

### DFN1006 Plastic-Encapsulate ESD Protection Diodes

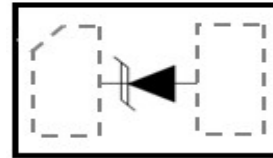
## DESCRIPTION

ESD0501L is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With a typical capacitance of 0.4pF, ESD0501L is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc. ESD0501L uses the ultra-small DFN1006 package. Each ESD0501L device can protect one high-speed data line. It offers system designers flexibility to protect single data lines where space is a premium concern. The combined features of low capacitance, ultra-small size, and high ESD robustness make ESD0501L ideal for high-speed data ports and high-frequency line applications, such as cellular phones and HD visual devices.

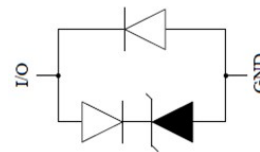
## Features

- ◆ Peak Power Dissipation : 60W (8/20 $\mu\text{s}$ )
- ◆ Transient protection for high speed data lines
- ◆ IEC61000-4-2 (ESD)  $\pm 15\text{kV}$  (air),  $\pm 8\text{kV}$  (contact)
- ◆ IEC61000-4-4 (EFT) 40A (5/50ns)  
Cable Discharge Event (CDE)
- ◆ Package optimized for high-speed lines
- ◆ Low clamping voltage
- ◆ Low Capacitance :0.4pF(Typical)
- ◆ Low leakage current

## Pin Configuration



## Circuit Diagram



## Mechanical Characteristics

- ◆ Package: DFN1006
- ◆ Flammability Rating: UL 94V-0
- ◆ Packaging: Tape and Reel
- ◆ Terminals: Gold plated, solderable per MIL-STD-750, method 2026
- ◆ Marking: 5L

## Applications

- ◆ Serial ATA
- ◆ Desktops, Servers and Notebooks
- ◆ Cellular Phones
- ◆ MDDI Ports
- ◆ USB Data Line Protection
- ◆ Display Ports
- ◆ Digital Visual Interfaced (DVI)

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

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	VESD	$\pm 20$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 20$	
Peak Pulse Power( $t_p=8/20\mu\text{s}$ waveform)	PPP	60	W
Operating Temperature	$T_{OPT}$	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature – Maximum (10 Second Duration)	$T_L$	260(10 sec.)	$^\circ\text{C}$

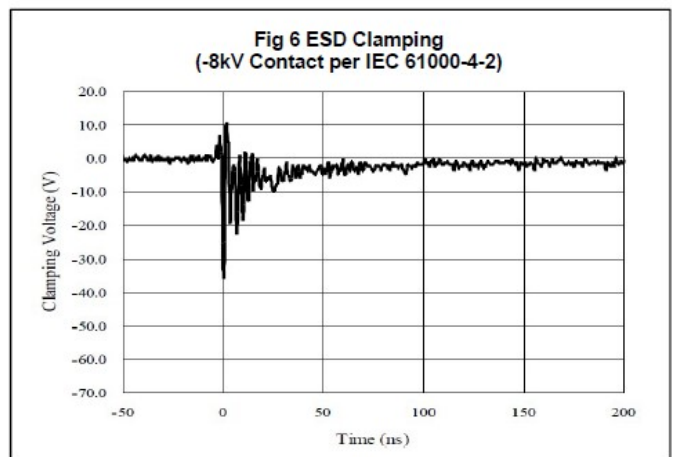
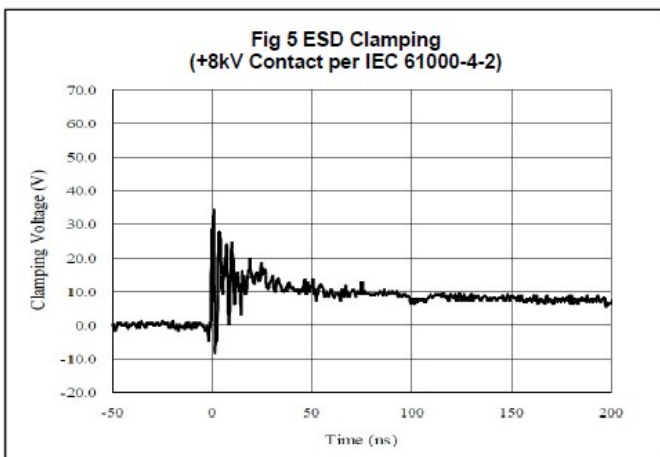
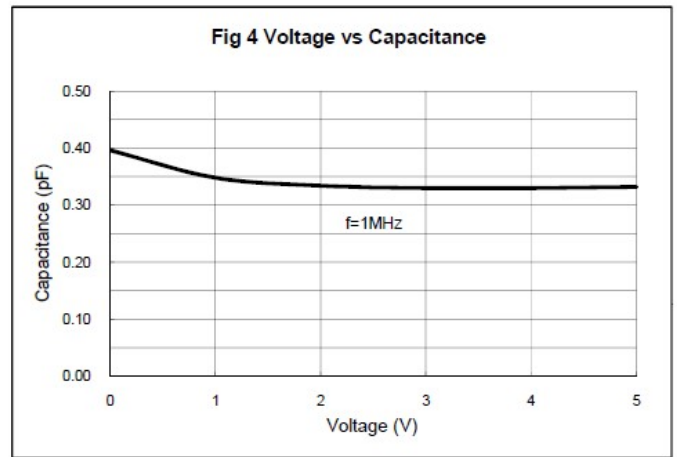
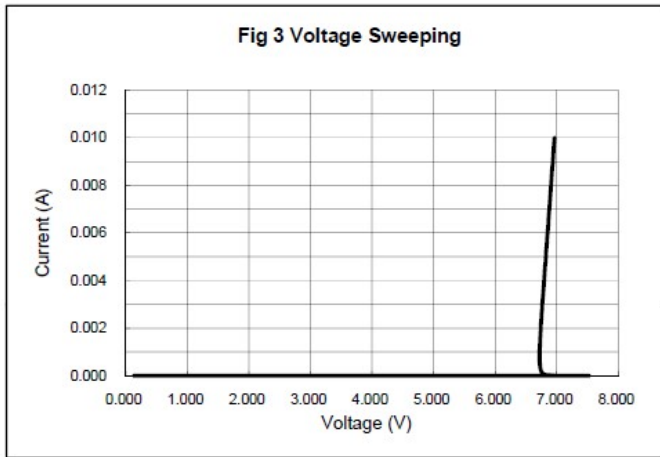
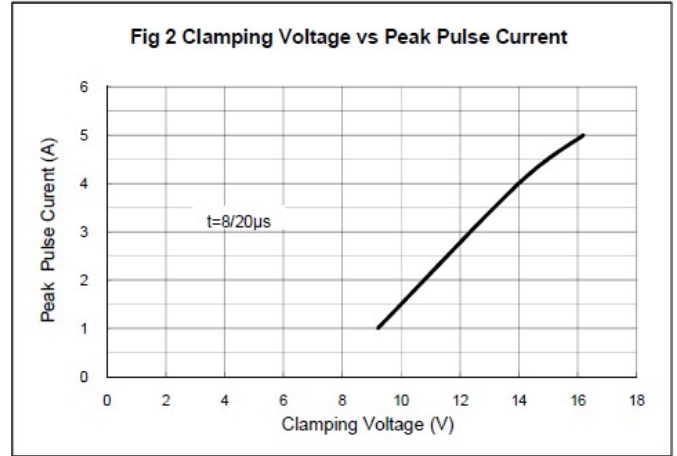
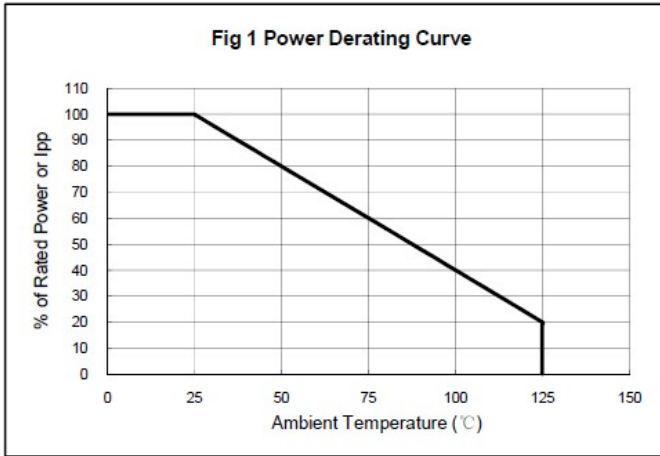
The above data are for reference only.

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

Symbol	Param	Test Condition	Min	Typ	Max	Units
$V_{RWM}$	Reverse Working Voltage				5.0	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T = 1\text{mA}$	6			V
$I_R$	Reverse Leakage Current	$V_{RWM} = 5\text{V}$			100	nA
$V_C$	Clamping Voltage	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$			10	V
		$I_{PP} = 4\text{A}, t_p = 8/20\mu\text{s}$			15	V
$C_J$	Junction Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$		0.4	0.5	pF

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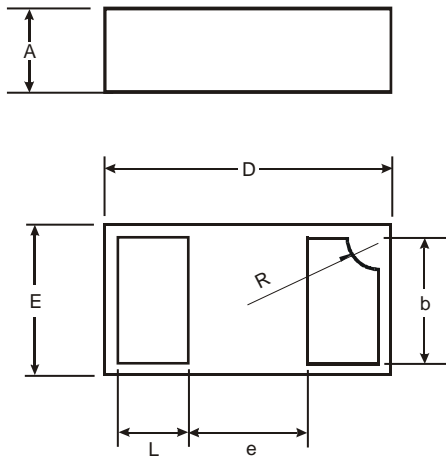
### ELECTRICAL CHARACTERISTICS CURVE



The curve above is for reference only.

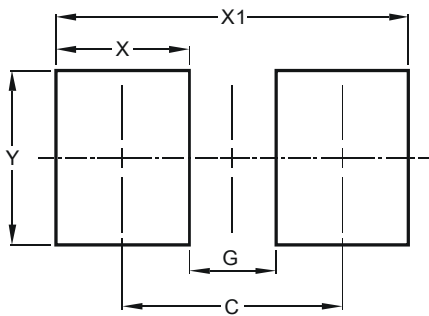
### Outlitne Drawing

#### DFN1006 Package Outline Dimensions



DFN1006			
Dim	Min	Max	Typ
A	0.45	0.55	0.50
b	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.40
L	0.20	0.30	0.25
R	0.07	0.17	0.12
All Dimensions in mm			

### Suggested Pad Layout



Dimensions	Value (in mm)
C	0.90
G	0.40
X	0.50
X1	1.10
Y	0.50

#### Note:

1. Controlling dimension: in/millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
DFN1006	7'	178	10,000	210×210×205	100,000	445×445×230	400,000