

# Transient Voltage Suppressors Array for ESD Protection

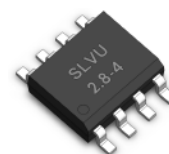
Low Capacitance

## SLVU2.8-4

### Description

The SLVU2.8-4 is in an SO-08 package and may be used to protect two high-speed line pairs. The "flow-thru" design minimizes trace inductance and reduces voltage overshoot associated with ESD events. The low clamping voltage of the SLVU2.8-4 minimizes the stress on the protected IC.

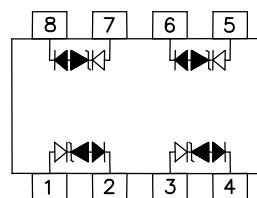
SO-08



### Feature

- ◆ 400 Watts Peak Pulse Power per Line (tp=8/20µs)
- ◆ Protects two line pairs (four lines)
- ◆ Low capacitance
- ◆ RoHS Compliant
- ◆ IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- ◆ IEC61000-4-4 (EFT) 40A (5/50 rps)
- ◆ IEC61000-4-5 (Lightning) 24A (8/20µs)

### Functional Diagram



### Applications

- ◆ 10/100/1000 Ethernet
- ◆ WAN/LAN Equipment
- ◆ Test & Measurement Equipment
- ◆ Switching Systems
- ◆ Instrumentation
- ◆ Audio/Video Inputs

### Mechanical Characteristics

- ◆ JEDEC SO-08 Package
- ◆ Molding Compound Flammability Rating : UL 94V-0
- ◆ Weight 70 Milligrams (Approximate)
- ◆ Quantity Per Reel : 500pcs
- ◆ Reel Size : 7 inch
- ◆ Lead Finish : Lead Free

### Mechanical Characteristics

Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (tp=8/20 s waveform)	400	W
T <sub>L</sub>	Lead Soldering Temperature	260 (10sec)	⊠
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	⊠
T <sub>J</sub>	Operating Temperature Range	-55 to +150	⊠
	IEC61000-4-2 (ESD)	Air Discharge Contact Discharge	±15 ±8 KV
	IEC61000-4-4 (EFT)	40	A
	IEC61000-4-5 ( Lightning )	24	A

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## SLVU2.8-4

Electrical Characteristics (@ 25 Unless Otherwise Specified)

Part Number	Device Marking	V <sub>RWM</sub> (V) (Max.)	V <sub>B</sub> (V) (Min.)	I <sub>T</sub> (mA)	V <sub>C</sub> @5A (Max.)	V <sub>C</sub>		I <sub>R</sub> (A) (Max.)	C (pF) (Typ.)
						(Max.)	(@A)		
SLVU2.8-4	SLVU 2.8-4	2.8	3.0	1	8.5	20	24	5	2

### Characteristic Curves

Fig1. 8/20 s Pulse Waveform

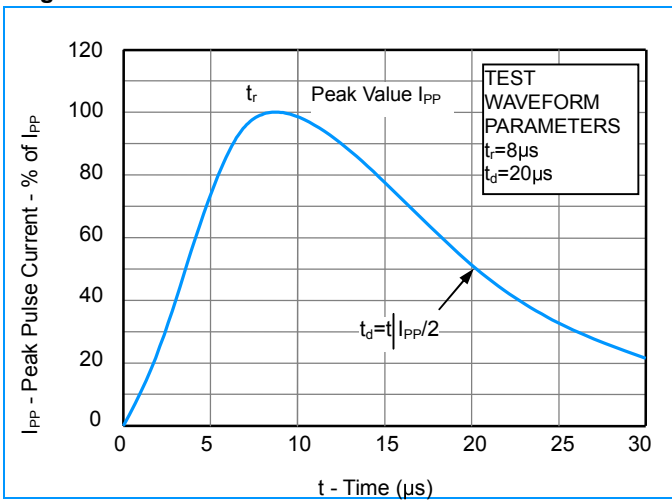


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

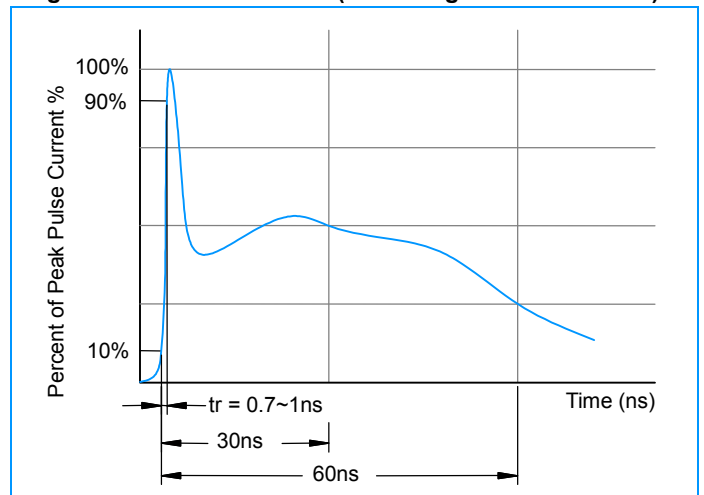


Fig3. Non - Repetitive Peak Pulse Power vs. Pulse Time

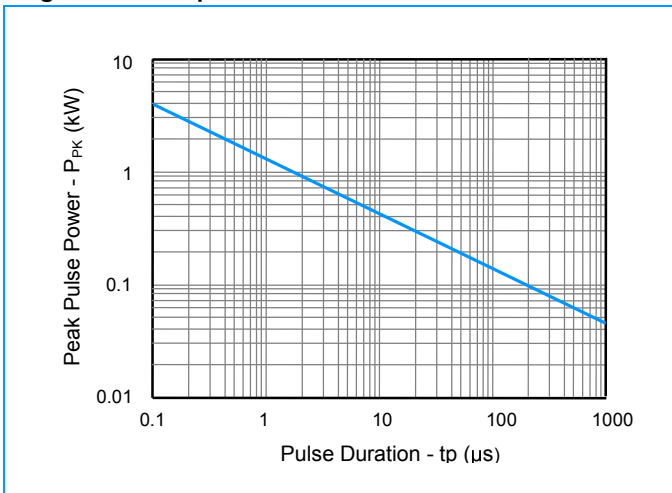
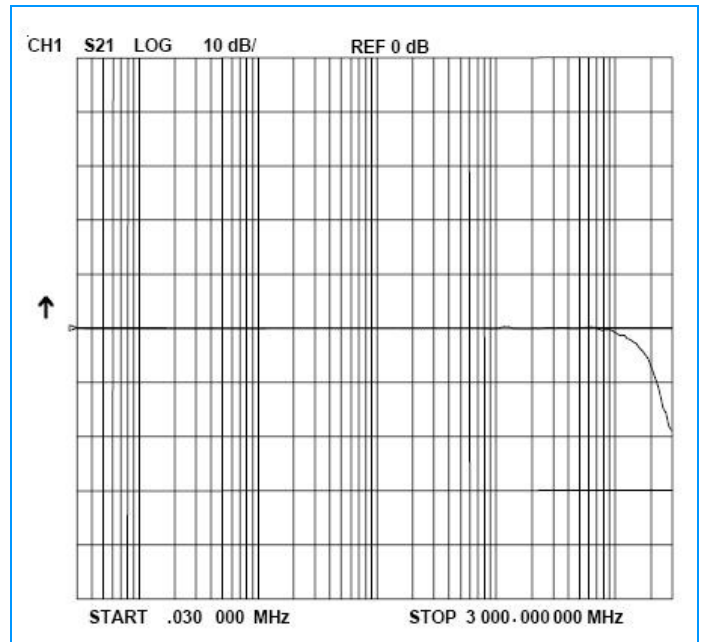


Fig4. Insertion Loss S21

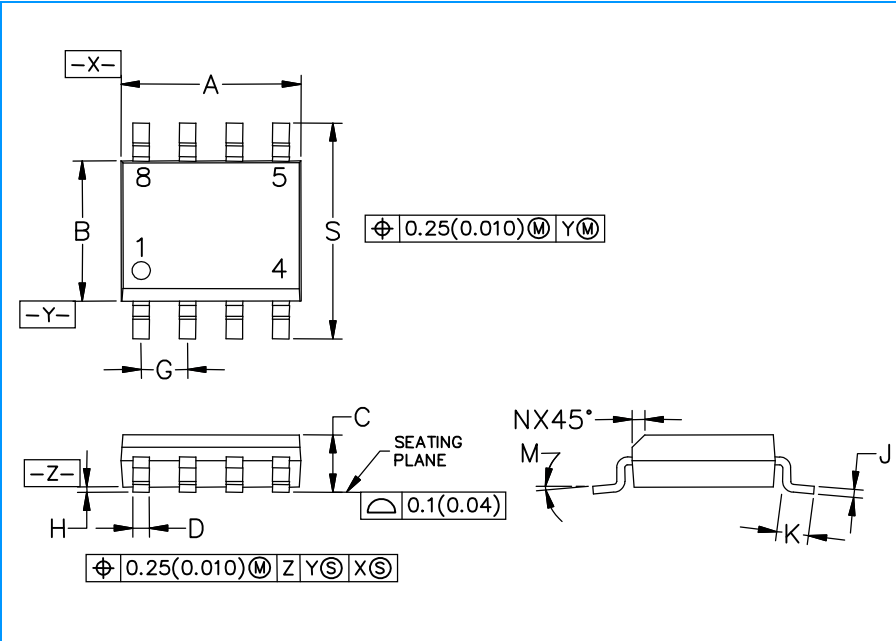


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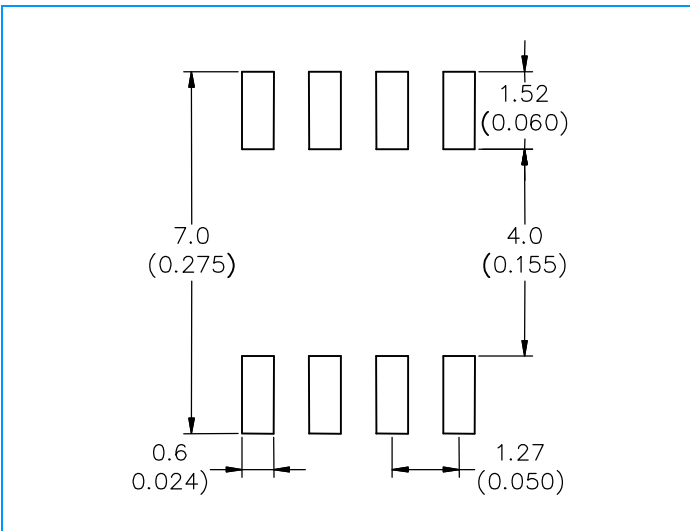
## SLVU2.8-4

### SO-08 Package Outline & Dimensions



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.35	0.51	0.013	0.020
G	1.27BSC		0.050BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

### Soldering Footprint



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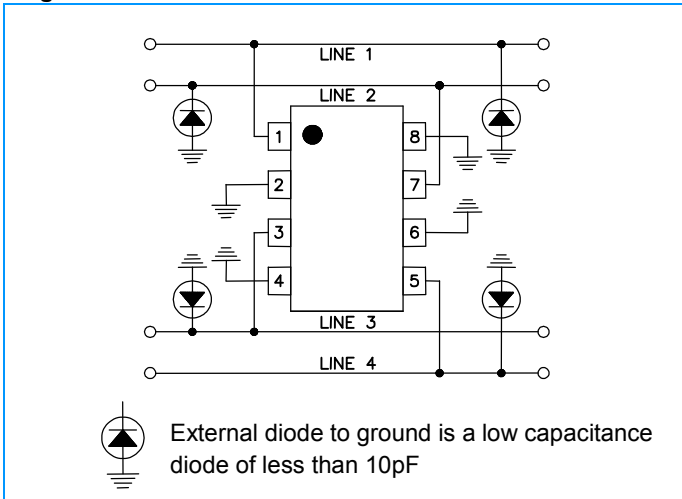
Low Capacitance

## SLVU2.8-4

### Applications Note

Electronic equipment is susceptible to damage caused by Electrostatic Discharge (ESD), Electrical Fast Transients (EFT), and tertiary lightning effects. Knowing that equipment can be damaged, the SLVU2.8-4 was designed to provide the level of protection required to safe guard sensitive equipment. This product can be used in different configurations to provide a level of protection to meet unidirectional line requirements as well as bidirectional requirements either in a common-mode or differential-mode configuration.

**Figure 1. Unidirectional Common-Mode Protection**



**Unidirectional Common-Mode Configuration (Figure 1)**

The SLVU2.8-4 provides up to four lines of protection in a common-mode configuration as depicted in figure 1.

Circuit connectivity is as follows:

- Line 1 is connected to Pin 1
- Line 2 is connected to Pin 7
- Line 3 is connected to Pin 3
- Line 4 is connected to Pin 5
- Pins 2, 4, 7 and 8 are connected to ground

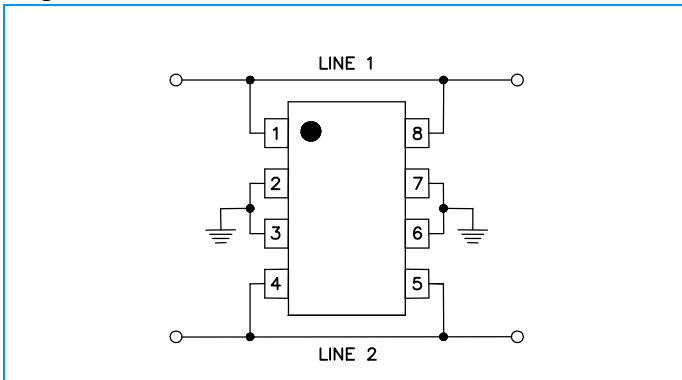
**Bidirectional Common-Mode Configuration (Figure2)**

The SLVU2.8-4 provides up to two lines of protection in a common-mode configuration as depicted in figure 2.

Circuit connectivity is as follows:

- Line 1 is connected to Pins 1 & 8
- Line 2 is connected to Pins 4 & 5
- Pins 2, 3, 6, and 7 are connected to ground

**Figure 2. Bidirectional Common-Mode Protection**



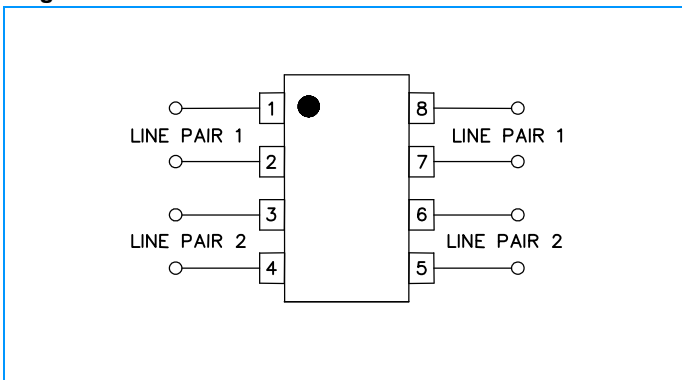
**Bidirectional Differential-Mode Configuration (Figure3)**

The SLVU2.8-4 provides up to two-line pairs of protection in a differential - mode configuration as depicted in figure 3.

Circuit connectivity is as follows:

- Line Pair 1 is connected to Pins 1 & 2
- Line Pair 1 is connected to Pins 7 & 8
- Line Pair 2 is connected to Pins 3 & 4
- Line Pair 2 is connected to Pins 5 & 6

**Figure 3. Bidirectional Differential-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.