Description

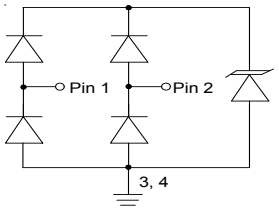
RClamp arrays are ultra low capacitance ESD protection devices designed to protect high speed data interfaces. This series has been specifically designed to protect sensitive components which are connected to high-speed data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

The RClamp0522P and RClamp0524P have a typical capacitance of only 0.30pF between I/O pins. This allows it to be used on circuits operating in excess of 3GHz without signal attenuation. They may be used to meet the ESD immunity requirements of IEC 61000-4-2. The RClamp0522P is designed to protect two lines, while the RClamp0524P will protect four lines.

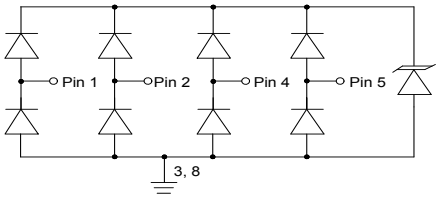
The RClamp0522P is in a 6-pin SLP1610P4 package. It measures 1.6 x 1.0 with a nominal height of 0.58mm.

The RClamp0524PA is in a 10-pin SLP2510P8 package. It measures 2.5 x 1.0 with a nominal height of 0.58mm.

The leads are spaced at a pitch of 0.5mm and are finished with lead-free NiPdAu. They are designed for easy PCB layout by allowing the traces to run straight through the device. The combination of small size, low capacitance, and high level of ESD protection makes them a flexible solution for applications such as HDMI, DisplayPortTM, MDDI, and eSATA interfaces.



2-Line Protection



4-Line Protection

Features

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

Applications

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

Mechanical Characteristics

- SLP1610P4 6-pin package (1.6 x 1.0 x
- 0.58mm) SLP2510P8 10-pin package (2.5 x 1.0 x 0.58mm) Pb-Free, Halogen Free,RoHS/WEEE Compliant
- Lead Pitch: 0.5mm
- Lead finish: NiPdAu

Absolute Maximum Rating

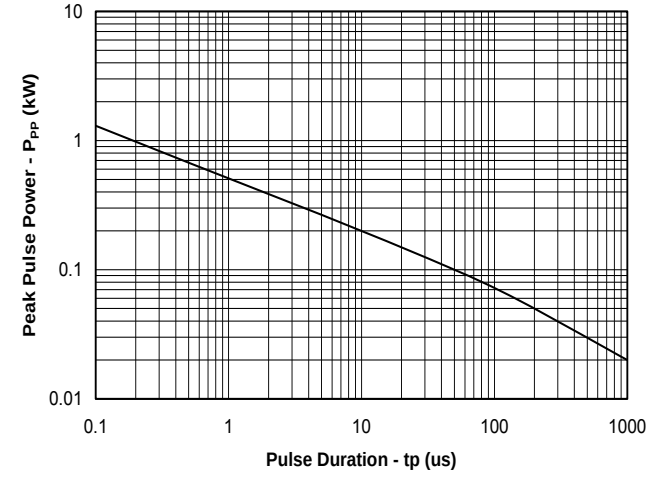
Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	P_{pk}	150	W
Peak Pulse Current (tp = 8/20μs)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	+/- 17 +/- 12	kV
Operating Temperature	T_J	-55 to +125	° C
Storage Temperature	T_{STG}	-55 to +150	° C

Electrical Characteristics (T=25℃)

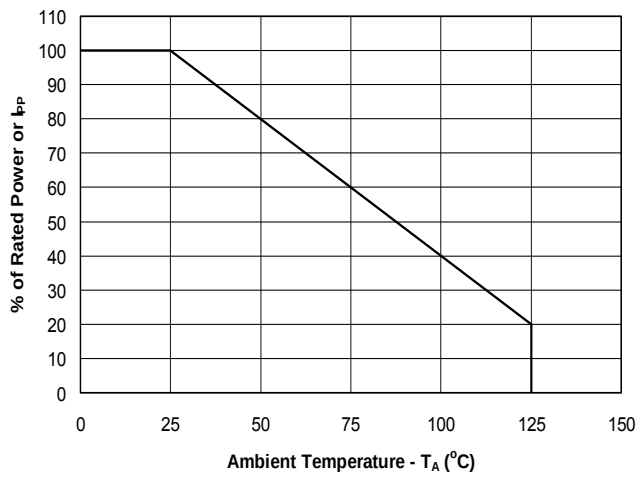
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Any I/O pin to ground			5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA Any I/O pin to ground	6			V
Reverse Leakage Current	I_R	V_{RWM} = 5V, T=25° C Any I/O pin to ground			1	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs Any I/O pin to ground			15	V
Junction Capacitance	C_j	V_R = 0V, f = 1MHz Between I/O pins		0.30	0.4	pF
Junction Capacitance	C_j	V_R = 0V, f = 1MHz Any I/O pin to ground			0.8	pF

Typical Characteristics

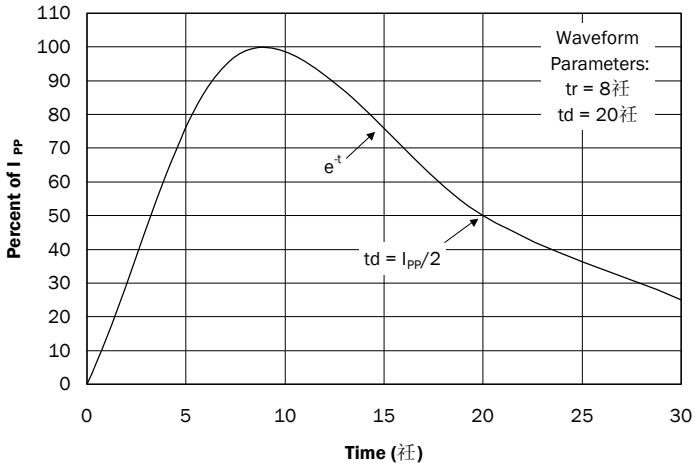
Non-Repetitive Peak Pulse Power vs. Pulse Time



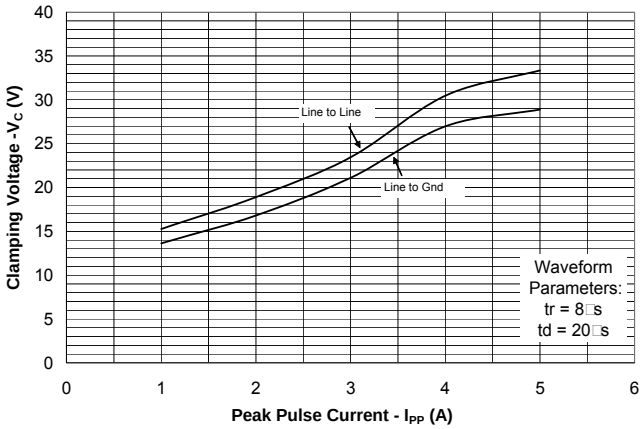
Power Derating Curve



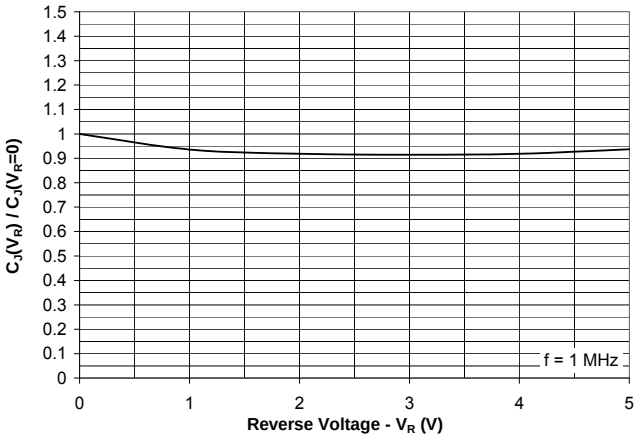
Pulse Waveform



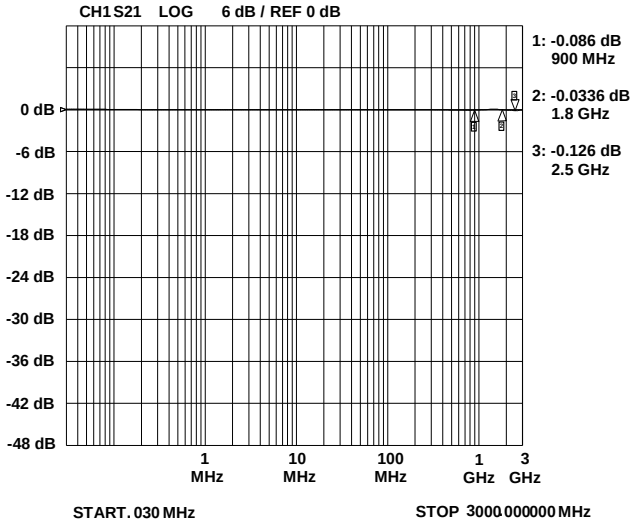
Clamping Voltage vs. Peak Pulse Current (Between any I/O and Ground)



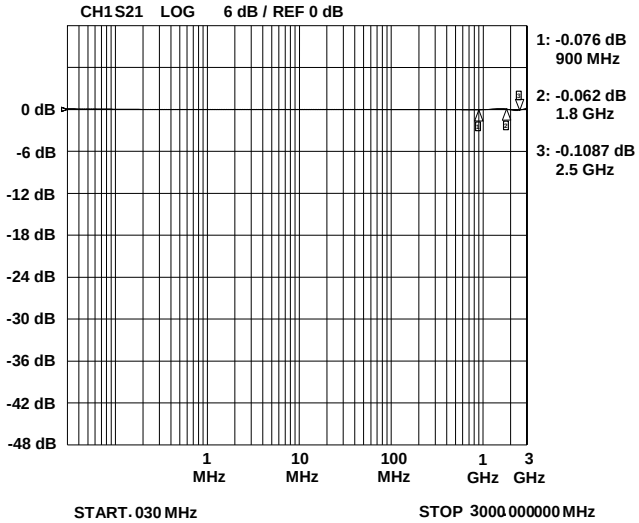
Normalized Capacitance vs. Reverse Voltage



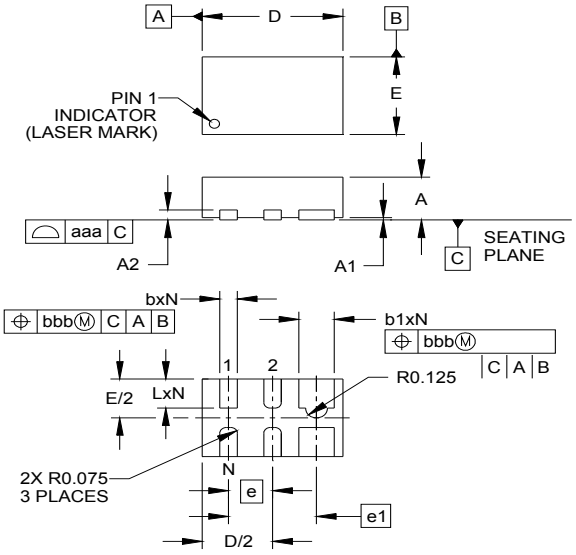
Insertion Loss S21 - I/O to GND



Insertion Loss S21 - I/O to I/O



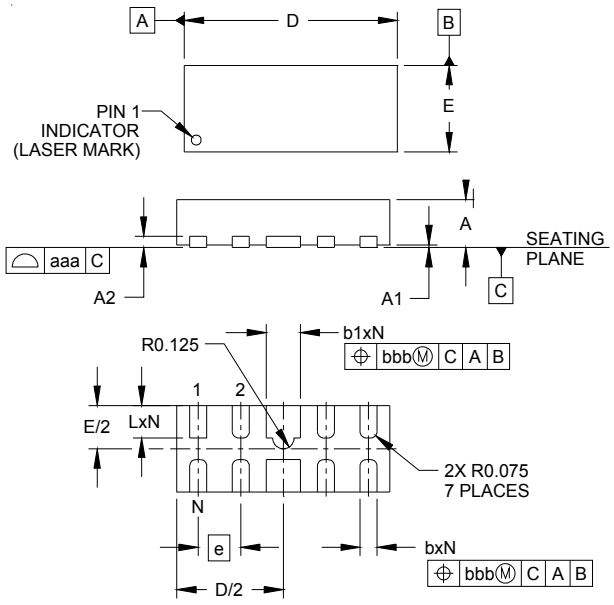
Outline Drawing - SLP1610P4/SLP2510P8



DIM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.020	.023	.026	0.50	0.58	0.65
A1	0.00	.001	.002	0.00	0.03	0.05
A2		(.005)			(0.13)	
b	.006	.008	.010	0.15	0.20	0.25
b1	.014	.016	.018	0.35	0.40	0.45
D	.059	.063	.067	1.50	1.60	1.70
E	.035	.039	.043	0.90	1.00	1.10
e		.020 BSC			0.50 BSC	
e1		.039 BSC			1.00 BSC	
L	.012	.015	.017	0.30	0.38	0.43
N		4			4	
aaa		.003			0.08	
bbb		.004			0.10	

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

SLP1610P4

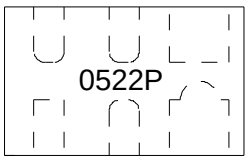


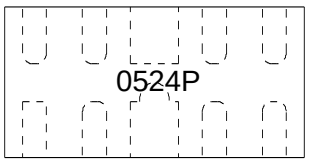
DIM	DIMENSIONS					
	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.020	.023	.026	0.50	0.58	0.65
A1	0.00	.001	.002	0.00	0.03	0.05
A2		(.005)			(0.13)	
b	.006	.008	.010	0.15	0.20	0.25
b1	.014	.016	.018	0.35	0.40	0.45
D	.094	.098	.102	2.40	2.50	2.60
E	.035	.039	.043	0.90	1.00	1.10
e		.020 BSC			0.50 BSC	
L	.012	.015	.017	0.30	0.38	0.425
N		8			8	
aaa		.003			0.08	
bbb		.004			0.10	

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

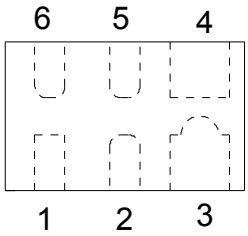
SLP2510P8

Marking



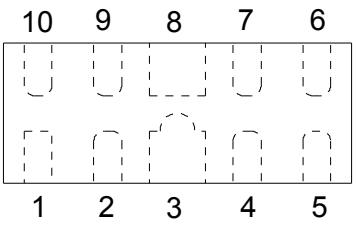


Pin Identification and Configuration



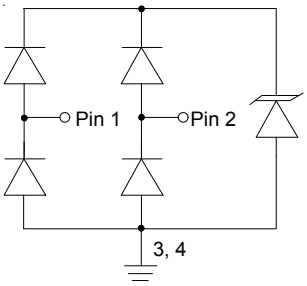
Pin	Identification
1 - 2	Input Lines
5 - 6	Output Lines (No Internal Connection)
3 - 4	Ground

SLP1610P4 Pin Configuration (Top View)

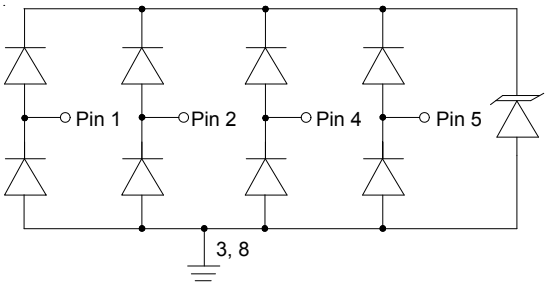


Pin	Identification
1, 2, 4, 5	Input Lines
6, 7, 9, 10	Output Lines (No Internal Connection)
3, 8	Ground

SLP2510P8 Pin Configuration (Top View)



Circuit Diagram



Circuit Diagram

Ordering information

Order code	Package	Base qty	Delivery mode
RCLAMP0522P.TCT	SLP1610P4	3000	Tape and reel
RCLAMP0524P	SLP2510P8	3000	Tape and reel