

Description

μClamp® TVS diodes are designed to protect sensitive electronics from damage or latch-up due to ESD. It features 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.

μClamp®2411PW is in a DFN 1.0 x 0.6 x 0.55mm 2-Lead package. Each device will protect one line operating at 24 volts. It gives the designer the flexibility to protect single lines in applications where arrays are not practical. The combination of their small size and high ESD surge capability makes them ideal for use in portable applications such as cellular phones, tablets, and notebook computers.

Features

- ESD withstand Voltage: +/-17kV (Contact) per and +/- 20kV (Air) per IEC 61000-4-2
- Surge Current: 3A (tp = 8/20μs) per IEC 61000-4-5
- Ultra-small package
- Protects one DC Power line
- Low clamping voltage
- Working voltage: 24V
- Low leakage current
- Solid-state silicon-avalanche technology

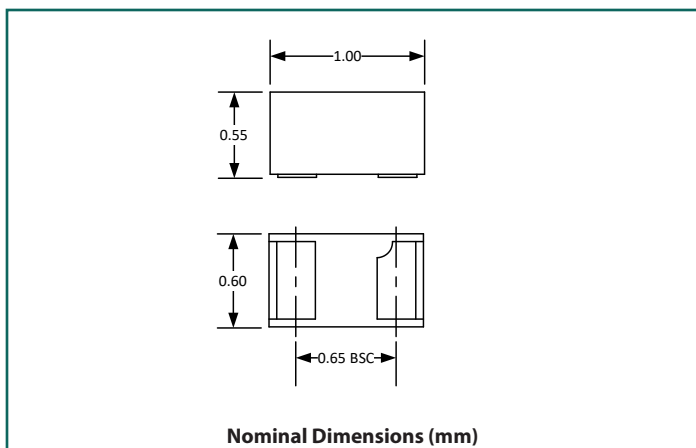
Mechanical Characteristics

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

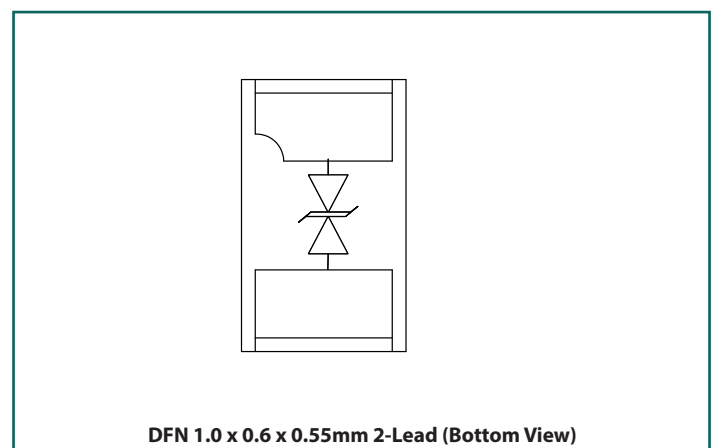
Applications

- Cellular Handsets & Accessories
- Notebook Computers
- Tablets
- Portable Instrumentation
- Chip-on-Glass Driver IC data line
- Peripherals
- 24V DC Power Rails

Package Dimension



Schematic & Pin Configuration



Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PK}	150	W
Peak Pulse Current ($t_p = 8/20\mu s$)	I_{PP}	3	A
ESD per IEC 61000-4-2 (Contact) ⁽¹⁾ ESD per IEC 61000-4-2 (Air) ⁽¹⁾	V_{ESD}	± 17 ± 20	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}				24	V
Reverse Breakdown Voltage	V_{BR}	$I_t = 1mA$	27	30	36	V
Reverse Leakage Current	I_R	$V_{RWM} = 24V$		<10	100	nA
Clamping Voltage	V_C	$I_{PP} = 2A, t_p = 8/20\mu s$		38.4	45	V
ESD Clamping Voltage ⁽²⁾	V_C	$I_{TLP} = 4A, t_p = 0.2/100ns$		35.9		V
		$I_{TLP} = 16A, t_p = 0.2/100ns$		41.5		
Dynamic Resistance ^{(2),(3)}	R_{DYN}	$t_p = 0.2/100ns$		0.4		Ω
Junction Capacitance	C_J	I/O to GND, $V_R = 0V, f = 1MHz$		8.5	15	pF

Notes:

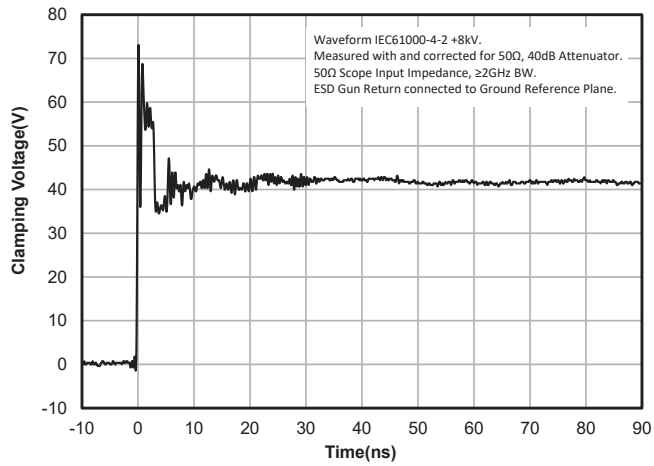
1) ESD gun return path connected to ESD ground plane.

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 $t_2 = 90ns$.

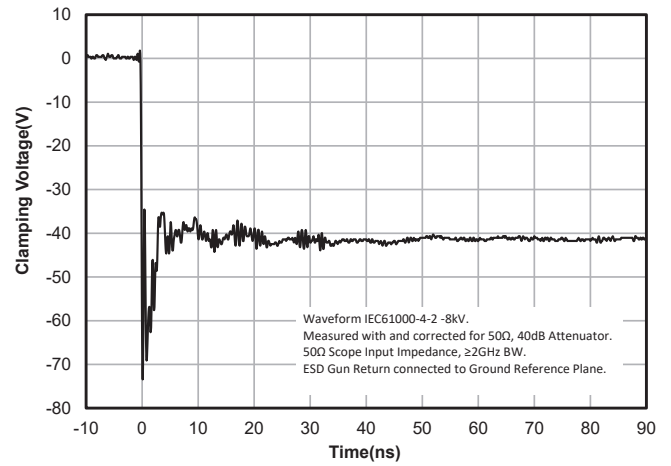
3) Dynamic resistance calculated from $I_{TLP} = 4A$ to $I_{TLP} = 16A$

Typical Characteristics

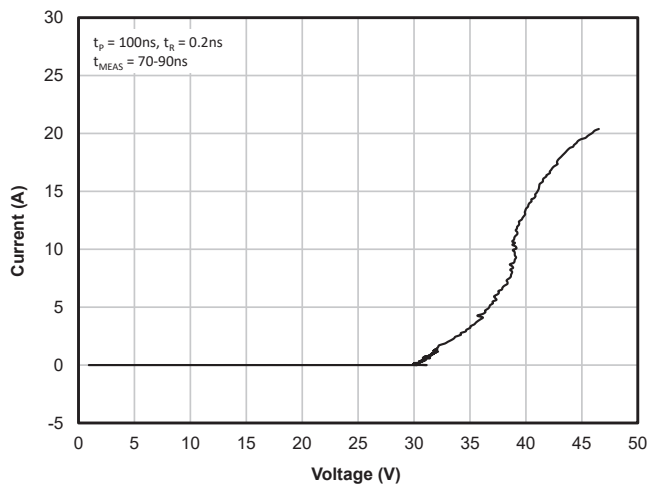
ESD Clamping (8kV Contact per IEC 61000-4-2)



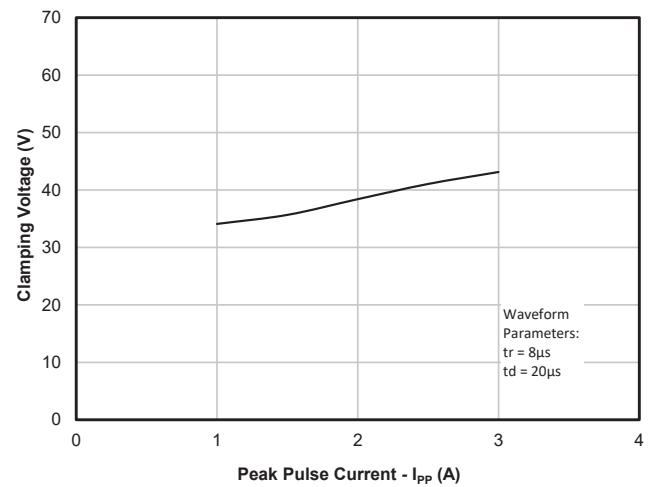
ESD Clamping (-8kV Contact per IEC 61000-4-2)



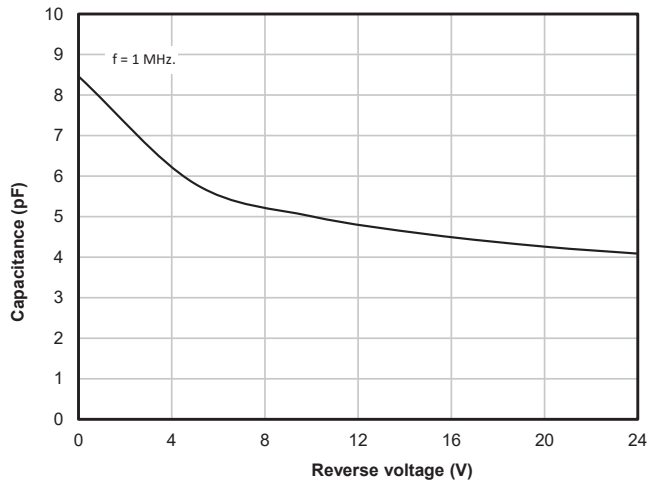
TLP Characteristic (Positive Pulse)



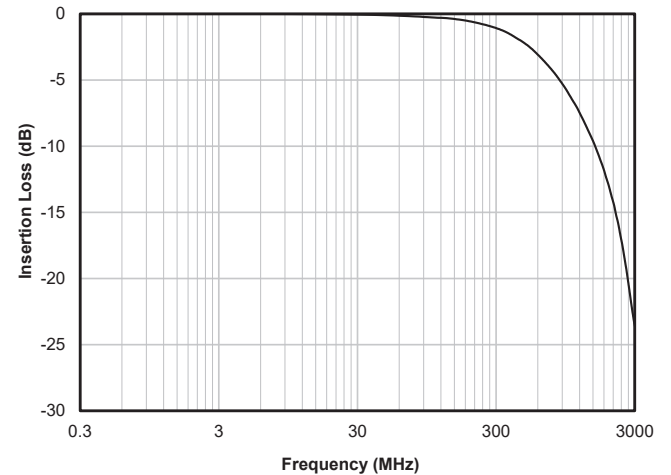
Clamping Voltage ($t_p=8/20\mu\text{s}$)



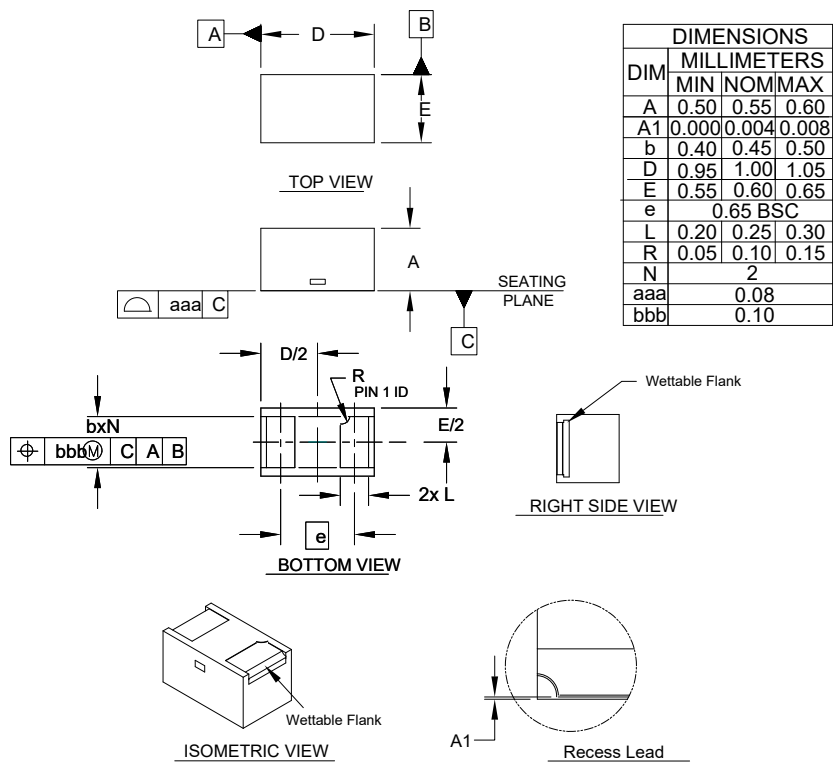
Capacitance vs. Reverse Voltage



Insertion Loss-S21

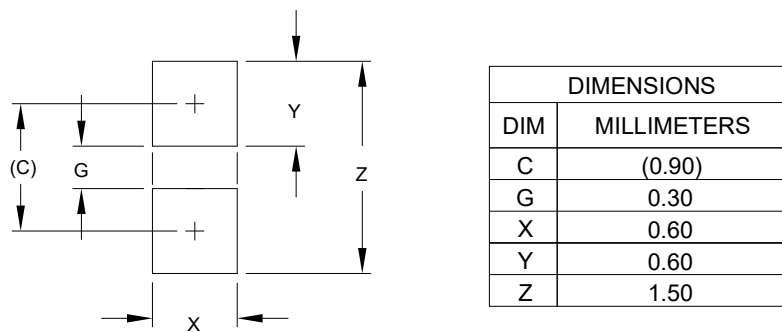


Outline Drawing - DFN 1.0 x 0.6 x 0.55mm 2-Lead



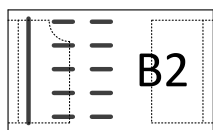
- NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

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



- 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.

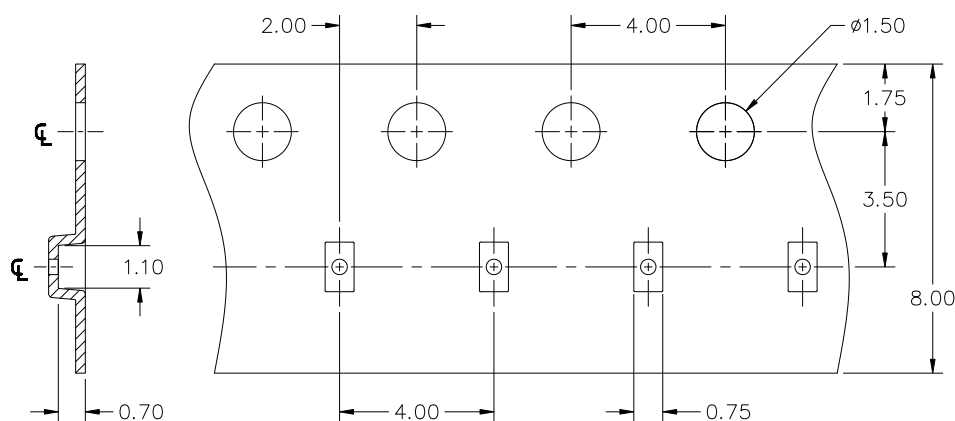
Marking Code



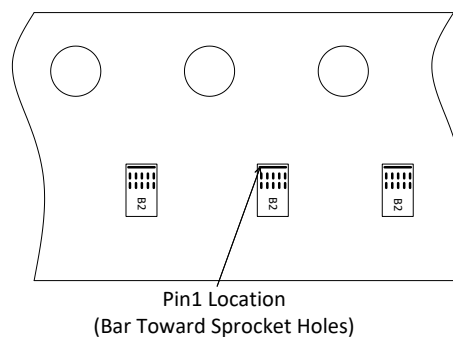
Notes:

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

Tape and Reel Specification



Note: All dimensions are nominal dimensions in mm.



Ordering Information

Part Number	Qty per Reel	Reel Size
μ Clamp2411PW.C	3,000	7"
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