

LOW CAPACITANCE TVS ARRAYS

APPLICATIONS

- ✓ 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)

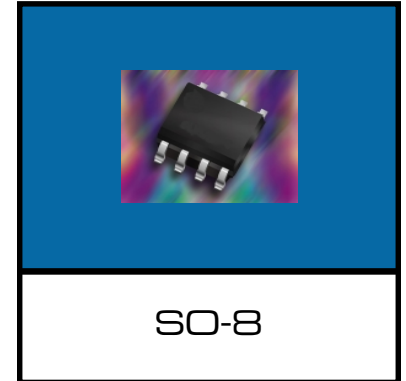
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns
- ✓ 61000-4-5 (Surge): 12A, 8/20 μ s - Level 1(Line-Gnd) & Level 2(Line-Line)

FEATURES

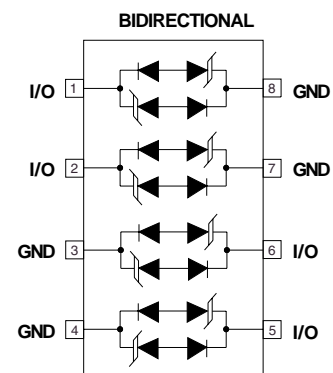
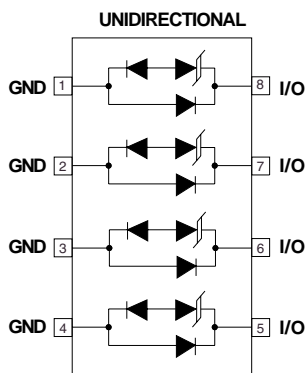
- ✓ 500 Watts Peak Pulse Power per Line($t_p = 8/20\mu$ s)
- ✓ Unidirectional & Bidirectional Configurations
- ✓ Available in Multiple Voltage Types Ranging from 3.0V to 24V
- ✓ Protects Up to Four (4) Lines
- ✓ ESD Protection > 40 kilovolts
- ✓ **LOW CAPACITANCE - 15pF**

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SO-8
- ✓ Weight 15 milligrams (Approximate)
- ✓ Flammability Rating UL 94V-0
- ✓ 12mm Tape and Reel Per EIA Standard 481
- ✓ Device Marking: Logo, Marking Code, Pin 1 Indicated by DOT on Top of Package



CIRCUIT DIAGRAMS



SMDA03LC thru SMDA24LCC

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}	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 Notes 1-2)	DEVICE MARKING	RATED STAND-OFF VOLTAGE	MINIMUM BREAKDOWN VOLTAGE	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM LEAKAGE CURRENT	MAXIMUM CAPACITANCE
		V_{WM} VOLTS	@ 1mA $V_{(BR)}$ VOLTS	@ $I_p = 1A$ V_C VOLTS	@ 8/20μs $V_C @ I_{PP}$	@ V_{WM} I_D μA	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.

Note 2: SPICE model and parameters available for this device on the ProTek Devices website: www.protekdevices.com.

GRAPHS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

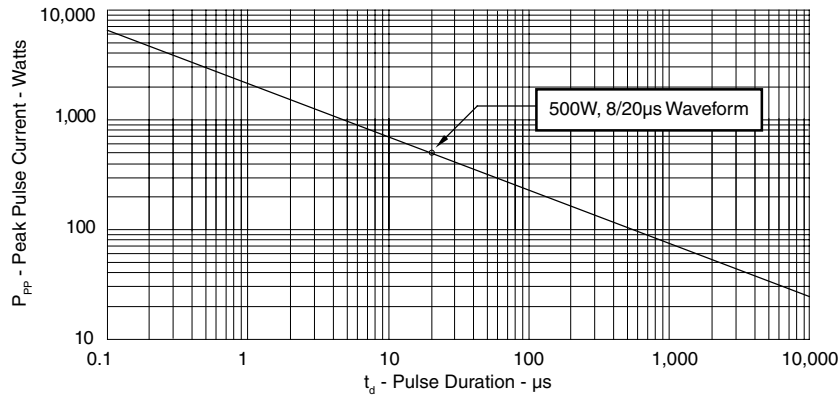


FIGURE 2
PULSE WAVE FORM

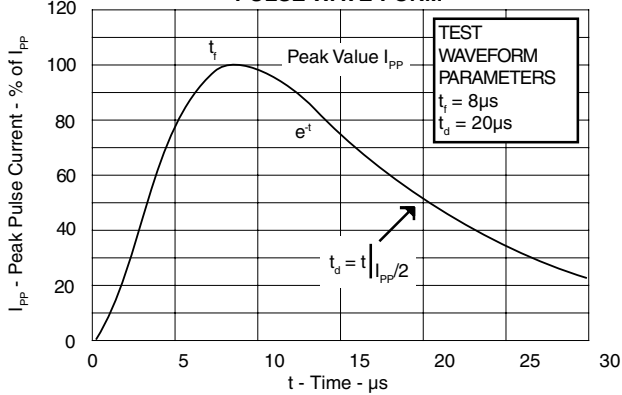


FIGURE 3
POWER DERATING CURVE

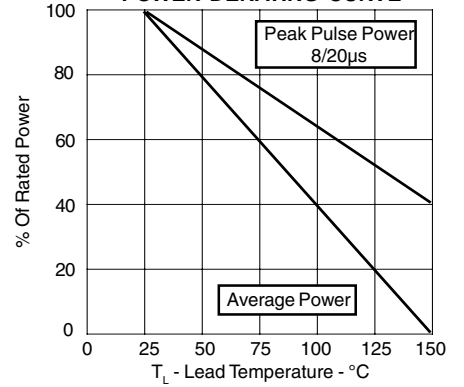
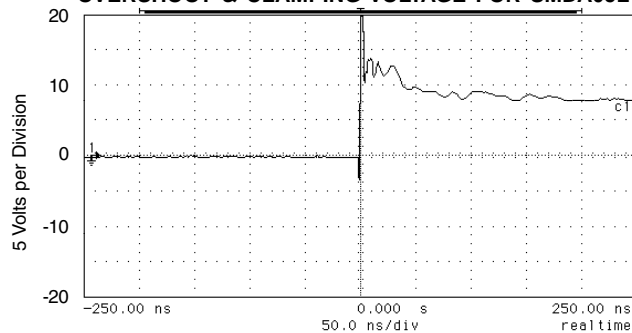


FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR SMDA05LC



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

APPLICATION NOTES

The SMDAxxLC & SMDAxxLCC Series are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD (> 40kV), 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 8/20 μ s waveform.

UNIDIRECTIONAL CONFIGURATION COMMON-MODE PROTECTION (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.

BIDIRECTIONAL CONFIGURATION COMMON-MODE PROTECTION (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 7.
- ✓ TPOP is connected to Pin 8.
- ✓ Pins 3, 4, 7 & 8 are connected to ground.

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.

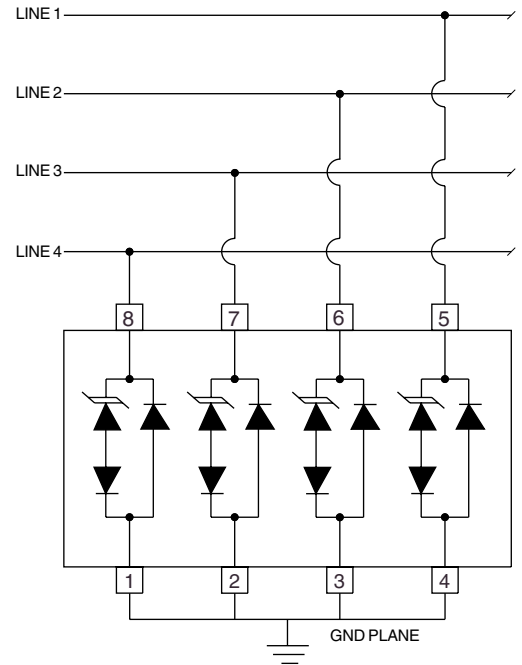


Figure 1. Unidirectional Common-Mode Protection

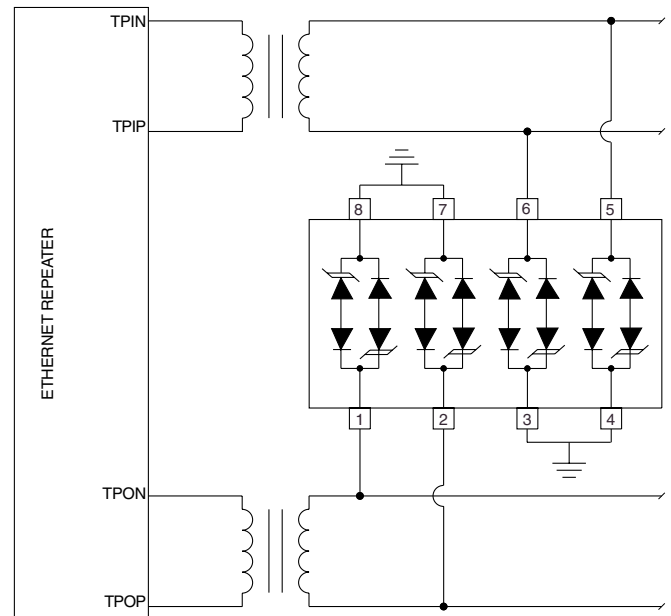


Figure 2. Bidirectional Common-Mode Protection

SMDA03LC thru SMDA24LCC

PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE

SO-8

PACKAGED 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

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.

06009 Rev 1 -11/01

MOUNTING PAD

TAPE & REEL ORDERING INFORMATION:

Surface mount product is taped and reeled in accordance with EIA-481.
 Suffix -T7: 7 Inch Reel - 1,000 pieces per reel (i.e., SMDA05LC-T7).
 Suffix -T13: 13 Inch Reel - 2,500 pieces per reel (i.e., SMDA05LC-T13).
 No Suffix: Bulk Quantities - 98 pieces per tube.

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