

ULTRA LOW CAPACITANCE TVS ARRAY

APPLICATIONS

- ✓ Ethernet - 10/100/1000 Base T
- ✓ Cellular Phones
- ✓ Audio/Video Inputs
- ✓ Handheld Electronics
- ✓ Personal Digital Assistant (PDA)

IEC COMPATIBILITY (EN61000-4)

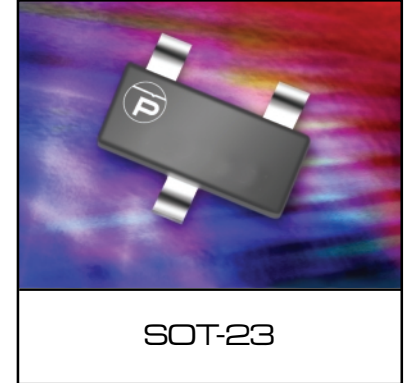
- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns
- ✓ 61000-4-5 (Surge): 24A, 8/20 μ s - Level 2(Line-Ground) & Level 3(Line-Line)

FEATURES

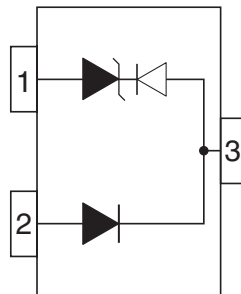
- ✓ 600 Watts Peak Pulse Power per Line ($t_p = 8/20\mu$ s)
- ✓ Unidirectional Configuration
- ✓ Protects One Line
- ✓ ESD Protection > 25 kilovolts
- ✓ **LOW LEAKAGE CURRENT < 1.0 μ A**
- ✓ **ULTRA LOW CAPACITANCE: 2.5pF**

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SOT-23
- ✓ Weight 14 milligrams (Approximate)
- ✓ Flammability rating UL 94V-0
- ✓ 8mm Tape and Reel Per EIA Standard 481
- ✓ Device Marking: Marking Code



PIN CONFIGURATION



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}	600	Watts
Peak Pulse Current ($t_p = 8/20\mu s$)	I_{PP}	30	A
Repetitive Peak Forward Current @ $t_p=5\mu s, F=50kHz$ Pin 2 to 3	I_{FRM}	700	mA
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified							
PART NUMBER (See Note 1)	DEVICE MARKING CODE	RATED STAND-OFF VOLTAGE	MINIMUM BREAKDOWN VOLTAGE	MINIMUM SNAP BACK VOLTAGE	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)	MAXIMUM CLAMPING VOLTAGE (See Fig. 2)
		V_{WM} VOLTS	@ 1mA $V_{(BR)}$ VOLTS	@ $I_{SB} = 50mA$ V_{SB} VOLTS	@ $I_p = 2A$ V_C VOLTS	@ $I_p = 5A$ V_C VOLTS	@ $I_p = 30A$ V_C VOLTS
SLVU2.8	SLA	2.8	3.0	2.8	3.9	7.0	21.0

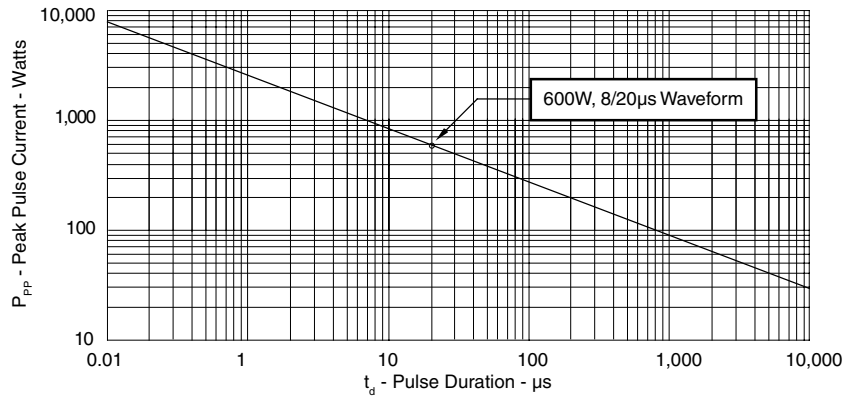
Note 1: Device measured from pin 3 to 1.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified							
MAXIMUM CLAMPING VOLTAGE Pin 2 to 1 (See Fig. 2)	TYPICAL CLAMPING VOLTAGE Pin 2 to 1 (See Fig. 2)	MAXIMUM LEAKAGE CURRENT Pin 3 to 1 or Pin 2 to 1	TYPICAL CAPACITANCE Pin 3 to 1 & 2 (Tied Together)	TYPICAL CAPACITANCE Pin 2 to 1 3 N.C.	MAXIMUM PEAK REVERSE VOLTAGE Pin 3 to 2 (See Note 2)	MAXIMUM REVERSE LEAKAGE CURRENT Pin 3 to 2 (See Note 2)	MAXIMUM FORWARD VOLTAGE Pin 2 to 3 (See Note 2)
@ $I_p = 5A$ V_C VOLTS	@ $I_p = 30A$ V_C VOLTS	@ V_{WM} I_b μA	@ 0V, 1MHz C pF	@ 0V, 1MHz C pF	@ $I_T = 10\mu A$ V_{FRM} VOLTS	@ $V_{WM} = 2.8V$ I_{DR} μA	@ $I_F = 1A$ $T_p = 120\mu s$ V_F VOLTS
8.5	21.0	1.0	20	2.5	40	0.1	2

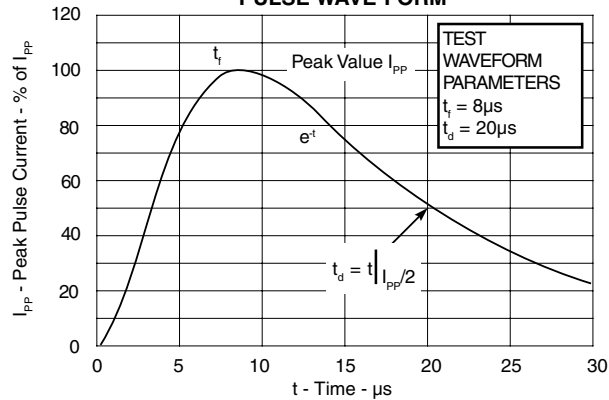
Note 2: Electrical characteristics for steering diodes.

GRAPHS

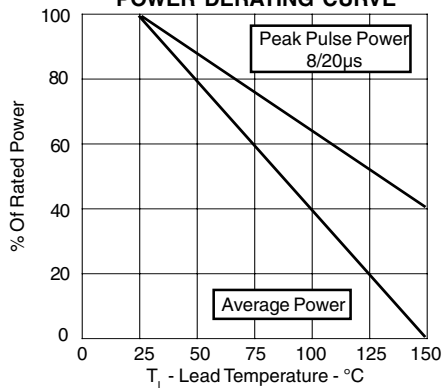
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



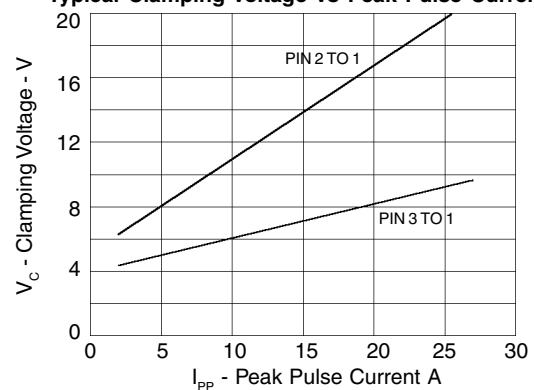
**FIGURE 2
PULSE WAVE FORM**



**FIGURE 3
POWER DERATING CURVE**



**FIGURE 4
Typical Clamping Voltage vs Peak Pulse Current**



APPLICATION NOTE

The SLVU2.8 is ideal for providing protection for electronic equipment that is susceptible to damage caused by Electrostatic Discharge (ESD), Electrical Fast Transients (EFT) and tertiary lightning effects. This product is offered in a unidirectional configuration and provides both common-mode or differential-mode protection.

UNIDIRECTIONAL COMMON-MODE CONFIGURATION (Figure 1)

The SLVU2.8 provides one line of unidirectional protection in a common-mode configuration as depicted in figure 1.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin 3
- ✓ Pins 1 and 2 are connected to ground

BIDIRECTIONAL COMMON-MODE CONFIGURATION (Figure 2)

Two SLVU2.8 devices provide one line of bidirectional protection in a common-mode configuration as depicted in figure 1.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin1 of Device 1 & Pin 2 of Device 2
- ✓ Pin 2 of Device 1 and Pin 1 of Device 2 are connected to ground
- ✓ Pin 3 of both devices is not connected

BIDIRECTIONAL DIFFERENTIAL-MODE CONFIGURATION (Figure 3)

Two SLVU2.8 devices provide up to two lines of bidirectional protection in a differential-mode configuration as depicted in figure 1.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin1 of Device 1 & Pin 2 of Device 2
- ✓ Line 2 is connected to Pin 2 of Device 1 & Pin 1 of Device 2

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

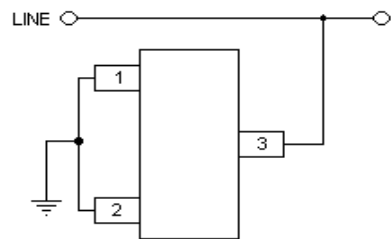


Figure 2. Bidirectional Common-Mode Protection

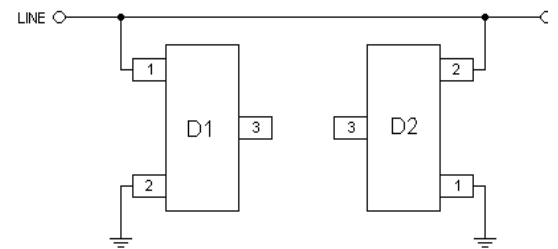
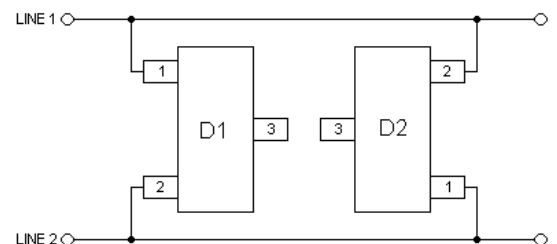
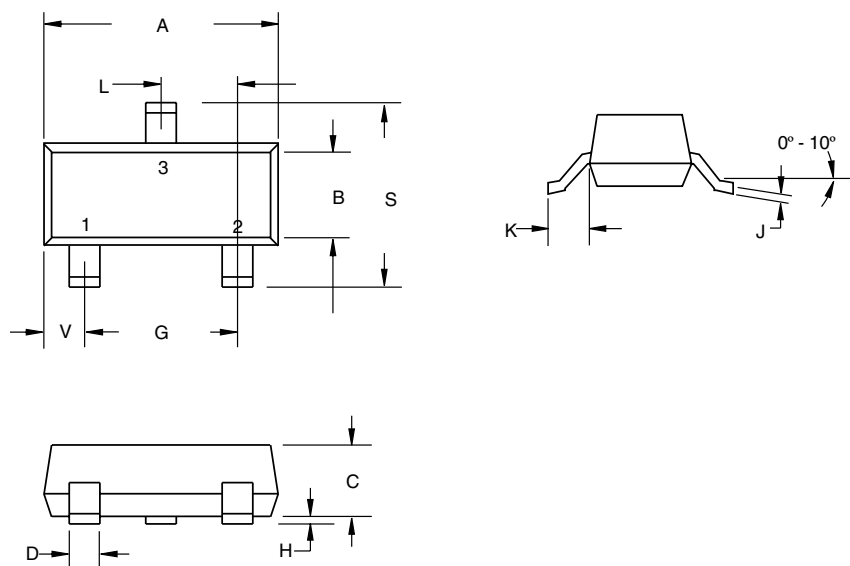


Figure 3. Bidirectional Differential-Mode Protection



PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE



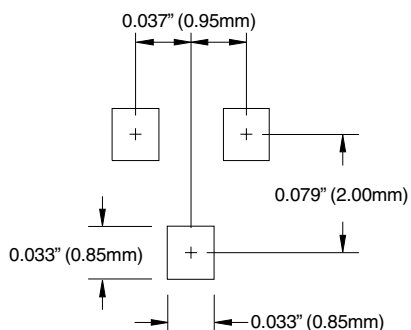
SOT-23



PACKAGE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.1102	0.1197
B	1.20	1.40	0.0472	0.0551
C	0.89	1.11	0.0350	0.0440
D	0.37	0.50	0.0150	0.0200
G	1.78	2.04	0.0701	0.0807
H	0.013	0.100	0.0005	0.0040
J	0.085	0.177	0.0034	0.0070
K	0.45	0.60	0.0180	0.0236
L	0.89	1.02	0.0350	0.0401
S	2.10	2.50	0.0830	0.0984
V	0.45	0.60	0.0177	0.0236

MOUNTING PAD



NOTES

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Pin 3 is the cathode (Unidirectional Only).
4. Dimensions are exclusive of mold flash and metal burrs.

TAPE & REEL/BULK ORDERING NOMENCLATURE

1. Surface mount product is taped and reeled in accordance with EIA-481.
2. Suffix -T7 = 7 Inch Reel - 3,000 pieces per 8mm tape, i.e., SLVU2.8-T7.
3. Suffix -T13 = 13 Inch Reel - 10,000 pieces per 8mm tape, i.e., SLVU2.8-T13.

Outline & Dimensions: Rev 1 - 11/01, 06012

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