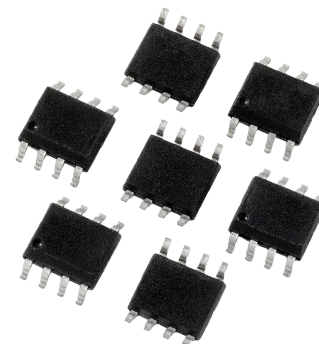


Description

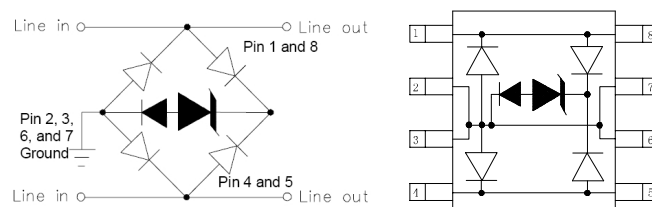
The LC03-3.3 is a 3.3V low capacitance TVS array, combining a TVS diode with a rectifier bridge to provide both common and differential transient protection in one package. The LC03-3.3 complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into a 8-pin lead-free SO-8 package, the LC03-3.3 is rated for GR-1089, intra-building transient immunity requirements for telecommunication installations and provide overvoltage protection for applications such as 10/100/1000 BaseT Ethernet and T3/E3 interfaces.



Features

- Low capacitance for high speed interfaces
- Ultra low leakage: nA level
- Low operating voltage
- Low clamping voltage
- Protects two lines in common and differential mode
- JEDEC SO-8 package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lightning) 100A (8/20 μs)
- RoHS Compliant

SOP-8



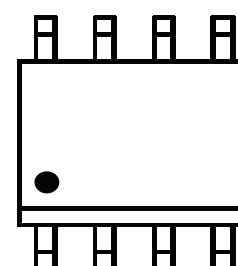
Circuit diagram

Mechanical Characteristics

- Package: SO-8
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- T1/E1 Line Cards
- T3/E3 and DS3 Interfaces
- STS-1 Interfaces
- 10/100/1000 BaseT Ethernet
- ISDN Interfaces
- Low Voltage Interfaces



Dot denotes Pin1

Ordering Information

Part Number	Packaging	Reel Size
LC03-3.3	2500/Tape & Reel	13 inch

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	1800	W
Peak Pulse Current (8/20 μs)	I _{PP}	100	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	± 30 ± 30	kV
Operating Temperature Range	T _J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

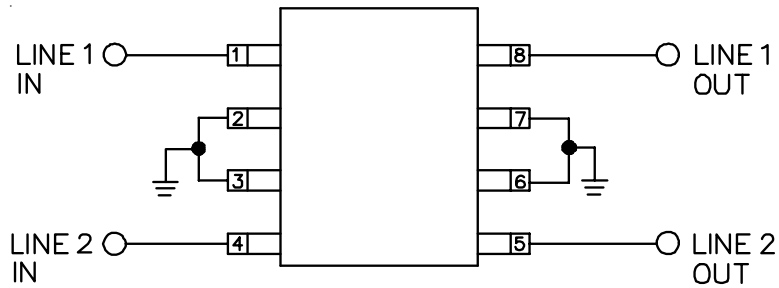
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			3.3	V	Any I/O Pin to GND
Punch-Through Voltage	V _{PT}	3.5			V	I _T = 2 μA , any I/O Pin to GND
Snap-Back Voltage	V _{SB}	2.8			V	I _T = 50mA, any I/O Pin to GND
Reverse Leakage Current	I _R			1	μA	V _{RWM} = 3.3V, any I/O Pin to GND
Clamping Voltage	V _C			11	V	I _{PP} = 50A (8 x 20 μs pulse), any I/O Pin to GND
Clamping Voltage	V _C			13	V	I _{PP} = 50A (8 x 20 μs pulse), between I/O Pins
Clamping Voltage	V _C			15	V	I _{PP} = 100A (8 x 20 μs pulse), any I/O Pin to GND
Clamping Voltage	V _C			18	V	I _{PP} = 100A (8 x 20 μs pulse), between I/O Pins
Junction Capacitance	C _J		9	12	pF	V _R = 0V, f = 1MHz, any I/O Pin to GND
Junction Capacitance	C _J		4.5	6	pF	V _R = 0V, f = 1MHz, between I/O Pins

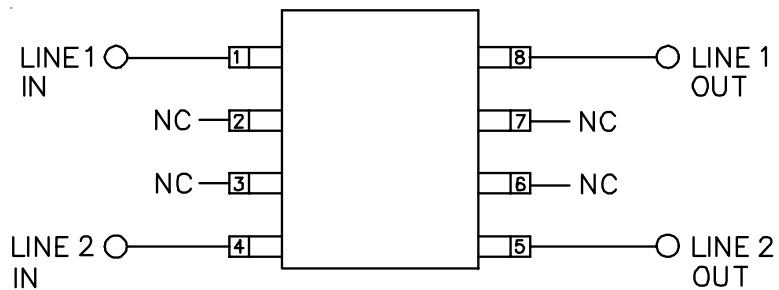
Note 1: I/O Pins are Pin 1, 4, 5 and 8

Typical Application

The LC03-3.3 is designed to protect two high speed data lines (one differential pair) from transient over-voltages which result from lightning and ESD. The device can be configured to protect in differential (Line to Line) and common (Line to Ground) mode. Data line inputs/outputs are connected at pins 1 to 8, and 4 to 5 as shown below. Pins 2, 3, 6, 7 are connected to ground. These pins should be connected directly to a ground plane on the board for the best results, the path length is kept as short as possible to minimize parasitic inductance. In applications where high common voltages are present, differential protection is achieved by leaving pins 2, 3, 6, and 7 not connected.

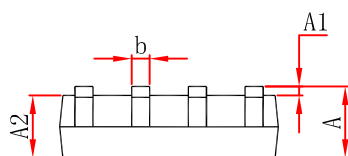
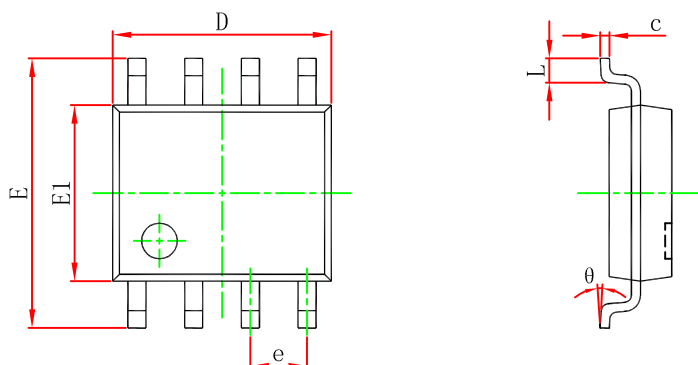


Connection for differential (Line to Line) and common mode protection (Line to Ground)



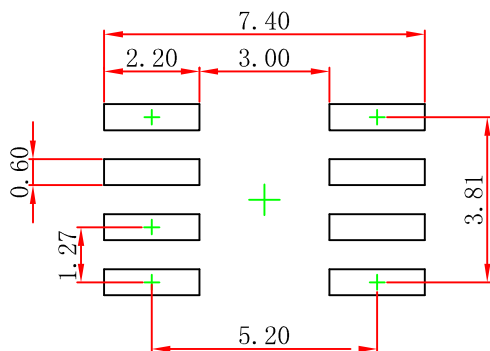
Connection for differential protection (Line to Line)

SOP-8 Package Outline Drawing



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

SOP8 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.