µClamp5031PW

µClamp®

5V ESD and EOS Protection

Description

µClamp® TVS diodes are designed to protect sensitive electronics from damage or latch-up due to ESD and EOS. TVS diodes offer desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

µClamp®5031PW features extremely good ESD protection characteristics highlighted by extremely low dynamic resistance, low peak ESD clamping voltage, and high ESD withstand voltage (+/-30kV contact per IEC 61000-4-2). These devices may also be used for EOS protection due to their high peak pulse current capaability (7.5A, tp = 8/20µs). Each device will protect one data or power line operating at 5 Volts.

µClamp5031PW is in a DFN 1.0 x 0.6 x 0.55mm 2-Lead package. The small package gives the designer the flexibility to protect single lines in applications where arrays are not practical. The combination of small size and high ESD surge capability makes them ideal for use in portable applications such as cellular phones and wearables.

Features

- ESD and EOS Protection
- ESD withstand voltage: +/-30kV (contact) and +/-30kV (air) per IEC 61000-4-2
- Protects one line
- Low ESD clamping voltage
- Working voltage: 5V
- Capacitance: 15pF Maximum
- Low leakage current
- Low dynamic resistance: 0.040 Ohms Typical
- Solid-state silicon-avalanche technology

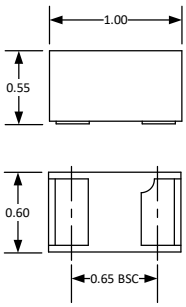
Mechanical Characteristics

- Package: DFN 1.0 x 0.6 x 0.55mm 2-Lead
- Pb-Free, Halogen Free, RoHS/WEEE compliant
- Lead Finish: Pb-Free
- Marking: Marking code
- Packaging: Tape and Reel

Applications

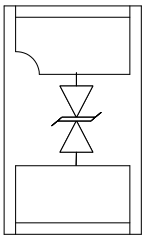
- Keypads, Side Keys, Audio Ports
- Industrial Equipment
- Portable Instrumentation
- Notebook Computers
- Cellular Handsets & Accessories

Package Dimension



Nominal Dimensions (mm)

Schematic & Pin Configuration



DFN 1.0 x 0.6 x 0.55mm 2-Lead (Bottom View)

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20µs)	P_{PK}	80	W
Peak Pulse Current (tp = 8/20µs)	I_{PP}	7.5	A
ESD per IEC 61000-4-2 (Air)(1) ESD per IEC 61000-4-2 (Contact)(1)	V_{ESD}	±30 ±30	kV
Operating Temperature	T_J	-40 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

Electrical Characteristics (T=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	6	7.7	9	V
Reverse Leakage Current	I_R	V_{RWM} = 5V		<5	100	nA
Clamping Voltage	V_C	I_{PP} = 7.5A, tp = 8/20µs		9.2	11	V
ESD Clamping Voltage(2)	V_C	I_{tlp} = 4A, t_P = 0.2/100ns (TLP)		7.7		V
		I_{tlp} =16A, t_P = 0.2/100ns (TLP)		8.2		
Dynamic Resistance(2),(3)	R_{DYN}	tlp = 0.2/100ns		0.04		Ω
Junction Capacitance	C_J	V_R = 0V, f = 1MHz		10.9	15	pF

Notes:

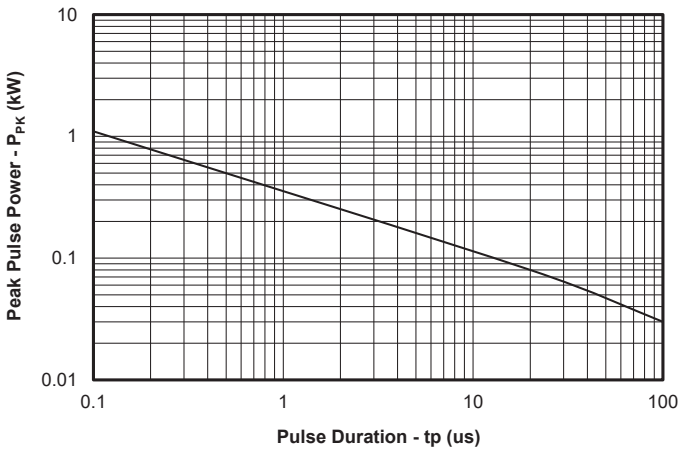
1) Measured with a 20dB attenuator, 50 Ohm scope input impedance, 2GHz bandwidth. ESD gun return path connected to ESD ground plane.

2) Transmission Line Pulse Test (TLP) Settings: tp = 100ns, tr = 0.2ns, I_{TLP} and V_{TLP} averaging window: t1 = 70ns to t2 = 90ns.

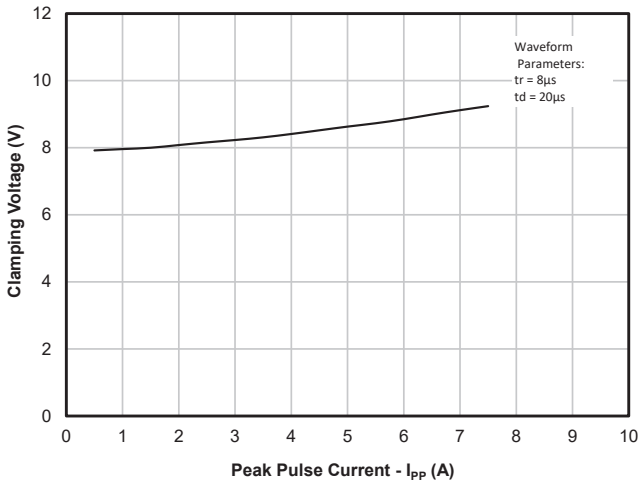
3) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A

Typical Characteristics

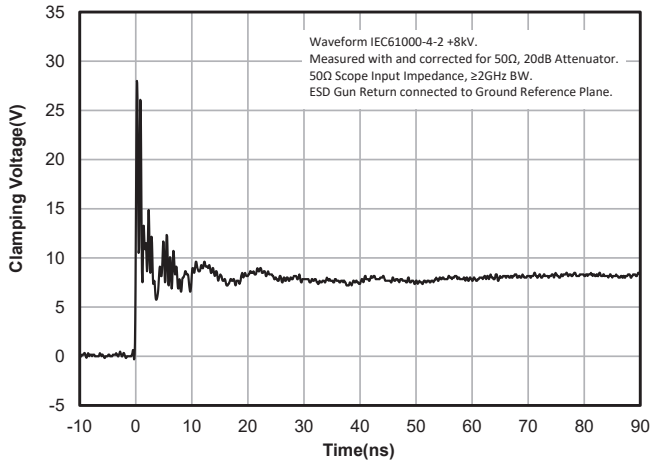
Non-Repetitive Peak Pulse Power vs. Pulse Time



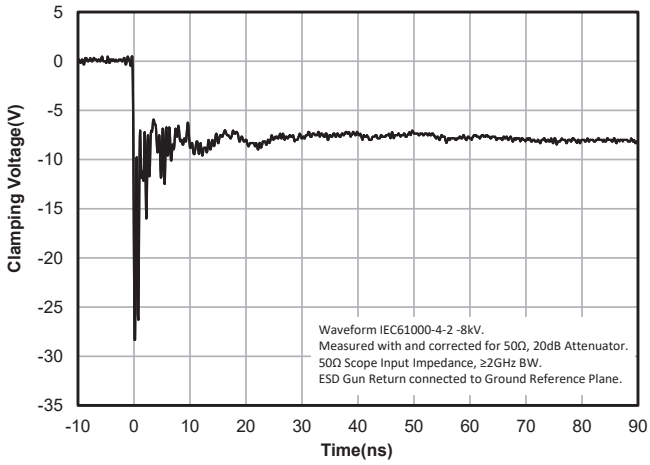
Clamping Characteristic (8/20us Waveform)



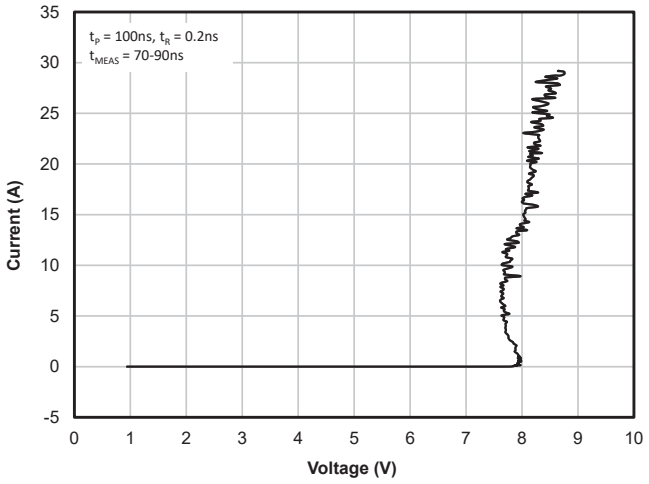
ESD Clamping (8kV Contact per IEC 61000-4-2)



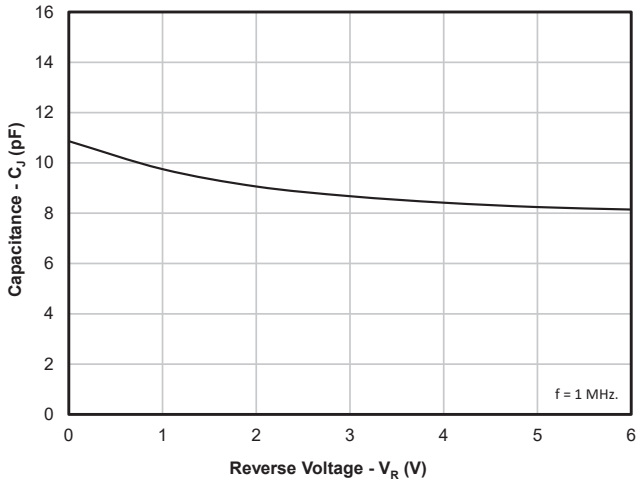
ESD Clamping (-8kV Contact per IEC 61000-4-2)



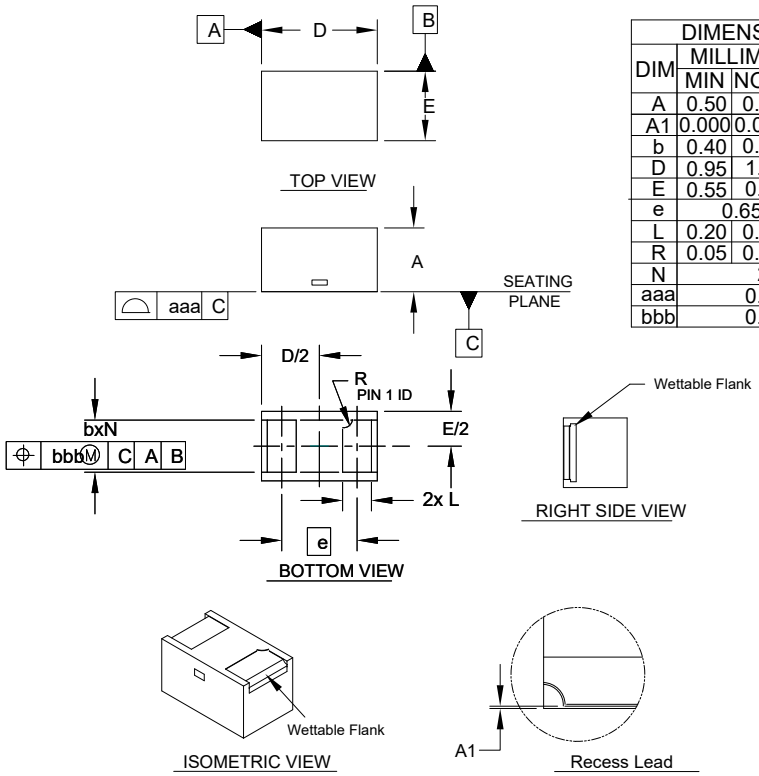
TLP Characteristic (Positive Pulse)



Capacitance vs. Reverse Voltage



Outline Drawing - DFN 1.0 x 0.6 x 0.55mm 2-Lead

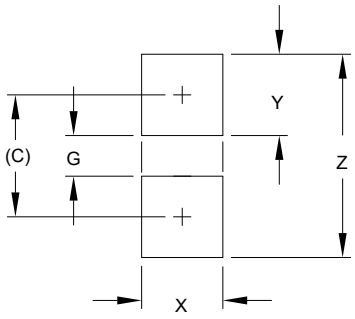


DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.000	0.004	0.008
b	0.40	0.45	0.50
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	0.65 BSC		
L	0.20	0.25	0.30
R	0.05	0.10	0.15
N	2		
aaa	0.08		
bbb	0.10		

NOTES:

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

Land Pattern - DFN 1.0 x 0.6 x 0.55mm 2-Lead

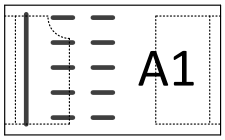


DIMENSIONS	
DIM	MILLIMETERS
C	(0.90)
G	0.30
X	0.60
Y	0.60
Z	1.50

NOTES:

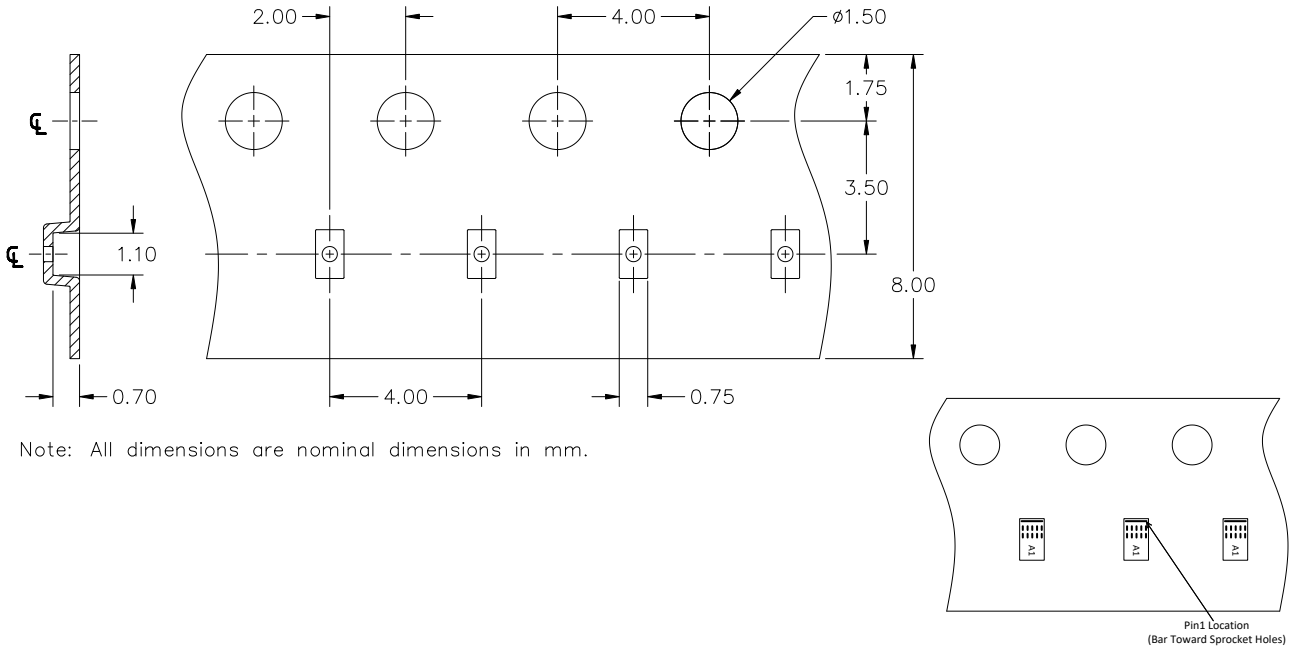
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Marking Code



Notes:
1. Device is electrically symmetrical
2. Marking will also include line matrix date code
3. Bar indicates Pin 1 location

Tape and Reel Specification



Ordering Information

Part Number	Qty per Reel	Reel Size
µClamp5031PW.C	3,000	7″

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Contact Information

Semtech Corporation
200 Flynn Road, Camarillo, CA 93012
Phone: (805) 498-2111, Fax: (805) 498-3804
www.semtech.com

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