

## SuperESD - TPPRTR5V0U2X

### 1. Description

The TPPRTR5V0U2X is Ultra low capacitance double rail-to-rail Electro Static Discharge (ESD) protection diode in a small SOT143 Surface Mounted Device (SMD) plastic package designed to protect two Hi-Speed data lines or high frequency signal lines from the damage caused by ESD and other transients.

### 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±15kV Contact Discharge
  - ±15kV Air Discharge
- IEC61000-4-5 (Surge) 5A (8/20µs)
- Protect two I/O lines
- Low operating and clamping voltage
- Low leakage current
- Solid-state silicon technology
- Low Junction capacitance: 0.6pF 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
TPPRTR5V0U2X	SOT-143	BSL3	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

Table-1 Ordering information

## 5. Pin Configuration and Functions

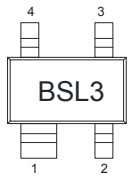
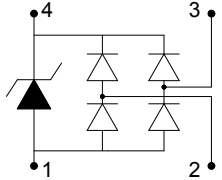
Pin	Name	Description	Outline	Circuit Diagram
1	GND	Connect to GND		
2	IO	Connect to IO		
3	IO	Connect to IO		
4	Vcc	Connect to Vcc		

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>	-	75	W
Peak pulse current (tp=8/20us)@25°C	I <sub>PP</sub>	-	5	A
ESD (IEC61000-4-2 air discharge) @25°C	V <sub>ESD</sub>	-	± 15	kV
ESD (IEC61000-4-2 contact discharge) @25°C	V <sub>ESD</sub>	-	± 15	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

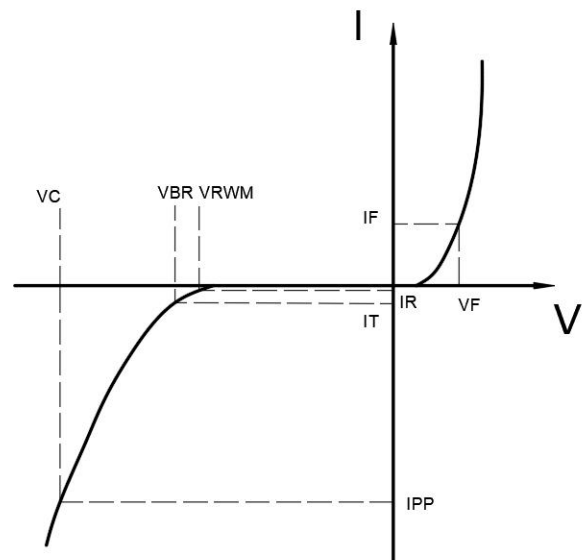
## 6.2. Electrical Characteristics

At TA = 25°C unless otherwise noted

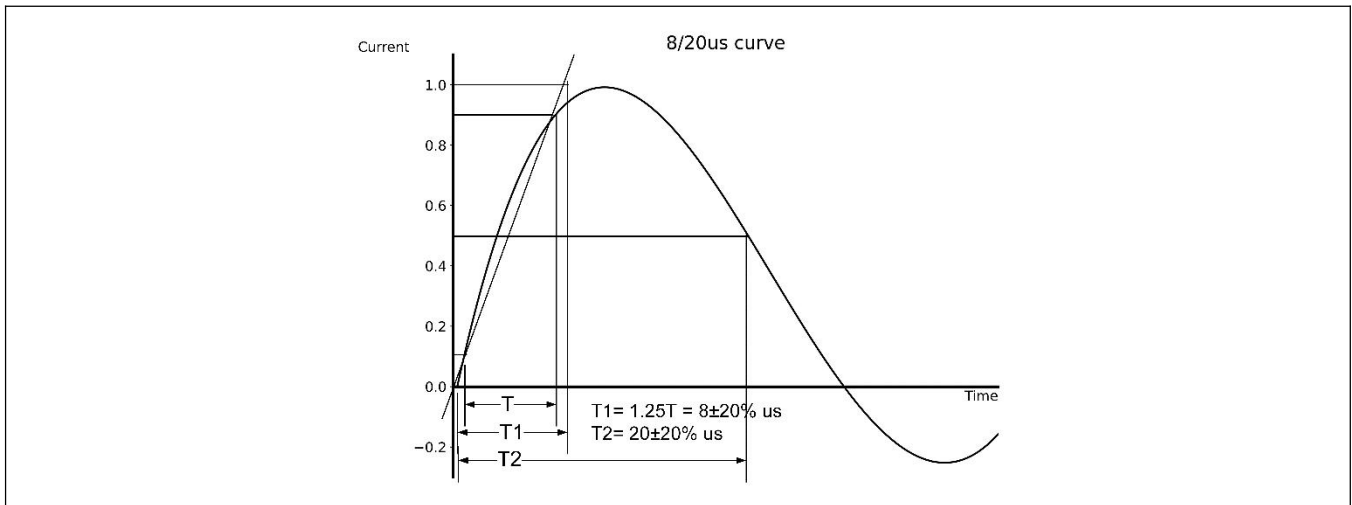
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$				5	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	6			V
Reverse Leakage Current	$I_R$	$V_{RWM}=5V$			1	$\mu A$
Clamping Voltage	$V_C$	$I_{PP}=1A$ ; $t_p=8/20\mu s$		10		V
Clamping Voltage	$V_C$	$I_{PP}=5A$ ; $t_p=8/20\mu s$		15		V
Junction Capacitance	$C_J$	$V_R=0V$ ; $f=1MHz$ I/O pin to I/O pin		0.3		pF
Junction Capacitance	$C_J$	$V_R=0V$ ; $f=1MHz$ I/O pin to GND		0.6		pF

Table-4 Electrical Characteristics

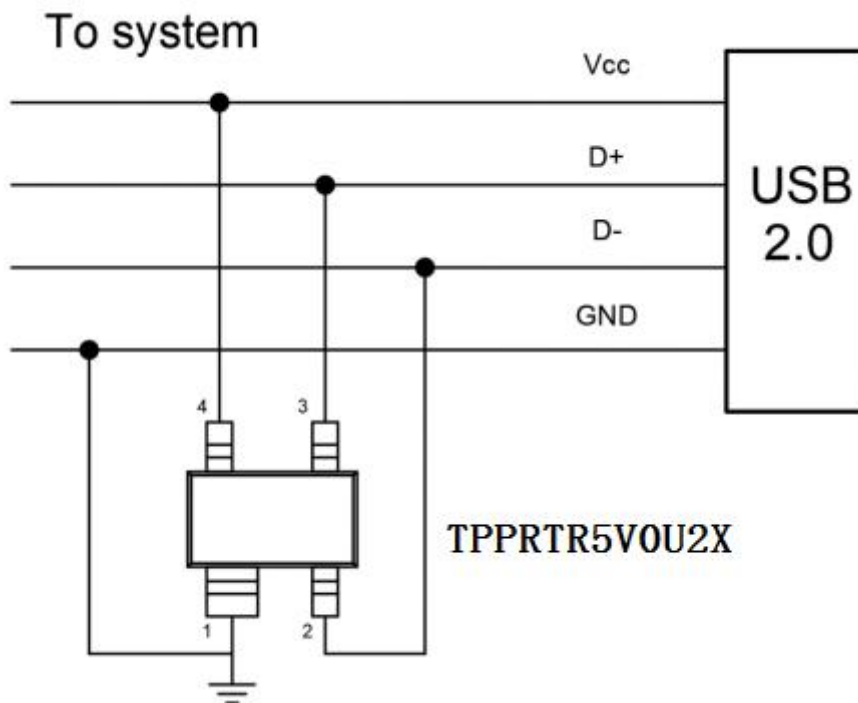
Symbol	Parameters
$V_{RWM}$	Peak Reverse Working Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



### 7. Typical Characteristic

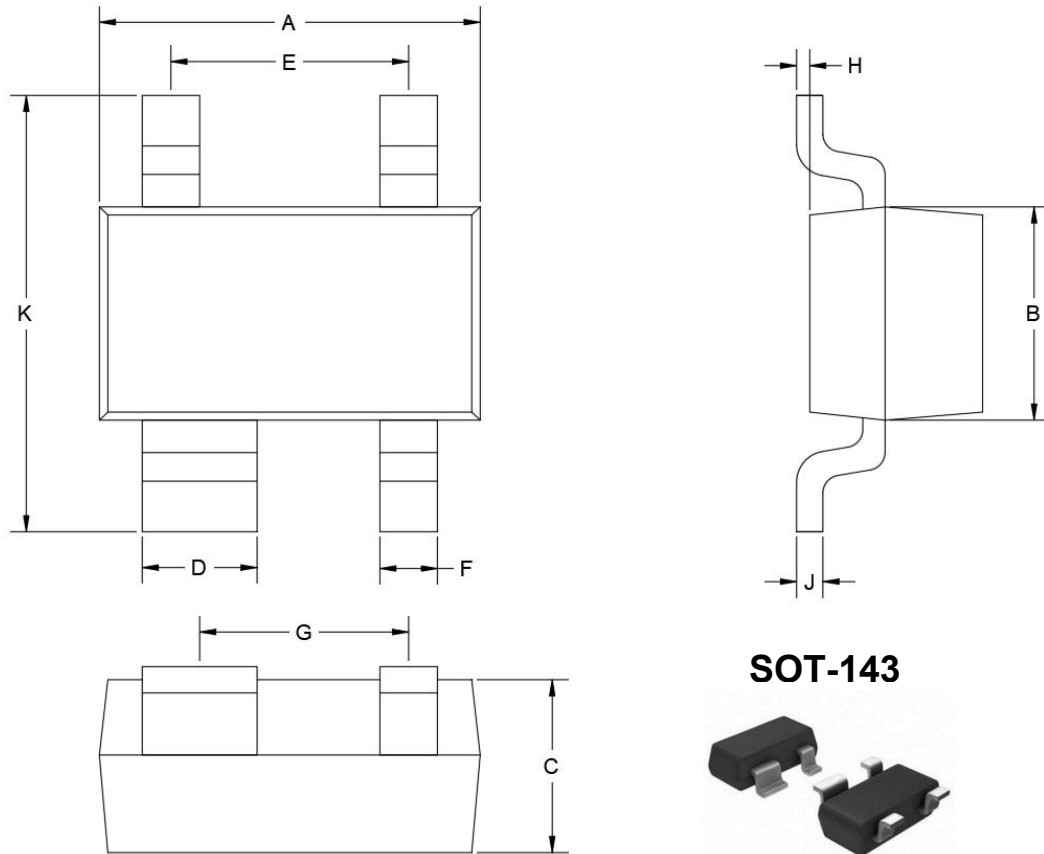


### 8. Typical Application

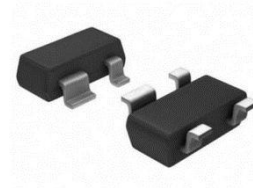


Typical Interface Application

9. Dimension



**SOT-143**

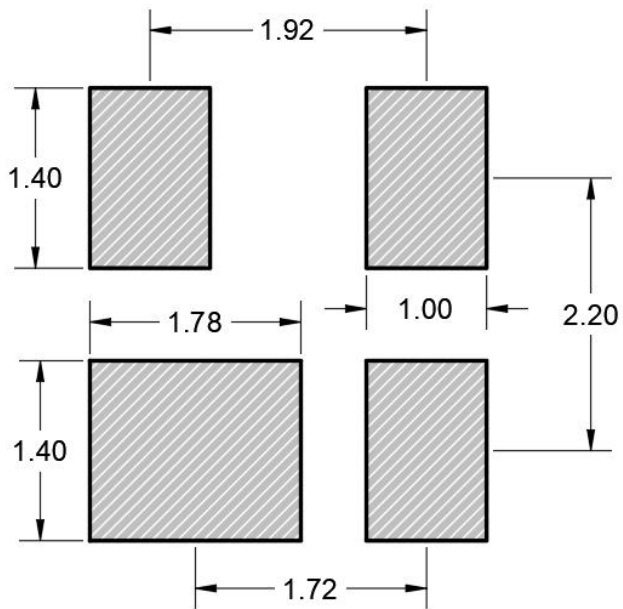


All dimension in millimeters

Symbol	A	B	C	D	E	F	G	H	J	K
Min	2.70	1.10	0.90	0.78	1.80	0.37	1.59	0.02	0.05	2.20
Max	3.10	1.50	1.10	0.88	2.00	0.43	1.79	0.10	0.15	2.60

Table-5 Product dimensions

## 10. Recommended Land Pattern

**Note:**

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference only

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