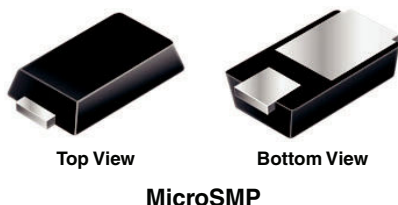


# Surface Mount Schottky Barrier Rectifiers

## eSMP® Series



### PRIMARY CHARACTERISTICS

|                        |            |
|------------------------|------------|
| $I_{F(AV)}$            | 1.0 A      |
| $V_{RRM}$              | 20 V, 30 V |
| $I_{FSM}$              | 25 A       |
| $V_F$ at $I_F = 1.0$ A | 0.35 V     |
| $T_J$ max.             | 150 °C     |

### TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

### FEATURES

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- 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

### MECHANICAL DATA

**Case:** MicroSMP

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

**Polarity:** Color band denotes the cathode end

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

| PARAMETER                                                                          | SYMBOL         | MSS1P2L       | MSS1P3L | UNIT |
|------------------------------------------------------------------------------------|----------------|---------------|---------|------|
| Device marking code                                                                |                | 12L           | 13L     |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 20            | 30      | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}$    | 1.0           |         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 25            |         | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | - 55 to + 150 |         | °C   |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER                             | TEST CONDITIONS | SYMBOL    | TYP. | MAX. | UNIT |
|---------------------------------------|-----------------|-----------|------|------|------|
| Maximum instantaneous forward voltage | $I_F = 0.5$ A   | $V_F$ (1) | 0.39 | -    | V    |
|                                       | $I_F = 1.0$ A   |           | 0.44 | 0.50 |      |
|                                       | $I_F = 0.5$ A   |           | 0.28 | -    |      |
|                                       | $I_F = 1.0$ A   |           | 0.35 | 0.40 |      |
| Maximum reverse current               | Rated $V_R$     | $I_R$ (2) | 15   | 250  | μA   |
|                                       |                 |           | 6.0  | 20   | mA   |
| Typical junction capacitance          | 4.0 V, 1 MHz    | $C_J$     | 65   | -    | pF   |

#### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

## MSS1P2L, MSS1P3L

Vishay General Semiconductor

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

| PARAMETER                  | SYMBOL                | MSS1P2L | MSS1P3L | UNIT |
|----------------------------|-----------------------|---------|---------|------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 125     |         | °C/W |
|                            | $R_{\theta JL}^{(1)}$ | 30      |         |      |
|                            | $R_{\theta JC}^{(1)}$ | 40      |         |      |

**Note**

<sup>(1)</sup> Thermal resistance from junction to ambient and junction to lead mounted on PCB with 6.0 mm x 6.0 mm copper pad areas  $R_{\theta JL}$  is measured at the terminal of cathode band.  $R_{\theta JC}$  is measured at the top center of the body

**ORDERING INFORMATION** (Example)

| PREFERRED P/N                 | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                     |
|-------------------------------|-----------------|------------------------|---------------|-----------------------------------|
| MSS1P3L-M3/89A                | 0.006           | 89A                    | 4500          | 7" diameter plastic tape and reel |
| MSS1P3LHM3/89A <sup>(1)</sup> | 0.006           | 89A                    | 4500          | 7" diameter plastic tape and reel |

**Note**

<sup>(1)</sup> Automotive grade

**RATINGS AND CHARACTERISTICS CURVES**

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

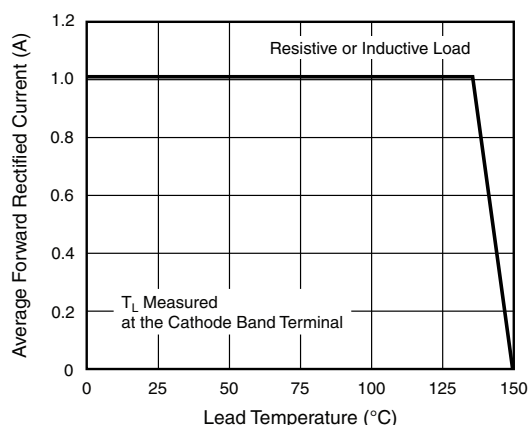


Fig. 1 - Maximum Forward Current Derating Curve

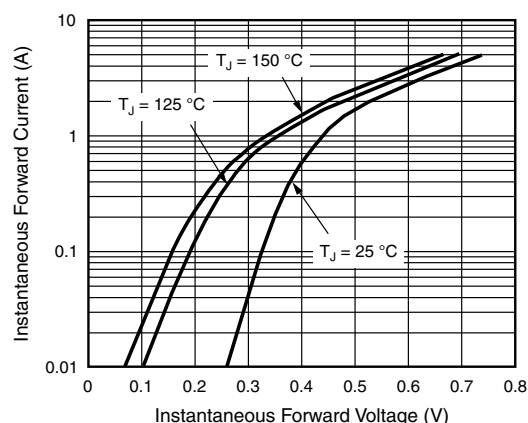


Fig. 3 - Typical Instantaneous Forward Characteristics

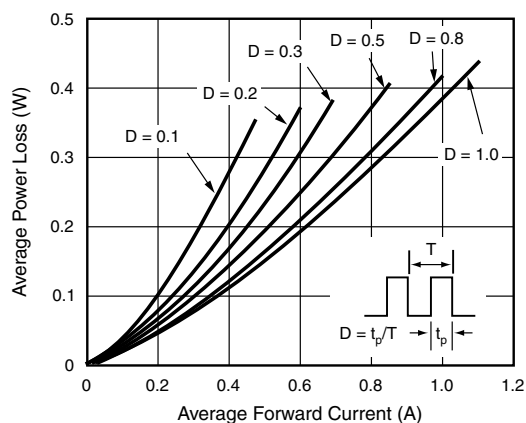


Fig. 2 - Forward Power Loss Characteristics

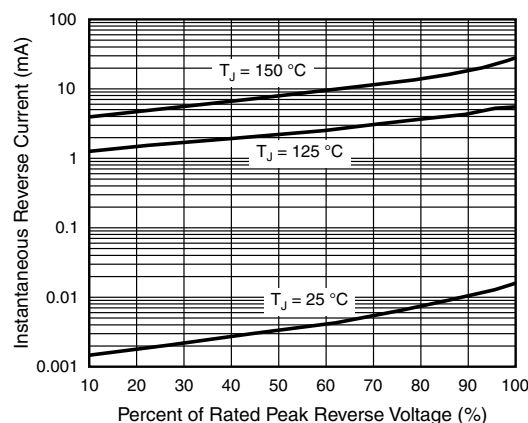


Fig. 4 - Typical Reverse Characteristics

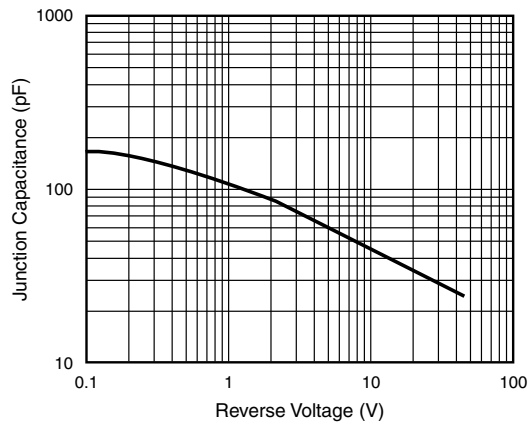


Fig. 5 - Typical Junction Capacitance

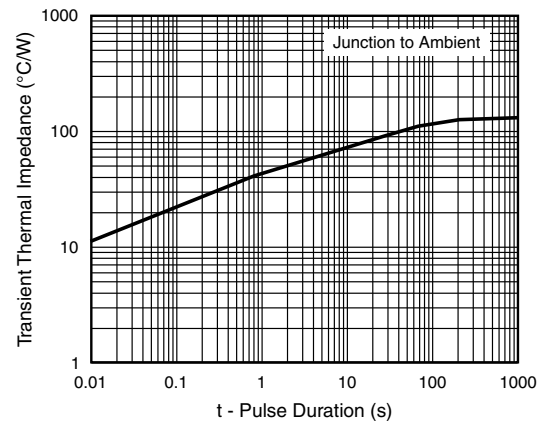
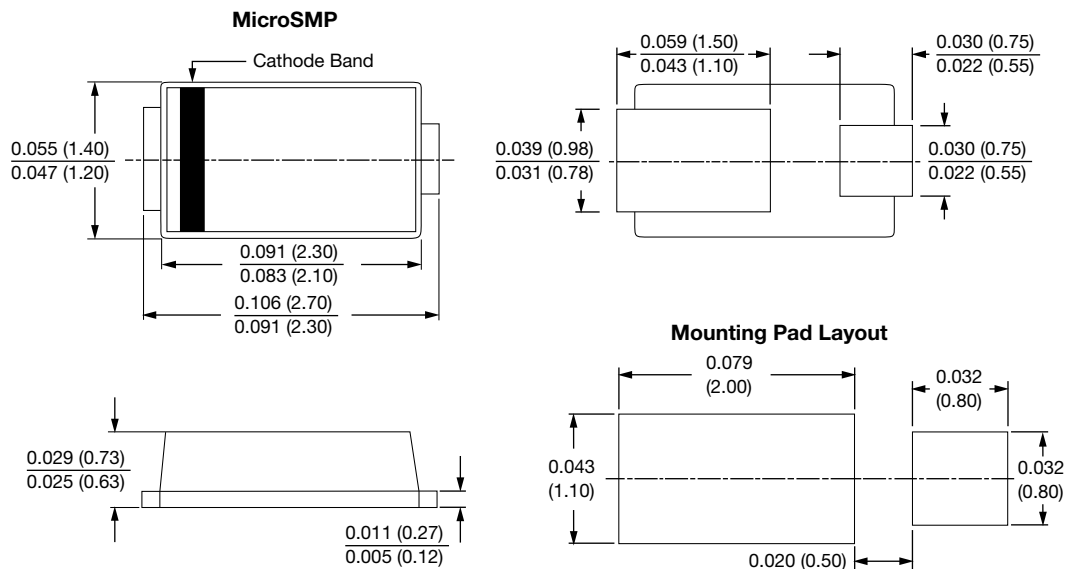


Fig. 6 - Typical Transient Thermal Impedance

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



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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9