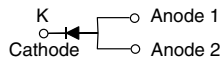


High Current Density Surface-Mount Schottky Barrier Rectifiers

eSMP® Series


SMPC (TO-277A)


FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- 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

LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

PRIMARY CHARACTERISTICS

| | |
|------------------------|----------------|
| $I_{F(AV)}$ | 5.0 A |
| V_{RRM} | 90 V, 100 V |
| I_{FSM} | 150 A |
| V_F at $I_F = 5.0$ A | 0.649 V |
| I_R | 4.5 μ A |
| T_J max. | 150 °C |
| Package | SMPC (TO-277A) |
| Circuit configuration | Single |

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, and polarity protection application.

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

Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified
("X" denotes revision code e.g. A, B,

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

| PARAMETER | SYMBOL | SS5P9 | SS5P10 | UNIT |
|---|----------------|-------------|--------|------|
| Device marking code | | S59 | S510 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 90 | 100 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 5.0 | | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 150 | | A |
| Non-repetitive avalanche energy at $I_{AS} = 2.0$ A, $T_J = 25$ °C | E_{AS} | 20 | | mJ |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | | °C |



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------------|-----------------------------------|-------------|-------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 2.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.708 | - | V |
| | $I_F = 5.0\text{ A}$ | | | 0.832 | 0.88 | |
| | $I_F = 2.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.571 | - | |
| | $I_F = 5.0\text{ A}$ | | | 0.649 | 0.68 | |
| Reverse current | Rated V_R | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 4.5 | 15 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 2.7 | 5 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 130 | - | pF |

Notes(1) Pulse test: 300 μs pulse width, 1 % duty cycle(2) Pulse test: Pulse width $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | | |
|---|-----------------------|-------|--------|--------------------|
| PARAMETER | SYMBOL | SS5P9 | SS5P10 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 65 | | $^\circ\text{C/W}$ |
| | $R_{\theta JL}$ | 3 | | |

Note

(1) Units mounted on recommended PCB 1 oz. pad layout

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SS5P10-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| SS5P10-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| SS5P10HM3_A/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| SS5P10HM3_A/I ⁽¹⁾ | 0.10 | I | 6500 | 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)

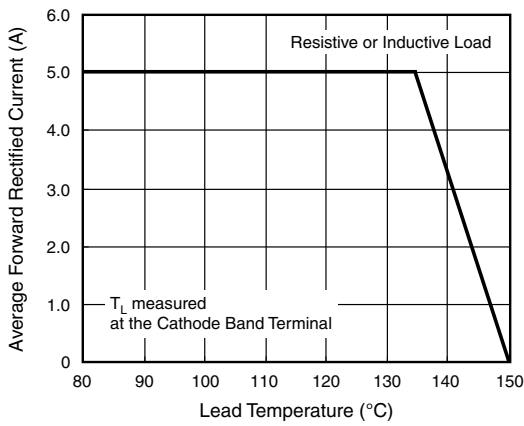


Fig. 1 - Maximum Forward Current Derating Curve

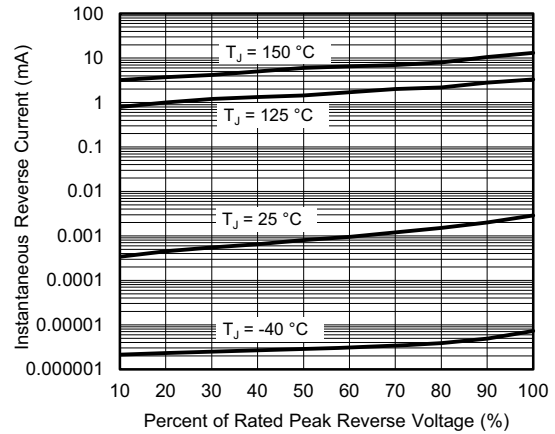


Fig. 4 - Typical Reverse Characteristics

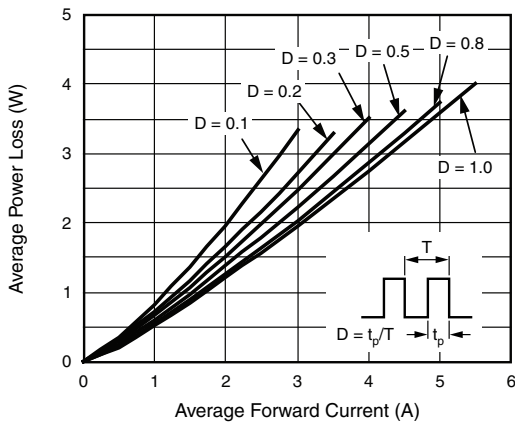


Fig. 2 - Forward Power Loss Characteristics

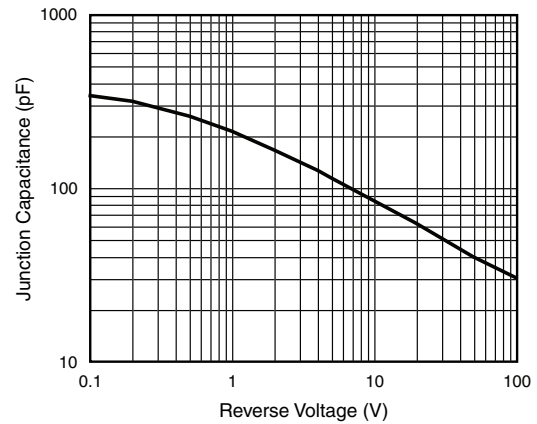


Fig. 5 - Typical Junction Capacitance

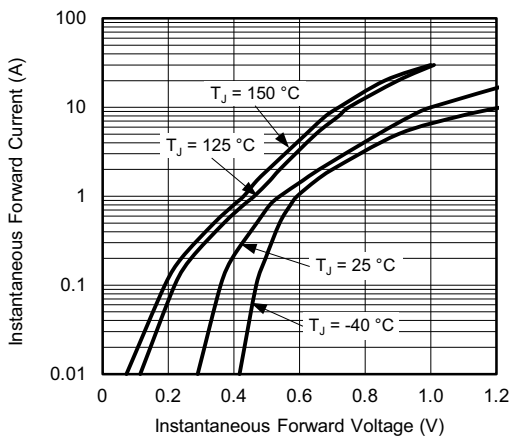


Fig. 3 - Typical Instantaneous Forward Characteristics

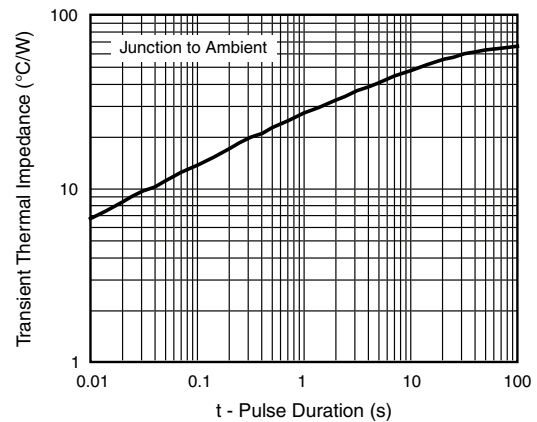
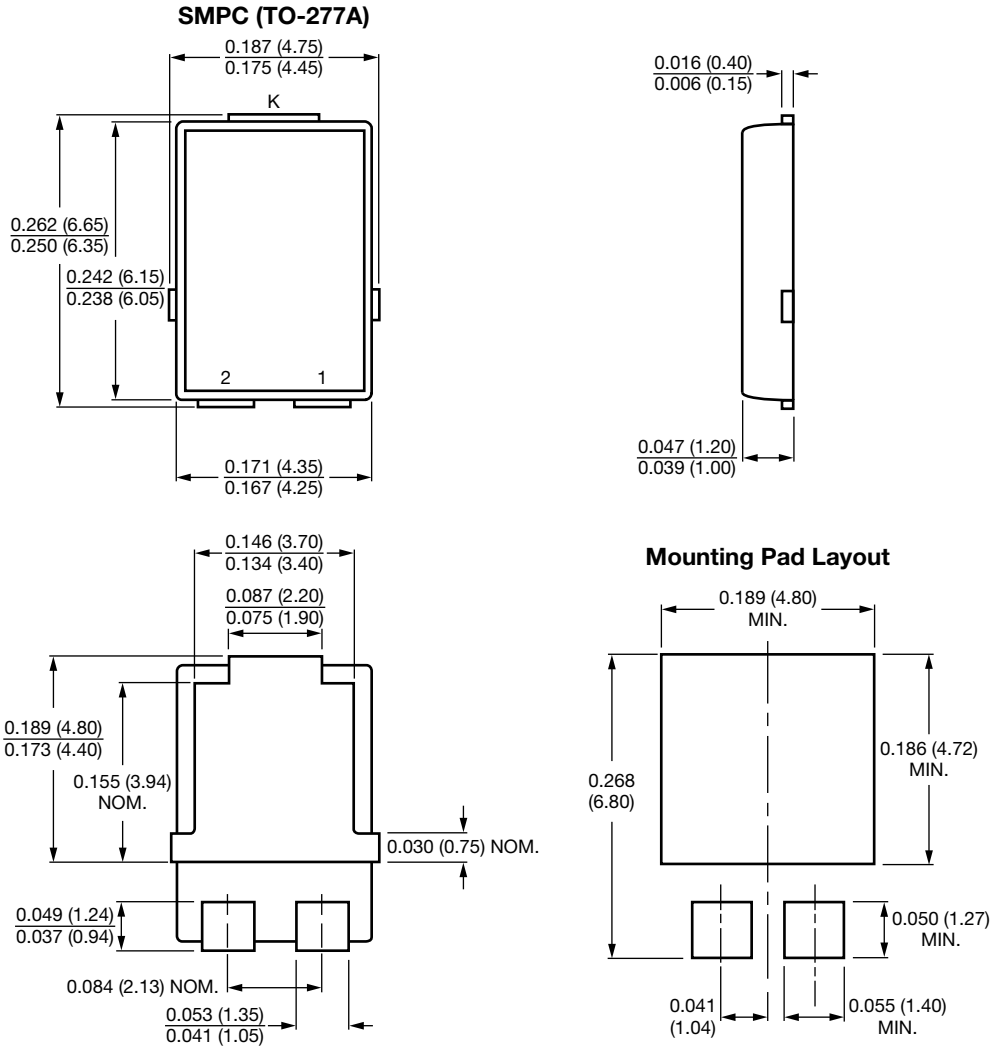


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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