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)
- Package optimized for high-speed lines
- Ultra-small package (1.7mm×1.0mm×0.50mm)
- Protects four data lines
- Low capacitance: 0.4pF for each channel
- 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
- ROHS compliant

Applications

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

Mechanical Characteristics

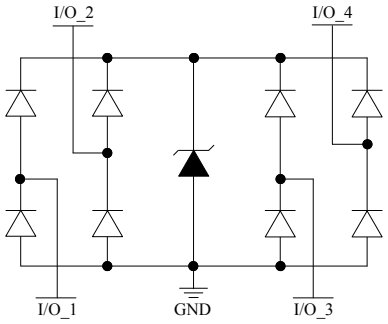
- DFN1710-6L package
- Flammability Rating: UL 94V-0
- Marking: Part number, Date
- Packaging: Tape and Reel

Description

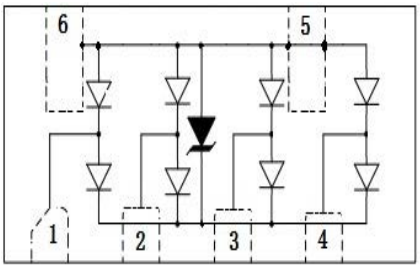
TT0314TDX is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.4pF only, TT0314TDX is designed to protect parasitic-sensitive systems against over-voltage and over-current 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.

TT0314TDX uses ultra-small DFN1710-6L package. Each TT0314TDX device can protect four high-speed data lines. The combined features of ultra - low capacitance, ultra - small size and high ESD robustness make TT0314TDX ideal for high-speed data ports and high -frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the TT0314TDX guarantees a minimum stress on the protected IC.

Circuit Diagram



Pin Configuration



DFN1710-6L

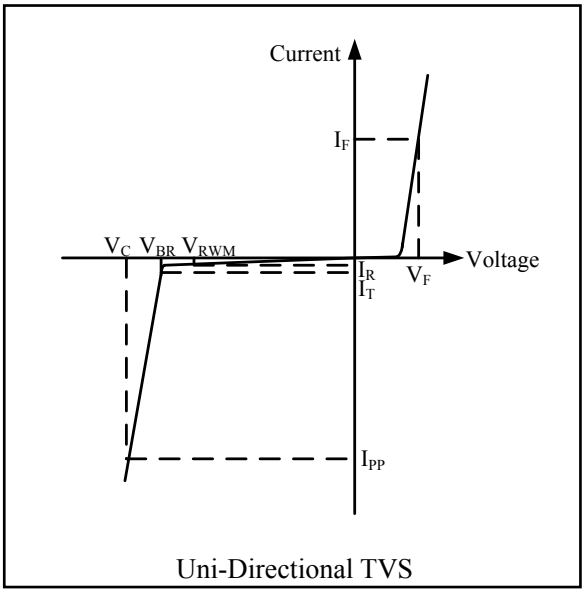
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±25 ±17	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C
I_{PP}	Peak Pulse Current (8/20μs)	4	A
P_{PK}	Peak Pulse Power (8/20μs)	40	W

Electrical Characteristics (T = 25°C)

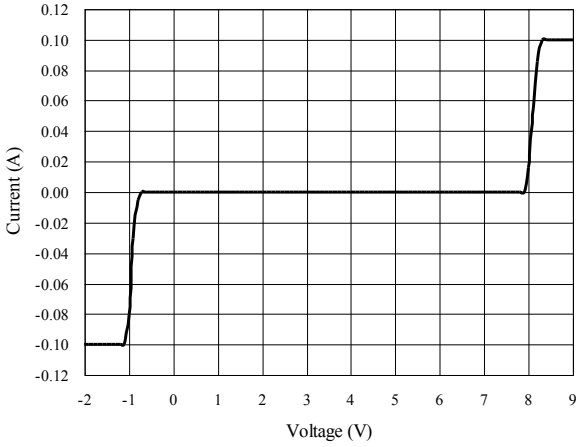
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal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



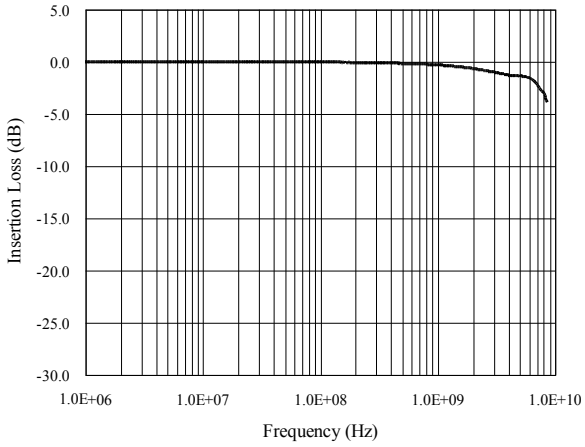
Uni-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				3.3	V
I_R	V_{RWM} = 3.3V, T = 25° 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} = 4A, t_p = 8/20μs Between I/O and GND			12	V
C_{ESD}	V_R = 0V, f = 1MHz Between I/O and GND		0.4	0.6	pF
C_{ESD}	V_R = 0V, f = 1MHz Between I/O and I/O		0.2	0.3	pF

Voltage Sweeping of I/O to GND

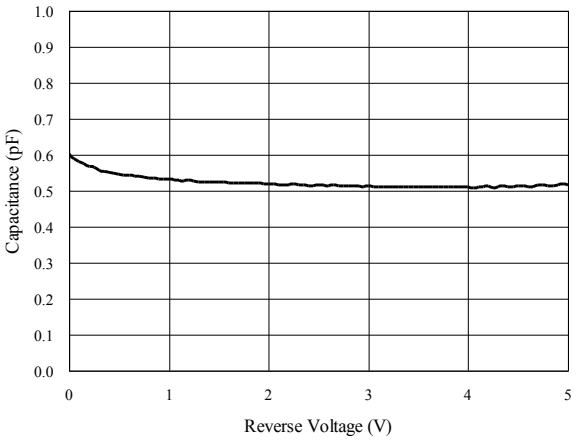


Insertion Loss S21 of I/O to GND

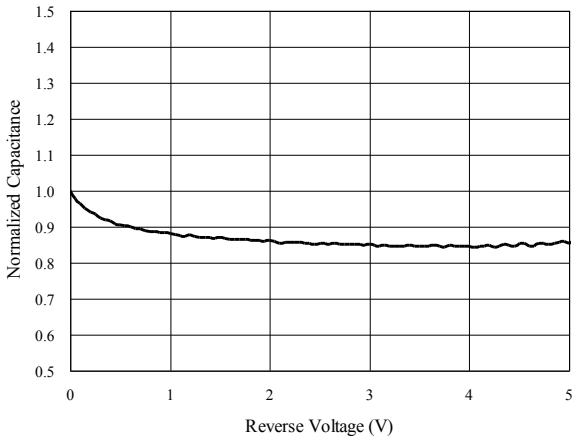


Capacitance *vs.* Voltage of I/O to GND (f = 1MHz)

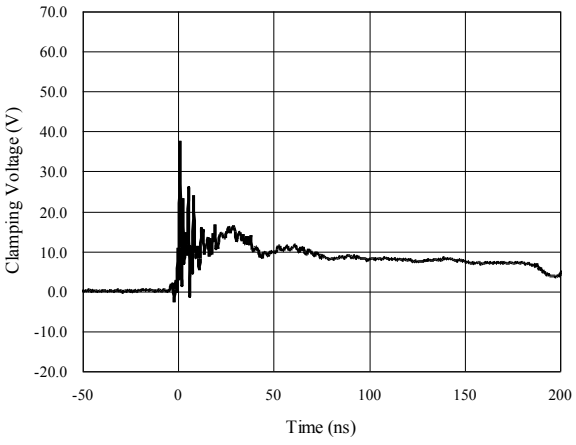
Capacitance *vs.* Reverse Voltage



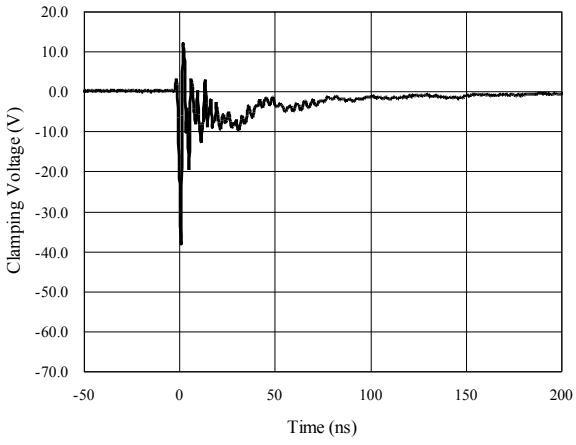
Normalized Capacitance *vs.* Reverse Voltage



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

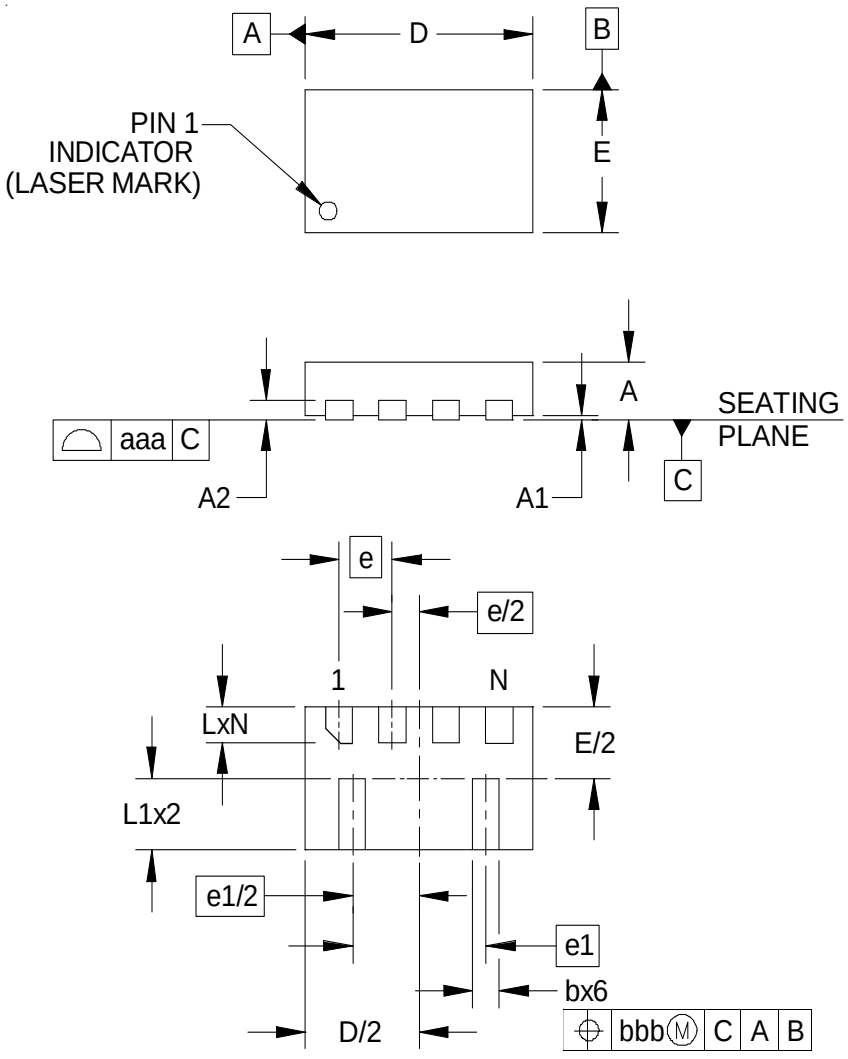


ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



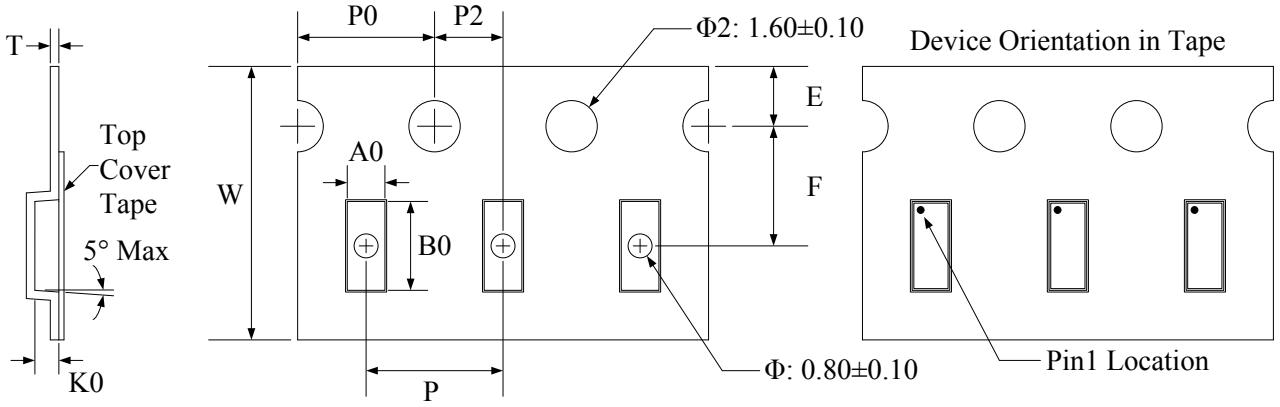
Package Outline

- ❑ DFN1710-6L package
- ❑ Thermally-Enhanced
- ❑ MSL-1 Level



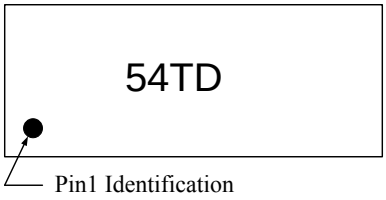
DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
A2		(0.15)	
b	0.15	0.20	0.25
D	1.65	1.70	1.75
E	0.95	1.00	1.05
e		0.40 BSC	
e1		1.00 BSC	
L	0.20	0.25	0.30
L1	0.45	0.50	0.55
N		4	
aaa		0.08	
bbb		0.10	

Tape and Reel Specification



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00+0.2 -0.2	1.00±0.1	1.85±0.1	0.85±0.1	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	0.20±0.05

Marking Codes



Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT0314TDX	3.3V	3,000	7 Inch