Surface Mount Ultrafast Rectifiers

eSMP™ Series

Top View Bottom View

MicroSMP

FEATURES

- Very low profile - typical height of 0.65 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop, low leakage current
- Ultrafast recovery times for high frequency
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 265 °C max. 10 s, per JESD 22-A111
- 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

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 µA
T_J max.	175 °C

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds ac-to-ac and dc-to-dc converters for commercial applications.

MECHANICAL DATA

Case: MicroSMP

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free and RoHS compliant, 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

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

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

MUH1PB thru MUH1PD

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 0.5 A I_F = 1.0 A	T_A = 25 °C	V_F	0.90 1.0	- 1.05	V
	I_F = 0.5 A I_F = 1.0 A	T_A = 125 °C		0.72 0.82	- 0.90	
Maximum reverse current (2)	Rated V_R	T_A = 25 °C T_A = 125 °C	I_R	- 3.0	1.0 15	µA
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	T_A = 25 °C	t_{rr}	19	25	ns
Typical reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			29	40	
Typical softness factor (t_b/t_a)	I_F = 1.0 A, dI/dt = 200 A/µs, V_R = 200 V	T_A = 125 °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	4.0 V, 1 MHz		C_J	10	-	pF

Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**MUH1PB**	**MUH1PC**	**MUH1PD**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JM}$	166 40			°C/W

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**
MUH1PD-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

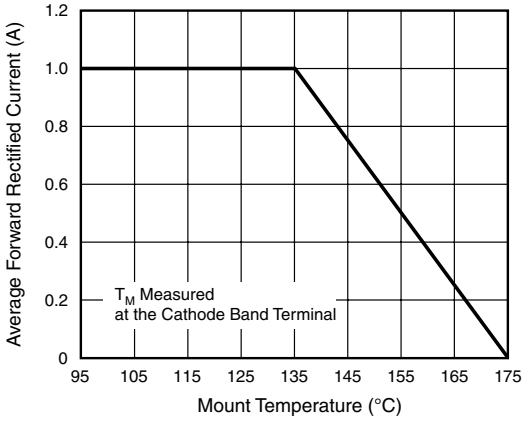

Figure 1. Maximum Forward Current Derating Curve

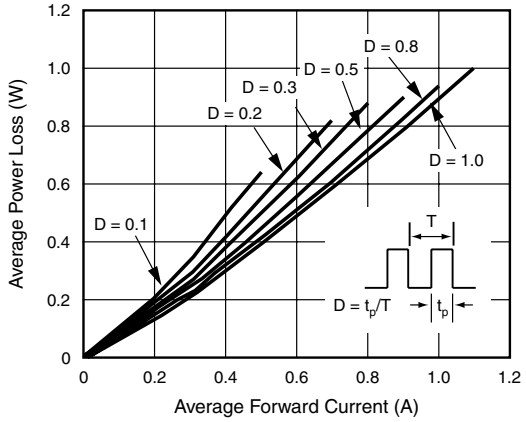

Figure 2. Forward Power Loss Characteristics

For technical questions within your region, please contact one of the following:
PDD-Americas@vishay.com, PDD-Asia@vishay.com, PDD-Europe@vishay.com

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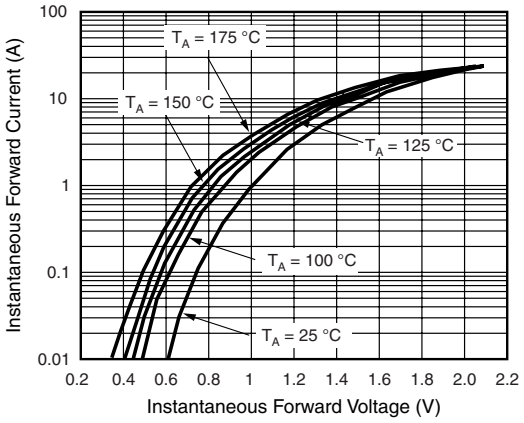


Figure 3. Typical Instantaneous Forward Characteristics

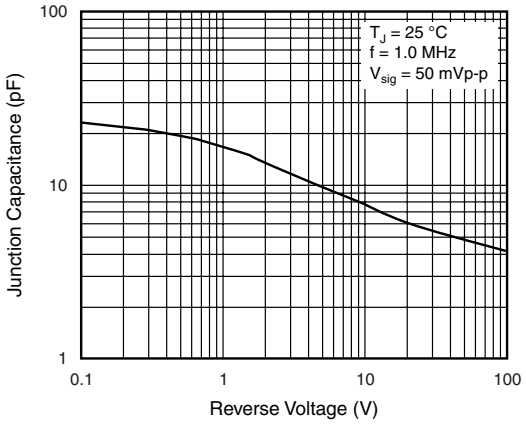


Figure 5. Typical Junction Capacitance

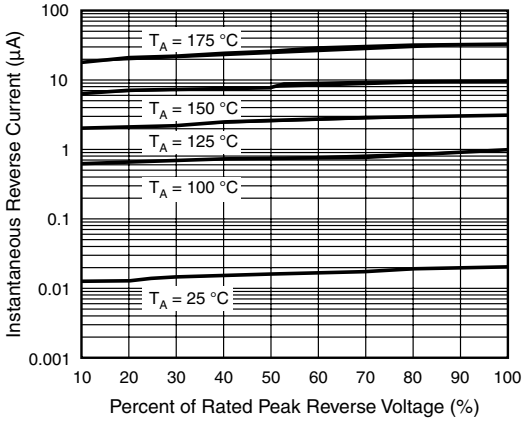


Figure 4. Typical Reverse Characteristics

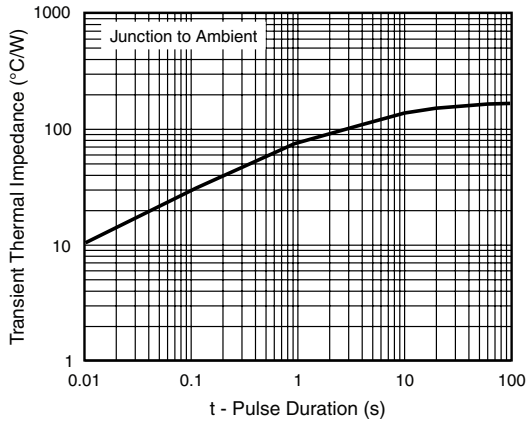
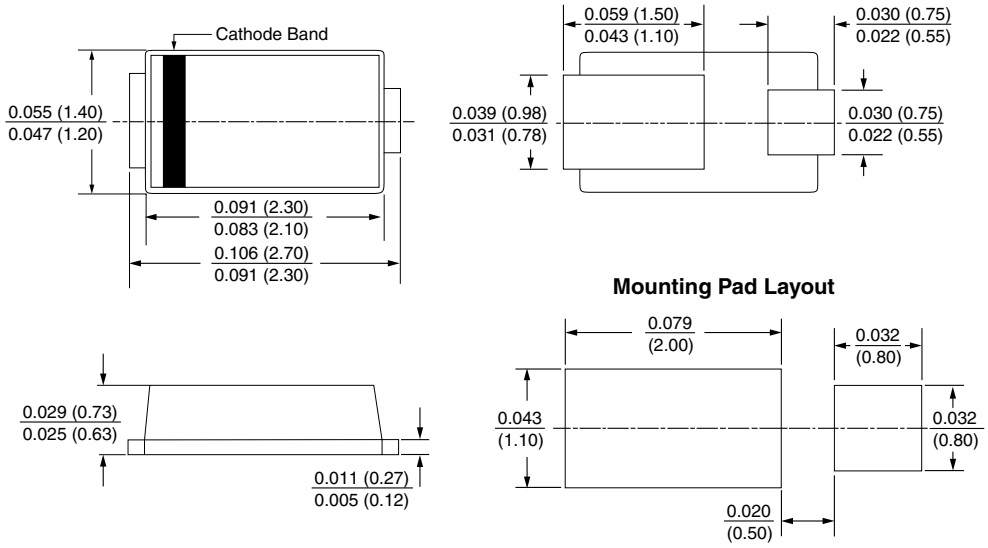


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

MicroSMP



Mounting Pad Layout

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