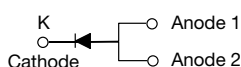


# High Current Density Surface-Mount Schottky Barrier Rectifier

## 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
- Meet 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](http://www.vishay.com/doc?99912)

AUTOMOTIVE  
GRADE  
Available



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## LINKS TO ADDITIONAL RESOURCES



3D Models

## PRIMARY CHARACTERISTICS

|                       |                |
|-----------------------|----------------|
| $I_{F(AV)}$           | 10 A           |
| $V_{RRM}$             | 50 V, 60 V     |
| $I_{FSM}$             | 280 A          |
| $E_{AS}$              | 20 mJ          |
| $V_F$ at $I_F = 10$ A | 0.55 V         |
| $T_J$ max.            | 150 °C         |
| Package               | SMPC (TO-277A) |
| Circuit configuration | Single         |

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, 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         | SS10P5                                | SS10P6 | UNIT |
|-----------------------------------------------------------------------------------|----------------|---------------------------------------|--------|------|
| Device marking code                                                               |                | S105                                  | S106   |      |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 50                                    | 60     | V    |
| Maximum average forward rectified current (fig. 1)                                | $I_{F(AV)}$    | 10 <sup>(1)</sup><br>7 <sup>(2)</sup> |        | A    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 280                                   |        | A    |
| Non-repetitive avalanche energy at $I_{AS} = 2$ A, $T_J = 25$ °C                  | $E_{AS}$       | 20                                    |        | mJ   |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -55 to +150                           |        | °C   |

## Notes

<sup>(1)</sup> Units mounted on infinite heatsink

<sup>(2)</sup> Units mounted on 5 cm x 5 cm, 2 oz. copper pad

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                     | TEST CONDITIONS       |                         | SYMBOL                        | TYP. | MAX. | UNIT |  |
|-------------------------------|-----------------------|-------------------------|-------------------------------|------|------|------|--|
| Instantaneous forward voltage | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.51 | -    | V    |  |
|                               | I <sub>F</sub> = 7 A  |                         |                               | 0.55 | -    |      |  |
|                               | I <sub>F</sub> = 10 A |                         |                               | 0.59 | 0.67 |      |  |
|                               | I <sub>F</sub> = 5 A  | T <sub>A</sub> = 125 °C |                               | 0.42 | -    |      |  |
|                               | I <sub>F</sub> = 7 A  |                         |                               | 0.47 | -    |      |  |
|                               | I <sub>F</sub> = 10A  |                         |                               | 0.55 | 0.63 |      |  |
| Reverse current               | Rated V <sub>R</sub>  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 7.8  | 150  | μA   |  |
|                               |                       | T <sub>A</sub> = 125 °C |                               | 5.9  | 15   | mA   |  |
| Typical junction capacitance  | 4.0 V, 1 MHz          |                         | C <sub>J</sub>                | 560  | -    | pF   |  |

**Notes**(1) Pulse test: 300  $\mu\text{s}$  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                | SS10P5 | SS10P6 | UNIT                 |
|--------------------------------------|-----------------------|--------|--------|----------------------|
| Typical thermal resistance per diode | $R_{\theta JA}^{(1)}$ | 60     |        | $^{\circ}\text{C/W}$ |
|                                      | $R_{\theta JL}$       | 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                      |
|------------------------------|-----------------|--------------|---------------|------------------------------------|
| SS10P6-M3/86A                | 0.10            | 86A          | 1500          | 7" diameter plastic tape and reel  |
| SS10P6-M3/87A                | 0.10            | 87A          | 6500          | 13" diameter plastic tape and reel |
| SS10P6HM3_A/H <sup>(1)</sup> | 0.10            | H            | 1500          | 7" diameter plastic tape and reel  |
| SS10P6HM3_A/I <sup>(1)</sup> | 0.10            | I            | 6500          | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

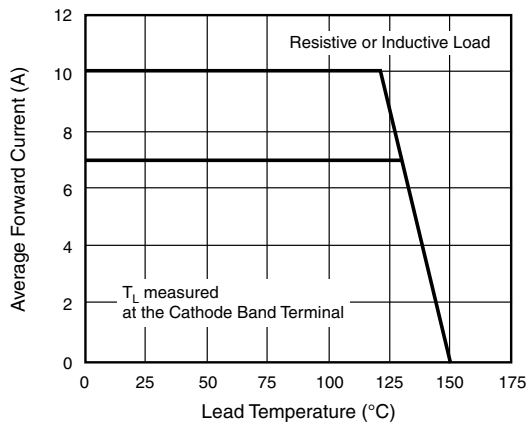
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

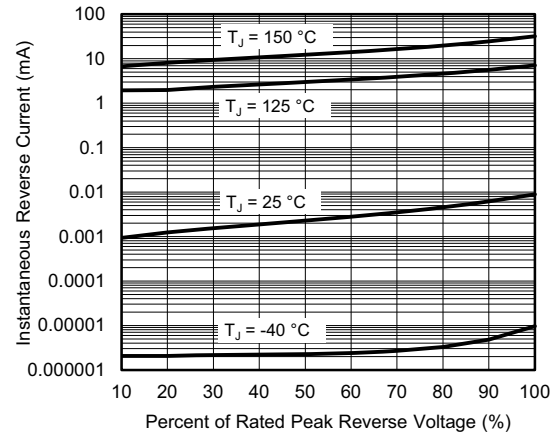


Fig. 4 - Typical Reverse Leakage Characteristics

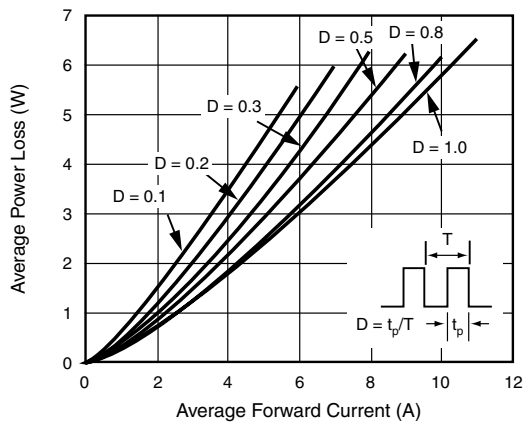


Fig. 2 - Forward Power Loss Characteristics

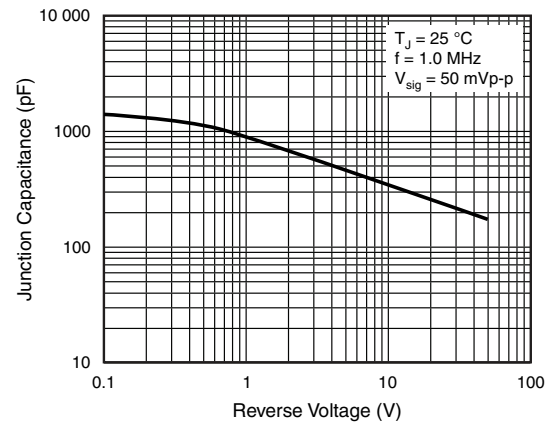


Fig. 5 - Typical Junction Capacitance

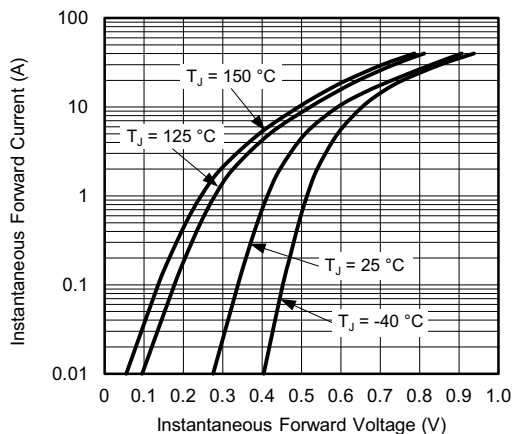


Fig. 3 - Typical Instantaneous Forward Characteristics

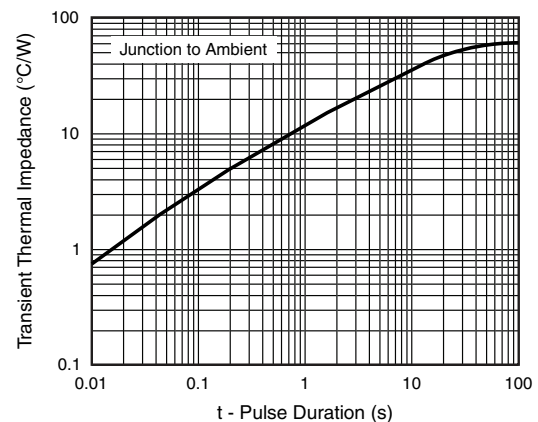
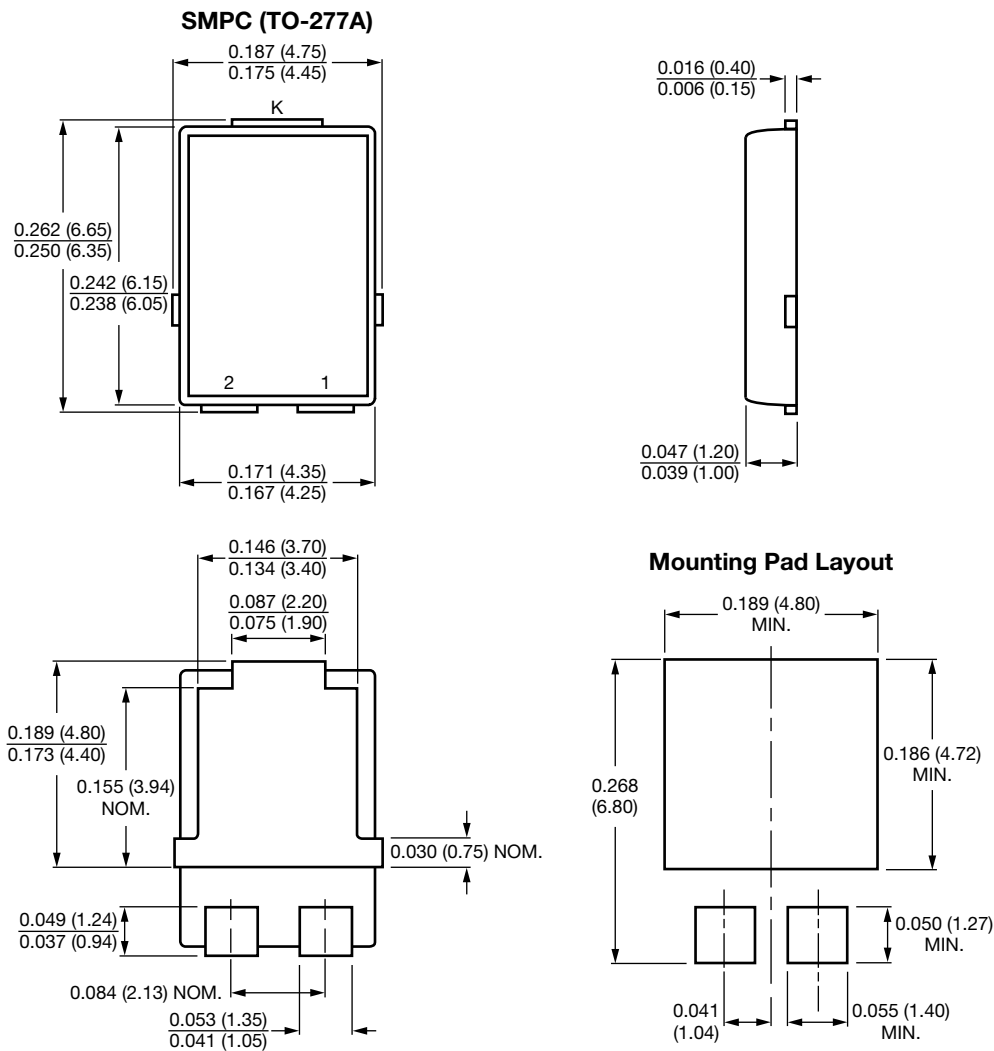


Fig. 6 - Typical Transient Thermal Impedance



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



Conform to JEDEC® TO-277A



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