

1. Description

The ESD9N12BA is a TVS (Transient Voltage Suppressor) designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and lightning.

3. Features

- ESD protection for high-speed data lines to IEC 61000-4-2 (ESD) $\pm 17\text{kV}$ (air), $\pm 12\text{kV}$ (contact) IEC 61000-4-5 (Lightning) 5A (8/20 μs) IEC 61000-4-4 (EFT) 40A (5/50ns)
- Package design optimized for high speed lines
- Flow-Through design

4. Mechanical Characteristics

- SLP1610P4 6-pin package (1.6 x 1.0 x 0.58mm)
- Lead Pitch: 0.5mm
- Lead finish: NiPdAu

2. Applications

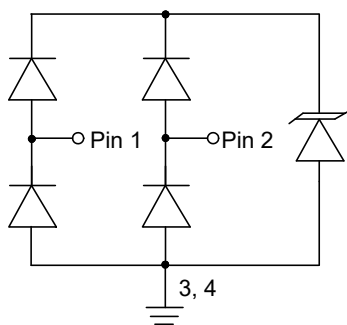
- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interface (DVI)
- DisplayPort™ Interface
- MDDI Ports
- PCI Express
- eSATA Interfaces

- Protects two or four I/O lines
- Low capacitance: 0.3pF typical (I/O to I/O)
- Low clamping voltage
- Low operating voltage: 5V
- Solid-state silicon-avalanche technology

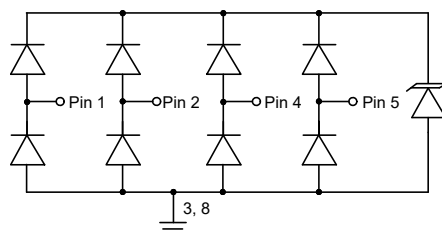
- SLP2510P8 10-pin package (2.5 x 1.0 x 0.58mm) Pb-Free, Halogen Free, RoHS/WEEE Compliant



5.1 Pinning information



SLP1610P4



DFN2510-10

6. Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu s$)	P_{PK}	150	W
Peak Pulse Current ($t_p=8/20\mu s$)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 17	kV
ESD per IEC 61000-4-2 (Contact)		± 12	kV
Junction temperature	T_J	-55 to 125	°C
Storage temperature	T_{STG}	-55 to 150	°C



7. Electrical Characteristics (T=25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse stand-off voltage	V_{RWM}	Any I/ O pin to ground			5	V
Reverse breakdown voltage	V_{BR}	$I_T=1mA$ Any I/ Opin to ground	6			V
Reverse leakage current	I_R	$V_{RWM}=5V$, T=25°C Any I/ Opin to ground			1	μA
Clamping voltage	V_C	$I_{PP}=1A$, $t_p=8/20\mu s$ Any I/ Opin to ground			15	V
Junction capacitance	C_J	$V_R=0V$, f=1MHz Between I/ Opins		0.3	0.4	pF
		$V_R=0V$, f=1MHz Any I/ Opin to ground			0.8	pF



8.1 Typical characteristic

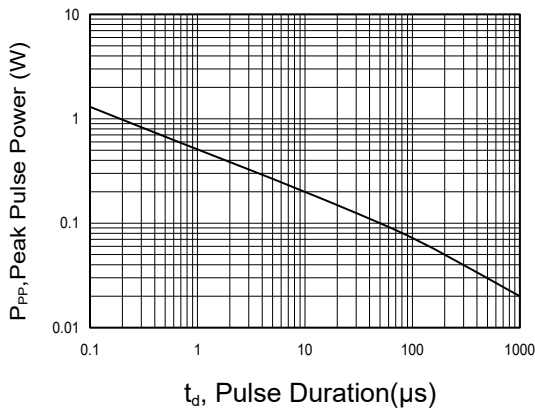


Figure 1: Non-Repetitive Peak Pulse Power vs. Pulse Time

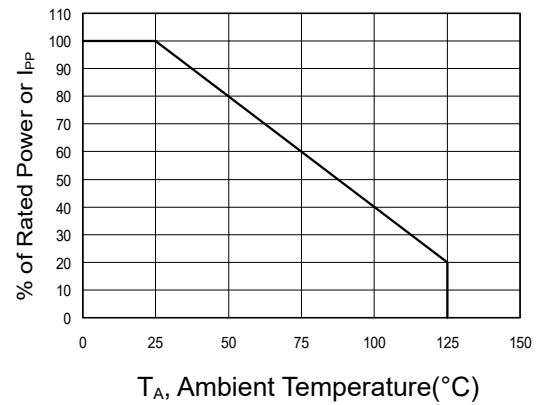


Figure 2: Power Derating Curve

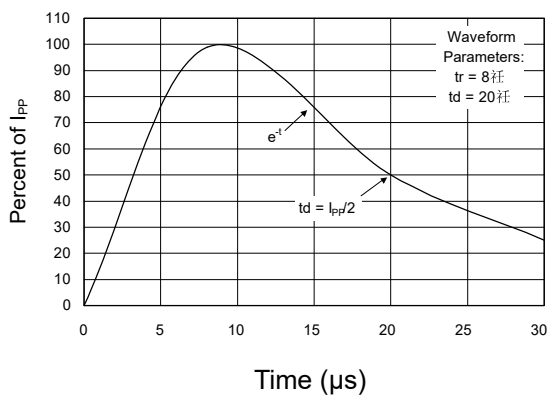


Figure 3: Pulse Waveform

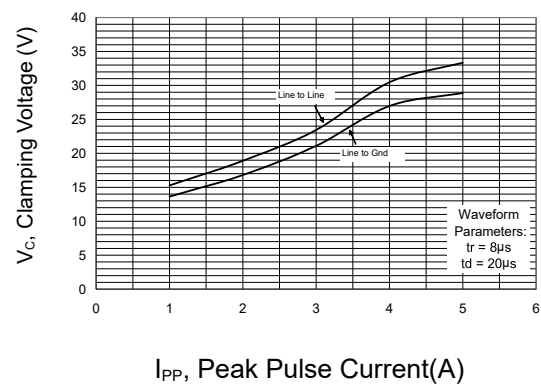


Figure 4: Clamping Voltage vs. Peak Pulse Current (Between any I/O and Ground)

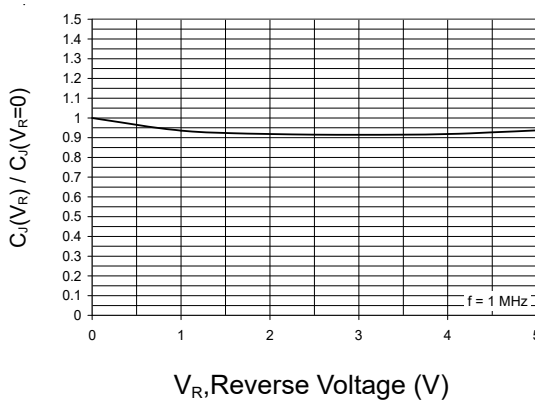


Figure 5: Normalized Capacitance vs. Reverse Voltage

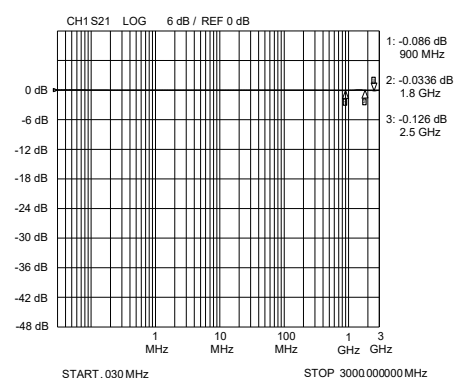


Figure 6: Insertion Loss S21 - I/O to GND



8.2Typical characteristic

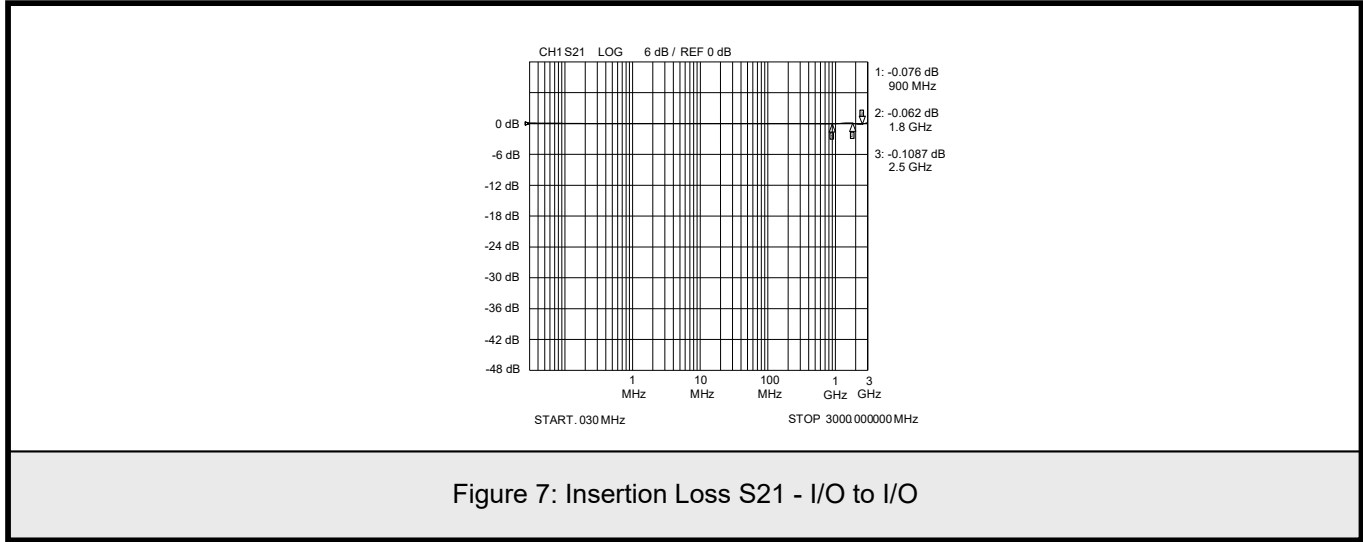
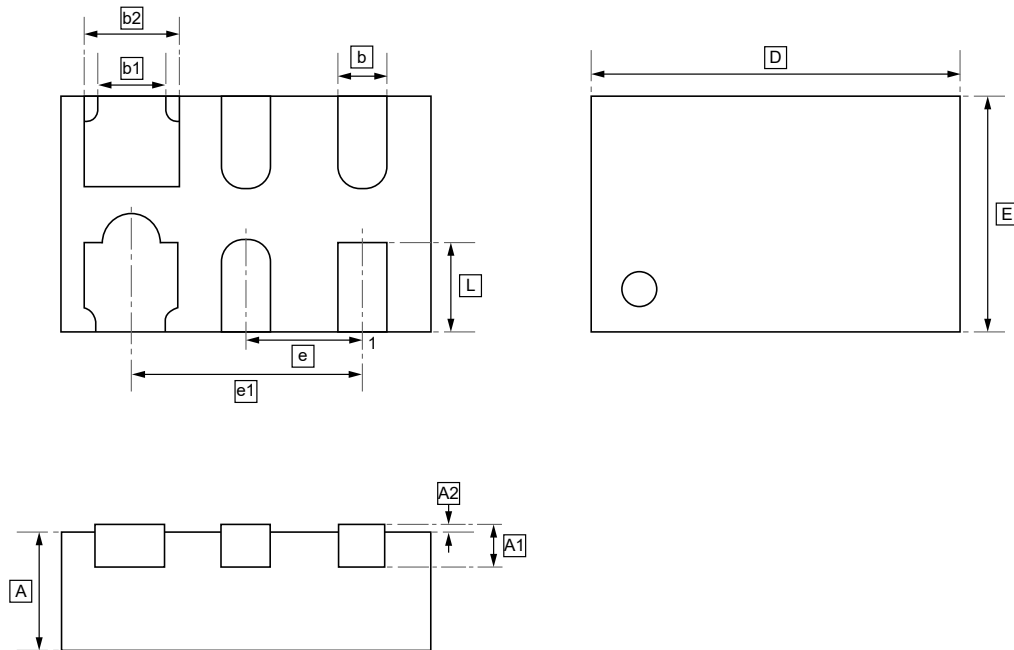


Figure 7: Insertion Loss S21 - I/O to I/O



9.1 SLP1610P4 Package Outline Dimensions

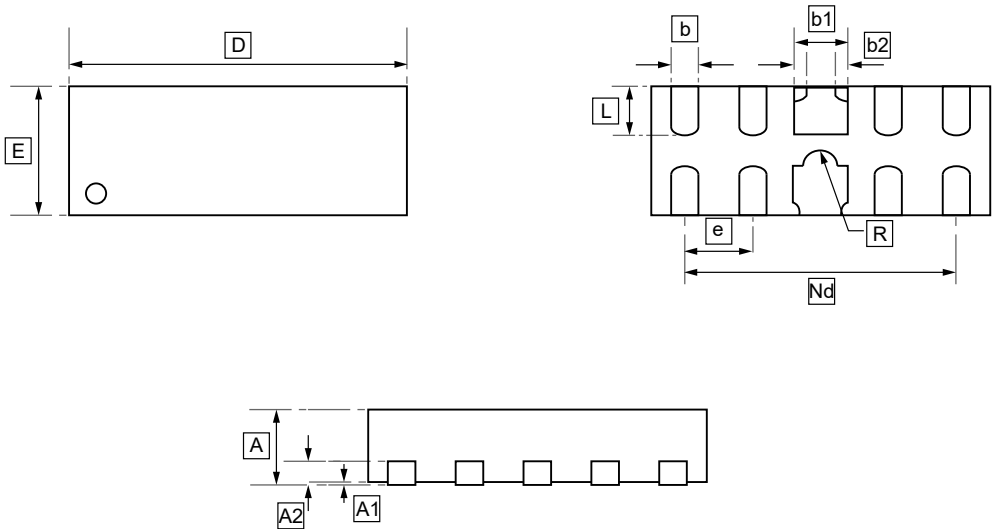


DIMENSIONS (mm are the original dimensions)

Symbol	D	E	L	b	b1	b2	e	e1	A	A1	A2
Min	1.55	0.95	0.33	0.15	0.35	0.25	0.50	1.00	0.45	0.15	0.00
Max	1.65	1.05	0.43	0.25	0.45	0.35	BSC	BSC	0.55	REF	0.05



9.DFN2510-10 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	D	E	b1	b2	b	L	Nd	e	R	A	A1	A2
Min	2.45	0.95	0.35	0.15	0.10	0.33	2.00	0.50	0.125	0.45	0.152	-
Max	2.55	1.05	0.45	0.25	0.20	0.43	BSC	BSC	BSC	0.55	REF	0.05



10.Ordering information

.0524P_U

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW RCLAMP0522P.TCT	0522P	SLP1610P4	3000	Tape and reel
UMW RCLAMP0524P	0524P	DFN2510-10	3000	Tape and reel



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