



Features

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

Description

TT3354TP 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, TT3354TP 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.

TT3354TP uses ultra-small DFN-10L package. Each TT3354TP device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make TT3354TP ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the TT3354TP guarantees a minimum stress on the protected IC.

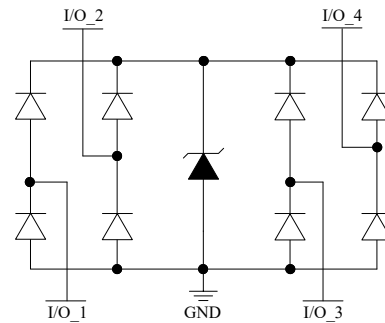
Applications

- ❑ 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)

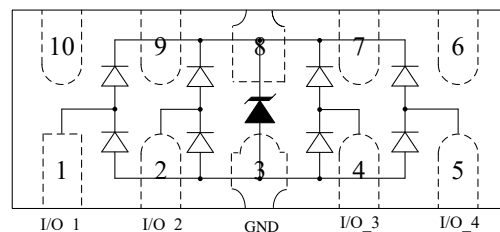
Mechanical Characteristics

- ❑ 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)	± 18 ± 11	kV
T_{OPT}	Operating Temperature	-55/+125	$^{\circ}C$
T_{STG}	Storage Temperature	-55/+150	$^{\circ}C$

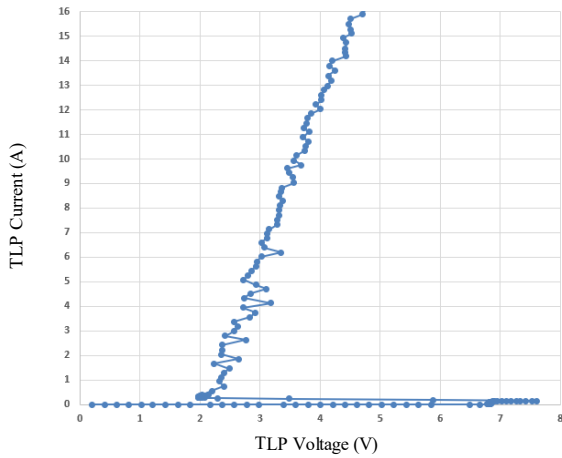
Electrical Characteristics (T = 25 $^{\circ}C$)

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	μA
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 $^{\circ}C$ Contact, I/O to GND		0.25		Ω
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

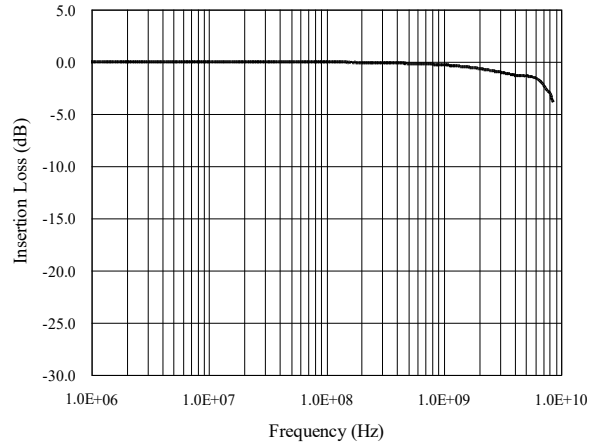
Notes:(1)Measurements performed using a 100ns Transmission Line Pulse(TLP) system.



TLP Measurement of I/O to GND

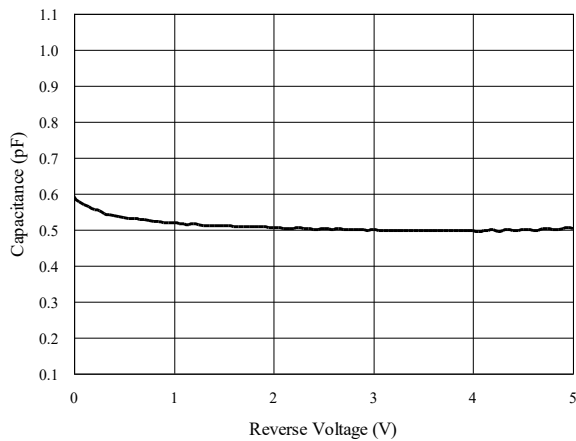


Insertion Loss S21 of I/O to GND

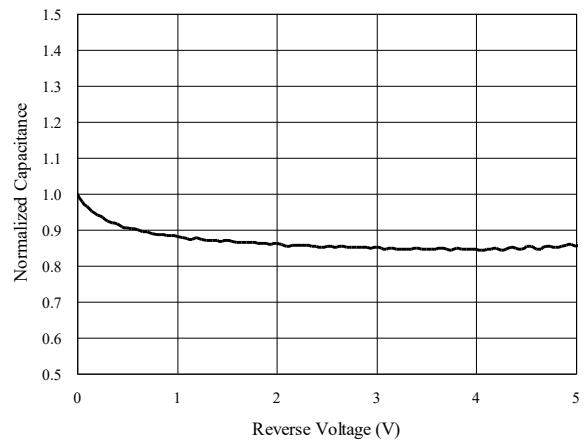


Capacitance vs. Voltage of I/O to GND (f = 1MHz)

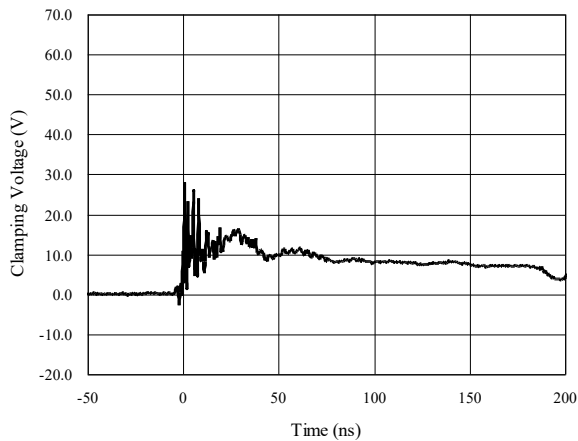
Capacitance vs. Reverse Voltage



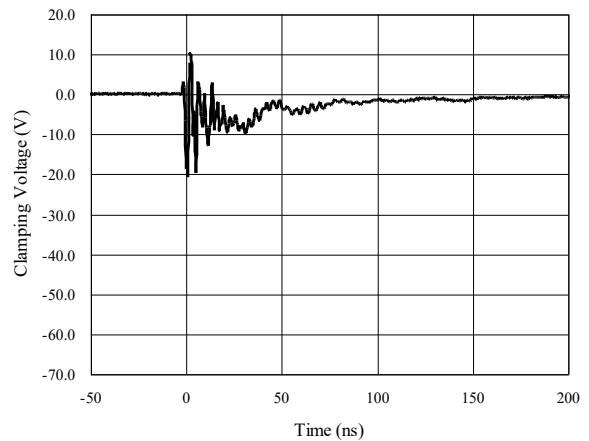
Normalized Capacitance vs. Reverse Voltage



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



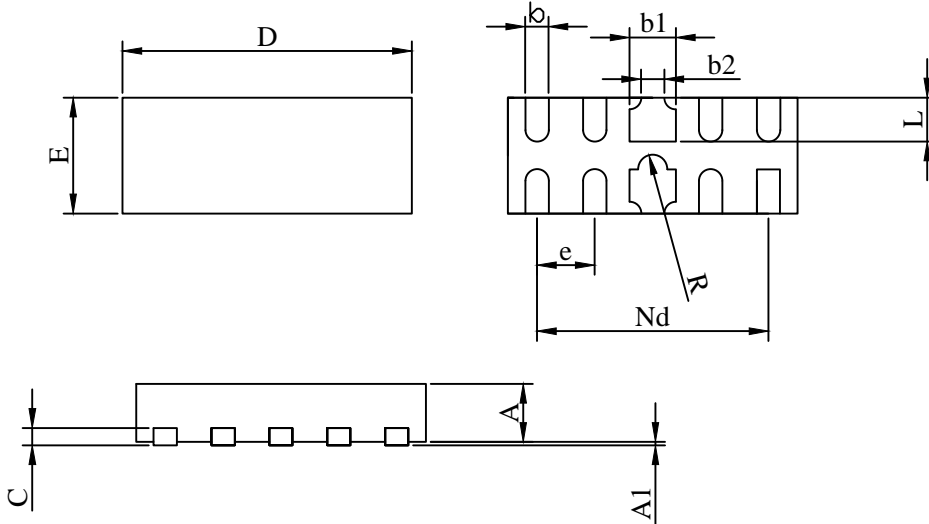
ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)





Package Outline

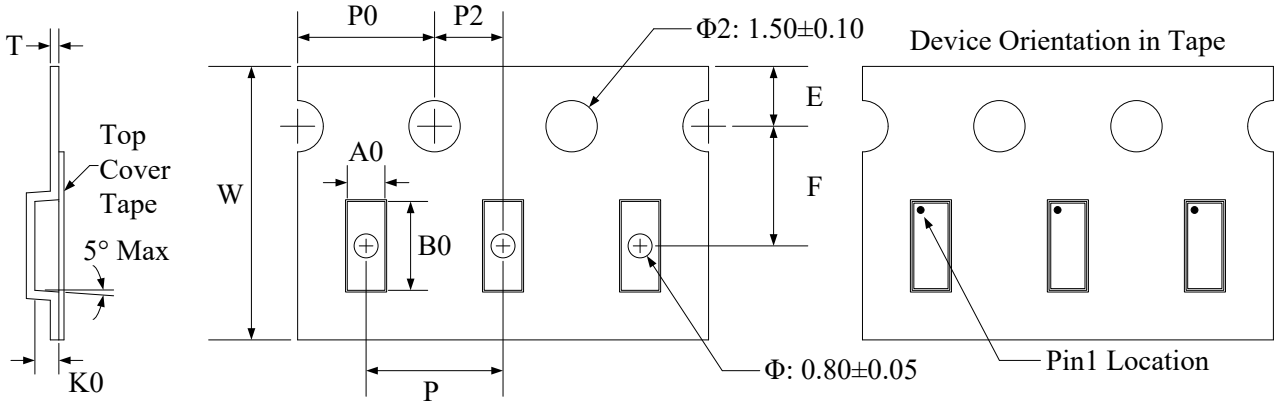
- DFN-10L package
- Thermally-Enhanced
- MSL-1 Level



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
TT3354TP	3.3V	3,000	7 Inch