

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.

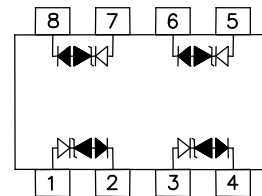
SO-08



Feature

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

Functional Diagram



Applications

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

Mechanical Characteristics

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

Mechanical Characteristics

Symbol	Parameter	Value	Units	
P _{PP}	Peak Pulse Power (tp=8/20µs waveform)	400	W	
T _L	Lead Soldering Temperature	260 (10sec)	°C	
T _{STG}	Storage Temperature Range	-55 to +150	°C	
T _J	Operating Temperature Range	-55 to +150	°C	
	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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Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Part Number	Device Marking	V _{RWM} (V) (Max.)	V _B (V) (Min.)	I _T (mA)	V _C @5A (Max.)	V _C		I _R (μA) (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. 8/20μs Pulse Waveform

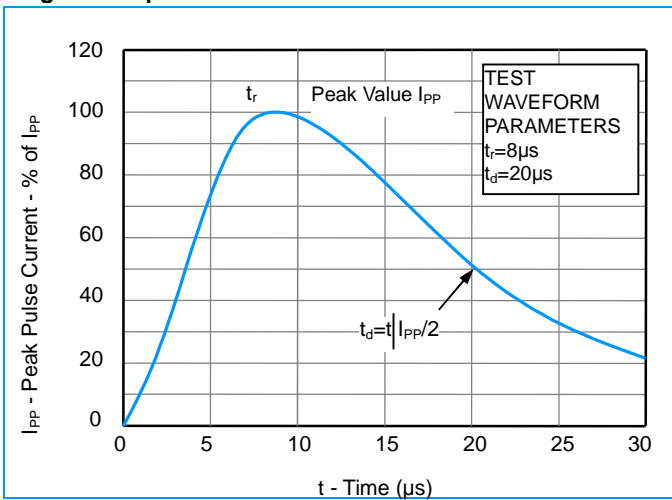


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

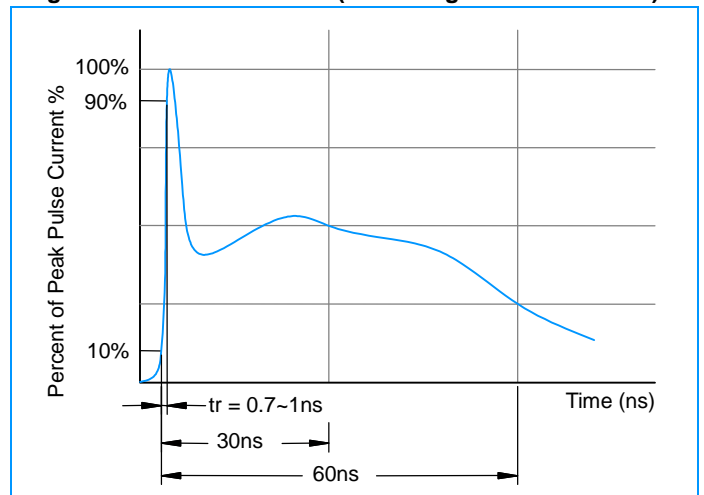


Fig3. Non - Repetitive Peak Pulse Power vs. Pulse Time

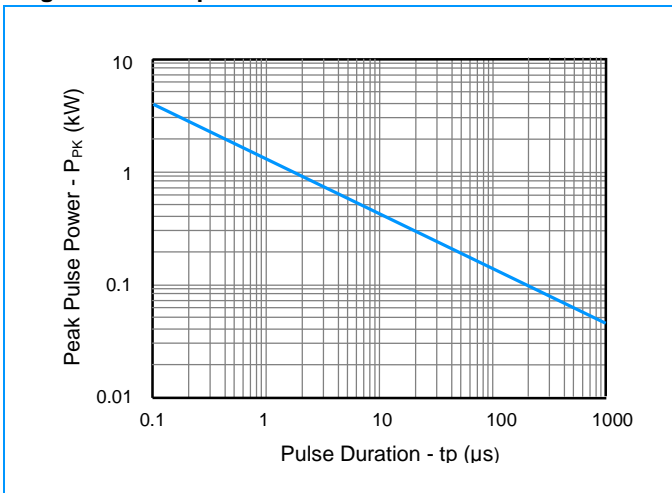
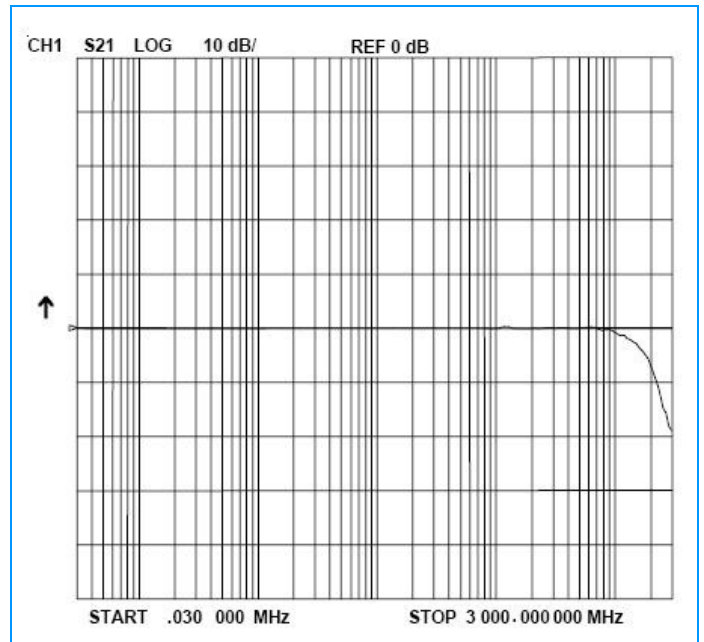


Fig4. Insertion Loss S21

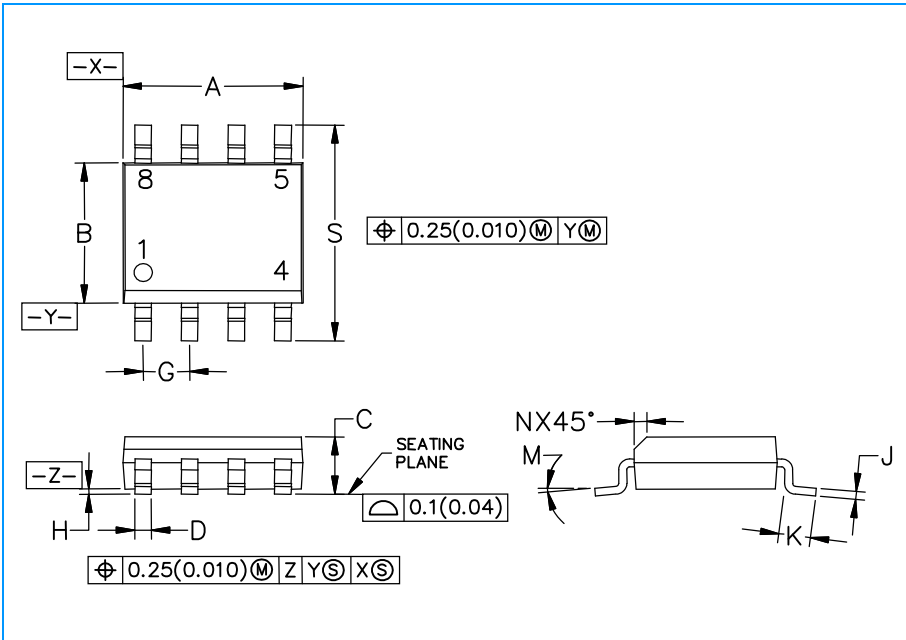


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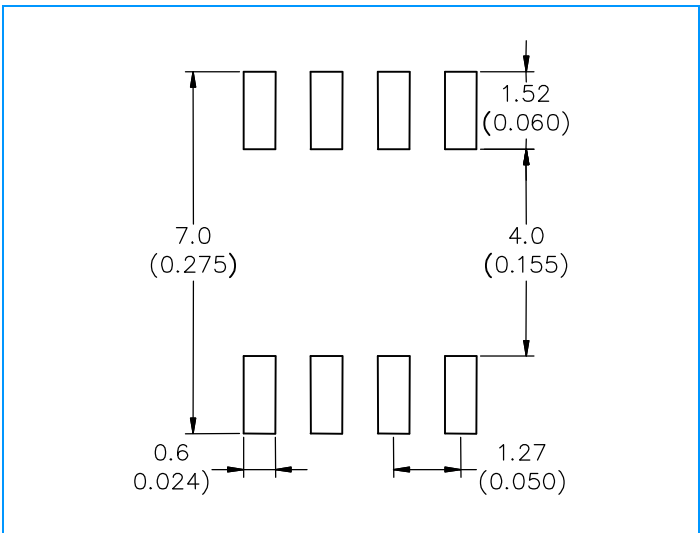
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SO-08 Package Outline & Dimensions



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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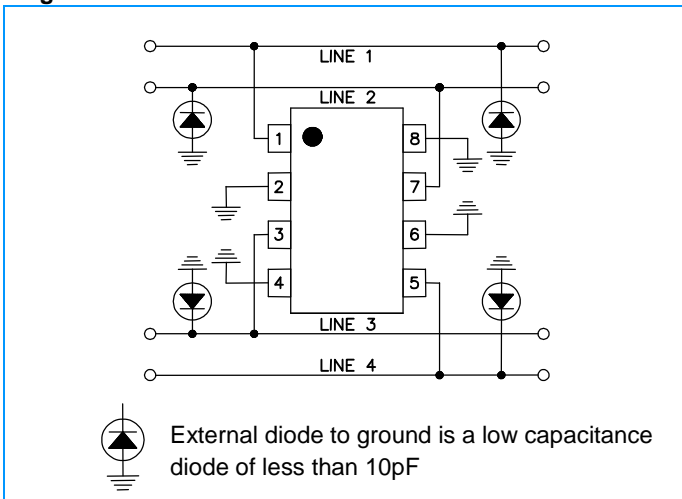
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Applications Note

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

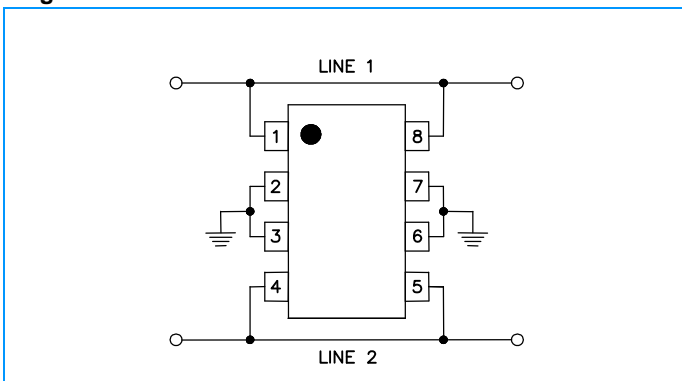
Bidirectional Common-Mode Configuration (Figure2)

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



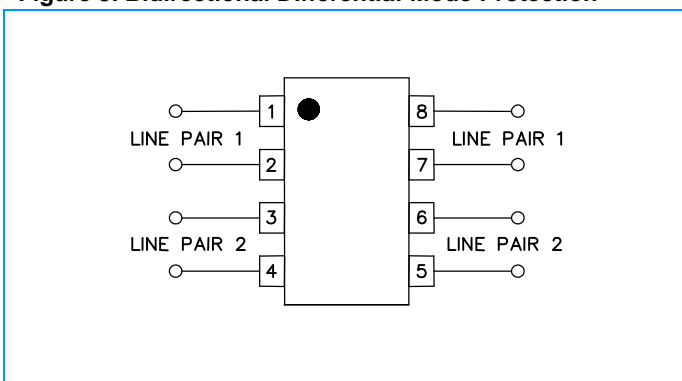
Bidirectional Differential-Mode Configuration (Figure3)

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.