

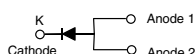


## High Current Density Surface Mount Schottky Barrier Rectifiers

### eSMP® Series



TO-277A (SMPC)



### 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

AUTOMOTIVE  
GRADE  
Available



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

### 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 $\mu$ A |
| $T_J$ max.             | 150 °C      |

### 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:** TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS compliant, and automotive grade

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

M3 suffix meets JESD 201 class 1A 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 <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |       |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|-------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP.  | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 2.5 A | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.708 | -    | V    |
|                                                                            | I <sub>F</sub> = 5.0 A |                         |                               | 0.832 | 0.88 |      |
|                                                                            | I <sub>F</sub> = 2.5 A | T <sub>A</sub> = 125 °C |                               | 0.571 | -    |      |
|                                                                            | I <sub>F</sub> = 5.0 A |                         |                               | 0.649 | 0.68 |      |
| Reverse current                                                            | Rated V <sub>R</sub>   | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 4.5   | 15   | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 2.7   | 5    | mA   |
| Typical junction capacitance                                               | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 130   | -    | 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 <sub>A</sub> = 25 °C unless otherwise specified) |                                 |       |       |      |
|-----------------------------------------------------------------------------|---------------------------------|-------|-------|------|
| PARAMETER                                                                   | SYMBOL                          | SS5P3 | SS5P4 | UNIT |
| Typical thermal resistance                                                  | R <sub>θJA</sub> <sup>(1)</sup> | 65    |       | °C/W |
|                                                                             | R <sub>θJL</sub>                | 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 |
| SS5P10HM3/86A <sup>(1)</sup>   | 0.10            | 86A          | 1500          | 7" diameter plastic tape and reel  |
| SS5P10HM3/87A <sup>(1)</sup>   | 0.10            | 87A          | 6500          | 13" diameter plastic tape and reel |

**Note**

(1) Automotive grade



# RATINGS AND CHARACTERISTICS CURVES

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

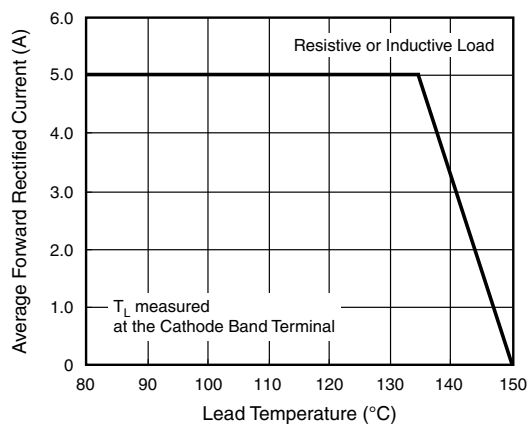


Fig. 1 - Maximum Forward Current Derating Curve

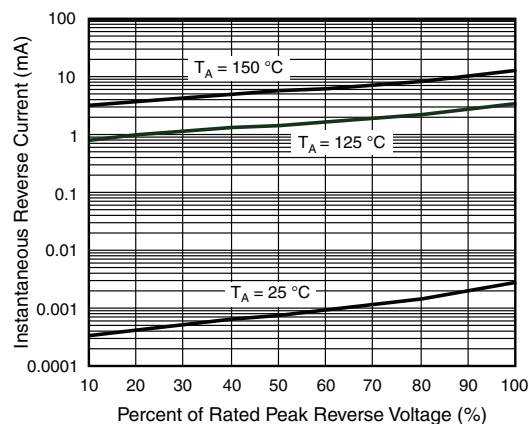


Fig. 4 - Typical Reverse Characteristics

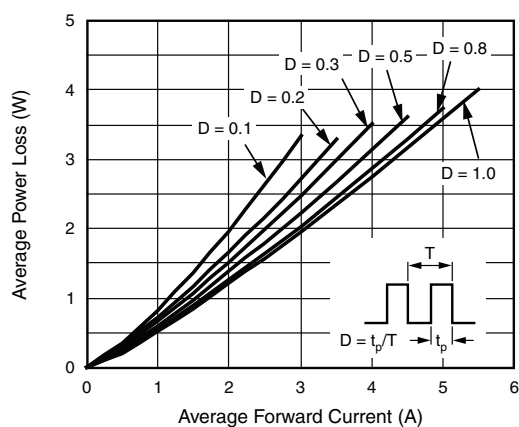


Fig. 2 - Forward Power Loss Characteristics

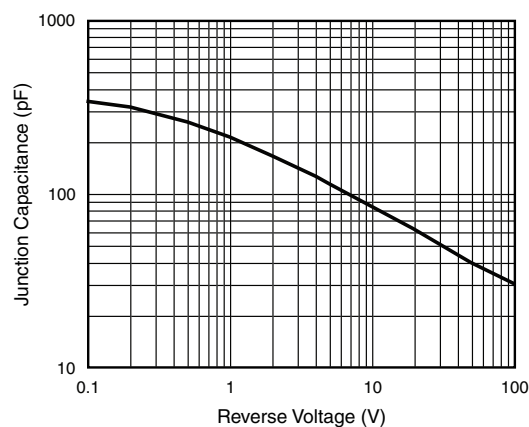


Fig. 5 - Typical Junction Capacitance

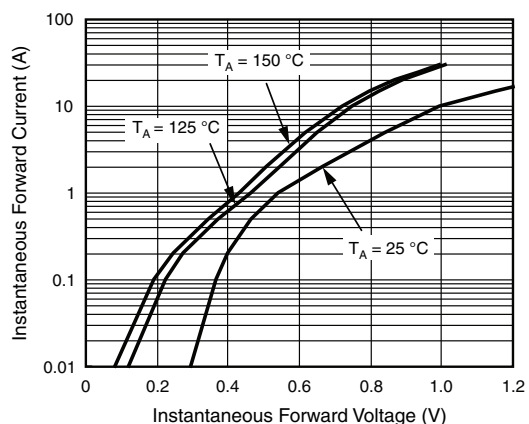


Fig. 3 - Typical Instantaneous Forward Characteristics

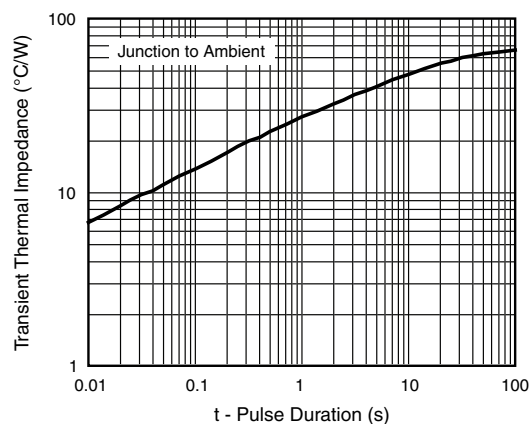
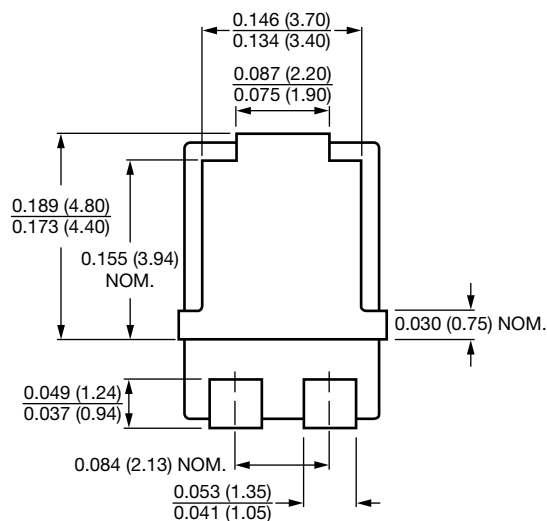
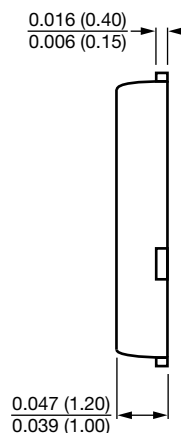
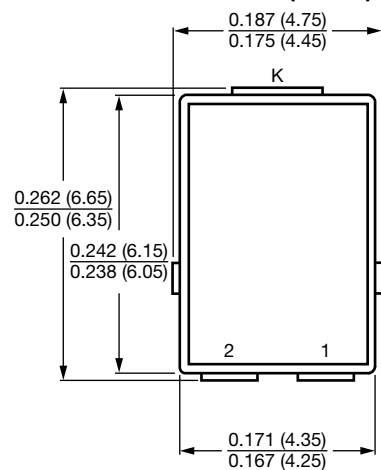
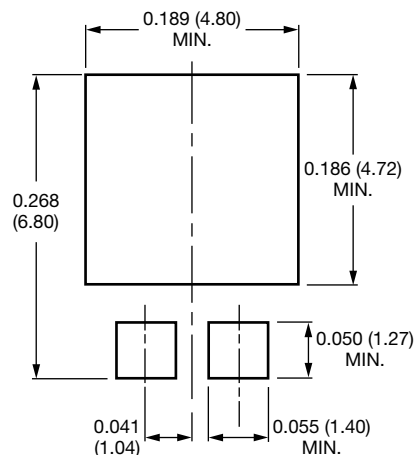


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)**TO-277A (SMPC)****Mounting Pad Layout**

Conform to JEDEC TO-277A



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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.