

## Excellent Integrated System Limited

Stocking Distributor

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[Vishay Semiconductor/Diodes Division](#)  
[MUH1PB-M3/89A](#)

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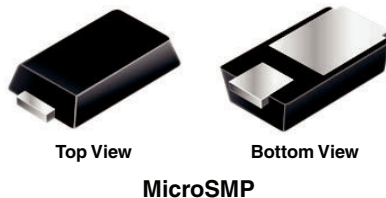


# MUH1PB thru MUH1PD

Vishay General Semiconductor

## Surface Mount Ultrafast Rectifiers

### eSMP® Series



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	100 V, 150 V, 200 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

### TYPICAL APPLICATIONS

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

### 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-020C, 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**



**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	MUH1PB	MUH1PC	MUH1PD	UNIT
Device marking code		HB	HC	HD	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	200	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

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ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage	I <sub>F</sub> = 0.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> (1)	0.90	-	V
	I <sub>F</sub> = 1.0 A			1.0	1.05	
	I <sub>F</sub> = 0.5 A	T <sub>A</sub> = 125 °C		0.72	-	
	I <sub>F</sub> = 1.0 A			0.82	0.90	
Maximum reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> (2)	-	1.0	μA
		T <sub>A</sub> = 125 °C		3.0	15	
Maximum reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A	T <sub>A</sub> = 25 °C	t <sub>rr</sub>	19	25	ns
Typical reverse recovery time	I <sub>F</sub> = 1.0 A, di/dt = 50 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>			29	40	
Typical softness factor (t <sub>b</sub> /t <sub>a</sub> )	I <sub>F</sub> = 1.0 A, di/dt = 200 A/μs, V <sub>R</sub> = 200 V	T <sub>A</sub> = 125 °C	S	0.5	-	
Typical reverse recovery current			I <sub>RM</sub>	3.4	4.6	A
Typical stored charge			Q <sub>rr</sub>	45	-	nC
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	10	-	pF

**Notes**

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MUH1PB	MUH1PC	MUH1PD	UNIT
Typical thermal resistance	R <sub>θJA</sub> (1)	166			°C/W
	R <sub>θJM</sub> (1)	40			

**Note**

(1) Free air, mounted on recommended copper pad area. Thermal resistance R<sub>θJA</sub> - from junction to ambient, R<sub>θJM</sub> - and junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
MUH1PD-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MUH1PDHM3/89A (1)	0.006	89A	4500	7" diameter plastic tape and reel

**Note**

(1) Automotive grade

## RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

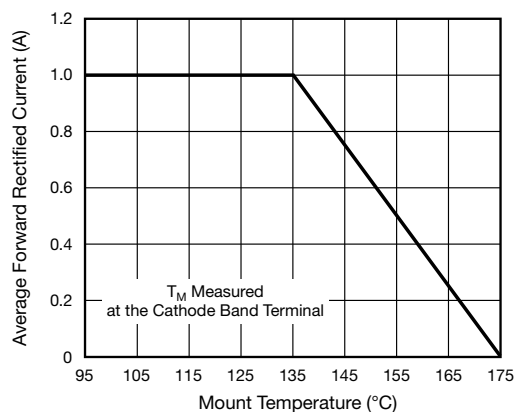


Fig. 1 - Maximum Forward Current Derating Curve

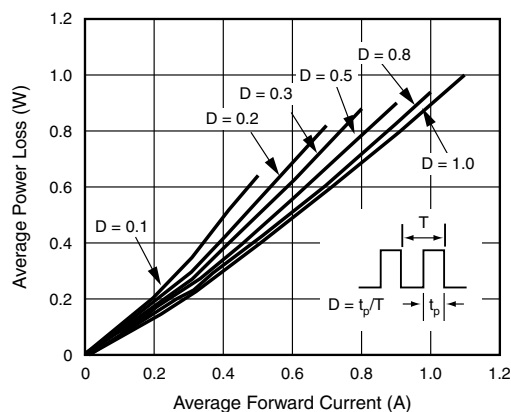


Fig. 2 - Forward Power Loss Characteristics



**MUH1PB thru MUH1PD**

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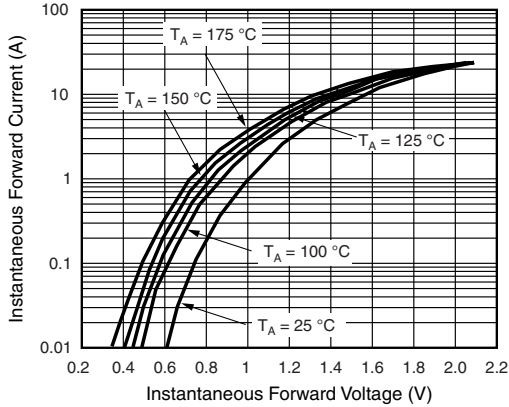


Fig. 3 - Typical Instantaneous Forward Characteristics

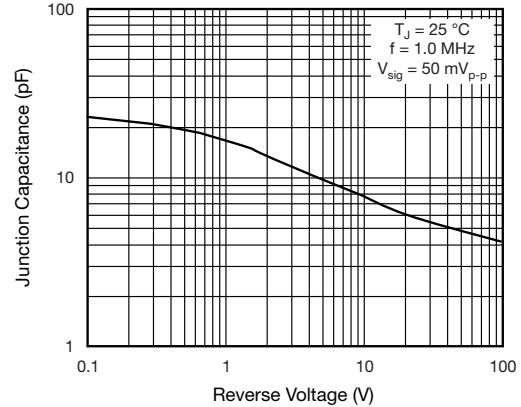


Fig. 5 - Typical Junction Capacitance

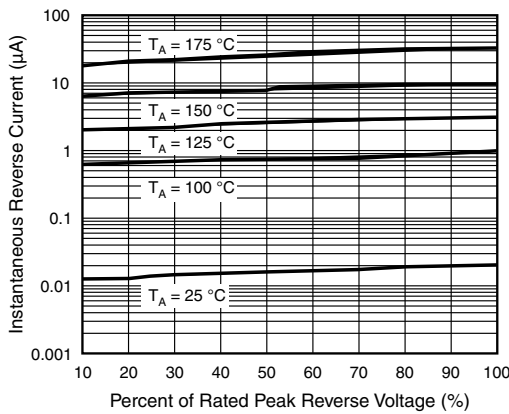


Fig. 4 - Typical Reverse Characteristics

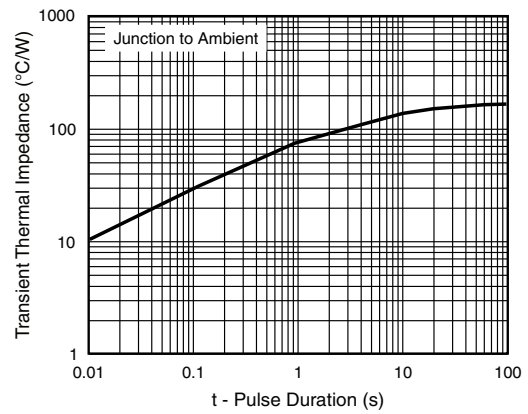
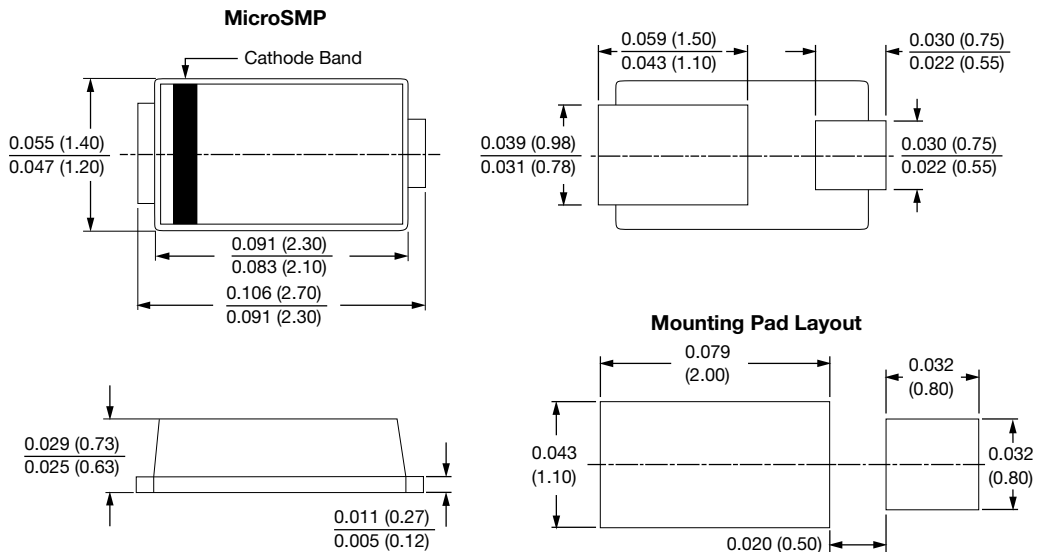


Fig. 6 - Typical Transient Thermal Impedance

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





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