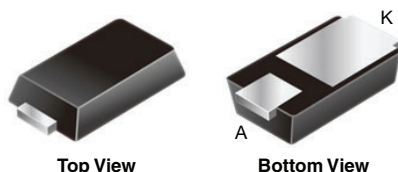


## Surface-Mount Ultrafast Rectifiers

### eSMP® Series



MicroSMP (DO-219AD)

Anode  Cathode

### LINKS TO ADDITIONAL RESOURCES



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



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

### 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

### 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 $\mu$ A
$T_J$ max.	175 °C
Package	MicroSMP (DO-219AD)
Circuit configuration	Single

### 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	$I_F = 0.5\text{ A}$	$V_F^{(1)}$	0.90	-	V
	$I_F = 1.0\text{ A}$		1.0	1.05	
	$I_F = 0.5\text{ A}$		0.72	-	
	$I_F = 1.0\text{ A}$		0.82	0.90	
Maximum reverse current	Rated $V_R$	$T_A = 25\text{ }^{\circ}\text{C}$	-	1.0	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$	3.0	15	
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$t_{rr}$	19	25	ns
Typical reverse recovery time	$I_F = 1.0\text{ A}$ , $dI/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1\text{ I}_{RM}$		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  $\mu\text{s}$  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 noted)

PARAMETER	SYMBOL	MUH1PB	MUH1PC	MUH1PD	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	166			°C/W
	R <sub>θJM</sub> <sup>(1)</sup>	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 <sup>(1)</sup>	0.006	89A	4500	7" diameter plastic tape and reel

**Note**

(1) Automotive grade

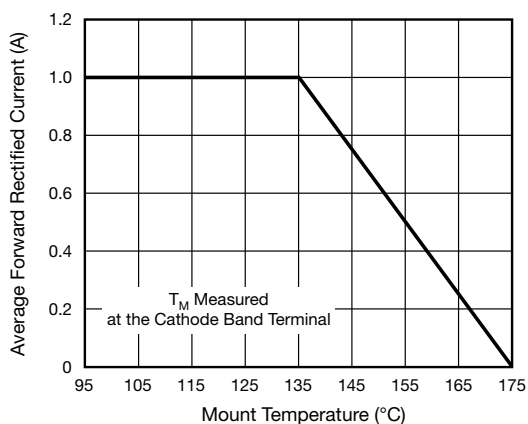
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

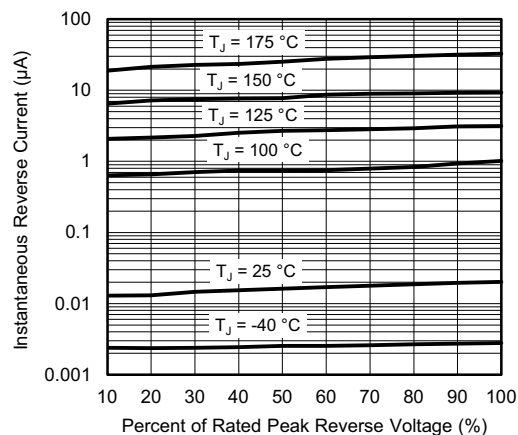


Fig. 4 - Typical Reverse Characteristics

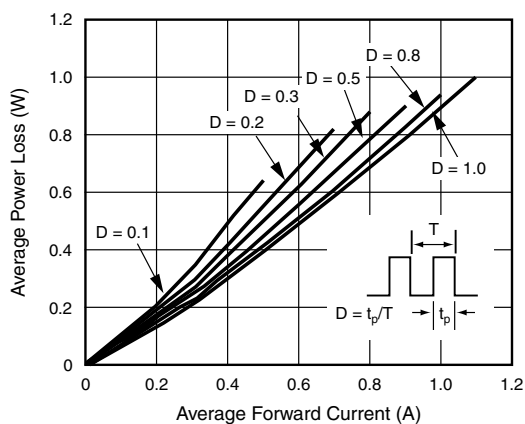


Fig. 2 - Forward Power Loss Characteristics

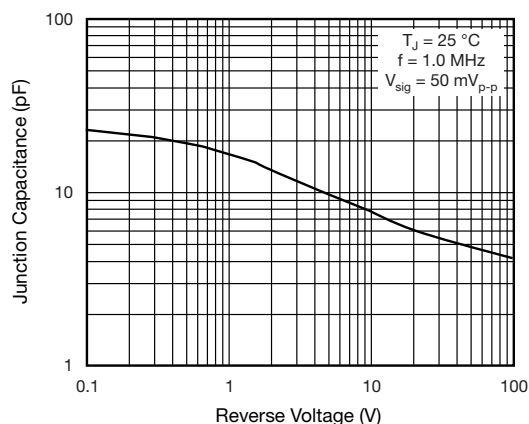


Fig. 5 - Typical Junction Capacitance

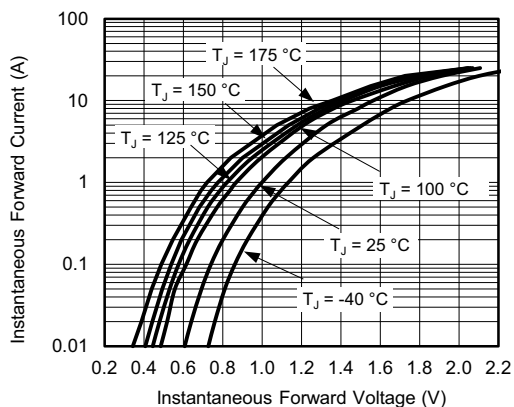


Fig. 3 - Typical Instantaneous Forward Characteristics

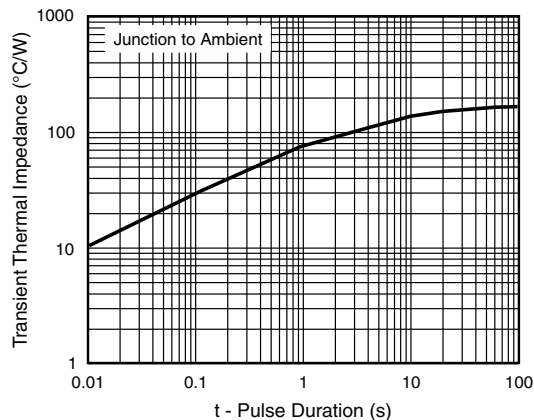
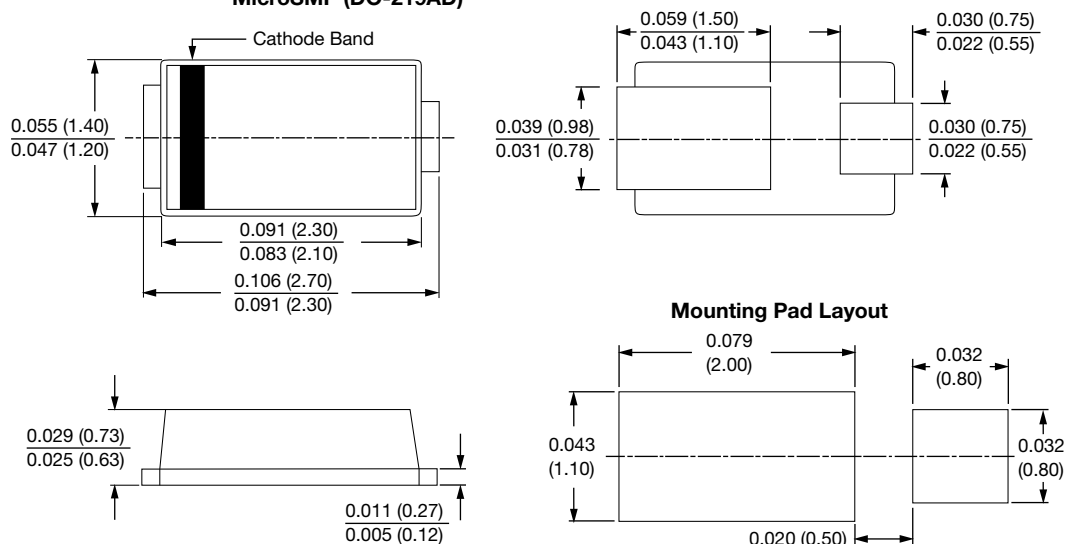


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### MicroSMP (DO-219AD)





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