

## Features

- ❑ Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±30kV (Air)
  - ±30kV (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- ❑ Package optimized for high-speed lines
- ❑ Ultra-small package (0.6mm×0.3mm×0.3mm)
- ❑ Protects one data, control or power line
- ❑ Low capacitance: 15pF (Maximum)
- ❑ Low leakage current: 0.01μA @  $V_{RWM}$ (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge
- ❑ Green Part

## Description

TT0501NAX is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With maximum capacitance of 15pF only, TT0501NAX 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 (±15kV air, ±8kV 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.

TT0501NAX uses ultra-small DFN0603 package. Each TT0501NAX device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

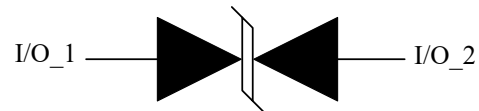
## Applications

- ❑ Portable Electronics
- ❑ Desktops, Servers and Notebooks
- ❑ Cellular Phones
- ❑ MP3 Ports
- ❑ Digital Camera Ports

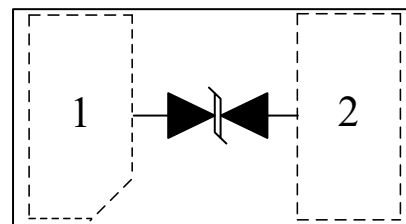
## Mechanical Characteristics

- ❑ DFN0603-2L package
- ❑ Flammability Rating: UL 94V-0
- ❑ Marking: Part number
- ❑ Packaging: Tape and Reel

## Circuit Diagram



## Pin Configuration



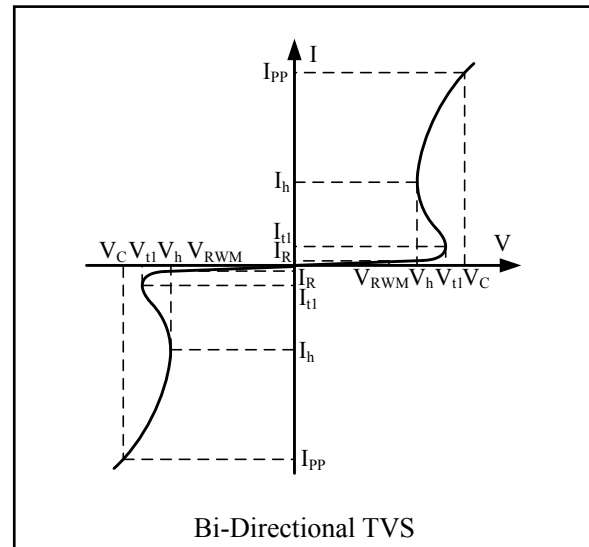
DFN0603-2L  
(Top View)

### Absolute Maximum Rating

Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20 $\mu$ s)	60	W
$I_{PP}$	Peak Pulse Current( $t_p=8/20\mu s$ )	8	A
$V_{ESD}$	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	$^{\circ}C$
$T_{STG}$	Storage Temperature	-55/+150	$^{\circ}C$

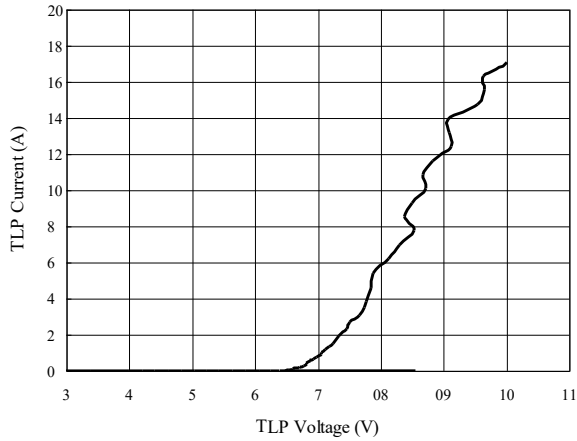
### Electrical Characteristics (T = 25 $^{\circ}C$ )

Symbol	Parameter
$V_{RWM}$	Nominal Reverse Working Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{t1}$	Trigger Voltage
$I_{t1}$	Trigger Current @ $V_{t1}$
$V_h$	Holding Voltage
$I_h$	Holding Current @ $V_h$
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{CR}$	Reverse Clamping Voltage @ $I_{PP}$
$I_{PP}$	Maximum Peak Pulse Current
$C_{ESD}$	Parasitic Capacitance

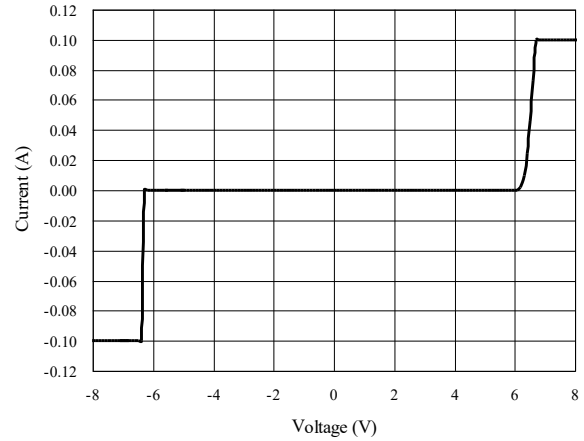


Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$				5.0	V
$I_R$	$V_{RWM} = 5.0V, T = 25^{\circ}C$		0.01	0.1	$\mu A$
$V_{t1}$	$I_{t1} = 10nA$	6.0		7.0	V
$V_h$	$I_h = 50mA$	5.5			V
$V_C$	$I_{PP} = 1A, t_p = 8/20\mu s$		6.0		V
$V_C$	$I_{PP} = 8A, t_p = 8/20\mu s$			8.5	V
$C_{ESD}$	$V_R = 0V, f = 1MHz$			18	pF

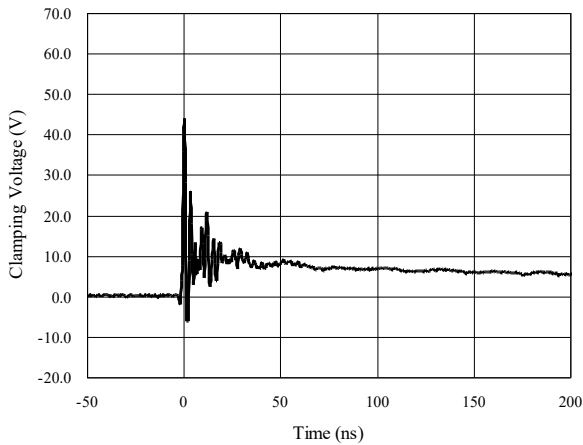
**TLP Measurement of I/O\_1 to I/O\_2**



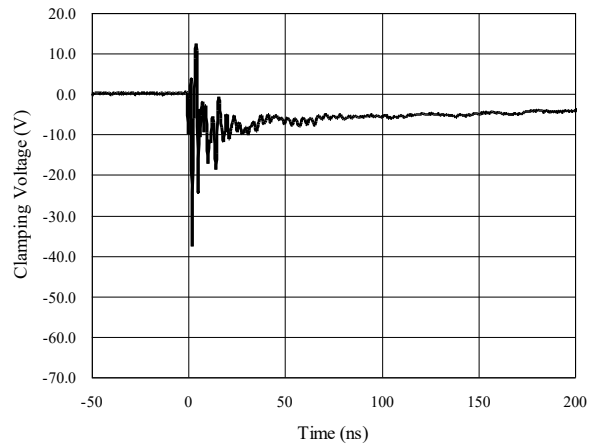
**Voltage Sweeping of I/O\_1 to I/O\_2**



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

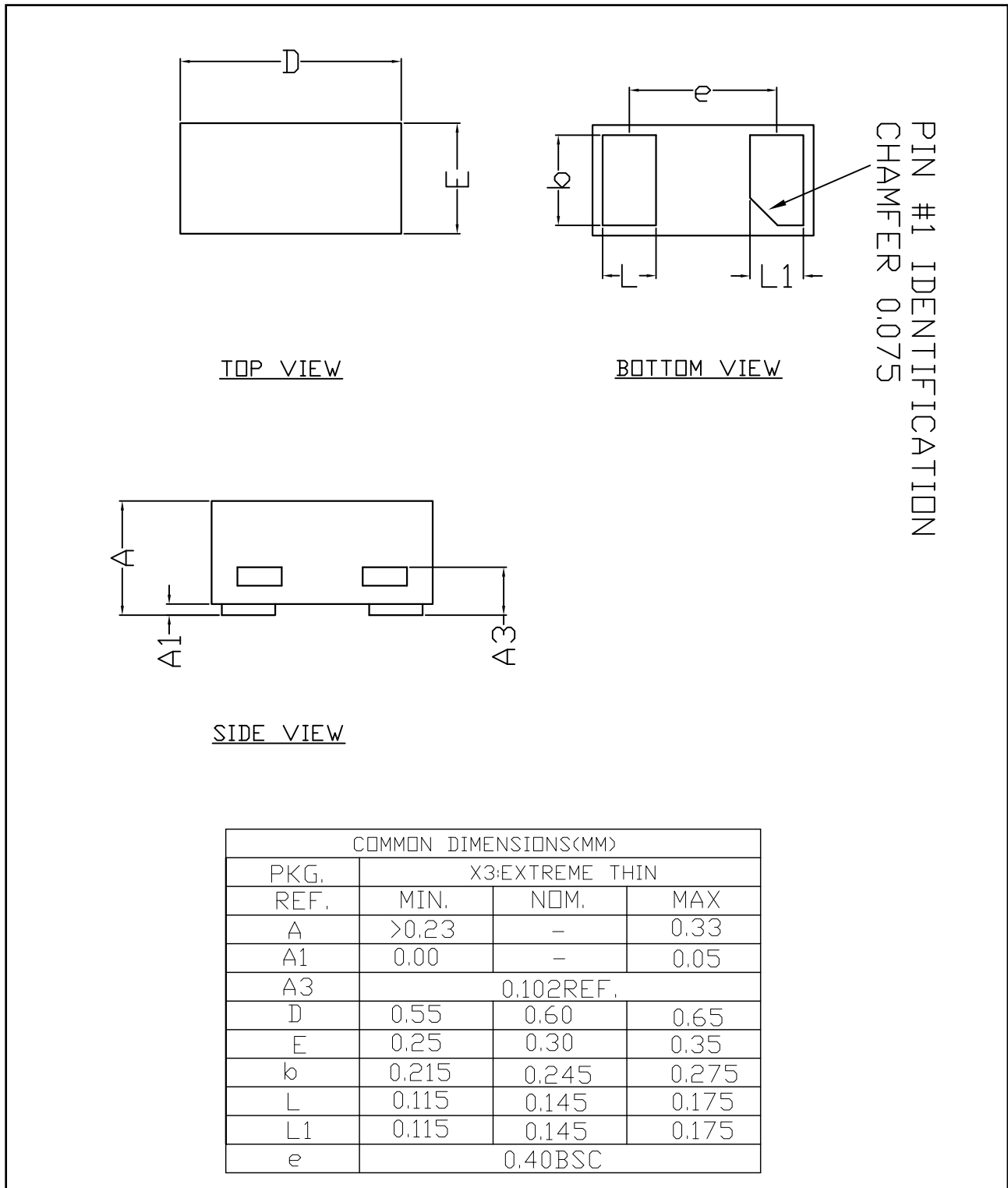


**ESD Clamping of I/O\_1 to I/O\_2  
(-8kV Contact per IEC 61000-4-2)**



## Package Outline

- DFN0603 package
- 2 leads
- MSL-1





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