Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

µClamp0511PQ
µClamp®
1-Line ESD Protection

PROTECTION PRODUCTS

Description

µClamp® series of TVS arrays are designed to protect sensitive electronics from damage or latch-up due to ESD. They feature large cross-sectional area junctions for conducting high transient currents. They offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

The µClamp®0511PQ is in a 2-pin, SLP1006P2 package. It measures 1.0 x 0.6 x 0.5mm. The leads are spaced at a pitch of 0.65mm and are finished with lead-free NiPdAu. Each device will protect one bidirectional line operating at ±5 volts. It gives the designer the flexibility to protect single lines in applications where arrays are not practical. They may be used to meet the ESD immunity requirements of IEC 61000-4-2 (±30kV contact & air discharge). The combination of small size and high ESD surge capability makes them ideal for use in portable applications such as cellular phones, digital cameras, and MP3 players.

The µClamp0511PQ is qualified to AEC-Q100 Grade 1 for Automotive use.

Features

- Transient protection for data lines to
  - IEC 61000-4-2 (ESD) ±30kV (contact & air)
  - IEC 61000-4-4 (EFT) 40A (tp = 5/50ns)
  - Cable Discharge Event (CDE)
- Ultra-small package (1.0 x 0.6 x 0.5mm)
- Protects one I/O or power line
- Low clamping voltage
- Working voltage: 5V
- Low leakage current
- Solid-state silicon-avalanche technology
- AEC-Q100 Grade 1 Qualified

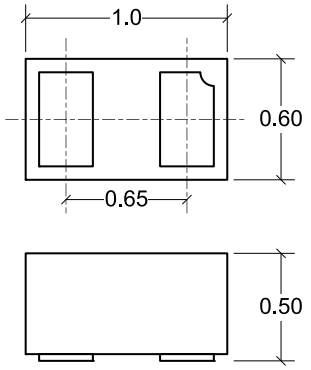
Mechanical Characteristics

- SLP1006P2 package
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Molding compound flammability rating: UL 94V-0
- Lead Finish: NiPdAu
- Packaging: Tape and Reel

Applications

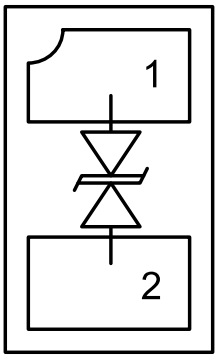
- Cellular Handsets & Accessories
- Cordless Phones & Smart Phones
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Players
- Automotive Applications

Package Dimension



Nominal Dimensions (mm)

Schematic & Pin Configuration



SLP1006P2 (Bottom View)

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (t_p = 8/20µs)	P_{PK}	170	W
Peak Pulse Current (t_p = 8/20µs)	I_{PP}	12	A
ESD per IEC 61000-4-2 (Air)(1) ESD per IEC 61000-4-2 (Contact)(1)	V_{ESD}	±30 ±30	kV
Operating Temperature	T_J	-40 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	Pin 1 to 2 or 2 to 1				5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA, Pin 1 to 2 or 2 to 1 T=-40°C to +125°C		6	8	10	V
Reverse Leakage Current	I_R	V_{RWM} = 5V Pin 1 to 2 or 2 to 1	T=25°C		0.025	1	µA
			T=125°C			1	
Clamping Voltage	V_C	I_{PP}=1A, t_p = 8/20µs Pin 1 to 2 or 2 to 1				11	V
		I_{PP}=12A, t_p = 8/20µs Pin 1 to 2 or 2 to 1				14	
Dynamic Resistance[2,3]	R_{DYN}	t_p = 0.2/100ns, Pin1 to 2 or 2 to 1			0.19		Ω
Junction Capacitance	C_J	V_R = 5V, f = 1MHz Pin 1 to 2 or 2 to 1	T=25°C			75	pF
			T=125°C			75	

Notes

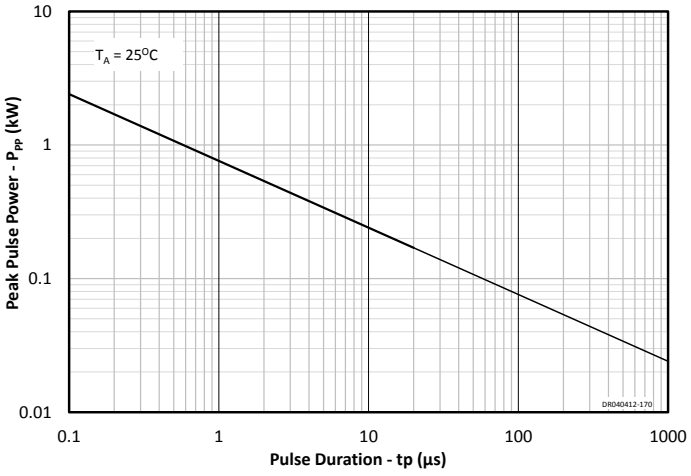
1) ESD gun return path connected to ESD ground reference plane.

2) Transmission Line Pulse Test (TLP) Settings: t_p = 100ns, t_r = 0.2ns, I_{TLP} and V_{TLP} averaging window: t_1 = 70ns to t_2 = 90ns.

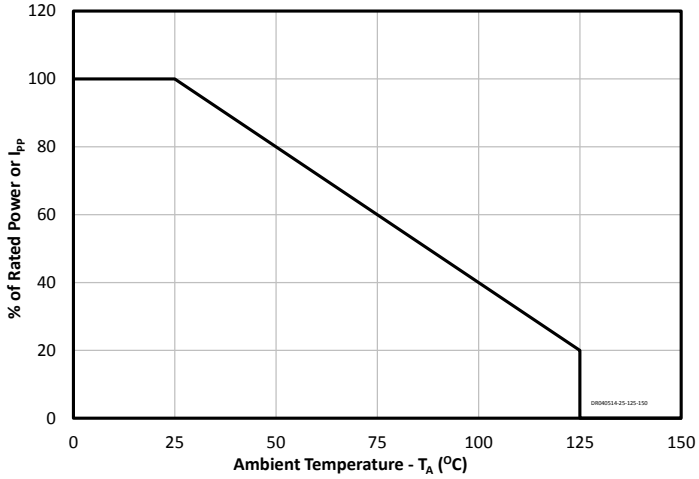
3) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A.

Typical Characteristics

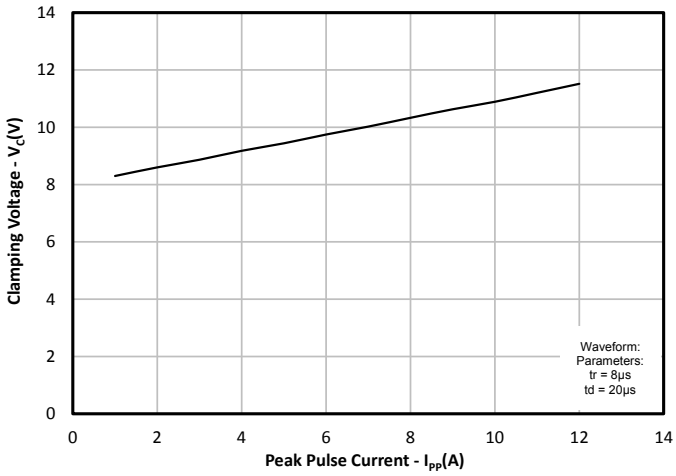
Non-Repetitive Peak Pulse Power vs. Pulse Time



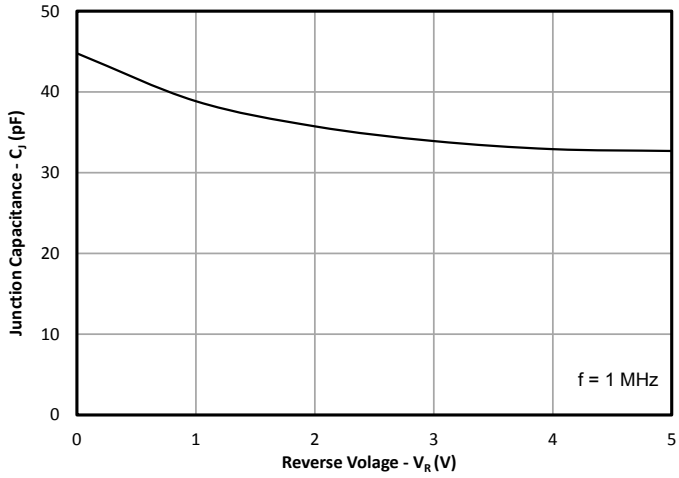
Power Derating Curve



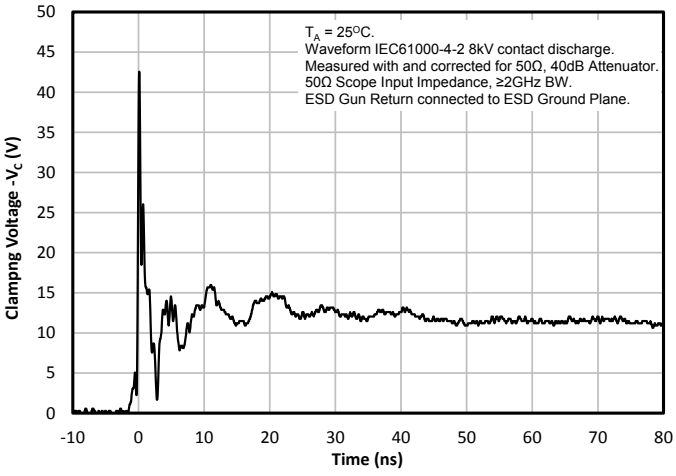
Clamping Voltage vs. Peak Pulse Current (t_p=8/20µs)



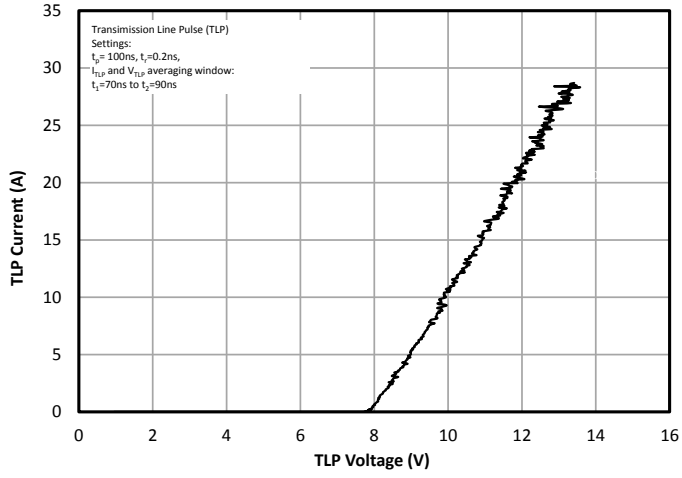
Capacitance vs. Reverse Voltage



ESD Clamping (8kV Contact per IEC 61000-4-2)

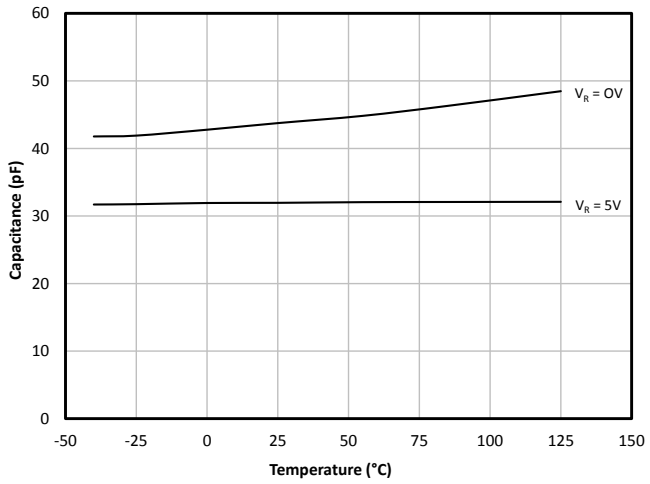


TLP Characteristic (Positive Pulse)

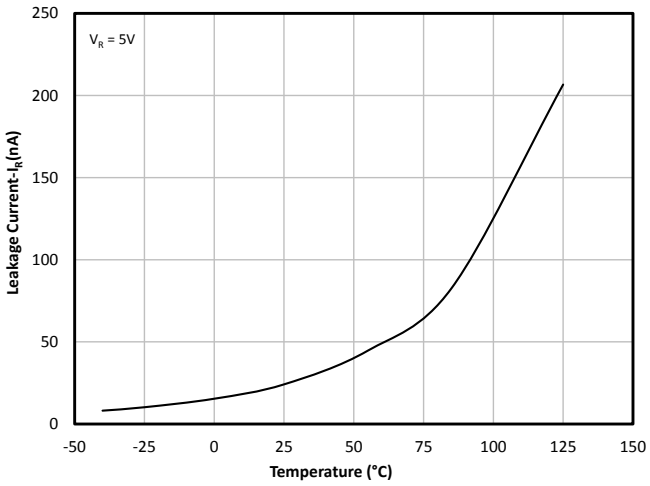


Typical Characteristics

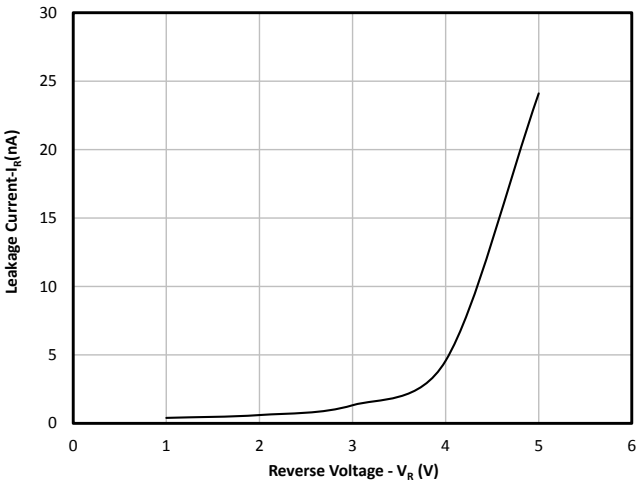
Junction Capacitance vs. Temperature



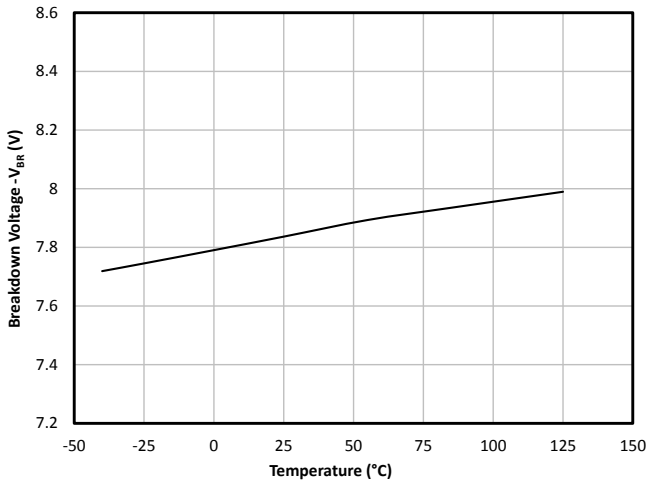
Leakage Current vs. Temperature



Leakage Current vs. Reverse Voltage



Reverse Breakdown Voltage vs. Temperature



Application Information

Device Connection Options

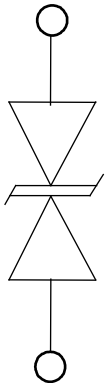
This TVS diode is designed to protect one data, I/O, or power supply line. The device is bidirectional and may be used on lines where the signal polarity can go above and below ground. The device is symmetrical, and therefore, the orientation of the device is not critical.

Circuit Board Layout Recommendations for Suppression of ESD

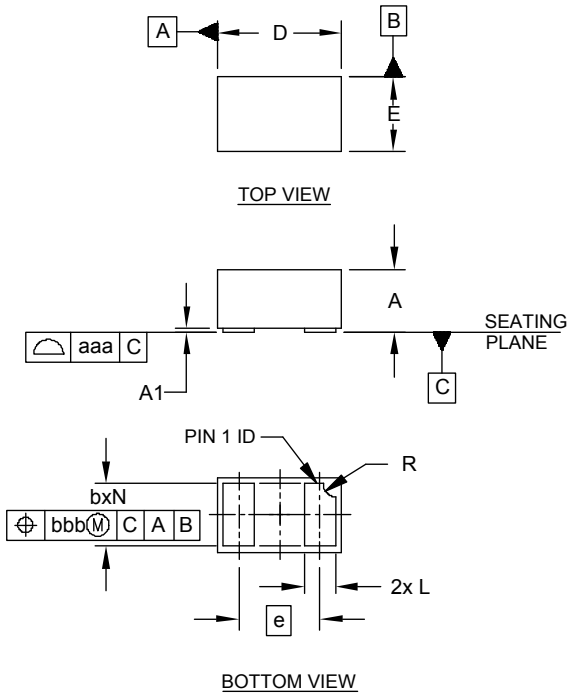
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

- Place the TVS near the input terminals or connectors to restrict transient coupling.
- Minimize the path length between the TVS and the protected line.
- Minimize all conductive loops including power and ground loops.
- The ESD transient return path to ground should be kept as short as possible.
- Never run critical signals near board edges.
- Use ground planes whenever possible.

Circuit Diagram



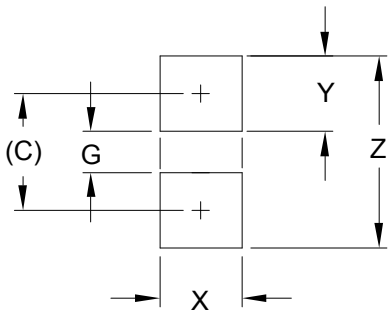
Outline Drawing - SLP1006P2



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.47	0.50	0.53
A1	0.00	0.03	0.05
b	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	0.65 BSC		
L	0.20	0.25	0.30
R	0.05	0.10	0.15
N	2		
aaa	0.08		
bbb	0.10		

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

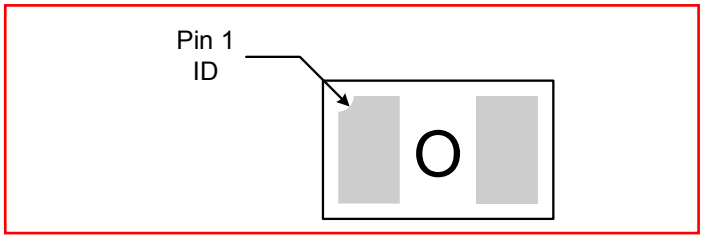
Land Pattern - SLP1006P2



DIMENSIONS	
DIM	MILLIMETERS
C	(0.85)
G	0.30
X	0.60
Y	0.55
Z	1.40

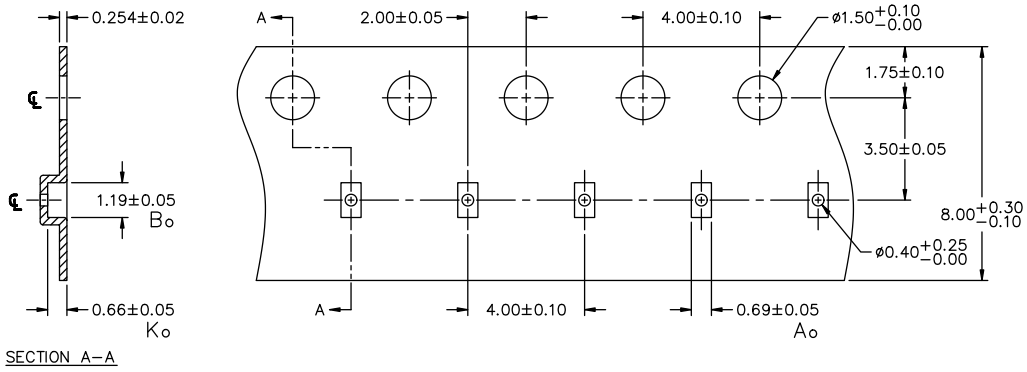
NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Marking Code

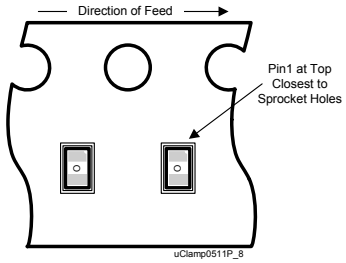


Note: Device is electrically symmetrical.

Tape and Reel Specification



)TES: 1.) ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.



Device Orientation in Tape

Ordering Information

Part Number	Qty per Reel	Reel Size
µClamp0511PQTCT	3,000	7”

Contact Information

Semtech Corporation
200 Flynn Road, Camarillo, CA 93012
Phone: (805) 498-2111, Fax: (805) 498-3804
www.semtech.com