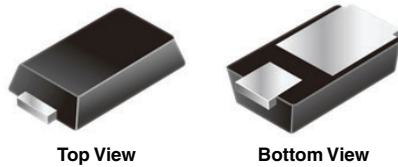


Surface Mount Ultrafast Rectifiers

eSMP® Series



Top View

Bottom View

MicroSMP (DO-219AD)

Anode Cathode

FEATURES

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop, low power losses
- Ultrafast recovery times for high frequency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

ADDITIONAL RESOURCES


[3D Models](#)

PRIMARY CHARACTERISTICS

| | |
|------------------------|---------------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 100 V, 150 V |
| I_{FSM} | 10 A |
| t_{rr} | 25 ns |
| V_F at $I_F = 1.0$ A | 0.82 V |
| I_R | 1 μ A |
| T_J max. | 175 °C |
| Package | MicroSMP (DO-219AD) |
| Circuit configuration | Single |

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds AC/AC and DC/DC converters.

MECHANICAL DATA

Case: MicroSMP (DO-219AD)

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 2 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 | MUH1PB | MUH1PC | UNIT |
|---|----------------|-------------|--------|------|
| Device marking code | | HB | HC | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 1.0 | | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 10 | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +175 | | °C |



| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|---|-----------------------------------|-------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT | |
| Maximum instantaneous forward voltage | $I_F = 0.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.90 | - | V |
| | $I_F = 1.0\text{ A}$ | | | 1.0 | 1.05 | |
| | $I_F = 0.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.72 | - | |
| | $I_F = 1.0\text{ A}$ | | | 0.82 | 0.90 | |
| Maximum reverse current | Rated V_R | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 1.0 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 3.0 | 15 | |
| Maximum reverse recovery time | $I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | t_{rr} | 19 | 25 | ns |
| Typical reverse recovery time | $I_F = 1.0\text{ A}$, $di/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1 I_{RM}$ | | | 29 | 40 | |
| Typical softness factor (t_b/t_a) | $I_F = 1.0\text{ A}$, $di/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$ | $T_A = 125\text{ }^\circ\text{C}$ | S | 0.5 | - | |
| Typical reverse recovery current | | | I_{RM} | 3.4 | 4.6 | A |
| Typical stored charge | | | Q_{rr} | 45 | - | nC |
| Typical junction capacitance | | | C_J | 10 | - | pF |

Notes(1) Pulse test: 300 μs 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 noted) | | | | | |
|--|-----------------------|--------|--------|--------|---------------------------|
| PARAMETER | SYMBOL | MUH1PB | MUH1PC | MUH1PD | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 166 | | | $^\circ\text{C}/\text{W}$ |
| | $R_{\theta JM}^{(1)}$ | 40 | | | |

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

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|-----------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| MUH1PC-M3/89A | 0.006 | 89A | 4500 | 7" diameter plastic tape and reel |
| MUH1PCHM3/89A ⁽¹⁾ | 0.006 | 89A | 4500 | 7" diameter plastic tape and reel |

Note

(1) Automotive grade

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

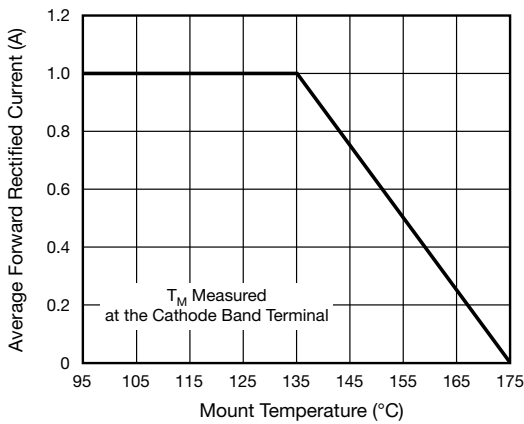


Fig. 1 - Maximum Forward Current Derating Curve

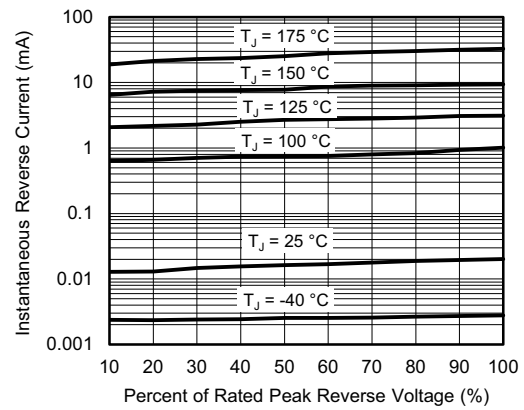


Fig. 4 - Typical Reverse Characteristics

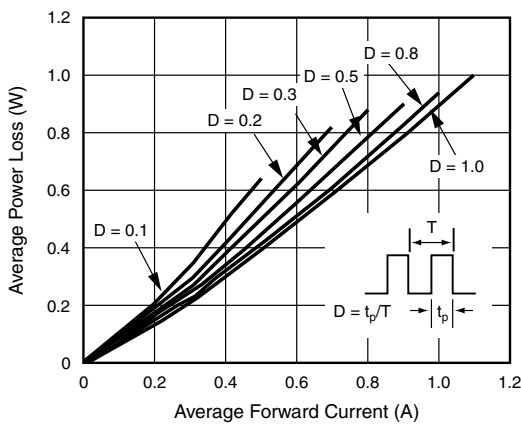


Fig. 2 - Forward Power Loss Characteristics

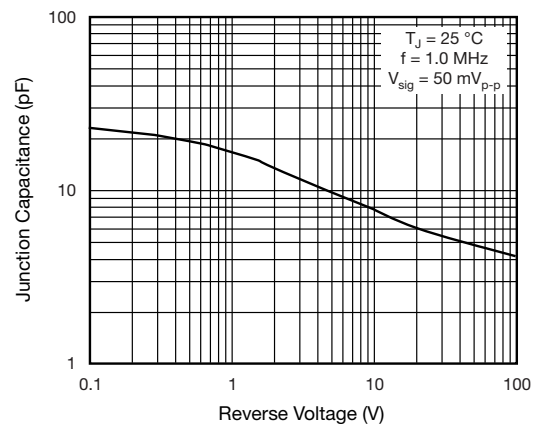


Fig. 5 - Typical Junction Capacitance

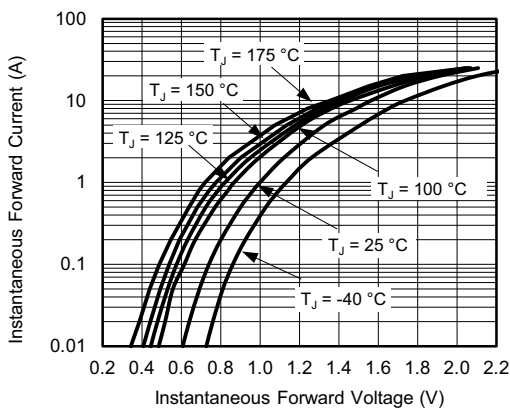


Fig. 3 - Typical Instantaneous Forward Characteristics

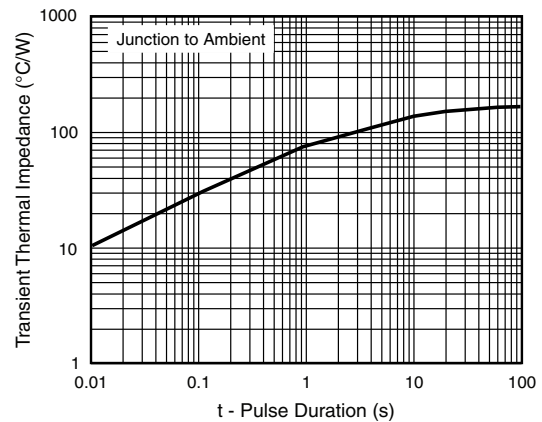
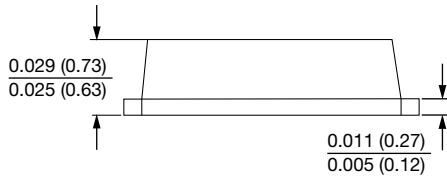
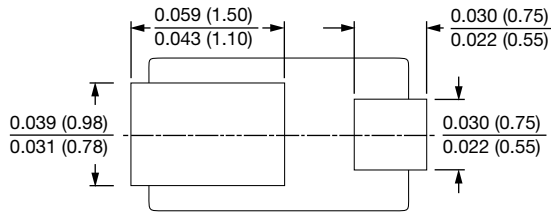
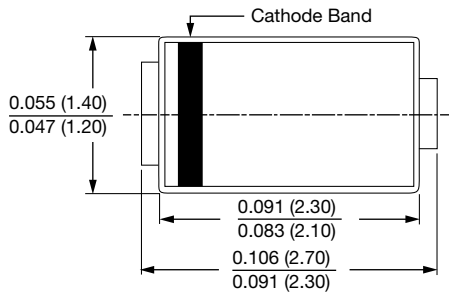


Fig. 6 - Typical Transient Thermal Impedance

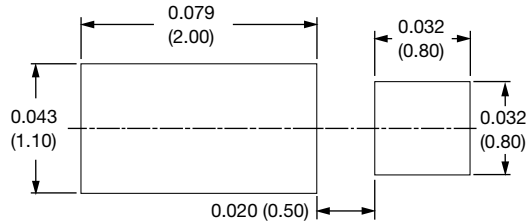


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP (DO-219AD)



Mounting Pad Layout





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