HALOGEN



## Vishay General Semiconductor

# Surface Mount TRANSZORB® Transient Voltage Suppressors



**DO-220AA (SMP)** 

PRIMARY CHARACTERISTICS					
V <sub>BR</sub> uni-directional	4.10 V to 44.2 V				
V <sub>WM</sub>	3.3 V to 36 V				
P <sub>PPM</sub>	400 W				
I <sub>FSM</sub>	40 A				
T <sub>J</sub> max.	150 °C				
Polarity	Uni-directional				
Package	DO-220AA (SMP)				

#### **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, 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 μs 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
- Material categorization: For definitions of compliance please see <a href="https://www.vishav.com/doc?99912">www.vishav.com/doc?99912</a>

#### **MECHANICAL DATA**

Case: DO-220AA (SMP)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS compliant, and

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

#### Notes

- (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 mm x 5.0 mm) copper pads to each terminal
- (3) Pulse test: 300 µs 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>M</sub> (2)	MAXIMUM PEAK PULSE SURGE CURRENT	MAXIMUM CLAMPING VOLTAGE AT IPPM
01450140		MIN.	MAX.			I <sub>D</sub> (μA) <sup>(3)</sup>	I <sub>PPM</sub> (A) <sup>(2)</sup>	V <sub>C</sub> (V)
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
SMP11A	AZ	12.2	13.5	1.0	11	1.0	22.0	18.2
SMP12A	BE	13.3	14.7	1.0	12	1.0	20.1	19.9
SMP13A	BG	14.4	15.9	1.0	13	1.0	18.6	21.5
SMP14A	BK	15.6	17.2	1.0	14	1.0	17.2	23.2
SMP15A	BM	16.7	18.5	1.0	15	1.0	16.4	24.4
SMP16A	BP	17.8	19.7	1.0	16	1.0	15.4	26.0
SMP17A	BR	18.9	20.9	1.0	17	1.0	14.5	27.6
SMP18A	BT	20.0	22.1	1.0	18	1.0	13.7	29.2
SMP20A	BV	22.2	24.5	1.0	20	1.0	12.3	32.4
SMP22A	BX	24.4	26.9	1.0	22	1.0	11.3	35.5
SMP24A	BZ	26.7	29.5	1.0	24	1.0	10.3	38.9
SMP26A	CE	28.9	31.9	1.0	26	1.0	9.5	42.1
SMP28A	CG	31.1	34.4	1.0	28	1.0	8.8	45.4
SMP30A	CK	33.3	36.8	1.0	30	1.0	8.3	48.4
SMP33A	CM	36.7	40.6	1.0	33	1.0	7.5	53.3
SMP36A	CP	40.0	44.2	1.0	36	1.0	6.9	58.1

#### Notes

<sup>(3)</sup> All terms and symbols are consistent with ANSI/IEEE C62.35

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	SYMBOL LIMIT			
Typical thermal resistance, junction to lead (1)	$R_{ heta JL}$	50	°C/W		
Typical thermal resistance, junction to ambient (2)	$R_{ heta JA}$	250	°C/W		

## Notes

<sup>(2)</sup> 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		

 $<sup>^{(1)}</sup>$   $V_{BR}$  measured after  $I_{T}$  applied for 300  $\mu s,\,I_{T}$  = square wave pulse or equivalent

<sup>(2)</sup> Surge current waveform per fig. 3 and derate per fig. 2

<sup>(1)</sup> Mounted on PCB with 5.0 mm x 5.0 mm copper pad areas attached to each terminal

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## **RATINGS AND CHARACTERISTICS CURVES**

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

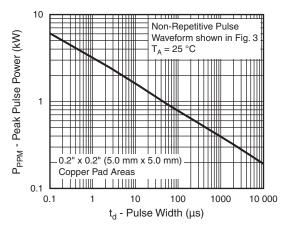


Fig. 1 - Peak Pulse Power Rating Curve

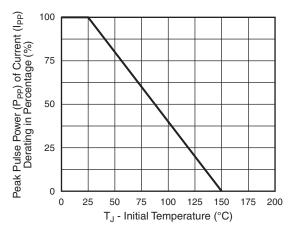


Fig. 2 - Pulse Derating Curve

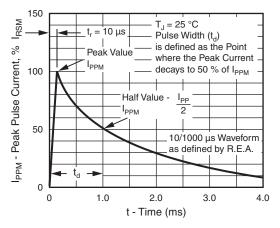


Fig. 3 - Pulse Waveform

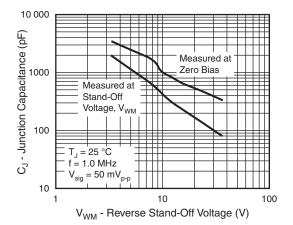


Fig. 4 - Typical Junction Capacitance

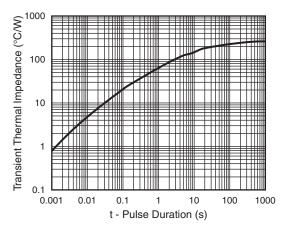
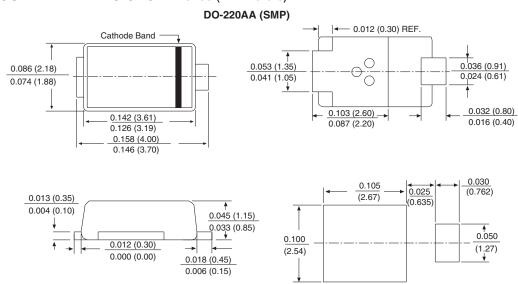


Fig. 5 - Typical Transient Thermal Impedance



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





## **Legal Disclaimer Notice**

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