



ESD3324PL

Bidirectional TVS Diodes Array

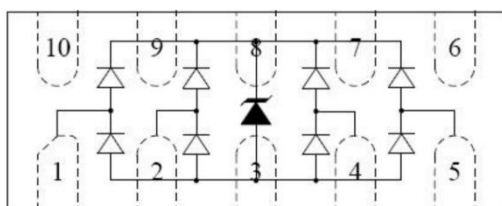
Description

ESD3324PL is an ultra-low capacitance ESD protection array designed to protection for high-speed data interfaces. With typical capacitance of 0.20pF (I/O to I/O) only, ESD3324PL 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), very fast charged device model (CDM) ESD and cable discharge event (CDE) etc. ESD3324PL uses ultra-small DFN2510 package. Each ESD3324PL device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make ESD3324PL ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the ESD3324PL guarantees a minimum stress on the protected IC.

Ordering Information

- Device:ESD3324PL
- Package:DFN2510
- Marking:3324PL
- Material:Halogen free and RoHS compliant
- Packing:Tape & Reel
- Quantity per reel:30,000pcs per 7" reel

Pin Configuration



Features

- Transient protection for high-speed data lines
- IEC61000-4-2(ESD) $\pm 25\text{kV}$ (air)
 $\pm 16\text{kV}$ (contact)
- IEC61000-4-5(Surge) 8A
- Ultra-small package(2.5mmx1.0mmx0.5mm)
- Working voltage: 3.3V
- Snap back featured
- Low capacitance: 0.20pF(Typical I/O to I/O)
- Low leakage current
- Low clamping voltage

Mechanical Data

- DFN2510 package
- Flammability Rating: UL 94V-0
- Terminal: Matte tin plated
- High temperature soldering guaranteed: 260°C/10s
- Packaging: Tape and Reel
- Reel size: 7 inch

Applications

- High-Definition Multi-Media Interface(HDMI)
- USB interfaces
- LVDS interfaces
- Display Port
- Communication systems
- Desktops, Servers and Notebooks

Circuit Diagram





ESD3324PL

Maximum Rating

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2(Air)	V_{ESD}	± 25	kV
ESD per IEC 61000-4-2(Contact)		± 16	
Peak Pulse Power(8/20 μ s)	P_{PP}	56	W
Peak Pulse Current(8/20 μ s)	I_{PP}	8	A
Operating Temperature	T_{OPT}	-55~+125	°C
Storage Temperature	T_{STG}	-55~+150	°C

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	Any I/O pin to GND			3.3	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1\text{mA}$ Any I/O pin to GND	5.0	7.2		V
Reverse Leakage Current	I_R	$V_{RWM}=3.3\text{V}$ Any I/O pin to GND			100	nA
Diode Forward Voltage	V_F	$I_F=10\text{mA}$			1.2	V
Clamping Voltage	V_C	$I_{PP}=1\text{A}, t_p=8/20\mu\text{s}$ Any I/O pin to GND		3.1	3.5	V
		$I_{PP}=8\text{A}, t_p=8/20\mu\text{s}$ Any I/O pin to GND		5.5	7	V
TLP Clamping Voltage	$V_{CTL P}$	TLP $I_{PP}=8\text{A}, t_p=100\text{nS}$		3.4		V
		TLP $I_{PP}=16\text{A}, t_p=100\text{nS}$		4.8		V
Parasitic Capacitance	C_{ESD}	$V_R=0\text{V}, f=1\text{MHz}$ Between I/O and GND		0.45	0.8	pF
		$V_R=0\text{V}, f=1\text{MHz}$ Between I/O and I/O		0.2	0.4	pF

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



Typical Characteristics

Fig 1 Clamping Voltage vs Peak Pulse Current

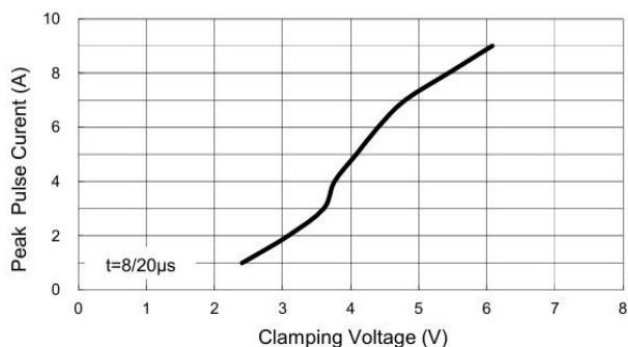


Fig 2 Voltage vs Capacitance

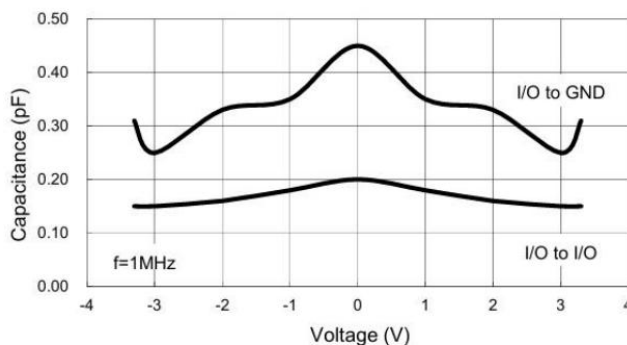


Fig 3 Transmission Line Pulsing (TLP) Measurement

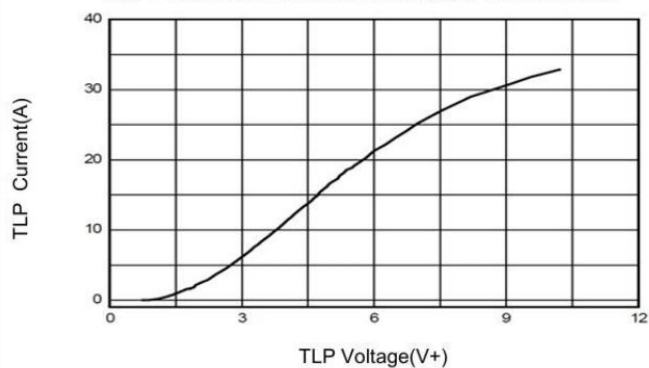


Fig 4 Transmission Line Pulsing (TLP) Measurement

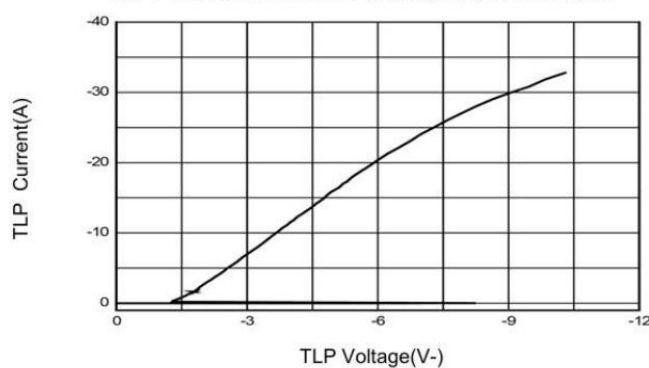


Fig 5 ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)

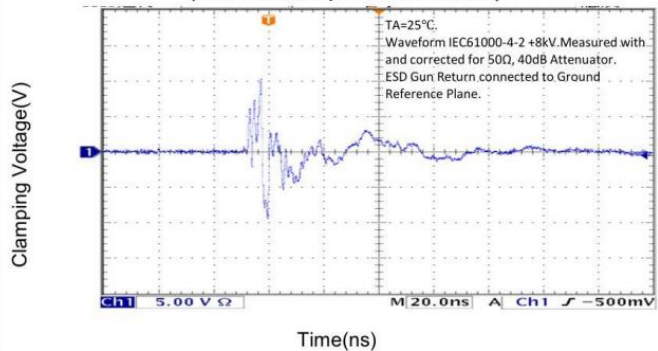
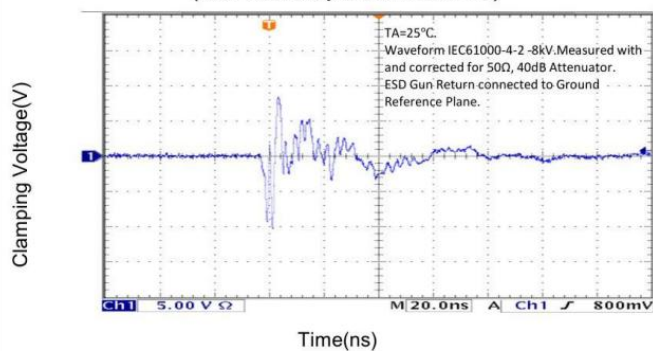


Fig 6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)

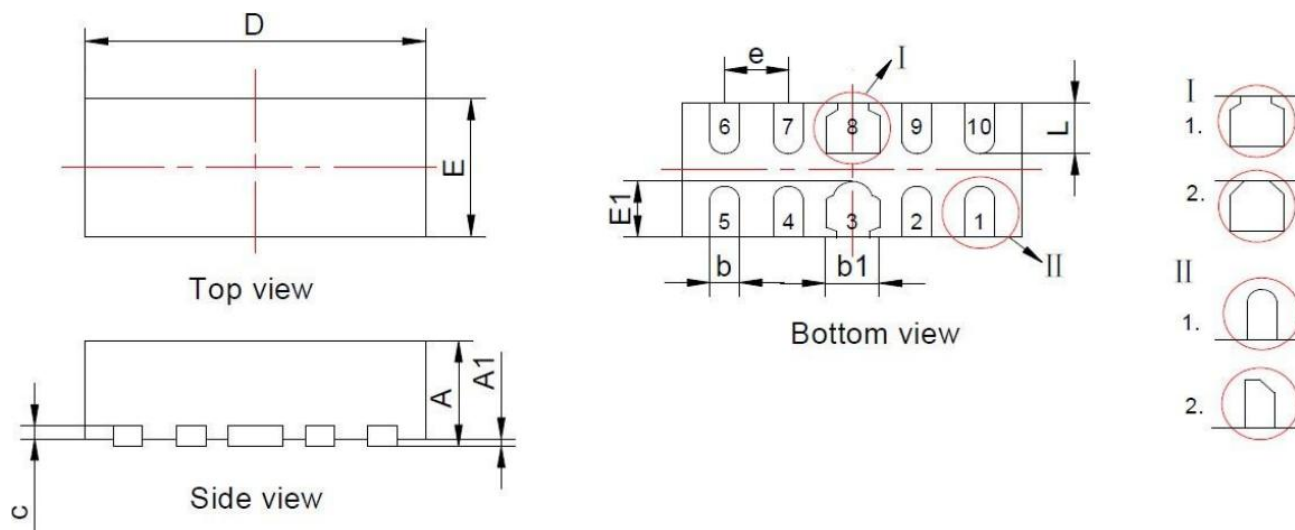




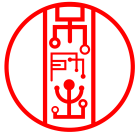
Package Information

DFN2510

Dimensions in mm



Symbol	Dimensions In Millimeters		
	Min	Nom	Max
D	2.45	2.50	2.55
E	0.95	1.00	1.05
b1	0.35	0.40	0.45
b	0.15	0.20	0.25
L	0.33	0.38	0.43
e	0.50 BSC		
E1	0.35	0.40	0.45
A	0.45	0.50	0.55
c	0.15 REF		
A1	0.00	-	0.05



Shikues Disclaimer

1.Accuracy of Information and Right to Modify

The information provided in this document is for reference only. Shikues reserves the right to make changes to this document and to the specifications of the products described herein at any time, without prior notice, for the purpose of improving reliability, function, design, or for any other reason. It is the customer's responsibility to obtain and verify the latest product information and specifications before making any final design, procurement, or usage decisions.

2.No Warranty

Shikues makes no express or implied warranties, representations, or guarantees regarding the suitability of its products for any particular purpose.

Shikues assumes no liability for any assistance provided or for the design of customer products. All products are supplied "as is."

3.Intended Use and Limitation of Liability

The products described in this document are intended for use in general-purpose electronic devices. They are neither designed nor tested nor authorized for use in transportation equipment or applications requiring high reliability. Unless expressly authorized in writing by Shikues, these products must not be used as critical components in life-support systems or any applications where failure could directly pose a risk to human life (including, but not limited to, medical devices, transportation systems, aerospace equipment, nuclear facilities, and safety-critical systems).

Shikues assumes no responsibility or liability for any consequences arising from the use of its products in unauthorized or unintended applications.

Neither Shikues nor its representatives shall be held liable for any resulting damages.

4.Intellectual Property

This document does not grant any express or implied license—whether by estoppel, implication, or otherwise—to use any intellectual property rights of Shikues.