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!

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uClamp0545T
Ultra Small µClamp®
5-Line ESD Protection

PROTECTION PRODUCTS - MicroClamp®

Description

µClamp® TVS diodes are designed to protect sensitive electronics from damage or latch-up due to ESD. They are designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and other portable electronics. They feature large cross-sectional area junctions for conducting high transient currents. This device offers desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

The µClamp®0545T is in a 6-pin SLP1007N6T package. It measures 1.0 x 0.7 mm with a nominal height of only 0.4mm. The leads are finished with lead-free NiPdAu. Each device will protect five lines 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. 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

- High ESD withstand Voltage: **+/-12kV** (Contact) per **IEC 61000-4-2**
- Very small PCB area: 0.7mm^2
- Protects up to five data lines
- Low reverse current: <10nA typical (VR=5V)
- Working voltage: +/- 5V
- Low capacitance: 4pF typical
- Low dynamic resistance: 0.70 Ohms (Typ)
- Solid-state silicon-avalanche technology

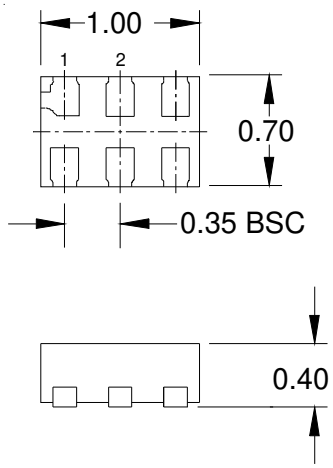
Mechanical Characteristics

- SLP1007N6T package
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Nominal Dimensions: 1.0 x 0.7 x 0.40 mm
- Lead Pitch: 0.35mm
- Lead Finish: NiPdAu
- Molding compound flammability rating: UL 94V-0
- Marking : Marking code + dot matrix date code
- Packaging : Tape and Reel

Applications

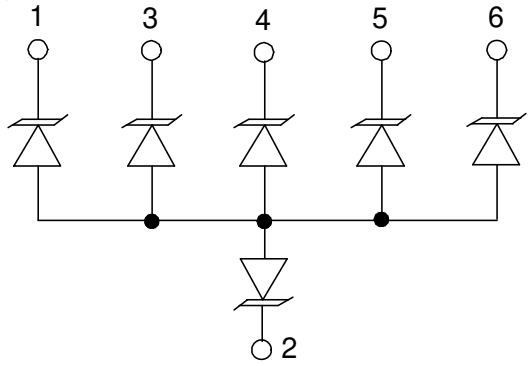
- Cellular Handsets & Accessories
- Keypads, Side Keys, Audio Ports
- LCD Connectors
- Digital Lines
- Analog Video

Dimensions



Nominal Dimensions (mm)

Schematic & PIN Configuration



5-Line, Bidirectional

Absolute Maximum Rating

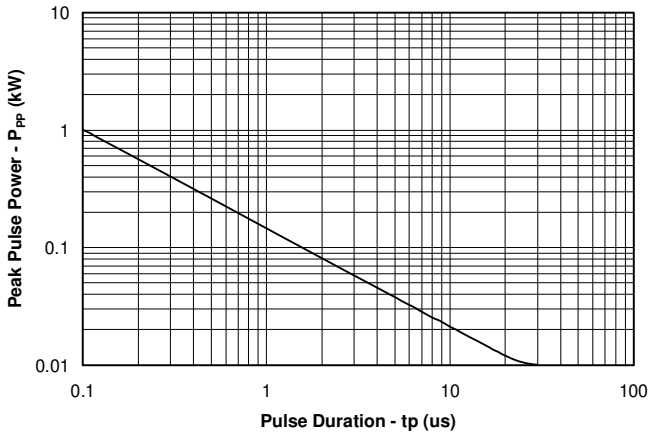
Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20µs)	P_{pk}	12	Watts
Maximum Peak Pulse Current (tp = 8/20µs)	I_{pp}	1	Amps
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	+/- 15 +/- 12	kV
Operating Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C)

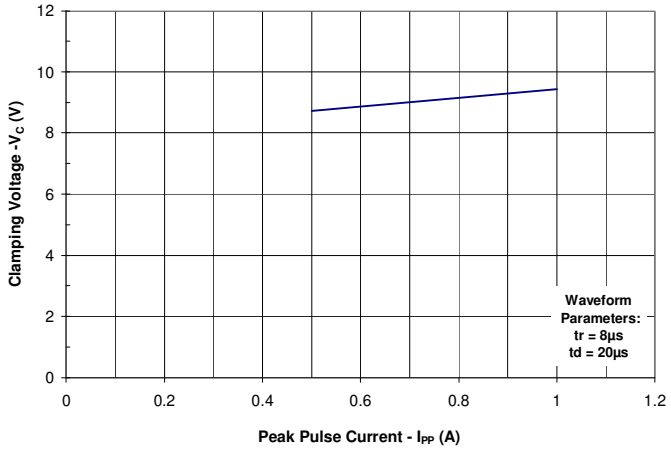
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}	Any I/O Pin to GND			5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA Any I/O Pin to GND	6	8.2	9.5	V
Reverse Leakage Current	I_R	V_{RWM} = 5V, T=25°C Any I/O Pin to GND		3	50	nA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20µs Any I/O Pin to GND			12	V
ESD Clamping Voltage	V_C	IPP = 16A, tlp = 0.2/100ns		19		V
Dynamic Resistance	R_{Dyn}	tp = 100ns		0.70		Ohms
Junction Capacitance	C_j	V_R = 0V, f = 1MHz Any I/O Pin to GND		4.5	9	pF

Typical Characteristics

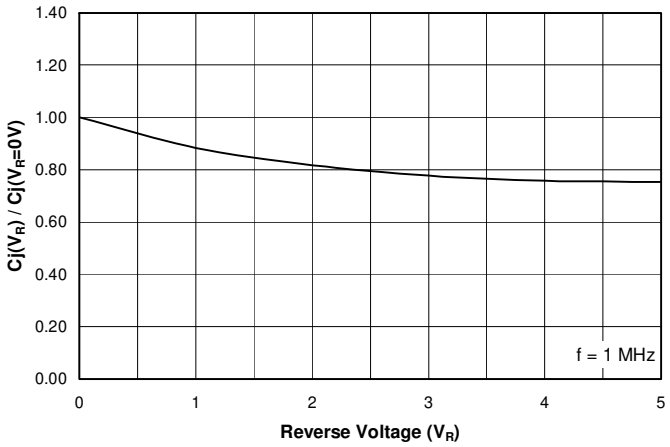
Non-Repetitive Peak Pulse Power vs. Pulse Time



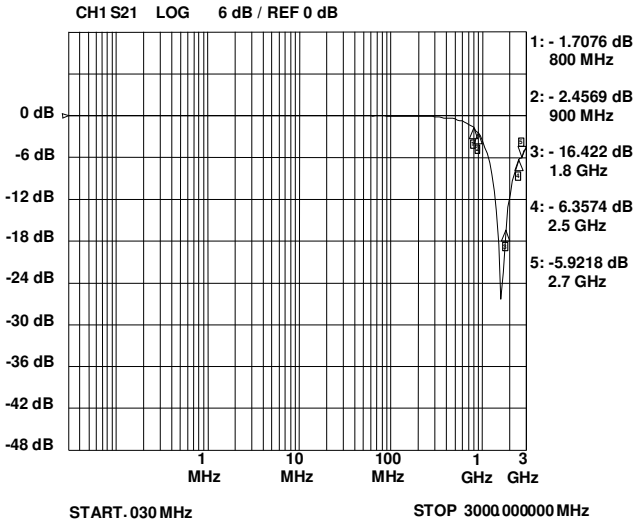
Clamping Voltage vs. Peak Pulse Current (tp=8/20us)



Normalized Junction Capacitance vs. Reverse Voltage

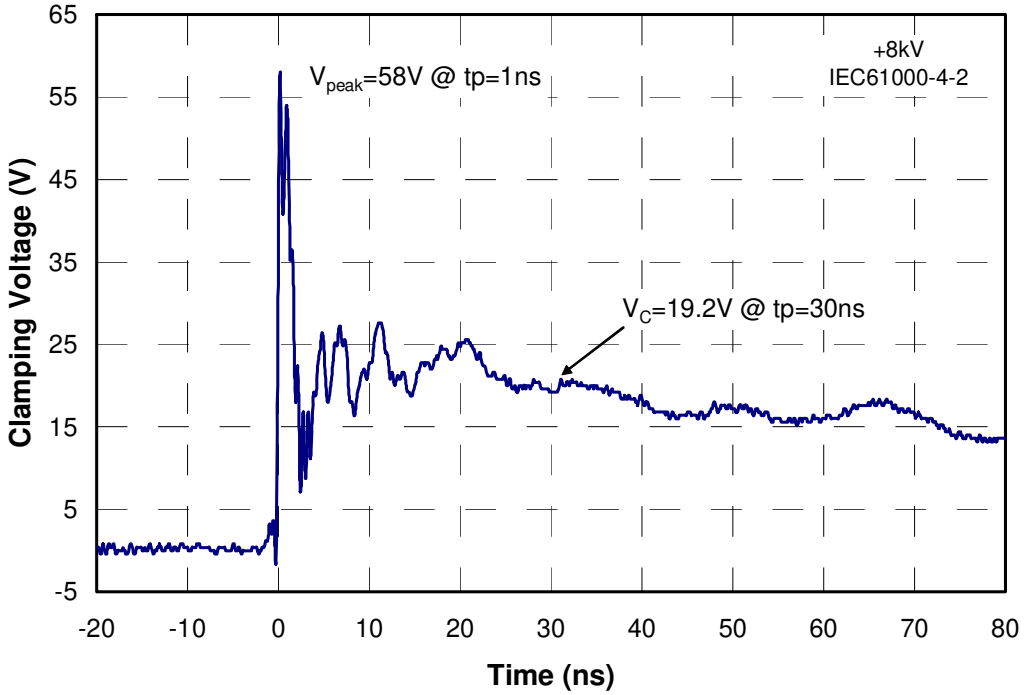


Typical Insertion Loss (S21) 30KHz to 3GhZ

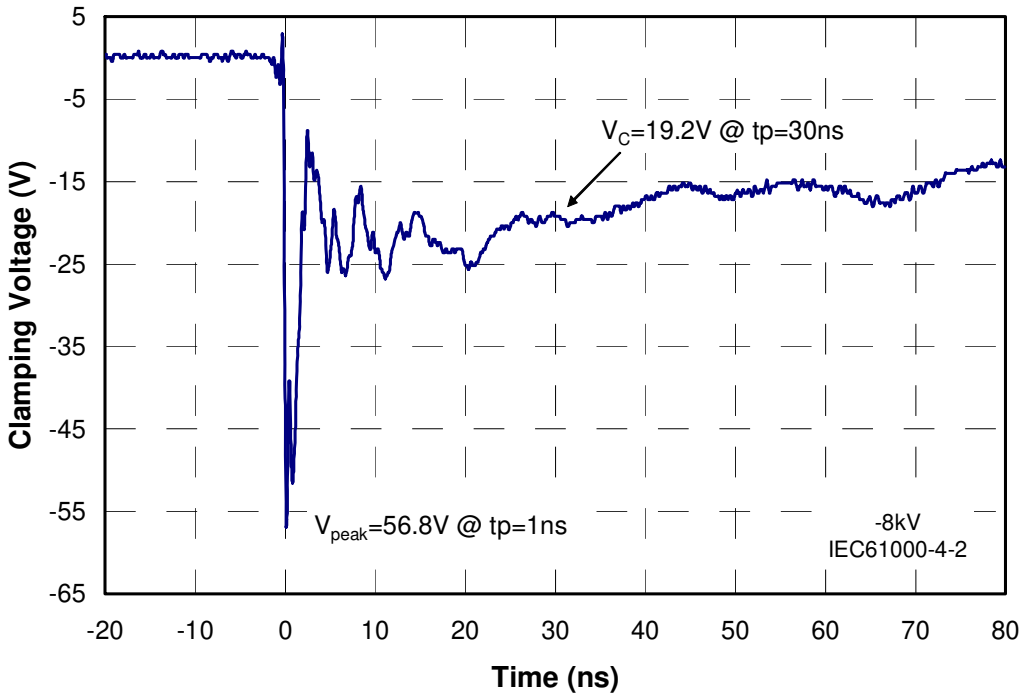


Typical Characteristics (Con't)

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

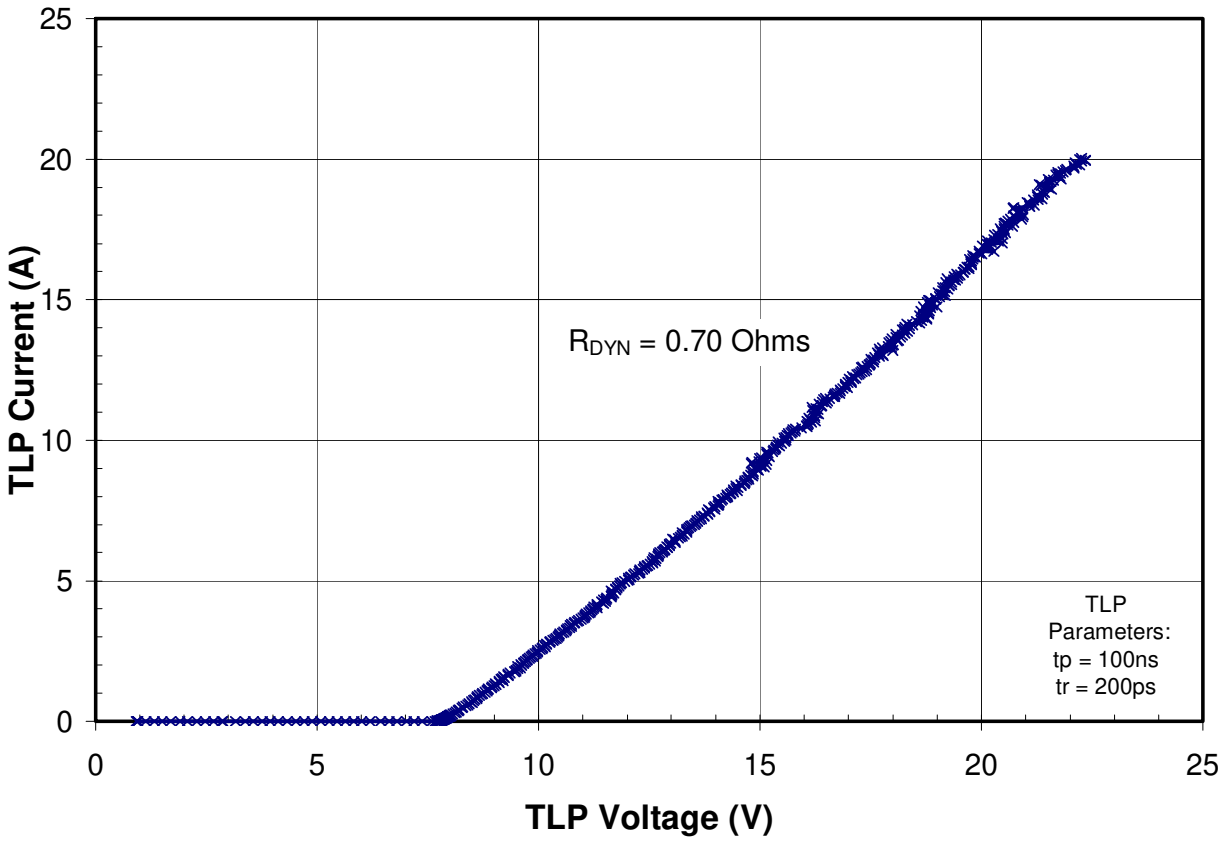


ESD Clamping (-8kV Contact per IEC 61000-4-2)



Typical Characteristics (Con't)

TLP Characteristic

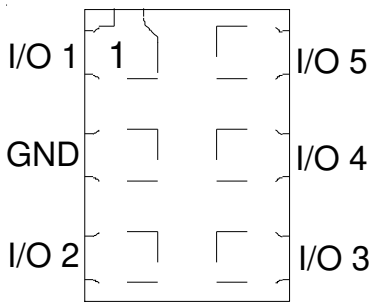


Applications Information

Device Connection Options

The µClamp0545T is designed to protect five data lines operating up to 5 volts. The device is bidirectional and may be used on lines where the signal polarity is above and below ground. The diagram at the right shows an example pin configuration with pin 2 connected to ground. However, due to the device symmetry, any pin may be connected to ground with the remaining pins conneted to the protected lines.

Example Pin Configuration

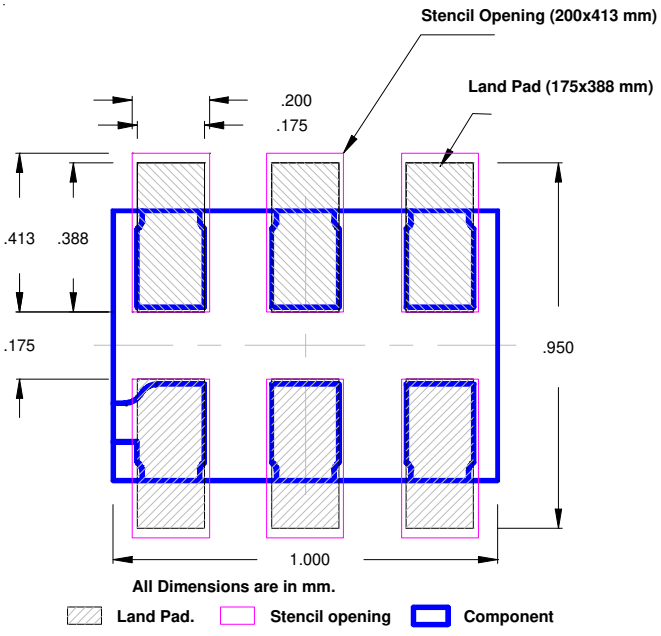


Assembly Guidelines

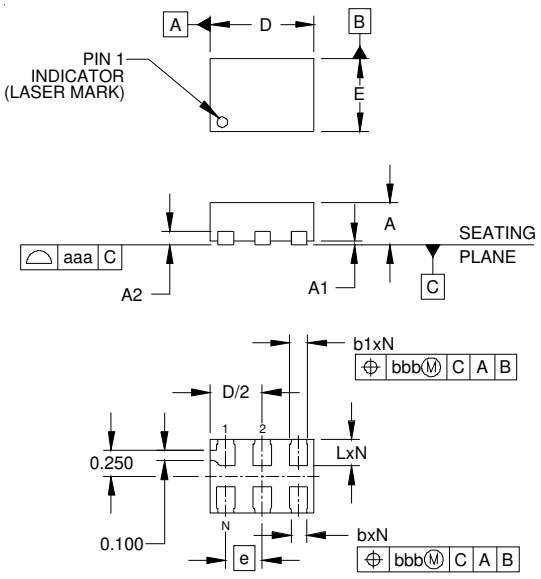
The small size of this device means that some care must be taken during the mounting process to insure reliable solder joint. The table below provides Semtech's recommended assembly guidelines for mounting this device. The figure at the right details Semtech's recommended aperture based on the below recommendations. Note that these are only recommendations and should serve only as a starting point for design since there are many factors that affect the assembly process. The exact manufacturing parameters will require some experimentation to get the desired solder application.

Assembly Parameter	Recommendation
Solder Stencil Design	Laser cut, Electro-polished
Aperture shape	Rectangular
Solder Stencil Thickness	0.100 mm (0.004")
Solder Paste Type	Type 4 size sphere or smaller
Solder Reflow Profile	Per JEDEC J-STD-020
PCB Solder Pad Design	Non-Solder mask defined
PCB Pad Finish	OSP OR NiAu

Recommended Mounting Pattern



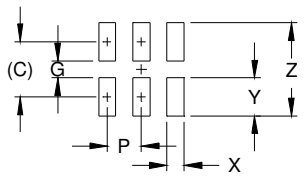
Outline Drawing - SLP1007N6T



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.37	0.40	0.43
A1	0.00	0.02	0.05
A2		(0.13)	
b	0.125	0.15	0.175
b1	0.15	0.175	0.20
D	0.90	1.00	1.10
E	0.60	0.70	0.80
e		0.35 BSC	
L	0.225	0.25	0.275
N		6	
aaa		0.08	
bbb		0.10	

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

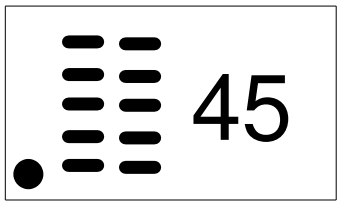
Land Pattern - SLP1007N6T



DIMENSIONS	
DIM	MILLIMETERS
C	(0.563)
G	0.175
P	0.35
X	0.175
Y	0.388
Z	0.95

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



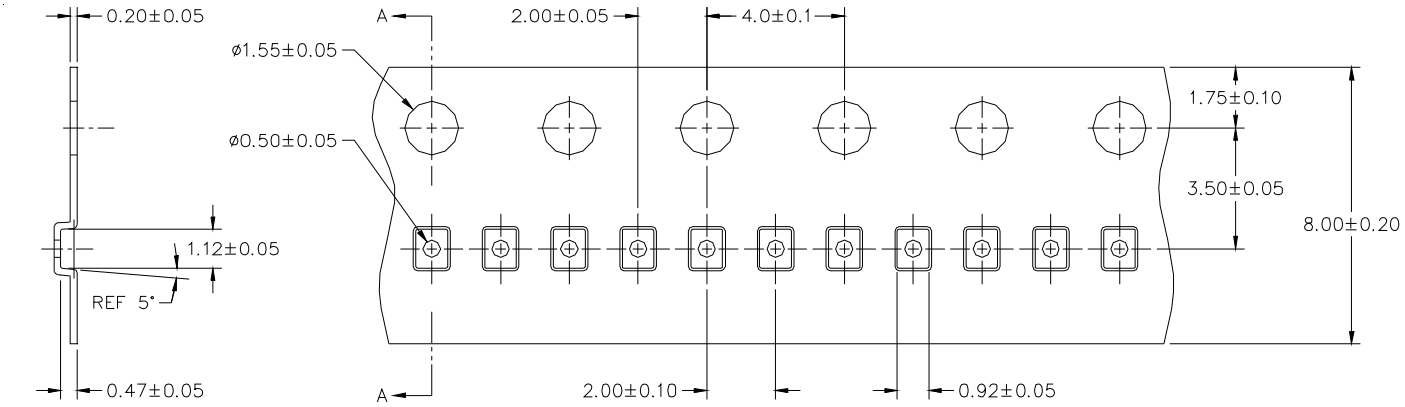
Notes:
Marking will also include line matrix date code

Ordering Information

Part Number	Qty per Reel	Reel Size
uClamp0545T.TNT	10,000	7 Inch

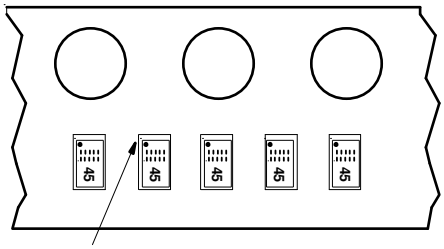
Notes:
MicroClamp, uClamp and µClamp are trademarks of Semtech Corporation

Carrier Tape Specification



SECTION A–A

Device Orientation in Tape



Pin 1 Location
(Towards Sprocket Holes)

Contact Information

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