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 0.6 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 0.3 pF matching capacitance between signal pairs
- Line capacitance of only 0.6 pF for each channel
- Design-friendly‘ pass-through ’signal routing

Application information

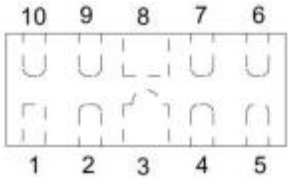
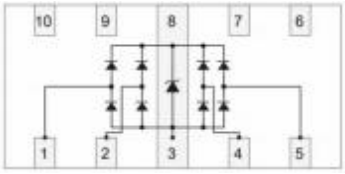
The device is designed for high-speed receiver and transmitter port protection:

- 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	Marking	Packaging
PWESD-5VDSB	DFN2510-10L	0524P	3000/Tape & Reel

Schematic & Pin configuration

Simplified outline	Graphic symbol
top view 	top view 

Maximum Ratings

(T_{OP} = 25 °C, unless otherwise specified)

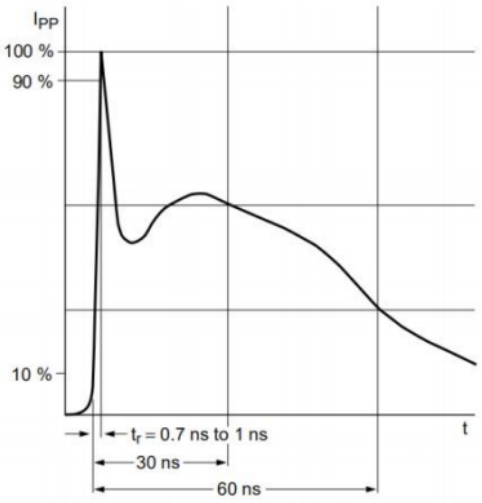
Parameter	Symbol	Value	Unit
Peak Pulse Power (Tp = 8/20μs)	P_{PPM}	55	W
Rated Peak Pulse Current (Tp = 8/20μs)	I_{PPM}	4	A
Maximum lead temperature for soldering during 10s	T_L	260	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C
Operating Temperature Range	T_{OP}	-40 to +125	°C
Maximum junction temperature	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

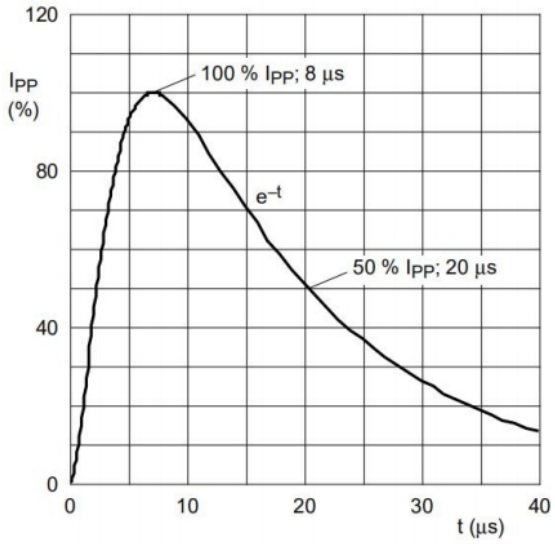
(T_{OP} = 25 °C, unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Reverse Working Voltage	V_{RWM}	--	--	5.0	V	
Breakdown Voltage	V_{BR}	6	--	8.5	V	I_T=1mA
Leakage Current ILeak	I_R	--	--	100	nA	V_{RWM}=5V
Clamping Voltage	V_C	--	--	13.0	V	I_{PP}=4A,T_p=8/20μs
Junction Capacitance	C_j	--	0.3	0.4	pF	V_R=0V, f=1MHz I/O to I/O
Junction Capacitance	C_j	--	0.6	0.7	pF	V_R=0V, f=1MHz I/O to GND

Typical Characteristics



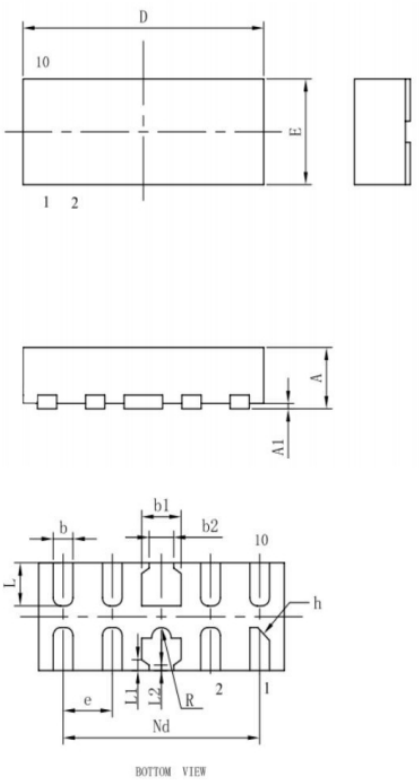
IEC61000-4-2 Waveform



IEC 61000-4-5 Waveform(8/20µs pulse)

Package Outline Dimensions

DFN2510-10L



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

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