

SUBMINATURE MONOLITHIC TVS ARRAYS

APPLICATIONS

- ✓ Ethernet - 10 Base T
- ✓ Cellular Phones
- ✓ Handheld Electronics
- ✓ FireWire & USB Interfaces

IEC COMPATIBILITY (EN61000-4)

- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

FEATURES

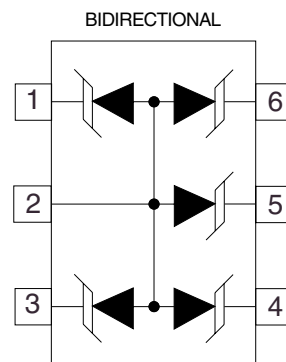
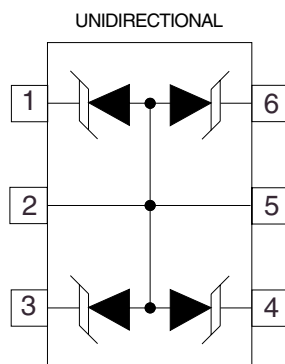
- ✓ ESD Protection > 25 kilovolts
- ✓ 350 Watts Peak Pulse Power per Line (8/20μs)
- ✓ Low Clamping Voltage
- ✓ Available in Multiple Voltage Types Ranging from 5V to 24V
- ✓ Unidirectional & Bidirectional Configurations
- ✓ Low Standby Current

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SOT-23-6
- ✓ Weight 0.6 grams (Approximate)
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Tape and Reel Per EIA Standard 481
- ✓ Device Marking: Marking Code & Logo
- ✓ Pin One Defined By DOT on Top of Package



CIRCUIT DIAGRAMS



DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ($t_p = 8/20\mu s$) - See Figure 1	P_{PP}	350	Watts
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (See Notes 1, 2 & 3)	DEVICE MARKING	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_p = 1A$ V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ 8/20 μs $V_C @ I_{PP}$	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D μA	TYPICAL CAPACITANCE (See Note 4) 0V @ 1 MHz C_i pF
PSMS05	PRH	5.0	6.0	9.8	21.0V @ 17.0A	20	150
PSMS05C	PRL	5.0	6.0	9.8	21.0V @ 17.0A	20	150
PSMS12	PRI	12.0	13.3	19	29.2V @ 12.0A	1	80
PSMS12C	PRM	12.0	13.3	19	29.2V @ 12.0A	1	80
PSMS15	PRJ	15.0	16.7	24	34.6V @ 10.0A	1	50
PSMS15C	PRN	15.0	16.7	24	34.6V @ 10.0A	1	50
PSMS24	PRK	24.0	26.7	40	58.3V @ 6.0A	1	40
PSMS24C	PRO	24.0	26.7	40	58.3V @ 6.0A	1	40

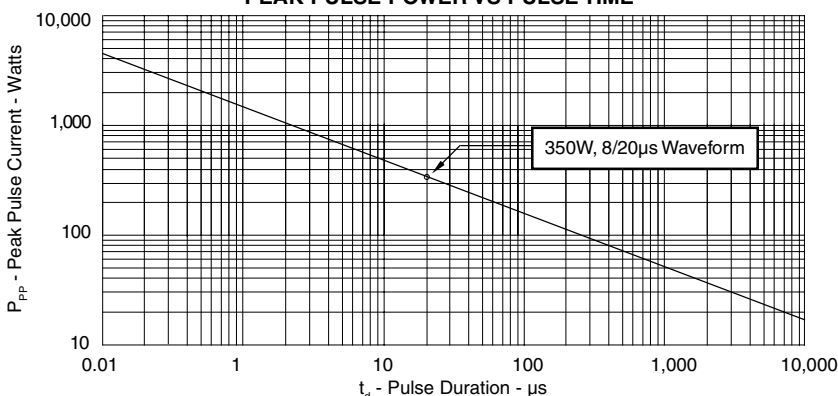
Note 1: Part numbers with an additional "C" suffix are bidirectional devices, i.e., PSMS05C.

Note 2: *Unidirectional Only:* Test between pin 1 to 2 or 5, 4 to 2 or 5, 6 to 2 or 5, 3 to 2 or 5.

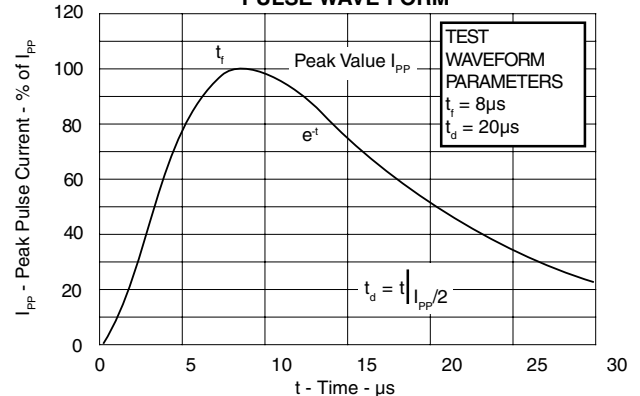
Note 3: *Bidirectional Only:* Test between pin 5 to 1 or 3 or 4 or 6. Electrical characteristics apply in both directions.

Note 4: *Unidirectional Only:* Capacitance measured between pins 1, 3, 4, 6, to 2.

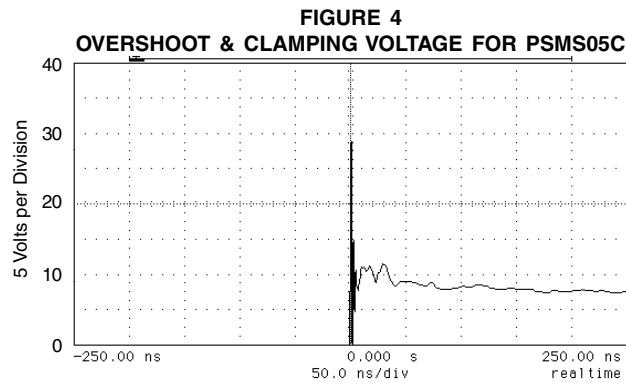
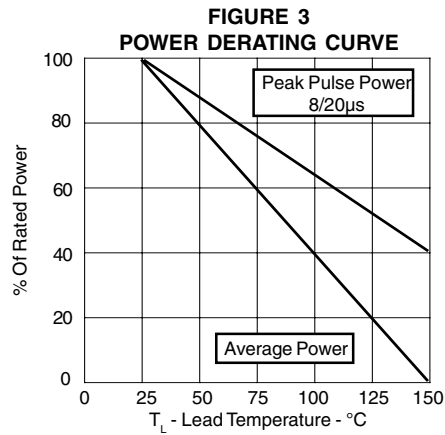
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



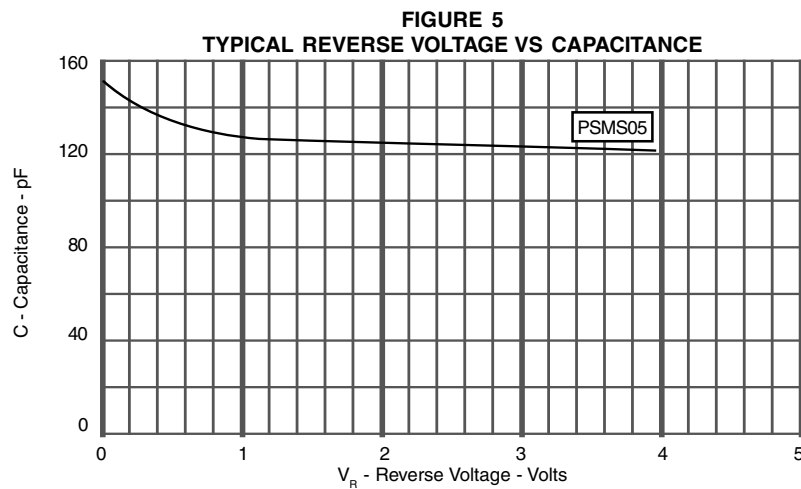
**FIGURE 2
PULSE WAVE FORM**



GRAPHS



ESD Test Pulse: 25 kilovolt, 1/30ns (waveform)



APPLICATION NOTES

The PSMS Series are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD (> 25kV) or EFT. This product series provides both unidirectional and bidirectional protection, with a surge capability of 350 Watts P_{pp} per line for an 8/20 μ s waveform.

UNIDIRECTIONAL COMMON MODE CONFIGURATION (Figure 1)

The PSMS Series provides up to four (4) lines of protection in a common mode configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin 1.
- ✓ Line 2 is connected to Pin 3.
- ✓ Line 3 is connected to Pin 4.
- ✓ Line 4 is connected to Pin 6.
- ✓ Pin 5 is connected to ground.
- ✓ Pin 2 is not connected.

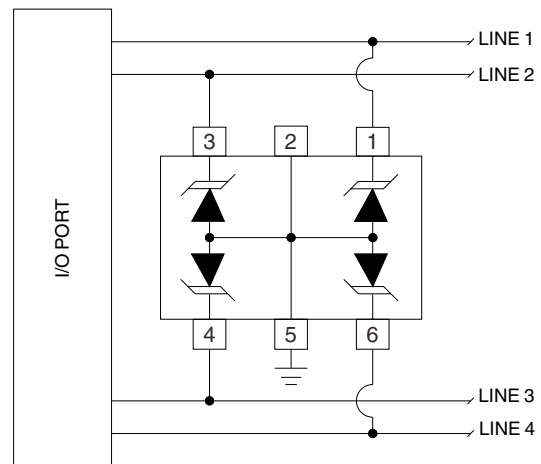


Figure 1 - Unidirectional Configuration
Common-Mode I/O Port Protection

BIDIRECTIONAL COMMON MODE CONFIGURATION (Figure 1)

The PSMSxxC Series provides up to four (4) lines of protection in a common mode configuration as depicted in Figure 2.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin 1.
- ✓ Line 2 is connected to Pin 3.
- ✓ Line 3 is connected to Pin 4.
- ✓ Line 4 is connected to Pin 5.
- ✓ Pin 6 is connected to ground.
- ✓ Pin 2 is not connected.

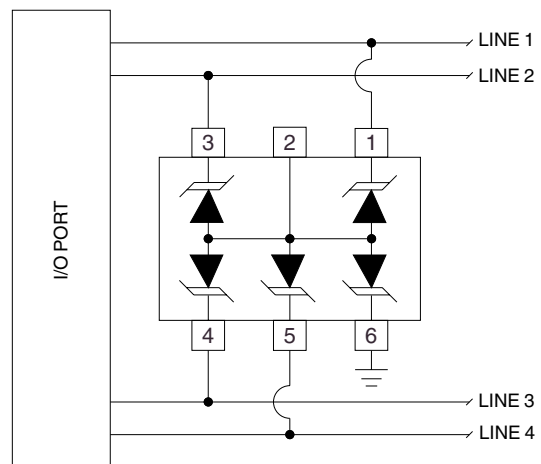


Figure 2 - Bidirectional Configuration
Common-Mode I/O Port Protection

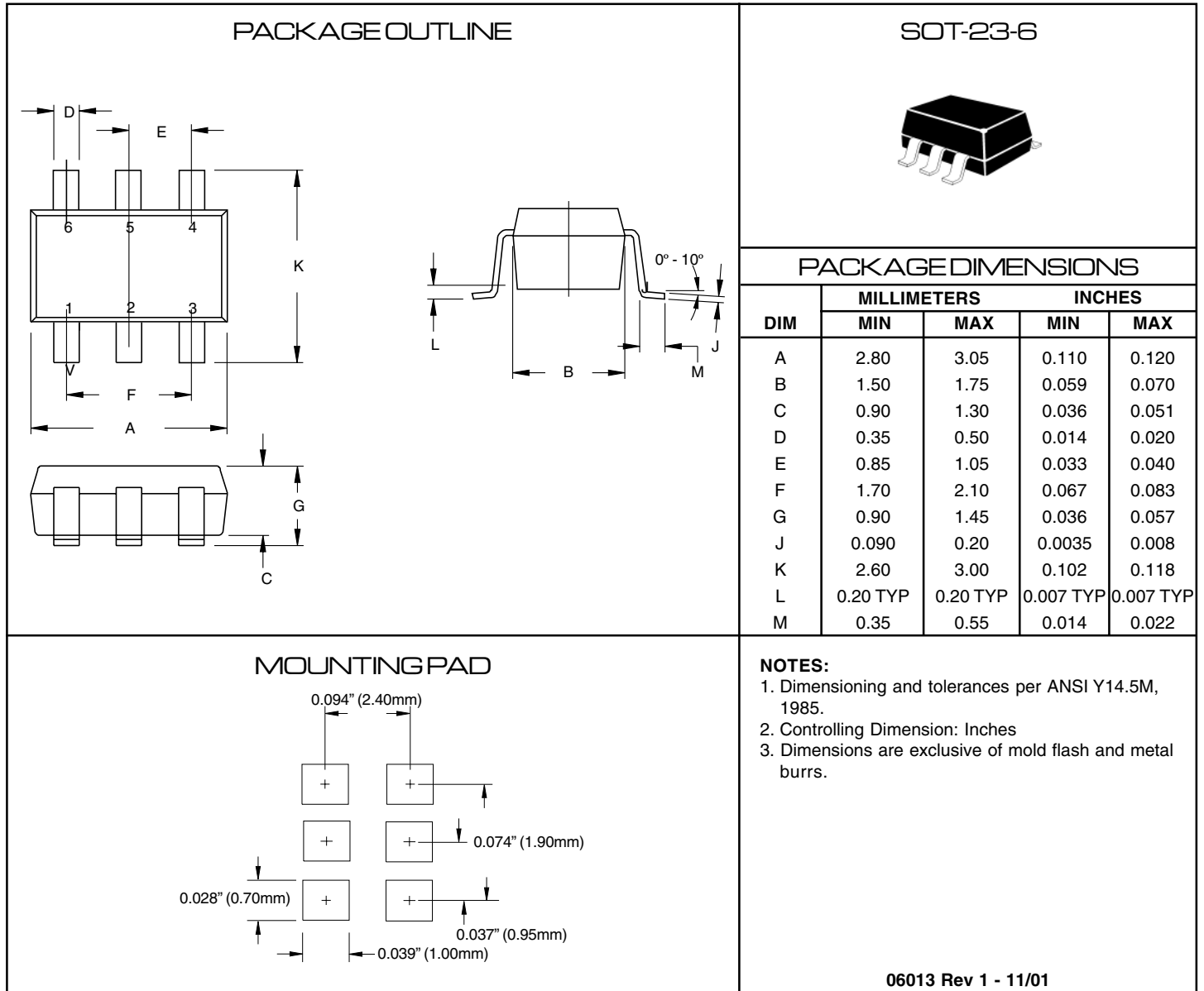
CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Circuit board layout is critical for Electromagnetic Compatibility (EMC) protection. The following guidelines are recommended:

- ✓ The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- ✓ The path length between the TVS device and the protected line should be minimized.
- ✓ All conductive loops including power and ground loops should be minimized.
- ✓ The transient current return path to ground should be kept as short as possible to reduce parasitic inductance.
- ✓ Ground planes should be used whenever possible. For multilayer PCBs, use ground vias.

PSMS05 thru PSMS24C

PACKAGE OUTLINE & DIMENSIONS



TAPE & REEL PACKAGING:

Surface mount product is taped and reeled in accordance with EIA-481, reel quantities and sizes are as follows:

7 Inch Reel - 3,000 pieces per reel; 13 Inch Reel - 10,000 pieces per reel

ProTek Devices

2929 South Fair Lane, Tempe, AZ 85282

Tel: 602-431-8101 Fax: 602-431-2288

E-Mail: sales@protekdevices.com

Web Site: www.protekdevices.com

COPYRIGHT © ProTek Devices 2003

SPECIFICATIONS: ProTek reserves the right to change the electrical and or mechanical characteristics described herein without notice (except JEDEC).

DESIGN CHANGES: ProTek reserves the right to discontinue product lines without notice, and that the final judgement concerning selection and specifications is the buyer's and that in furnishing engineering and technical assistance, ProTek assumes no responsibility with respect to the selection or specifications of such products.