

PROTECTION PRODUCTS - MicroClamp[®]

Description

μ Clamp[®] TVS diodes 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. This device offers desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

The μ Clamp[®]4014P is in a 10-pin SGP2510P8 package measuring 2.5 x 1.0mm with a nominal height of only 0.60mm. Leads are finished with lead-free NiPdAu. Each device will protect four lines operating at +/- 40 volts. This device gives the designer flexibility to replace multiple single line devices in space constrained applications. The flow through package design simplifies PCB layout. uClamp4014P may be used to meet the ESD immunity requirements of IEC 61000-4-2. The combination of high ESD surge capability and innovative package design makes them ideal for use in applications such as LCD Televisions, monitors, and industrial equipment.

Features

- ◆ High ESD withstand Voltage: +/-**18kV** (Contact) per **IEC 61000-4-2**
- ◆ Protects up to four VBus lines
- ◆ Flow-Through Package
- ◆ Low reverse current: <10nA typical (VR=40V)
- ◆ Working voltage: +/- 40V
- ◆ Dynamic resistance: 2 Ohms (Typ)
- ◆ Solid-state silicon-avalanche technology

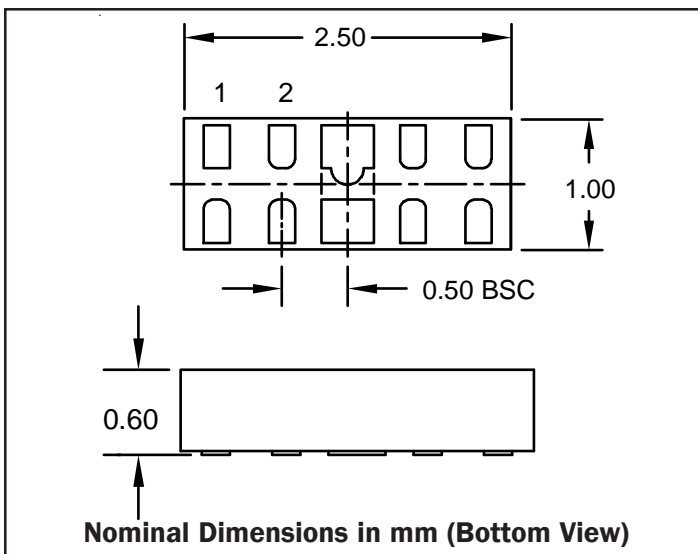
Mechanical Characteristics

- ◆ SGP2510P8 10-pin package (2.5 x 1.0 x 0.60mm)
- ◆ Lead Pitch: 0.5mm
- ◆ Pb-Free, Halogen Free, RoHS/WEEE Compliant
- ◆ Molding compound flammability rating: UL 94V-0
- ◆ Marking: Marking code + date code
- ◆ Packaging: Tape and Reel

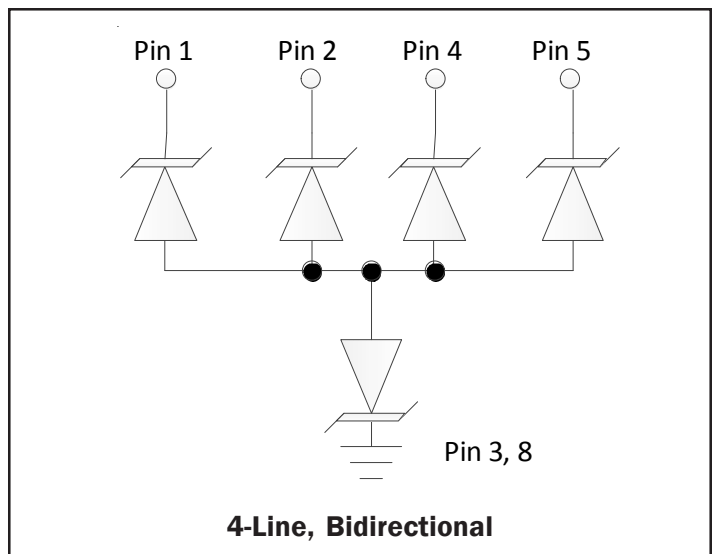
Applications

- ◆ Chip-On-Glass (COG) Panels
- ◆ VBus Protection
- ◆ LCD Televisions
- ◆ Set Top Box
- ◆ Industrial Equipment

Dimensions



Circuit Diagram



PROTECTION PRODUCTS

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	P_{pk}	225	Watts
Maximum Peak Pulse Current (tp = 8/20μs)	I_{pp}	3	Amps
ESD per IEC 61000-4-2 (Air) ¹ ESD per IEC 61000-4-2 (Contact) ¹	V_{ESD}	+/- 20 +/- 18	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}	Pins 1, 2, 4, and 5 to Pins 3 & 8			40	V
Reverse Breakdown Voltage	V_{BR}	$I_t = 1mA$ Pins 1, 2, 4, or 5 to Pins 3 & 8	42	47	52	V
Reverse Leakage Current	I_R	$V_{RWM} = 40V, T=25°C$ Pins 1, 2, 4, or 5 to Pins 3 & 8		<0.005	0.250	μA
Clamping Voltage	V_C	$I_{pp} = 3A, tp = 8/20μs$ Pins 1, 2, 4, or 5 to Pins 3 & 8			75	V
ESD Clamping Voltage ²	V_C	$I_{pp} = 4A,$ $t_{lp} = 0.2/100ns$ Pins 1, 2, 4, or 5 to Pins 3 & 8		54		V
ESD Clamping Voltage ²	V_C	$I_{pp} = 16A,$ $t_{lp} = 0.2/100ns$ Pins 1, 2, 4, or 5 to Pins 3 & 8		78		V
Dynamic Resistance ^{2,3}	R_{DYN}	$tp = 100ns$		2		Ohms
Junction Capacitance	C_j	$V_R = 40V, f = 1MHz$ Pins 1, 2, 4, or 5 to Pins 3 & 8		5	10	pF

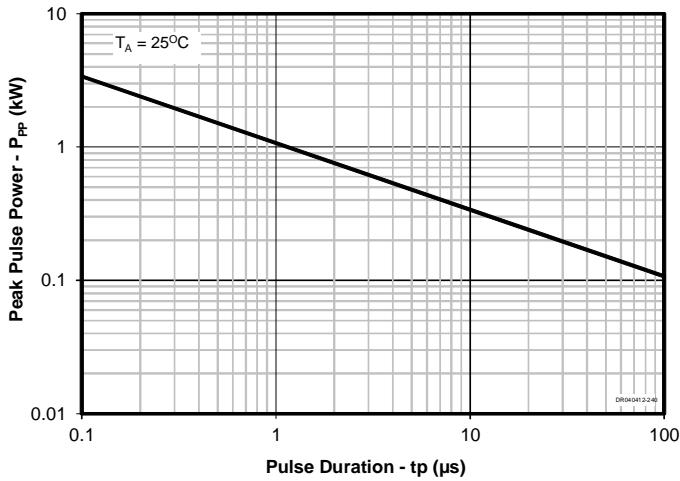
Notes

- 1)ESD gun return path connected to ESD ground 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 $I_{pp} = 4A$ to $I_{pp} = 16A$

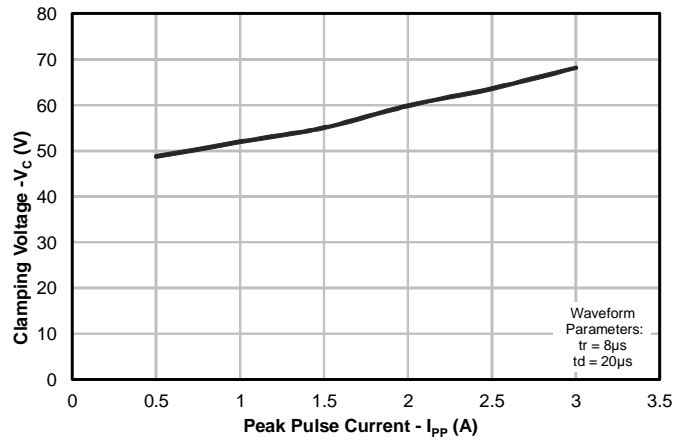
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Typical Characteristics

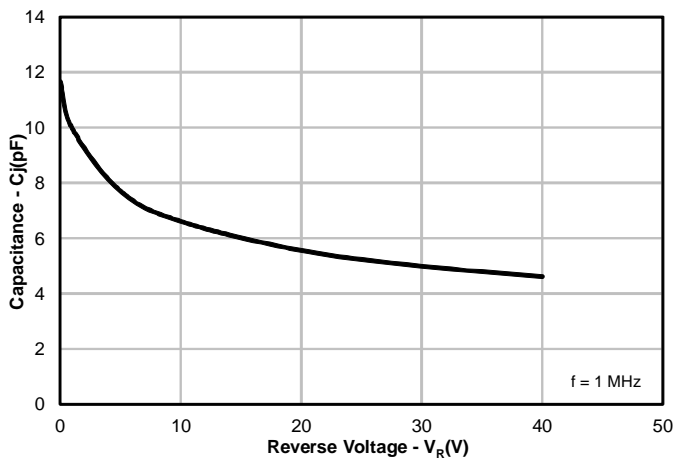
Non-Repetitive Peak Pulse Power vs. Pulse Time



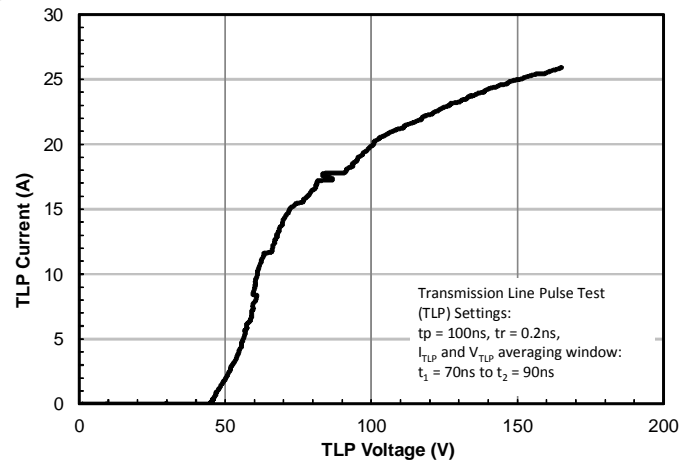
Clamping Voltage vs. Peak Pulse Current ($t_p=8/20\mu$ s)



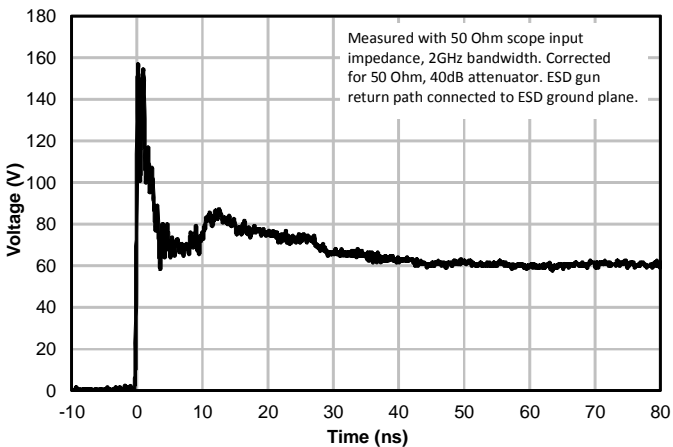
Junction Capacitance vs. Reverse Voltage



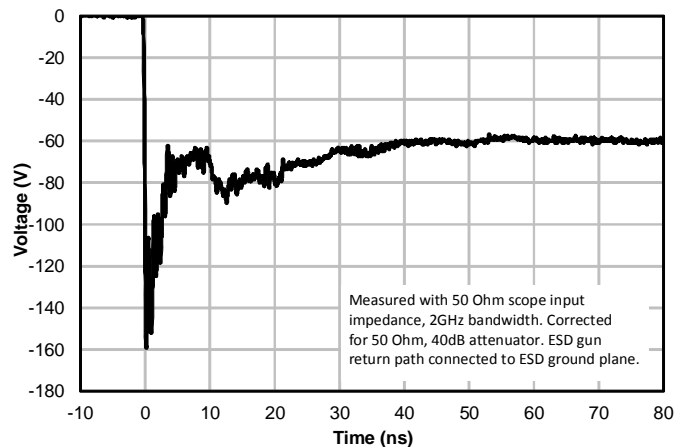
TLP Characteristic



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

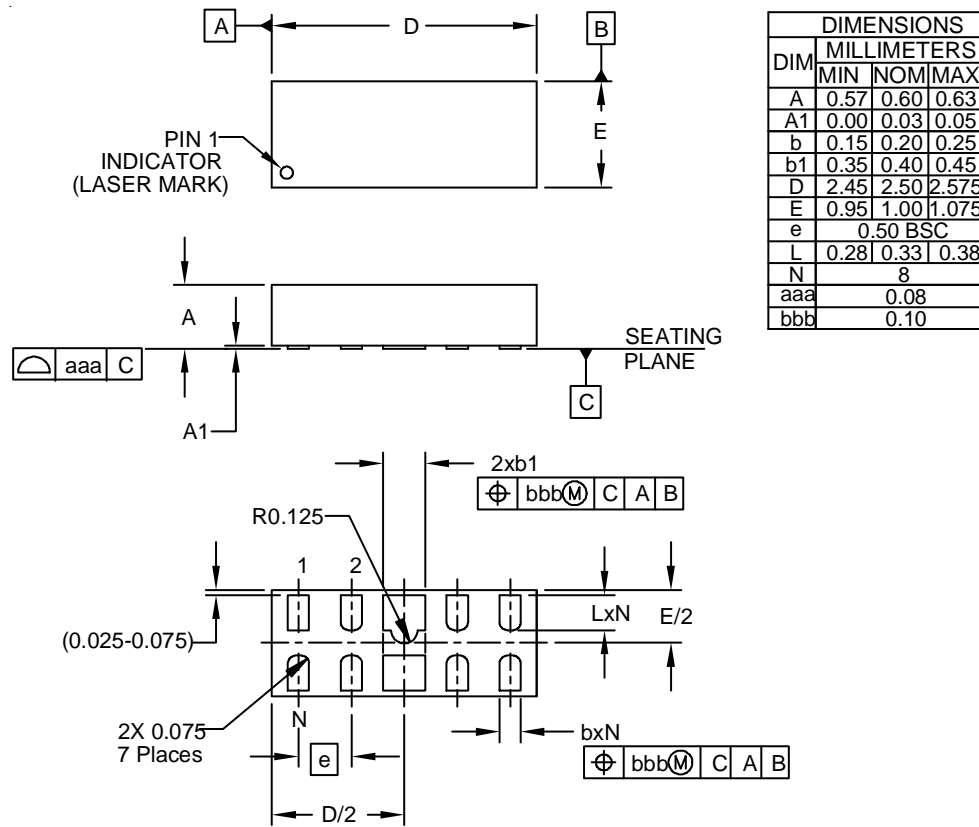


ESD Clamping (-8kV Contact per IEC 61000-4-2)



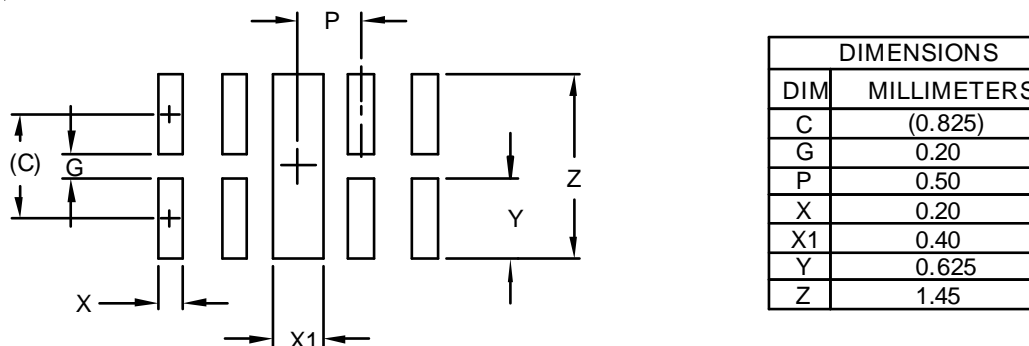
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Outline Drawing - SGP2510P8



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

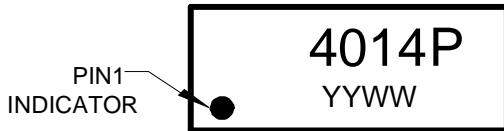
Land Pattern - SGP2510P8



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.

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Marking Code

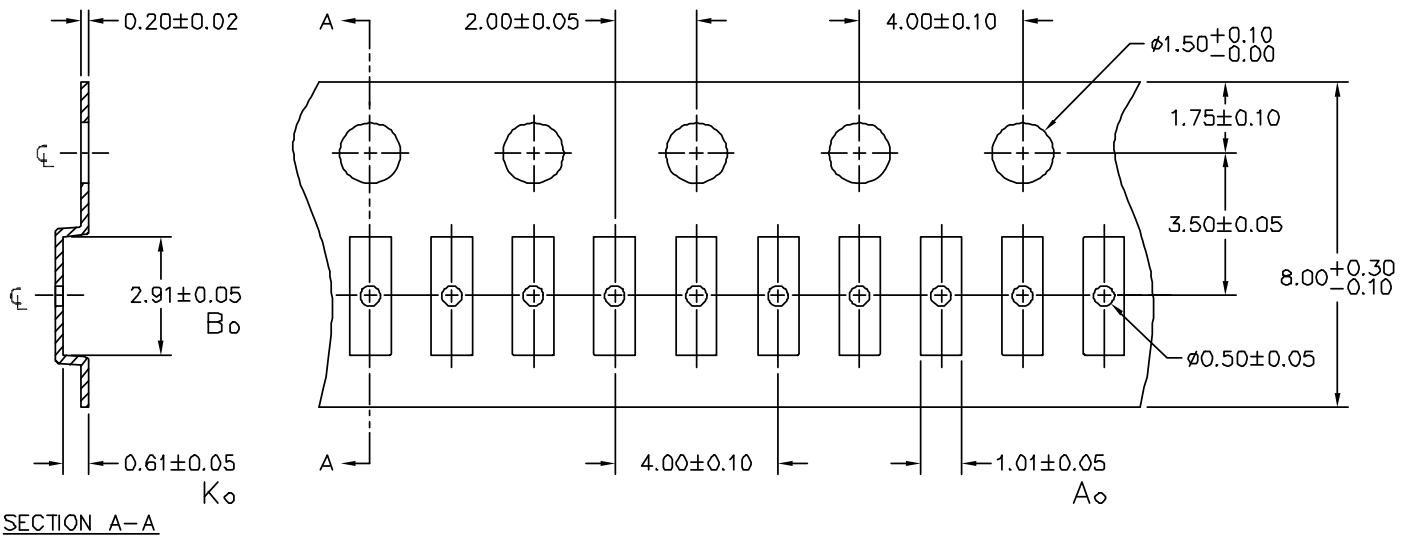


Ordering Information

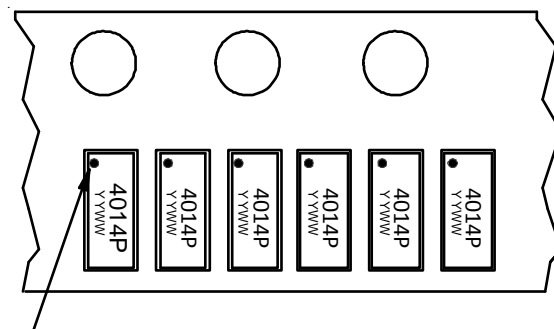
Part Number	Qty per Reel	Reel Size
uClamp4014P.TNT	10,000	7 Inch

Notes:
MicroClamp, uClamp and μ Clamp are trademarks of Semtech Corporation

Carrier Tape Specification



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



Pin 1 Location (Towards Sprocket Holes)

→
User Direction of feed

Device Orientation in Tape

Contact Information

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