

## 1. Description

The ESD5Z5.0T1G-ES is a Transient Voltage Suppressor that designed to protect components which are connected to data and transmission lines against electrostatic discharge (ESD), electrical fast Transients (EFT), and lightning. All pins are rated to withstand 30kV ESD pulses using the IEC61000-4-2 air discharge methods.

## 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - $\pm 30\text{kV}$  Contact Discharge
  - $\pm 30\text{kV}$  Air Discharge
- 200W Peak pulse Power (8/20us)
- RoHS compliance
- Unidirectional configuration
- Low clamping voltage
- Low leakage current
- Protects one power or I/O

## 3. Applications

- Portable electronics
- Control & monitoring systems
- Servers, notebooks, and desktop PCs
- Set-top box
- Communication systems
- Digital cameras

## 4. Ordering Information

| Part Number                           | Package | Material     | Packing     | Quantity per reel | Flammability Rating | Reel Size |
|---------------------------------------|---------|--------------|-------------|-------------------|---------------------|-----------|
| ESD5Z5.0T1G-ES                        | SOD-523 | Halogen free | Tape & Reel | 3000 PCS          | UL 94V-0            | 7 inches  |
| Marking for the ESD5Z5.0T1G-ES series |         |              |             |                   |                     |           |
| $V_{RWM}$                             | 3.3V    | 5V           | 7V          | 12V               | 15V                 | 24V       |
| Marking                               | N1      | N2           | Z.H.8       | N3                | N4                  | N5        |

Table-1 Ordering information

## 5. Pin Configuration and Functions

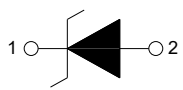
| Pin | Name | Description    | Outline                                                                                     | Circuit Diagram                                                                     |
|-----|------|----------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1   | IO   | Connect to IO  | Note1<br> |  |
| 2   | GND  | Connect to GND |                                                                                             |                                                                                     |

Table-2 Pin configuration

Note1: This diagram is only an electrical schematic, and the actual pin size is based on POD.

## 6. Specification

### 6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

| Parameters                                 | Symbol           | Min. | Max.             | Unit |
|--------------------------------------------|------------------|------|------------------|------|
| Peak pulse power (tp=8/20us)@25°C          | P <sub>pk</sub>  | -    | 200              | W    |
| Peak pulse current (tp=8/20us)@25°C        | I <sub>PP</sub>  | -    | Refer to Table-5 | A    |
| ESD (IEC61000-4-2 air discharge) @25°C     | V <sub>ESD</sub> | -    | ±30              | kV   |
| ESD (IEC61000-4-2 contact discharge) @25°C | V <sub>ESD</sub> | -    | ±30              | kV   |
| Junction temperature                       | T <sub>J</sub>   | -    | 150              | °C   |
| Operating temperature                      | T <sub>OP</sub>  | -40  | 125              | °C   |
| Storage temperature                        | T <sub>STG</sub> | -55  | 150              | °C   |
| Lead temperature                           | T <sub>L</sub>   | -    | 260              | °C   |

Table-3 Absolute Maximum rating

## 6.2. Electrical Characteristics

| Symbol    | Description                                                              |
|-----------|--------------------------------------------------------------------------|
| $V_{RWM}$ | Rated reverse stand-off voltage                                          |
| $V_{BR}$  | Minimum breakdown voltage @ $I_T = 1mA$                                  |
| $V_{CL}$  | Typical Clamping voltage                                                 |
| $I_{PP}$  | Maximum peak pulse current                                               |
| $I_R$     | Reverse leakage current @ $V_{RWM}$                                      |
| $C_O$     | Typical line capacitance ( $V_{IO}=0V$ , $V_{P-P} = 30mV$ , $f = 1MHz$ ) |

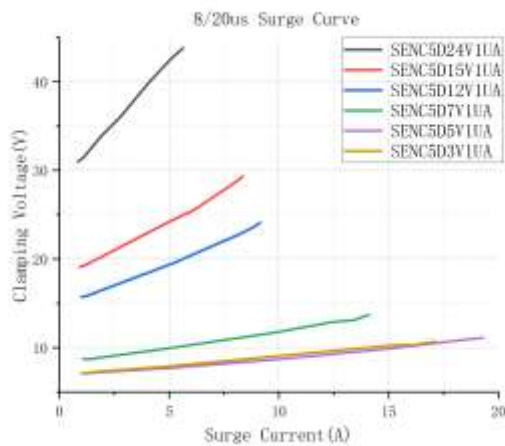
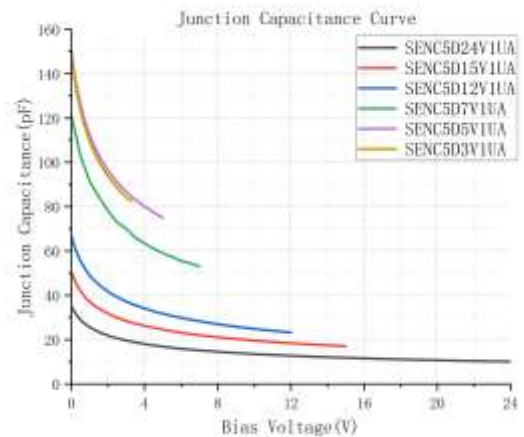
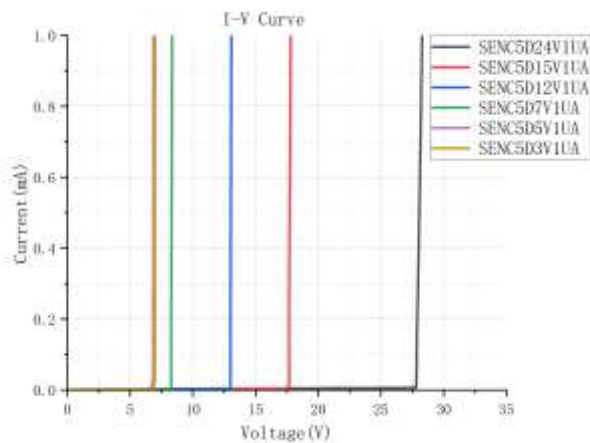
Table-4 Parameters Description

At  $T_A = 25^{\circ}C$  unless otherwise noted

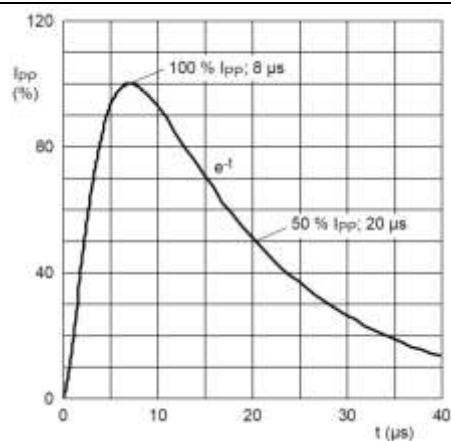
| Part Number    | $V_{RWM}$<br>(Max.) | $V_{BR}$<br>(Min.) | $V_{CL}@I=1A$<br>(Typ.) | $I_{PP}$<br>(Max.) | $V_{CL}@I=I_{PP}$<br>(Typ.) | $I_R$<br>(Max.) | $C_O$<br>(Typ.) | $C_O$<br>(Max.) |
|----------------|---------------------|--------------------|-------------------------|--------------------|-----------------------------|-----------------|-----------------|-----------------|
|                | (V)                 | (V)                | (V)                     | (A)                | (V)                         | ( $\mu A$ )     | (pF)            | (pF)            |
| ESD5Z5.0T1G-ES | 5.0                 | 6.5                | 7.5                     | 15                 | 10                          | 1.0             | 150             | 180             |

Table-5 Electrical Characteristics for All Series

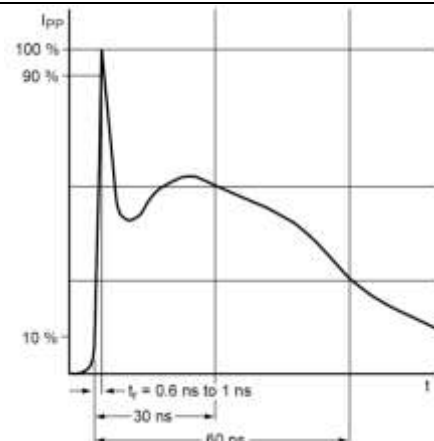
## 7. Typical Characteristic



### Measurement Wave According to IEC Standard

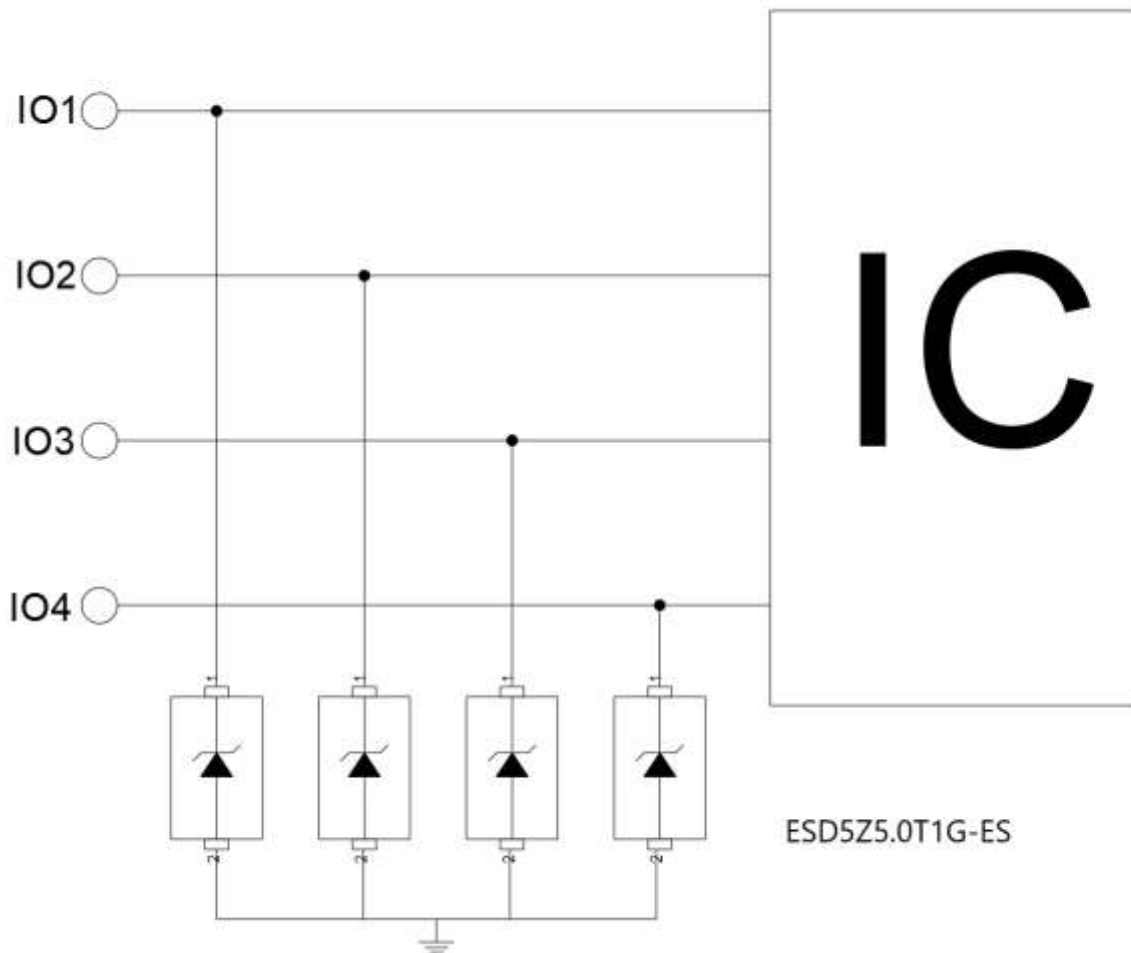


8/20  $\mu$ s pulse waveform according to IEC 61000-4-5



ESD pulse waveform according to IEC 61000-4-2

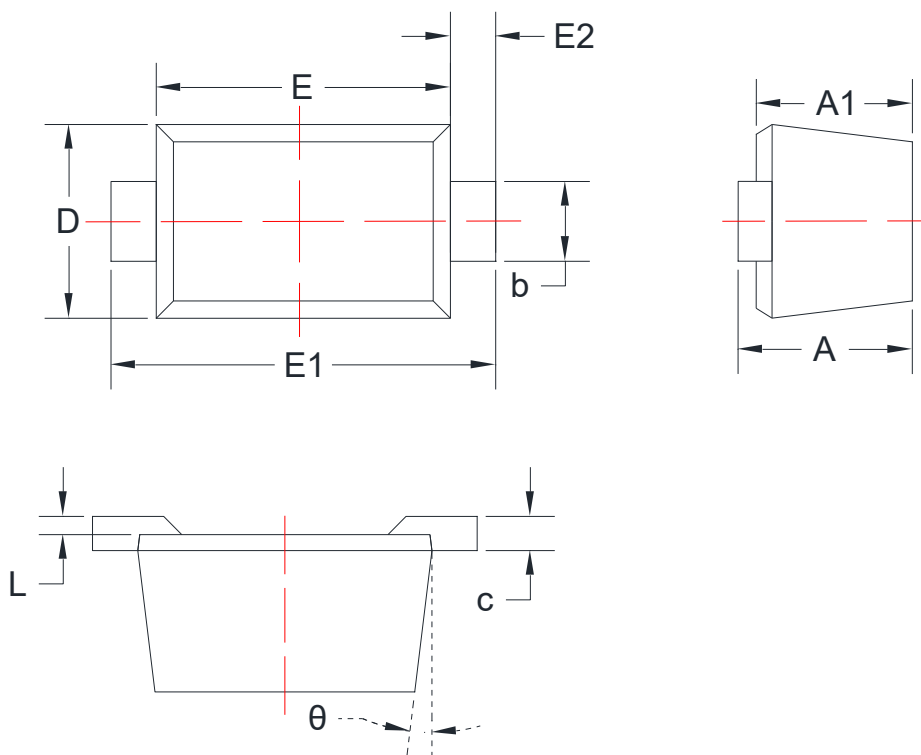
## 8. Typical Application



Pic-3 Typical Internet 1G Interface Application

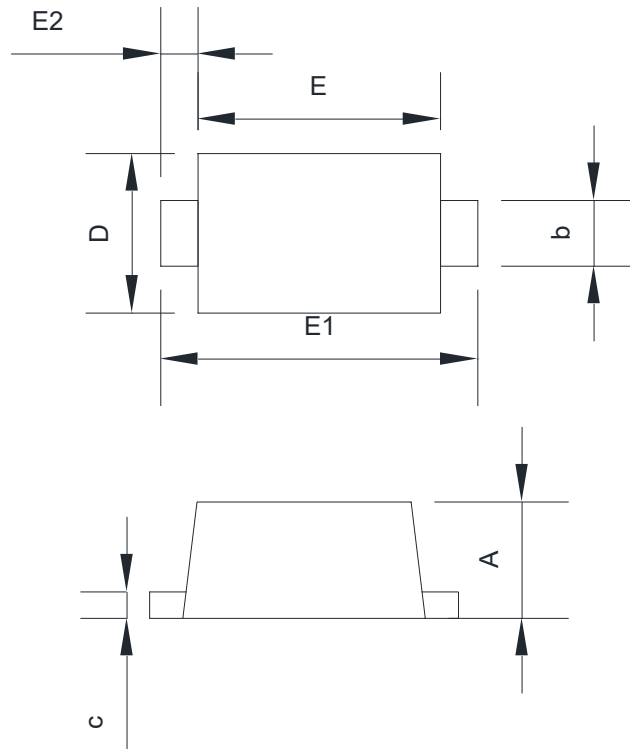
## 9. Dimension (SOD-523)

### POD A(SX)



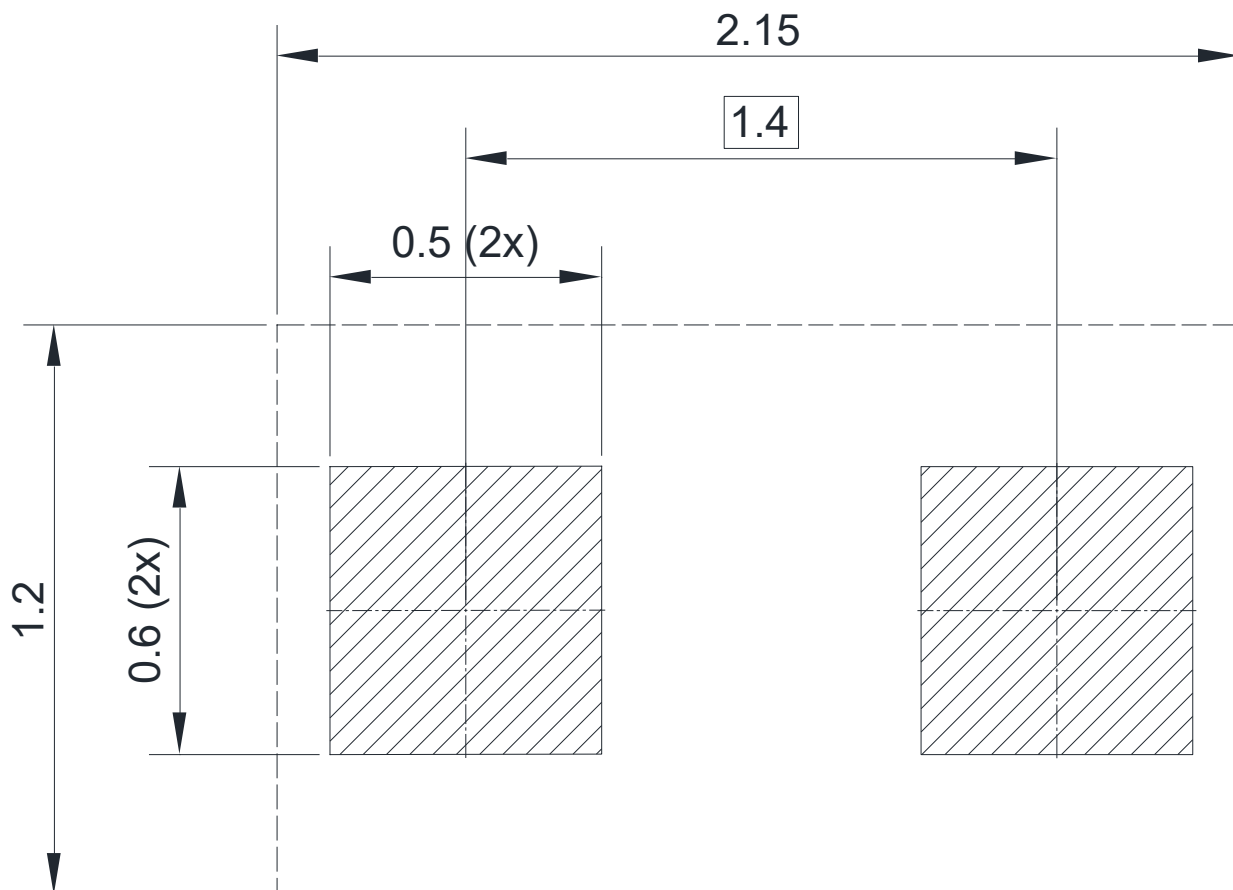
| Symbol | Dimensions in Millimeters |      |
|--------|---------------------------|------|
|        | Min.                      | Max. |
| A      | 0.50                      | 0.73 |
| A1     | 0.45                      | 0.70 |
| b      | 0.25                      | 0.38 |
| c      | 0.08                      | 0.20 |
| D      | 0.70                      | 0.90 |
| E      | 1.10                      | 1.30 |
| E1     | 1.50                      | 1.70 |
| E2     | 0.10                      | 0.30 |
| L      | 0.00                      | 0.07 |
| θ      | 7° REF                    |      |

POD B(H)



| Symbol | Dimensions in Millimeters |      |
|--------|---------------------------|------|
|        | Min.                      | Max. |
| A      | 0.50                      | 0.70 |
| b      | 0.25                      | 0.35 |
| c      | 0.10                      | 0.20 |
| D      | 0.75                      | 0.85 |
| E      | 1.10                      | 1.30 |
| E1     | 1.50                      | 1.70 |
| E2     | 0.10                      | 0.30 |

## 10. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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