

Ultra Low Capacitance ESD Protection Array

DESCRIPTION

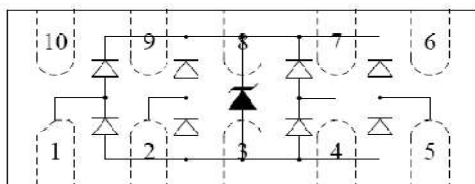
TUSD0514U is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.2pF (I/O to I/O) only, TUSD0514U is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4($\pm 15\text{KV}$ air, $\pm 8\text{KV}$ contact discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns), very fast charged device model (CDM) ESD and cable discharge event(CDE), etc.

TUSD0514U uses ultra-small DFN2510 package. Each TUSD0514U device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make TUSD0514U ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the TUSD0514U guarantees a minimum stress on the protected IC.

ORDERING INFORMATION

- ✧ Device: TUSD0514U
- ✧ Package: DFN2510
- ✧ Marking:
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

PIN CONFIGURATION



FEATURES

- ✧ Transient protection for high-speed data lines
IEC 61000-4-2(ESD) $\pm 25\text{KV}$ (Air)
 $\pm 20\text{KV}$ (Contact)
- IEC 61000-4-4(EFT)40A(5/50ns)
Cable Discharge Event(CDE)
- ✧ Package optimized for high-speed lines
- ✧ Ultra-small package(2.5mm*1.0mm*0.5mm)
- ✧ Protects four data lines
- ✧ Low capacitance: 0.2pF (I/O to I/O)
- ✧ Low leakage current
- ✧ Low clamping voltage
- ✧ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{KV}$ contact discharge

MACHANICAL DATA

- ✧ DFN2510 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed: $260^{\circ}\text{C}/10\text{s}$
- ✧ Reel size: 7 inch

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 Interface (DVI)

PACKAGE OUTLINE



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ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Units
P_{PP}	Peak Pulse Power (8/20 μ s)	60	W
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	± 25 ± 20	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}C$)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage	Any I/O pin to GND			5.0	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1mA$ Any I/O pin to GND	6.0		9.0	V
I_R	Reverse Leakage Current	$V_{RWM} = 5V$ Any I/O pin to GND			1.0	μA
V_C	Clamping Voltage	$I_{PP} = 1A$, $t_p = 8/20\mu s$ Any I/O pin to GND			10	V
V_C	Clamping Voltage	$I_{PP} = 4A$, $t_p = 8/20\mu s$ Any I/O pin to GND			15	V
C_{ESD}	Parasitic Capacitance	$V_R = 0V$, $f = 1MHz$ Between I/O and GND		0.4	0.5	pF
C_{ESD}	Parasitic Capacitance	$V_R = 0V$, $f = 1MHz$ Between I/O and I/O		0.2	0.3	pF

Note: I/O pins are pin 1,2,4,5, GND pins are pin 3,8.

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ELECTRICAL CHARACTERISTICS CURVE

Fig 1 Power Derating Curve

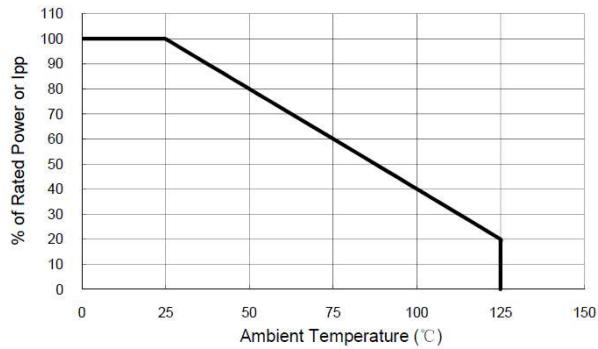


Fig 2 Clamping Voltage vs Peak Pulse Current

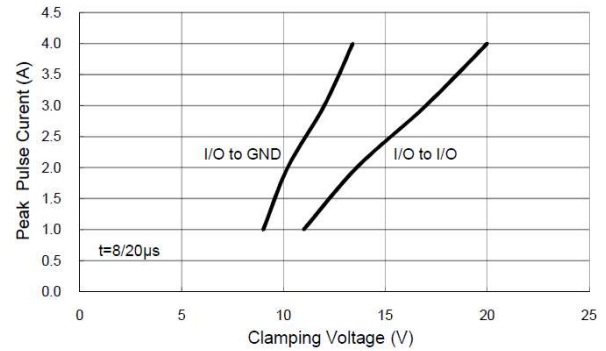


Fig 3 Voltage Sweeping of I/O to I/O

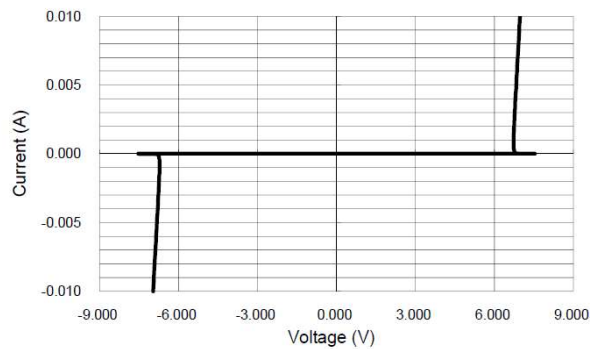
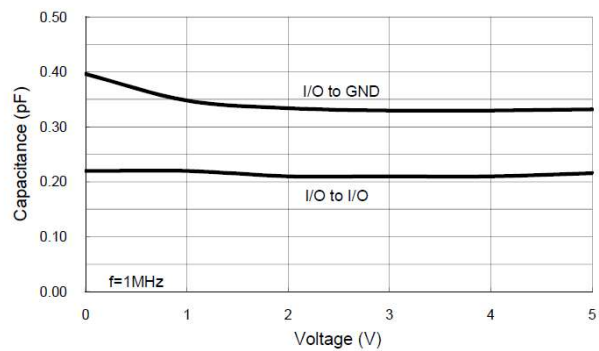
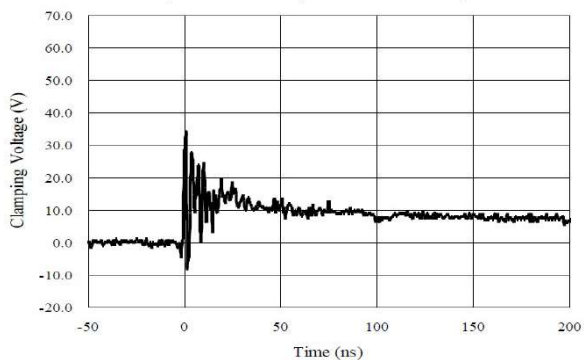


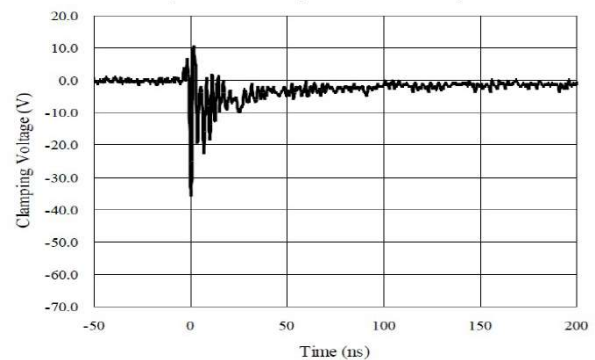
Fig 4 Voltage vs Capacitance



**Fig 5 ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)**

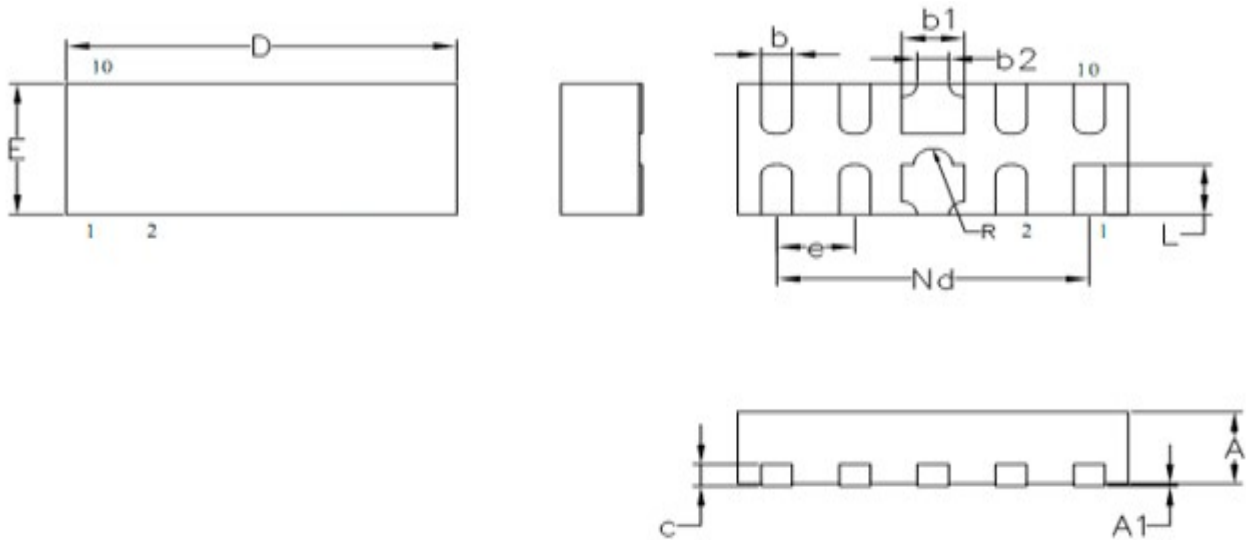


**Fig 6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)**



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DFN2510 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions (mm)		
	Min.	Nom.	Max.
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	2.00BSC		
e	0.50BSC		
R	0.10	0.125	0.15
A	0.45	0.50	0.55
c	0.15REF		
A1	0.00	-	0.05