

Features

- 400 Watts peak pulse power ($t_p=8/20\mu s$)
- One device protects one unidirectional line
- Two devices protect two high-speed data line pairs
- Low capacitance
- Low leakage current
- Low operating and clamping voltage
- Solid-state Punch through Avalanche TVS process technology



IEC COMPATIBILITY (EN61000-4)

- IEC 61000-4-2 (ESD) $\pm 15kV$ (air), $\pm 8kV$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 24A (8/20 μs)

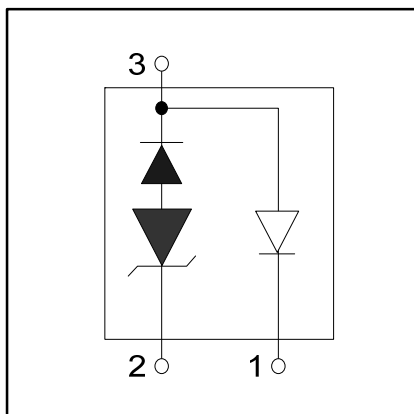
Mechanical Characteristics

- JEDEC SOT23-3L package
- Molding compound flammability rating: UL 94V-0
- Marking: Marking Code
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

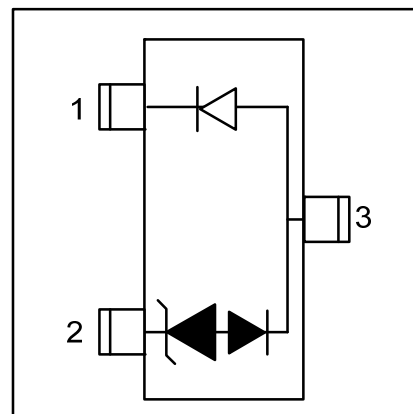
Applications

- Switching Systems
- WAN/LAN Equipment
- Desktops, Servers, Notebooks & Handhelds
- T1/E1 secondary IC Side Protection
- Laser Diode Protection
- 10/100 Ethernet
- Base Stations

Circuit Diagram



Schematic & PIN Configuration

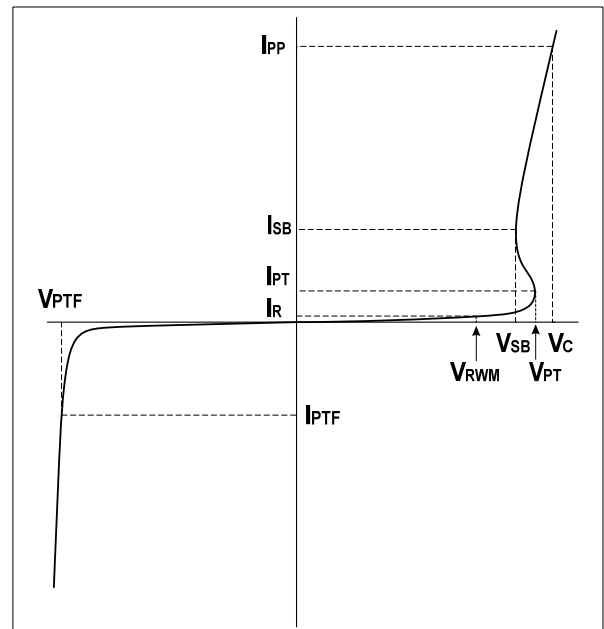


SOT23-3L (Top View)

Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu s$) see Figure1& Figure2	P_{PP}	400	Watts
Peak Pulse Current ($t_p=8/20\mu s$)	I_{PP}	24	A
Lead Soldering Temperature	T_L	260(10sec)	°C
Operating Temperature	T_J	-55 to + 125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Parameters (T=25°C)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{PT}	Punch-through Breakdown Voltage @ I_T
V_{SB}	Snap-Back Voltage @ I_{SB}
I_{SB}	Snap-Back Current
I_{PT}	Test Current
V_{PTF}	Forward Punch-through Breakdown Voltage @ I_F
I_{PTF}	Forward Test Current



Electrical Characteristics(T=25°C)

WS2.8LVU						
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Pin 2 to 3 or Pin 2 to 1			2.8	V
Punch-through Voltage	V_{PT}	$I_{PT}=2\mu A$, Pin 2 to 3	3.0			V
Snap-Back Voltage	V_{SB}	$I_{SB}=50mA$	2.8			V
Reverse Leakage Current	I_R	$V_{RWM}=2.8V$ Pin 2 to 3 or Pin 2 to 1			1	μA
Clamping Voltage (Note1)	V_C	$I_{PP}=2A$, $t_p=8/20\mu s$ Pin2 to 3			3.9	V

Electrical Characteristics (Cont.)

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Clamping Voltage	V_C	$I_{PP}=5A$, $t_p=8/20\mu s$ Pin2 to 3			7.0	V
Clamping Voltage	V_C	$I_{PP}=24A$, $t_p=8/20\mu s$ Pin2 to 3			15	V
Clamping Voltage	V_C	$I_{PP}=2A$, $t_p=8/20\mu s$ Pin2 to 1			4.5	V
Clamping Voltage	V_C	$I_{PP}=5A$, $t_p=8/20\mu s$ Pin2 to 1			9.5	V
Clamping Voltage	V_C	$I_{PP}=24A$, $t_p=8/20\mu s$ Pin2 to 1			16.5	V
Junction Capacitance (Note2)	C_j	Pin 1&2 to Pin3 (Pin 1 and 2 tied together) $V_R = 0V$, $f = 1MHz$		20	50	pF
Junction Capacitance	C_j	Pin 2 to 1 (Pin 3 N.C.) $V_R = 0V$, $f = 1MHz$		3	6	pF
Steer Diode						
Reverse Breakdown Voltage	V_{BR}	$I_T = 10\mu A$ Pin 1 to 3	50			V
Reverse Leakage Current	I_R	$V_{RWM} = 2.8V$ Pin 1 to 3			1	μA
Forward Voltage (Note3)	V_F	$I_F=1A$ Pin3 to 1			2	V

NOTES:

1. The 8/20 μs test pulse wave is shown in figure3, and the clamping voltage vs. I_{PP} is shown in figure4.
2. The Junction Capacitance vs. Reverse Voltage is shown in figure5.
3. The Forward Voltage vs. Forward Current for Steer diode is shown in figure6.

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

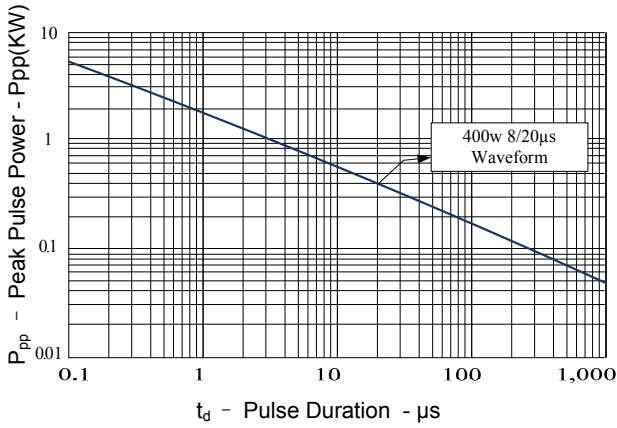


Figure 2: Power Derating Curve

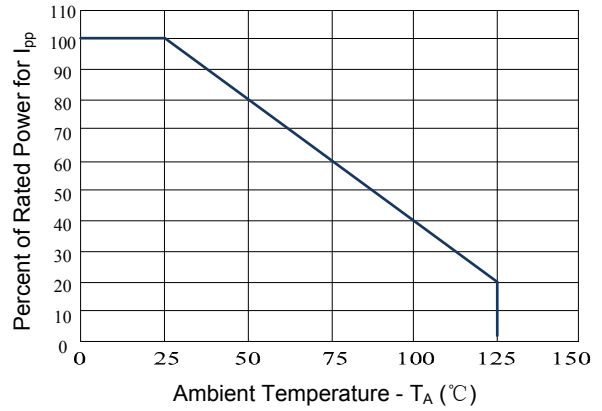


Figure3: Pulse Waveform

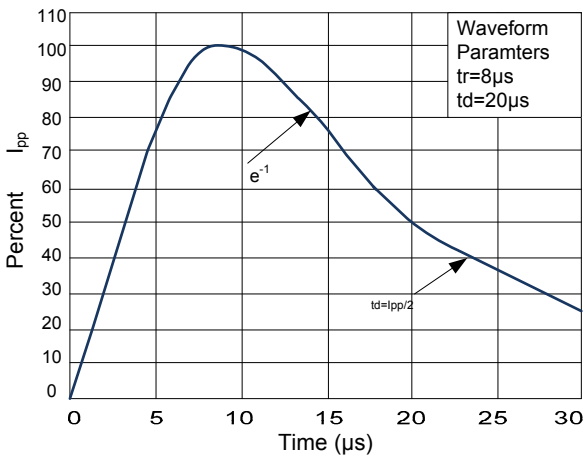


Figure 4: Clamping Voltage vs. Peak Pulse Current

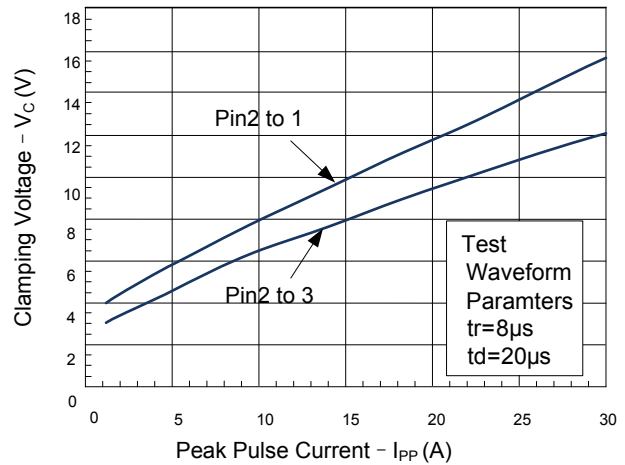


Figure 5: Capacitance vs. Reverse Voltage

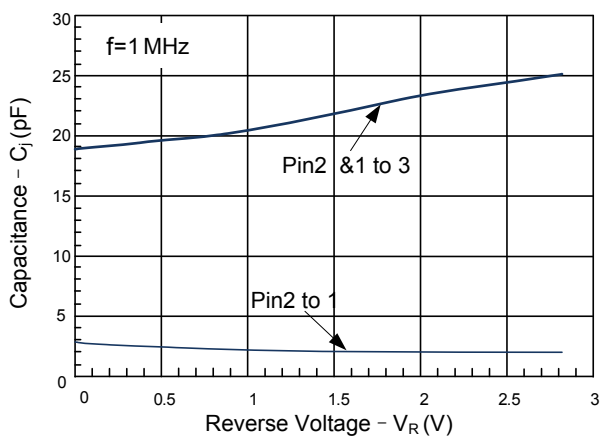
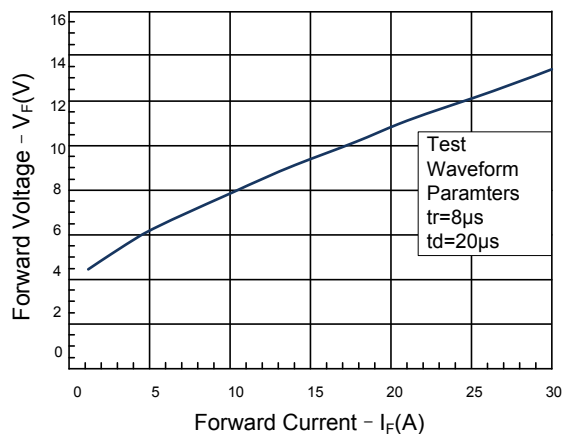


Figure 6: Forward Voltage vs. Forward Current



Application Information

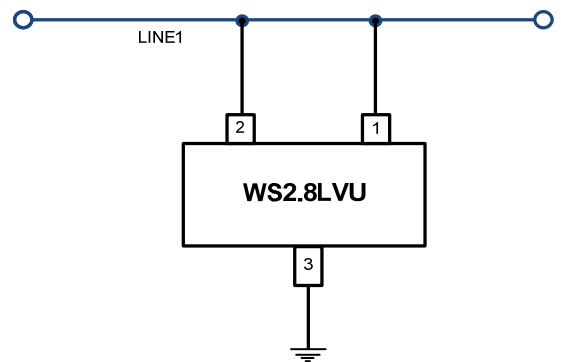
The WS2.8LVU is designed to providing protection for electronic equipment that is susceptible to damage caused by Electrostatic Discharge (ESD), Electrical Fast Transients (EFT) and tertiary lightning effects. This product is offered in a unidirectional configuration and provides both common-mode and differential-mode protection.

Unidirectional Common-mode Protection

One WS2.8LVU provides one line of unidirectional protection

in a common-mode configuration . Pins 1 and 2 are connected to Line1

- Pin 3 is connected to ground
- Pin2 to Pin3 Clamp the positive transient
- Pin3 to pin1 clamp the negative transient approach to ground

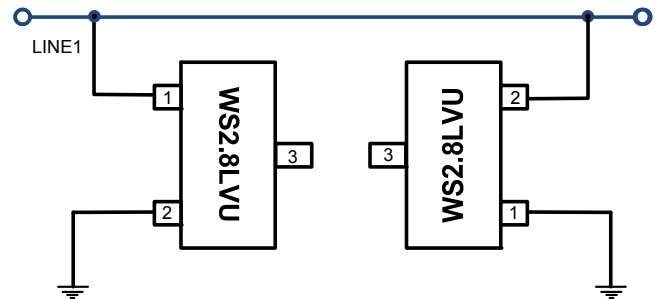


Bidirectional Common-mode Protection

Two WS2.8LVU devices provide one line of bidirectional

Protection in a common-mode configuration .

- Pin1 of first and Pin2 of second is connected to Line1
- Pin 2 of first and Pin1 of second is connected to ground
- Pin 3 of both is not connected
- the first device is used to clamp the negative transient
- the second device is used to clamp the positive transient

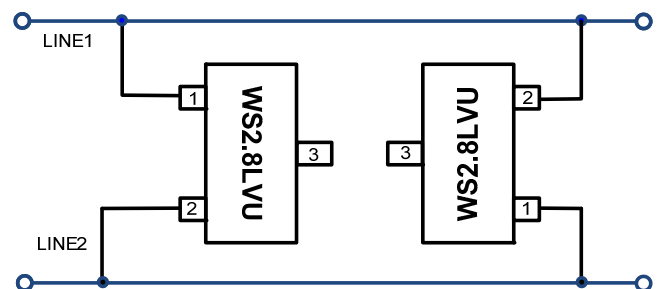


Bidirectional Differential-mode Protection

Two WS2.8LVU devices provide two lines of bidirectional

protection in a differential-mode configuration.

- Pin1 of first and Pin2 of second is connected to Line1
- Pin 2 of first and Pin1 of second is connected to Line2
- Pin 3 of both devices is not connected
- Pin2 to pin1 clamp the transient between line1 and line2
- The configuration provide low capacitance protection for high speed differential line pair



Outline Drawing – SOT23-3L

PACKAGE OUTLINE

SOT23-3L

DIMENSIONS				
SYMBOL	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
A2	0.035	0.039	0.900	1.000
D	0.079	0.087	2.000	2.200
E	0.045	0.053	1.150	1.350
E1	0.085	0.096	2.150	2.450
e	0.020 TYP		0.650 TYP	
e1	0.047	0.055	1.200	1.400
L	0.022 REF		0.525 REF	
L1	0.010	0.018	0.260	0.460
θ	0°		8°	0°

DIMENSIONS		
DIM	INCHES	MILLIMETERS
Z	0.090	2.300
G	0.073	1.850
P	0.020 TYP	0.650 TYP
X	0.008	0.200
Y	0.033	0.085

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.

Marking Codes

Part Number	WS2.8LVU
Marking Code	U2.8