



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

### eSMP<sup>™</sup> Series



DO-220AA (SMP)

PRIMARY CHARACTERISTICS	
$V_{WM}$	3.3 V to 36 V
$P_{PPM}$	400 W
$I_{FSM}$	40 A
$T_J \text{ max.}$	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 for consumer, computer, industrial, automotive and telecommunication.

### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Available in uni-directional
- 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-020, LF maximum peak of 260 °C
- 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:** DO-220AA (SMP)

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 cathode end

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

### Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above  $T_A = 25$  °C per fig. 2

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

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

## SMP3V3 thru SMP36A

Vishay General Semiconductor



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)								
DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE $V_{BR}$ AT $I_T$ <sup>(1)</sup> (V)		TEST CURRENT $I_T$ (mA)	STAND-OFF VOLTAGE $V_{WM}$ (V)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ ) <sup>(3)</sup>	MAXIMUM PEAK PULSE SURGE CURRENT $I_{PPM}$ (A) <sup>(2)</sup>	MAXIMUM CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V)
		MIN.	MAX.					
SMP3V3	AC	4.10	5.10	1.0	3.3	200	54.8	7.3
SMP5.0A	AE	6.40	7.07	10	5.0	150	43.5	9.2
SMP6.0A	AG	6.67	7.37	10	6.0	600	38.8	10.3
SMP6.5A	AK	7.22	7.98	10	6.5	100	35.7	11.2
SMP7.0A	AM	7.78	8.60	10	7.0	50	33.3	12.0
SMP7.5A	AN	8.33	9.21	1.0	7.5	50	31.0	12.9
SMP8.0A	AR	8.89	9.83	1.0	8.0	20	29.4	13.6
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

## Notes

<sup>(1)</sup>  $V_{BR}$  measured after  $I_T$  applied for 300  $\mu\text{s}$ ,  $I_T$  = square wave pulse or equivalent<sup>(2)</sup> Surge current waveform per fig. 3 and derate per fig. 2<sup>(3)</sup> All terms and symbols are consistent with ANSI/IEEE C62.35



THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Typical thermal resistance, junction to lead <sup>(1)</sup>	$R_{\theta JL}$	50	$^\circ\text{C/W}$
Typical thermal resistance, junction to ambient <sup>(2)</sup>	$R_{\theta JA}$	250	$^\circ\text{C/W}$

**Notes**

- (1) Mounted on P.C.B. with 5.0 mm x 5.0 mm copper pad areas attached to each terminal
- (2) Mounted on minimum recommended pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMP3V3-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SMP3V3-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SMP11A-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SMP11A-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel

**RATINGS AND CHARACTERISTICS CURVES**

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

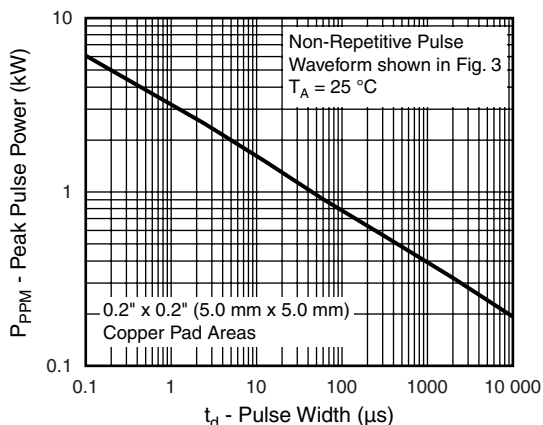


Fig. 1 - Peak Pulse Power Rating Curve

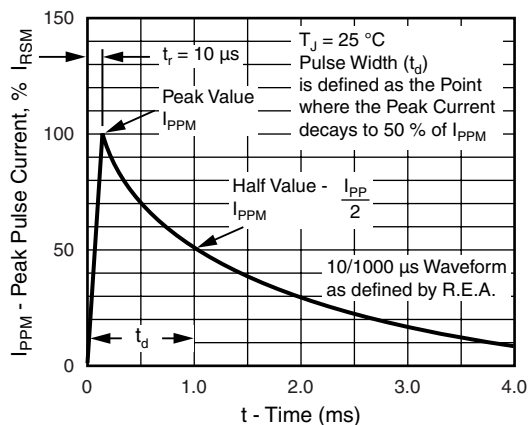


Fig. 3 - Pulse Waveform

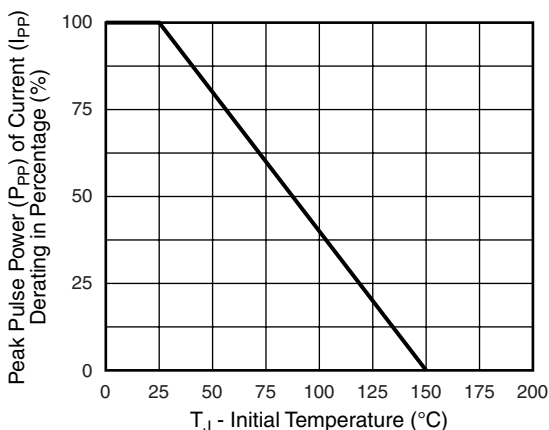


Fig. 2 - Pulse Derating Curve

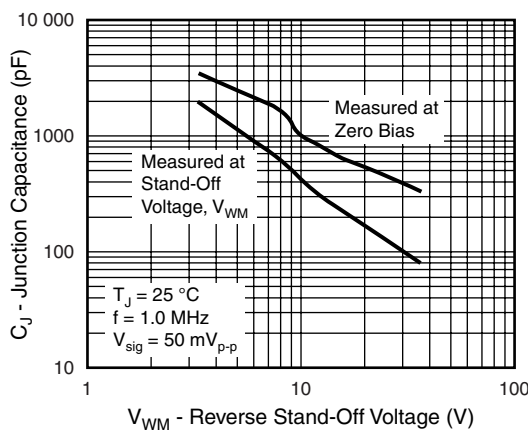


Fig. 4 - Typical Junction Capacitance

# SMP3V3 thru SMP36A

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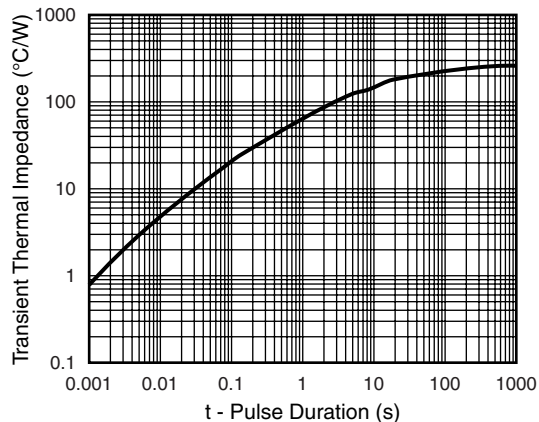
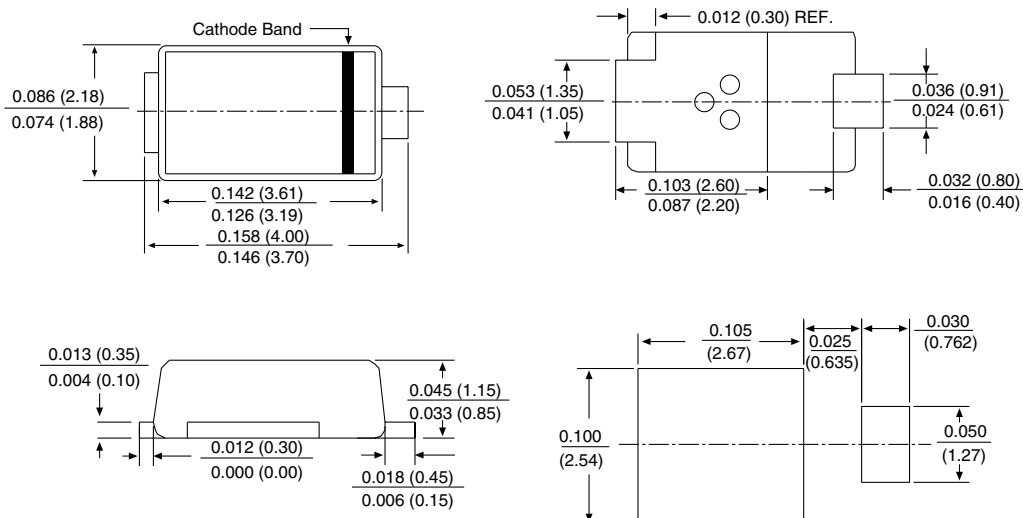


Fig. 5 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-220AA (SMP)





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