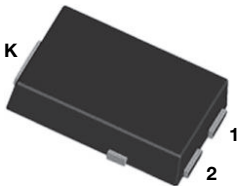
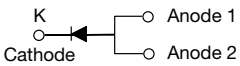
# High Current Density Surface-Mount High Voltage Schottky Rectifiers

**eSMP® Series**




**SMPC (TO-277A)**




## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology, $T_J$ = 175 °C maximum
- Low leakage current
- Meets MSL level 1, per J-STD-020
- 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

## TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or 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

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 10 A |
| $V_{RRM}$ | 90 V, 100 V |
| $I_{FSM}$ | 200 A |
| $E_{AS}$ | 20 mJ |
| $V_F$ at $I_F$ = 10 A | 0.661 V |
| $I_R$ | 0.3 µA |
| $T_J$ max. | 175 °C |
| Package | SMPC (TO-277A) |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **SS10PH9** | **SS10PH10** | **UNIT** |
| Device marking code | | 10H9 | 10H10 | |
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 90 | 100 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 10 | | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 200 | | 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 +175 | | °C |



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| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Instantaneous forward voltage | $I_F$ = 5 A | $T_A$ = 25 °C | $V_F$ (1) | 0.725 | - | V |
| | $I_F$ = 10 A | | | 0.800 | 0.88 | |
| | $I_F$ = 5 A | $T_A$ = 125 °C | | 0.581 | - | |
| | $I_F$ = 10 A | | | 0.661 | 0.74 | |
| Reverse current | Rated $V_R$ | $T_A$ = 25 °C | $I_R$ (2) | 0.3 | 10 | µA |
| | | $T_A$ = 125 °C | | 0.3 | 3 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 270 | - | pF |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise specified) | | | | |
|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **SS10PH9** | **SS10PH10** | **UNIT** |
| Typical thermal resistance | $R_{\theta JA}$ (1) | 60 | | °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** |
| SS10PH10-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| SS10PH10-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| SS10PH10HM3_A/H (1) | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| SS10PH10HM3_A/I (1) | 0.10 | I | 6500 | 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 specified)

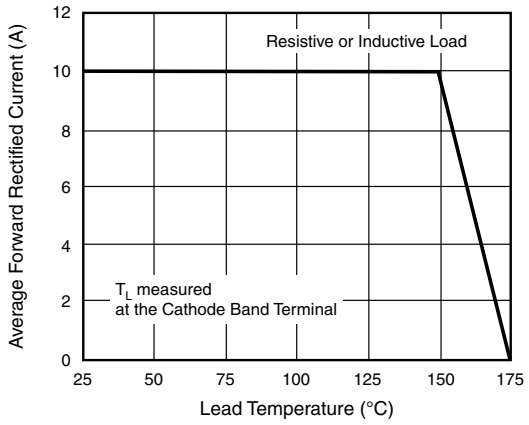



Fig. 1 - Maximum Forward Current Derating Curve

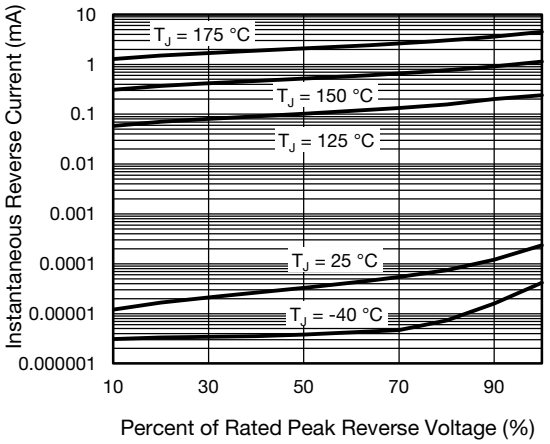



Fig. 4 - Typical Reverse Characteristics

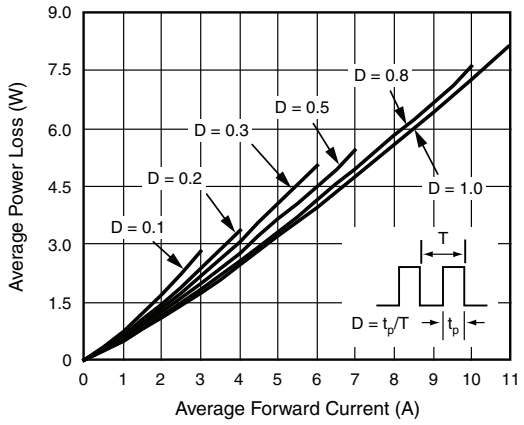



Fig. 2 - Forward Power Loss Characteristics

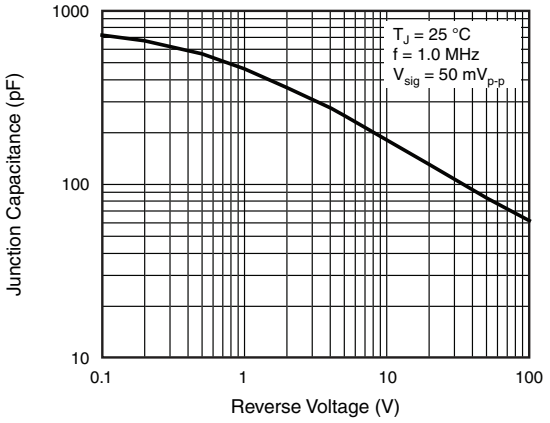



Fig. 5 - Typical Junction Capacitance

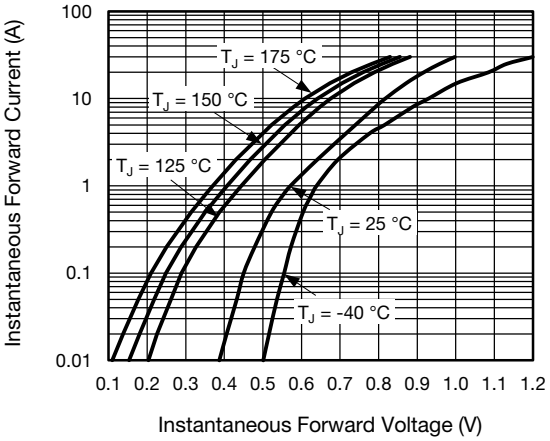



Fig. 3 - Typical Instantaneous Forward Characteristics

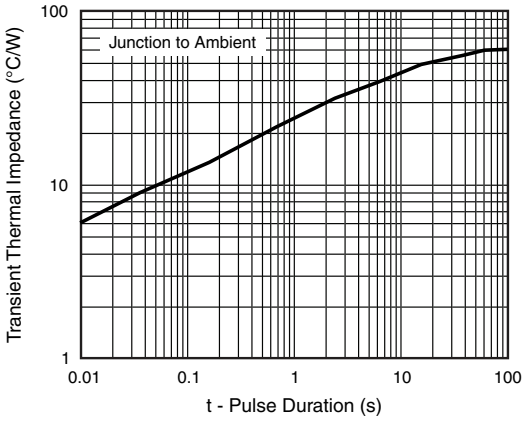
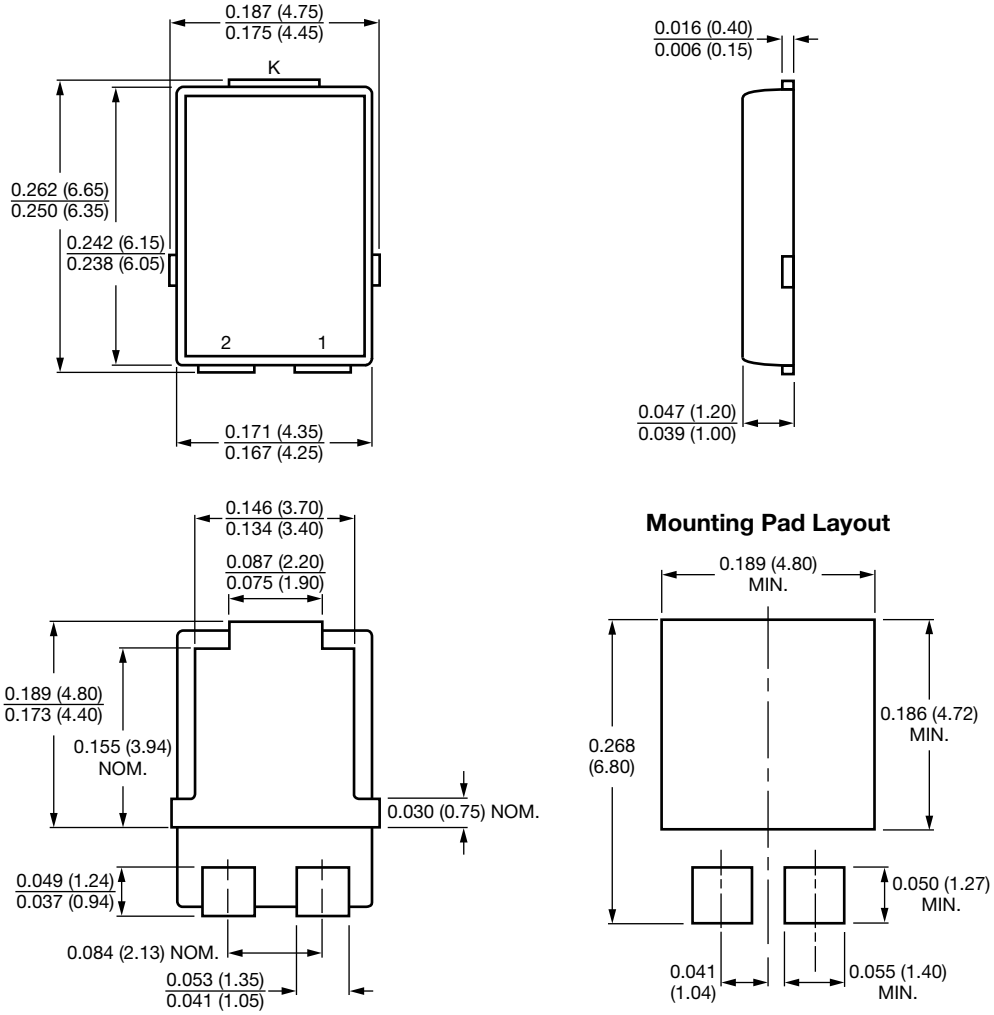



Fig. 6 - Typical Transient Thermal Impedance


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**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMPC (TO-277A)**




Conform to JEDEC® TO-277A



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