

## 2-Channel ESD Protection for Super-Speed USB 3.0 Interface

### Features

- Supports USB 3.0 data rate(5Gbps)
- Ultra low Capacitance: 0.4pF typical I/O to GND
- Ultra low Leakage : nA level
- Low operating voltage: 5.5V
- Bi-directional TVS Diode Array
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test  
Air discharge:  $\pm 20\text{kV}$   
Contact discharge:  $\pm 15\text{kV}$
  - IEC 61000-4-5 Surge 3.3 A (8/20 $\mu\text{s}$ )
  - IEC61000-4-4 (EFT) 40A (5/50ns)
- ROHS Compliant

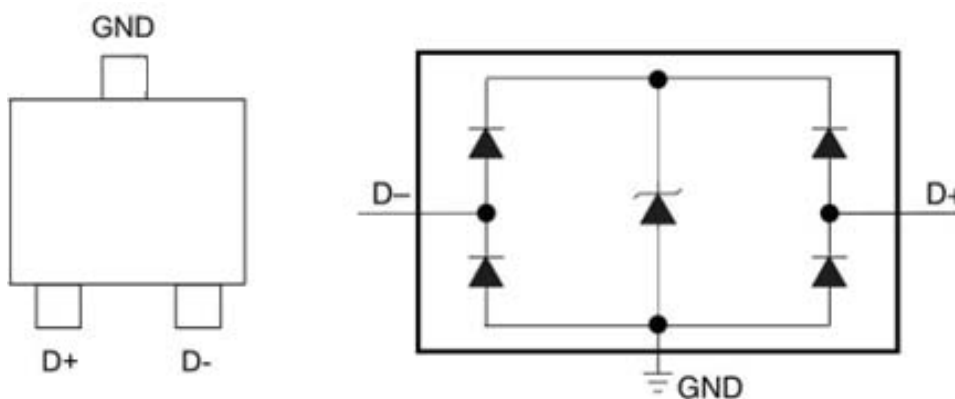
### Mechanical Characteristics

- Package: SOT-9x3
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connection: See Diagram Below
- Shipping Qty : 8000pcs/7Inch Tape & Reel

### Applications

- Notebooks
- Set-top boxes
- DVD Player
- Media Player
- Portable Computer

## Dimensions and Pin Configuration





# FPD2EUSB30ADRTR

## Absolute Maximum Ratings (TA=25°C unless otherwise specified )

| Parameter  | Symbol           | Value       | Unit |
|--|------------------|-------------|------|
| Peak Pulse Power (8/20μs)                                    | Ppk              | 50          | W    |
| ESD per IEC61000-4-2 (Air)<br>ESD per IEC61000-4-2 (Contact) | V <sub>ESD</sub> | ±20<br>±18  | kV   |
| Operating Temperature Range                                  | T <sub>J</sub>   | -55 to +125 | °C   |
| Storage Temperature Range                                    | T <sub>stg</sub> | -55 to +150 | °C   |

## Electrical Characteristics (TA=25°C unless otherwise specified )

| Parameter                              | Symbol            | Min | Typ | Max  | Unit | Test Condition                              |
|--|-------------------|-----|-----|------|------|---|
| Reverse Working Voltage                | V <sub>RWM</sub>  |     |     | 3.3  | V    |   |
| Breakdown Voltage                      | V <sub>BR</sub>   | 4.5 |     |      | V    | I <sub>T</sub> =1mA                         |
| Leakage Current                        | I <sub>Leak</sub> |     | 0   | 100  | nA   | V <sub>IO</sub> =5V                         |
| Dynamic resistance                     | R <sub>DYN</sub>  |     | 0.6 |      | Ω    | any I/O pin to GND                          |
| Clamping Voltage (I/O-GND)             | V <sub>C</sub>    |     |     | 13   | V    | I <sub>PP</sub> =1A, T <sub>p</sub> =8/20μs |
| Clamping Voltage(V <sub>CC</sub> -GND) | V <sub>C</sub>    |     |     | 18   | V    | I <sub>PP</sub> =3A, T <sub>p</sub> =8/20μs |
| Junction Capacitance<br>( I/O to GND)  | C <sub>J</sub>    |     | 0.4 |      | pF   | V <sub>R</sub> =0V, f=1MHz,                 |
| Junction Capacitance<br>( I/O to I/O)  | C <sub>J</sub>    |     | 0.2 | 0.35 | pF   | V <sub>R</sub> =0V, f=1MHz,                 |

## Typical Performance Characteristics (T<sub>A</sub>=25°C unless otherwise Specified)

Fig1. 8/20μs Pulse Waveform

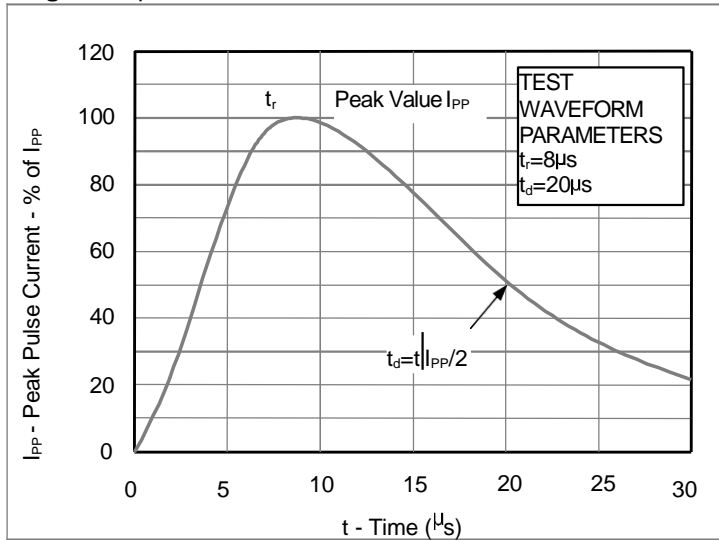


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

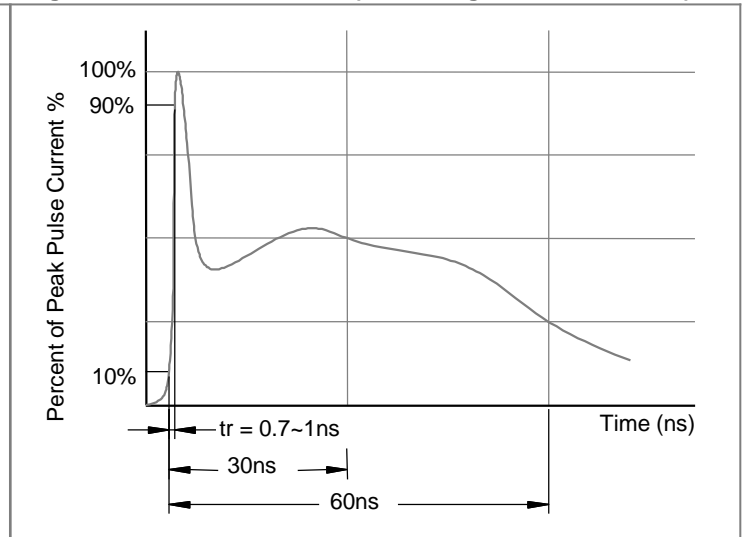
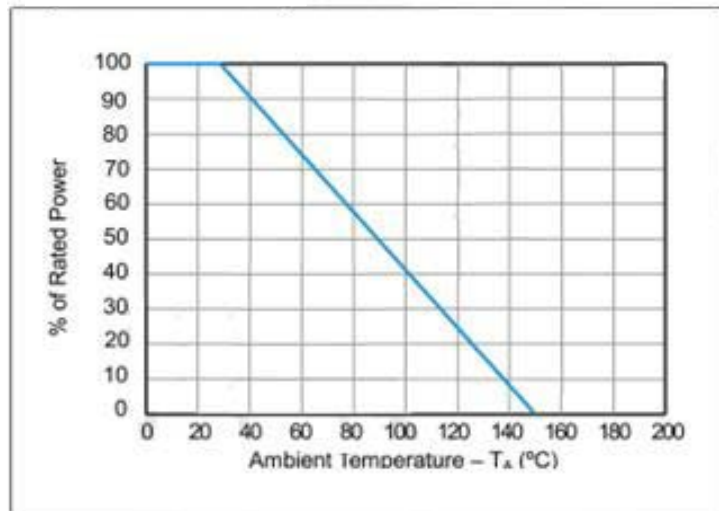
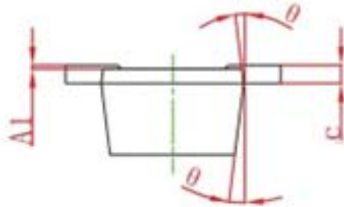
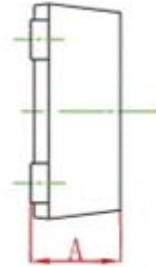
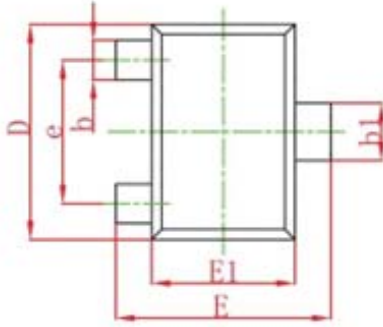


Fig3. Power Derating Curve



## SOT-9x3 Package Outline Dimensions



| Symbol   | Dimensions in Millimeters |       | Dimensions in Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 0.430                     | 0.500 | 0.017                | 0.020 |
| A1       | 0.000                     | 0.050 | 0.000                | 0.002 |
| b        | 0.170                     | 0.270 | 0.007                | 0.011 |
| b1       | 0.270                     | 0.370 | 0.011                | 0.015 |
| c        | 0.080                     | 0.150 | 0.003                | 0.006 |
| D        | 1.150                     | 1.250 | 0.045                | 0.049 |
| E        | 1.150                     | 1.250 | 0.045                | 0.049 |
| E1       | 0.750                     | 0.850 | 0.030                | 0.033 |
| e        | 0.800TYP.                 |       | 0.031TYP.            |       |
| $\theta$ | 7° REF.                   |       | 7° REF.              |       |