

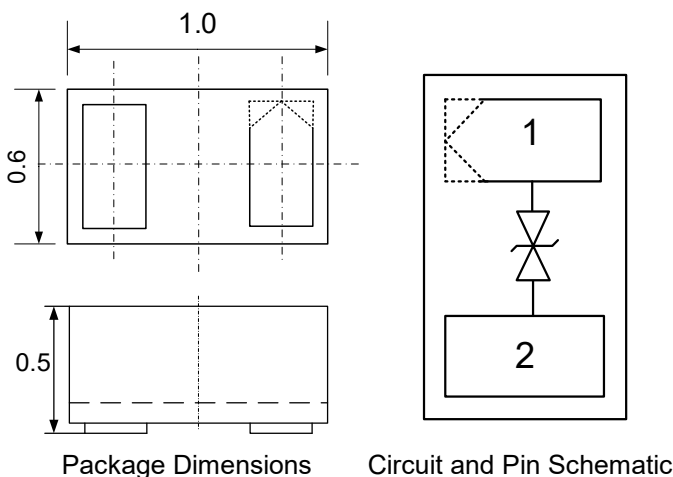
## Description

The DL3321P1S is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast re-sponse time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The DL3321P1S has an ultra-low capacitance with a typical value at 0.6pF, and complies with the IEC 61000-4-2 (ESD) with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into a DFN1006-2 leadfree package. The small size, ultra-low capacitance and high ESD surge protection make DL3321P1S an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

## Mechanical Characteristics

- ◆ Package: DFN1006-2 (1.0 x0.6 x0.5mm)
- ◆ Case Material: "Green" Molding Compound.
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

## Dimensions and Pin Configuration



Package Dimensions

Circuit and Pin Schematic

## Features

- ◆ Ultra small package: 1.0 x0.6 x0.5mm
- ◆ Ultra low capacitance: 0.6pF typical
- ◆ Ultra low leakage: nA level
- ◆ Operating voltage: 3.3V
- ◆ Low clamping voltage
- ◆ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
  - IEC61000-4-5 (Lightning) 12A (8/20 $\mu\text{s}$ )
- ◆ RoHS Compliant

## Applications

- ◆ Ethernet 10/100/1000 Base T

Caution:



This Device is designed for signal line protection only.

Not intended to be used under bias, not for application with a power line.

## Marking Information



## Ordering Information

Part Number	Marking	Packaging	Reel Size
DL3321P1S	AS	10000/Tape & Reel	7 inch

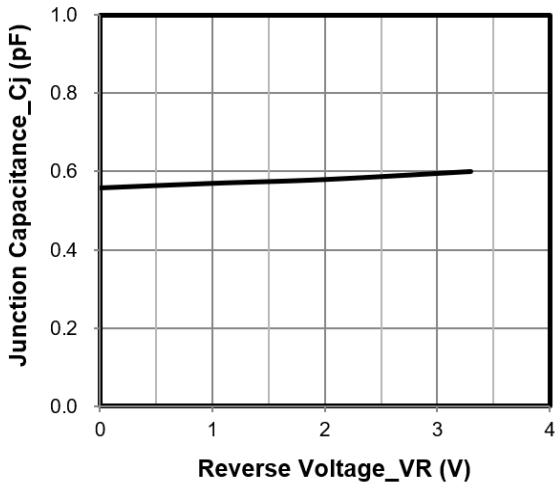
### **Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)**

Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20 $\mu\text{s}$ )	Ppk	60	W
Peak Pulse Current(8/20 $\mu\text{s}$ )	I <sub>PP</sub>	12	A
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	$\pm 30$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 30$	
Operating Temperature Range	T <sub>J</sub>	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	$^{\circ}\text{C}$

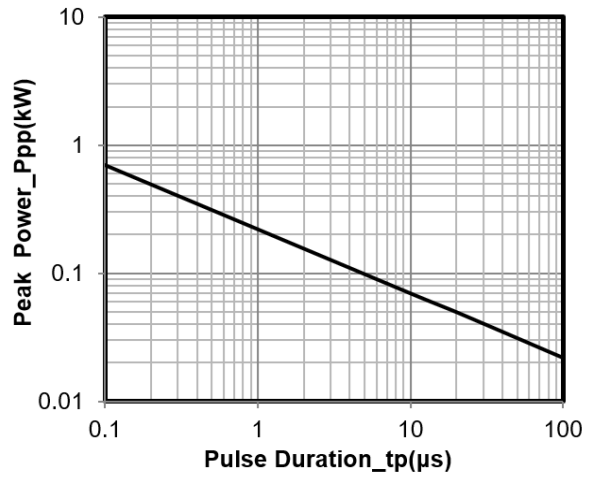
### **Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			3.3	V	
Punch-Through Voltage	V <sub>PT</sub>	3.5			V	I <sub>T</sub> = 2 $\mu\text{A}$
Snap-Back Voltage	V <sub>SB</sub>	0.8			V	I <sub>T</sub> = 50mA
Reverse Leakage Current	I <sub>R</sub>			0.2	$\mu\text{A}$	V <sub>RWM</sub> = 3.3V
Clamping Voltage	V <sub>C</sub>		4		V	I <sub>PP</sub> = 1A (8 x 20 $\mu\text{s}$ pulse)
Clamping Voltage	V <sub>C</sub>		6		V	I <sub>PP</sub> = 12A (8 x 20 $\mu\text{s}$ pulse)
Junction Capacitance	C <sub>J</sub>		0.6		pF	V <sub>R</sub> = 0V, f = 1MHz

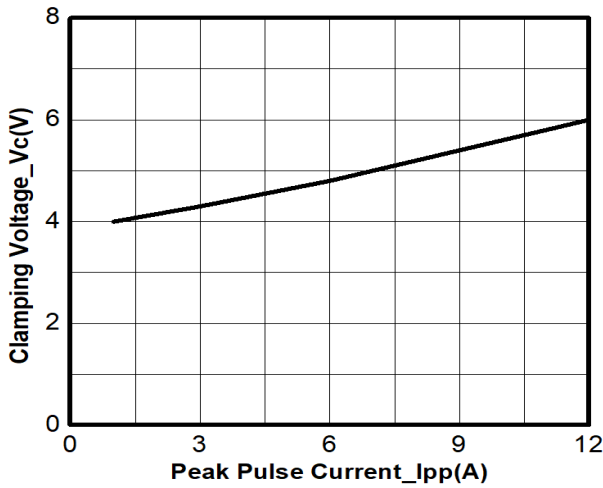
**Typical Performance Characteristics (TA=25°C unless otherwise Specified)**



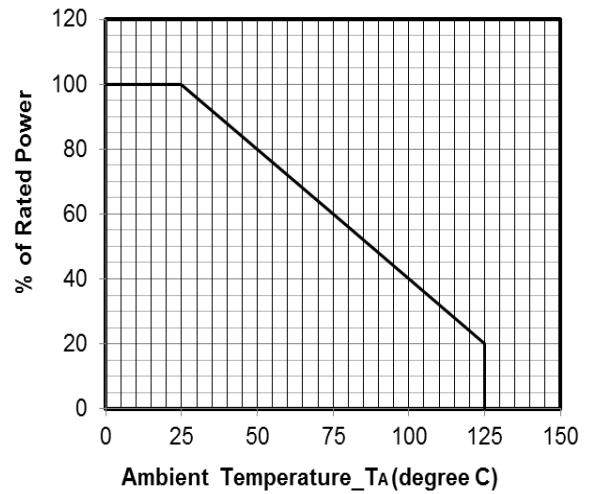
**Junction Capacitance vs. Reverse Voltage**



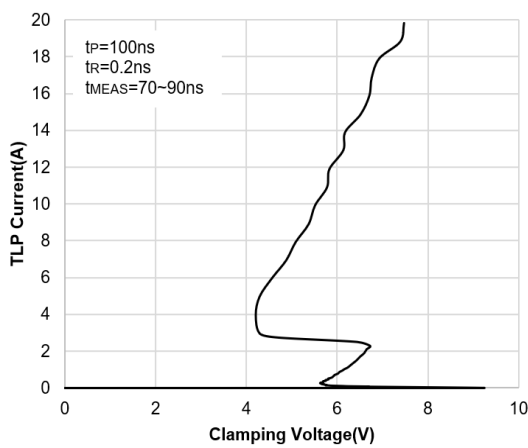
**Peak Pulse Power vs. Pulse Time**



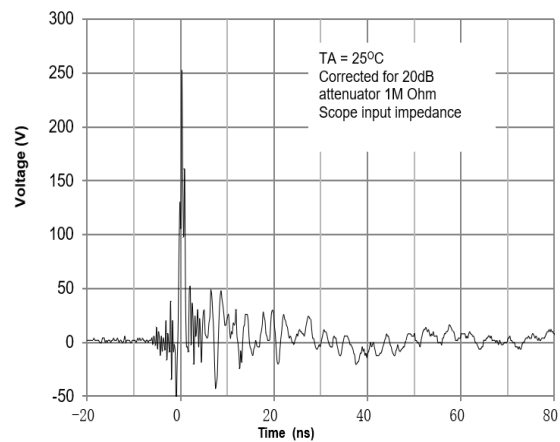
**Clamping Voltage vs. Peak Pulse Current**



**Power Derating Curve**



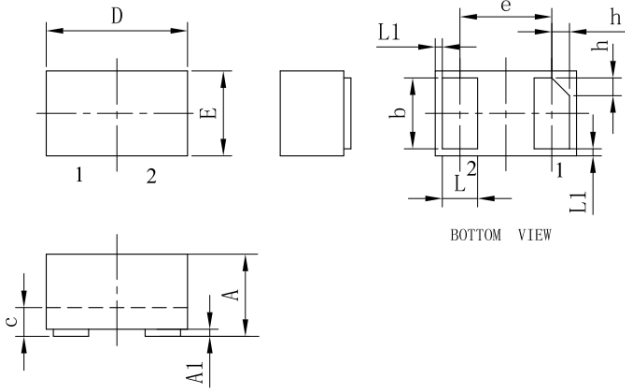
**TLP I/V Curve**



**ESD Clamping Voltage**

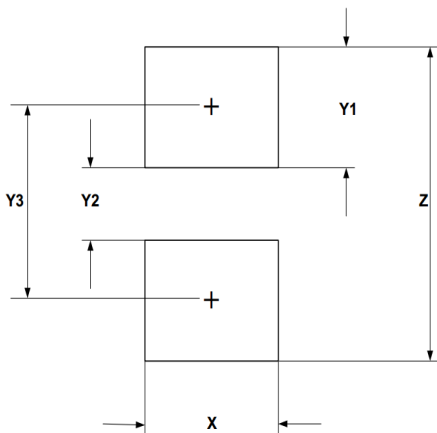
**8 kV Contact per IEC61000-4-2**

## DFN1006-2 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.450	0.500	0.550	0.018	0.020	0.022
A1	0.000	0.020	0.050	0.000	0.001	0.002
b	0.450	0.50	0.550	0.018	0.020	0.022
c	0.120	0.150	0.180	0.005	0.006	0.007
D	0.950	1.000	1.050	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.05REF			0.002REF		
h	0.07	0.12	0.17	0.003	0.005	0.007

## Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052

## Contact Information

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