

### DFN2510 Plastic-Encapsulate Diodes

## DESCRIPTION

ESD0524P 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, 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(±15KV air, ±8KV 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.

ESD0524P uses ultra-small DFN2510 package. Each ESD0524P device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make ESD0524P ideal for high-speed 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.

## Features

- ◆ Transient protection for asymmetrical data lines
- ◆ IEC61000-4-2 (ESD) ±25kV (air), ±20kV (contact)  
IEC61000-4-4 (EFT) 40A (5/50ns)  
Cable Discharge Event(CDE)
- ◆ Package optimized for high-speed lines
- ◆ 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 ±8KV contact discharge

## Mechanical Characteristics

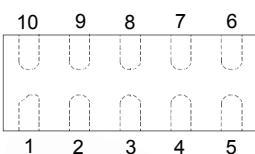
- ◆ Package: DFN2510
- ◆ Flammability Rating: UL 94V-0
- ◆ Terminal: Matte tin plated.
- ◆ High temperature soldering guaranteed:  
260℃/10s
- ◆ Marking: 0524P
- ◆ Packaging: Tape and Reel

## Applications

- ◆ Serial ATA
- ◆ High Definition Multi-Media Interface (HDMI)
- ◆ Desktops, Servers and Notebooks
- ◆ USB 2.0/3.0 Power and Data Line Protection

- ◆ MDDI Ports
- ◆ Display Ports
- ◆ PCI Express
- ◆ Digital Visual Interface (DVI)

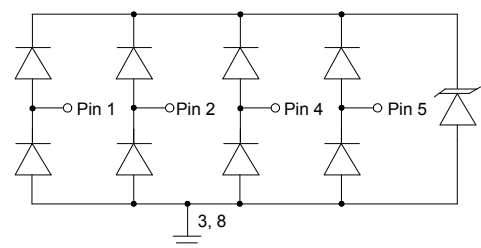
## Package Outline & Pin Configuration



Pin	Identification
1, 2, 4, 5	Input Lines
3, 8	Ground
6, 7, 9, 10	Output Lines (No Internal Connection)



## Circuit Diagram



**Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

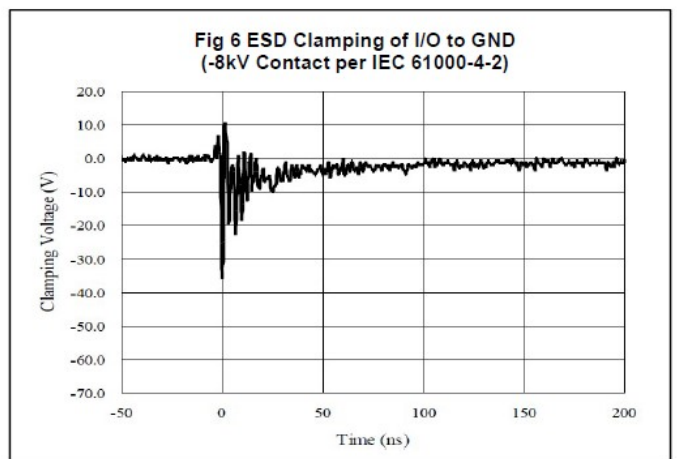
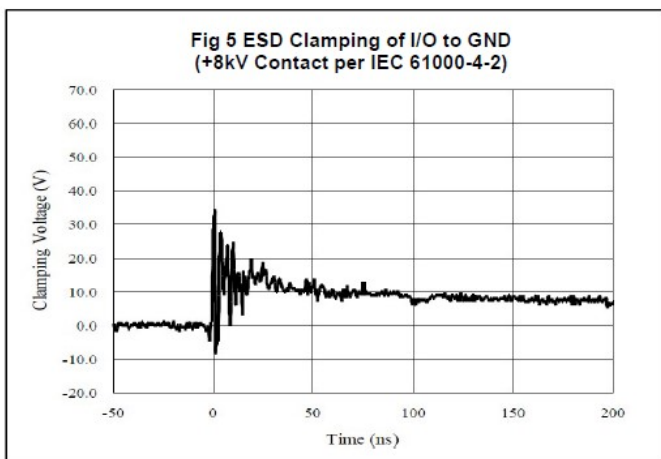
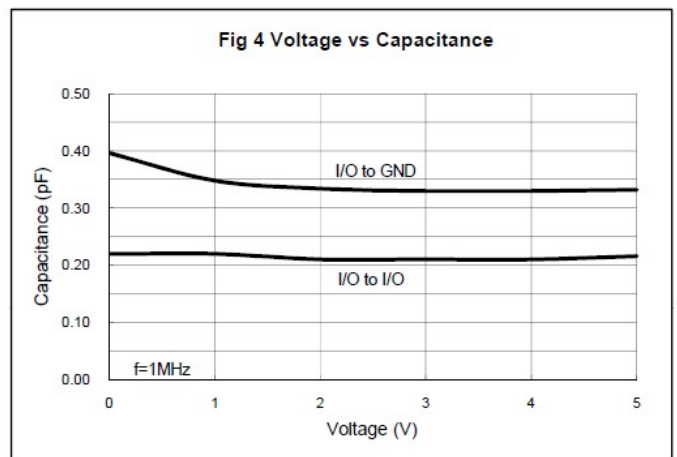
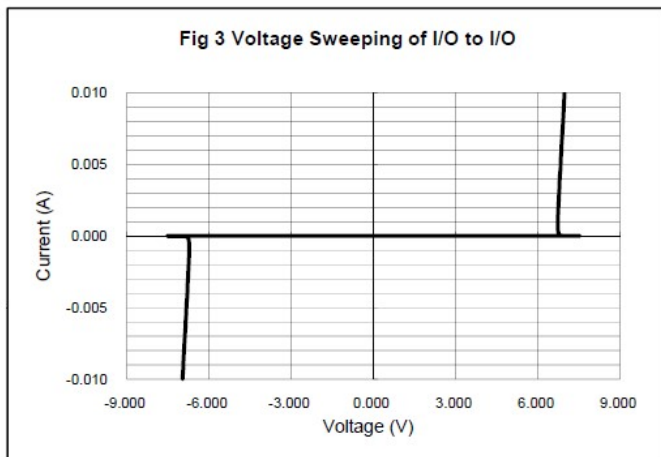
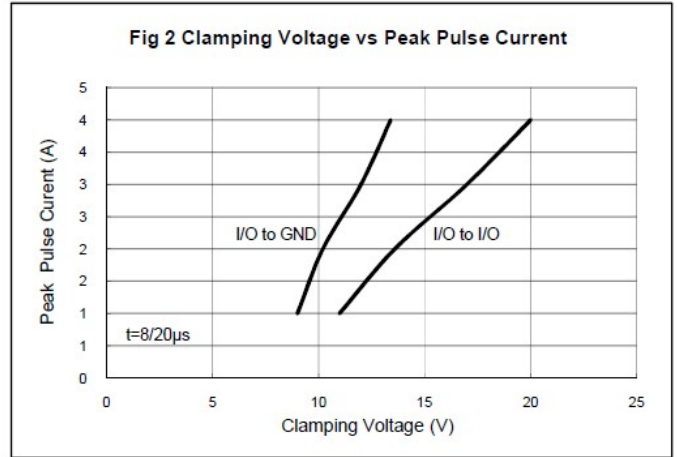
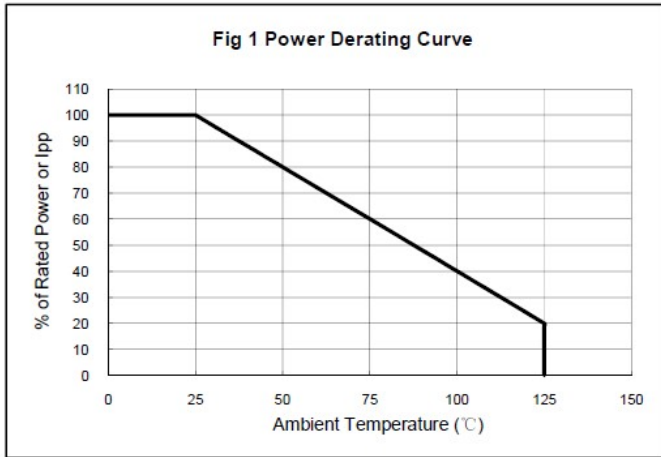
Symbol	Parameter	Value	Units
$P_{PP}$	Peak Pulse Power (8/20 $\mu\text{s}$ )	60	W
$V_{ESD}$	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	$\pm 25$ $\pm 20$	kV
$T_{OPT}$	Operating Temperature	-55/+125	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-55/+150	$^{\circ}\text{C}$

**Electrical Characteristics ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)**

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	$I_T = 1\text{mA}$ Any I/O pin to GND	6.0		9.0	V
$I_R$	Reverse Leakage Current	$V_{RWM} = 5\text{V}$ Any I/O pin to GND			1.0	$\mu\text{A}$
$V_C$	Clamping Voltage	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$ Any I/O pin to GND			10	V
		$I_{PP} = 4\text{A}$ , $t_p = 8/20\mu\text{s}$ Any I/O pin to GND			15	V
$C_{ESD}$	Capacitance	$V_R = 0\text{V}$ , $f = 1\text{MHz}$ Between I/O and GND		0.4	0.5	pF
$C_{ESD}$	Capacitance	$V_R = 0\text{V}$ , $f = 1\text{MHz}$ Between I/O and I/O		0.2	0.3	pF

Note:

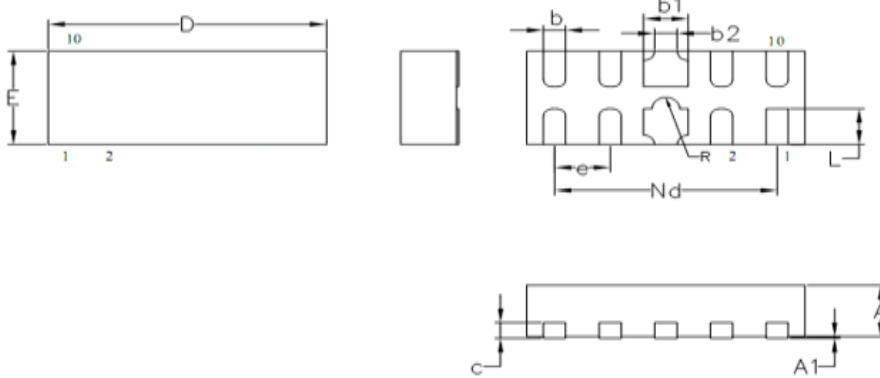
- 1) I/O pins are pin 1,2,4,5, GND pins are pin 3,8.
- 2) The above data are for reference only.

**ELECTRICAL CHARACTERISTICS CURVE**


The curve above is for reference only.

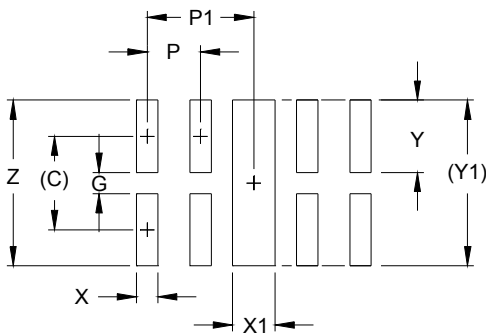
### Outlitne Drawing

### DFN2510 Package Outline Dimensions



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.018	.020	.022	0.45	0.50	0.55
A1	0.00	.001	.002	0.00	0.03	0.05
C	(0.005)			(0.15)		
b	.006	.008	.010	0.15	0.20	0.25
b1	.014	.016	.018	0.35	0.40	0.45
D	.096	.098	.100	2.45	2.50	2.55
E	.035	.039	.041	0.90	1.00	1.05
e	.020 BSC			0.50 BSC		
L	.012	.015	.017	0.30	0.38	0.43
Nd	0.079 BSC			2.00 BSC		
b2	.008 REF			0.20 REF		
R	.004	.005	0.06	0.10	.125	0.15

### Suggested Pad Layout



DIM	DIMENSIONS	
	INCHES	MILLIMETERS
C	(.034)	(0.875)
G	.008	0.20
P	.020	0.50
P1	.039	1.00
X	.008	0.20
X1	.016	0.40
Y	.027	0.675
Y1	(.061)	(1.55)
Z	.061	1.55

NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.