



# SMP11 thru SMP36A

New Product Vishay General Semiconductor

## Surface Mount TRANSZORB® Transient Voltage Suppressors



DO-220AA (SMP)

### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Available in Unidirectional
- 400 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020C
- Solder Dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



### 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 for consumer, computer, industrial, automotive and telecommunication.

### MECHANICAL DATA

**Case:** DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

E3 suffix for commercial grade

**Polarity:** Color band denotes cathode end

MAJOR RATINGS AND CHARACTERISTICS	
V <sub>WM</sub>	11 V to 36 V
P <sub>PPM</sub>	400W
I <sub>FSM</sub>	40 A
T <sub>j</sub> max.	150 °C

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform <sup>(1,2)</sup> (Fig. 1)	P <sub>PPM</sub>	400	W
Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	I <sub>PPM</sub>	see table next page	A
Peak forward surge current 10 ms single half sine-wave <sup>(2)</sup>	I <sub>FSM</sub>	40	A
Maximum instantaneous forward voltage at 25 A <sup>(3)</sup>	V <sub>F</sub>	2.5	V
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	- 55 to + 150	°C

**Note:**

(1) Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25 °C per Fig. 2

(2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal

(3) Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

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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> <sup>(1)</sup> (V)		TEST CURRENT I <sub>T</sub> (mA)	STAND-OFF VOLTAGE V <sub>WM</sub> (V)	MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>D</sub> (μA) <sup>(3)</sup>	MAXIMUM PEAK PULSE SURGE CURRENT I <sub>PPM</sub> (A) <sup>(2)</sup>	MAXIMUM CLAMPING VOLTAGE AT I <sub>PPM</sub> V <sub>C</sub> (V)
		MIN	MAX					
SMP11	AY	12.2	14.9	1.0	11	1.0	19.9	20.1
SMP11A	AZ	12.2	13.5	1.0	11	1.0	22.0	18.2
SMP12	BD	13.3	16.3	1.0	12	1.0	18.2	22.0
SMP12A	BE	13.3	14.7	1.0	12	1.0	20.1	19.9
SMP13	BF	14.4	17.6	1.0	13	1.0	16.8	23.8
SMP13A	BG	14.4	15.9	1.0	13	1.0	18.6	21.5
SMP14	BH	15.6	19.1	1.0	14	1.0	15.5	25.8
SMP14A	BK	15.6	17.2	1.0	14	1.0	17.2	23.2
SMP15	BL	16.7	20.4	1.0	15	1.0	14.9	26.9
SMP15A	BM	16.7	18.5	1.0	15	1.0	16.4	24.4
SMP16	BN	17.8	21.8	1.0	16	1.0	13.9	28.8
SMP16A	BP	17.8	19.7	1.0	16	1.0	15.4	26.0
SMP17	BQ	18.9	23.1	1.0	17	1.0	13.1	30.5
SMP17A	BR	18.9	20.9	1.0	17	1.0	14.5	27.6
SMP18	BS	20.0	24.4	1.0	18	1.0	12.4	32.2
SMP18A	BT	20.0	22.1	1.0	18	1.0	13.7	29.2
SMP20	BU	22.2	27.1	1.0	20	1.0	11.2	35.8
SMP20A	BV	22.2	24.5	1.0	20	1.0	12.3	32.4
SMP22	BW	24.4	29.8	1.0	22	1.0	10.2	39.4
SMP22A	BX	24.4	26.9	1.0	22	1.0	11.3	35.5
SMP24	BY	26.7	32.6	1.0	24	1.0	9.3	43.0
SMP24A	BZ	26.7	29.5	1.0	24	1.0	10.3	38.9
SMP26	CD	28.9	35.3	1.0	26	1.0	8.6	46.6
SMP26A	CE	28.9	31.9	1.0	26	1.0	9.5	42.1
SMP28	CF	31.1	38.0	1.0	28	1.0	8.0	50.0
SMP28A	CG	31.1	34.4	1.0	28	1.0	8.8	45.4
SMP30	CH	33.3	40.7	1.0	30	1.0	7.5	53.5
SMP30A	CK	33.3	36.8	1.0	30	1.0	8.3	48.4
SMP33	CL	36.7	44.9	1.0	33	1.0	6.8	59.0
SMP33A	CM	36.7	40.6	1.0	33	1.0	7.5	53.3
SMP36	CN	40.0	48.9	1.0	36	1.0	6.2	64.3
SMP36A	CP	40.0	44.2	1.0	36	1.0	6.9	58.1

**Note:**

- (1) V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300 μs, I<sub>T</sub> = square wave pulse or equivalent
- (2) Surge current waveform per Fig. 3 and derate per Fig. 2
- (3) All terms and symbols are consistent with ANSI/IEEE C62.35

ORDERING INFORMATION				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMP11A-E3/84A	0.024	84A	3000	7" Diameter Plastic Tape & Reel
SMP11A-E3/85A	0.024	85A	10000	13" Diameter Plastic Tape & Reel

## RATINGS AND CHARACTERISTICS CURVES

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

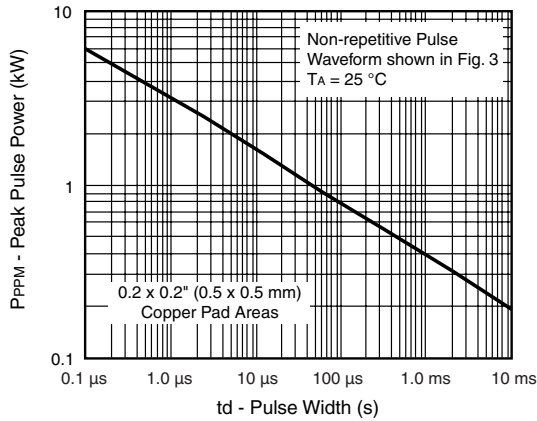


Figure 1. Peak Pulse Power Rating Curve

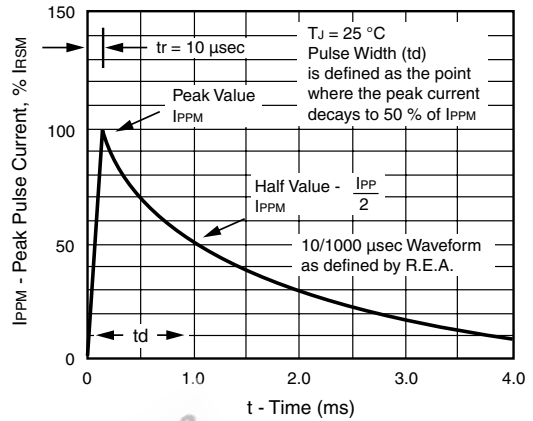


Figure 3. Pulse Waveform

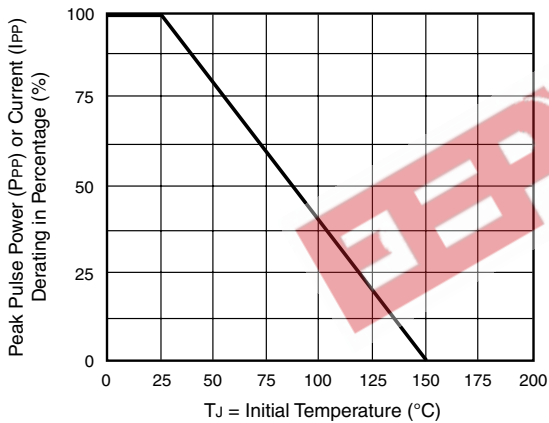


Figure 2. Pulse Derating Curve

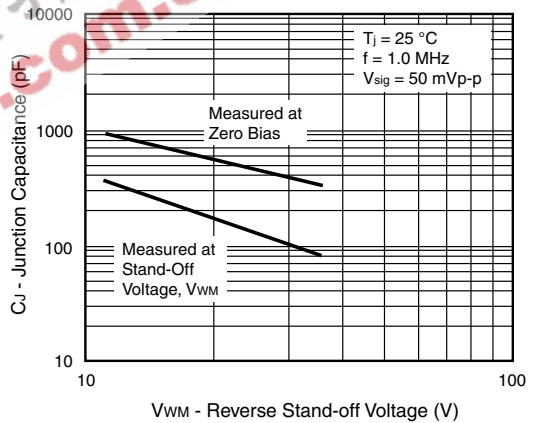
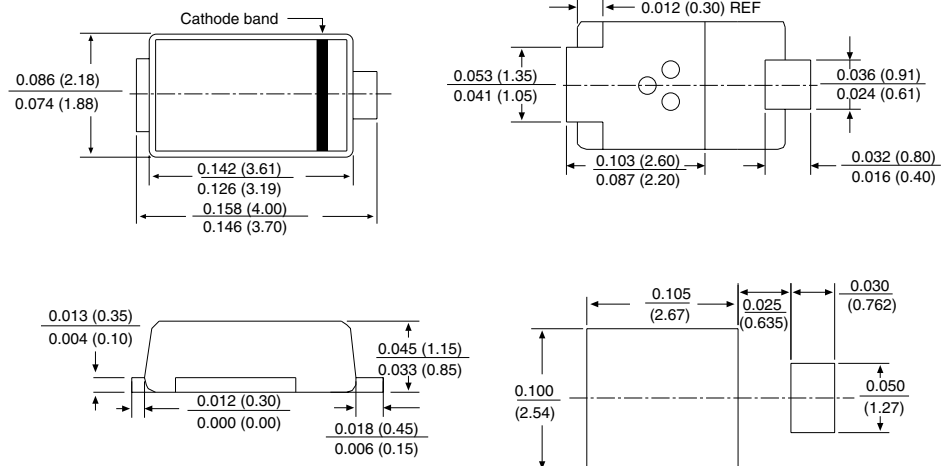


Figure 4. Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-220AA (SMP)





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