

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

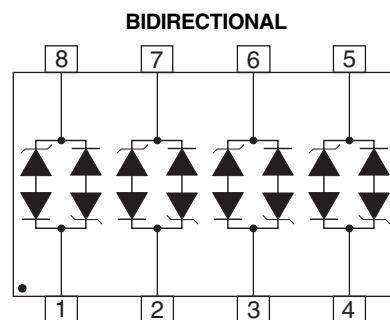
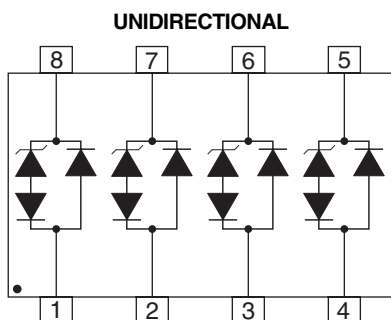
- ✓ 500 Watts Peak Pulse Power per Line (tp=8/20 μ s)
- ✓ Unidirectional & Bidirectional Configurations
- ✓ Available in Multiple Voltage Types Ranging From 3V to 24V
- ✓ Protects Up to Four (4) Lines
- ✓ ESD Protection > 40 kilovolts
- ✓ Low Capacitance: 15pF
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SO-8
- ✓ Weight 70 milligrams (Approximate)
- ✓ Available in Lead-Free Pure-Tin Plating(Annealed)
- ✓ Solder Reflow Temperature:
Pure-Tin - Sn, 100: 260-270°C
- ✓ Consult Factory for Leaded Device Availability
- ✓ Flammability Rating UL 94V-0
- ✓ 12mm Tape and Reel Per EIA Standard 481
- ✓ Marking: Marking Code, Logo, Date Code & Pin One Defined By Dot on Top of Package


SO-8

PIN CONFIGURATIONS



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_L	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Forward Voltage @ 50mA, 300 μs - Square Wave (See Note 1)	V_F	1.5	Volts

Note 1: Only applies to unidirectional devices.

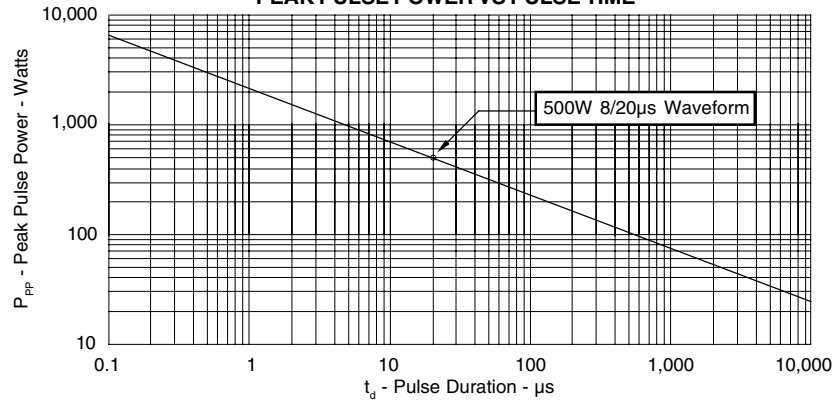
ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER (See Notes 1)	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 (See Note 2)
		V_{WM} VOLTS	@ 1mA $V_{(BR)}$ VOLTS	@ $I_F = 1A$ V_C VOLTS	@ 8/20 μs $V_C @ I_{PP}$	@ V_{WM} I_b 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

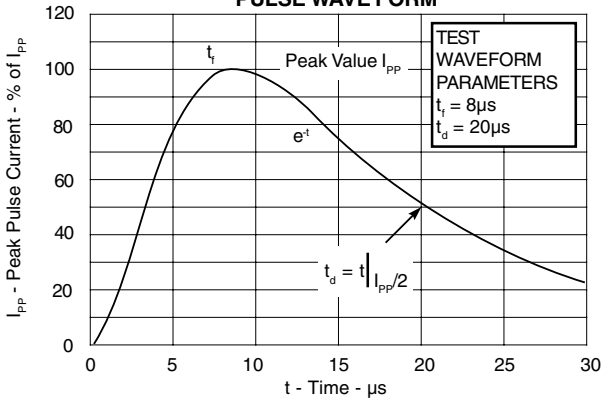
Note 1: Part numbers with a "C" suffix are bidirectional devices, i.e., SMDA03LCC.

GRAPHS

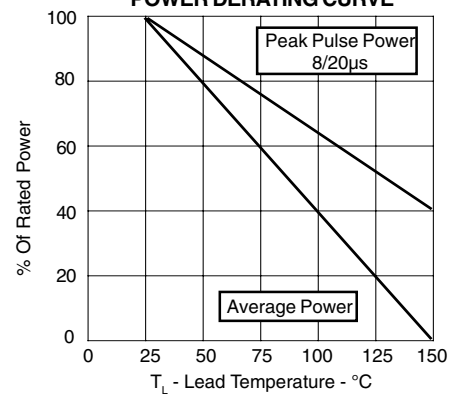
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



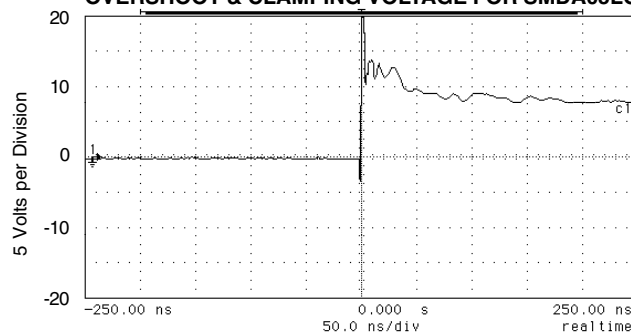
**FIGURE 2
PULSE WAVE FORM**



**FIGURE 3
POWER DERATING CURVE**



**FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR SMDA05LC**



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

SMDA03LC thru SMDA24LCC

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 8/20 μ s 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.

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 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

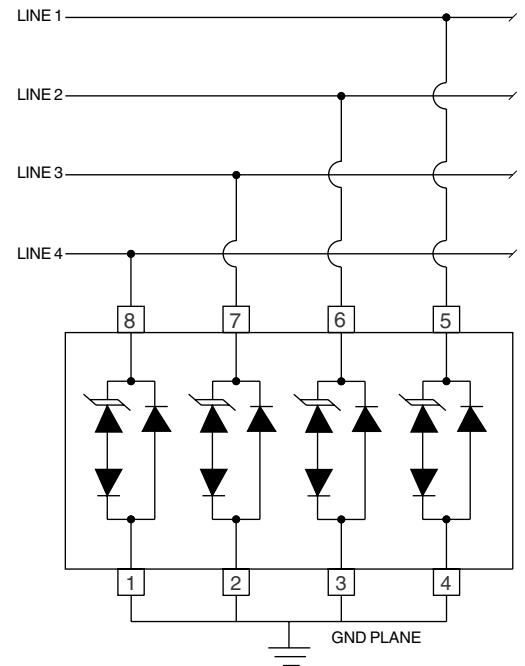
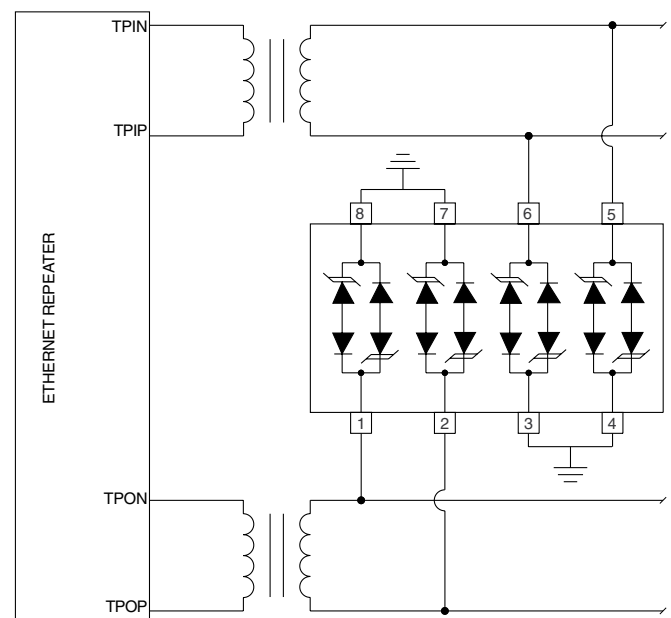
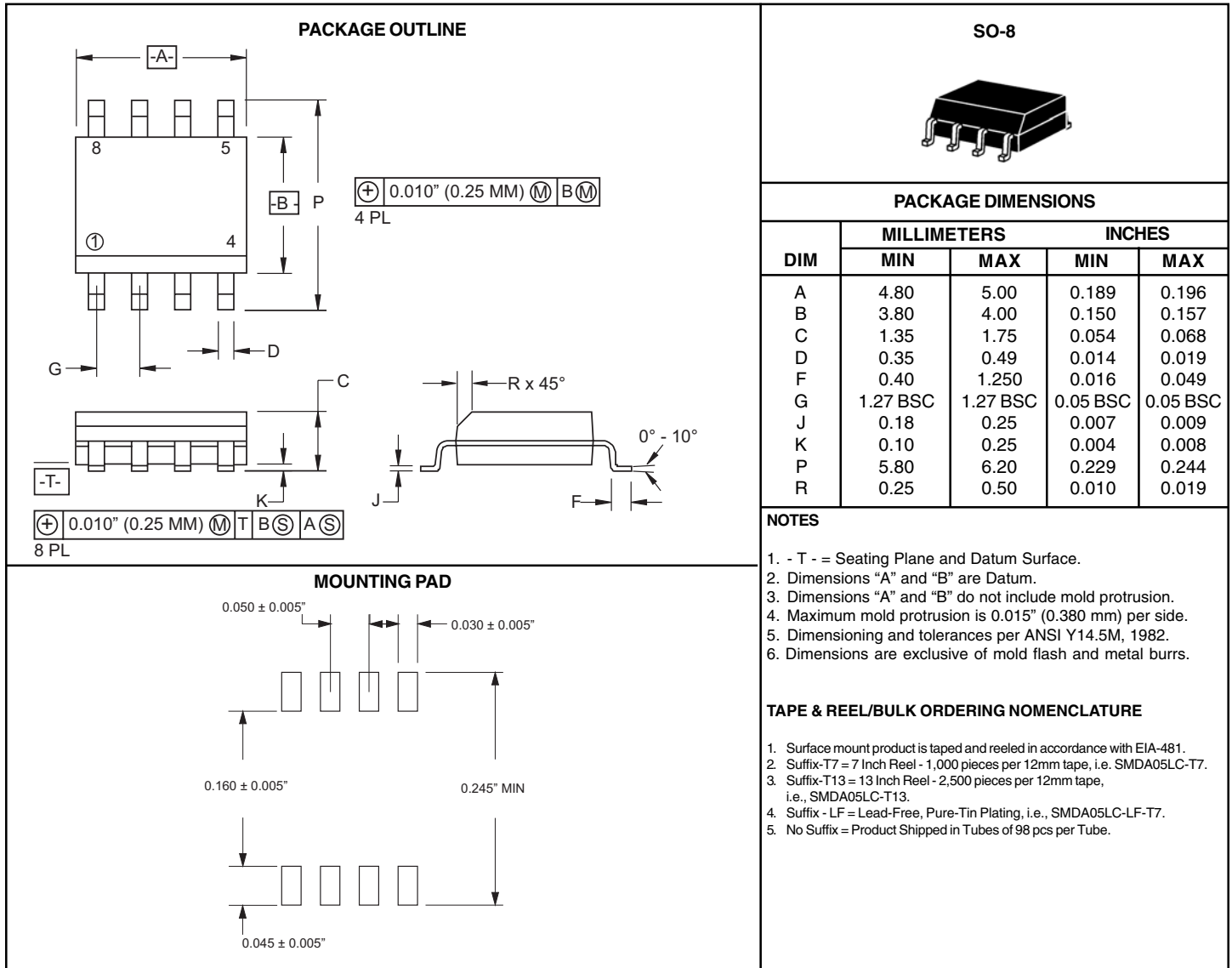


Figure 2. Bidirectional Common-Mode Protection



SMDA03LC thru SMDA24LCC

SO-8 PACKAGE OUTLINE & DIMENSIONS



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[DF2S5.6ASL,L3F](#) [DF2S5.6FS\(TPL3\)](#) [DF2S6.2ASL,L3F](#) [DF2S6.2CT,L3F](#) [DF2S6.8FS,L3M](#) [DF2S8.2FS,L3M](#) [DF5A5.6JE,LM](#)
[EMI5206MUTAG](#) [EMI6316FCTBG](#) [EMI8141MUTAG](#) [EMIF03-SIM05F3](#) [MSMP13A-M3/89A](#) [ESD5V0D5-TP](#) [ESD5Z6.0T5G](#)
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