

## Low Capacitance TVS/ESD Protection Diode

### DESCRIPTION

TEP0801MLC is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for data, control or power lines. With typical capacitance of 12pF only, TEP0801MLC 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.

TEP0801MLC uses ultra-small DFN1006 package. Each TEP0801MLC device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

### ORDERING INFORMATION

- ✧ Device: TEP0801MLC
- ✧ Package: DFN1006
- ✧ Marking: FM (F means Part no; M means the date code which is the assembly month in three years, changing as (1~9, 0, A~Z))
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 10,000pcs

### CIRCUIT DIAGRAM



### 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 $\times$ 0.4mm)
- ✧ Protects one data, control or power line
- ✧ Low capacitance: 12pF (Typical)
- ✧ Low leakage current: 100nA @  $V_{RWM}$  (Typical)
- ✧ Low clamping voltage
- ✧ Each I/O pin can withstand over 1000 ESD strikes for  $\pm 8\text{kV}$  contact discharge

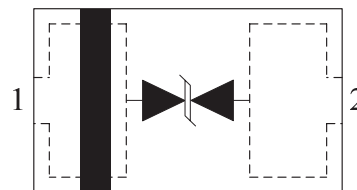
### MACHANICAL DATA

- ✧ 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

- ✧ Portable Electronics
- ✧ Desktops, Servers and Notebooks
- ✧ Cellular Phones
- ✧ MP3 Ports
- ✧ Digital Ports
- ✧ Subscriber Identity Module (SIM) card

### PIN CONFIGURATION



**ABSOLUTE MAXIMUM RATING**

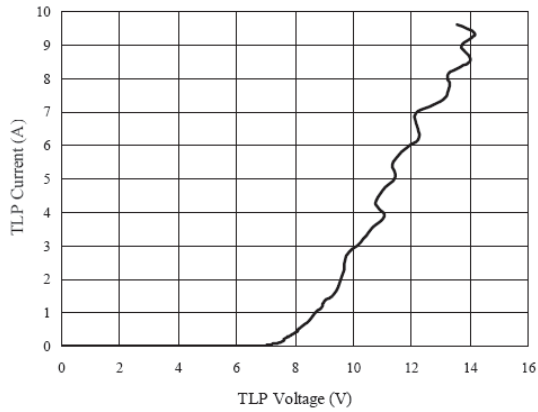
Symbol	Parameter	Value	Units
$V_{ESD}$	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$\pm 30$ $\pm 30$	kV
$T_{OPT}$	Operating Temperature	-55/+125	°C
$T_{STG}$	Storage Temperature	-55/+150	°C

**ELECTRICAL CHARACTERISTICS (Tamb=25°C)**

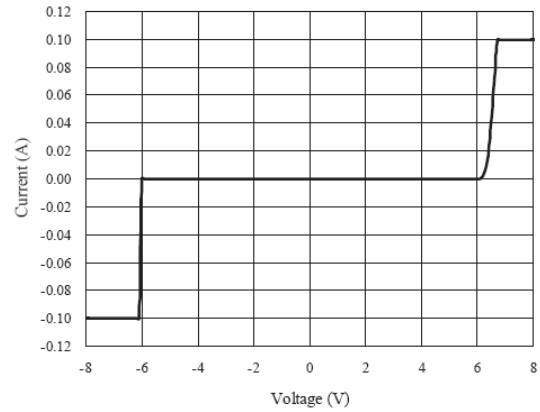
Symbol	Parameter	Test Condition	Min	Typ	Max	Units
$V_{RWM}$	Reverse Working Voltage				5.0	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T = 1\text{mA}$	5.5	6.0	8.0	V
$I_R$	Reverse Leakage Current	$V_{RWM} = 5\text{V}$		0.1	1.0	$\mu\text{A}$
$V_{C1}$	Clamping Voltage 1	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$			10	V
$V_{C2}$	Clamping Voltage 2	$I_{PP} = 4\text{A}$ , $t_p = 8/20\mu\text{s}$			15	V
$C_J$	Junction Capacitance	$V_R = 0\text{V}$ , $f = 1\text{MHz}$		12		pF

## RATING AND CHARACTERISTICS CURVES (TEP0801MLC)

TLP Measurement of I/O\_1 to I/O\_2

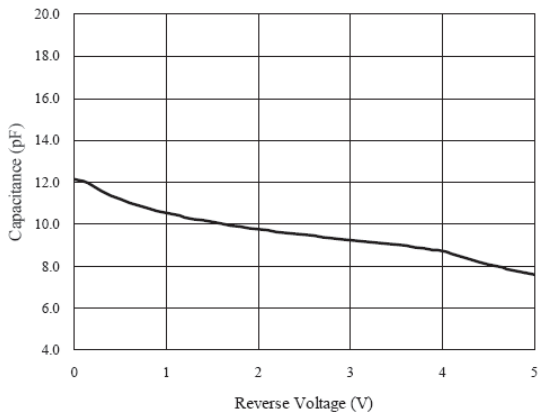


Voltage Sweeping of I/O\_1 to I/O\_2

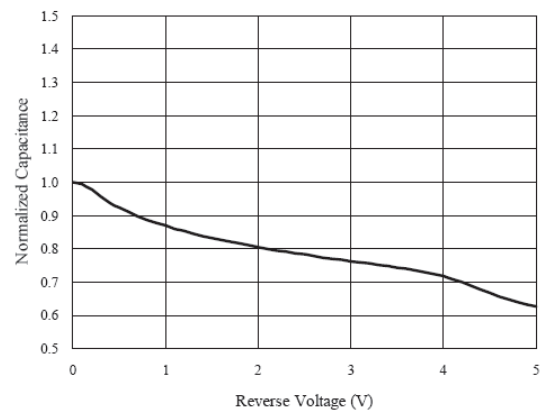


### Capacitance vs. Voltage of I/O\_1 to I/O\_2 (f = 1MHz)

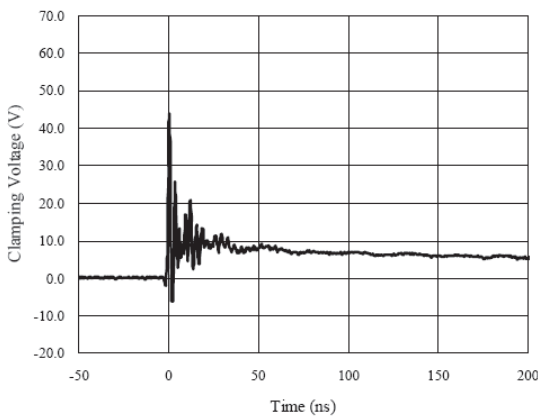
Capacitance vs. Reverse Voltage



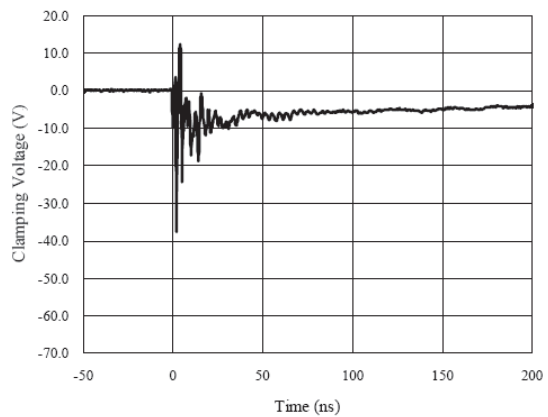
Normalized Capacitance vs. Reverse Voltage



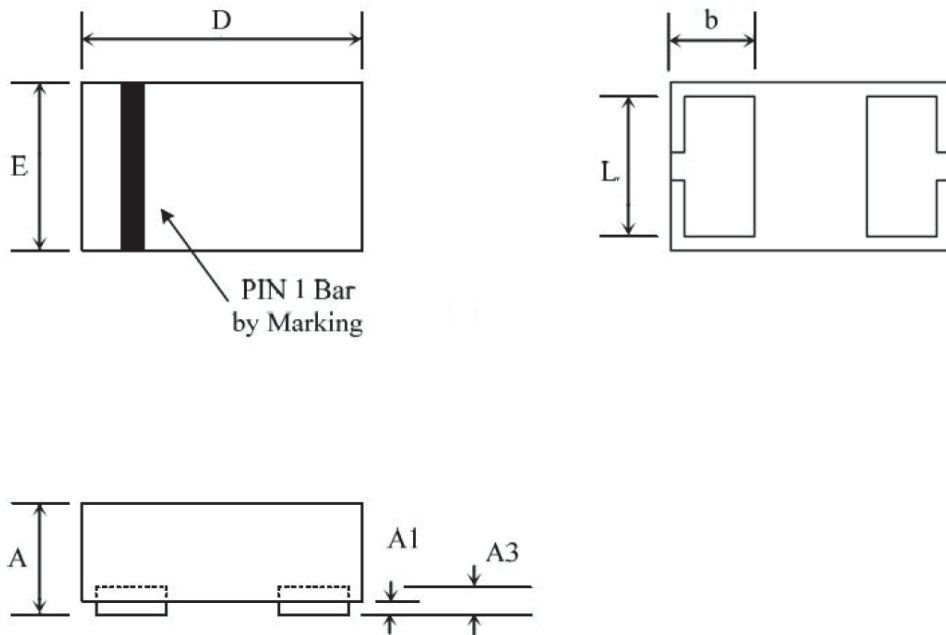
ESD Clamping of I/O\_1 to I/O\_2  
(+8kV Contact per IEC 61000-4-2)



ESD Clamping of I/O\_1 to I/O\_2  
(-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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