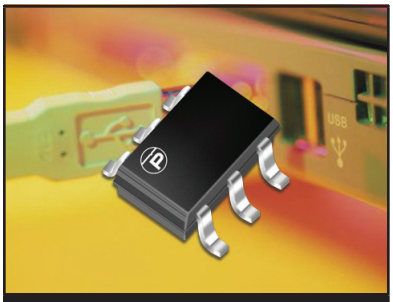
MULTI-LINE TVS ARRAY



SOT-23-6 PACKAGE

DESCRIPTION

The SMSxx and SMSxxC series are subminiature monolithic TVS suppressor arrays designed for the protection of sensitive IC components from the damaging effects of Electrostatic Discharge (ESD). This series is ideally suited for use in portable electronics such as SMART phones, laptops, and other wireless devices.

The SMSxx and SMSxxC series is usable on I/O ports where the signal voltage is positive. These devices will also provide protection in accordance with IEC 61000-4-2 and IEC 61000-4-4 requirements. This series is available in a SOT-23-6 package configuration and is rated at 350 Watts peak pulse power (8/20µs) per line.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 12A, 8/20µs - Level 1(Line-Gnd) & Level 2(Line-Line)
- 350 Watts Peak Pulse Power per Line(tp = 8/20µs)
- Monolithic Design
- Protects 4 or 5 Lines
- Unidirectional & Bidirectional Configurations
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- Low Leakage Current
- Avaiable in Multiple Voltages
- RoHS Compliant
- REACH Compliant

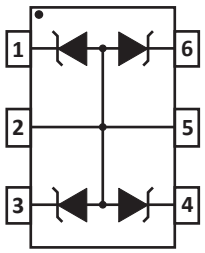
APPLICATIONS

- SMART Phones
- Portable Electronics
- FireWire, Ethernet and USB Interfaces

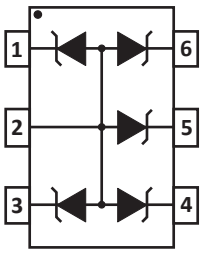
MECHANICAL CHARACTERISTICS

- Molded JEDEC SOT-23-6 Package
- Approximate Weight: 16 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
  Pure-Tin - Sn, 100: 260-270°C
- Flammability Rating UL 94V-0
- 8mm Tape and Reel per EIA Standard 481

PIN CONFIGURATIONS



4 LINES



5 LINES

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20µs) - See Figure 1	P_{PP}	350	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 (Notes 1-3)	DEVICE MARKING	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ I_P = 1A V_C VOLTS	MAXIMUM LEAKAGE CURRENT @V_{WM} I_D µA	TYPICAL CAPACITANCE (Note 4) @0V, 1MHz Cj pF
SMS05	PRH	5.0	6.0	9.8	20	150
SMS05C	PRL	5.0	6.0	9.8	20	150
SMS12	PRI	12.0	13.3	19.0	1	80
SMS12C	PRM	12.0	13.3	19.0	1	80
SMS15	PRJ	15.0	16.7	24.0	1	50
SMS15C	PRN	15.0	16.7	24.0	1	50
SMS24	PRK	24.0	26.7	40.0	1	40
SMS24C	PRO	24.0	26.7	40.0	1	40

NOTES
1. Part numbers with an additional "C" suffix are bidirectional, i.e., SMS05**C**.
2. Unidirectional Only: For SMSxx, test between pin 1 to 2 or 5, 4 to 2 or 5, 6 to 2 or 5, 3 to 2 or 5. For SMSxxC, test between 2 to 1, 3, 4, 5, or 6.
3. Bidirectional Only: For SMSxxC, test between pin 5 to 1 or 3 or 4 or 6. Electrical characteristics apply in both directions.
4. Unidirectional Only: For SMSxx, capacitance measured between pins 1, 3, 4, 6 to 2. For SMSxxC, capactiance measured between pins 2 to 1, 3, 4, 5, or 6.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

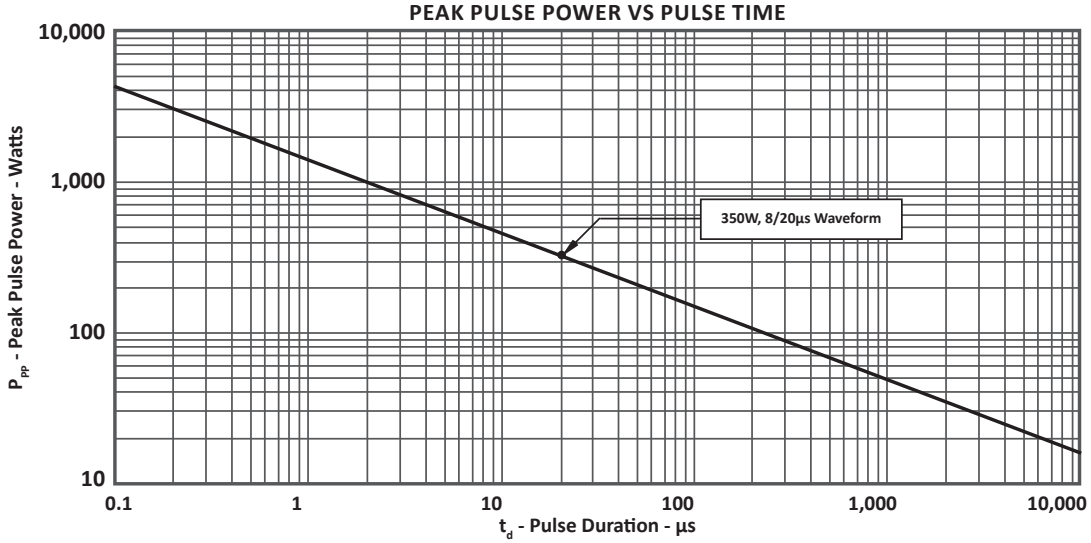


FIGURE 2
PULSE WAVE FORM

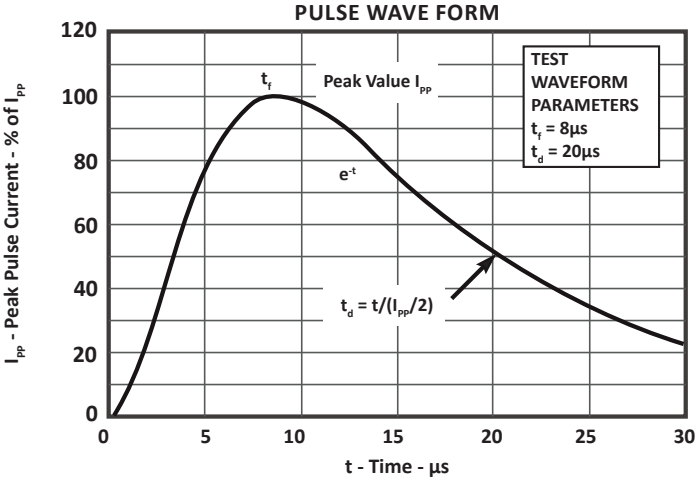
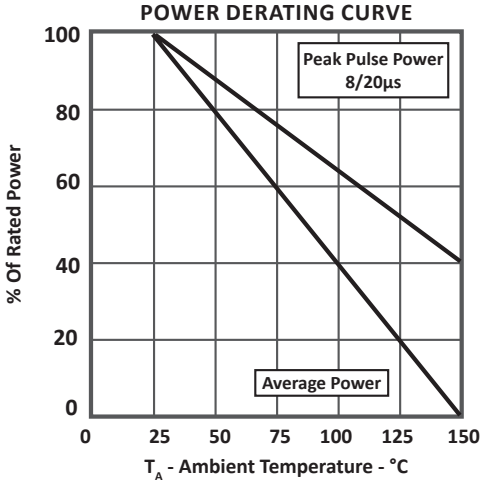
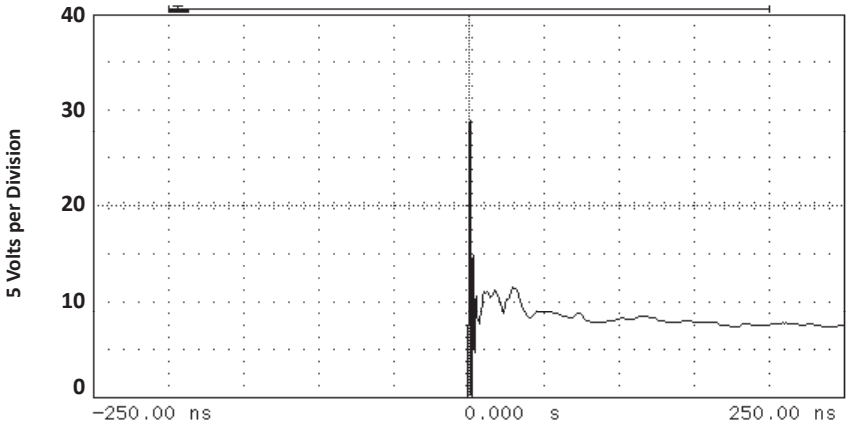


FIGURE 3
POWER DERATING CURVE



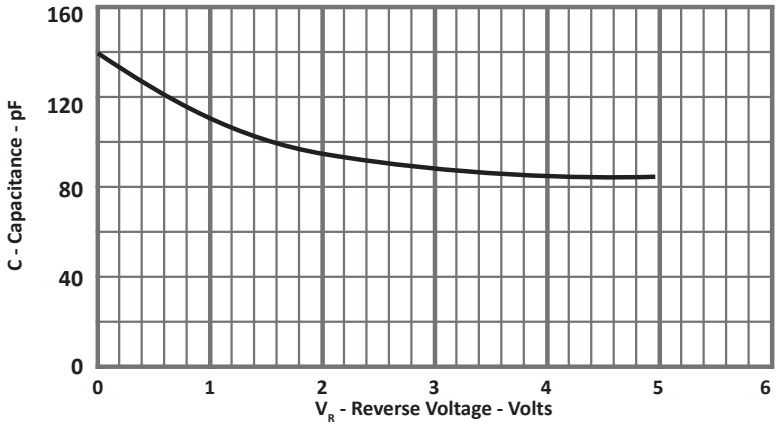
TYPICAL DEVICE CHARACTERISTICS

FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR SMS05C



ESD Test Pulse - 25 kilovolt, 1/30ns (Waveshape)

FIGURE 5
TYPICAL REVERSE VOLTAGE VS CAPACITANCE FOR SMS05



APPLICATION INFORMATION

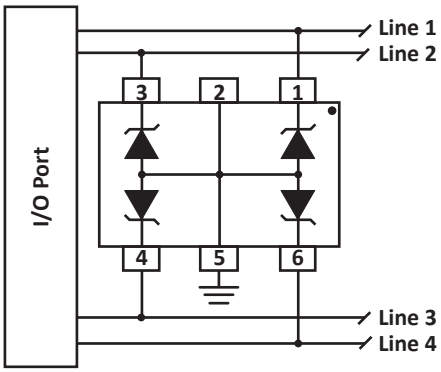


FIGURE 1 - COMMON-MODE I/O PORT PROTECTION (UNIDIRECTIONAL)

Circuit connectivity is as follows:
- Line 1 connected to pin 1.
- Line 2 connected to pin 3.
- Line 3 connected to pin 4.
- Line 4 connected to pin 6.
- Pin 5 connected to ground.
- Pin 6 not connected.

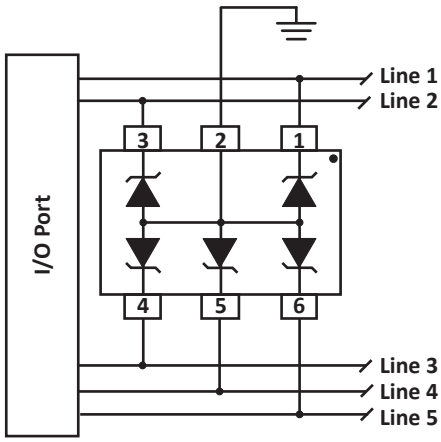


FIGURE 2 - COMMON-MODE I/O PORT PROTECTION (UNIDIRECTIONAL - 5 LINES)

Circuit connectivity is as follows:
- Line 1 connected to pin 1.
- Line 2 connected to pin 3.
- Line 3 connected to pin 4.
- Line 4 connected to pin 5.
- Line 5 connected to pin 6.
- Pin 2 connected to ground.

APPLICATION INFORMATION

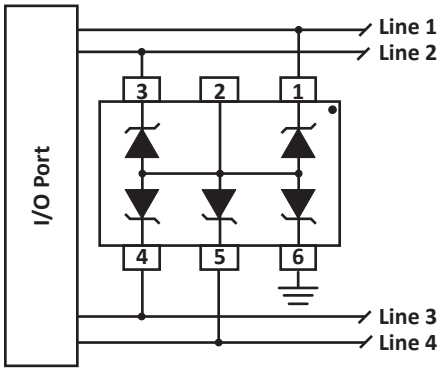


FIGURE 3 - COMMON-MODE I/O PORT PROTECTION (BIDIRECTIONAL)

Circuit connectivity is as follows:
- Line 1 connected to pin 1.
- Line 2 connected to pin 3.
- Line 3 connected to pin 4.
- Line 4 connected to pin 5.
- Pin 6 connected to ground.
- Pin 2 not connected.

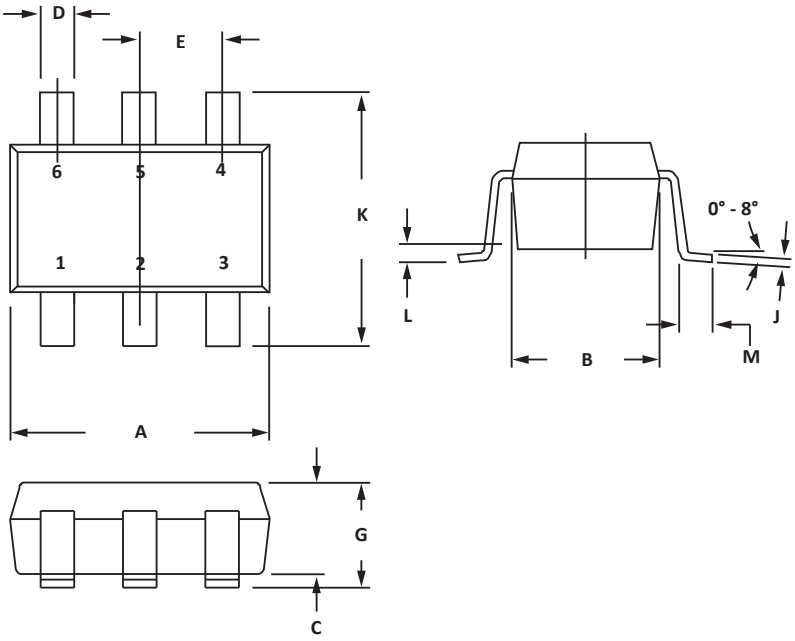
CIRCUIT BOARD RECOMMENDATIONS

Circuit board layout is critical for electromagnetic compatibility 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.

SOT-23-6 PACKAGE INFORMATION

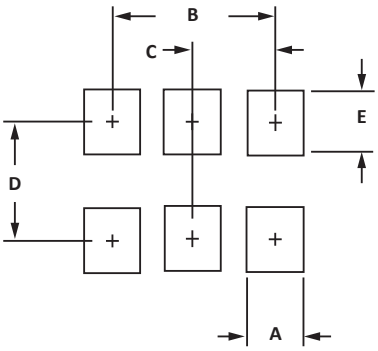
OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.05	0.110	0.120
B	1.50	1.75	0.059	0.070
C	0.90	1.30	0.036	0.051
D	0.30	0.40	0.012	0.016
E	0.85	1.05	0.033	0.040
G	0.90	1.45	0.036	0.057
J	0.09	0.20	0.003	0.008
K	2.60	3.00	0.102	0.118
L	0.0	0.15	0.0	0.006
M	0.30	0.60	0.012	0.024

NOTES
1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Dimensions are exclusive of mold flash and metal burrs.

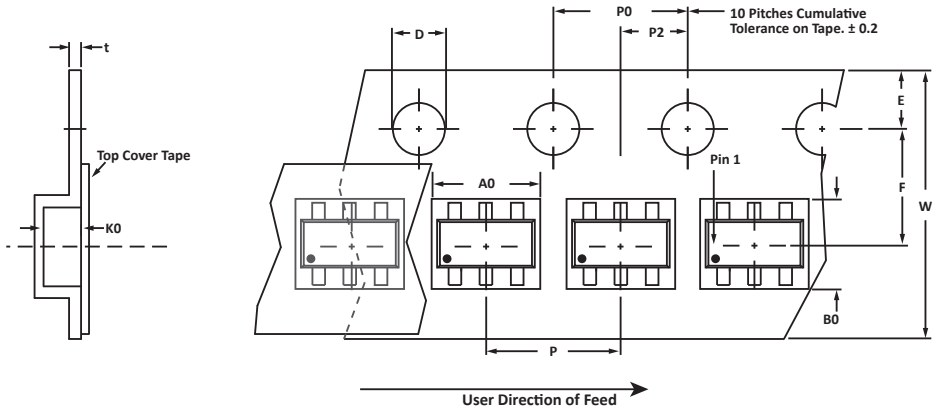


PAD LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.70	0.028
B	1.90	0.074
C	0.95	0.037
D	2.40	0.094
E	1.00	0.039

NOTES
1. Controlling dimension: inches.



TAPE AND REEL



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	3.20 ± 0.10	3.20 ± 0.10	1.65 ± 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) and pin one defined by dot on package.

Package outline, pad layout and tape specifications per document number 06013.R5 2/11

ORDERING INFORMATION					
BASE PART NUMBER (xx = Voltage)	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
SMSxx/SMSxxC	-LF	-T7	3,000	7"	n/a

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

COMPANY INFORMATION

COMPANY PROFILE

In business more than 25 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. ProTek Devices is ISO 9001:2015 certified.

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