

## Ultra Low Capacitance TVS/ESD Protection Diode

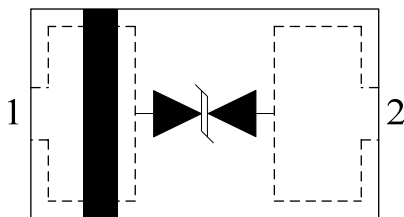
### DESCRIPTION

GESD0801S-12 is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.35pF only, GESD0801S-12 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. GESD0801S-12 uses ultra-small DFN1006 package. Each GESD0801S-12 device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make GESD0801S-12 ideal for high-speed data port and high-frequency line (e.g., USB 2.0 & antenna line) applications, such as cellular phones and HD visual devices.

### ORDERING INFORMATION

- ✧ Device: GESD0801S-12
- ✧ Package: DFN1006
- ✧ Marking: C5
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 10,000pcs

### PIN CONFIGURATION



### FEATURES

- ✧ Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD)  $\pm 15\text{kV}$  (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 $\times$ 0.6mm $\times$ 0.55mm)
- ✧ Protects one data, control or power line
- ✧ Low capacitance: 0.35pF (Typical)
- ✧ Low leakage current: 10nA @ VRWM (Typical)
- ✧ Low clamping voltage
- ✧ Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge

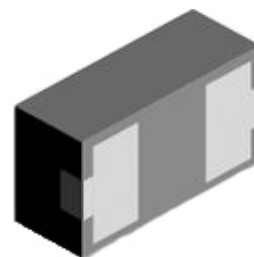
### MACHANICAL DATA

- ✧ DFN1006 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed:  $260^{\circ}\text{C}/10\text{s}$
- ✧ Reel size: 7 inch

### APPLICATIONS

- ✧ Serial ATA
- ✧ USB Ports
- ✧ PCI Express
- ✧ Cellular Phones
- ✧ Desktops, Servers and Notebooks

### PACKAGE OUTLINE



## ABSOLUTE MAXIMUM RATING

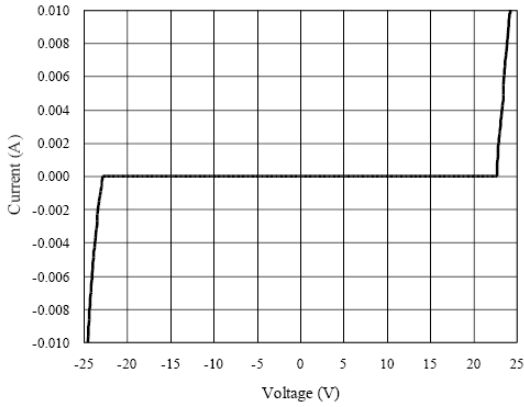
Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (8/20μs)	20	W
V <sub>ESD</sub>	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±15 ±12	kV
T <sub>OPT</sub>	Operating Temperature	-55/+125	°C
T <sub>STG</sub>	Storage Temperature	-55/+150	°C

## ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C)

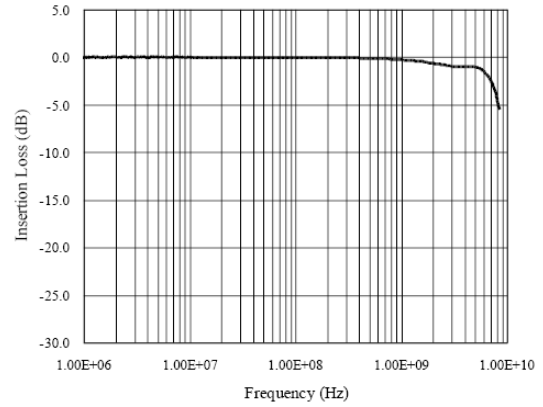
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>RWM</sub>	Reverse Working Voltage				12.0	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA		16		V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 12V		0.01	1.0	μA
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs		18	20	V
C <sub>J</sub>	Junction Capacitance	V <sub>R</sub> = 0V, f = 1MHz		0.35	0.50	pF

### ELECTRICAL CHARACTERISTICS CURVE

**Voltage Sweeping of I/O to I/O**

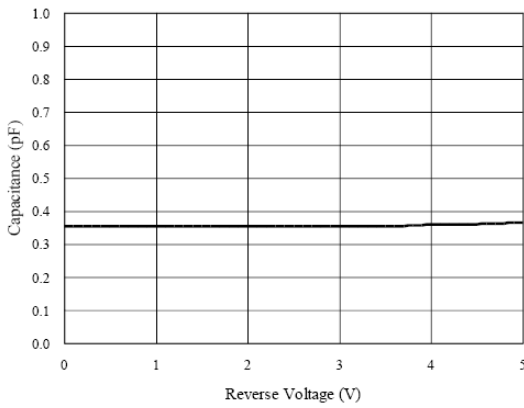


**Insertion Loss S21 of I/O to I/O**

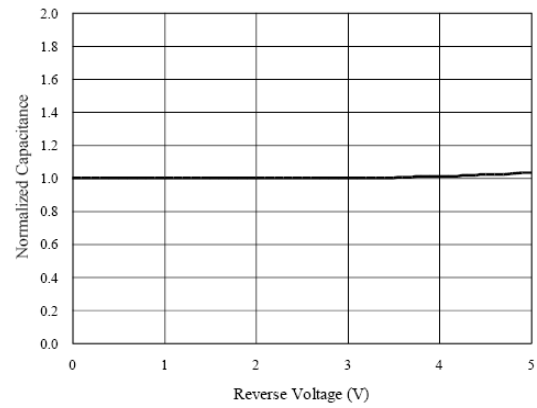


**Capacitance vs. Voltage of I/O to I/O (f = 1MHz)**

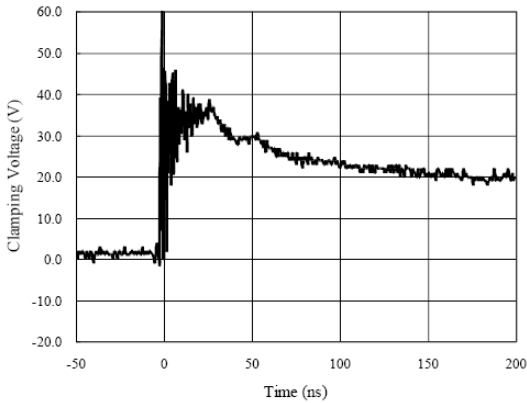
Capacitance vs. Reverse Voltage



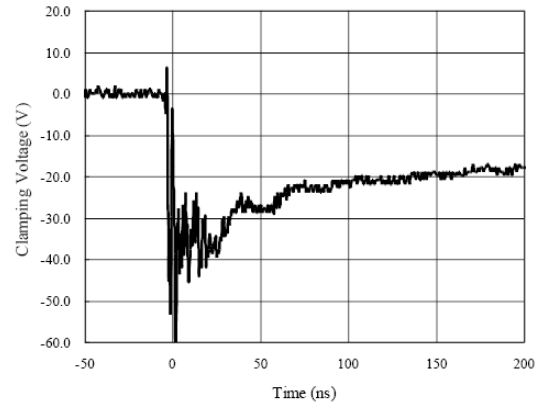
Normalized Capacitance vs. Reverse Voltage



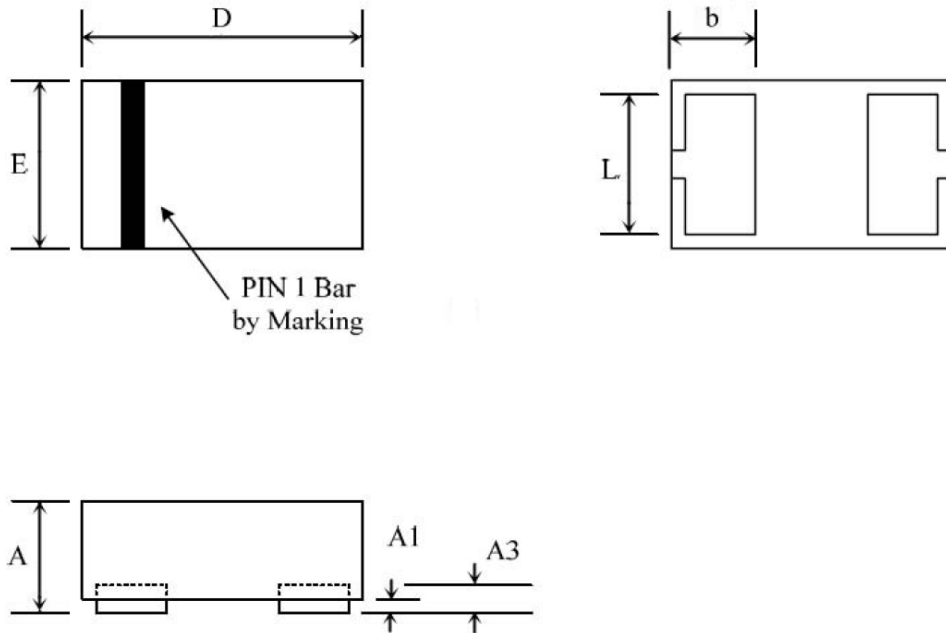
**ESD Clamping of I/O to I/O  
(+8kV Contact per IEC 61000-4-2)**



**ESD Clamping of I/O to I/O  
(-8kV Contact per IEC 61000-4-2)**



## DFN1006 PACKAGE OUTLINE DIMENSIONS



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
L	0.450	0.550	0.018	0.022
b	0.250	0.400	0.100	0.016