

## SuperESD - BST143A053U-ES

### 1. Description

The BST143A053U-ES is an ultra-low capacitance TVS (Transient Voltage Suppressor) array designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge).

### 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - $\pm 25\text{kV}$  Contact Discharge
  - $\pm 25\text{kV}$  Air Discharge
- IEC61000-4-5 (Surge) 7A (8/20 $\mu\text{s}$ )
- Protect two I/O lines
- Low operating and clamping voltage
- Low leakage current
- Solid-state silicon technology
- Low Junction capacitance: 1.0pF Typ.

### 3. Applications

- USB 2.0
- DVI and HDMI interfaces
- Mobile and cordless phones
- Personal Digital Assistants (PDA)
- Digital cameras
- PCs, notebooks, printers and other PC peripherals

### 4. Ordering Information

| Part Number    | Package | Marking | Material     | Packing     | Quantity per reel | Flammability Rating | Reel Size |
|----------------|---------|---------|--------------|-------------|-------------------|---------------------|-----------|
| BST143A053U-ES | SOT-143 | R05     | Halogen free | Tape & Reel | 3,000 PCS         | UL 94V-0            | 7 inches  |

Table-1 Ordering information

## 5. Pin Configuration and Functions

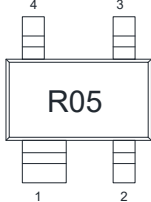
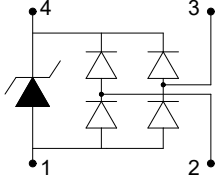
| Pin | Name | Description    | Outline                                                                           | Circuit Diagram                                                                     |
|-----|------|----------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1   | GND  | Connect to GND |  |  |
| 2   | IO   | Connect to IO  |                                                                                   |                                                                                     |
| 3   | IO   | Connect to IO  |                                                                                   |                                                                                     |
| 4   | Vcc  | Connect to Vcc |                                                                                   |                                                                                     |

Table-2 Pin configuration

## 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>  | -    | 140  | W    |
| Peak pulse current (tp=8/20us)@25°C        | I <sub>PP</sub>  |      | 7    | A    |
| ESD (IEC61000-4-2 air discharge) @25°C     | V <sub>ESD</sub> | -    | ±25  | kV   |
| ESD (IEC61000-4-2 contact discharge) @25°C | V <sub>ESD</sub> | -    | ±25  | 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

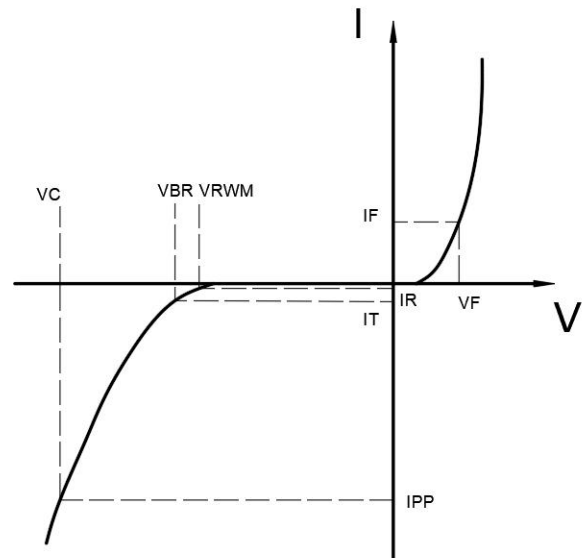
## 6.2. Electrical Characteristics

At TA = 25°C unless otherwise noted

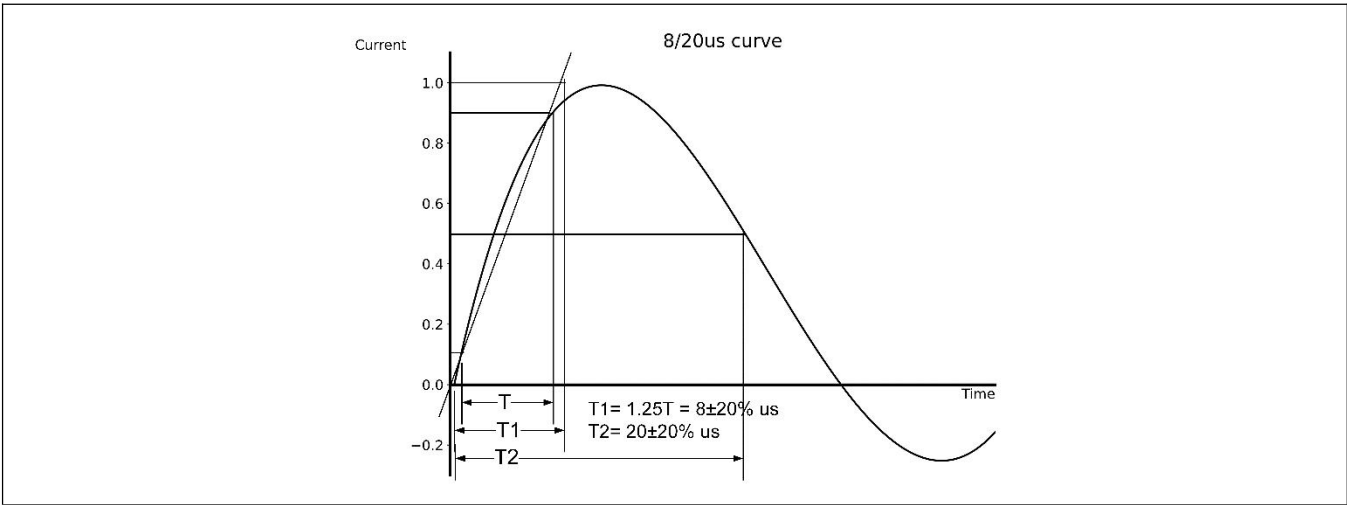
| Parameter                 | Symbol    | Conditions                                | Min. | Typ. | Max. | Units   |
|---------------------------|-----------|-------------------------------------------|------|------|------|---------|
| Reverse Stand-off Voltage | $V_{RWM}$ |                                           |      |      | 5    | V       |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T=1mA$                                 | 6    |      | 9    | V       |
| Reverse Leakage Current   | $I_R$     | $V_{RWM}=5V$                              |      |      | 1    | $\mu A$ |
| Clamping Voltage          | $V_C$     | $I_{PP}=1A$ ; $t_p=8/20\mu s$             |      | 9    | 13   | V       |
| Clamping Voltage          | $V_C$     | $I_{PP}=7A$ ; $t_p=8/20\mu s$             |      | 12   | 15   | V       |
| Junction Capacitance      | $C_J$     | $V_R=0V$ ; $f=1MHz$<br>I/O pin to I/O pin |      | 0.5  | 0.8  | pF      |
| Junction Capacitance      | $C_J$     | $V_R=0V$ ; $f=1MHz$<br>I/O pin to GND     |      | 1.0  | 1.6  | pF      |

Table-4 Electrical Characteristics

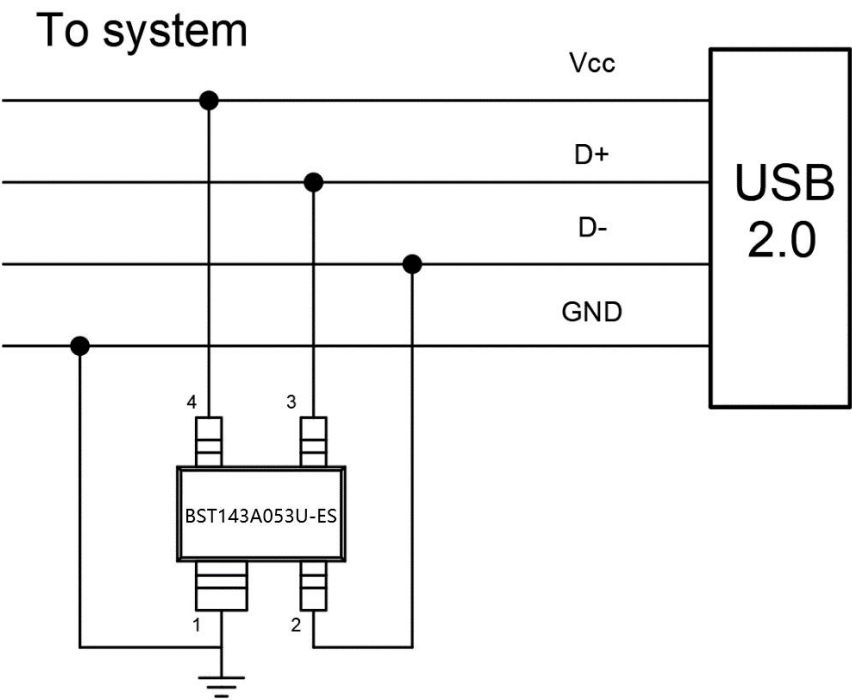
| Symbol    | Parameters                          |
|-----------|-------------------------------------|
| $V_{RWM}$ | Peak Reverse Working Voltage        |
| $I_R$     | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$           |
| $I_T$     | Test Current                        |
| $I_{PP}$  | Maximum Reverse Peak Pulse Current  |
| $V_C$     | Clamping Voltage @ $I_{PP}$         |
| $I_F$     | Forward Current                     |
| $V_F$     | Forward Voltage @ $I_F$             |



7. Typical Characteristic

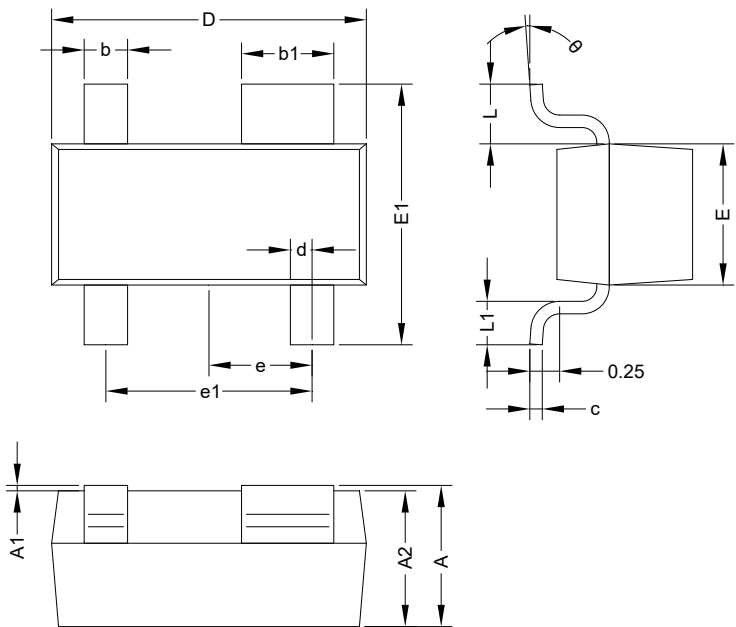


8. Typical Application



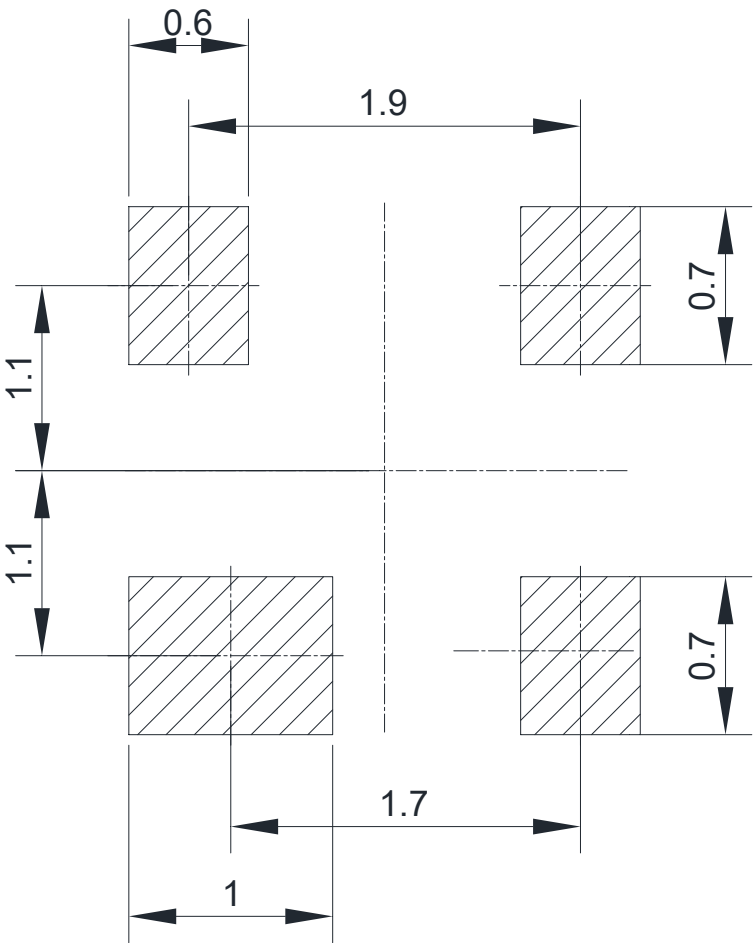
Typical Interface Application

9. Dimension (SOT-143)



| COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER |           |       |       |        |           |       |       |
|---------------------------------------------|-----------|-------|-------|--------|-----------|-------|-------|
| SYMBOL                                      | MIN       | TYP   | MAX   | SYMBOL | MIN       | TYP   | MAX   |
| A                                           | 0.95      | 1.125 | 1.300 | E      | 1.200     | 1.300 | 1.400 |
| A1                                          | 0.00      | 0.050 | 0.100 | E1     | 2.250     | 2.400 | 2.550 |
| A2                                          | 0.900     | 1.050 | 1.200 | e      | 0.950 TYP |       |       |
| b                                           | 0.300     | 0.400 | 0.500 | e1     | 1.800     | 1.900 | 2.000 |
| b1                                          | 0.750     | 0.850 | 0.950 | L      | 0.550 TYP |       |       |
| c                                           | 0.080     | 0.115 | 0.150 | L1     | 0.300     | 0.400 | 0.500 |
| D                                           | 2.800     | 2.900 | 3.000 | θ      | 0°        | 4°    | 8°    |
| d                                           | 0.200 TYP |       |       |        |           |       |       |

9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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