

## Ultra Low Capacitance TVS/ESD Protection Diode

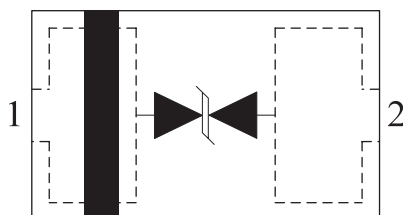
### DESCRIPTION

TEP0801S-12LC 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, TEP0801S-12LC 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. TEP0801S-12LC uses ultra-small DFN1006 package. Each TEP0801S-12LC 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 TEP0801S-12LC 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: TEP0801S-12LC
- ◇ 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

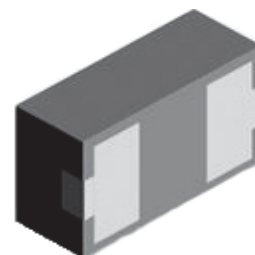
### MACHANICAL DATA

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

### APPLICATIONS

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

### PACKAGE OUTLINE



**ABSOLUTE MAXIMUM RATING**

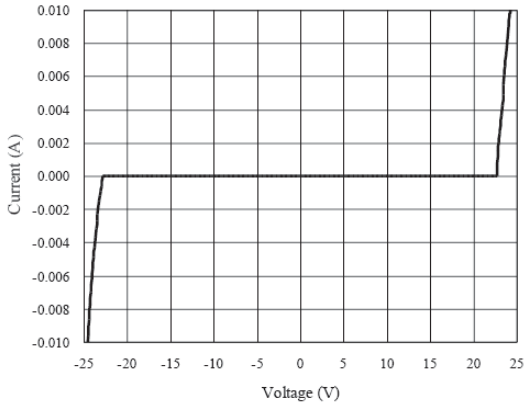
Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (8/20μs)	20	W
V <sub>ESD</sub>	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±15 ±12	kV
T <sub>OPT</sub>	Operating Temperature	-55/+125	°C
T <sub>STG</sub>	Storage Temperature	-55/+150	°C

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

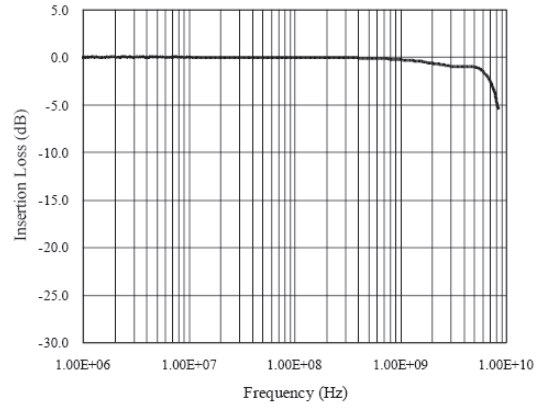
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>RWM</sub>	Reverse Working Voltage				12.0	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA		16		V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 12V		0.01	1.0	μA
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 1A, t <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

# RATING AND CHARACTERISTICS CURVES (TEP0801S-12LC)

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

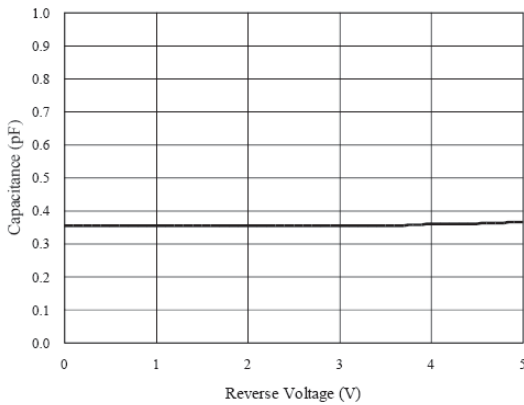


**Insertion Loss S21 of I/O to I/O**

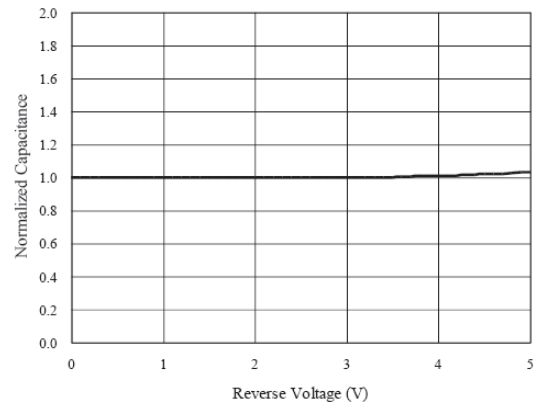


**Capacitance vs. Voltage of I/O to I/O (f = 1MHz)**

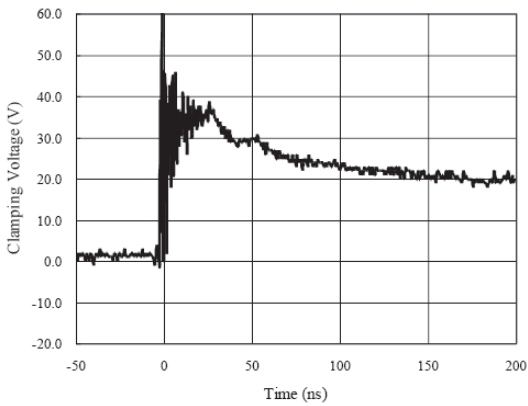
Capacitance vs. Reverse Voltage



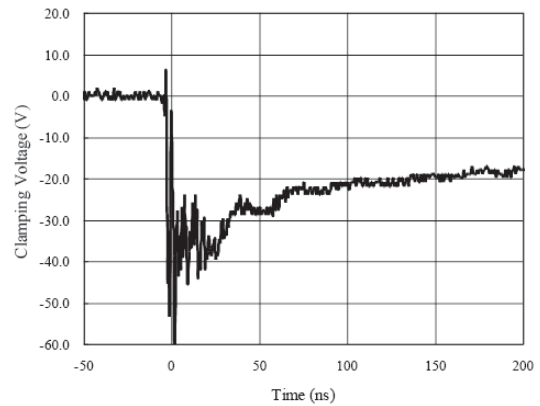
Normalized Capacitance vs. Reverse Voltage



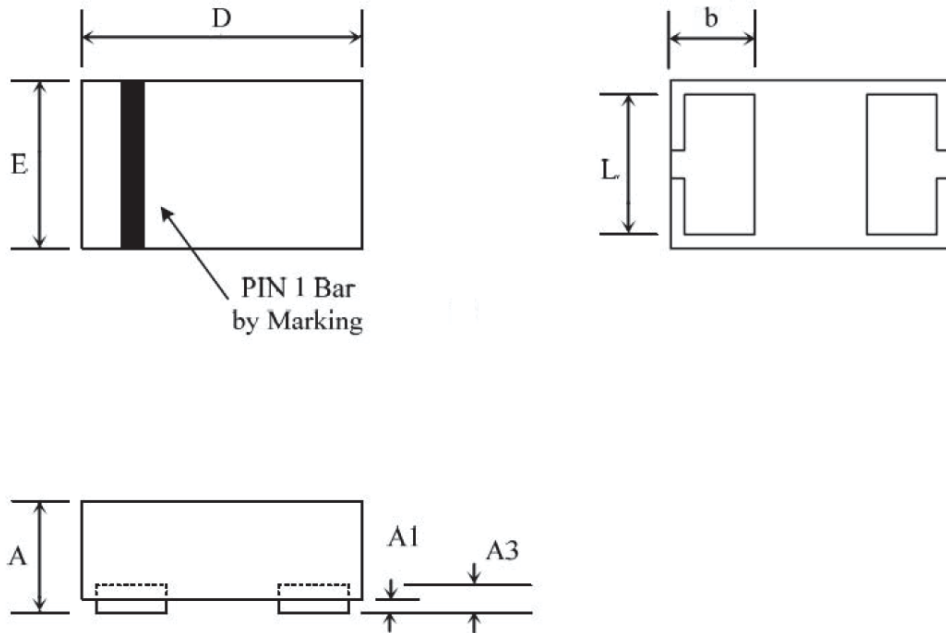
**ESD Clamping of I/O to I/O  
(+8kV Contact per IEC 61000-4-2)**



**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	0.50	1.050	0.03	0.041
E	0.550	0.650	0.022	0.026
L	0.450	0.550	0.018	0.022
□	0.250	0.400	0.100	0.016

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