

Features

- ❑ Transient protection for high-speed data lines
 - IEC 61000-4-2 (ESD) ±25kV (Air)
 - ±17kV (Contact)
 - IEC 61000-4-4 (EFT) 40A (5/50 ns)
 - Cable Discharge Event (CDE)
- ❑ Small package (1.6mm × 1.0mm × 0.50mm)
- ❑ Protects two data lines
- ❑ Low capacitance: 0.25pF Typical (I/O-I/O)
- ❑ Low leakage current: 0.1μA @ V_{RWM} (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

TT0512TDX is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.25pF only, TT0512TDX 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.

TT0512TDX uses small DFN1610-6L package. Each TT0512TDX device can protect two high-speed data lines. The combined features of low capacitance, small size and high ESD robustness make TT0512TDX ideal for high-speed data ports and high-frequency lines (e.g., USB2.0 & DVI) applications. The low clamping voltage of the TT0512TDX guarantees a minimum stress on the protected IC.

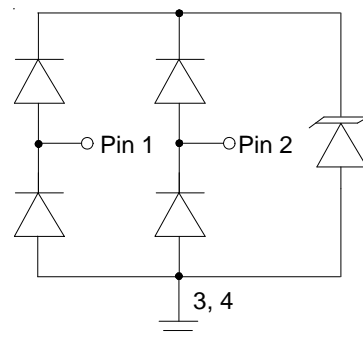
Applications

- ❑ Serial ATA
- ❑ PCI Express
- ❑ Desktops, Servers and Notebooks
- ❑ MDDI Ports
- ❑ USB2.0 Power and Data Line Protection
- ❑ Display Ports
- ❑ Digital Visual Interfaces (DVI)

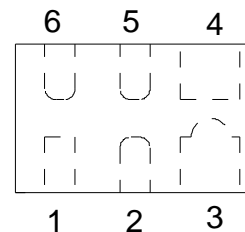
Mechanical Characteristics

- ❑ DFN1610-6L package
- ❑ Flammability Rating: UL 94V-0
- ❑ Marking: Part number
- ❑ Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



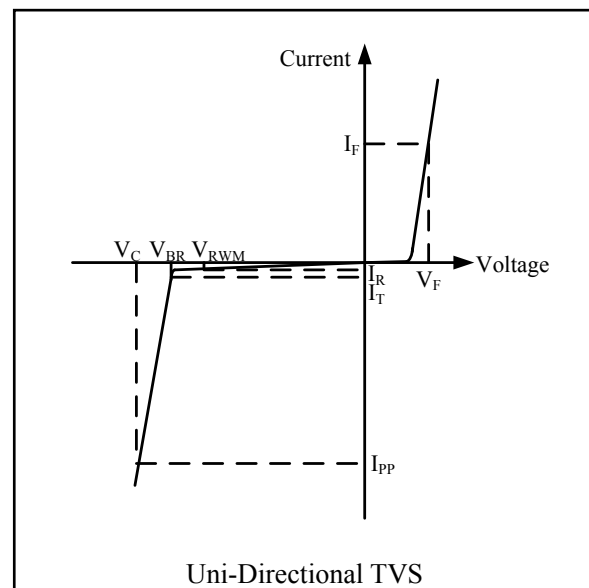
Pin	Identification
1 - 2	Input Lines
5 - 6	Output Lines (No Internal Connection)
3 - 4	Ground

Absolute Maximum Rating

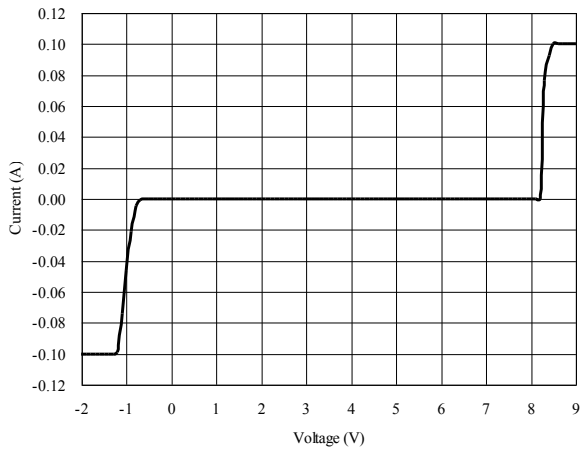
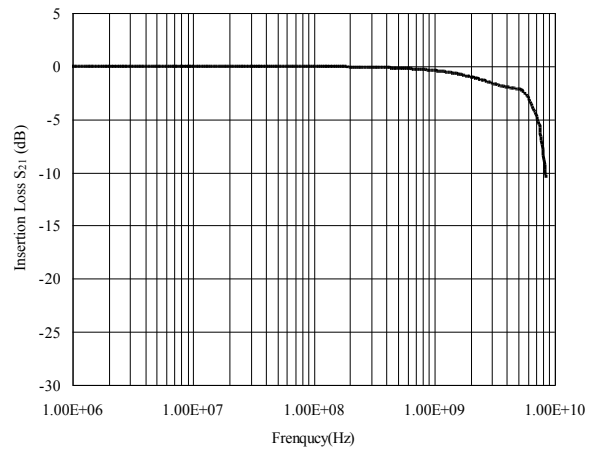
Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air)	±25	kV
	ESD per IEC 61000-4-2 (Contact)	±17	
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

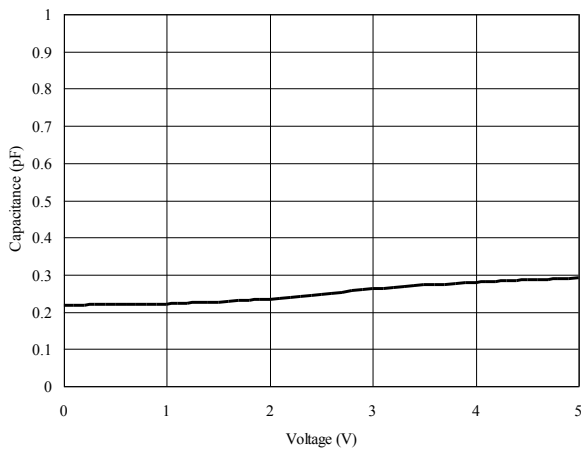
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency
I_F	Forward Current
V_F	Forward Voltage @ I_F



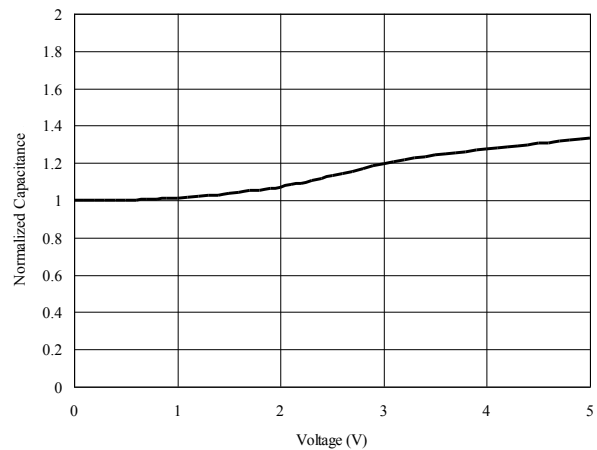
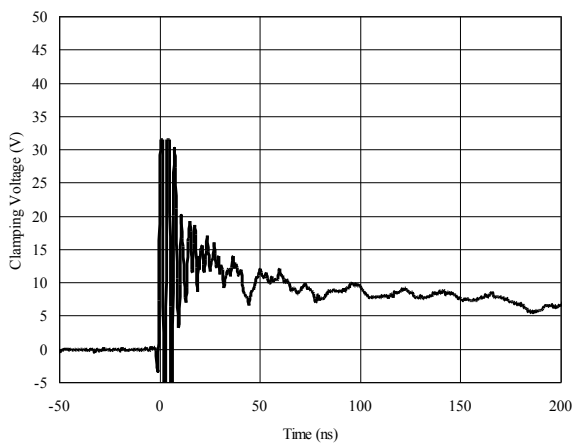
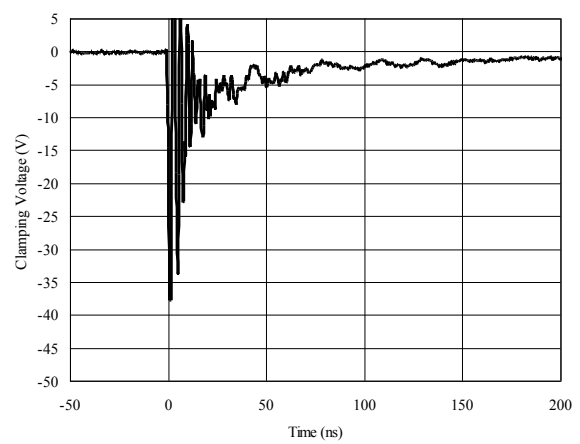
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5.0	V
I_R	$V_{RWM} = 5V, T = 25^\circ C$ Between I/O and GND		0.1	1.0	μA
V_{BR}	$I_T = 1mA$ Between I/O and GND	6.0	8.0	10.0	V
V_C	$I_{PP} = 1A, t_p = 8/20\mu s$ Between I/O and GND			12	V
C_{ESD}	$V_R = 0V, f = 1MHz$ Between I/O and GND		0.6	0.9	pF
C_{ESD}	$V_R = 0V, f = 1MHz$ Between I/O and I/O		0.25	0.5	pF

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)

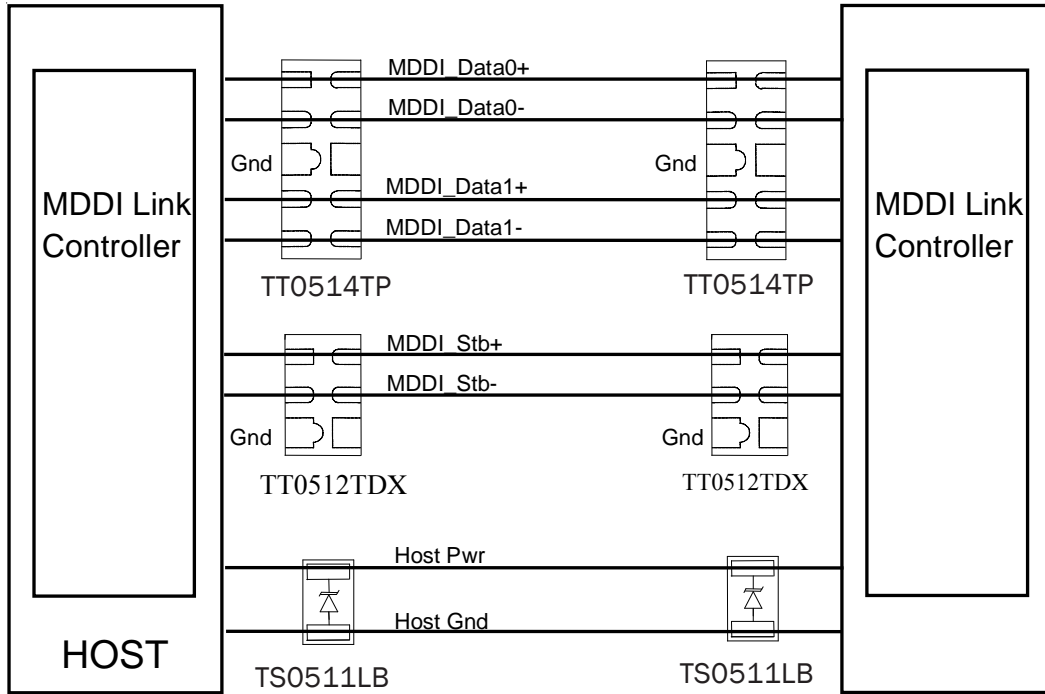
Capacitance vs. Reverse Voltage



Normalized Capacitance vs. Reverse Voltage


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

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


Application Information



MDDI Port Protection

Universal Serial Bus ESD Protection

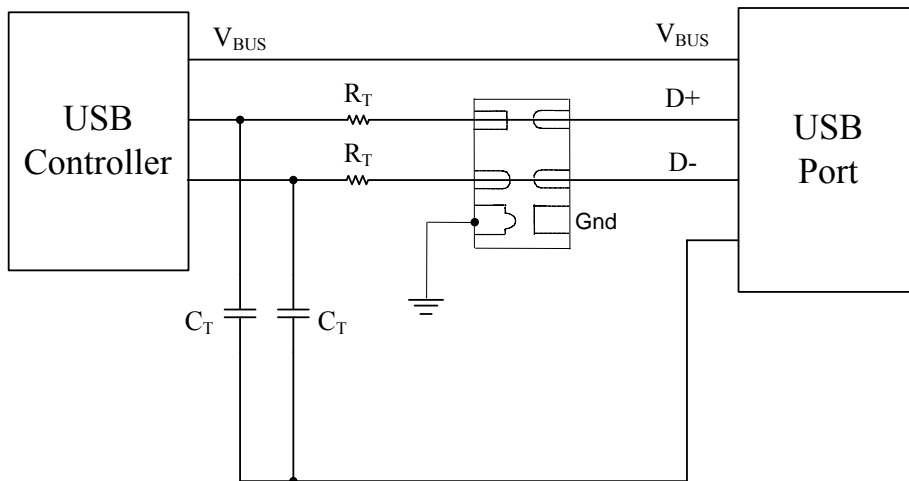
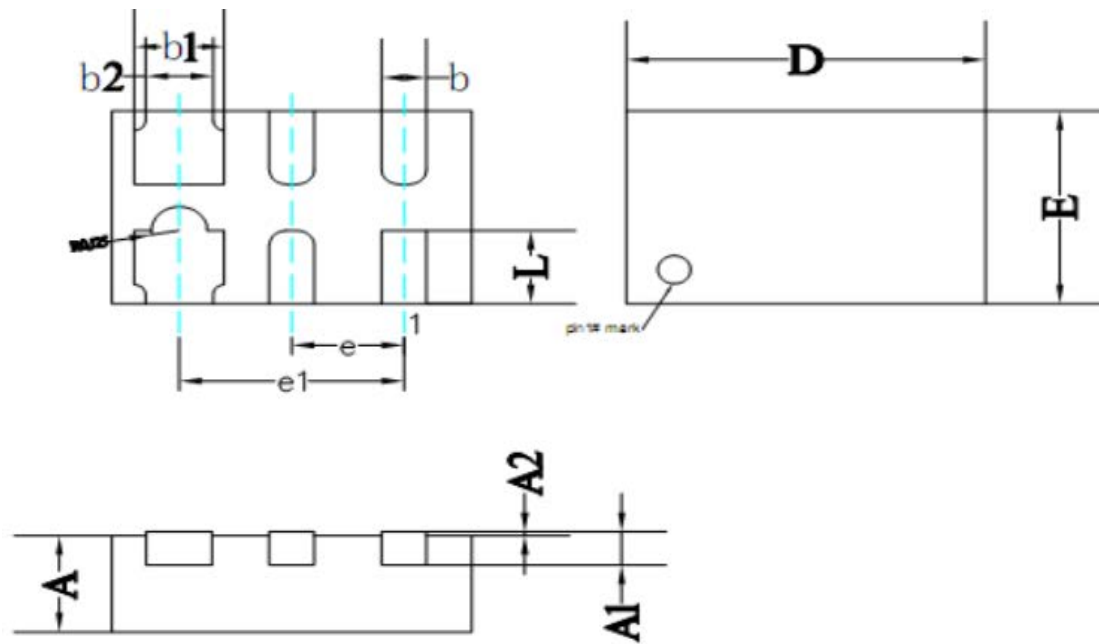


Figure 3 Schematic and Diagram for USB 2.0 Protection using TT0512TDX

Package Outline

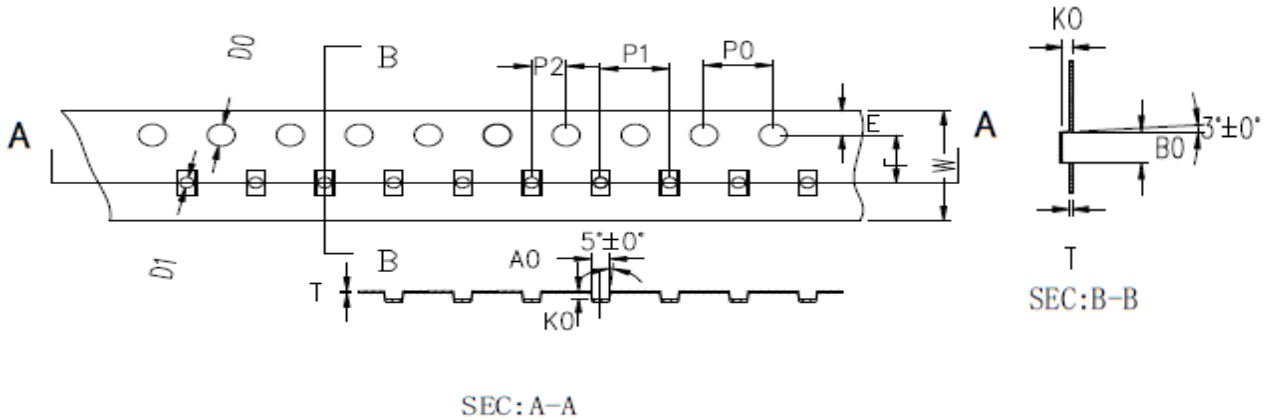
- DFN1610-6L package



ALL DIMENSIONS IN MM

	MIN	NOM	MAX
D	1.55	1.60	1.65
E	0.95	1.00	1.05
L	0.33	0.38	0.43
b	0.15	0.20	0.25
b1	0.35	0.40	0.45
b2	0.25	0.30	0.35
e	0.50BSC		
e1	1.00BSC		
A	0.45	0.5	0.55
A1			
A2	0.00	-	0.05

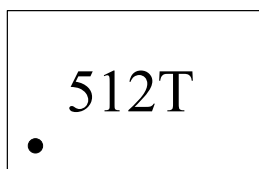
Tape and Reel Specification



ITEM	SPECIFICATION	TOL.(±)
W	8.00	±0.20
E	1.75	±0.1
F	3.50	±0.1
D0	1.55	±0.05
D1	0.8	±0.1
P0	4.00	±0.1
P1	4.00	±0.1
P2	2.00	±0.05
P0*10	40.00	±0.20

ITEM	SPECIFICATION	TOL.(±)
T	0.20	±0.05
A0	1.15	±0.1
B0	1.85	±0.1
K0	0.85	±0.1

Marking Codes



Note:

(1) "512T" is part number, fixed.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT0512TDX	5V	3,000	7 Inch

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [ESD Suppressors / TVS Diodes](#) category:

Click to view products by [Shenzhen JingYang](#) manufacturer:

Other Similar products are found below :

[60KS200C](#) [D18V0L1B2LP-7B](#) [D5V0F4U5P5-7](#) [NTE4902](#) [P4KE27CA](#) [P6KE11CA](#) [P6KE8.2A](#) [SA60CA](#) [SA64CA](#) [SMBJ12CATR](#)
[SMBJ33CATR](#) [SMBJ6.5A](#) [SMBJ8.0A](#) [ESD101-B1-02ELS](#) [E6327](#) [ESD112-B1-02EL](#) [E6327](#) [ESD7451N2T5G](#) [19180-510](#) [CPDT-5V0USP-](#)
[HF](#) [3.0SMCJ33CA-F](#) [3.0SMCJ36A-F](#) [HSPC16701B02TP](#) [JANTX1N6126A](#) [D3V3Q1B2DLP3-7](#) [D55V0M1B2WS-7](#) [SCM1293A-04SO](#)
[ESD200-B1-CSP0201](#) [E6327](#) [SM12-7](#) [CEN955](#) [W/DATA](#) [VESD12A1A-HD1-GS08](#) [CPDQC5V0-HF](#) [D1213A-01LP4-7B](#) [ESD101-B1-02EL](#)
[E6327](#) [AOZ8808DI-03](#) [5KP15A](#) [5KP48A](#) [5KP90A](#) [ESD3V3D7-TP](#) [15KPA36A-LF](#) [P4KE56CA](#) [P4KE68A](#) [P4KE91CATR](#) [P6KE120A](#)
[P6KE13CA](#) [P6KE43CA](#) [P6KE6.8CA](#) [P6KE8.2](#) [P6SMBJ20CA](#) [JANTX1N6072A](#) [SR2835ESKG](#) [SA90CA](#)