

**2-Line Bi-directional TVS Diode****DESCRIPTION**

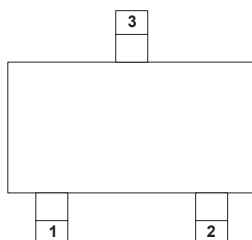
The SESD5T5BD is a 2-line bi-directional low capacitance TVS diode array, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamp-ing voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The SESD5T5BD has a low capacitance with a typical value at 16pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into a 3-pin SOT-523 lead-free package. The small size, very low capacitance and high ESD surge protection make SESD5T5BD an ideal choice to protect cell phone, digital video interfaces, high speed data ports, and many other portable applications.

**FEATURES**

- Ultra low leakage: nA level
- Operating voltage: 5V
- Low clamping voltage
- Up to 2 data lines protects

**MECHANICAL DATA**

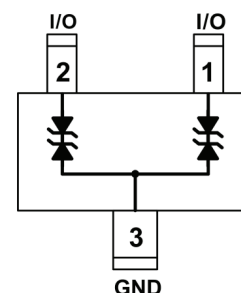
- Case : Molded, plastic SOT-523
- Lead Finish: Matte Tin
- Epoxy : UL94-V0 rated flame retardant

**SOT-523 PACKAGE****APPLICATIONS**

- Mobile Display Digital Interface (MDDI)
- USB 2.0
- Photodetector Protection
- HBT Power Amplifier Protection
- Infiniband Transceiver Protection
- Firewire Ports

**IEC COMPATIBILITY**

- IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air),  $\pm 30\text{kV}$  (contact)
- IEC61000-4-5 (Lightning) 8A (8/20 $\mu\text{s}$ )

**SCHEMATIC & PIN CONFIGURATION**

**2-Line Bi-directional TVS Diode****Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

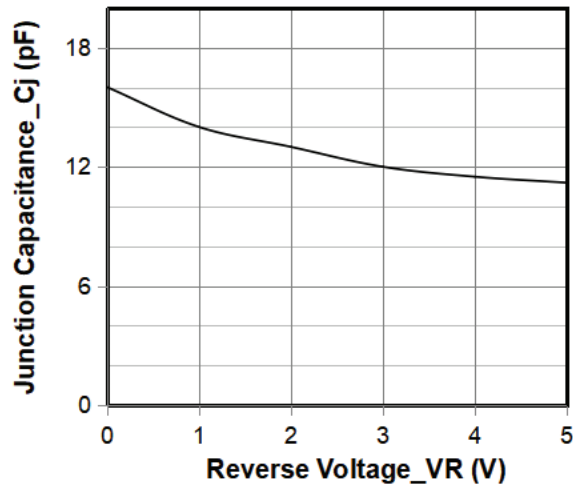
| Parameter                                                      | Symbol           | Value                | Unit               |
|----------------------------------------------------------------|------------------|----------------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )                         | Ppk              | 80                   | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ )                       | I <sub>PP</sub>  | 8                    | A                  |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | V <sub>ESD</sub> | $\pm 30$<br>$\pm 30$ | kV                 |
| Operating Temperature Range                                    | T <sub>J</sub>   | -55 to +125          | $^{\circ}\text{C}$ |
| Storage Temperature Range                                      | T <sub>stg</sub> | -55 to +150          | $^{\circ}\text{C}$ |

**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

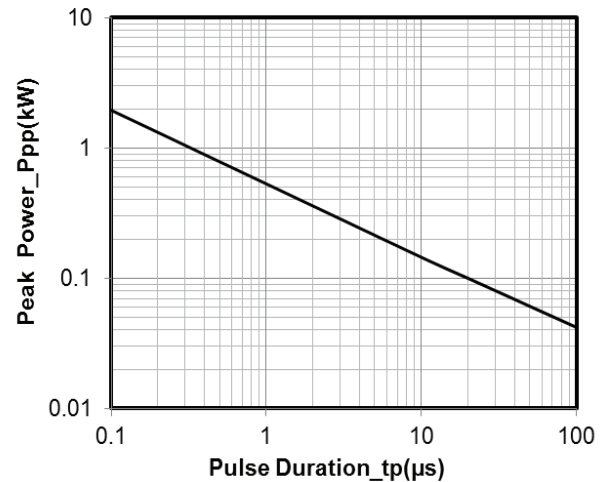
| Parameter               | Symbol           | Min | Typ | Max | Unit          | Test Condition                                                             |
|-------------------------|------------------|-----|-----|-----|---------------|----------------------------------------------------------------------------|
| Reverse Working Voltage | V <sub>RWM</sub> |     |     | 5   | V             | Pin 1 or pin 2 to pin 3                                                    |
| Breakdown Voltage       | V <sub>BR</sub>  | 5.6 | 6.5 | 8   | V             | I <sub>T</sub> = 1mA, pin 1 or pin 2 to pin 3                              |
| Reverse Leakage Current | I <sub>R</sub>   |     |     | 0.1 | $\mu\text{A}$ | V <sub>RWM</sub> = 5V, pin 1 or pin 2 to pin 3                             |
| Clamping Voltage        | V <sub>C</sub>   |     |     | 8   | V             | I <sub>PP</sub> = 1A (8 x 20 $\mu\text{s}$ pulse), pin 1 or pin 2 to pin 3 |
| Clamping Voltage        | V <sub>C</sub>   |     |     | 11  | V             | I <sub>PP</sub> = 8A (8 x 20 $\mu\text{s}$ pulse), pin 1 or pin 2 to pin 3 |
| Junction Capacitance    | C <sub>J</sub>   |     | 15  |     | pF            | V <sub>R</sub> = 0V, f = 1MHz, pin 1 or pin 2 to pin 3                     |



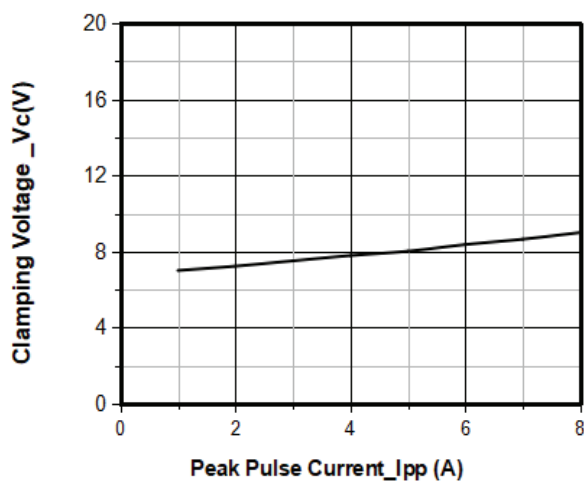
## Typical Performance Characteristics (TA=25°C unless otherwise Specified)



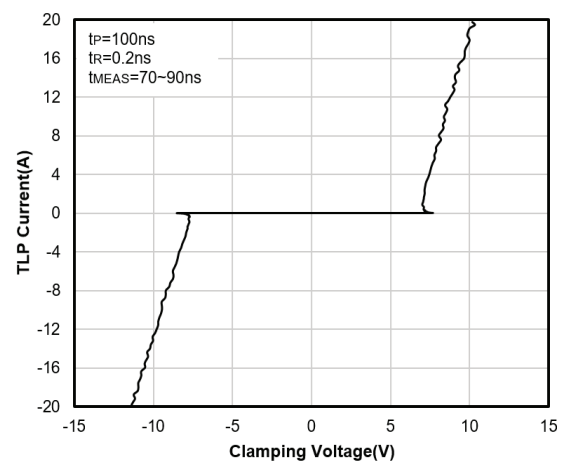
Junction Capacitance vs. Reverse Voltage



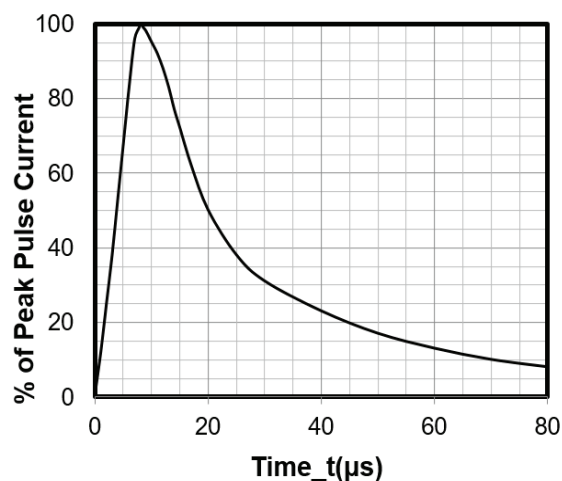
Peak Pulse Power vs. Pulse Time



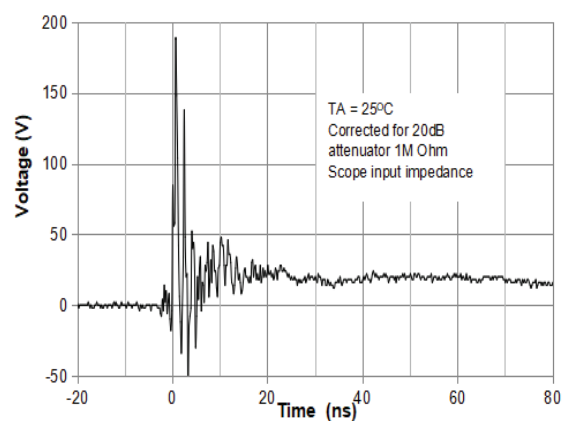
Clamping Voltage vs. Peak Pulse Current ( $t_p = 8/20 \mu$ s)



TLP Curve



8 X 20  $\mu$ s Pulse Waveform



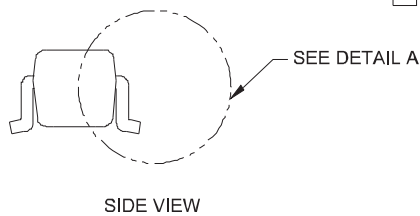
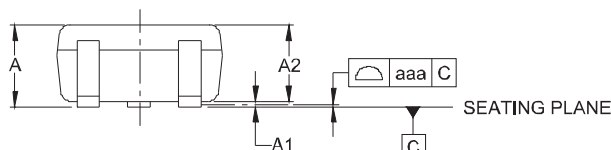
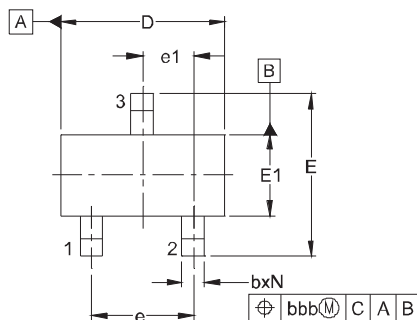
ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

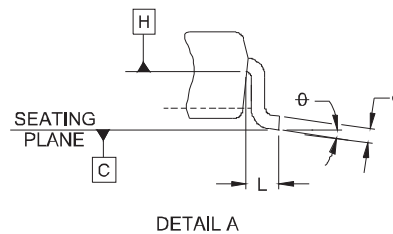


## Outline Drawing

## SOT-523(Q)



| DIM | INCHES   |      |      | MILLIMETERS |      |      |
|-----|----------|------|------|-------------|------|------|
|     | MIN      | NOM  | MAX  | MIN         | NOM  | MAX  |
| A   | .023     | -    | .035 | 0.60        | -    | 0.90 |
| A1  | .000     | -    | .004 | 0.00        | -    | 0.10 |
| A2  | .023     | .030 | .031 | 0.60        | 0.75 | 0.80 |
| b   | .005     | -    | .012 | 0.15        | -    | 0.30 |
| c   | .003     | -    | .008 | 0.10        | -    | 0.20 |
| D   | .059     | .063 | .067 | 1.50        | 1.60 | 1.70 |
| E   | .057     | .063 | .069 | 1.45        | 1.60 | 1.75 |
| E1  | .029     | .031 | .033 | 0.75        | 0.80 | 0.85 |
| e   | .039 BSC |      |      | 1.00 BSC    |      |      |
| e1  | .020 BSC |      |      | 0.50 BSC    |      |      |
| L   | (.009)   |      |      | (0.22)      |      |      |
| N   | 3        |      |      | 3           |      |      |
| θ   | 0°       | -    | 8°   | 0°          | -    | 8°   |
| aaa | .004     |      |      | 0.10        |      |      |
| bbb | .008     |      |      | 0.20        |      |      |

**Rev.A**

**Ordering Information:**

| Device PN                                                      | Marking <sup>(4)</sup> | Packing                |
|----------------------------------------------------------------|------------------------|------------------------|
| SESD5T5BD-T <sup>(1)</sup> H <sup>(2)</sup> -WS <sup>(3)</sup> | U2S5                   | Tape&Reel: 3 Kpcs/Reel |

Note: (1) Packing code, Tape & Reel Packing

(2) Packing code suffix "G" for RoHS product ; Packing code Suffix "H" for halogen free product.  
All materials and products supplied comply with the U.S. Toxic Substances Control Act statement, PBT Chemicals.

(3) Willas brand abbreviation, Label Type does not display

(4) There may be additional marking, which relates to the lot trace code information (data code and vendor code), the logo or the environmental category on the device

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