

4-Line ESD Protection Diode Array



General description

The device is designed to protect high-speed interfaces such as SuperSpeed USB, High-Definition Multimedia Interface (HDMI), DisplayPort, external Serial Advanced Technology Attachment (eSATA) and Low Voltage Differential Signaling (LVDS) interfaces against ElectroStatic Discharge (ESD).

The device includes four high-level ESD protection diode structures for ultra high-speed signal lines and is encapsulated in a leadless small DFN2510-10L plastic package.

All signal lines are protected by a special diode configuration offering ultra low line capacitance of only 0.55 pF. These diodes utilize a unique snap-back structure in order to provide protection to downstream components from ESD voltages up to 15 kV contact exceeding IEC 61000-4-2, level 4.

Features and benefits

- System ESD protection for USB 2.0 and SuperSpeed USB 3.0, HDMI 2.0, DisplayPort, eSATA and LVDAS
- All signal lines with integrated rail-to-rail clamping diodes for downstream ESD protection of 15 kV exceeding IEC 61000-4-2, level 4
- Matched 0.5 mm trace spacing
- Signal lines with 0.25 pF matching capacitance between signal pairs
- Line capacitance of only 0.55 pF for each channel
- Design-friendly 'pass-through' signal routing

Application information

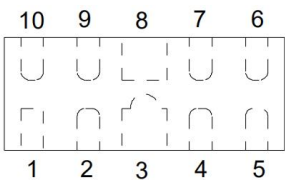
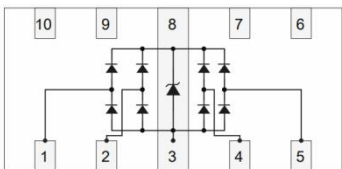
The device is designed for high-speed receiver and transmitter port protection:

- TVs and monitors (HDMI)
- DVD recorders and players
- Notebooks, main board graphic cards and ports
- Set-top boxes and game consoles
- SATA and eSATA Interface
- USB3.0

Ordering information

Device	Package	Packaging	Reel Size
ESD3324P-SL	DFN2510-10L	3000/Tape & Reel	7 Inch

Schematic & Pin configuration

Simplified outline	Graphic symbol
top view 	top view 

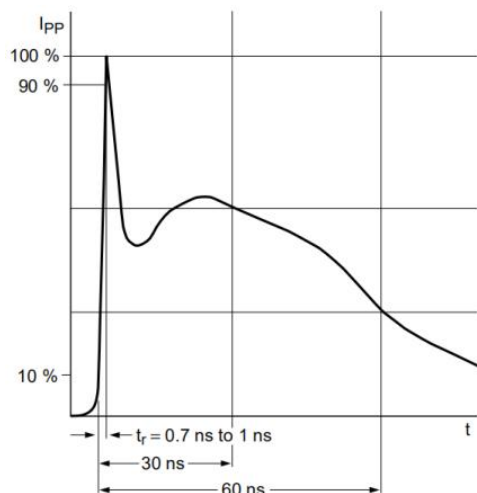
Maximum Ratings (T_A= 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (Tp = 8/20 μ s)	P _{PPM}	60	W
Rated Peak Pulse Current (Tp = 8/20 μ s) (I/O to GND)	I _{PPM}	5	A
Maximum lead temperature for soldering during 10s	T _L	260	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C
Operating Temperature Range	T _{OP}	-40 to +125	°C
Maximum junction temperature	T _j	150	°C
ESD voltage IEC 61000-4-2 (air discharge)	V _{ESD}	20	kV
ESD voltage IEC 61000-4-2 (contact discharge)	V _{ESD}	15	kV

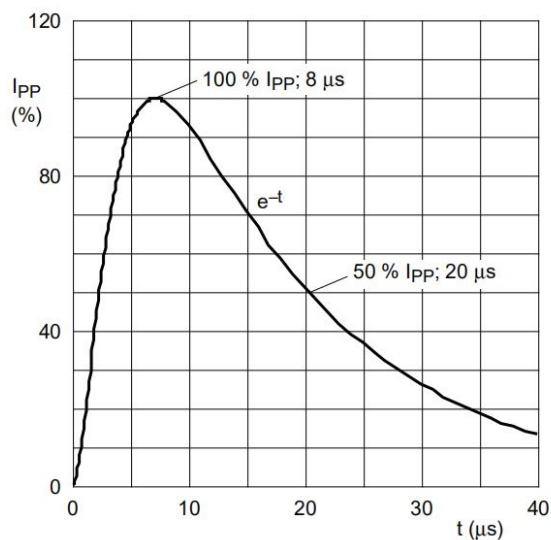
Electrical Characteristics (T_A= 25 °C, unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Reverse Working Voltage	V _{RWM}	--	--	3.3	V	
Breakdown Voltage (I/O to GND)	V _{BR}	4.0	4.7	5.5	V	I _T =1mA
Breakdown Voltage (I/O to I/O)	V _{BR}	4.5	5.6	6.2	V	I _T =1mA
Leakage Current I _{Leak}	I _R	--	--	100	nA	V _{RWM} =3.3V
Clamping Voltage (I/O to GND)	V _C	--	9.0	10.0	V	I _{PP} =5A, Tp=8/20μs
Clamping Voltage (I/O to I/O)	V _C	--	13.0	15.0	V	I _{PP} =4A, Tp=8/20μs
Junction Capacitance (I/O to I/O)	C _j	--	0.25	0.35	pF	V _R =0V, f=1MHz
Junction Capacitance(I/O to GND)	C _j	--	0.55	0.7	pF	V _R =0V, f=1MHz

Typical Characteristics

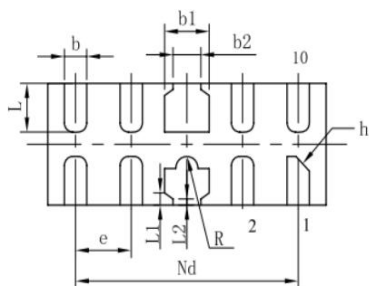
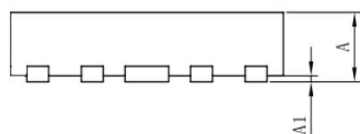
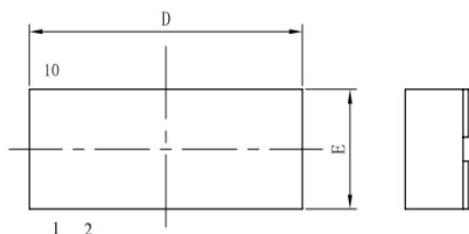


IEC61000-4-2 Waveform



IEC 61000-4-5 Waveform(8/20μs pulse)

Package Outline Dimensions (DFN2510-10L)



BOTTOM VIEW

Symbol	Dimensions In Millimet	
	Min	Max
A	0.48	0.60
A1	0.00	0.05
b	0.15	0.25
b1	0.35	0.45
b2	0.20	0.30
D	0.45	0.55
e	0.50BSC	
Nd	2.00BSC	
E	0.95	1.05
L	0.33	0.45
L1	0.075REF	
L2	0.05REF	
h	0.08	0.15
R	0.05	0.15