

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 capability (7.5A, $t_p = 8/20\mu s$). 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

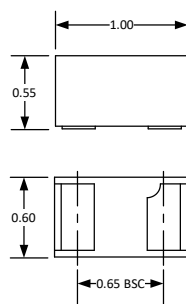
Mechanical Characteristics

- 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

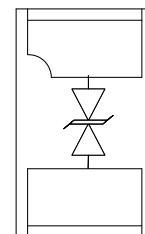
- Keypads, Side Keys, Audio Ports
- Industrial Equipment
- Portable Instrumentation
- Notebook Computers
- Cellular Handsets & Accessories

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 ($t_p = 8/20\mu s$)	P_{PK}	80	W
Peak Pulse Current ($t_p = 8/20\mu s$)	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 ($T=25^\circ C$ 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	$I_{PP} = 7.5A, t_p = 8/20\mu s$		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}	$t_{lp} = 0.2/100ns$		0.04		Ω
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz$		10.9	15	pF

Notes:

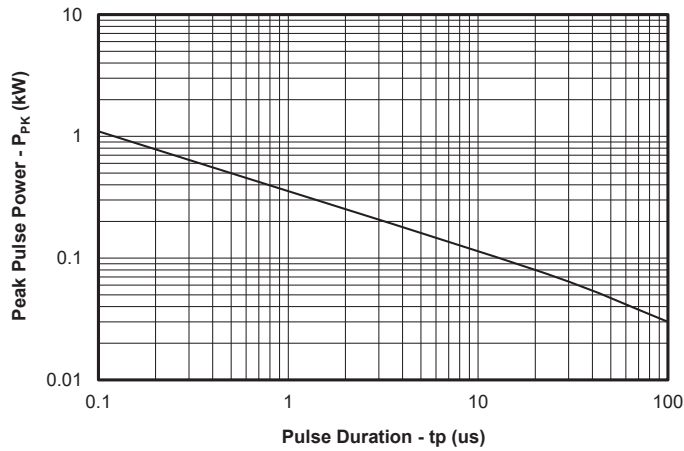
1) Measured with a 20dB attenuator, 50 Ohm scope input impedance, 2GHz bandwidth. ESD gun return path connected to ESD ground plane.

2) Transmission Line Pulse Test (TLP) Settings: $t_p = 100ns$, $t_r = 0.2ns$, I_{tLP} and V_{tLP} averaging window: $t_1 = 70ns$ to $t_2 = 90ns$.

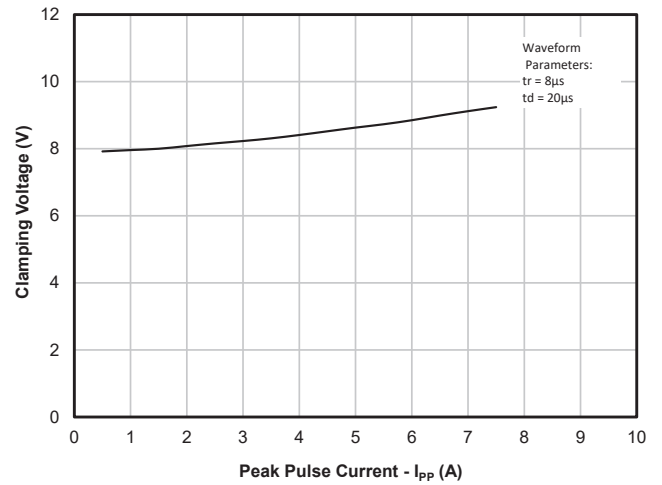
3) Dynamic resistance calculated from $I_{tLP} = 4A$ to $I_{tLP} = 16A$

Typical Characteristics

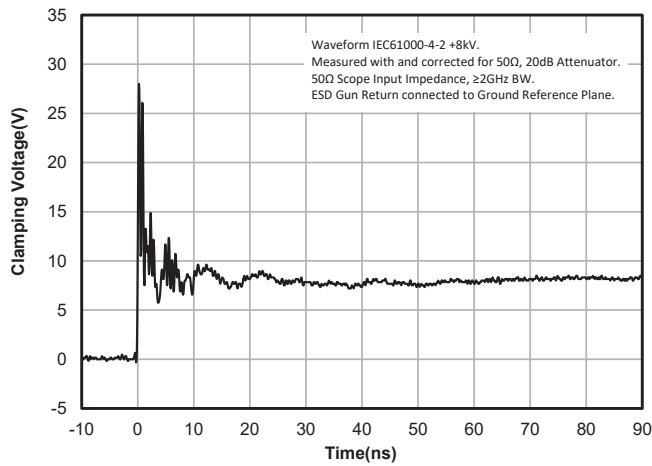
Non-Repetitive Peak Pulse Power vs. Pulse Time



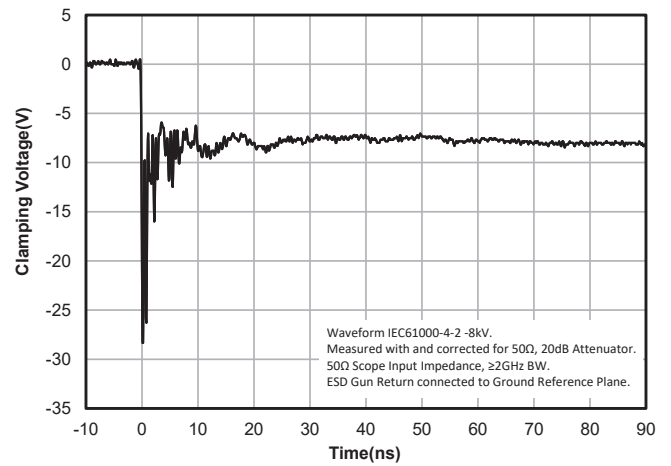
Clamping Characteristic (8/20us Waveform)



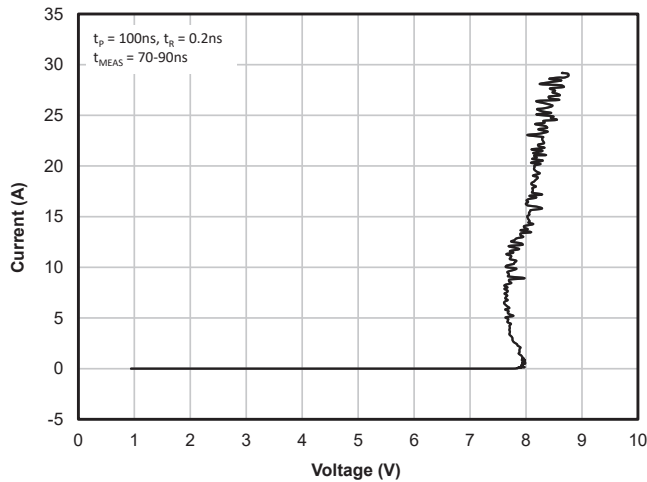
ESD Clamping (8kV Contact per IEC 61000-4-2)



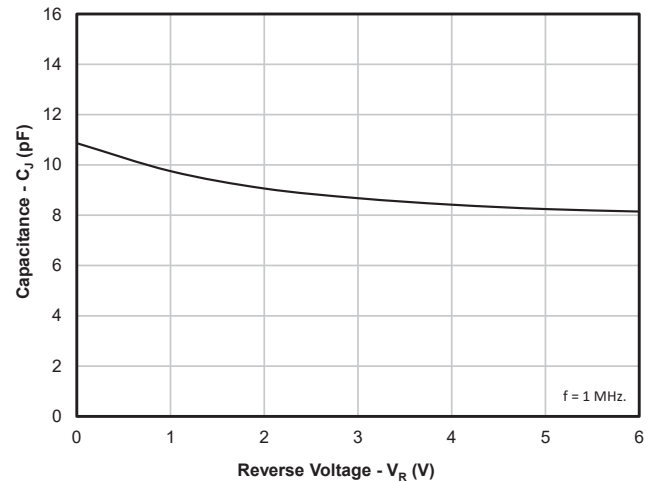
ESD Clamping (-8kV Contact per IEC 61000-4-2)



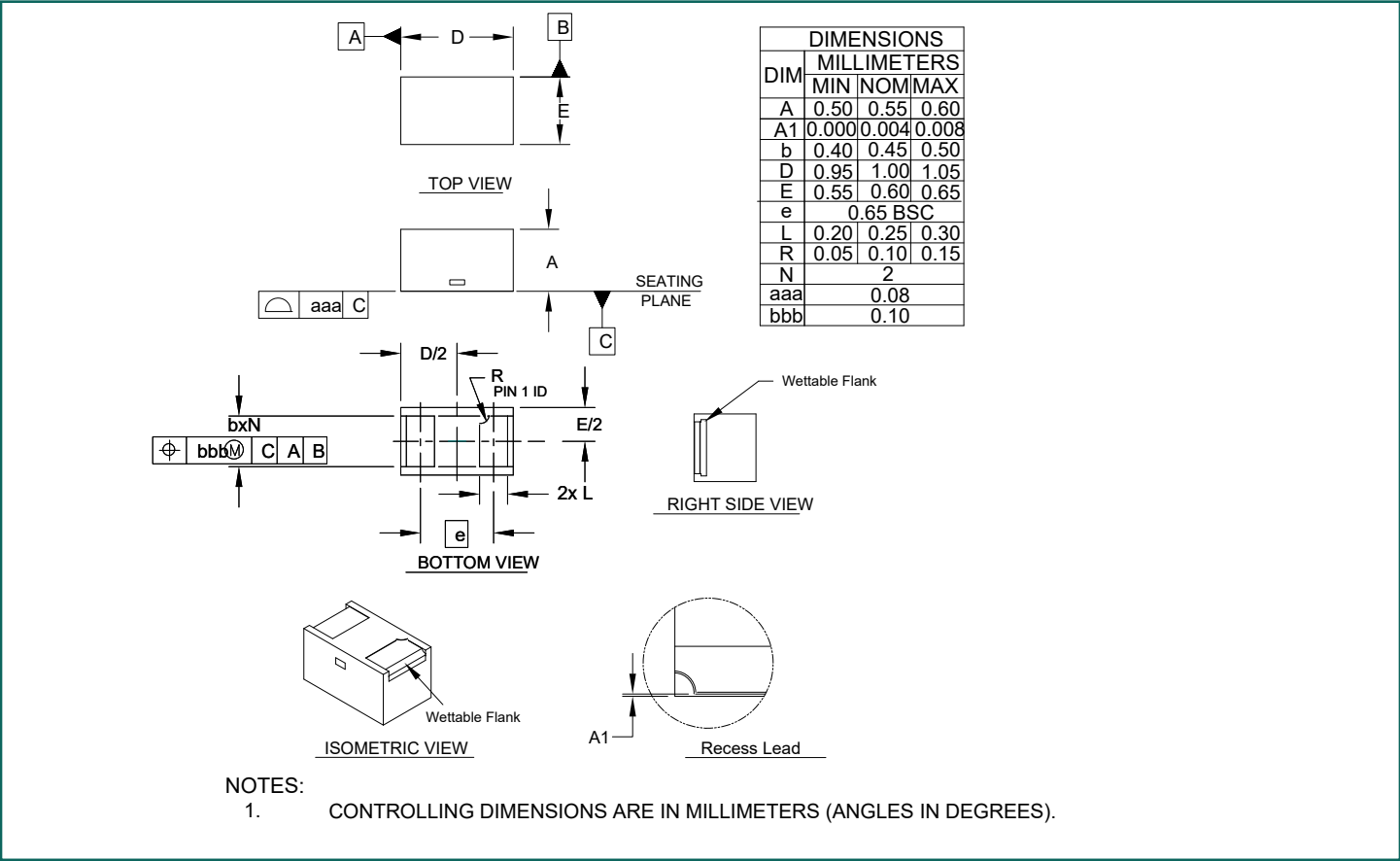
TLP Characteristic (Positive Pulse)



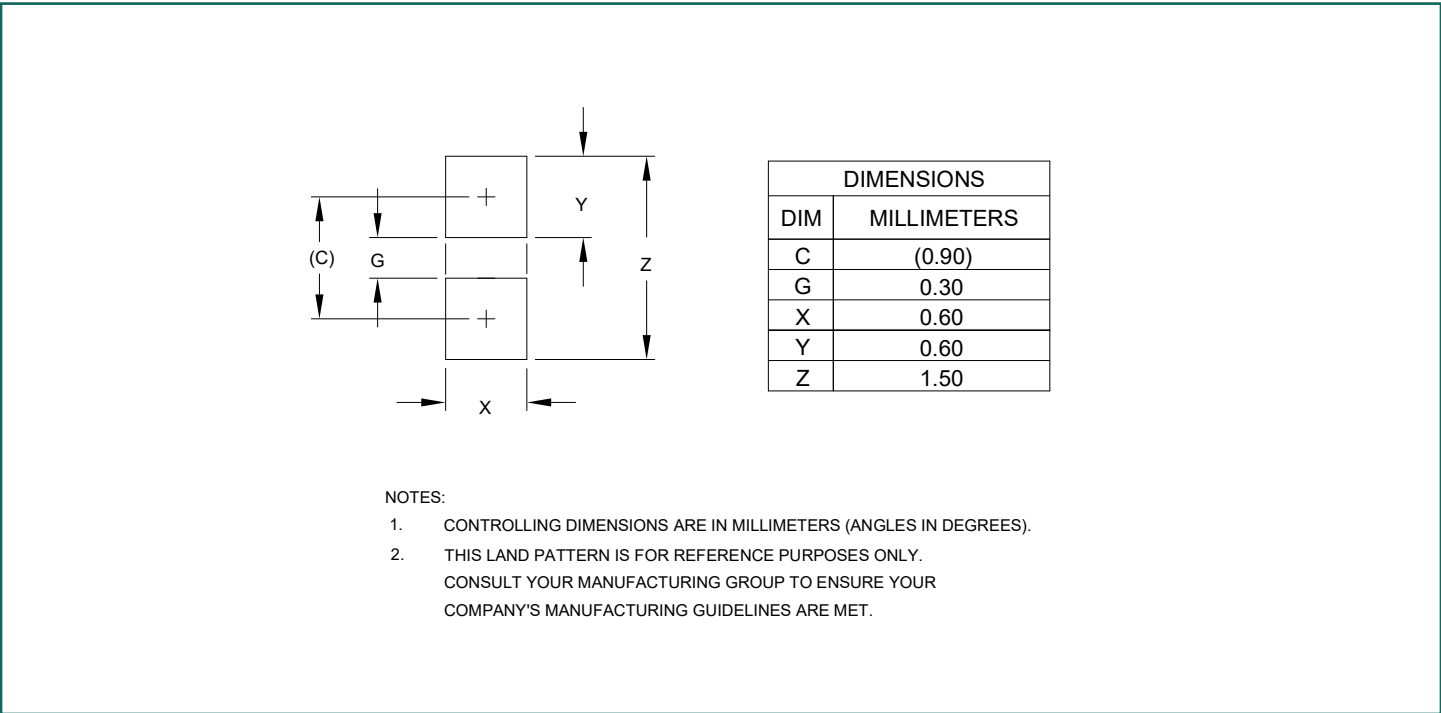
Capacitance vs. Reverse Voltage



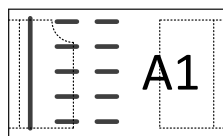
Outline Drawing - DFN 1.0 x 0.6 x 0.55mm 2-Lead



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



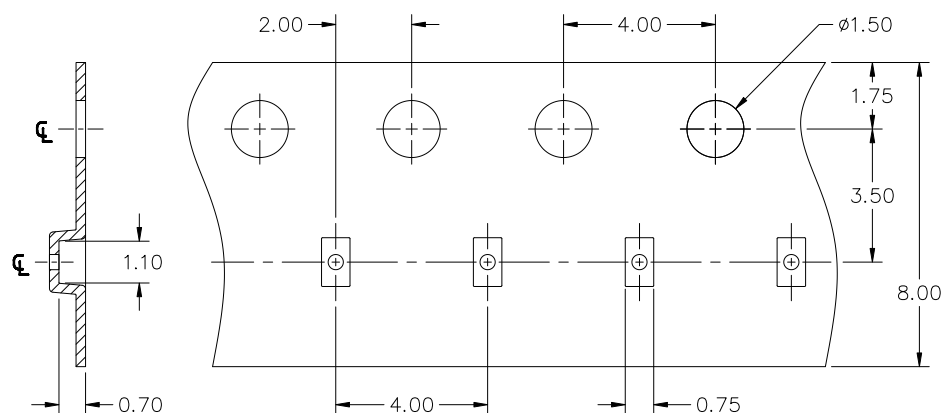
Marking Code



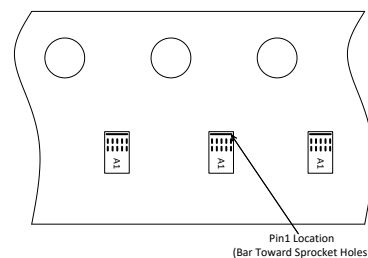
Notes:

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

Tape and Reel Specification



Note: All dimensions are nominal dimensions in mm.



Ordering Information

Part Number	Qty per Reel	Reel Size
μ Clamp5031PW.C	3,000	7"
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