

Ultralow Capacitance TVS Diodes Array for ESD Protection

 Lead(Pb)-Free

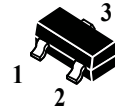
FEATURES:

- * 400 W Peak Pulse Power per Line (tp=8/20 uS)
- * One Device Protects one Unidirectional Line.
- * Low Capacitance.
- * Low Leakage Current.
- * Low operating and Clamping Voltages.
- * Transient Protection for High Speed Data Lines.to
- * IEC61000-4-2(ESD) ±15kV(air), ±8kV(Contact)
- * IEC61000-4-4(EFT) 40A(5/50ns)
- * IEC61000-4-5(lightning) 24A(8/20µs)

APPLICATIONS:

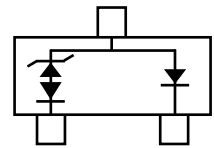
- * Ethernet 10/100/1000 Base T
- * WAN/LAN Equipment
- * Desktop,Services,Notebooks & Handhelds
- * Laser Diode Protection

**TRANSIENT
VOLTAGE
SUPPRESSORS
400 WATTS
2.8 VOLTS**



SOT-23

Equivalent Circuit Diagram:



Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak Pulse Power(tp = 8/20µs) - See Fig.1	P _{PK}	400	W
Peak Pulse Current(tp = 8/20µs)	I _{PP}	24	A
Storage Temperature Range	T _{STG}	-55 to 150	°C
Operating Junction Temperature Range	T _j	-55 to 150	°C

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units
Reverse Stand-Off Voltage Pin 3 to 1 or Pin 2 to 1	V_{RWM}	-	-	2.8	V
Punch-Through Voltage $I_{PT} = 2\mu A$, Pin 3 to 1	V_{PT}	3.0	-	-	V
Snap-Back Voltage $I_{SB} = 50mA$, Pin 3 to 1	V_{SB}	2.8	-	-	V
Reverse Leakage Current $V_{RWM} = 2.8V$, $T = 25^{\circ}C$ Pin 3 to 1 or Pin 2 to 1	I_R	-	-	1	μA
Clamping Voltage $I_{PP} = 2A$, $t_P = 8/20\mu s$, Pin 3 to 1 $I_{PP} = 5A$, $t_P = 8/20\mu s$, Pin 3 to 1 $I_{PP} = 24A$, $t_P = 8/20\mu s$, Pin 3 to 1 $I_{PP} = 5A$, $t_P = 8/20\mu s$, Pin 2 to 1 $I_{PP} = 24A$, $t_P = 8/20\mu s$, Pin 2 to 1	V_C	-	-	3.9 7 12.5 8.5 15	V
Junction Capacitance $V_R = 0V$, $f = 1MHz$, Pin 3 to 1 and 2 (Pin 1 and 2 tied together) $V_R = 0V$, $f = 1MHz$, Pin 2 to 1 (Pin 3 N.C.)	C_j	-	70 3.5	100 5	pF

Steering Diode Characteristics

Parameter	Symbol	Min	Typ	Max	Units
Reverse Breakdown Voltage $I_T = 10\mu A$, Pin 3 to 2	V_{BRR}	40	-	-	V
Reverse Leakage Current $V_{RWM} = 2.8V$, $T = 25^{\circ}C$, Pin 3 to 2	I_{BRR}	-	-	1	μA
Forward Voltage $I_F = 1A$, Pin 2 to 3	V_F	-	-	2	V

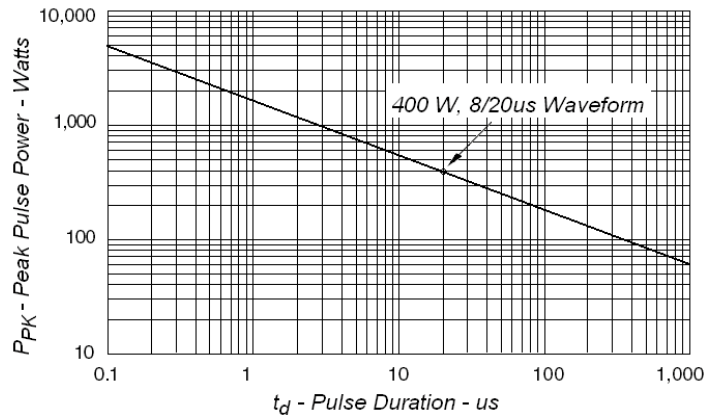


Fig.1 Peak Pulse Power VS Pulse Time

Electrical Parameter

Symbol	Parameter
I_{PP}	Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Reverse Stand-Off Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{SB}	Snap-Back Voltage @ I_{SB}
I_{SB}	Snap-Back Current
V_{PT}	Punch-Through Voltage
I_{PT}	Punch-Through Current
V_{BRR}	Reverse Breakdown Voltage @ I_{BRR}
I_{BRR}	Reverse Breakdown Current

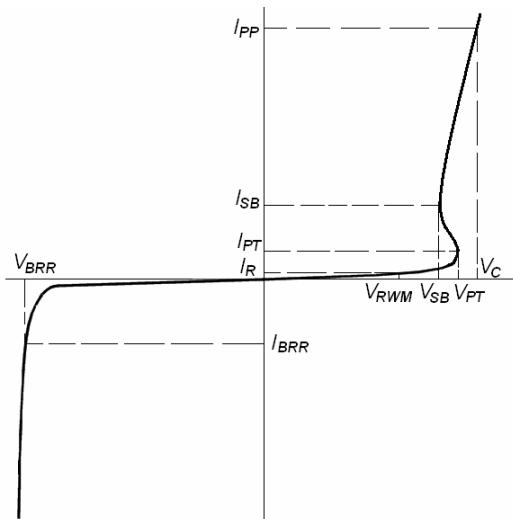


Fig.2 SLVU2.8 IV Characteristic Curve

Typical Characteristics

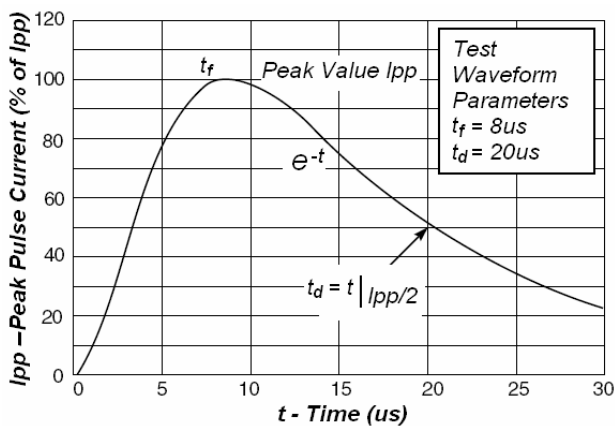


Fig.3 Pulse Waveform

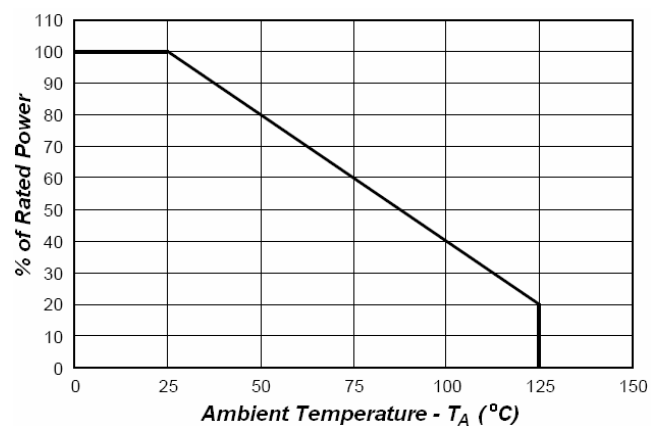


Fig.4 Power Derating Curve

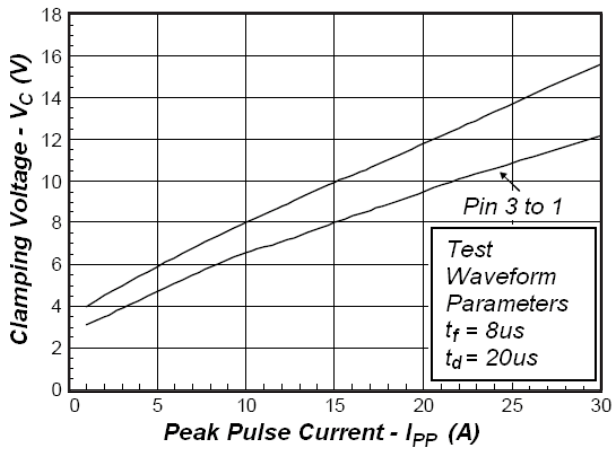


Fig.5 Clamping Voltage vs Peak Pulse Current

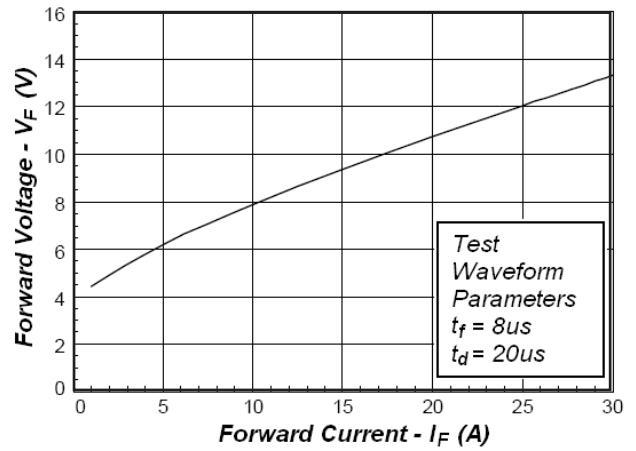


Fig.6 Forward Voltage vs Forward Current

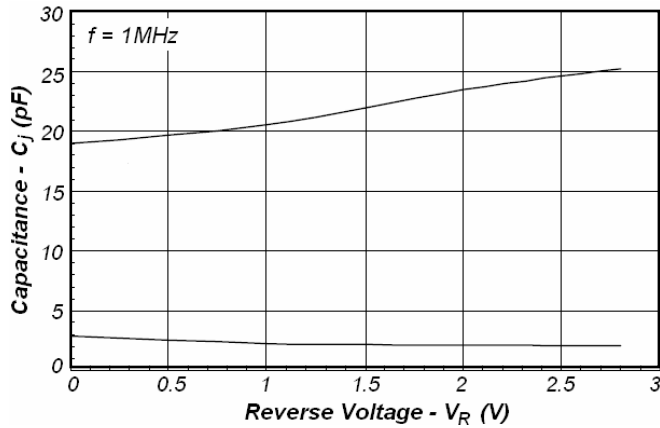


Fig.7 Reverse Voltage vs Capacitance

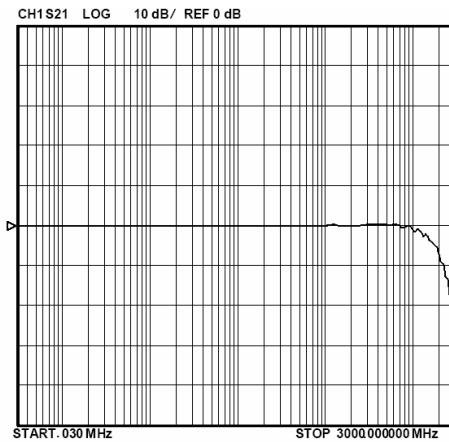


Fig.8 Insertion Loss S21

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 commonmode or differential-mode protection.

Unidirectional Common-Mode Protection (Fig.9)

The SLVU2.8 provides one line of unidirectional protection in a common-mode configuration as depicted in figure 9.

Circuit connectivity is as follows:

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

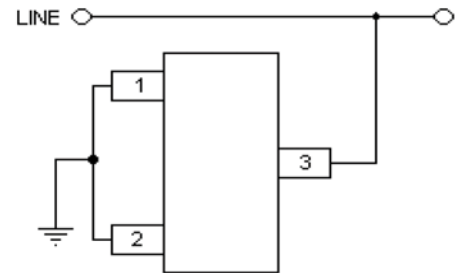


Fig.9

Bidirectional Common-Mode Protection (Fig.10)

Two SLVU2.8 devices provide one line of bidirectional protection in a common-mode configuration as depicted in fig.10

Circuit connectivity is as follows:

- * Line 1 is connected to Pin 1 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

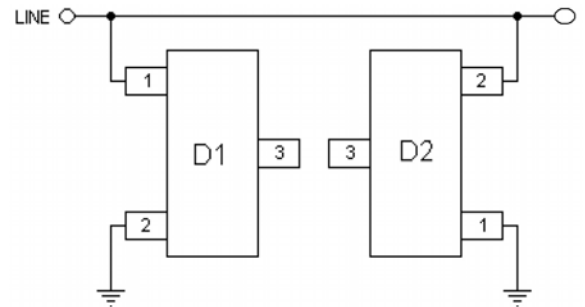


Fig.10

Bidirectional Differential-Mode Protection (Fig.11)

Two SLVU2.8 devices provide up to two lines of bidirectional protection in a differential mode configuration as depicted in fig.11

Circuit connectivity is as follows:

- * Line 1 is connected to Pin 1 of Device 1 & Pin 2 of Device 2
- * Line 2 is connected to Pin 2 of Device 1 & Pin 1 of Device 2

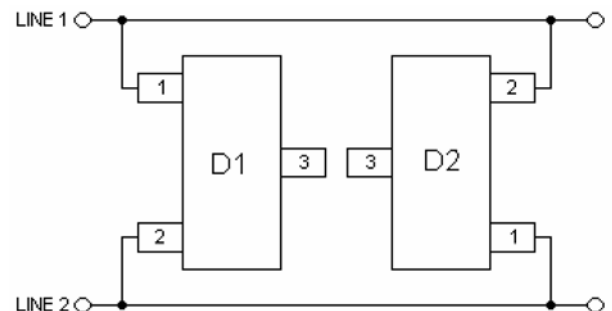


Fig.11

Circuit Board Layout Protection

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.

Typical Applications

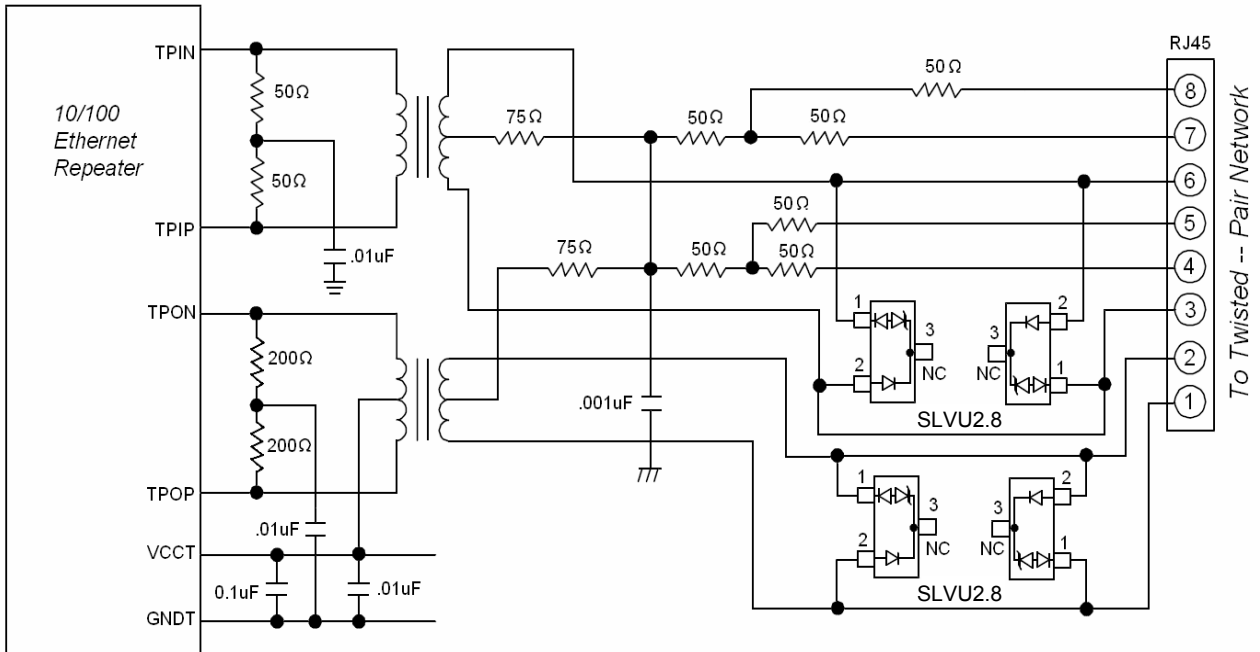


Fig12. 10/100 Ethernet Protection Circuit

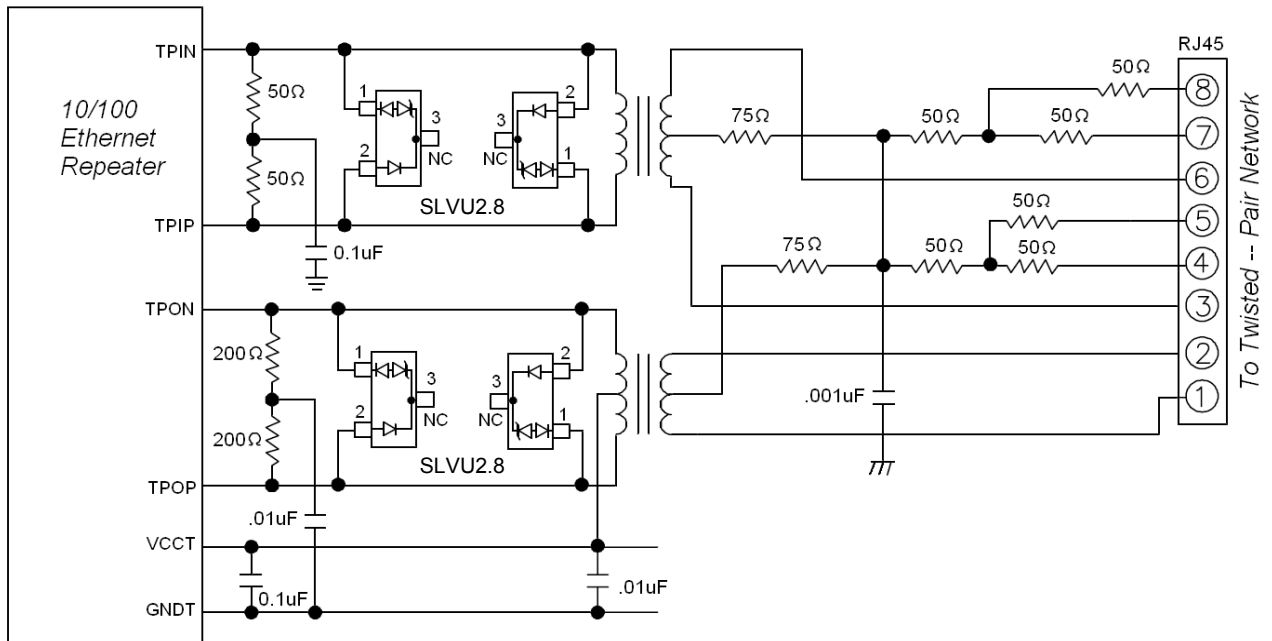
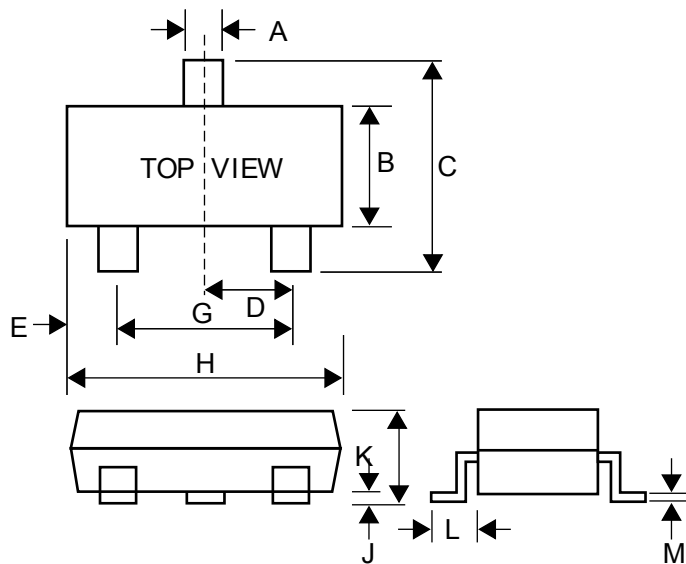


Fig13. 10/100 Ethernet "Enhanced" Lightning Protection Circuit

SOT-23 Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25