



## Features

- ❑ Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD)  $\pm 17\text{kV}$  (Air)
  - $\pm 8\text{kV}$  (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- ❑ Package optimized for high-speed lines
- ❑ Ultra-small package (1.0mm×0.6mm×0.55mm)
- ❑ Protects one data, control or power line
- ❑ Low capacitance: 0.15pF (Typical)
- ❑ Low leakage current: 0.1uA @  $V_{\text{RWM}}$  (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge
- ❑ ROHS compliant

## Mechanical Characteristics

- ❑ DFN1006-2L package
- ❑ Flammability Rating: UL 94V-0
- ❑ Packaging: Tape and Reel

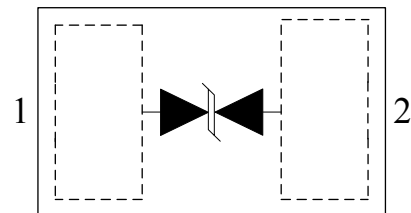
## Applications

- ❑ Serial ATA
- ❑ PCI Express
- ❑ Desktops, Servers and Notebooks
- ❑ Cellular Phones
- ❑ MDDI Ports
- ❑ USB2.0/3.0/3.1 Power and Data Line Protection
- ❑ Display Ports
- ❑ Digital Visual Interfaces (DVI)
- ❑ HDMI 1.4/2.0

## Circuit Diagram



## Pin Configuration



DFN1006-2L  
(Top View)

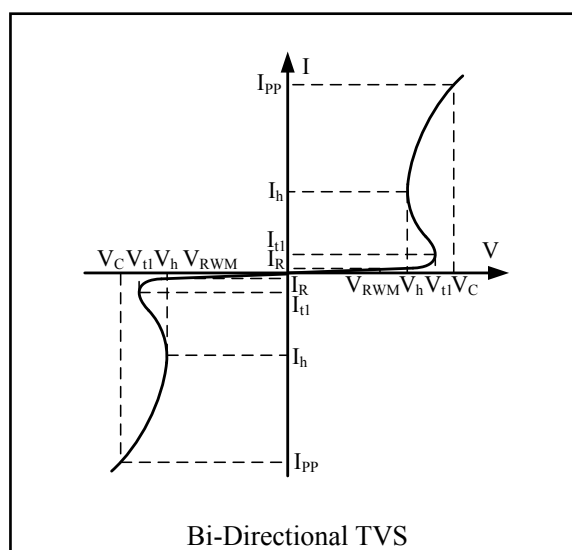


## Absolute Maximum Rating

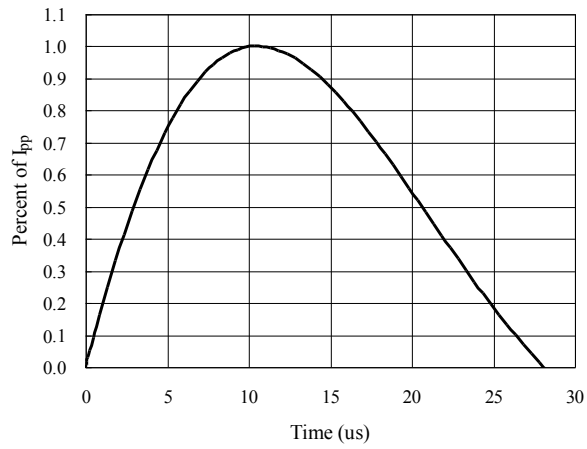
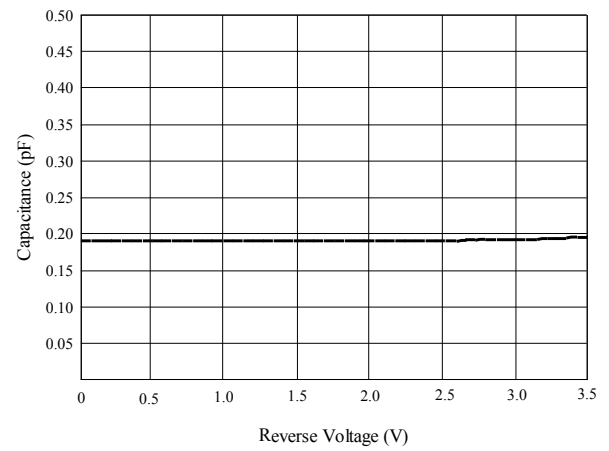
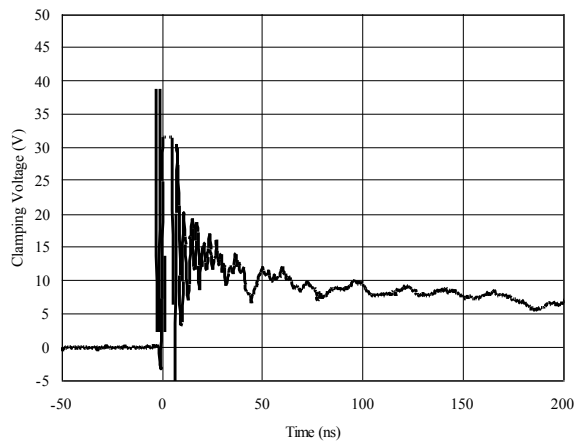
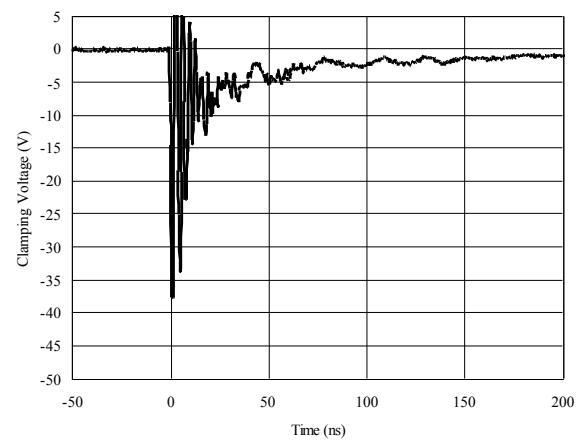
| Symbol    | Parameter                                                     | Value                | Units       |
|-----------|---------------------------------------------------------------|----------------------|-------------|
| $I_{PP}$  | Peak Pulse Current( $t_p=8/20\mu s$ )                         | 5                    | A           |
| $V_{ESD}$ | ESD per IEC 61000-4-2(Air)<br>ESD per IEC 61000-4-2 (Contact) | $\pm 17$<br>$\pm 10$ | kV          |
| $T_{OPT}$ | Operating Temperature                                         | $-55/+125$           | $^{\circ}C$ |
| $T_{STG}$ | Storage Temperature                                           | $-55/+150$           | $^{\circ}C$ |

## Electrical Characteristics (T = 25 $^{\circ}C$ )

| Symbol    | Parameter                           |
|-----------|-------------------------------------|
| $V_{RWM}$ | Nominal Reverse Working Voltage     |
| $I_R$     | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{tl}$  | Trigger Voltage                     |
| $I_{tl}$  | Trigger Current @ $V_{tl}$          |
| $V_h$     | Holding Voltage                     |
| $I_h$     | Holding Current @ $V_h$             |
| $V_C$     | Clamping Voltage @ $I_{PP}$         |
| $I_{PP}$  | Maximum Peak Pulse Current          |
| $C_d$     | Diode Capacitance                   |



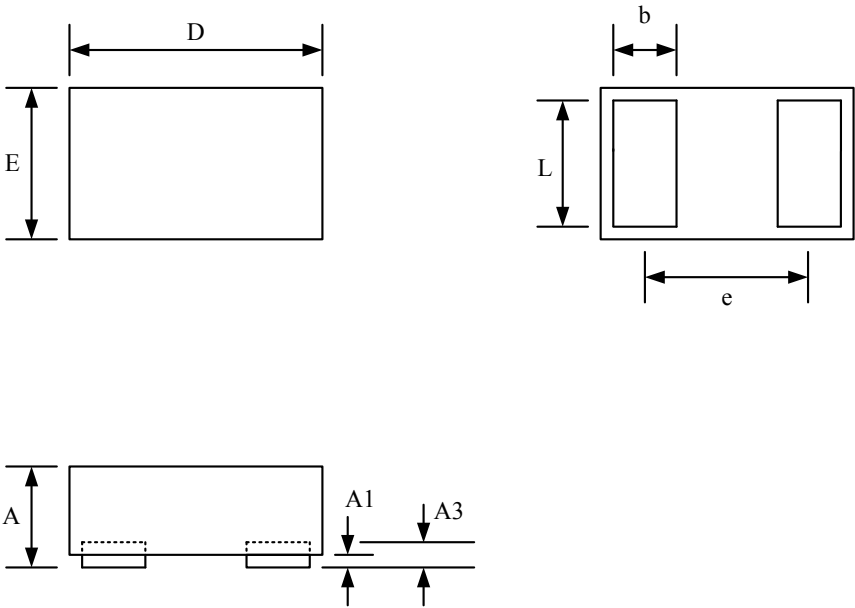
| Symbol    | Test Condition                    | Minimum | Typical | Maximum | Units   |
|-----------|-----------------------------------|---------|---------|---------|---------|
| $V_{RWM}$ |                                   |         |         | 3.3     | V       |
| $I_R$     | $V_{RWM} = 3.3V, T = 25^{\circ}C$ |         | 0.1     | 0.5     | $\mu A$ |
| $V_{tl}$  | $I_{tl} = 10\mu A$                | 6.5     |         | 8.5     | V       |
| $V_h$     | $I_h = 30mA$                      |         | 2.4     |         | V       |
| $V_C$     | $I_{PP} = 1A, t_p = 8/20\mu s$    |         |         | 4.0     | V       |
| $V_C$     | $I_{PP} = 5A, t_p = 8/20\mu s$    |         |         | 5.0     | V       |
| $C_d$     | $V_R = 0V, f = 1MHz$              |         | 0.15    | 0.19    | pF      |

**8/20 $\mu$ s Pulse Waveform****Capacitance vs. Reverse Voltage****ESD Clamping of I/O to GND  
(+8kV Contact per IEC 61000-4-2)****ESD Clamping of I/O to GND  
(-8kV Contact per IEC 61000-4-2)**



Package Outline

- DFN1006-2L package
- 2 leads, very small package
- MSL-1

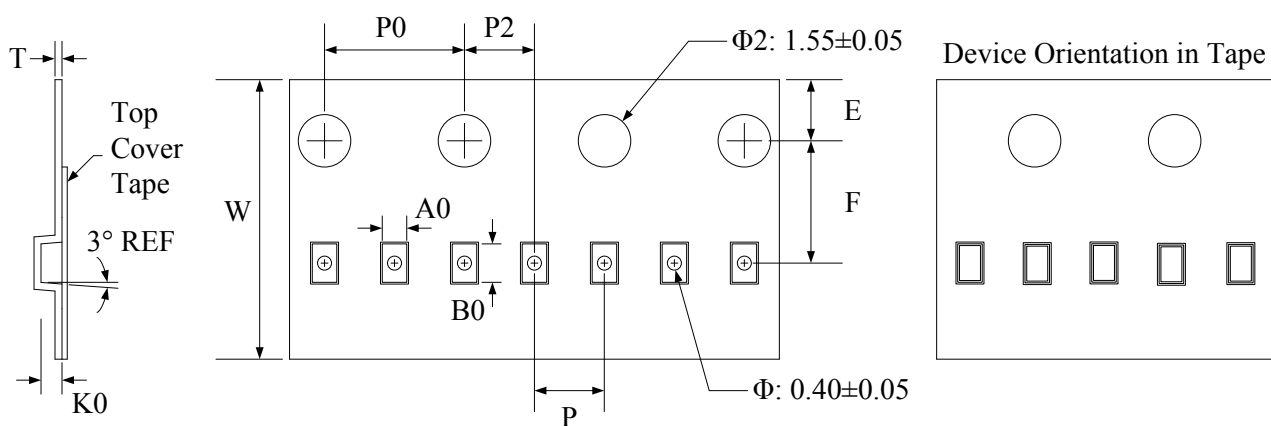


Package Dimensions (Controlling dimensions are in millimeters)

| Symbol | Dimensions In Millimeters |         | Dimensions In Inches |         |
|--------|---------------------------|---------|----------------------|---------|
|        | Minimum                   | Maximum | Minimum              | Maximum |
| A      | 0.400                     | 0.550   | 0.016                | 0.022   |
| A1     | 0.000                     | 0.050   | 0.000                | 0.002   |
| A3     | 0.125 REF                 |         | 0.005 REF            |         |
| D      | 0.950                     | 1.050   | 0.037                | 0.041   |
| E      | 0.550                     | 0.650   | 0.022                | 0.026   |
| b      | 0.200                     | 0.300   | 0.008                | 0.012   |
| e      | 0.650 BSC                 |         | 0.026 BSC            |         |
| L      | 0.450                     | 0.550   | 0.018                | 0.022   |

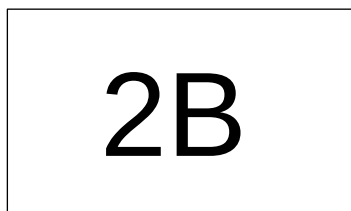


## Tape and Reel Specification



| Symbol          | W        | A0       | B0        | K0        | E        | F        | P       | P0      | P2       | T        |
|-----------------|----------|----------|-----------|-----------|----------|----------|---------|---------|----------|----------|
| Dimensions (mm) | 8.00±0.1 | 0.7±0.05 | 1.15±0.05 | 0.55±0.05 | 1.75±0.1 | 3.5±0.05 | 2.0±0.1 | 4.0±0.1 | 2.0±0.05 | 0.2±0.05 |

## Marking Codes



## Ordering Information

| Part Number  | Working Voltage | Quantity Per Reel | Reel Size |
|--------------|-----------------|-------------------|-----------|
| ESDQR3V3BX-T | 3.3V            | 10,000            | 7 Inch    |