

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 μs 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

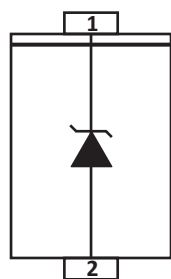
APPLICATIONS

- Automotive

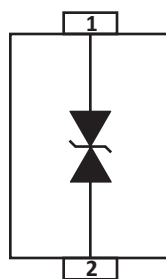
MECHANICAL CHARACTERISTICS

- 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 _{PP} | 500 | Watts |
| Bidirectional: Peak Pulse Power (tp = 8/20μs) - See Figure 1 | P _{PP} | 400 | Watts |
| Operating Temperature | T _L | -55 to 150 | °C |
| Storage Temperature | T _{STG} | -55 to 150 | °C |

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER | DEVICE MARKING | RATED STAND-OFF VOLTAGE V _{WM} VOLTS | MINIMUM BREAKDOWN VOLTAGE @ 1mA V _(BR) VOLTS | MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ IP = 1A V _C VOLTS | MAXIMUM LEAKAGE CURRENT @V _{WM} I _D 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 |
| PAM08SD2305 | B | 5.0 | 6.0 | 9.8 | 10 | 350 |
| PAM08SD2305C | H | 5.0 | 6.0 | 9.8 | 10 | 175 |
| PAM08SD2308 | C | 8.0 | 8.5 | 13.4 | 10 | 250 |
| PAM08SD2308C | J | 8.0 | 8.5 | 13.4 | 10 | 150 |
| PAM08SD2312 | D | 12.0 | 13.3 | 19.0 | 1 | 150 |
| PAM08SD2312C | K | 12.0 | 13.3 | 19.0 | 1 | 50 |
| PAM08SD2315 | E | 15.0 | 16.7 | 24.0 | 1 | 100 |
| PAM08SD2315C | L | 15.0 | 16.7 | 24.0 | 1 | 40 |
| PAM08SD2318 | 18 | 18.0 | 20.0 | 29.0 | 1 | 90 |
| PAM08SD2318C | N | 18.0 | 20.0 | 29.0 | 1 | 40 |
| PAM08SD2324 | F | 24.0 | 26.7 | 43.0 | 1 | 88 |
| PAM08SD2324C | M | 24.0 | 26.7 | 43.0 | 1 | 40 |
| PAM08SD2336 | R | 36.0 | 40.0 | 60.0 | 1 | 75 |
| PAM08SD2336C | T | 36.0 | 40.0 | 60.0 | 1 | 35 |

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

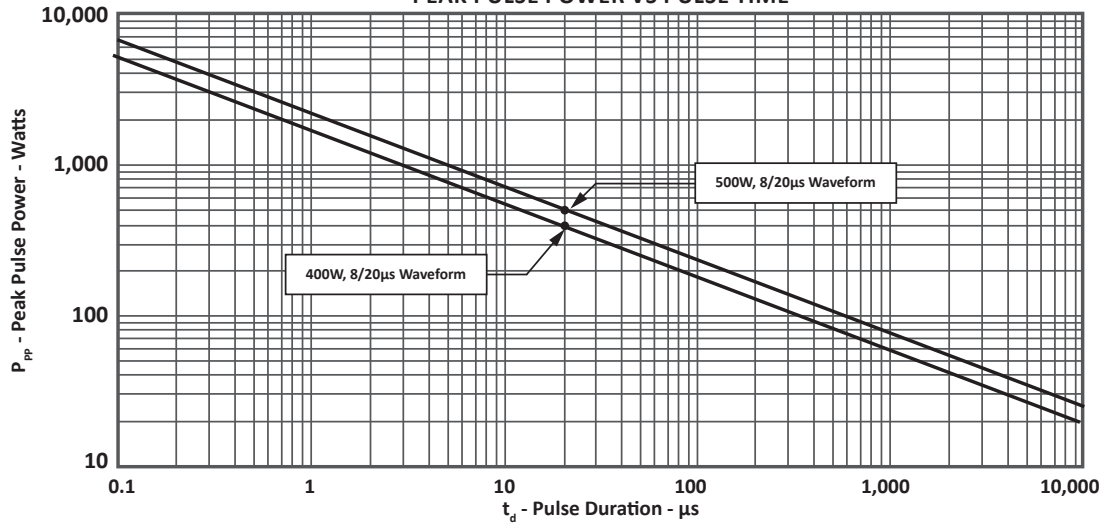


FIGURE 2
PULSE WAVE FORM

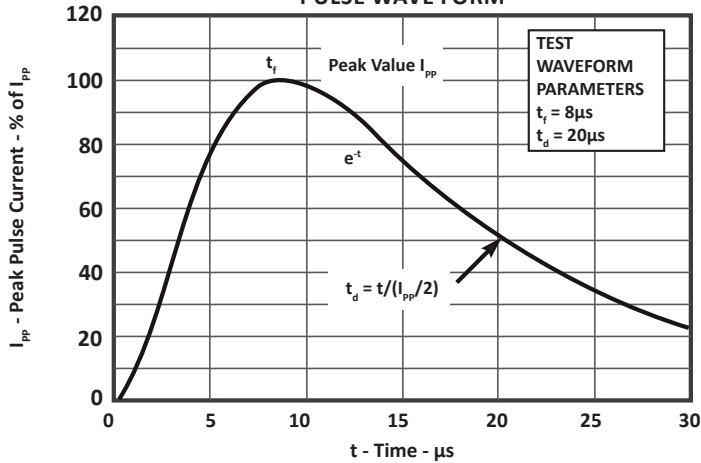
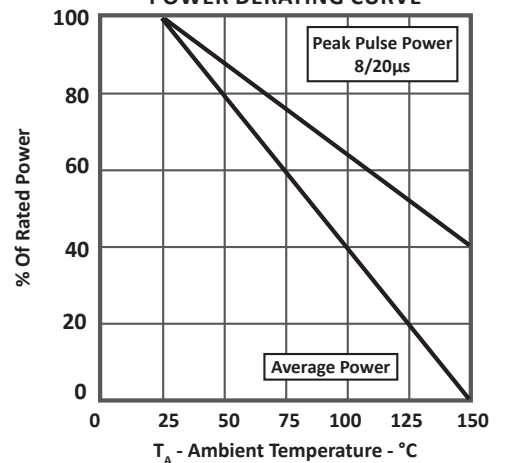


FIGURE 3
POWER DERATING CURVE



TYPICAL DEVICE CHARACTERISTICS

FIGURE 4
 OVERSHOOT & CLAMPING VOLTAGE FOR PAM08SD2303

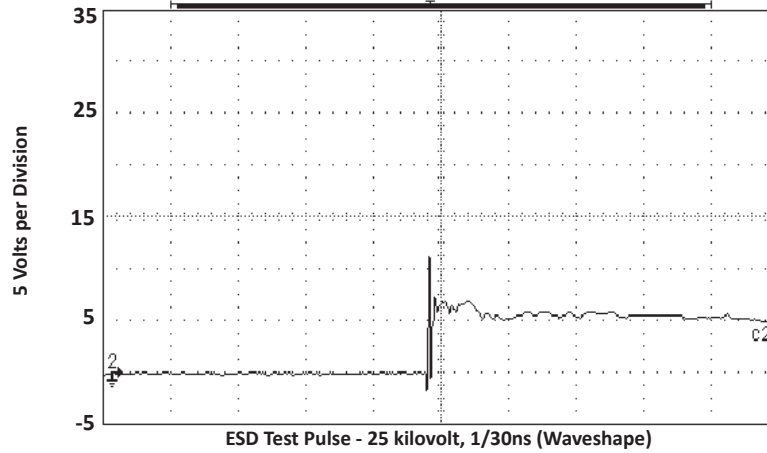
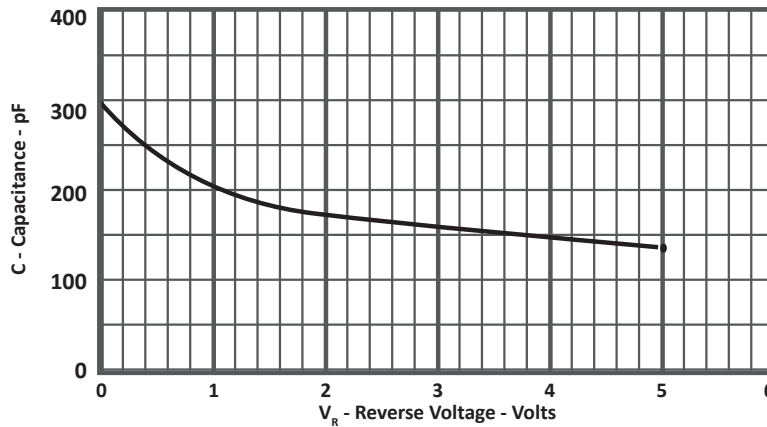


FIGURE 5
 CAPACITANCE VS REVERSE VOLTAGE



TYPICAL DEVICE CHARACTERISTICS

FIGURE 6
PAM08SD2303 FORWARD TLP
 Leakage Current @ Pulse (I) - μ A
 Leakage Test Voltage = 0.5V

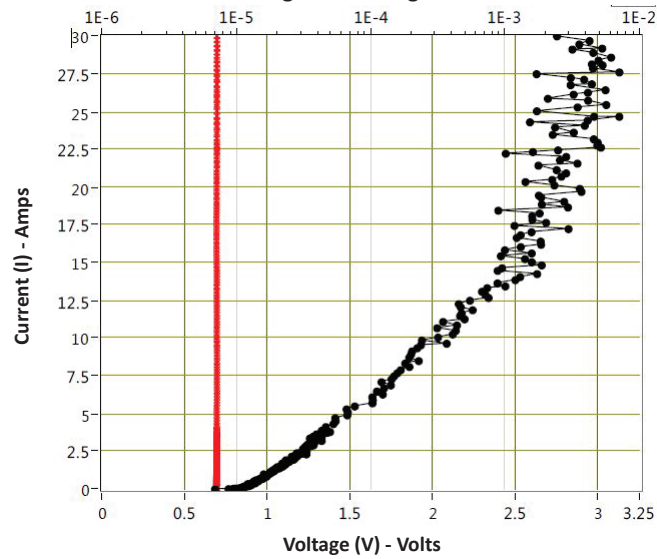
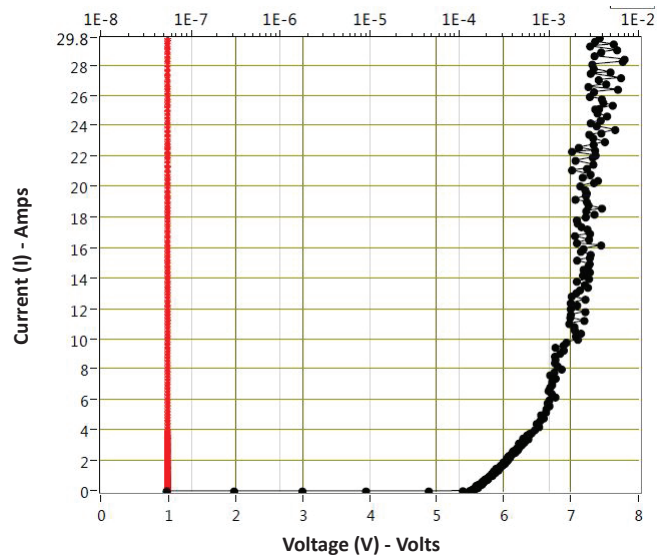


FIGURE 7
PAM08SD2303 REVERSE TLP
 Leakage Current @ Pulse (I) - μ A
 Leakage Test Voltage = 0.5V



Note: Indicative TLP performance- for reference only

SPICE MODEL

FIGURE 1
SPICE MODEL FOR

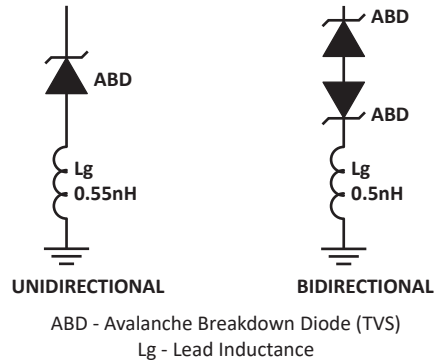


TABLE 1 - SPICE PARAMETERS

| PARAMETER | UNIT | ABD(TVS) |
|-----------------|------|-------------|
| BV | V | See Table 2 |
| IBV | μA | 1 |
| C _{jo} | pF | See Table 2 |
| I _s | A | See Table 2 |
| Vj | V | 0.6 |
| M | - | 0.33 |
| N | - | 1 |
| R _s | Ohms | See Table 2 |
| TT | s | 1E-8 |
| EG | eV | 1.11 |

TABLE 2 - ABD SPECIFIC SPICE PARAMETERS

| PART NUMBER | B _v (VOLTS) | C _{jo} (pF) | I _s (AMPS) | Rs(OHMS) |
|--------------|------------------------|----------------------|-----------------------|----------|
| PAM08SD2303 | 4.0 | 438 | 1E-11 | 0.21 |
| PAM08SD2305 | 6.0 | 284 | 1E-11 | 0.14 |
| PAM08SD2308 | 8.5 | 146 | 1E-11 | 0.28 |
| PAM08SD2312 | 13.3 | 123 | 1E-13 | 0.40 |
| PAM08SD2315 | 16.7 | 102 | 1E-13 | 0.52 |
| PAM08SD2324 | 26.7 | 61 | 1E-13 | 1.54 |
| PAM08SD2336 | 43.0 | 24 | 1E-13 | 3.83 |
| 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 |
| PAM08SD2336C | 43 | 12.0 | 1E-13 | 3.83 |

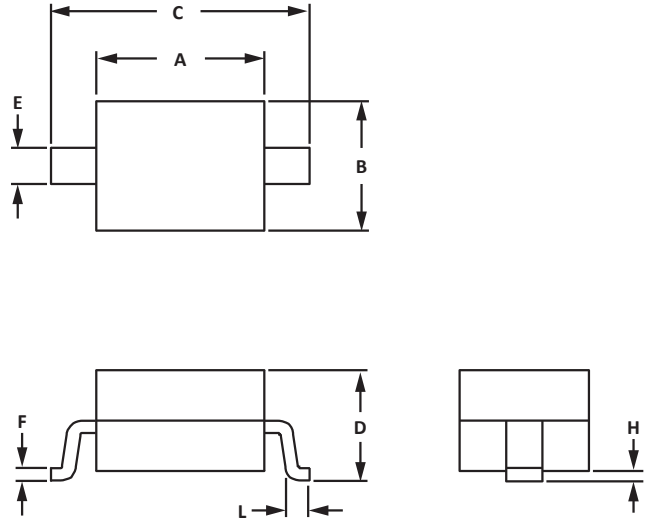
SOD-323 PACKAGE INFORMATION

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.

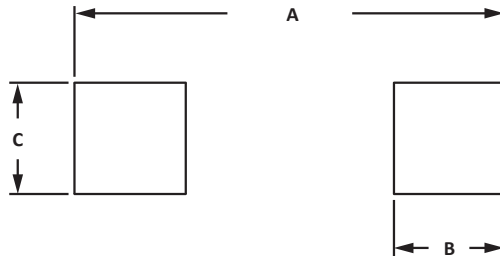


PAD LAYOUT DIMENSIONS

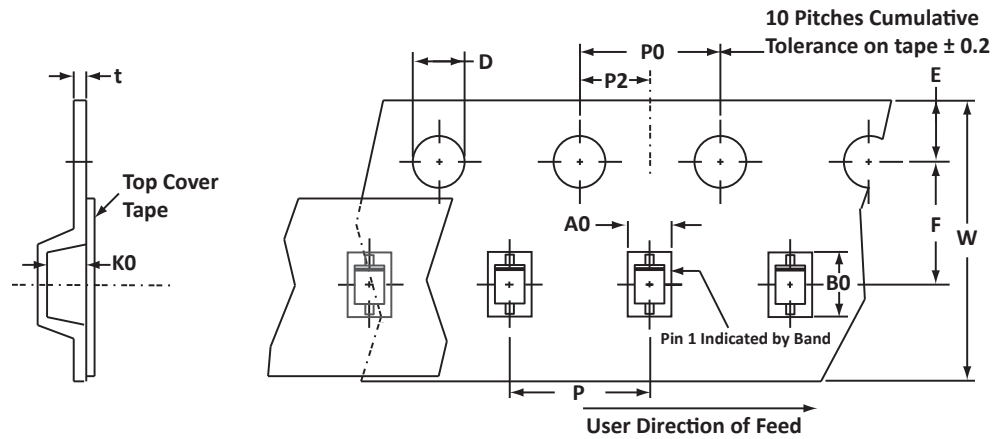
| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 2.87 | 3.12 | 0.113 | 0.123 |
| B | 0.66 | 0.91 | 0.026 | 0.036 |
| C | 0.66 | 0.91 | 0.026 | 0.036 |

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

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- 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

COMPANY PROFILE

In business more than 30 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection that include Transient Voltage Suppressor (TVS) Arrays, Steering Diode Array Hybrids, High-power Components and Modules, as well as Steering Diodes, EMI Filter/TVS Arrays and Thyristor Surge Suppressors. These components deliver circuit protection in electronic systems from numerous overvoltage events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices is an ISO 9001 certified company.

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