

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[Semtech](#)
[UCLAMP0501T.TCT](#)

For any questions, you can email us directly:
sales@integrated-circuit.com



uClamp0501T

Low Profile μ Clamp™

1-Line ESD protection

PROTECTION PRODUCTS - MicroClamp™

Description

The μ Clamp™ series of TVS arrays are designed to protect sensitive electronics from damage or latch-up due to ESD. It is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and other portable electronics. It features 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 μ Clamp™0501T is in a 2-pin, RoHS/WEEE compliant, SLP1006P2T package. It measures 1.0 x 0.6 mm with a nominal height of only 0.4mm. The leads are spaced at a pitch of 0.65mm and are finished with lead-free NiPdAu. Each device will protect one 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, Level 4 (± 15 kV air, ± 8 kV contact 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.

Features

- ◆ Transient protection for data lines to **IEC 61000-4-2 (ESD) ± 15 kV (air), ± 8 kV (contact)**
IEC 61000-4-4 (EFT) 40A (tp = 5/50ns)
Cable Discharge Event (CDE)
- ◆ Ultra-small package (1.0 x 0.6 x 0.4mm)
- ◆ Protects one data line
- ◆ Low clamping voltage
- ◆ Working voltage: 5V
- ◆ Low leakage current
- ◆ Solid-state silicon-avalanche technology

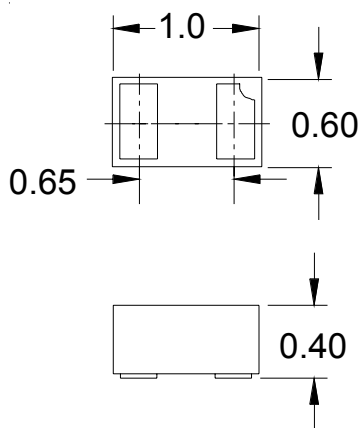
Mechanical Characteristics

- ◆ SLP1006P2T package
- ◆ RoHS/WEEE Compliant
- ◆ Nominal Dimensions: 1.0 x 0.6 x 0.4 mm
- ◆ Lead Finish: NiPdAu
- ◆ Molding compound flammability rating: UL 94V-0
- ◆ Marking : Marking code, cathode band
- ◆ Packaging : Tape and Reel

Applications

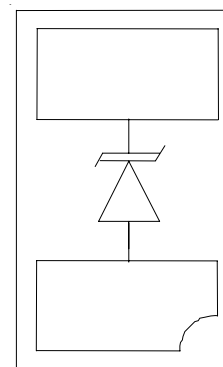
- ◆ Cellular Handsets & Accessories
- ◆ Personal Digital Assistants (PDAs)
- ◆ Notebooks & Handhelds
- ◆ Portable Instrumentation
- ◆ Digital Cameras
- ◆ Peripherals
- ◆ MP3 Players

Dimensions



Nominal Dimensions (mm)

Schematic & PIN Configuration



SLP1006P2T (Bottom View)

PROTECTION PRODUCTS

Absolute Maximum Rating

| Rating | Symbol | Value | Units |
|--|------------------|------------------|-------|
| Peak Pulse Power (tp = 8/20µs) | P _{pk} | 25 | Watts |
| Maximum Peak Pulse Current (tp = 8/20µs) | I _{pp} | 2 | Amps |
| ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact) | V _{ESD} | +/- 20 +/- 15 | kV |
| Operating Temperature | T _J | -55 to +125 | °C |
| Storage Temperature | T _{STG} | -55 to +150 | °C |

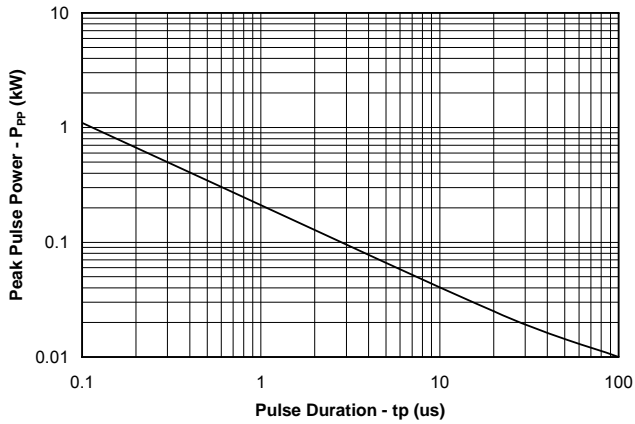
Electrical Characteristics (T=25°C)

| Parameter | Symbol | Conditions | Minimum | Typical | Maximum | Units |
|---------------------------|------------------|---|---------|---------|---------|-------|
| Reverse Stand-Off Voltage | V _{RWM} | | | | 5 | V |
| Reverse Breakdown Voltage | V _{BR} | I _t = 1mA | 6 | | | V |
| Reverse Leakage Current | I _R | V _{RWM} = 5V, T=25°C | | | 0.25 | µA |
| Forward Voltage | V _F | I _F = 10mA | | 1 | 1.2 | V |
| Clamping Voltage | V _C | I _{pp} = 2A, t _p = 8/20µs | | | 12.5 | V |
| Junction Capacitance | C _j | V _R = 0V, f = 1MHz | | | 10 | pF |
| Junction Capacitance | C _j | V _R = 3.3V, f = 1MHz | | 4.5 | | pF |

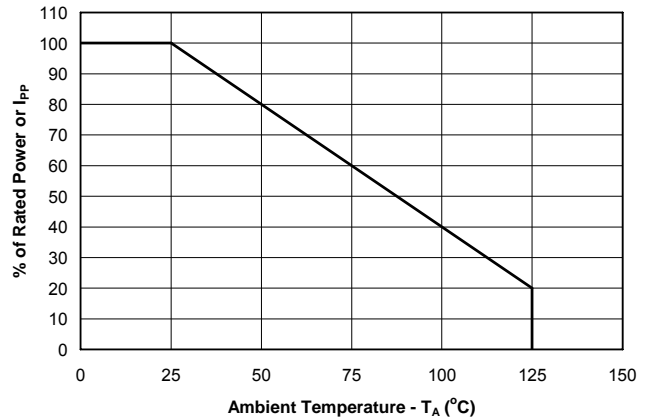
PROTECTION PRODUCTS

Typical Characteristics

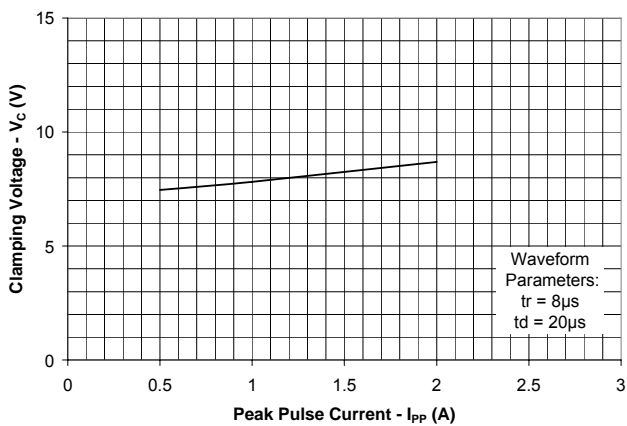
Non-Repetitive Peak Pulse Power vs. Pulse Time



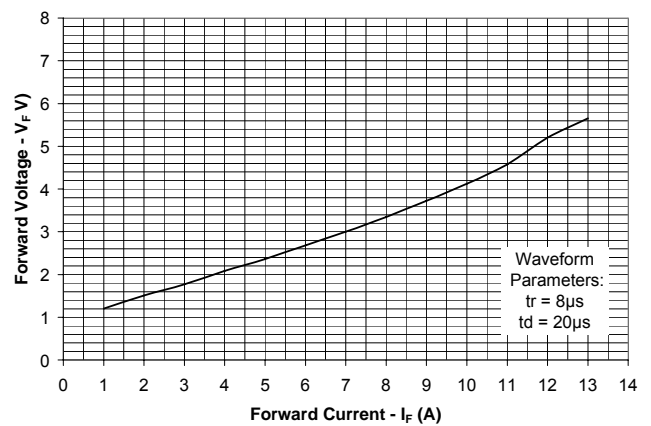
Power Derating Curve



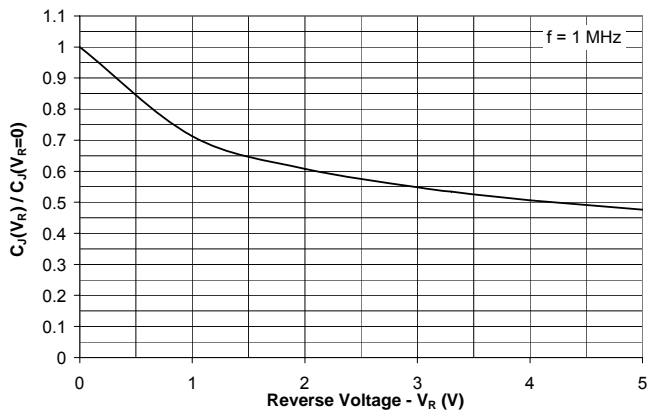
Clamping Voltage vs. Peak Pulse Current



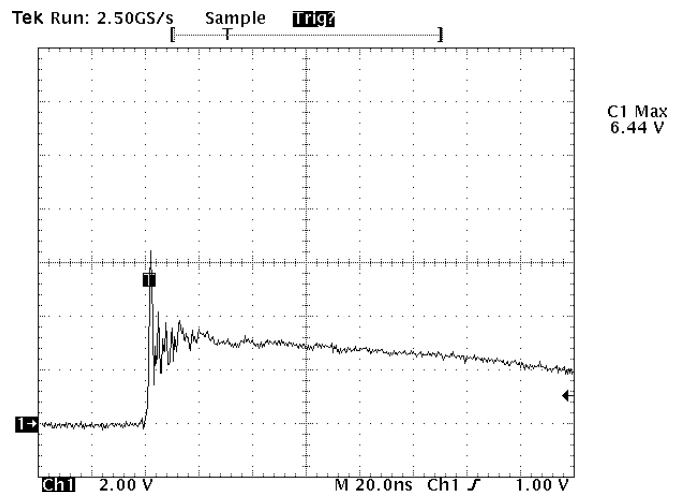
Forward Voltage vs. Forward Current



Junction Capacitance vs. Reverse Voltage



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

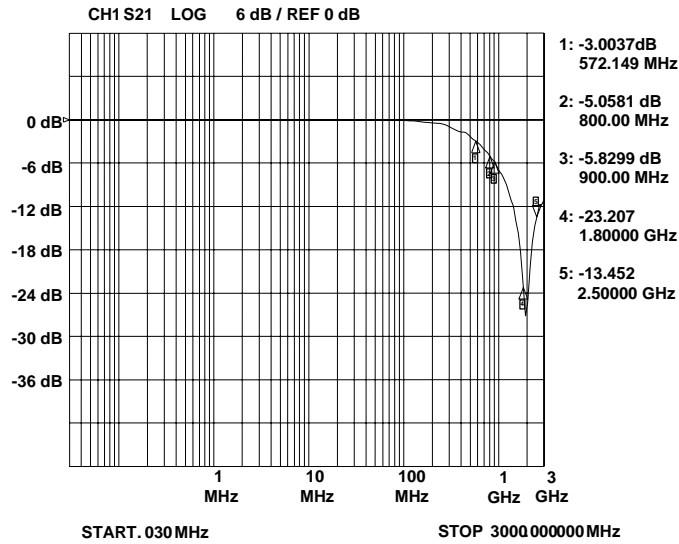


Note: Data is taken with a 10x attenuator

PROTECTION PRODUCTS

Typical Characteristics

Insertion Loss S21



PROTECTION PRODUCTS

Applications Information

Device Connection Options

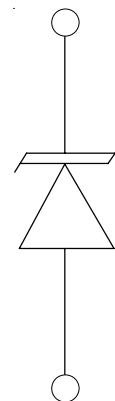
This device is designed to protect one data or power supply line. The device is unidirectional and may be used on lines where the signal polarity is above ground. The cathode band should be placed towards the line that is to be protected.

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:

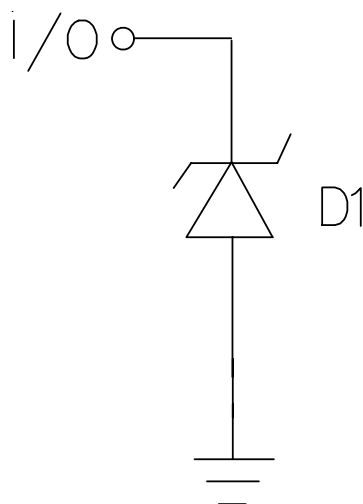
- Place the TVS near the input terminals or connectors to restrict transient coupling.
- Minimize the path length between the TVS and the protected line.
- Minimize all conductive loops including power and ground loops.
- The ESD transient return path to ground should be kept as short as possible.
-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

Circuit Diagram



PROTECTION PRODUCTS

Applications Information - Spice Model

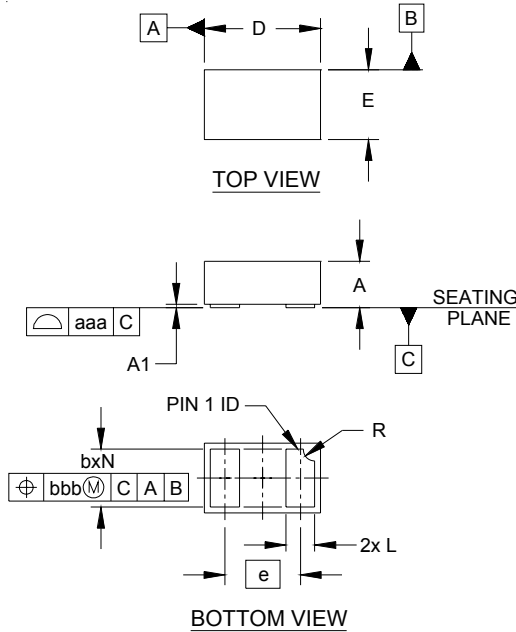


uClamp0501T Spice Model

| uClamp0501T Spice Parameters | | |
|-------------------------------------|-------------|-----------------|
| Parameter | Unit | D1 (TVS) |
| IS | Amp | 2.05e-15 |
| BV | Volt | 7.0 |
| VJ | Volt | 0.80 |
| RS | Ohm | 0.75 |
| IBV | Amp | 1.0E-3 |
| CJO | Farad | 9e-12 |
| TT | sec | 2.541E-9 |
| M | -- | 0.25 |
| N | -- | 1.1 |
| EG | eV | 1.11 |

PROTECTION PRODUCTS

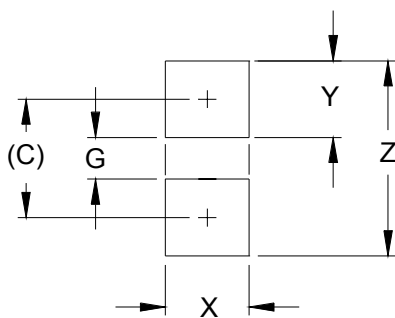
Outline Drawing - SLP1006P2T



| DIM | DIMENSIONS | | | | | |
|-----|------------|------|------|-------------|------|------|
| | INCHES | | | MILLIMETERS | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | .015 | .016 | .017 | 0.37 | 0.40 | 0.43 |
| A1 | .000 | .001 | .002 | 0.00 | 0.03 | 0.05 |
| b | .018 | .020 | .022 | 0.45 | 0.50 | 0.55 |
| D | .035 | .039 | .043 | 0.90 | 1.00 | 1.10 |
| E | .020 | .024 | .028 | 0.50 | 0.60 | 0.70 |
| e | .026 BSC | | | 0.65 BSC | | |
| L | .008 | .010 | .012 | 0.20 | 0.25 | 0.30 |
| R | .002 | .004 | .006 | 0.05 | 0.10 | 0.15 |
| N | 2 | | | 2 | | |
| aaa | .003 | | | 0.08 | | |
| bbb | .004 | | | 0.10 | | |

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

Land Pattern - SLP1006P2T

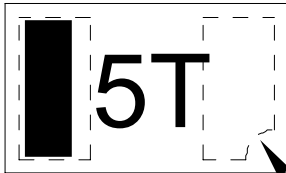


| DIM | DIMENSIONS | |
|-----|------------|-------------|
| | INCHES | MILLIMETERS |
| C | (.033) | (0.85) |
| G | .012 | 0.30 |
| X | .024 | 0.60 |
| Y | .022 | 0.55 |
| Z | .055 | 1.40 |

- 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.

PROTECTION PRODUCTS

Marking Code



PIN 1 ID

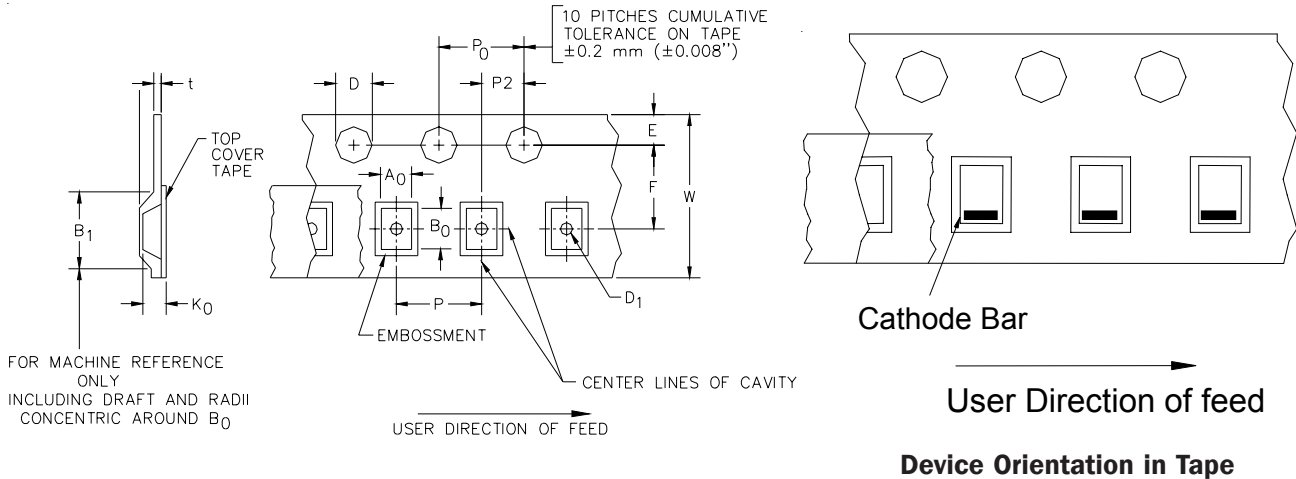
Ordering Information

| Part Number | Working Voltage | Qty per Reel | Reel Size |
|-----------------|-----------------|--------------|-----------|
| uClamp0501T.TCT | 5V | 3,000 | 7 Inch |

Notes:

1) This is a lead-free, RoHS/WEEE compliant product
 MicroClamp, uClamp and μClamp are marks of Semtech Corporation

Tape and Reel Specification



| A0 | B0 | K0 |
|-----------------|-----------------|-----------------|
| 0.69 +/-0.10 mm | 1.19 +/-0.10 mm | 0.66 +/-0.10 mm |

| Tape Width | B, (Max) | D | D1 | E | F | P | P0 | P2 | T | W |
|------------|---------------|---|---------------------|--------------------------|-------------------------|-------------------------|------------------------|-------------------------|----------------------|--------------------------------------|
| 8 mm | 4.2 mm (.165) | 1.5 + 0.1 mm - 0.0 mm (0.59 +0.05 - .000) | 0.4 mm ±0.25 (.031) | 1.750±.10 mm (.069±.004) | 3.5±0.05 mm (.138±.002) | 4.0±0.10 mm (.157±.004) | 4.0±0.1 mm (.157±.004) | 2.0±0.05 mm (.079±.002) | 0.254±0.02 mm (.016) | 8.0 mm + 0.3 mm - 0.1 mm (.312±.012) |

Contact Information

Semtech Corporation
 Protection Products Division
 200 Flynn Rd., Camarillo, CA 93012
 Phone: (805)498-2111 FAX (805)498-3804