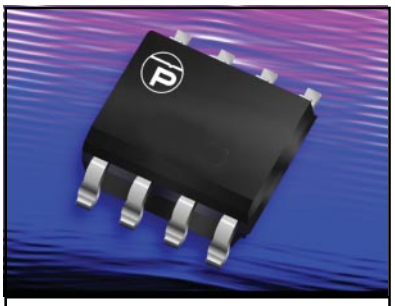
PROTEK DEVICES
Only One Name Means ProTek'Tion™

SMDA03LC thru SMDA24LCC

LOW CAPACITANCE TVS ARRAY

APPLICATIONS



SO-8

✔ SCSI & IDE Interfaces
✔ Parallel & Serial Port Protection (RS-232)
✔ Ethernet - 10/100 Base T
✔ Test & Measurement Equipment
✔ Industrial Control: Low Voltage Sensors

IEC COMPATIBILITY (EN61000-4)

✔ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
✔ 61000-4-4 (EFT): 40A - 5/50ns
✔ 61000-4-5 (Surge): 12A, 8/20µs - Level 1(Line-Gnd) & Level 2(Line-Line)

FEATURES

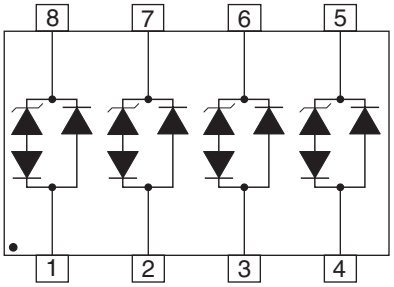
✔ 500 Watts Peak Pulse Power per Line (tp=8/20µs)
✔ Unidirectional & Bidirectional Configurations
✔ Available in Multiple Voltage Types Ranging From 3V to 24V
✔ Protects Up to Four (4) Lines
✔ ESD Protection > 40 kilovolts
✔ ***LOW CAPACITANCE: 15pF***
✔ RoHS Compliant in Lead-Free Versions

MECHANICAL CHARACTERISTICS

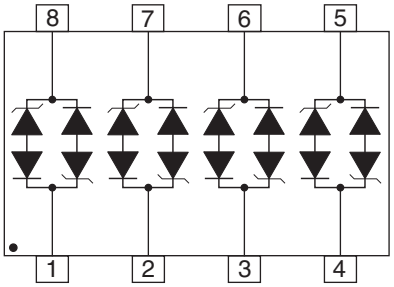
✔ Molded JEDEC SO-8 Package
✔ Weight 70 milligrams (Approximate)
✔ Available in Tin-Lead or Lead-Free Pure-Tin Plating(Annealed)
✔ Solder Reflow Temperature:
  Tin-Lead - Sn/Pb, 85/15: 240-245°C
  Pure-Tin - Sn, 100: 260-270°C
✔ Flammability rating UL 94V-0
✔ 12mm Tape and Reel Per EIA Standard 481
✔ Marking: Logo, Marking Code, Date Code & Pin One Defined By Dot on Top of Package

PIN CONFIGURATIONS

UNIDIRECTIONAL



BIDIRECTIONAL



DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (t_p = 8/20µs) - See Figure 1	P_{PP}	500	Watts
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C
Forward Voltage @ 50mA, 300µs - Square Wave (Note 1)	V_F	1.5	Volts

Note 1: Only applies to unidirectional devices.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified							
PART NUMBER (See Note 1)	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) @8/20µs V_C @ I_{PP}	MAXIMUM LEAKAGE CURRENT @V_{WM} I_D µA	MAXIMUM CAPACITANCE 0V @ 1 MHz C pF
SMDA03LC	SLA	3.3	4.5	7.0	10.9V @ 43.0A	125	15
SMDA03LCC	SLB	3.3	4.5	7.0	10.9V @ 43.0A	125	15
SMDA05LC	SLC	5.0	6.0	9.8	13.5V @ 42.0A	20	15
SMDA05LCC	SLD	5.0	6.0	9.8	13.5V @42.0A	20	15
SMDA08LC	SLE	8.0	8.5	13.4	16.9V @ 34.0A	10	15
SMDA08LCC	SLF	8.0	8.5	13.4	16.9V @ 34.0A	10	15
SMDA12LC	SLG	12.0	13.3	19.0	25.9V @ 27.0A	1	15
SMDA12LCC	SLH	12.0	13.3	19.0	25.9V @ 27.0A	1	15
SMDA15LC	SLJ	15.0	16.7	24.0	30.0V @ 17.0A	1	15
SMDA15LCC	SLK	15.0	16.7	24.0	30.0V @ 17.0A	1	15
SMDA24LC	SLL	24.0	26.7	43.0	49.0V @ 12.0A	1	15
SMDA24LCC	SLM	24.0	26.7	43.0	49.0V @ 12.0A	1	15

Note 1: Part numbers with a “C” suffix are bidirectional devices, i.e., SMDA03LCC.

GRAPHS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

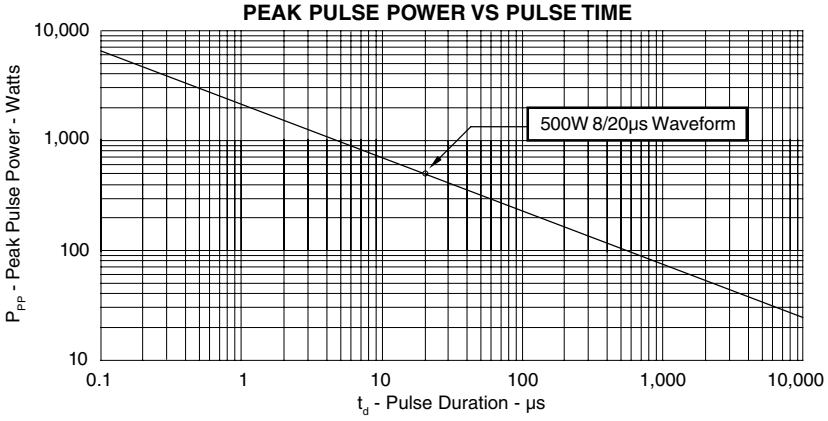


FIGURE 2
PULSE WAVE FORM

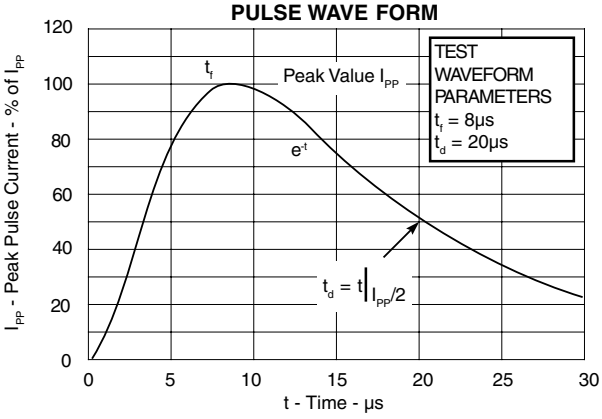


FIGURE 3
POWER DERATING CURVE

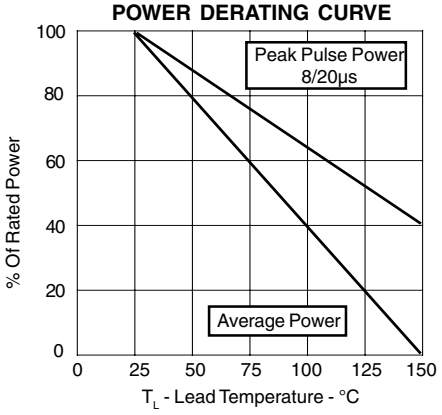
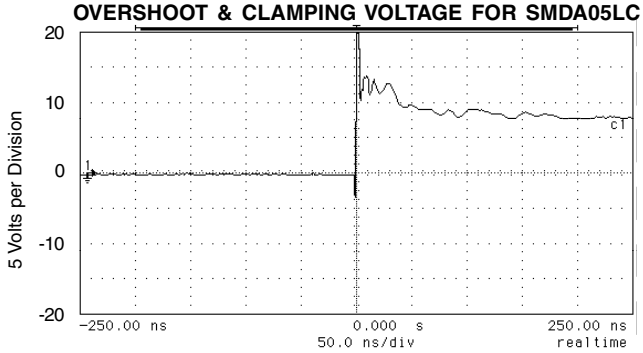


FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR SMDA05LC



ESD Test Pulse: 5 kilovolt, 1/30ns (waveform)

APPLICATION NOTE

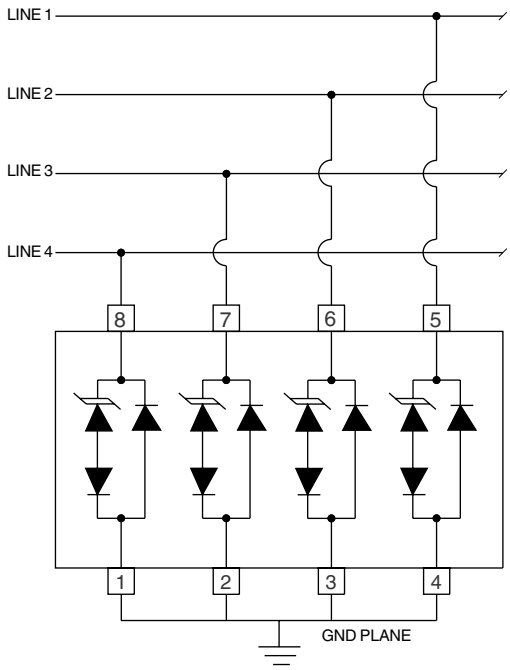
The SMDAxxLC & SMDAxxLCC Series are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD, EFT and other types of surges. This product series provides both unidirectional and bidirectional protection, with a surge capability of 500 Watts P_{PP} per line for an 8/20µs waveform and ESD protection > 40kV.

UNIDIRECTIONAL COMMON-MODE CONFIGURATION(Figure 1)

The SMDAxxLC 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 5.
- ✔ Line 2 is connected to Pin 6.
- ✔ Line 3 is connected to Pin 7.
- ✔ Line 4 is connected to Pin 8.
- ✔ Pins 1-4 are connected to ground.

Figure 1. Unidirectional Common-Mode Protection



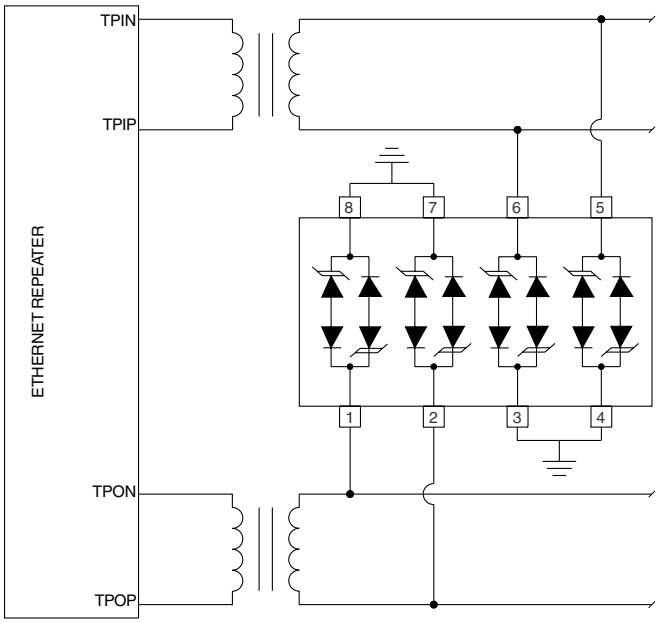
BIDIRECTIONAL COMMON-MODE CONFIGURATION (Figure 2)

Ideal for Ethernet applications, SMDAxxLCC Series provides up to four (4) lines of protection in a common-mode configuration as depicted in Figure 2.

Circuit connectivity is as follows:

- ✔ TPIN is connected to Pin 5.
- ✔ TPIP is connected to Pin 6.
- ✔ TPON is connected to Pin 1.
- ✔ TPOP is connected to Pin 2.
- ✔ Pins 3, 4, 7 & 8 are connected to ground.

Figure 2. Bidirectional Common-Mode Protection



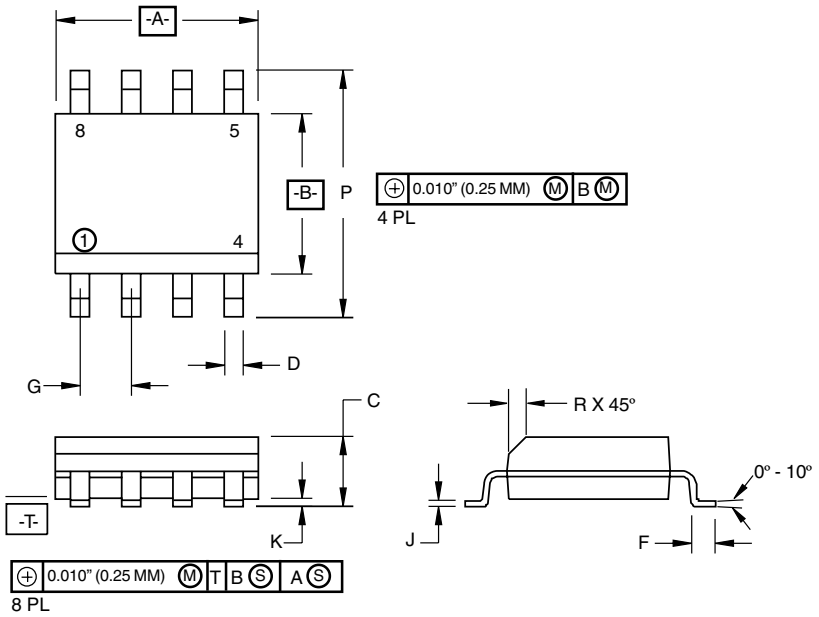
CIRCUIT BOARD LAYOUT RECOMMENDATIONS

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

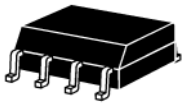
- ✔ The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- ✔ The path length between the TVS device and the protected line should be minimized.
- ✔ All conductive loops 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.

PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE



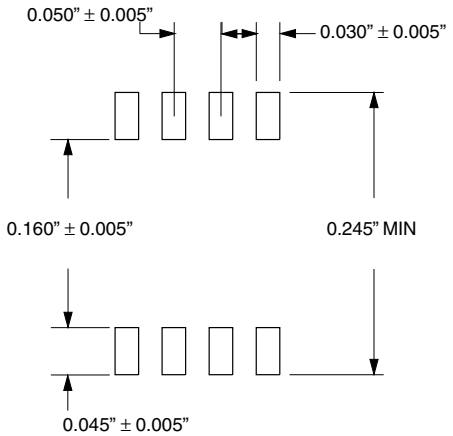
SO-8



PACKAGE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.250	0.016	0.049
G	1.27 BSC	1.27 BSC	0.05 BSC	0.05 BSC
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.008
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

MOUNTING PAD



NOTES

1. - T - = Seating Plane and Datum Surface.
2. Dimensions "A" and "B" are Datum.
3. Dimensions "A" and "B" do not include mold protrusion.
4. Maximum mold protrusion is 0.015" (0.380 mm) per side.
5. Dimensioning and tolerances per ANSI Y14.5M, 1982.
6. Dimensions are exclusive of mold flash and metal burrs.

TAPE & REEL/BULK ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. Suffix-T7 = 7 Inch Reel - 1,000 pieces per 12mm tape, i.e., *SMDA05LC-T7*.
3. Suffix-T13 = 13 Inch Reel - 2,500 pieces per 12mm tape, i.e., *SMDA05LC-T13*.
4. Suffix - LF = Lead-Free, Pure-Tin Plating, i.e., *SMDA05LC-LF-T7*.
5. No Suffix = Product Shipped in Tubes of 98 pcs per Tube.

Outline & Dimensions: Rev 1 - 11/01, 06009

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