

## 1. Description

The SP3374NUTG(ES) is Transient Voltage Suppressor that designed to protect components which are connected to data and transmission lines against electrostatic discharge (ESD), electrical fast transient (EFT), and lightning. All pins are rated to withstand 30kV ESD pulses using the IEC61000-4-2 air discharge method.

## 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - $\pm 30\text{kV}$  Contact Discharge
  - $\pm 30\text{kV}$  Air Discharge
- 1250W Peak pulse Power (8/20us)
- Low clamping voltage
- Working voltage: 3.3V
- Low leakage current
- RoHS compliant
- Protecting 4 unidirectional lines
- Ultra Low Junction capacitance: 3.0 pF TYP. (IO-GND)

## 3. Applications

- USB & HDMI Interfaces
- Portable electronics
- Servers, notebooks, and desktop PCs
- Display Port 1.3, eSATA
- Digital Visual Interface (DVI)
- PoE

## 4. Ordering Information

| Part Number    | Package     | Marking       | Material     | Packaging   | Quantity per reel | Flammability Rating | Reel Size |
|----------------|-------------|---------------|--------------|-------------|-------------------|---------------------|-----------|
| SP3374NUTG(ES) | DFN2030-10L | .30F3V4UA/LOT | 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 |
|----------------------|------|----------------|---------|-----------------|
| 1,2,4,5,<br>6,7,9,10 | IO   | Connect to IO  |         |                 |
| 3,8                  | GND  | Connect to GND |         |                 |

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>  | -    | 1250 | W    |
| Peak pulse current (tp=8/20us)@25°C        | I <sub>PP</sub>  |      | 50   | 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

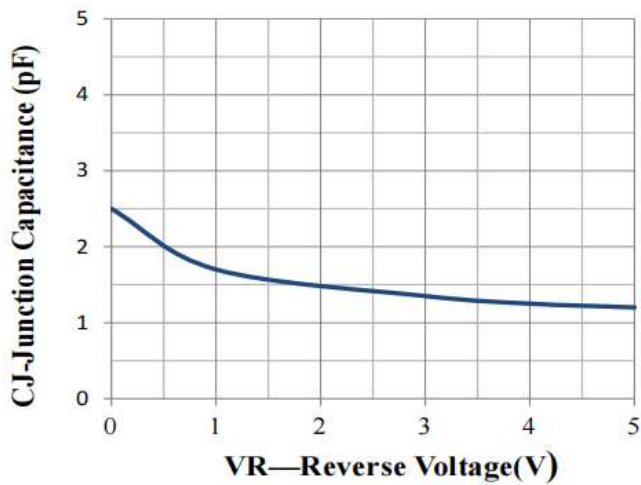
At TA = 25°C unless otherwise noted

| Parameter                 | Symbol    | Conditions                                                                                           | Min. | Typ. | Max. | Units   |
|---------------------------|-----------|------------------------------------------------------------------------------------------------------|------|------|------|---------|
| Reverse Stand-off Voltage | $V_{RWM}$ |                                                                                                      |      |      | 3.3  | V       |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T=1mA$ , IO-GND                                                                                   | 3.5  |      |      | V       |
| Reverse Leakage Current   | $I_R$     | $V_{RWM}=3.3V$                                                                                       |      |      | 0.2  | $\mu A$ |
| Clamping Voltage          | $V_{CL}$  | $I_{PP}=1A$ , $t_p=8/20\mu s$ , Any I/O to Ground                                                    |      |      | 10   | V       |
| Clamping Voltage          | $V_{CL}$  | $I_{PP}=30A$ , $t_p=8/20\mu s$ , Any I/O to Ground                                                   |      |      | 18   | V       |
| Clamping Voltage          | $V_{CL}$  | $I_{PP}=50A$ , $t_p=8/20\mu s$ , Line-to-Line, two I/O pins connected together on each line (Note 1) |      |      | 25   | V       |
| Junction Capacitance      | $C_J$     | $V_R=0V$ , $f=1MHz$ , Any I/O to Ground                                                              |      | 3.0  | 5.0  | pF      |
|                           |           | $V_R=0V$ , $f=1MHz$ , Between I/O pins                                                               |      | 1.8  | 3.0  |         |

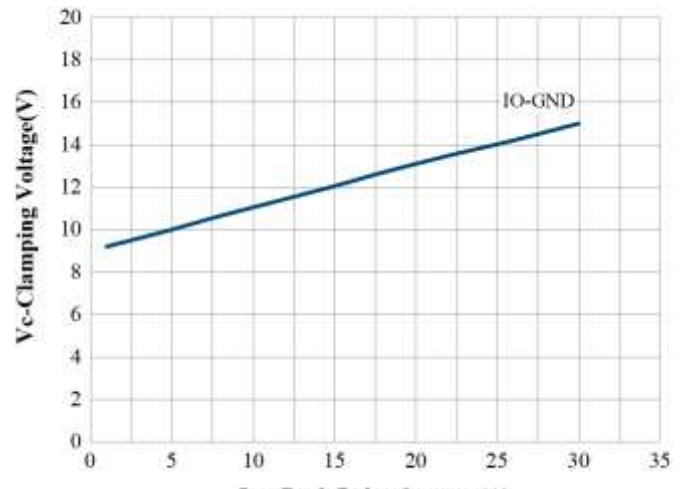
Table-4 Electrical Characteristics

Note 1: Ratings with 2 pins connected together per the recommended configuration (ie pin 1 connected to pin 10, pin 2 connected to pin 9, pin 4 connected to pin 7, and pin 5 connected to pin 6).

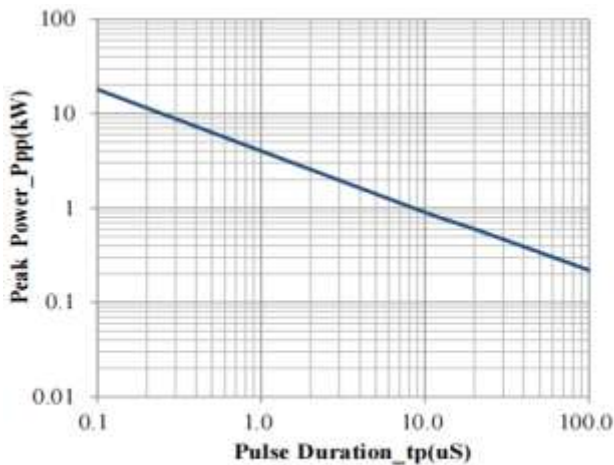
## 7. Typical Characteristic



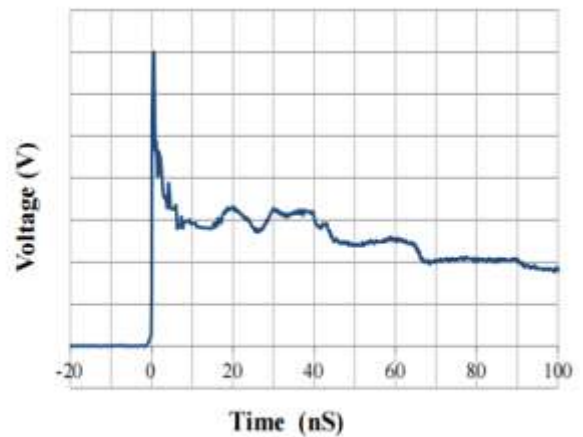
**Junction Capacitance vs. Reverse Voltage**



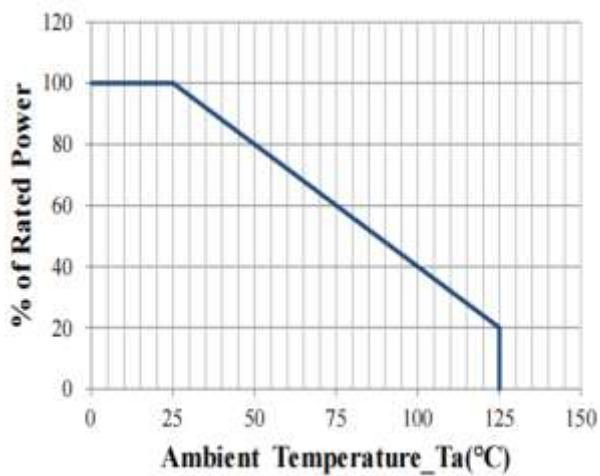
**Clamping Voltage vs. Peak Pulse Current**



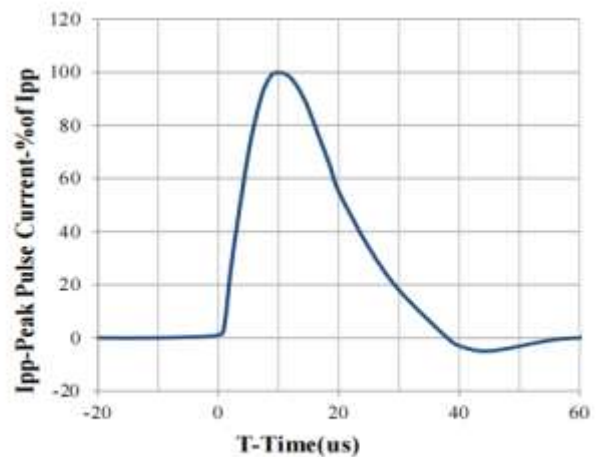
**Peak Pulse Power vs. Pulse Time**



**IEC61000-4-2 Pulse Waveform**



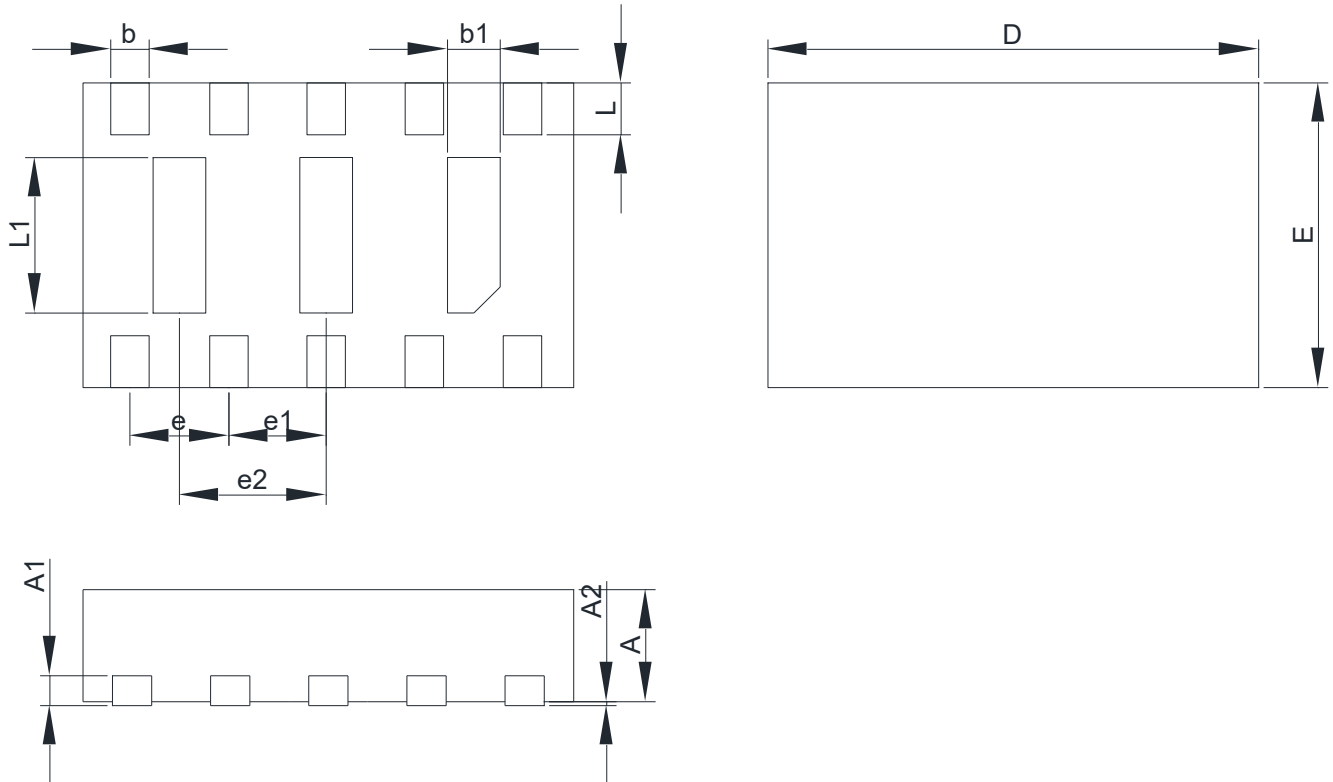
**Power Derating Curve**



**8 X 20us Pulse Waveform**

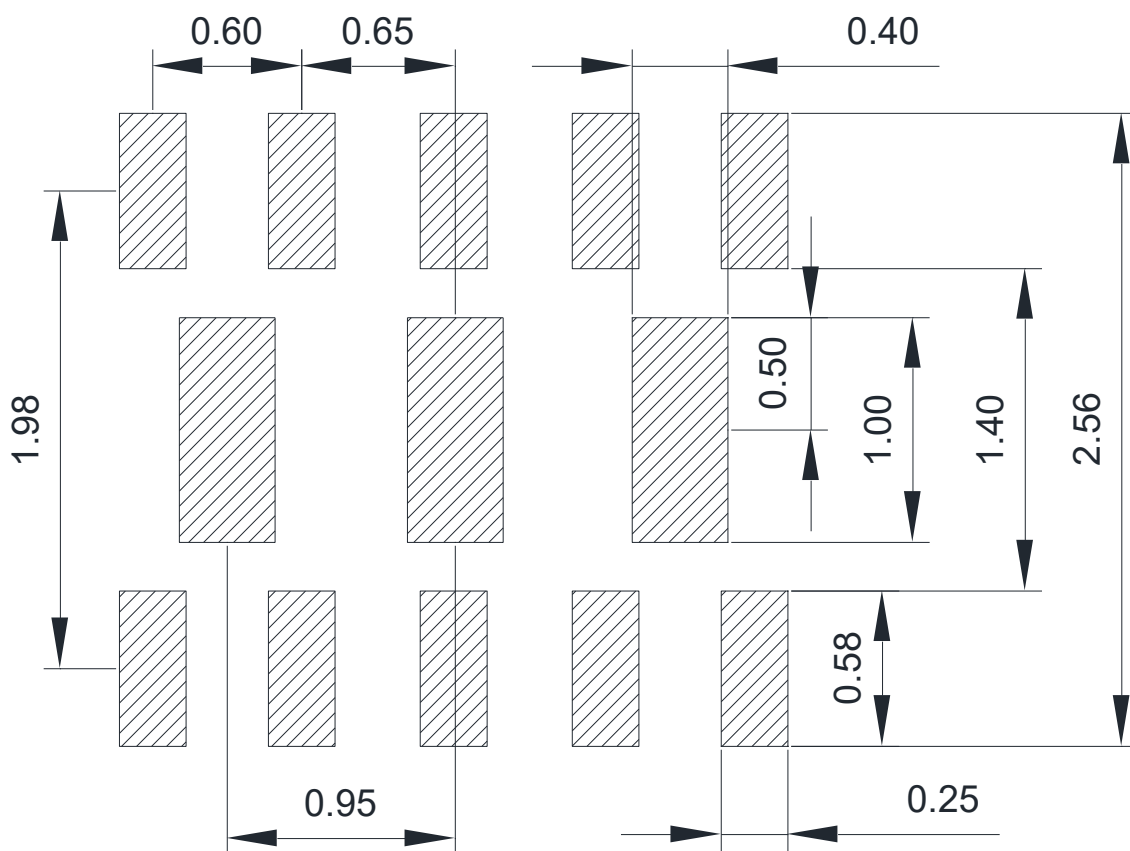
## 8. Dimension (DFN2030-10L)

POD (T)



| Dimensions in Millimeter |      |      |      |        |         |      |      |
|--------------------------|------|------|------|--------|---------|------|------|
| Symbol                   | Min. | Nom. | Max. | Symbol | Min.    | Nom. | Max. |
| D                        | 2.95 | 3.00 | 3.05 | e      | 0.60BSC |      |      |
| E                        | 1.95 | 2.00 | 2.05 | e1     | 0.65BSC |      |      |
| b                        | 0.15 | 0.20 | 0.25 | e2     | 0.95BSC |      |      |
| L                        | 0.25 | 0.30 | 0.35 | A      | 0.45    | 0.50 | 0.55 |
| b1                       | 0.30 | 0.35 | 0.40 | A1     | 0.15REF |      |      |
| L1                       | 0.95 | 1.00 | 1.05 | A2     | 0.00    | -    | 0.05 |

## 9. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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