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

uClamp0504A
µClamp™
4-Line ESD protection Array

PROTECTION PRODUCTS - MicroClamp™

Description

The µClamp™ series of TVS arrays are designed to protect sensitive electronics from damage or latch-up due to ESD. They are designed for use in applications where board space is at a premium. Each device requires less than 2.9mm^2 of PCB area and will protect up to four lines. They are unidirectional devices and may be used on lines where the signal polarities are above ground.

TVS diodes are solid-state devices designed specifically for transient suppression. 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 uClamp™0504A may be used to meet the immunity requirements of IEC 61000-4-2, level 4. The small SC-89 package makes them ideal for use in portable electronics such as cell phones, PDA's, notebook computers, and digital cameras. These devices feature a lead-free, matte tin lead finish. They are compatible with both lead free and SnPb assembly techniques.

Features

- Transient protection for data lines to
  IEC 61000-4-2 (ESD) 15kV (air), 8kV (contact)
  IEC 61000-4-4 (EFT) 40A (5/50ns)
- Protects four I/O lines
- Ultra-small SC-89 package (**1.7 x 1.7 x 0.6mm**) requires less than 2.9mm^2 of PCB area
- Working voltage: 5V
- Low leakage current
- Low operating and clamping voltages
- Solid-state silicon-avalanche technology

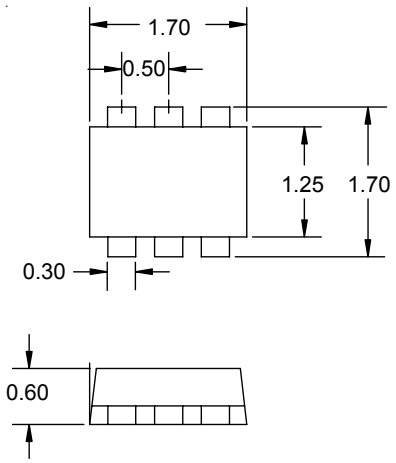
Mechanical Characteristics

- SC-89 (SOT-666) package
- Molding compound flammability rating: UL 94V-0
- Marking : Marking Code
- Weight: 2.9mg (typical)
- Lead Finish: Matte Tin
- Packaging : Tape and Reel per EIA 481

Applications

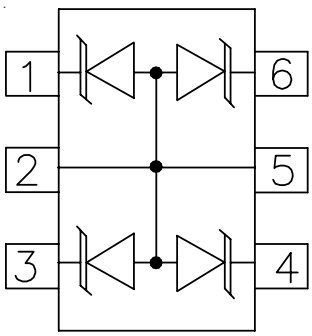
- Cellular Handsets & Accessories
- Cordless Phones
- Personal Digital Assistants (PDA's)
- Notebooks & Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- MP3 Players

Dimensions



Maximum Dimensions (mm)

Schematic & PIN Configuration



SC-89 (Top View)

Absolute Maximum Rating

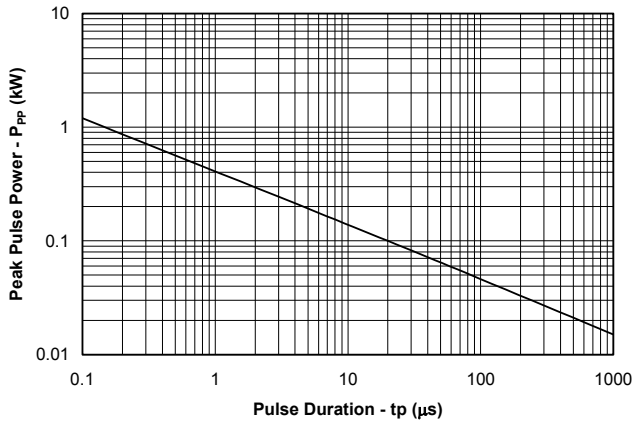
Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20µs)	P_{pk}	100	Watts
Maximum Peak Pulse Current (tp = 8/20µs)	I_{pp}	7	Amps
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{PP}	+/- 20 +/- 12	kV
Lead Soldering Temperature	T_L	260 (10 sec.)	°C
Operating Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C)

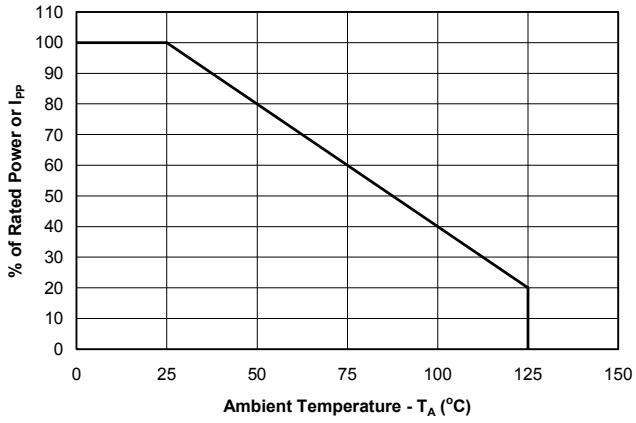
Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	6			V
Reverse Leakage Current	I_R	V_{RWM} = 5V, T=25°C			1	µA
Reverse Leakage Current	I_R	V_{RWM} = 3V, T=25°C			0.500	µA
Forward Voltage	V_F	I_F = 10mA		0.80		V
Clamping Voltage	V_C	I_{PP} = 1A, t_p = 8/20µs			9	V
Clamping Voltage	V_C	I_{PP} = 7A, t_p = 8/20µs			12	V
Junction Capacitance	C_j	Between I/O Pins and Gnd V_R = 0V, f = 1MHz		60	75	pF

Typical Characteristics

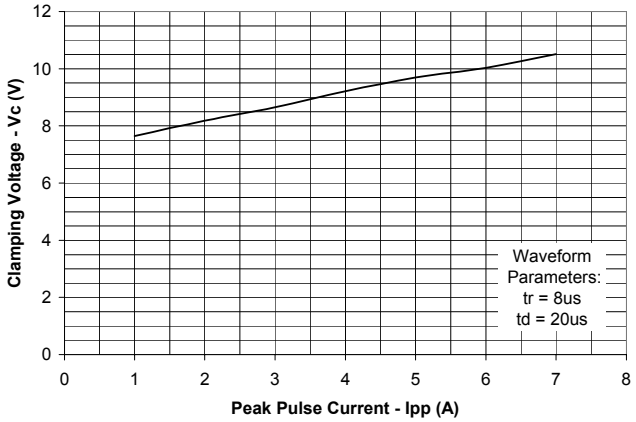
Non-Repetitive Peak Pulse Power vs. Pulse Time



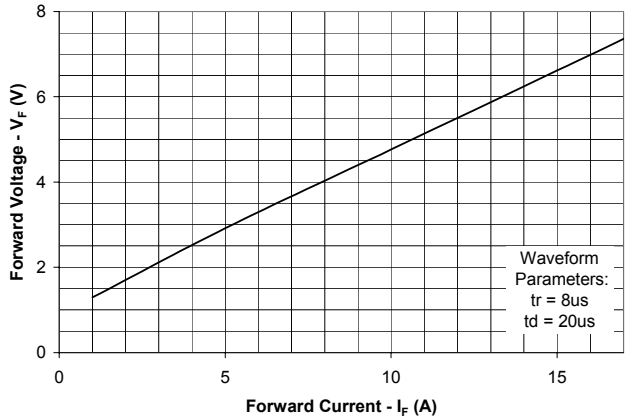
Power Derating Curve



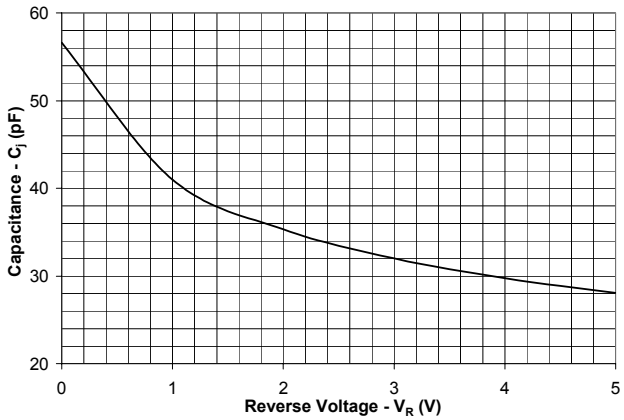
Clamping Voltage vs. Peak Pulse Current



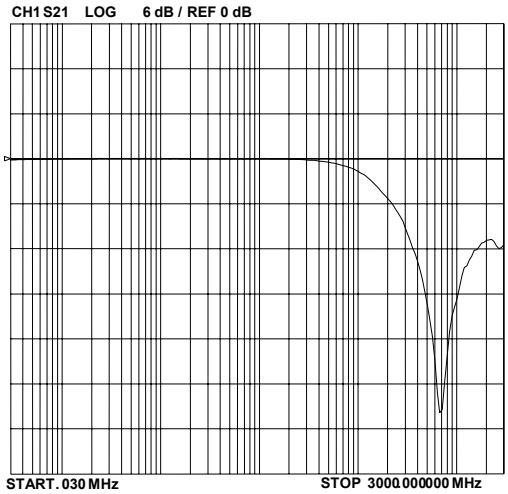
Forward Voltage vs. Forward Current



Junction Capacitance vs. Reverse Voltage

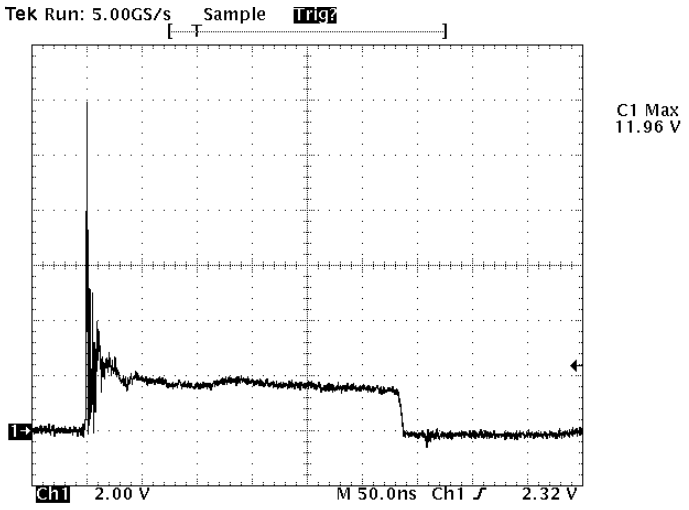


Insertion Loss S21

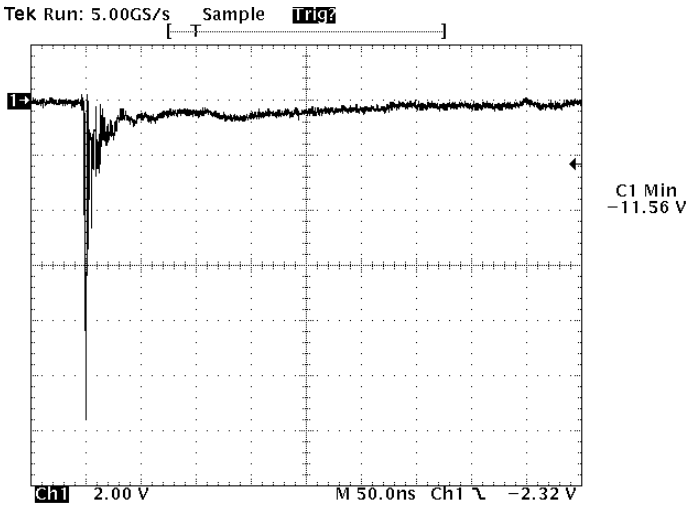


Typical Characteristics (Con't.)

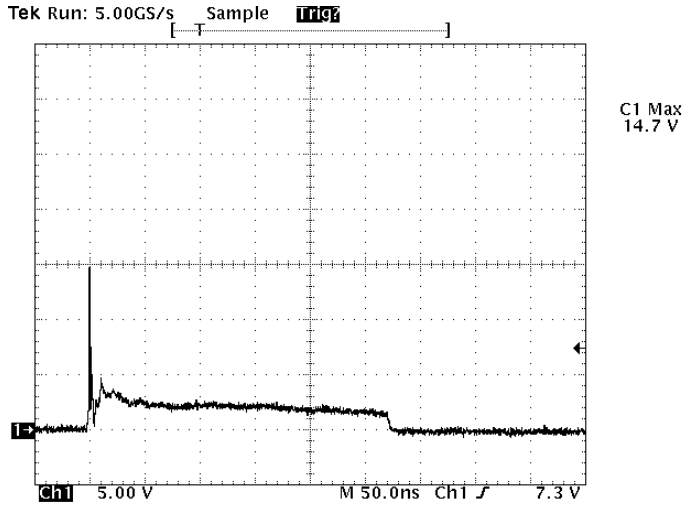
ESD Clamping
(8kV Contact per IEC 61000-4-2)



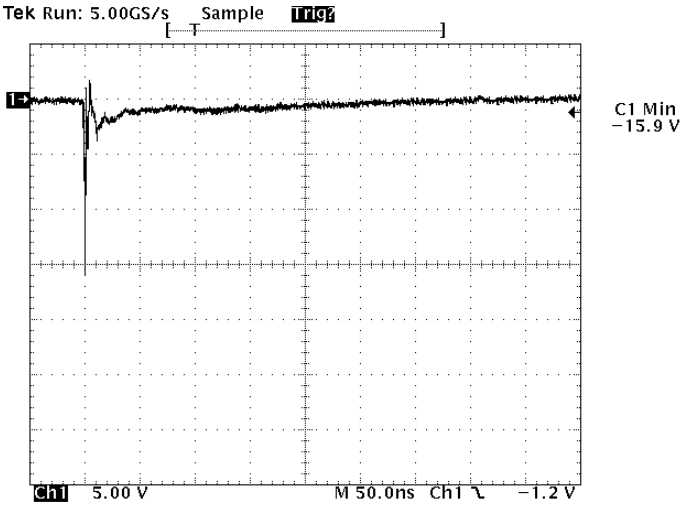
ESD Clamping
(-8kV Contact per IEC 61000-4-2)



ESD Clamping
(15kV air per IEC 61000-4-2)



ESD Clamping
(-15kV air per IEC 61000-4-2)



Applications Information

Device Connection for Protection of Four Data Lines

These devices are designed to protect up to four unidirectional data lines. The device is connected as follows:

1. Unidirectional protection of four I/O lines is achieved by connecting pins 1, 3, 4, and 6 to the data lines. Pins 2 and 5 are connected to ground. The ground connection should be made directly to the ground plane for best results. The path length is kept as short as possible to reduce the effects of parasitic inductance in the board traces.

Circuit Board Layout Recommendations for Suppression of ESD.

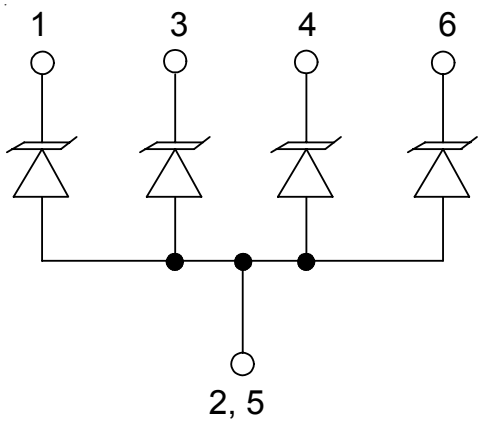
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

- 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.

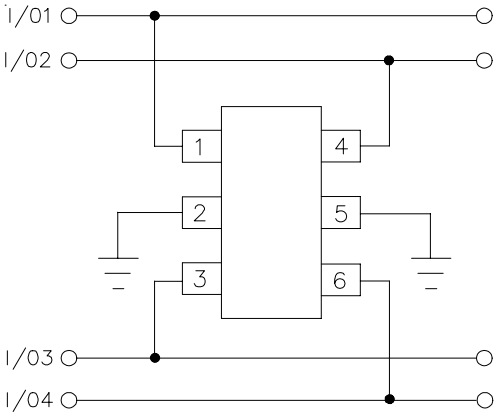
Matte Tin Lead Finish

Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

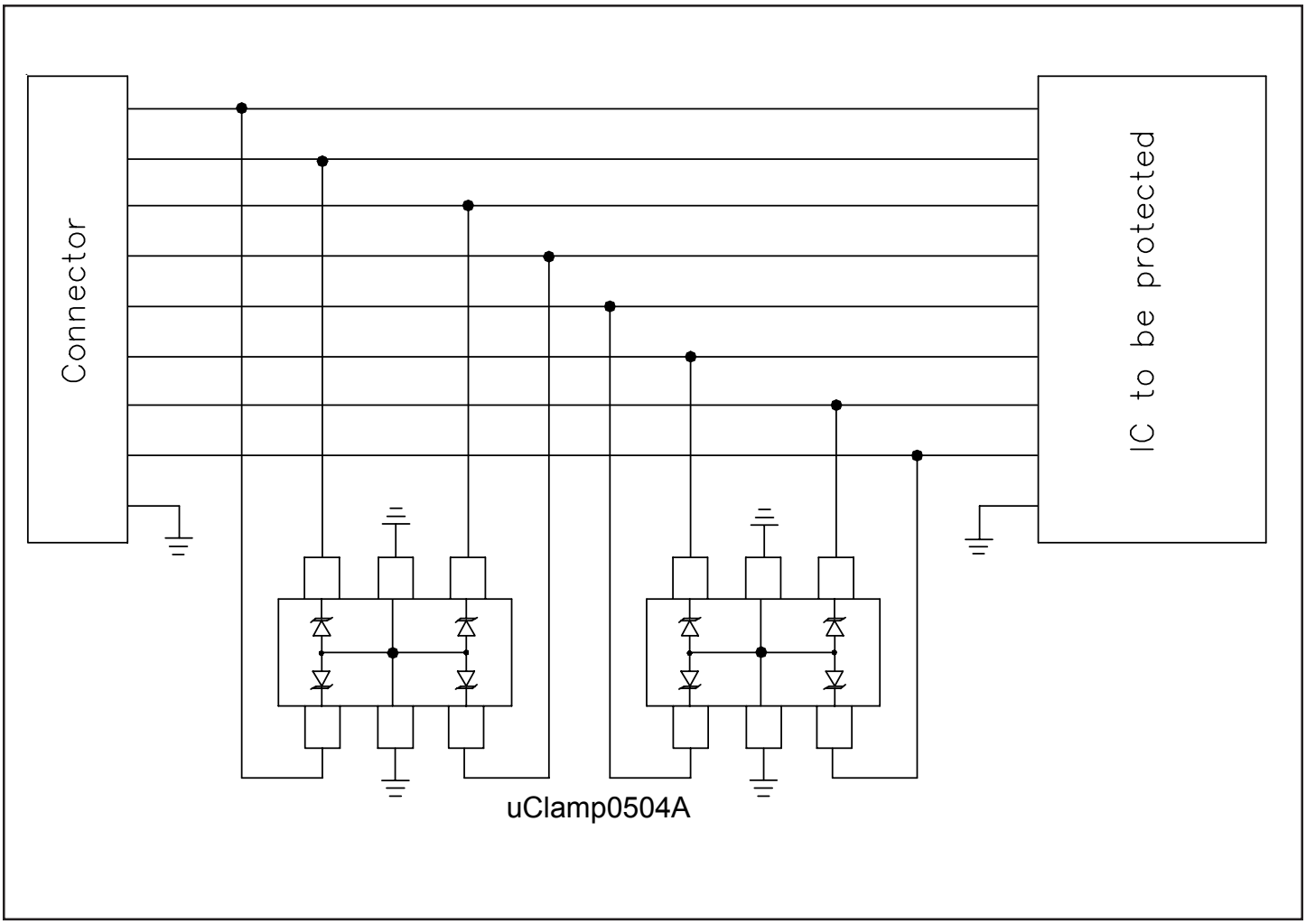
Circuit Diagram



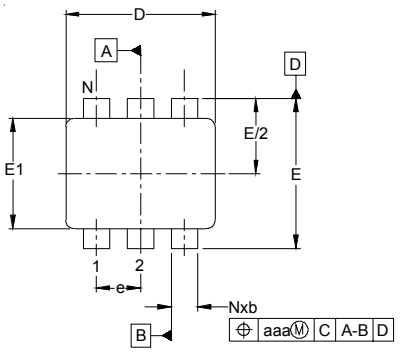
Protection of Four Unidirectional Lines

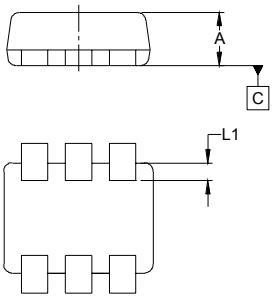


Typical Applications



Outline Drawing - SC-89 (SOT-666)



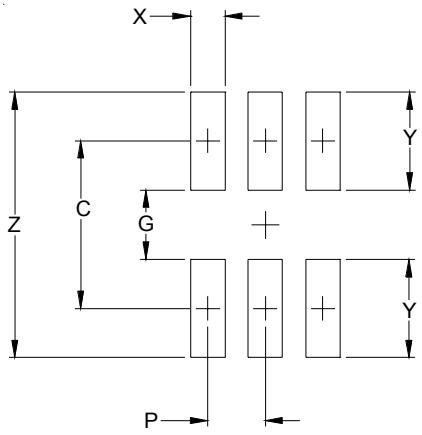


DIMENSIONS						
DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.019	-	.024	0.50	-	0.60
b	.005	-	.012	0.15	-	0.30
c	.003	-	.007	0.10	-	0.18
D	.059	.063	.067	1.50	1.60	1.70
E	.061	.063	.067	1.55	1.60	1.70
E1	.043	.047	.049	1.10	1.20	1.25
e	.020 BSC			0.50 BSC		
L	.003	.008	.012	0.10	0.20	0.30
L1	.003	.006	.008	0.10	0.15	0.20
N	6			6		
aaa	.004			0.10		

NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. DIMENSIONS "E1" AND "D" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

Land Pattern - SC-89 (SOT-666)

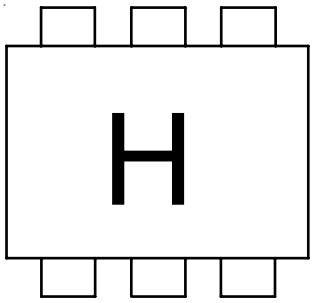


DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	(.057)	(1.45)
P	.020	0.50
G	.024	0.60
X	.012	0.30
Y	.033	0.85
Z	.090	2.30

NOTES:

1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Marking Code



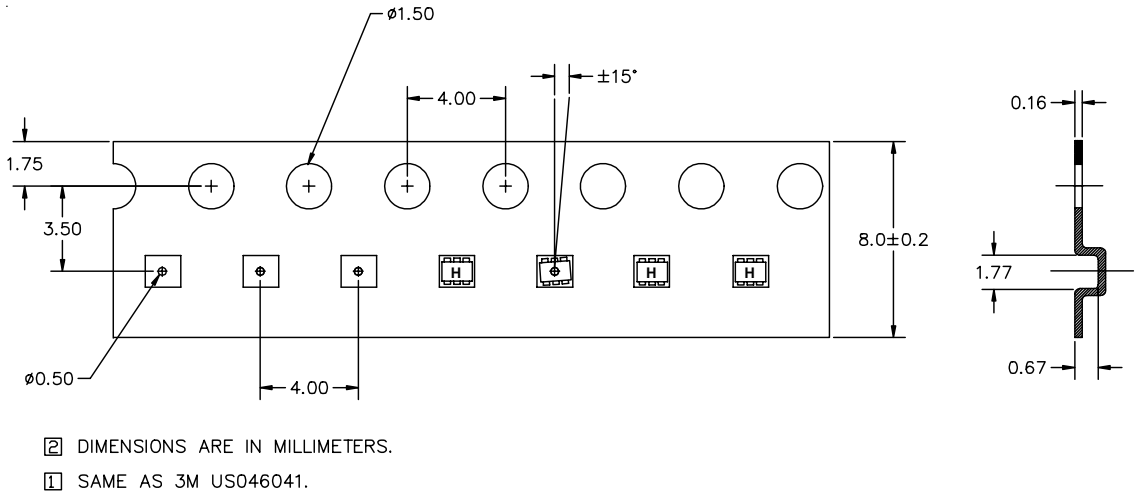
Note:
(1) Device is symmetrical so there is no pin 1 identifier.

Ordering Information

Part Number	Working Voltage	Device Marking	Qty per Reel	Reel Size
uClamp0504A.TCT	5V	H	3,000	7 Inch

MicroClamp, uClamp and µClamp are marks of Semtech Corporation

Tape and Reel Specification



Tape Specification and Device Orientation

Contact Information

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