

## Features

- ❑ Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±18kV (Air)
  - ±11kV (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- ❑ Package optimized for high-speed lines
- ❑ Ultra-small package (2.5mm×1.0mm×0.55mm)
- ❑ Protects four data lines
- ❑ Low capacitance: 0.6pF (Maximum)
- ❑ Low leakage current: 0.1μA @ V<sub>RWM</sub> (Maximum)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge
- ❑ ROHS compliant

## Description

TT3354TPX is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With Maximum capacitance 0.6pF only, TT3354TPX 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.

TT3354TPX uses ultra-small DFN-10L package. Each TT3354TPX device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make TT3354TPX ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the TT3354TPX guarantees a minimum stress on the protected IC.

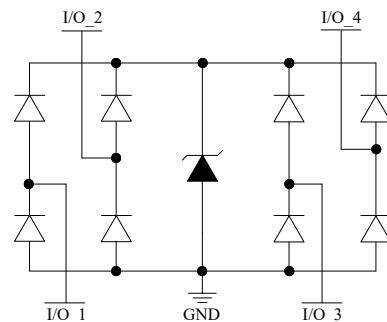
## Applications

- ❑ Serial ATA
- ❑ PCI Express
- ❑ Desktops, Servers and Notebooks
- ❑ MDDI Ports
- ❑ USB 2.0/3.0/3.1 Power and Data Line Protection
- ❑ Display Ports
- ❑ High Definition Multi-Media Interface (HDMI)
- ❑ Digital Visual Interfaces (DVI)

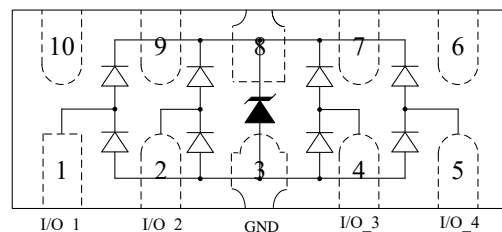
## Mechanical Characteristics

- ❑ DFN-10L package
- ❑ Flammability Rating: UL 94V-0
- ❑ Marking: Part number
- ❑ Packaging: Tape and Reel

## Circuit Diagram



## Pin Configuration



DFN-10L  
(Top View)

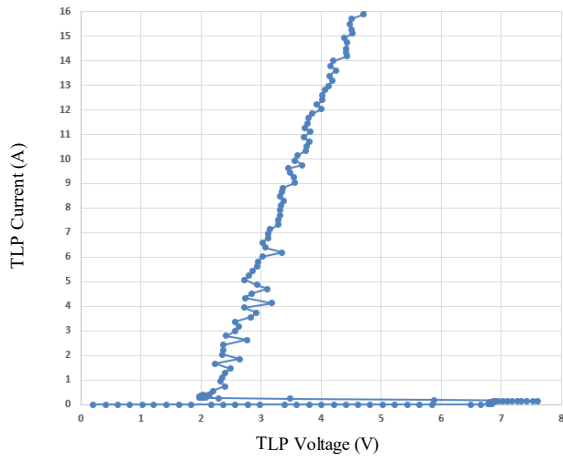
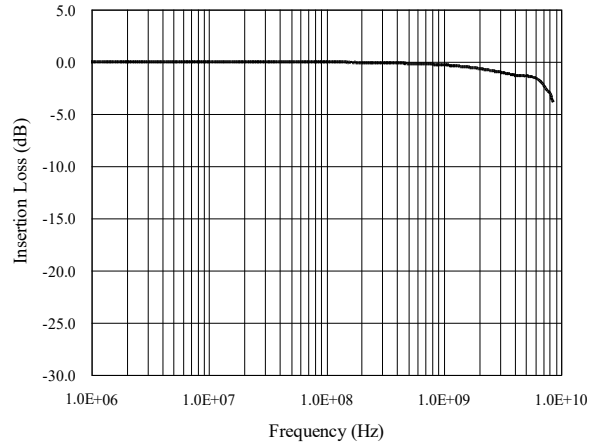
### Absolute Maximum Rating

Symbol	Parameter	Value	Units
$I_{PP}$	Peak Pulse Current( $t_p=8/20\mu s$ )	6.0	A
$V_{ESD}$	ESD per IEC 61000-4-2(Air) ESD per IEC 61000-4-2 (Contact)	$\pm 18$ $\pm 11$	kV
$T_{OPT}$	Operating Temperature	-55/+125	°C
$T_{STG}$	Storage Temperature	-55/+150	°C

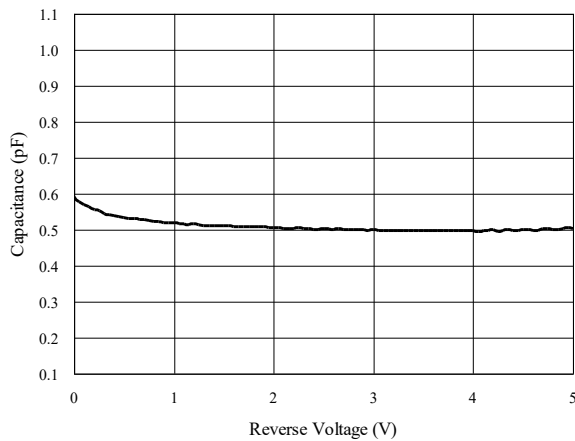
### Electrical Characteristics (T = 25°C)

Symbol	Test Condition	Minimum	Typical	Maximum	Units
$V_{RWM}$				3.3	V
$I_R$	$V_{RWM} = 3.3V, T = 25^\circ C$		0.01	0.1	$\mu A$
$V_{t1}$	$I_{t1} = 1mA$		7.0		V
$V_h$	$I_h = 30mA$		1.7		V
$V_C$	$I_{PP}= 6.0A, t_p = 8/20\mu s$			3.5	V
$V_C$	$I_{PP}= 8.0A, t_p = 100ns^{(1)}$			3.5	V
	$I_{PP}= 16.0A, t_p = 100ns^{(1)}$			5.0	V
$R_{dyn}$	IEC61000-4-2 0-6KV, T=25°C Contact, I/O to GND		0.25		$\Omega$
$C_{ESD}$	$V_R = 0V, f = 1MHz$ Between I/O and GND			0.6	pF
$C_{ESD}$	$V_R = 0V, f = 1MHz$ Between I/O and I/O			0.3	pF

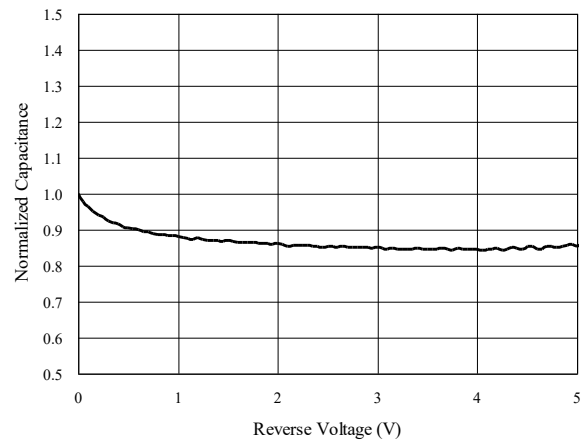
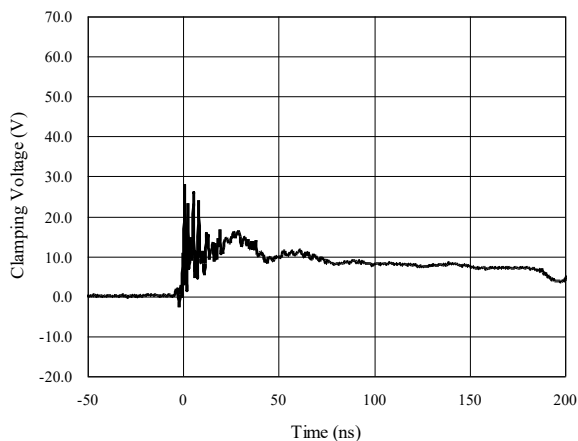
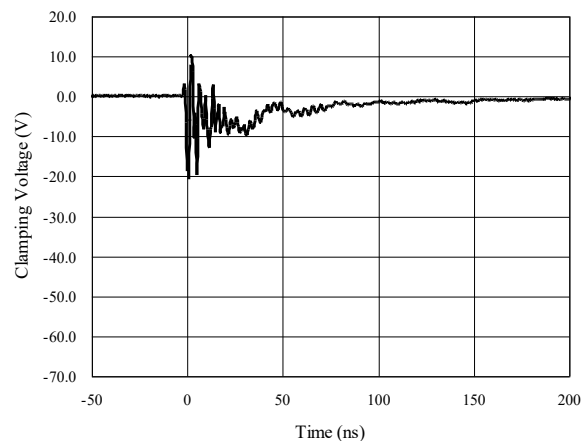
Notes:(1)Measurements performed using a 100ns Transmission Line Pulse(TLP) system.

**TLP Measurement of I/O to GND**

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

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

Capacitance vs. Reverse Voltage

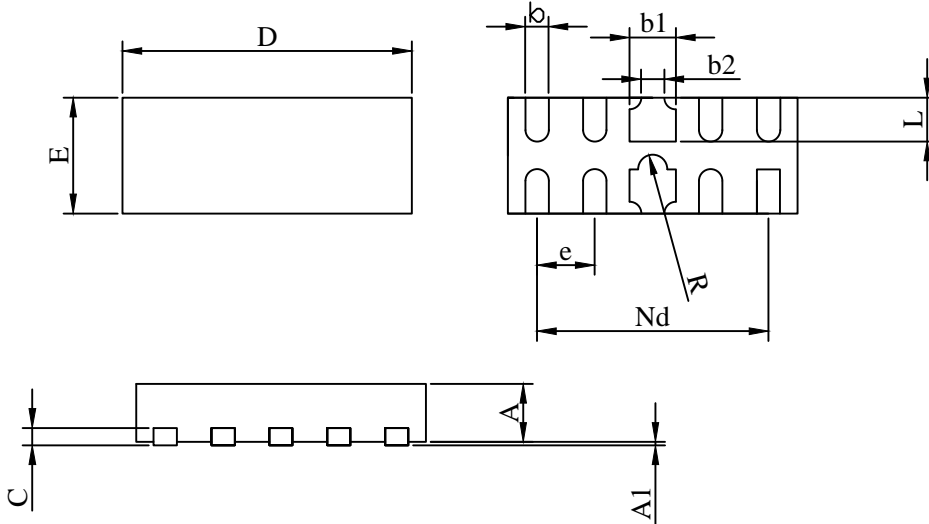


Normalized Capacitance vs. Reverse Voltage


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

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


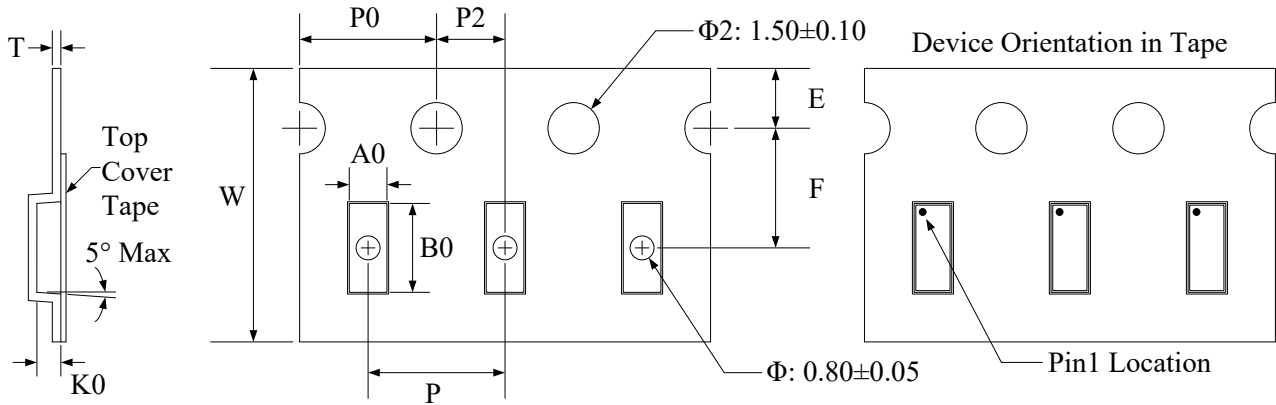
### Package Outline

- DFN-10L package
- Thermally-Enhanced
- MSL-1 Level



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
L			
D	2.45	2.50	2.55
E	0.95	1.00	1.05
b1	0.35	0.40	0.45
b2	0.20REF		
b	0.15	0.20	0.25
L	0.33	0.38	0.43
Nd	2.00REF		
e	0.50REF		
R	0.10	0.125	0.15
A	0.45	0.50	0.55
c	0.15REF		
A1	0.00	-	0.05

### Tape and Reel Specification



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00+0.3 -0.1	1.23±0.05	2.7±0.05	0.7±0.05	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	0.25±0.02

### Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT3354TPX	3.3V	3,000	7 Inch

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