



ESD0524P

Ultra Low Capacitance ESD Protection Array

Description

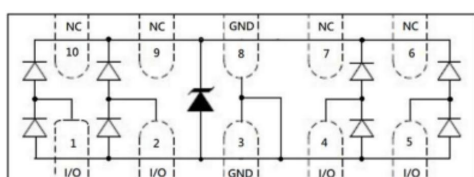
ESD0524P is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.25pF (I/O to I/O) only, ESD0524P is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4($\pm 8\text{KV}$ contact, $\pm 15\text{KV}$ air discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns), very fast charged device model (CDM) ESD and cable discharge event (CDE) etc.

ESD0524P uses ultra-small DFN2510 package. Each ESD0524P device can protect four highspeed data lines. The combined features of ultralow capacitance, ultra-small size and high ESD robustness make ESD0524P ideal for highspeed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the ESD0524P guarantees a minimum stress on the protected IC.

Ordering Information

- Device:ESD0524P
- Package:DFN2510
- Marking:0524P
- 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) $\pm 25\text{kV}$ (Contact)
 $\pm 30\text{kV}$ (Air)
- IEC61000-4-4(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: 0.25pF(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

Mechanical Data

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





ESD0524P

Absolute Maximum Rating

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2(Air)	V_{ESD}	± 30	kV
ESD per IEC 61000-4-2(Contact)		± 25	kV
Peak Pulse Power(8/20 μ s)	P_{PP}	75	W
Operating Temperature	T_{OPT}	-55~+125	°C
Storage Temperature	T_{STG}	-55~+150	°C

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	Any I/O pin to GND			5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$ Any I/O pin to GND	6.0		9.0	V
Reverse Leakage Current	I_R	$V_{RWM}=5V$ Any I/O pin to GND			1.0	μA
Clamping Voltage	V_C	$I_{PP}=1A, t_p=8/20\mu s$ Any I/O pin to GND			10	V
		$I_{PP}=4.8A, t_p=8/20\mu s$ Any I/O pin to GND			15	V
TLP Clamping Voltage	$V_{CTL P}$	$I_{PP}=8A$ IEC61000-4-2 Level 2 Equivalent($\pm 4kV$ Contact, $\pm 8kV$ Air) Between I/O and GND		16		V
		$I_{PP}=16A$ IEC61000-4-2 Level 4 Equivalent($\pm 8kV$ Contact, $\pm 16kV$ Air) Between I/O and GND		23		V
Parasitic Capacitance	C_{ESD}	$V_R=0V, f=1MHz$ Between I/O and GND		0.4	0.5	pF
		$V_R=0V, f=1MHz$ Between I/O and I/O		0.25	0.3	pF

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



ESD0524P

Typical Characteristics

Fig 1 Power Derating Curve

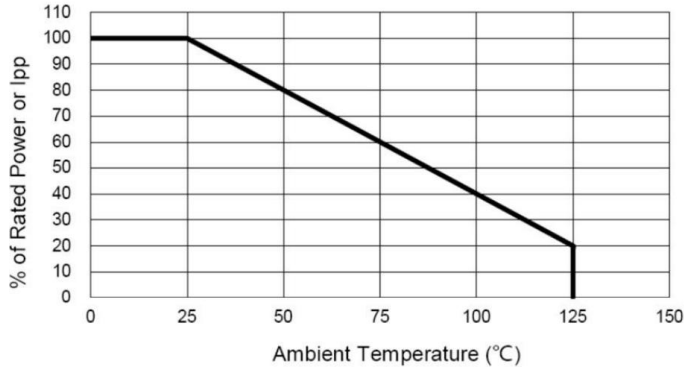


Fig2 Peak Pulse Current vs Clamping voltage

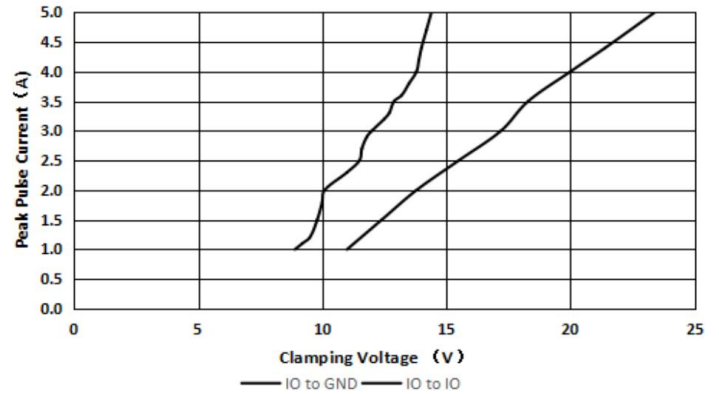


Fig 3 Voltage Sweeping of I/O to I/O

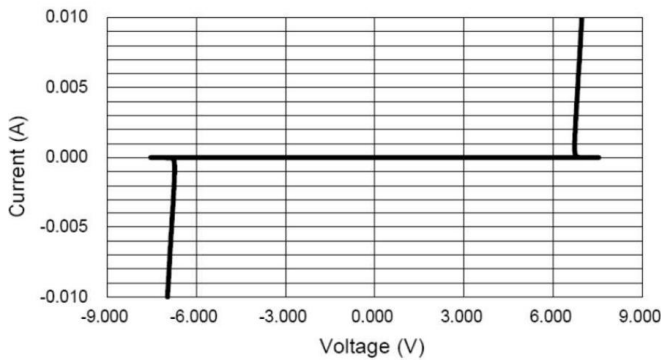


Fig 4 Voltage vs Capacitance

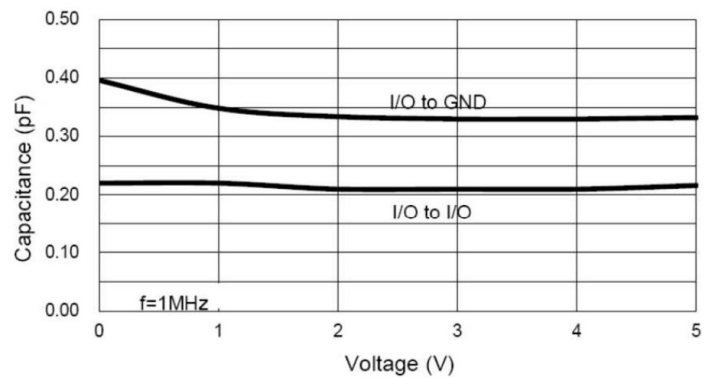


Fig 5 ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)

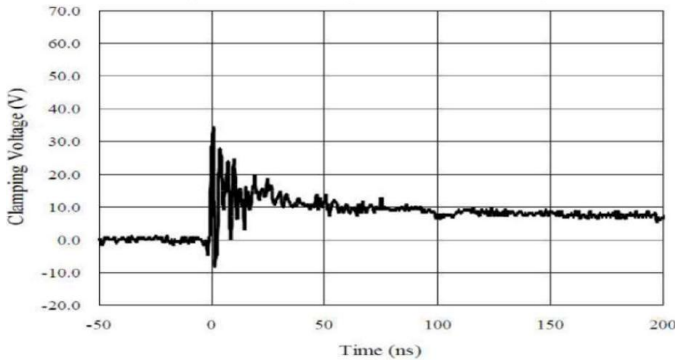


Fig 6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)

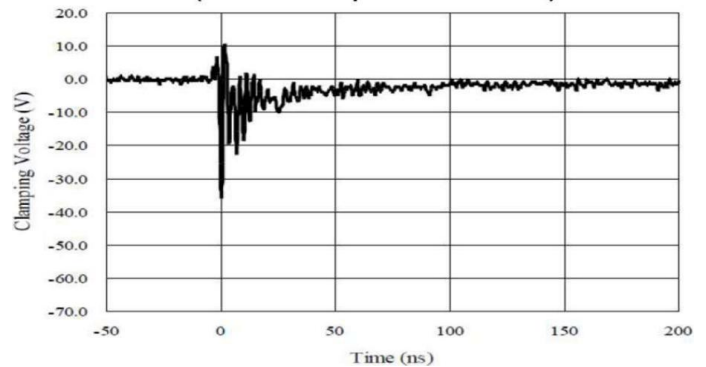
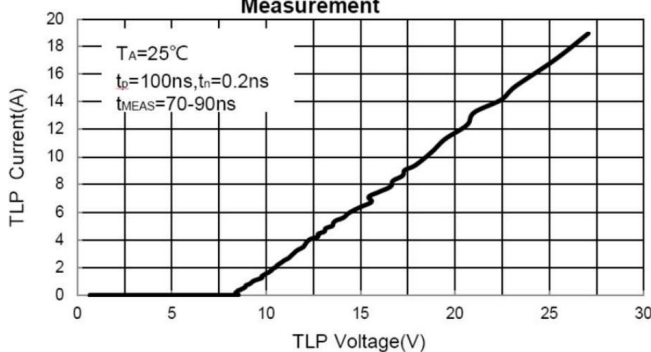


Fig7 Transmission Line Pulsing (TLP)
Measurement

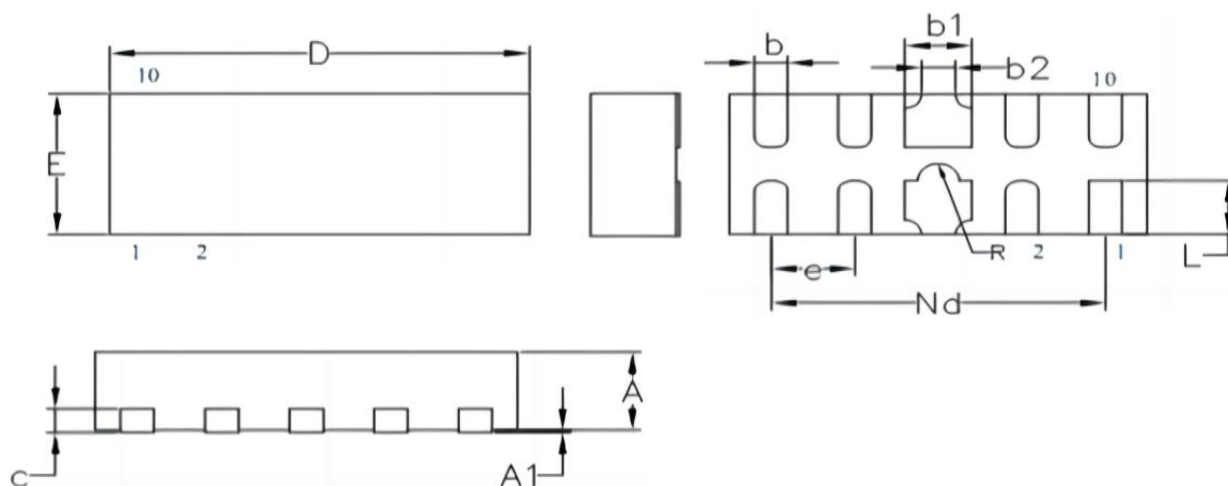




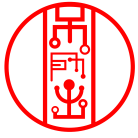
Package Information

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
b2	0.20 REF		
b	0.15	0.20	0.25
L	0.33	0.38	0.43
Nd	2.00 BSC		
e	0.50 BSC		
R	0.10	0.125	0.15
A	0.45	0.50	0.55
c	0.15 REF		
A1	0.00	-	0.05



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