

Description

RClamp®01811PW is a low capacitance FemtoClamp® ESD protection device specifically designed to protect high-speed differential lines. It offers desirable characteristics for board-level protection including fast response time, low operating and clamping voltage, and no device degradation.

The RClamp01811PW ESD protection characteristics include a low typical dynamic resistance of 0.15 Ohms, low peak ESD clamping voltage, and a high ESD withstand voltage per IEC 61000-4-2 ($\pm 30\text{kV}$ contact). It also features a high EOS peak pulse current rating of 8A ($t_p = 8/20\mu\text{s}$). RClamp01811PW maximum capacitance is limited to 1.2pF with low insertion loss at 2.5GHz and 5GHz.

RClamp01811PW is in a 2-pin 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 space-constrained applications.

Features

- ESD withstand voltage: $\pm 30\text{kV}$ (Contact), $\pm 30\text{kV}$ (Air) per IEC 61000-4-2
- Low capacitance: 1.2pF Maximum
- Protects one line
- Working voltage: 1.8V
- Low reverse leakage current: 100nA max at $V_R = 1.8\text{V}$
- Solid-state silicon-avalanche technology

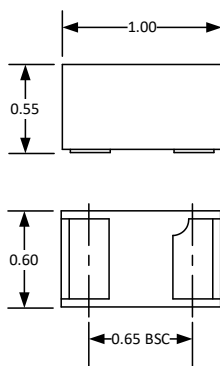
Mechanical Characteristics

- 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

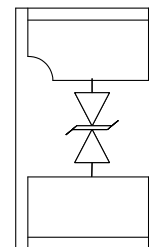
- Cellphones and accessories
- Notebooks & Handhelds

Package Dimension



Nominal Dimensions (mm)

Schematic and Pin Configuration



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

Absolute Maximum Ratings

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PK}	45	W
Peak Pulse Current ($t_p = 8/20\mu s$)	I_{PP}	8	A
ESD per IEC 61000-4-2 (Contact) ⁽¹⁾	V_{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Air) ⁽¹⁾		± 30	
Operating Temperature	T_{OP}	-40 to +85	°C
Junction Temperature and Storage Temperature	T_J and 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}				1.8	V
Reverse Breakdown Voltage	V_{BR}	$I_t = 10mA$	2.2	2.6	3.4	V
Reverse Leakage Current	I_R	$V_{RWM} = 1.8V$		<10	100	nA
Clamping Voltage ⁽²⁾	V_C	$I_{PP} = 8A$, $t_p = 1.2/50\mu s$ (Voltage), $8/20\mu s$ (Current) Combination Waveform, $R_s = 2\Omega$		4.6	5.8	V
ESD Clamping Voltage ⁽³⁾	V_C	$t_p = 0.2/100ns$ (TLP)	$I_{PP} = 4A$	4		V
			$I_{PP} = 16A$	5.7		
Dynamic Resistance ⁽³⁾⁽⁴⁾	R_{DYN}	$t_p = 0.2/100ns$ (TLP)		0.15		Ohms
Junction Capacitance	C_J	$V_R = 0V$ to V_{RWM} , $f = 1MHz$		0.52	1.2	pF
Insertion Loss	I_L	$f = 2.5GHz$		0.16		dB
		$f = 5GHz$		0.40		dB

Notes:

(1): ESD gun return path connected to Ground Reference Plane (GRP).

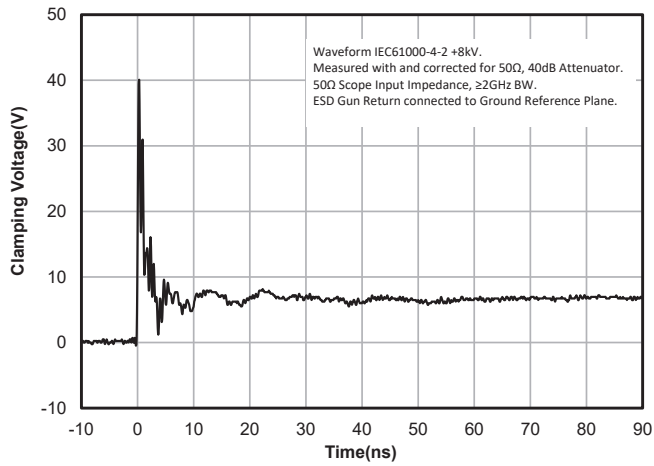
(2): Measured using a $1.2/50\mu s$ voltage, $8/20\mu s$ current combination waveform, $R_s = 2$ Ohms. Clamping is defined as the peak voltage across the device after the device snaps back to a conducting state.

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

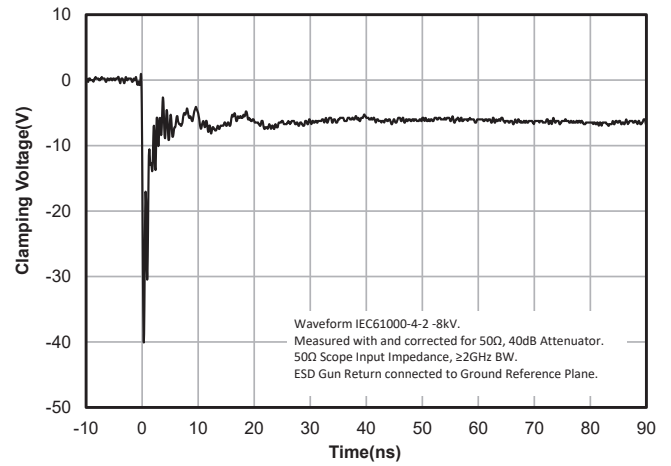
(4): Dynamic resistance calculated from $I_{TLP} = 4A$ to $I_{TLP} = 16A$

Typical Characteristics

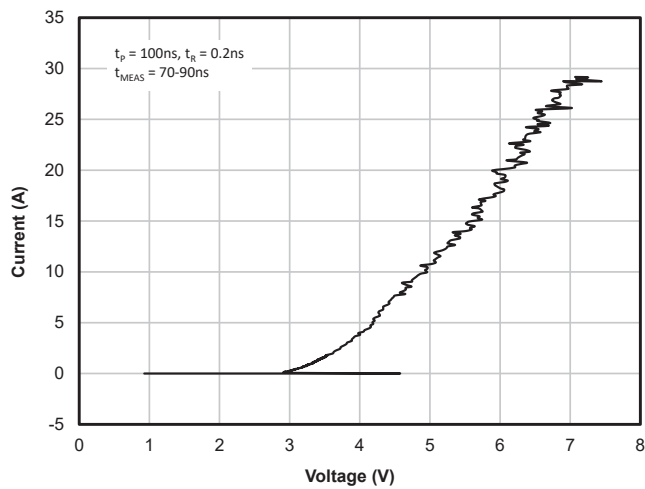
ESD Clamping (+8kV Contact per IEC 61000-4-2)



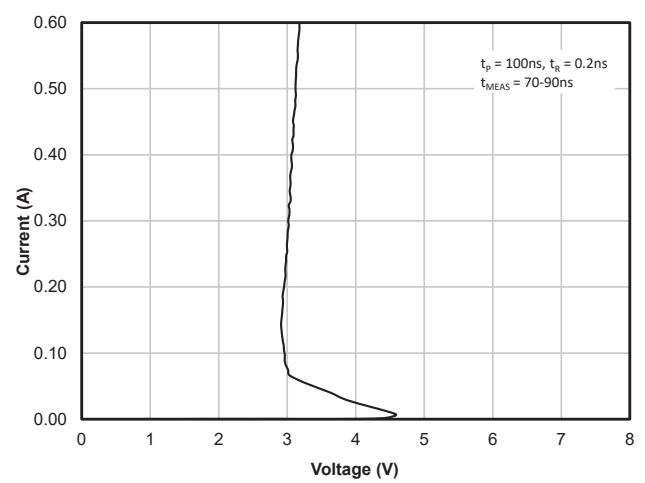
ESD Clamping (-8kV Contact per IEC 61000-4-2)



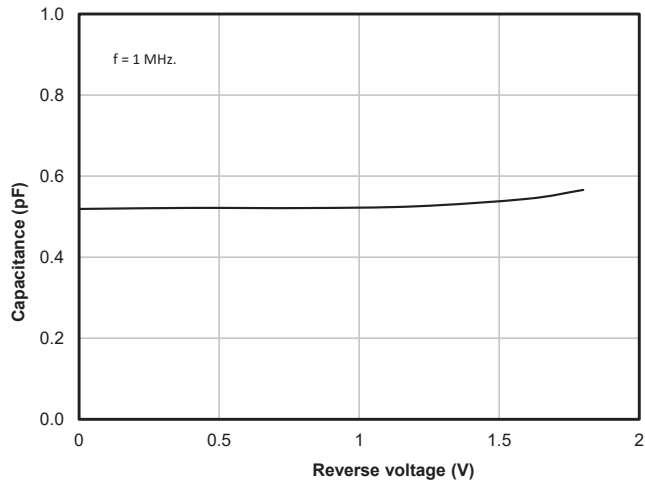
TLP Characteristic (Positive Pulse)



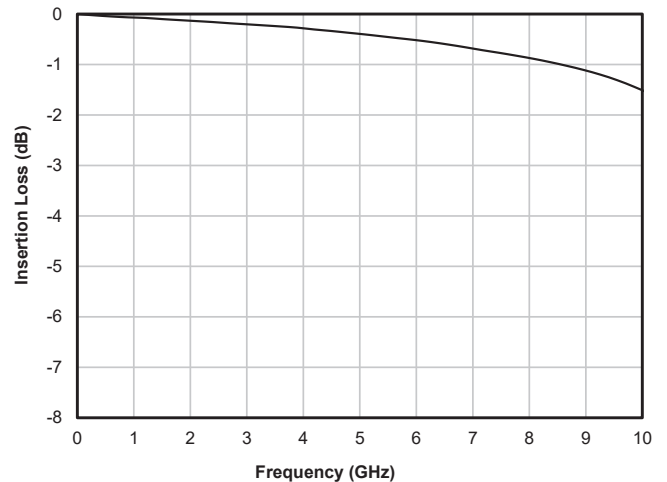
TLP Characteristic (Low Current Detail)



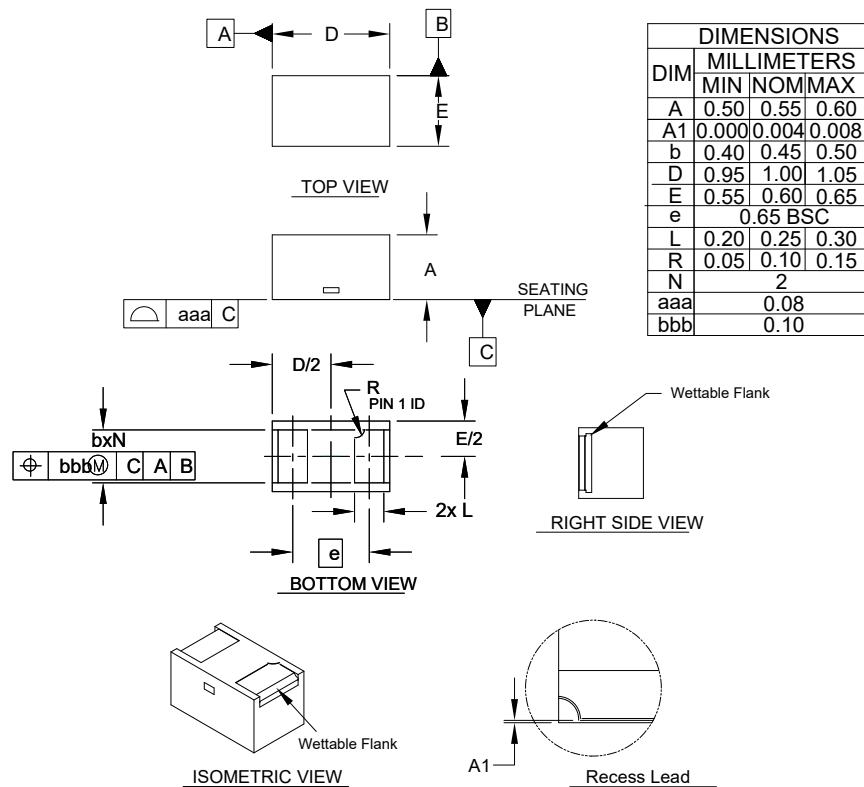
Capacitance vs. Reverse Voltage



Insertion Loss (S21)



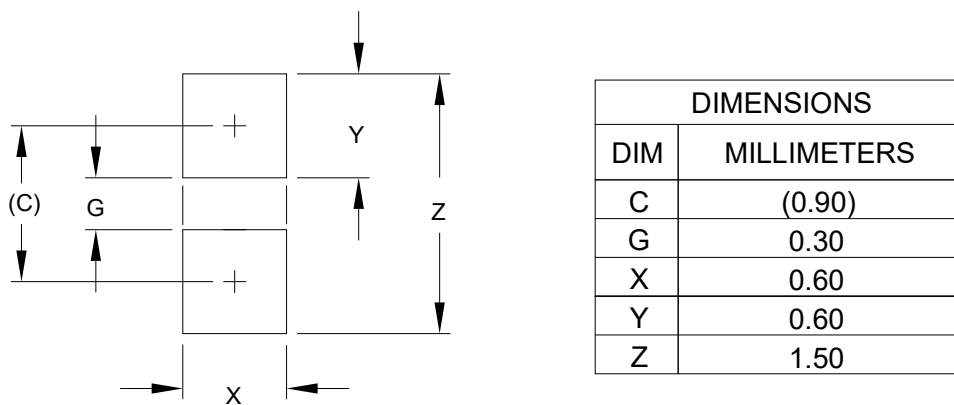
Outline Drawing - DFN 1.0 x 0.6 x 0.55mm 2-Lead



NOTES:

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

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

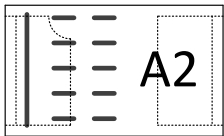


NOTES:

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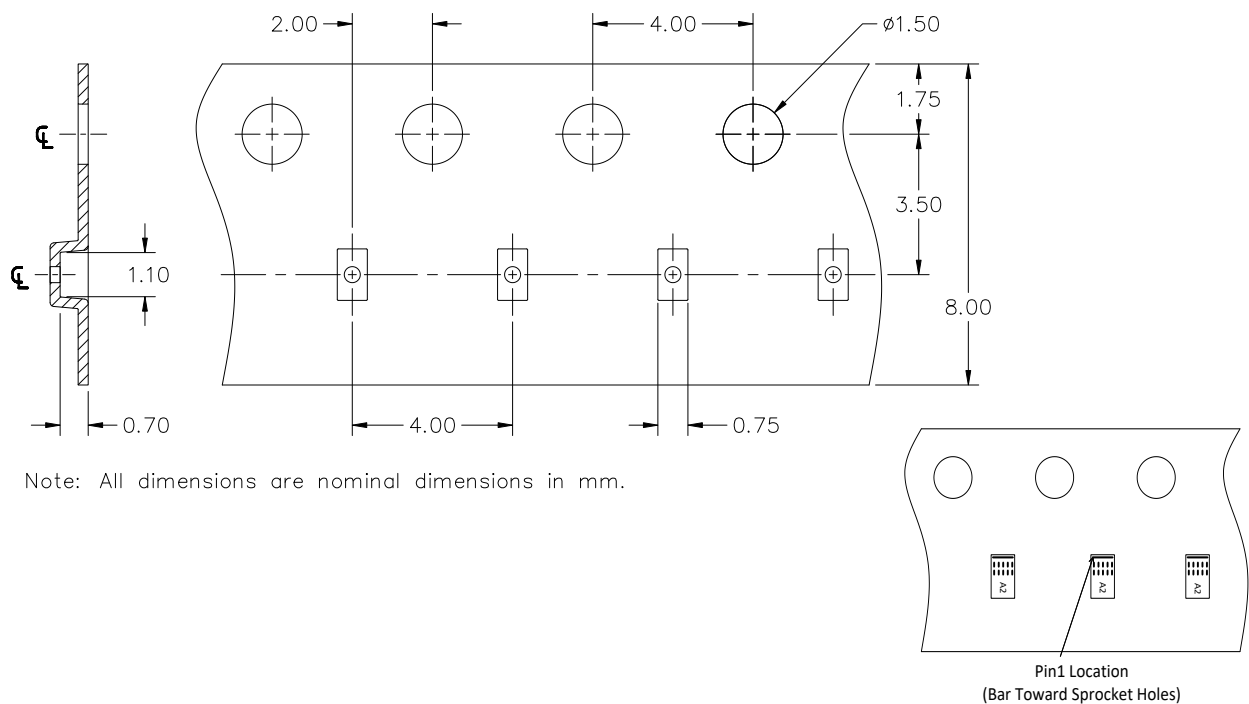
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

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
RClamp01811PW.C	3,000	7 Inch
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