

## HIGH POWERED TVS ARRAYS



### DESCRIPTION

The PAM08SD23xx/C Series are transient voltage suppressor arrays designed for ESD protection of automotive applications. These silicon based diodes offer superior clamping voltage and performance compared to other technologies such as MLVs.

The PAM08SD23xx/C Series can be utilized as a single line protector in a unidirectional or bidirectional configuration. The SOD-323 small package configuration offers designers the flexibility of placement on the printed circuit board for each I/O port or voltage bus. The PAM08SD23xx/C Series meets the IEC 61000-4-2 (ESD), 61000-4-4 (EFT) and 61000-4-5 requirements.

### FEATURES

- **AEC-Q101 Qualified**
- Compatible with IEC 61000-4-2 (ESD): Air  $\pm 15\text{kV}$ , Contact  $\pm 8\text{kV}$
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 24A, 8/20 $\mu\text{s}$  Level 2 (Line-Gnd) & Level 3 (Line-Line)
- Unidirectional: 500 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu\text{s}$ )
- Bidirectional: 400 Watts Peak Pulse Power per Line ( $t_p = 8/20\mu\text{s}$ )
- Replacement for MLV (0805)
- Unidirectional & Bidirectional Configurations
- Available in Multiple Voltages
- Protects One Power or I/O Port
- ESD Protection > 25kV
- Low Clamping Voltage
- RoHS Compliant
- REACH Compliant

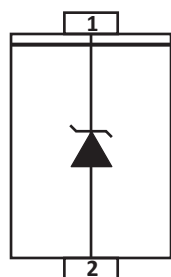
### APPLICATIONS

- Automotive

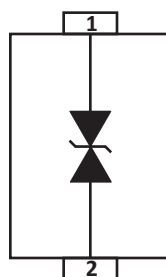
### MECHANICAL CHARACTERISTICS

- Molded JEDEC SOD-323 Package
- Approximate Weight: 5 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 8mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

### PIN CONFIGURATIONS



**UNIDIRECTIONAL**



**BIDIRECTIONAL**

**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

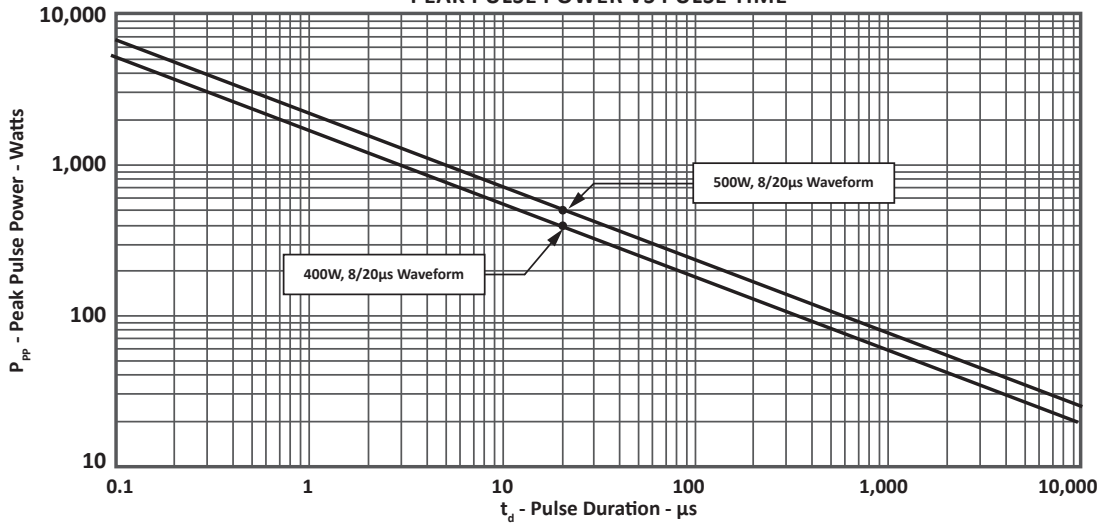
PARAMETER	SYMBOL	VALUE	UNITS
Unidirectional: Peak Pulse Power (tp = 8/20μs) - See Figure 1	P <sub>PP</sub>	500	Watts
Bidirectional: Peak Pulse Power (tp = 8/20μs) - See Figure 1	P <sub>PP</sub>	400	Watts
Operating Temperature	T <sub>L</sub>	-55 to 150	°C
Storage Temperature	T <sub>STG</sub>	-55 to 150	°C

**ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified**

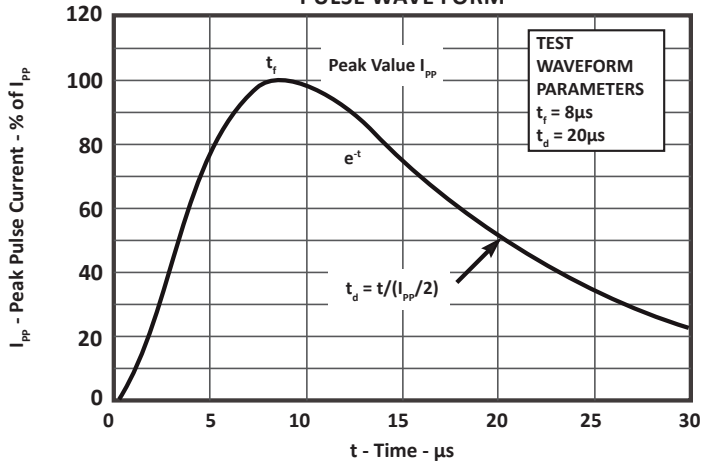
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE  V <sub>WM</sub> VOLTS	MINIMUM BREAKDOWN VOLTAGE  @ 1mA V <sub>(BR)</sub> VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ IP = 1A V <sub>C</sub> VOLTS	MAXIMUM LEAKAGE CURRENT  @V <sub>WM</sub> I <sub>D</sub> μA	TYPICAL CAPACITANCE  @0V, 1MHz C pF
PAM08SD2303	A	3.3	4.0	6.5	125	500
PAM08SD2303C	G	3.3	4.0	7.0	125	200
PAM08SD2305C	H	5.0	6.0	9.8	10	175
PAM08SD2308C	J	8.0	8.5	13.4	10	150
PAM08SD2312C	K	12.0	13.3	19.0	1	50
PAM08SD2315	E	15.0	16.7	24.0	1	100
PAM08SD2324C	M	24.0	26.7	43.0	1	40
PAM08SD2336C	T	36.0	40.0	60.0	1	35

**TYPICAL DEVICE CHARACTERISTICS**

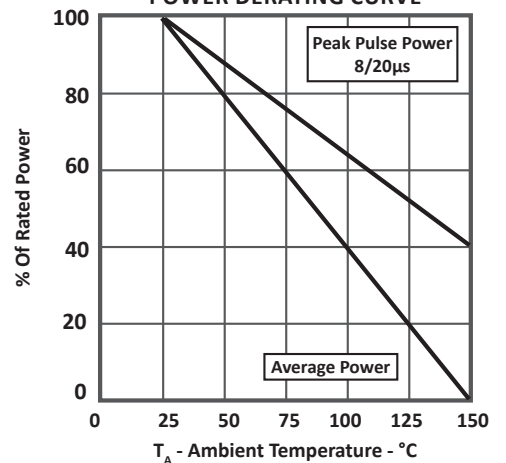
**FIGURE 1**  
**PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2**  
**PULSE WAVE FORM**

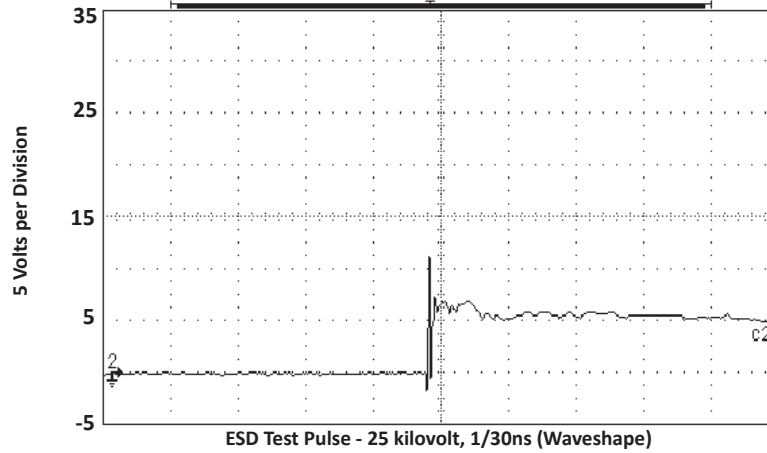


**FIGURE 3**  
**POWER DERATING CURVE**

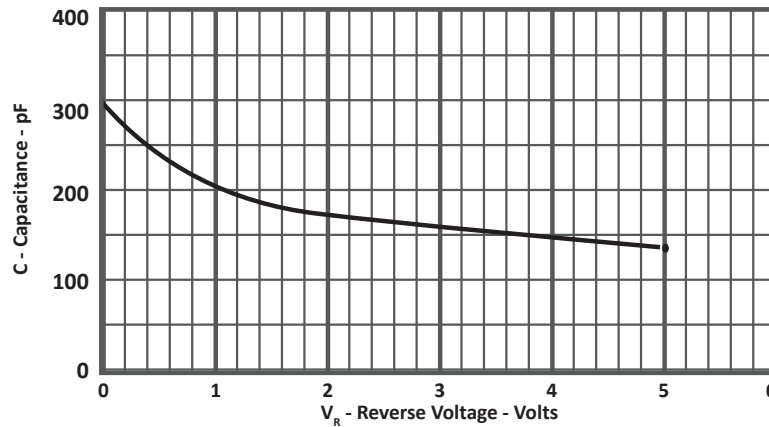


## TYPICAL DEVICE CHARACTERISTICS

**FIGURE 4**  
**OVERSHOOT & CLAMPING VOLTAGE FOR PAM08SD2303**

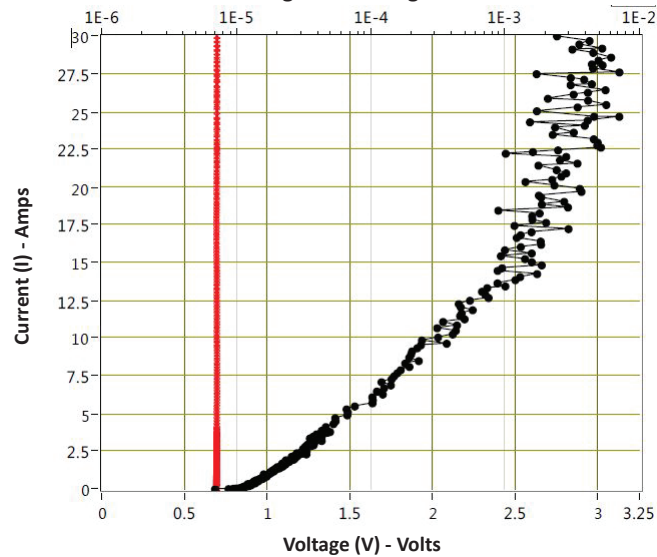


**FIGURE 5**  
**CAPACITANCE VS REVERSE VOLTAGE**

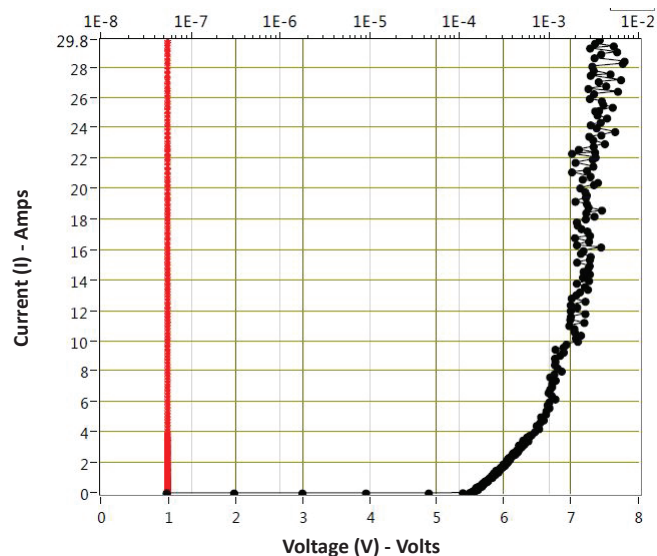


## TYPICAL DEVICE CHARACTERISTICS

**FIGURE 6**  
**PAM08SD2303 FORWARD TLP**  
 Leakage Current @ Pulse (I) -  $\mu$ A  
 Leakage Test Voltage = 0.5V



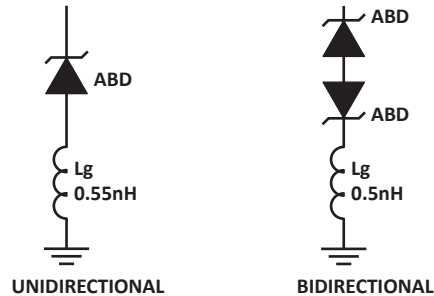
**FIGURE 7**  
**PAM08SD2303 REVERSE TLP**  
 Leakage Current @ Pulse (I) -  $\mu$ A  
 Leakage Test Voltage = 0.5V



Note: Indicative TLP performance- for reference only

## SPICE MODEL

FIGURE 1  
SPICE MODEL FOR



ABD - Avalanche Breakdown Diode (TVS)  
Lg - Lead Inductance

TABLE 1 - SPICE PARAMETERS

PARAMETER	UNIT	ABD(TVS)
BV	V	See Table 2
IBV	μA	1
C <sub>jo</sub>	pF	See Table 2
I <sub>s</sub>	A	See Table 2
Vj	V	0.6
M	-	0.33
N	-	1
R <sub>s</sub>	Ohms	See Table 2
TT	s	1E-8
EG	eV	1.11

TABLE 2 - ABD SPECIFIC SPICE PARAMETERS

PART NUMBER	B <sub>v</sub> (VOLTS)	C <sub>jo</sub> (pF)	I <sub>s</sub> (AMPS)	Rs(OHMS)
PAM08SD2303	4.0	438	1E-11	0.21
PAM08SD2315	16.7	102	1E-13	0.52
PAM08SD2303C	4.5	219	1E-11	0.21
PAM08SD2305C	6.0	142	1E-11	0.14
PAM08SD2308C	8.5	73	1E-11	0.28
PAM08SD2312C	13.3	62	1E-13	0.40
PAM08SD2315C	16.7	51	1E-13	0.52
PAM08SD2324C	26.7	30	1E-13	1.54

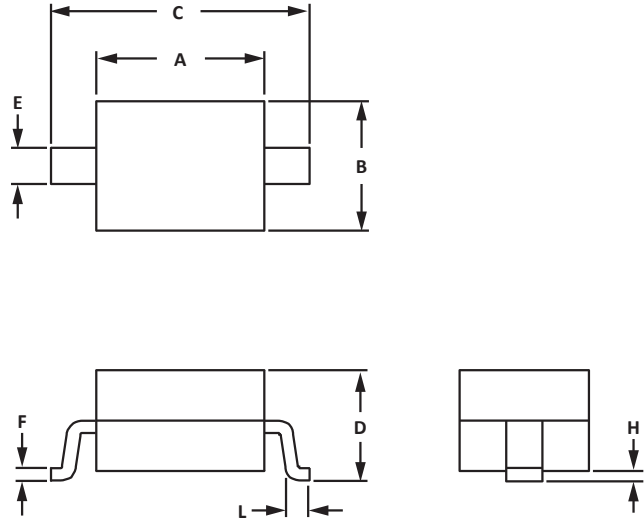
## SOD-323 PACKAGE INFORMATION

## OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.60	1.90	0.063	0.075
B	1.15	1.45	0.045	0.057
C	2.39	2.70	0.094	0.106
D	0.80	1.10	0.031	0.043
E	0.25	0.40	0.010	0.016
F	0.10	0.20	0.004	0.008
H	-	0.10	-	0.004
L	0.20	-	0.008	-

## NOTES

- Controlling dimension: millimeters.
- Dimensioning and tolerances per ANSI Y14.5M, 1985.
- Dimensions are exclusive of mold flash and metal burrs.

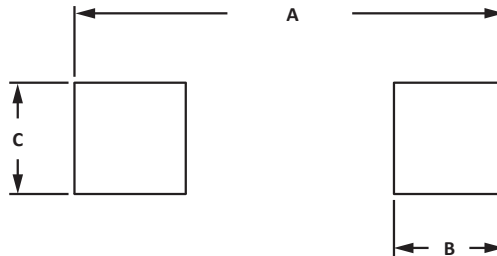


## PAD LAYOUT DIMENSIONS

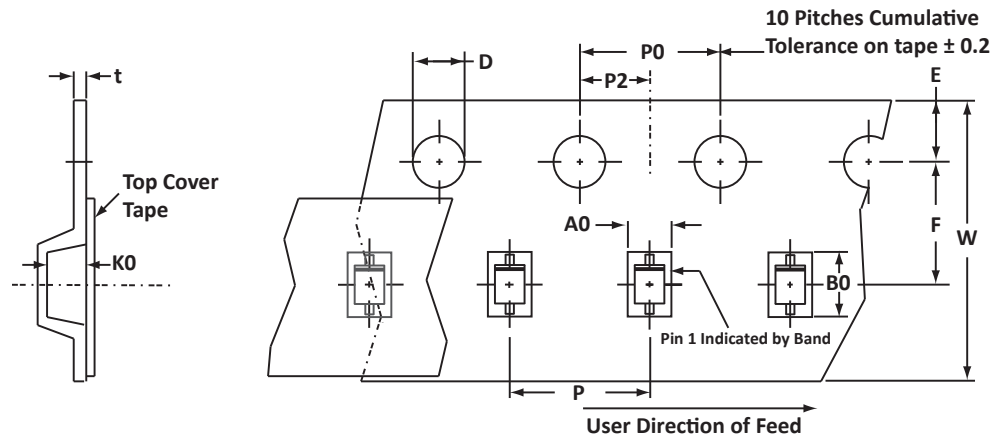
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.87	3.12	0.113	0.123
B	0.66	0.91	0.026	0.036
C	0.66	0.91	0.026	0.036

## NOTES

- Controlling dimension: millimeters.



## TAPE AND REEL



## SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	1.55 ± 0.10	2.90 ± 0.10	1.35 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	0.25

## NOTES

1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Suffix - T7 = 7" Reel - 3,000 pieces per 8mm tape.
4. Marking on Part - marking code (see page 2), polarity band (Unidirectional Only).

## ORDERING INFORMATION

BASE PART NUMBER (xx = Voltage)	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PAM08SD23xx/C	N/A	-T7	3,000	7"	N/A

This device is only available in a Lead-Free configuration.



## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products.

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