

## Dual Line ESD Protection Diode Array

### UESD6V8S2B SOT523

#### General Description

The UESD6V8S2B of TVS diode array is designed to protect sensitive electronics from damage or latch-up due to ESD and is for use in applications where board space is at a premium. It is unidirectional device and may be used on lines where the signal polarities are above ground, each device will protect up to two lines.

TVS diodes are solid-state devices feature large cross-sectional area junctions for conducting high transient currents, specifically for transient suppression. It offers desirable characteristics for board level protection including fast response time, low operating, low clamping voltage, and no device degradation.

The UESD6V8S2B may be used to meet the immunity requirements of IEC 61000-4-2,  $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge and MIL-STD-883 METHOD 3015,  $\pm 8\text{kV}$  HBM. The small package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras.

#### Applications

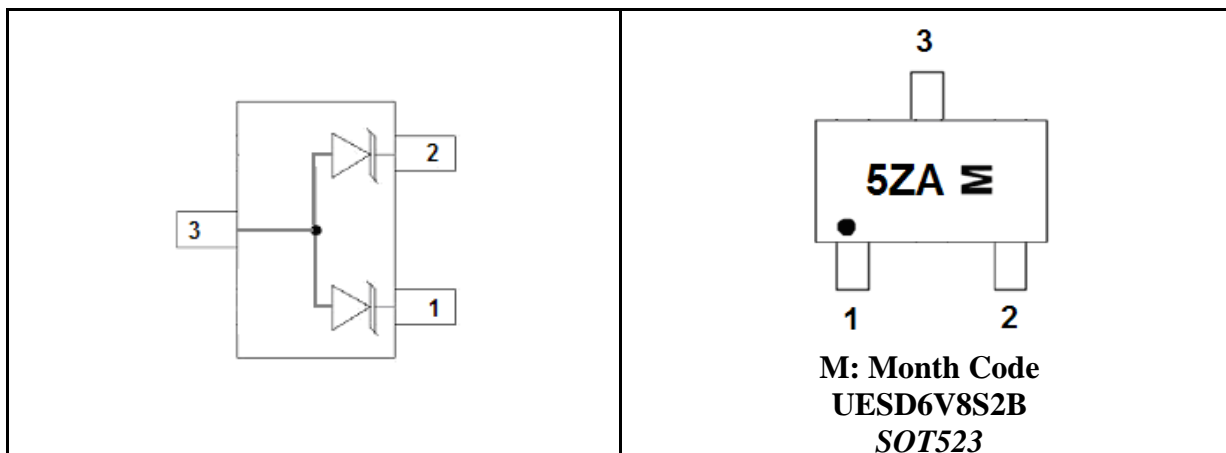
- Cellular Handsets & Accessories
- Cordless Phones
- Personal Digital Assistants (PDA's)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- MP3 Players

#### Features

- Transient Protection for Data & Power Lines to IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (Air),  $\pm 8\text{kV}$  (Contact)
- MIL-STD-883 3015 (HBM)  $\pm 8\text{ kV}$
- Protect Two I/O Lines
- Working Voltages: 5V
- Low Leakage Current
- Low Operating and Clamping Voltage
- Solid-State Silicon Avalanche Technology

#### Pin Configurations

#### Top View



## Ordering Information

| Part Number | Working Voltage | Packaging Type | Channel | Marking Code | Shipping Qty              |
|-------------|-----------------|----------------|---------|--------------|---------------------------|
| UESD6V8S2B  | 5.0V            | SOT523         | 2       | 5ZA          | 3000pcs/7Inch Tape & Reel |

## Absolute Maximum Ratings

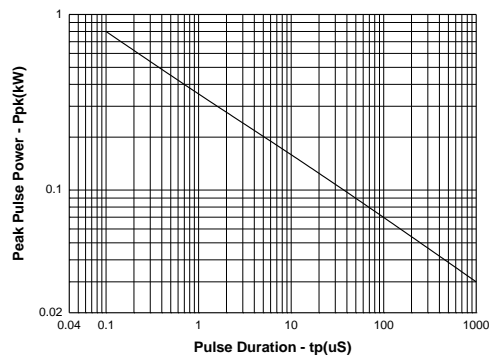
| RATING                           | SYMBOL           | VALUE        | UNITS |
|----------------------------------|------------------|--------------|-------|
| Peak Pulse Power (tp = 8/20μs)   | P <sub>PK</sub>  | 140          | Watts |
| Peak Pulse Current (tp = 8/20μs) | I <sub>PP</sub>  | 11           | A     |
| Lead Soldering Temperature       | T <sub>L</sub>   | 260(10 sec.) | °C    |
| Operating Temperature            | T <sub>J</sub>   | -55 to +125  | °C    |
| Storage Temperature              | T <sub>STG</sub> | -55 to +125  | °C    |

## Electrical Characteristics

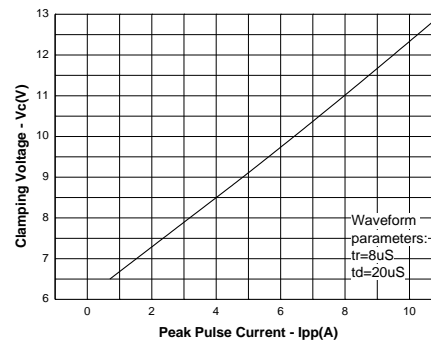
| PARAMETER                  | SYMBOL               | CONDITIONS                                      | MIN | TYP | MAX | UNIT |
|----------------------------|----------------------|---|-----|-----|-----|------|
| Reverse Stand-Off Voltage  | V <sub>RWM</sub>     |   |     |     | 5   | V    |
| Reverse Breakdown Voltage  | V <sub>BR</sub>      | I <sub>t</sub> = 1mA                            | 6   | 6.8 | 7.2 | V    |
| Reverse Leakage Current    | I <sub>R</sub>       | V <sub>RWM</sub> = 5V, T=25 °C                  |     |     | 0.1 | μA   |
| Clamping Voltage           | V <sub>C</sub>       | I <sub>PP</sub> = 5A, t <sub>p</sub> = 8/20μs   |     |     | 9.1 | V    |
|                            |                      | I <sub>PP</sub> = 11A, t <sub>p</sub> = 8/20μs  |     |     | 13  |      |
| Junction Capacitance       | C <sub>J</sub>       | Pin 1,2 to 3<br>V <sub>R</sub> = 0V, f = 1MHz   |     | 40  | 50  | pF   |
| Junction Capacitance       | C <sub>J</sub>       | Pin 1,2 to 3<br>V <sub>R</sub> = 2.5V, f = 1MHz |     | 30  | 40  | pF   |
| Reverse dynamic resistance | R <sub>dyn,rev</sub> | I <sub>PP</sub> =1A~5A                          |     | 0.6 |     | Ω    |
| Forward dynamic resistance | R <sub>dyn,fwd</sub> |   |     | 0.5 |     | Ω    |

## Typical Operating Characteristics

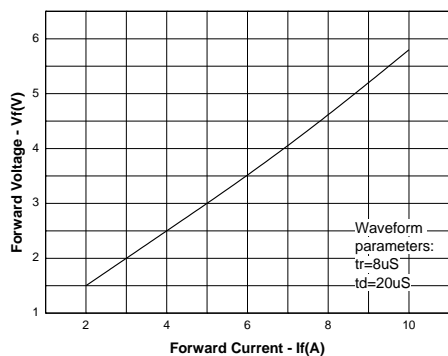
### Non-Repetitive Peak Pulse Power vs. Pulse Time



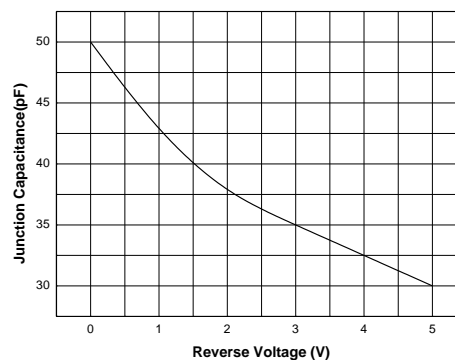
### Clamping Voltage vs. Peak Pulse Current



### Forward Voltage vs. Forward Current



### Junction Capacitance vs. Reverse Voltage



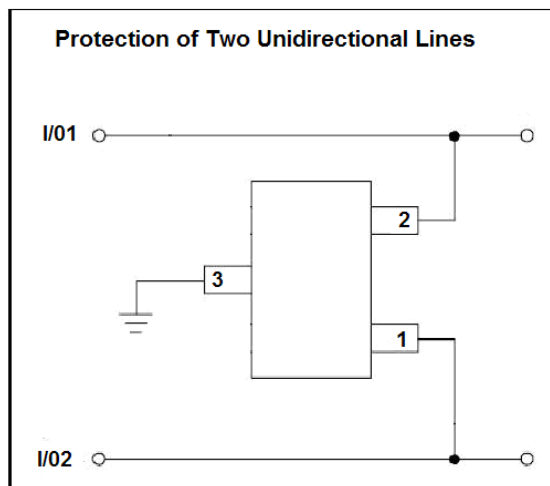
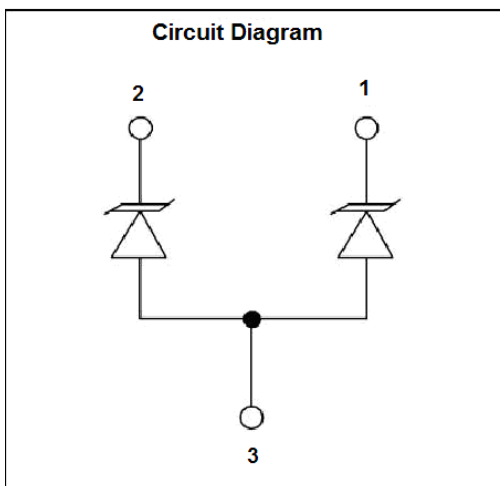
## Application Information

UESD6V8S2B ESD protection diode is designed to protect dual data, I/O, or power supply line. The device is unidirectional and may be used on lines where the signal polarity is above ground. The cathode should be placed towards the line that is to be protected.

### Device Connection for Protection of Dual Data Lines

The Dual TVS Diode Array is designed to protect up to two unidirectional data lines. The device is connected as follows:

Unidirectional protection of two I/O lines is achieved by connecting pins 1 and 2 to the data lines. Pin 3 is connected to ground. The ground connection should be made directly to the ground plane for best results. The path length is kept as short as possible to reduce the effects of parasitic inductance in the board traces.



### Circuit Board Layout Recommendations for Suppression of ESD

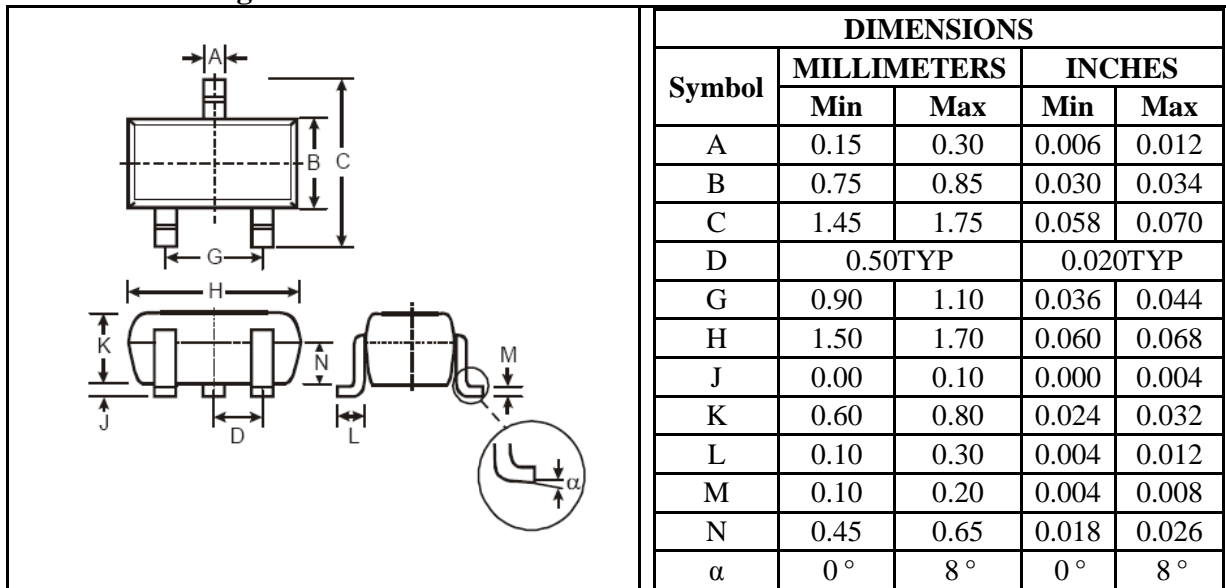
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

- Place the TVS near the input terminals or connectors to restrict transient coupling.
- Minimize the path length between the TVS and the protected line.
- Minimize all conductive loops including power and ground loops.
- The ESD transient return path to ground should be kept as short as possible.
- Never run critical signals near board edges.
- Use ground planes whenever possible. For multilayer printed-circuit boards, use ground vias.
- Keep parallel signal paths to a minimum.
- Avoid running protection conductors in parallel with unprotected conductor.
- Minimize all printed-circuit board conductive loops including power and ground loops.
- Avoid using shared transient return paths to a common ground point.

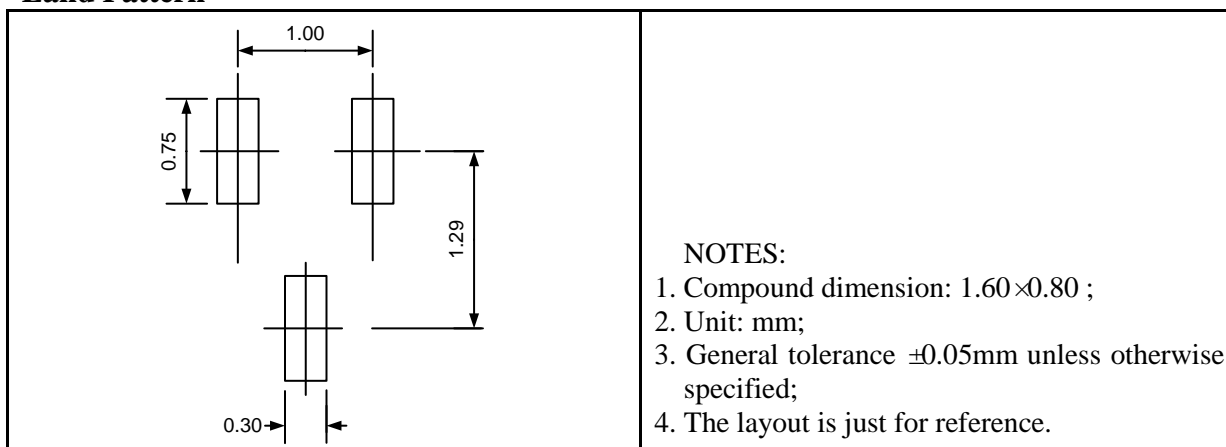
## Package Information

### UESD6V8S2B SOT523

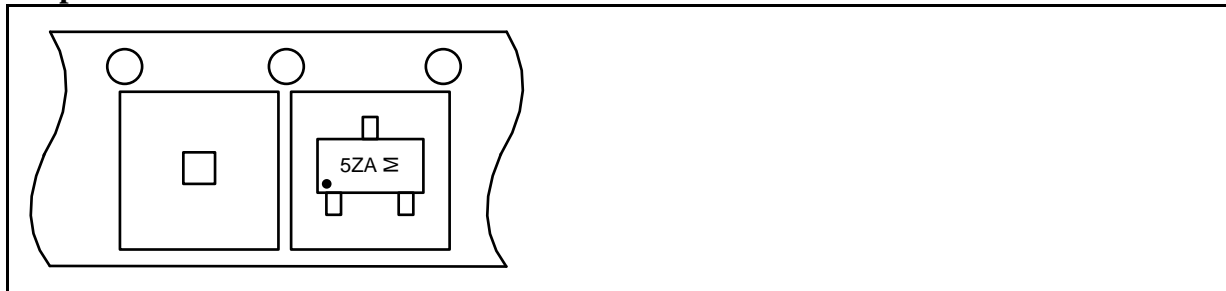
#### Outline Drawing



#### Land Pattern



#### Tape and Reel Orientation



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