µClamp3673P
36V TVS Diode Array for ESD & EOS Protection

PROTECTION PRODUCTS

Description

The µClamp®3673P is a high-surge transient voltage suppressor (TVS) optimized for protection of sensitive digital sensors used in proximity switches and industrial control applications. The µClamp3673P protects the components from over-voltages caused by Electro-Static Discharge (ESD), Electrical Fast Transients (EFT), and Tertiary Lightning.

The µClamp3673P features a working voltage of 36 volts with a minimum breakdown voltage of 37 volts. They are rated to handle a continuous forward current of up to 300mA with a low forward voltage drop of less than 1 volt (I_F = 300mA). They are designed with high surge capability (18 Amps at tp=8/20µs) and a low clamping voltage of <50V.

The µClamp3673P is in a 6-pin SGP3016N6 package. It measures 3.0x1.6x0.57mm. The leads are spaced at a pitch of 1.0mm and are finished with lead-free NiPdAu. Each device will protect three lines operating at 36 volts. The small size and unique features of the µClamp3673P make it ideal for protection of DC high-side and low-side 3 wire proximity switches in industrial applications.

Features

- Transient protection for proximity sensors
  - **IEC 61000-4-2 (ESD): ±30 kV (contact & air)**
  - **IEC 61000-4-4 (EFT): 40A**
  - **IEC 61000-4-5 (Lightning surge): 18A (tp = 8/20 µs)**
- Ultra-small package (3.0 x 1.6 x 0.57mm)
- Protects one three line sensor
- Low clamping voltage
- High operating voltage: 36V
- Solid-state silicon-avalanche technology

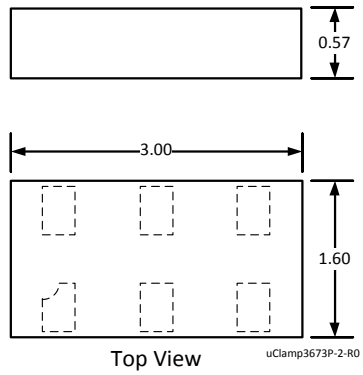
Mechanical Characteristics

- SGP3016N6 package
- Molding compound flammability rating: UL 94V-0
- Packaging : Tape and Reel
- Lead Finish: NiPdAu
- Pb-Free, Halogen Free, RoHS/WEEE Compliant

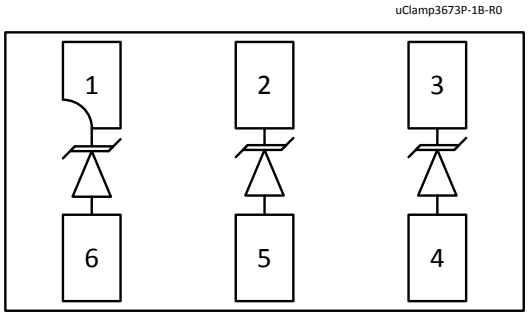
Applications

- Two and Three Wire DC High-Side and Low-Side Proximity Switches
- I/O Link
- Digital Sensor Input Protection
- Industrial Controls
- 24V - 36V DC Supply Protection

Package Dimension



Schematic & Pin Configuration



Bottom View SGP3016N6

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20µs)	P_{PK}	1300	W
Peak Pulse Current (tp = 8/20µs)	I_{PP}	18	A
Maximum Steady State Forward Current (1)	I_F	300	mA
ESD per IEC 61000-4-2 (Air) (2) ESD per IEC 61000-4-2 (Contact) (2)	V_{ESD}	±30 ±30	kV
Maximum Thermal Impedance (3)	$R_{\theta JA}$	100	^{O}C/W
Operating Temperature	T_J	-40 to +125	^{O}C
Storage Temperature	T_{STG}	-55 to +150	^{O}C

Electrical Characteristics (T=25^{O}C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}				36	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	37		44	
Reverse Leakage Current	I_R	V_{RWM} = 36V		10	100	nA
Forward Voltage Drop	V_F	I_F = 300mA			1.0	V
Clamping Voltage[2]	V_C	I_{PP} = 2A, tp = 8/20µs		45	50	
		I_{PP} = 18A, tp = 8/20µs			70	
Junction Capacitance	C_J	V_R = 0V, f = 1MHz		106	150	pF

Notes:

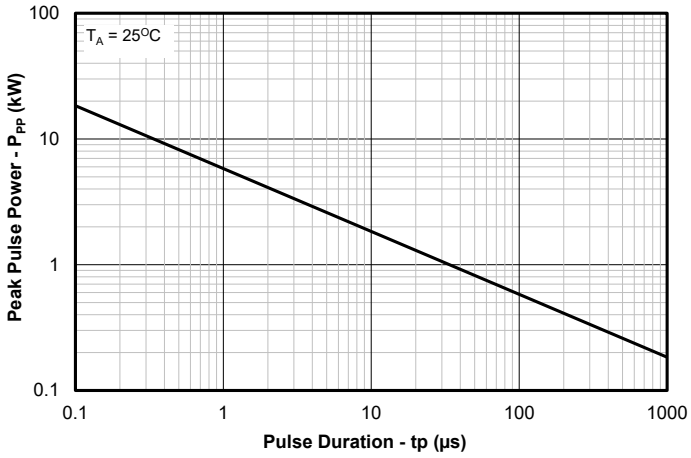
1) If multiple diodes conduct in the forward direction at any instant,the sum of the currents must not exceed this rating.

2) ESD Gun return path to Ground Reference Plane (GRP)

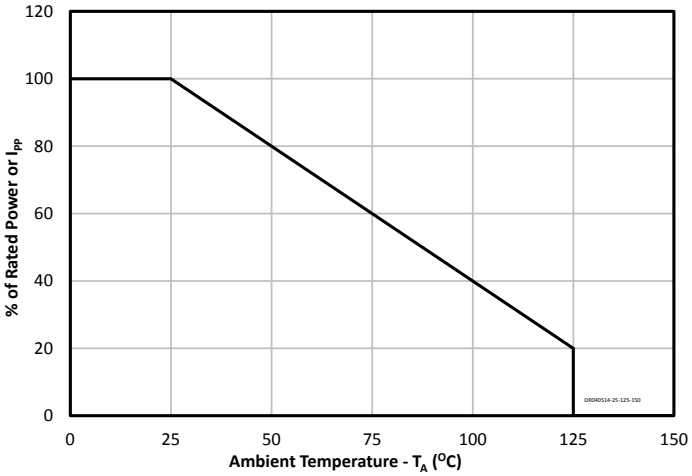
3) Any one diode to ambient

Typical Characteristics

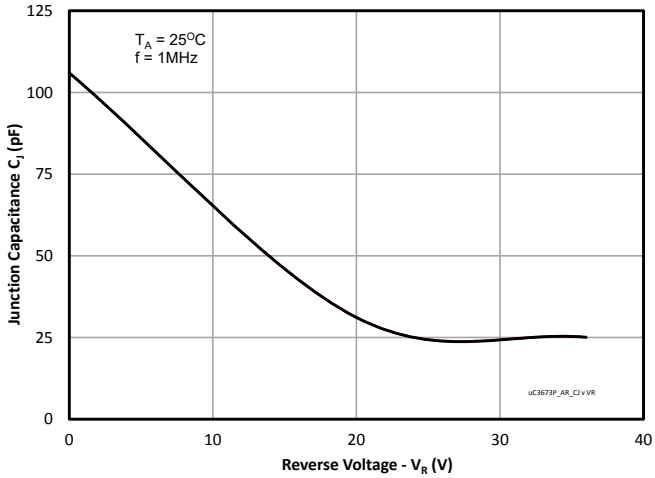
Non-Repetitive Peak Pulse Power vs. Pulse Time



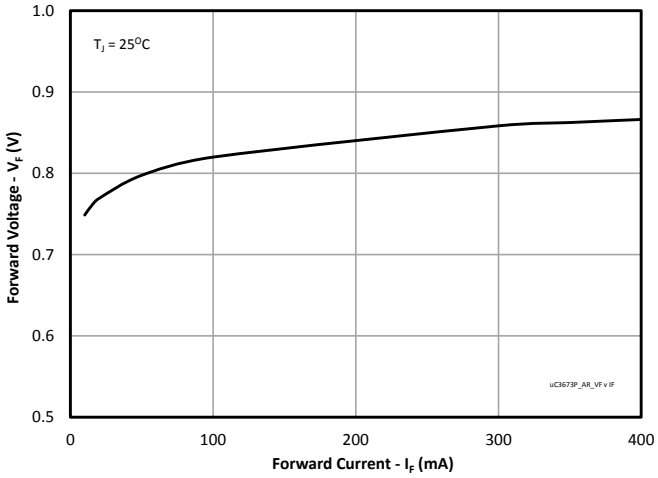
Power Derating Curve



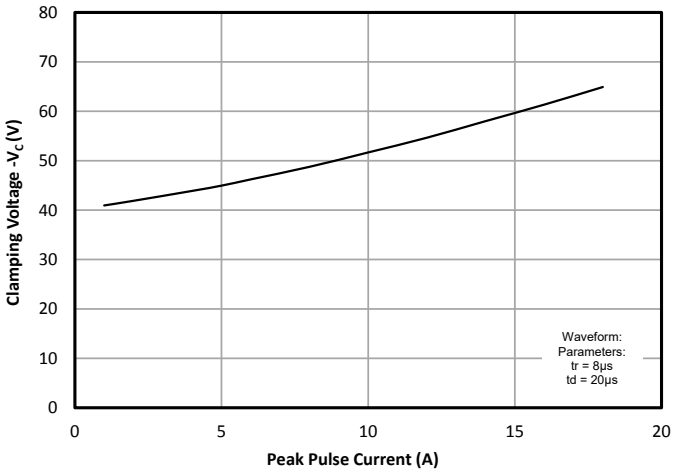
Junction Capacitance vs. Reverse Voltage



Forward Voltage Drop vs. Forward Current

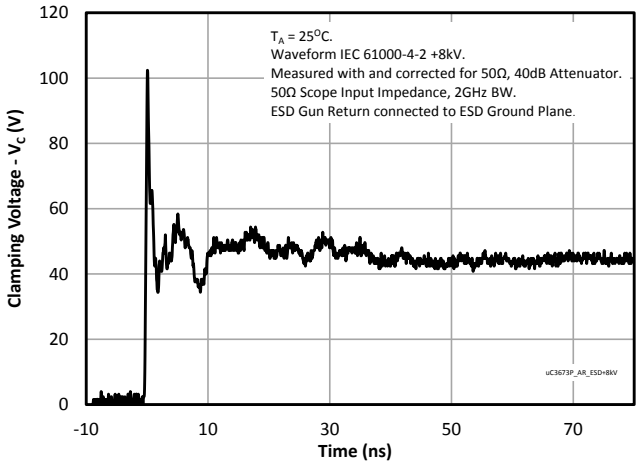


Clamping Voltage vs. Peak Pulse Current (tp=8/20µs)

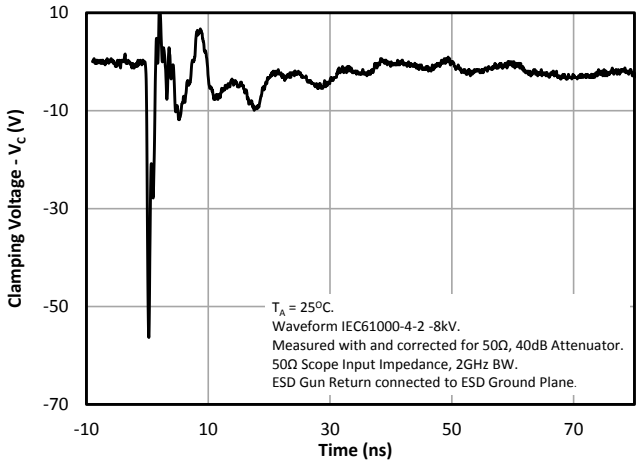


Typical Characteristics (Continued)

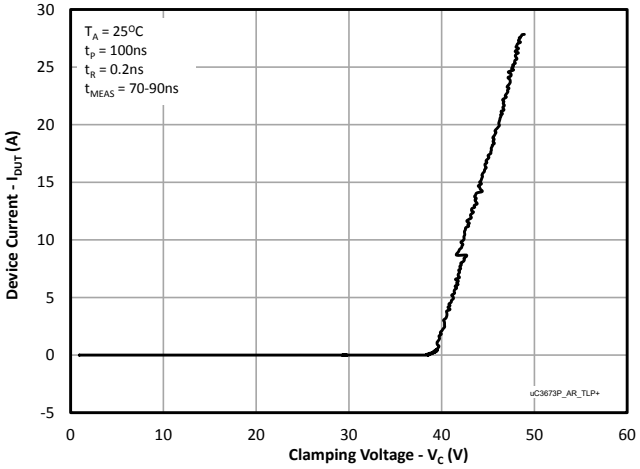
ESD Clamping (+8kV contact per IEC 61000-4-2)



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



TLP Characteristic

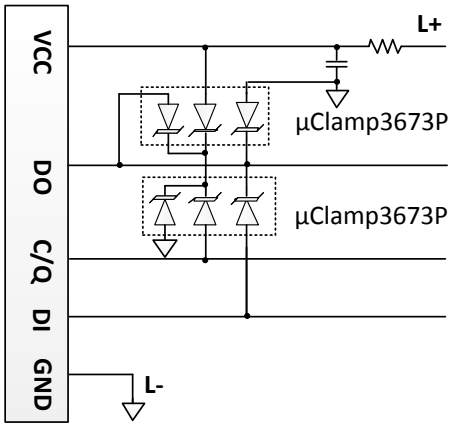


Application Information

I/O Link Interface

For incandescent lamp loads and other types of resistive & inductive loads, protection from each cable pin to ground is recommended. A typical protection circuit using two µClamp3673P is shown in the schematic below.

ESD & Surge Protection for I/O Link



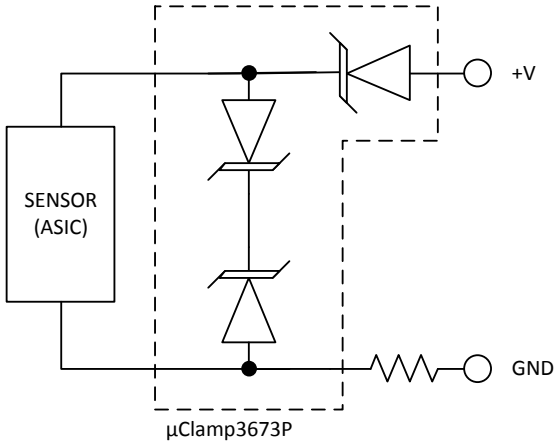
Device Connection for Protection of Two and Three Wire Proximity Switches

Digital sensors help to bridge the gap between the physical world and the digital world in applications such as computer controlled factory automation, automotive spark timing and throttle position sensing amongst others. In such environments, transient voltages can easily disrupt or damage sensitive sensor inputs. The µClamp3673P provides transient voltage protection for the digital sensors to ensure their operation is not disrupted by the physical world.

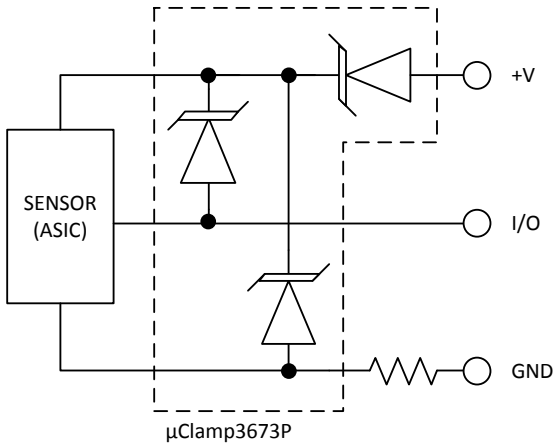
The µClamp3673P is designed to meet the high surge capability and low clamping voltage needed to protect the ASIC and control logic used in proximity switches.

The µClamp3673P provides protection for the power and I/O lines. Typical configurations for the protection of two and three wire switches are illustrated:

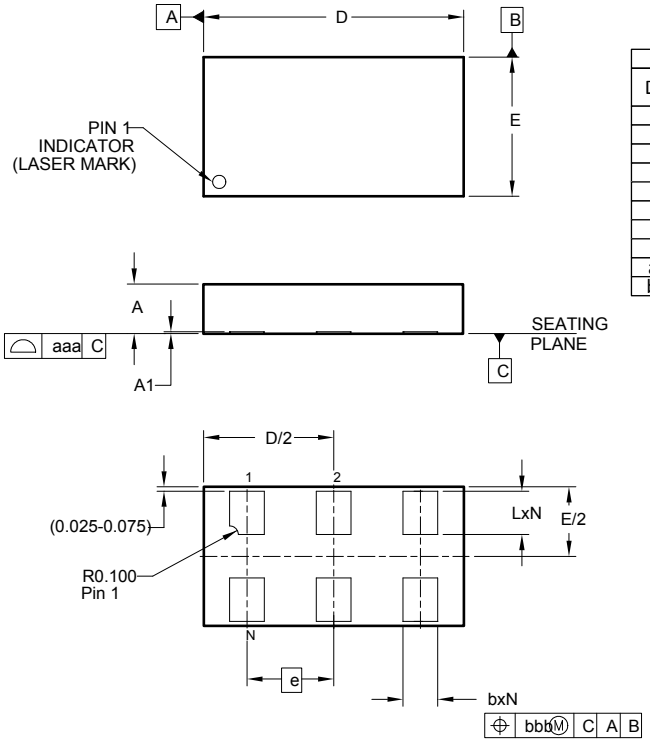
2-wire DC Proximity Switch Appilcation



3-wire DC Proximity Switch Appilcation



Outline Drawing - SGP3016N6

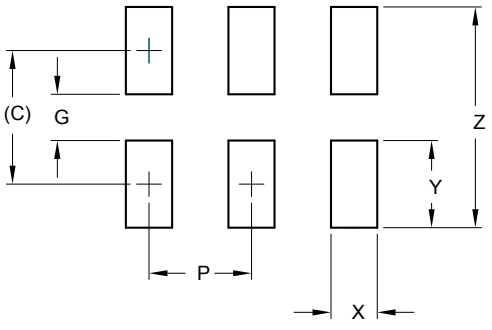


DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.52	0.57	0.62
A1	0.00	0.015	0.05
b	0.35	0.40	0.45
D	2.95	3.00	3.05
E	1.55	1.60	1.65
e	1.00 BSC		
L	0.45	0.50	0.55
N	6		
aaa	0.08		
bbb	0.10		

SGP3016N6-1-R0

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

Land Pattern - SGP3016N6

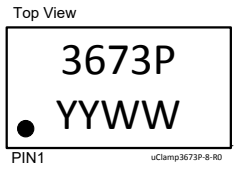


DIMENSIONS	
DIM	MILLIMETERS
C	(1.30)
G	0.45
P	1.00
X	0.45
Y	0.85
Z	2.15

SGP3016N6-2-R0

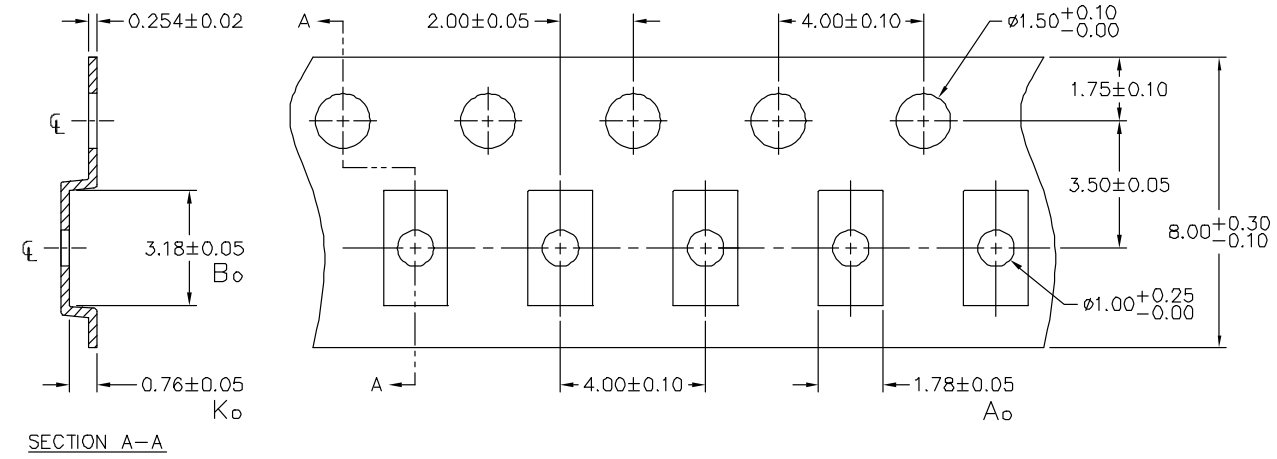
NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Marking Code

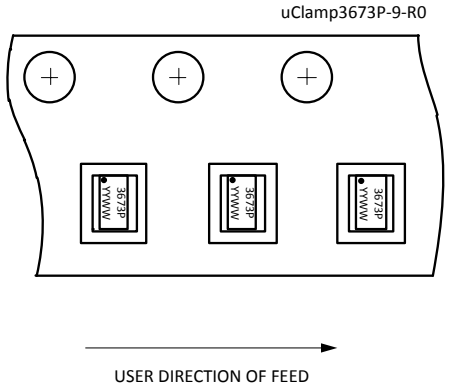


Notes: YYWW = Date Code

Tape and Reel Specification



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



Ordering Information

Part Number	Qty per Reel	Reel Size
µClamp3673P. TCT	3,000	7″

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