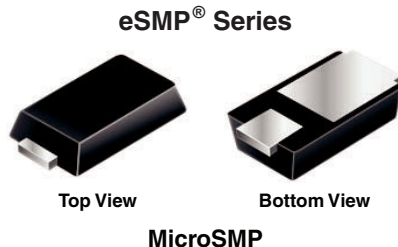




## Ultra Low $V_F$ Surface Mount Schottky Barrier Rectifiers



The ultra low  $V_F$  Schottky optimized for forward voltage drop with high reverse current trade-off.

| PRIMARY CHARACTERISTICS |            |
|-------------------------|------------|
| $I_{F(AV)}$             | 1.0 A      |
| $V_{RRM}$               | 20 V, 30 V |
| $I_{FSM}$               | 30 A       |
| $V_F$ at $I_F = 1.5$ A  | 0.30 V     |
| $T_J$ max.              | 125 °C     |

### APPLICATIONS

Application designed and qualified for hard disc driver where the  $V_F$  performance and size are required. HTIR is not a concern.

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |             |               |         |      |
|--|-------------|---------------|---------|------|
| PARAMETER  | SYMBOL      | MSS1P2U       | MSS1P3U | UNIT |
| Device marking code  |             | 12U           | 13U     |      |
| 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 | $I_{FSM}$   | 30            |         | A    |
| Operating junction temperature range   | $T_J$       | - 55 to + 125 |         | °C   |
| Storage temperature range  | $T_{STG}$   | - 55 to + 150 |         | °C   |

### FEATURES

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- Caution: High reverse leakage
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**



**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

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

M3 suffix meets JESD 201 class 1A whisker test

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

# MSS1P2U, MSS1P3U

Vishay General Semiconductor



| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                      |                                  |                                   |      |      |               |
|---|----------------------|----------------------------------|-----------------------------------|------|------|---------------|
| PARAMETER   | TEST CONDITIONS      | SYMBOL                           | TYP.                              | MAX. | UNIT |               |
| Maximum instantaneous forward voltage   | $I_F = 0.5\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$                       | 0.23 | -    | V             |
|   | $I_F = 1.0\text{ A}$ |                                  |                                   | 0.30 | -    |               |
|   | $I_F = 1.5\text{ A}$ |                                  |                                   | 0.35 | 0.40 |               |
|   | $I_F = 0.5\text{ A}$ | $T_J = 85\text{ }^\circ\text{C}$ |                                   | 0.16 | -    |               |
|   | $I_F = 1.0\text{ A}$ |                                  |                                   | 0.24 | -    |               |
|   | $I_F = 1.5\text{ A}$ |                                  |                                   | 0.30 | 0.35 |               |
| Maximum reverse current   | Rated $V_R$          | $I_R^{(2)}$                      | $T_J = 25\text{ }^\circ\text{C}$  | 0.4  | 1.2  | $\mu\text{A}$ |
|   |                      |                                  | $T_J = 125\text{ }^\circ\text{C}$ | 12   | 30   | mA            |
| Typical junction capacitance  | 4.0 V, 1 MHz         | $C_J$                            | 68                                | -    | pF   |               |

**Notes**

- Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of  $T_J$  therefore must include forward and reverse power effects.
- <sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle
- <sup>(2)</sup> Pulse test: Pulse width  $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                       |         |                    |
|--|-----------------------|---------|--------------------|
| PARAMETER  | SYMBOL                | MSS1P3U | UNIT               |
| Typical thermal resistance   | $R_{\theta JA}^{(1)}$ | 170     | $^\circ\text{C/W}$ |
|  | $R_{\theta JM}^{(1)}$ | 30      |                    |

**Note**

<sup>(1)</sup> Free air, mounted on recommended copper pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient,  $R_{\theta JM}$  - junction to mount.

| ORDERING INFORMATION (Example) |                 |                        |               |                                   |
|--------------------------------|-----------------|------------------------|---------------|-----------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                     |
| MSS1P3U-M3/89A                 | 0.006           | 89A                    | 4500          | 7" diameter plastic tape and reel |

## RATINGS AND CHARACTERISTICS CURVES

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

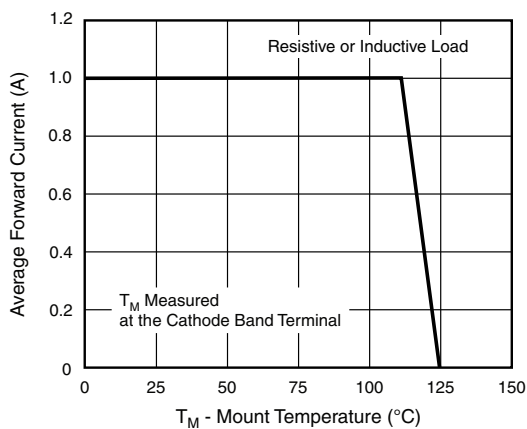


Fig. 1 - Maximum Forward Current Derating Curve

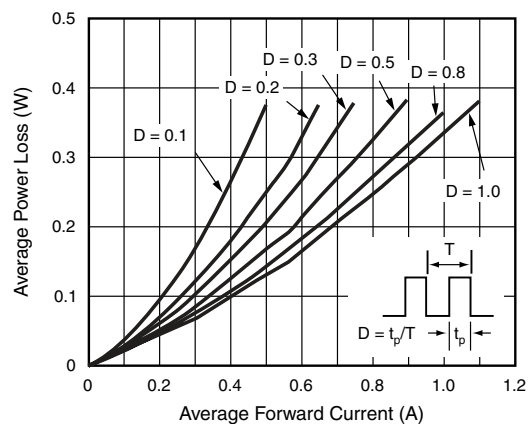


Fig. 2 - Forward Power Loss Characteristics

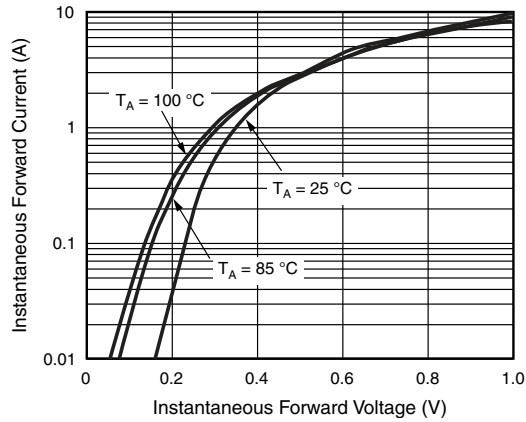


Fig. 3 - Typical Instantaneous Forward Characteristics

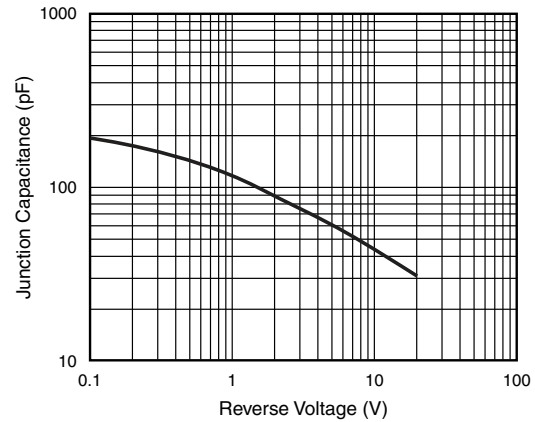


Fig. 5 - Typical Junction Capacitance

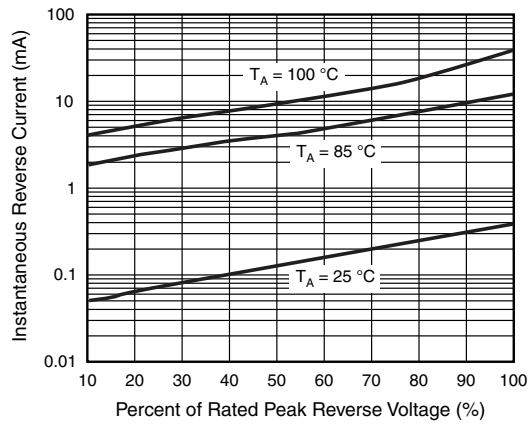


Fig. 4 - Typical Reverse Characteristics

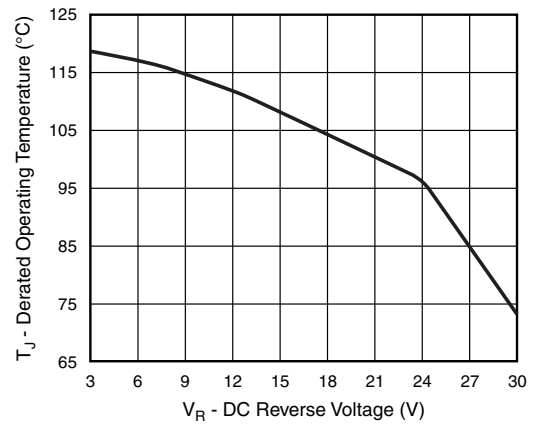
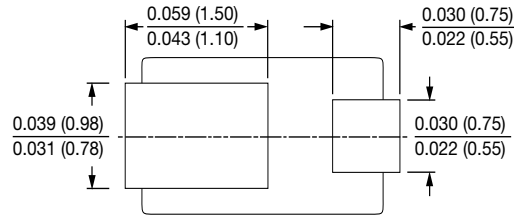
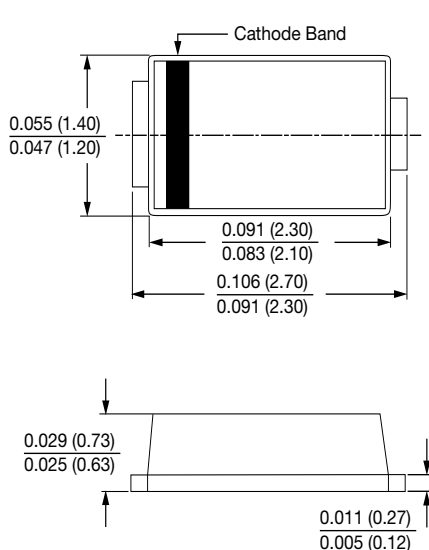


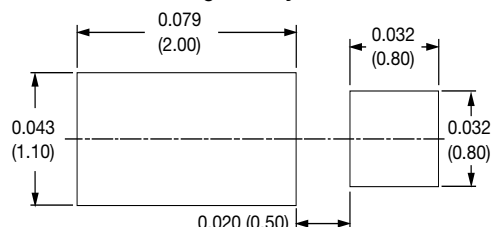
Fig. 6 - Typical Operating Temperature Derating

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

**MicroSMP**



**Mounting Pad Layout**





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