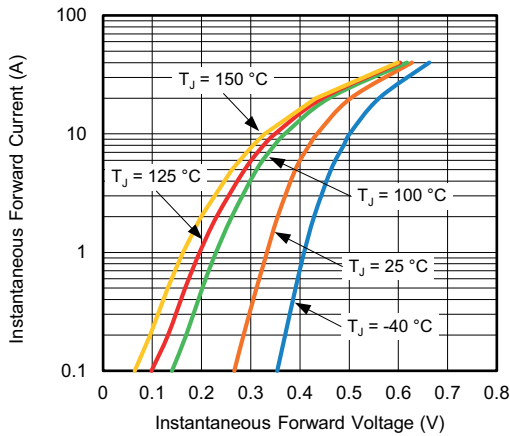


Fig. 3 - Typical Instantaneous Forward Characteristics

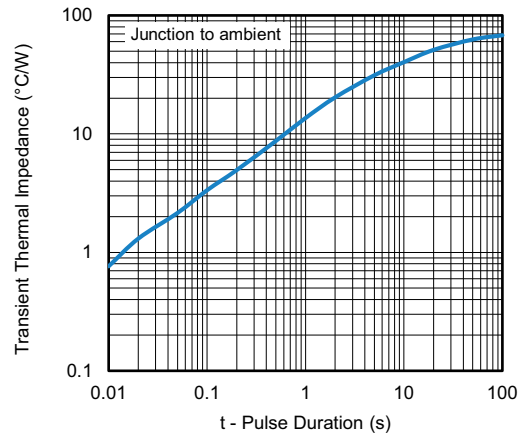
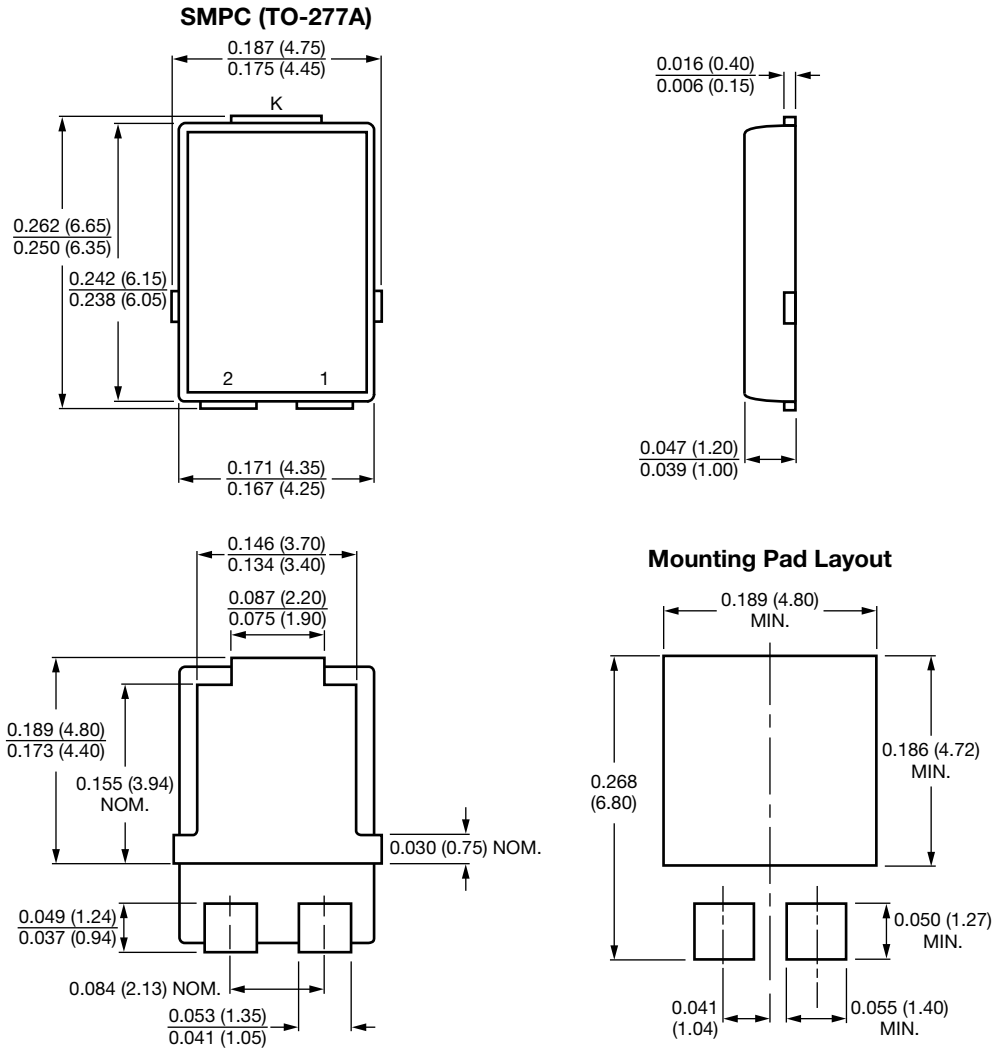


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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