

Description

The DC3321P1 is a 3.3V bi-directional ESD protection diode, utilizing leading monolithic silicon technology to provide fast response time and ultra low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive data and power line. The DC3321P1 complies with the IEC 61000-4-2 (ESD) standard with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into an ultra-small 1.0 x 0.6 x 0.5mm lead-free DFN package. The small size and high ESD surge protection make DC3321P1 an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

Features

- ◆ Ultra small package: 1.0 x 0.6 x 0.5mm
- ◆ Protects one data line
- ◆ Ultra low leakage: nA level
- ◆ Operating voltage: 3.3V
- ◆ Ultra 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) 8A (8/20 μs)
- ◆ RoHS Compliant

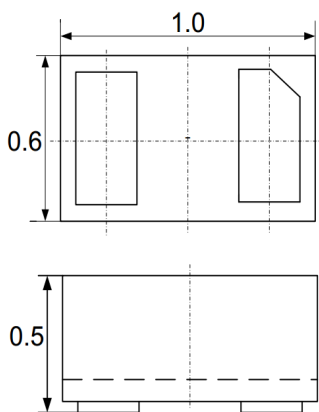
Mechanical Characteristics

- ◆ Package: DFN1006-2 (1.0 x 0.6 x 0.5mm)
- ◆ Case Material: "Green" Molding Compound.
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

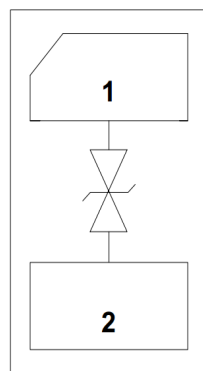
Applications

- ◆ Cellular Handsets and Accessories
- ◆ Personal Digital Assistants
- ◆ Notebooks and Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ Peripherals
- ◆ Audio Players
- ◆ Keypads, Side Keys, LCD Displays

Dimensions and Pin Configuration



Package Dimensions



Circuit and Pin Schematic

Marking Information



Ordering Information

| Part Number | Marking | Packaging | Reel Size |
|-------------|---------|-------------------|-----------|
| DC3321P1 | 3X | 10000/Tape & Reel | 7 inch |

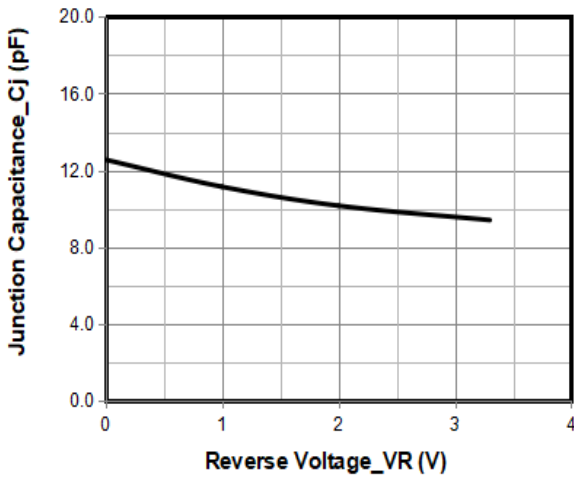
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter | Symbol | Value | Unit |
|---|------------------|-------------|------|
| Peak Pulse Power(8/20 μs) | Ppk | 80 | W |
| Peak Pulse Current(8/20 μs) | I _{PP} | 8 | A |
| ESD per IEC 61000-4-2 (Air) | V _{ESD} | ±30 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ±30 | |
| Operating Temperature Range | T _J | -55 to +125 | °C |
| Storage Temperature Range | T _{stg} | -55 to +150 | °C |

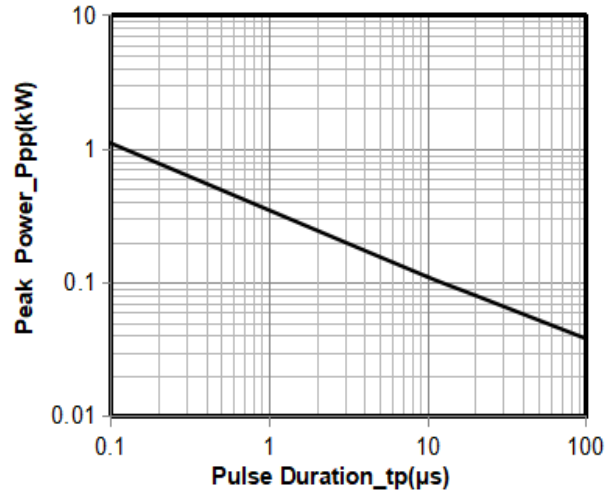
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------|------------------|-----|------|-----|------|---|
| Reverse Working Voltage | V _{RWM} | | | 3.3 | V | |
| Punch-Through Voltage | V _{PT} | 3.4 | | | V | I _T = 2 μA |
| Snap-Back Voltage | V _{SB} | 3.4 | | | V | I _T = 1mA |
| Reverse Leakage Current | I _R | | 5 | 50 | nA | V _{RWM} = 3.3V |
| Clamping Voltage | V _C | | | 6 | V | I _{PP} = 1A (8 x 20 μs pulse) |
| Clamping Voltage | V _C | | | 8 | V | I _{PP} = 5A (8 x 20 μs pulse) |
| Clamping Voltage | V _C | | | 10 | V | I _{PP} = 8A (8 x 20 μs pulse) |
| Junction Capacitance | C _J | | 12.5 | 25 | pF | V _R = 0V, f = 1MHz |

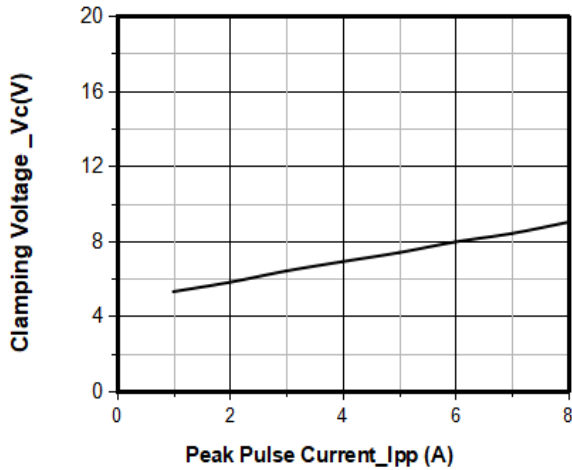
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



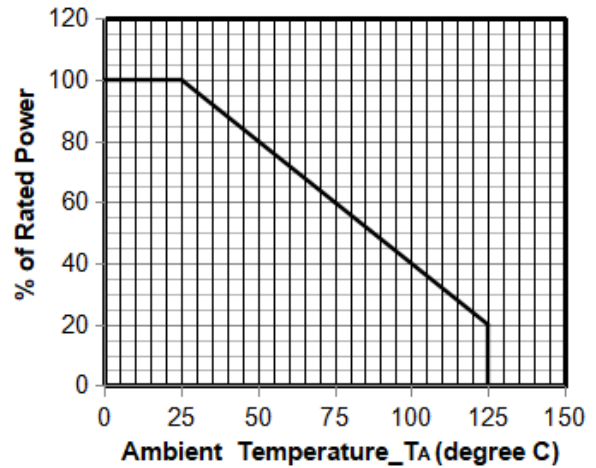
Junction Capacitance vs. Reverse Voltage



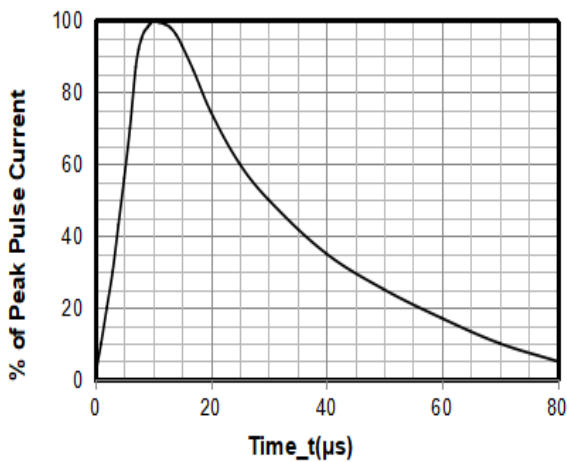
Peak Pulse Power vs. Pulse Time



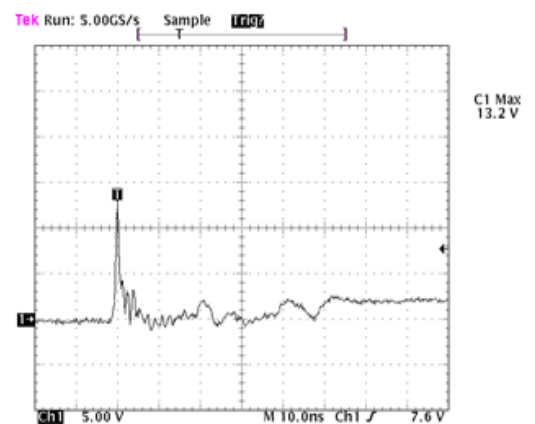
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20 s Pulse Waveform

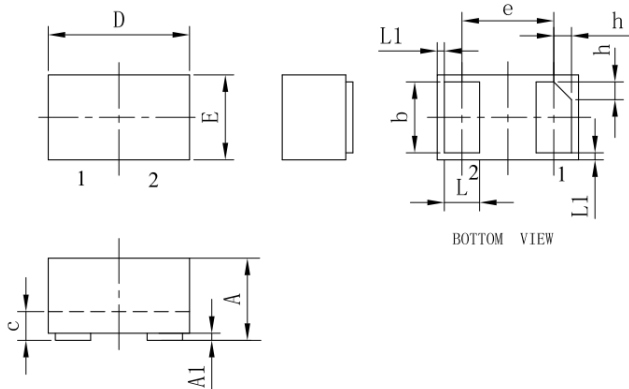


Note: Data is taken with a 10x attenuator

ESD Clamping Voltage

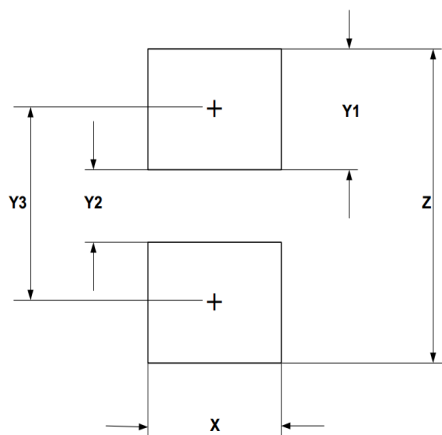
8 kV Contact per IEC61000-4-2

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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