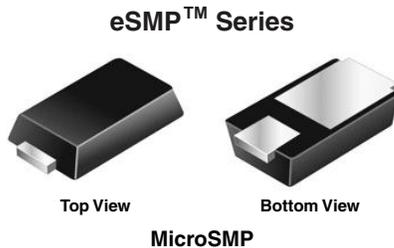


# Surface Mount TRANSZORB<sup>®</sup> Transient Voltage Suppressors



## FEATURES

- Very low profile - typical height of 0.68 mm
- Ideal for automated placement
- Oxide planar chip junction
- Uni-directional polarity only
- Peak pulse power: 100 W (10/1000  $\mu$ s)
- ESD capability: **15 kV (air)**, **8 kV (contact)**
- Meets MSL level 1, per J-STD-020C, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- **Halogen-free**



PRIMARY CHARACTERISTICS	
$V_{WM}$	3.3 V
$P_{PPM}$	100 W
$I_{FSM}$	25 A
$T_J$ max.	150 °C

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units specifically for protecting 3.3 V supplied sensitive equipment against transient overvoltages.

## MECHANICAL DATA

**Case:** MicroSMP

Molding compound meets UL 94V-0 flammability rating.

Base P/N-E3 - RoHS compliant, commercial grade  
 Base P/NHE3 - RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

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

Base P/NHM3 - halogen-free and RoHS compliant, high reliability/automotive grade (AEC-Q101 qualified)

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and 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	VALUE	UNIT
Peak pulse power dissipation <sup>(1)(2)</sup>	$P_{PPM}$	100	W
Peak pulse current with a 10/1000 $\mu$ s waveform (Fig. 1)	$I_{PPM}$	13.7	A
Peak pulse current with a 8/20 $\mu$ s waveform (Fig. 1)	$I_{PPM}$	75	A
Non repetitive peak forward surge current 8.3 ms single half sine-wave <sup>(2)</sup>	$I_{FSM}$	25	A
Power dissipation $T_L = 120$ °C <sup>(2)</sup>	$P_D$	1.0	W
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 150	°C

**Notes:**

- (1) Non-repetitive current pulse, per Fig. 1
- (2) Mounted on 6.0 x 6.0 mm copper pads to each terminal



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)											
DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V <sub>BR</sub> AT I <sub>T</sub>		MAXIMUM REVERSE LEAKAGE CURRENT I <sub>R</sub> AT V <sub>WM</sub>		MAXIMUM CLAMPING VOLTAGE AT V <sub>C</sub> AT I <sub>PPM</sub>		MAXIMUM CLAMPING VOLTAGE AT V <sub>C</sub> AT I <sub>PPM</sub>		TYPICAL TEMP. COEFFICIENT OF V <sub>BR</sub>	TYPICAL JUNCTION CAPACITANCE C <sub>J</sub> AT 0 V
		MIN.		MAX.		10/1000 μs		8/20 μs		(10 <sup>-4</sup> /°C)	1 MHz
		V	mA	μA	V	V	A	V	A		
MSP3V3	KC	4.1	1.0	200	3.3	7.3	13.7	11.0	75	- 5.3	850

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance <sup>(1)</sup>	R <sub>θJA</sub>	125	°C/W
	R <sub>θJL</sub>	30	

**Note:**

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas. R<sub>θJL</sub> is measured at the terminal of cathode band.

IMMUNITY TO STATIC ELECTRICAL DISCHARGE TO THE FOLLOWING STANDARDS (T <sub>A</sub> = 25 °C unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body model (contact mode)	C = 100 pF, R = 1.5 kΩ	V <sub>C</sub>	H3B	> 8 kV
IEC-61000-4-2 <sup>(2)</sup>	Human body model (air discharge mode) <sup>(1)</sup>	C = 150 pF, R = 150 Ω		4	> 15 kV

**Notes:**

(1) Immunity to IEC-61000-4-2 air discharge mode has a typical performance > 30 kV

(2) System ESD standard

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
MSP3V3-E3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSP3V3HE3/89A <sup>(1)</sup>	0.006	89A	4500	7" diameter plastic tape and reel
MSP3V3-M3/89A	0.006	89A	4500	7" diameter plastic tape and reel
MSP3V3HM3/89A <sup>(1)</sup>	0.006	89A	4500	7" diameter plastic tape and reel

**Note:**

(1) High reliability/automotive grade (AEC-Q101 qualified)

**RATINGS AND CHARACTERISTICS CURVES**

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

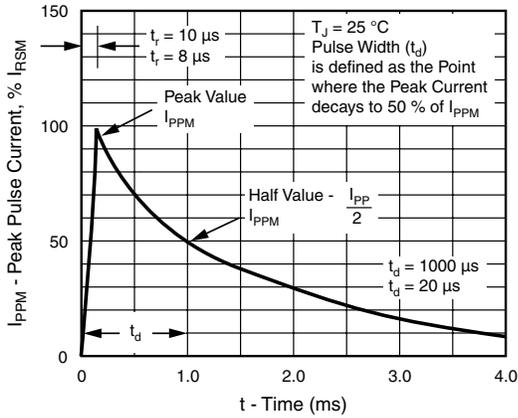


Figure 1. Pulse Waveform

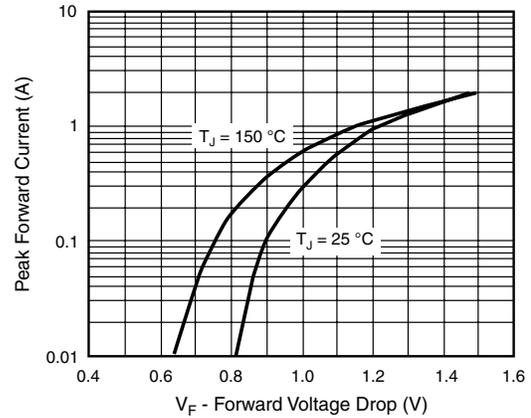


Figure 4. Typical Peak Forward Voltage Drop vs. Peak Forward Current

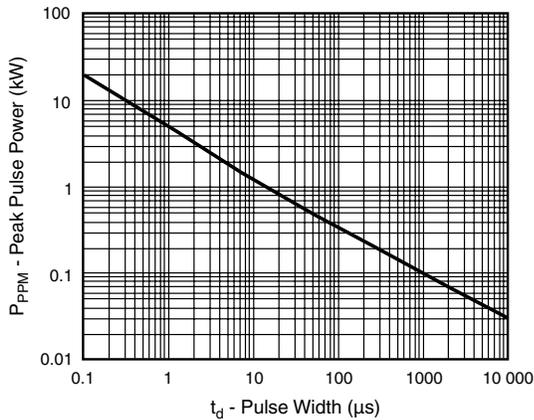


Figure 2. Peak Pulse Power Rating Curve

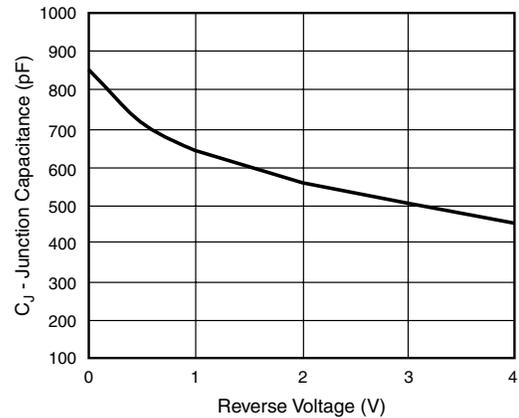


Figure 5. Typical Junction Capacitance

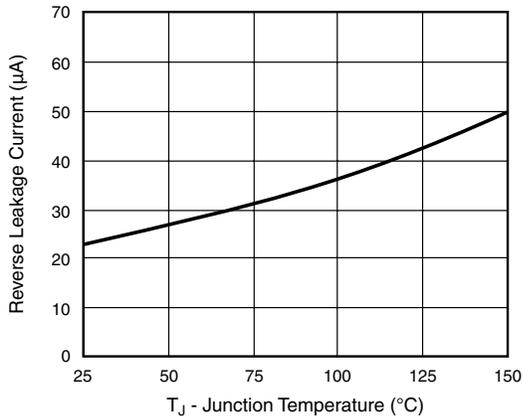


Figure 3. Relative Variation of Leakage Current vs. Junction Temperature

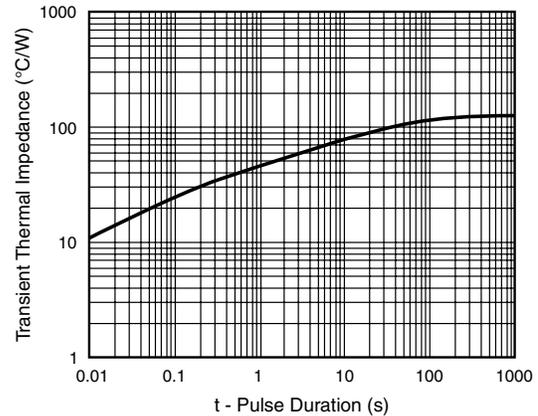
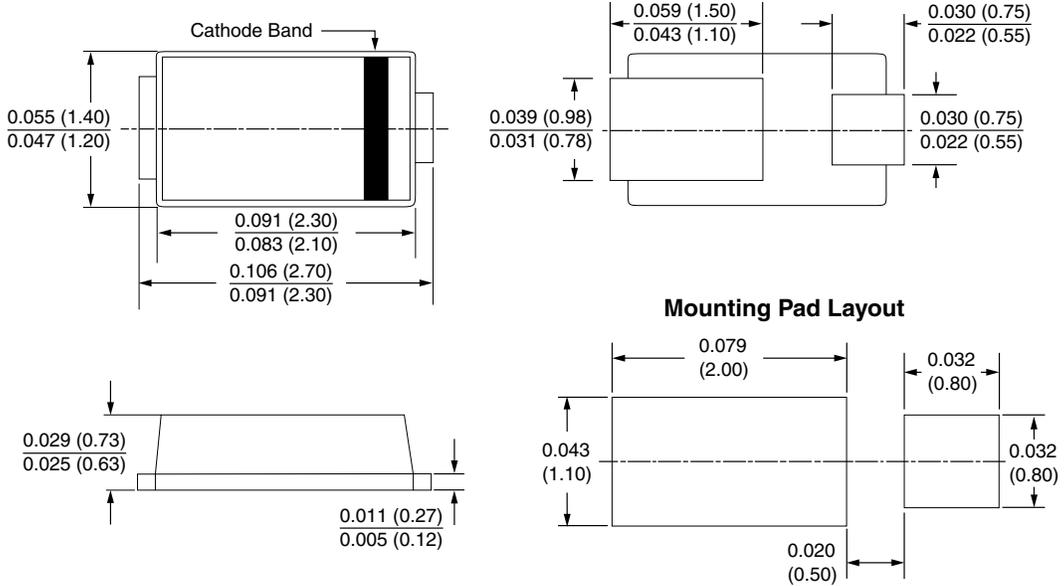


Figure 6. Typical Transient Thermal Impedance

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

**MicroSMP**





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