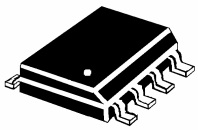
Microsemi
SCOTTSDALE DIVISION

2 DIFFERENTIAL LINE PAIRS TVSarray ™

DESCRIPTION

The SLVU2.8K-4 provides 500 Watt protection with LOW CAPACITANCE and the LOWEST LEAKAGE in the industry for two lines in common mode or two differential line pairs. Low bi-directional capacitance of 10 pF per line pair and the LOW STANDBY CURRENT provides a more stable signal in higher frequency applications and at lower operating voltages of 2.8 volts. The SLVU2.8K-4 bidirectional array is designed for use in applications where protection is required at the board level from voltage transients caused by electrostatic discharge (ESD) as defined in IEC 61000-4-2, electrical fast transients (EFT) per IEC 61000-4-4 and effects of secondary lightning. These arrays are used to protect two differential line pairs in a bi-directional mode by connecting both pins 1 and 8 to line 1 of pair one and pins 2 and 7 to line 2 of pair one. For protecting a second pair, connect pins 3 and 6 to line 1 of pair two, and pins 4 and 5 to line 2 of pair two as shown in Figures 4 and 4A. The array can also be used for protecting two direct lines in the common mode by connecting either side of the pair to ground and the other side to line as shown in Figure 3.

TVSarray™ SERIES



APPLICATIONS

- EIA-RS232 data rate: 19.6 kbs
- EIA-RS422 data rate: 10 Mbs
- EIA-RS423 data rate: 100 kbs
- 10 / 100 Ethernet
- WAN / LAN Equipment

IMPORTANT: For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

FEATURES

- Protects 2 bidirectional lines or 2 differential line pairs
- Provides electrically-isolated protection
- Low operating voltage: 2.8 volts
- Low bidirectional capacitance: 10 pF
- Low clamping voltage of 5.5 volts at 2 amps

PACKAGING

- Tape & Reel per EIA Standard 481
- 13 inch reel; 2,500 pieces (STANDARD)
- Carrier tubes; 95 pcs (OPTIONAL)

MAXIMUM RATINGS

- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Peak Pulse Power: 500 watts
  (8/20 µs, Figure 1 and Figure 2)

MECHANICAL

- Molded SO-8 Surface Mount
- UL 94V-0 Flammability Classification
- Weight 0.066 grams (approximate)
- Marking: Logo, device marking code, date code
- Pin #1 defined by dot on top of package

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless otherwise specified

PART NUMBER	DEVICE MARKING	STAND OFF VOLTAGE V_{WM} VOLTS	PUNCH-THRU VOLTAGE V_{PT} I_{PT} = 2 µA VOLTS	SNAP-BACK VOLTAGE V_{SB} I_{SB} = 50 mA VOLTS	STANDBY (LEAKAGE) CURRENT I_D V_{WM} = 2.8V µA	CLAMPING VOLTAGE V_C I_{PP} = 2 A (Figure 2) VOLTS	CLAMPING VOLTAGE V_C I_{PP} = 5 A (Figure 2) VOLTS	CLAMPING VOLTAGE V_C I_{PP} = 24 A (Figure 2) VOLTS	CAPACITANCE (f=1 MHz) * C @0V pF
		MAX	MIN	MIN	MAX	MAX	MAX	MAX	TYP
SLVU2.8K-4	2.8K-4	2.8	3.0	2.8	0.1	5.5	8.5	15	5

* Capacitance per line pair or line-to-ground is 10 pF typical for bi-directional protection.

Note: Transient Voltage Suppressor (TVS) product is normally selected based on its stand off voltage V_{WM}. Product selected voltage should be equal to or greater than the continuous peak operating voltage of the circuit to be protected.

Microsemi
Scottsdale Division
8700 E. Thomas Rd. PO Box 1390, Scottsdale, AZ 85252 USA, (480) 941-6300, Fax: (480) 947-1503

SLVU2.8K-4

SYMBOLS & DEFINITIONS

Symbol	DEFINITION
V_{WM}	Stand Off Voltage: Maximum dc voltage that can be applied over the operating temperature range. V_{WM} must be selected to be equal or be greater than the operating voltage of the line to be protected.
V_{PT}	Punch-Thru Voltage: The minimum voltage the device will exhibit at a specified current
V_{SB}	Snap-Back Voltage: The minimum snap-back voltage the device will exhibit at a specified current
V_C	Clamping Voltage: Maximum clamping voltage across the TVS device when subjected to a given current at a pulse time of 20 µs.
I_D	Standby Current: Leakage current at V_{WM}.
C	Capacitance: Capacitance of the TVS as defined @ 0 volts at a frequency of 1 MHz and stated in picofarads.

GRAPHS

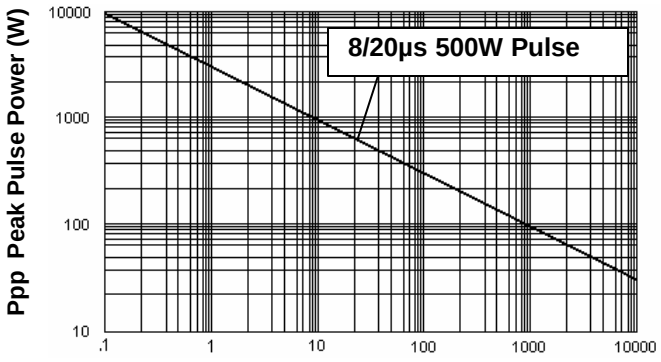


Figure 1
Peak Pulse Power Vs Pulse Time t = µsec

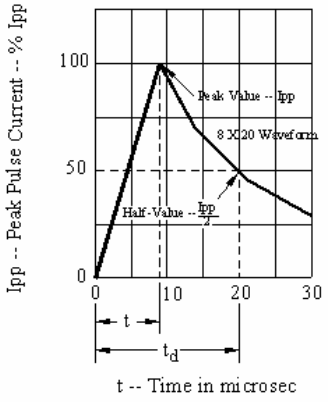
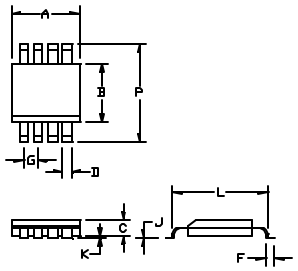


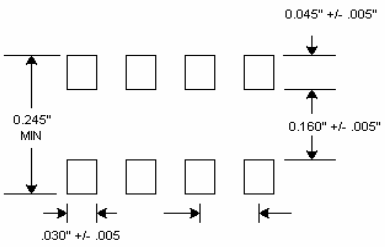
Figure 2
Pulse Wave Form

OUTLINE AND SCHEMATIC

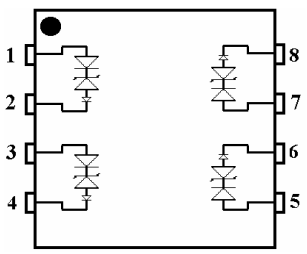


	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.188	0.197	4.77	5.00
B	0.150	0.158	3.81	4.01
C	0.053	0.069	1.35	1.75
D	0.011	0.021	0.28	0.53
F	0.016	0.050	0.41	1.27
G	0.050 BSC		1.27 BSC	
J	0.006	0.010	0.15	0.25
K	0.004	0.008	0.10	0.20
L	0.189	0.206	4.80	5.23
P	0.228	0.244	5.79	6.19

OUTLINE



PAD LAYOUT



SCHEMATIC

SLVU2.8K-4

APPLICATION NOTES

Note: Transient Voltage Suppressor (TVS) product is normally selected based on its stand off voltage V_{WM}. Product selected voltage should be equal to or greater than the continuous peak operating voltage of the circuit to be protected.

All electronic equipment are susceptible to damage generated by ESD, EFT and lightning interference. With this in mind the SLUV2.8K-4 was designed to provide a level of component protection that meets or exceeds IEC standards 61000-4-2 and 61000-4-4 plus moderate levels of induced lightning. This device can be used for protecting two bidirectional lines in the common mode, or two line pairs in the differential mode. The following description defines common and differential mode configurations.

Bidirectional two line common mode (Figure 3)
Two lines can be protected in the bidirectional common mode by utilizing the SLVU2.8K-4 product. Devices are connected in an anti-parallel configuration between line and ground. Pins 1 and 8 are connected to line (or ground) while the pin pair 2 and 7 is connected to the ground (or line). Note that product can be connected in either configuration.
For protecting the second line in the bidirectional common mode Pins 4 and 5 are connected to line 2 (or ground) while the pin pair 3 and 6 are connected to the ground (or line). Note that product can be connected in either configuration.

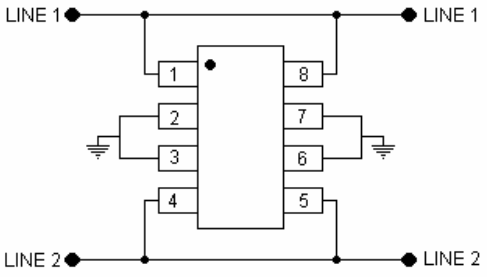


Figure 3
COMMON MODE CONFIGURATION

Bidirectional two line pair differential mode (Figure 4 and Figure 4A)
Two line pairs can be protected in the differential mode by utilizing the SLVU2.8K-4 product. The device circuits are connected in an anti-parallel configuration between line 1 and line 2 of the Line Pair to be protected.

For protecting Line Pair #1, pins 1 and 8 are connected to line 2 and pin 2 and 7 are connected to line 1 of the line pair.

For protecting Line Pair #2 in the bidirectional-differential mode, connect pins 4 and 5 to line 1 and pins 3 and 6 to line 2 of Line Pair #2

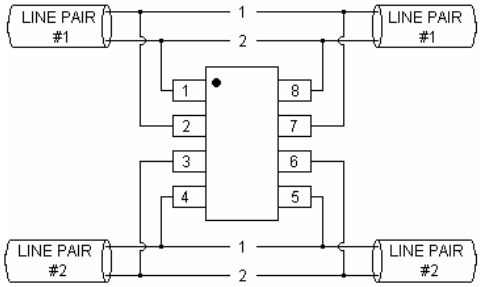


Figure 4
DIFFERENTIAL MODE CONFIGURATION

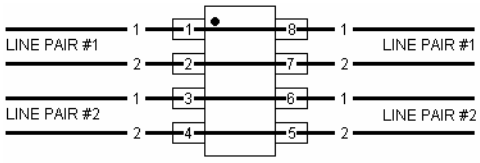


Figure 4A
DIFFERENTIAL MODE CONFIGURATION
CIRCUIT BOARD LAYOUT

Microsemi
Scottsdale Division
8700 E. Thomas Rd. PO Box 1390, Scottsdale, AZ 85252 USA, (480) 941-6300, Fax: (480) 947-1503