

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

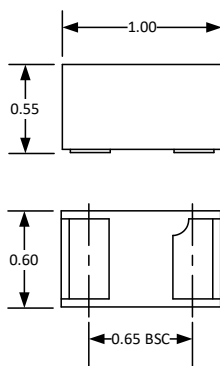
Mechanical Characteristics

- 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

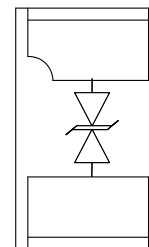
- Cellphones and accessories
- Notebooks & Handhelds

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).

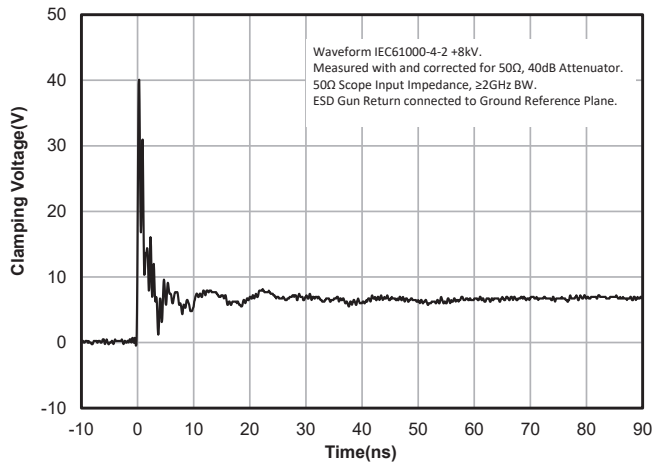
(2): Measured using a $1.2/50\mu s$ voltage, $8/20\mu s$ current combination waveform, $R_s = 2$ Ohms. Clamping is defined as the peak voltage across the device after the device snaps back to a conducting state.

(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 $t_2 = 90ns$.

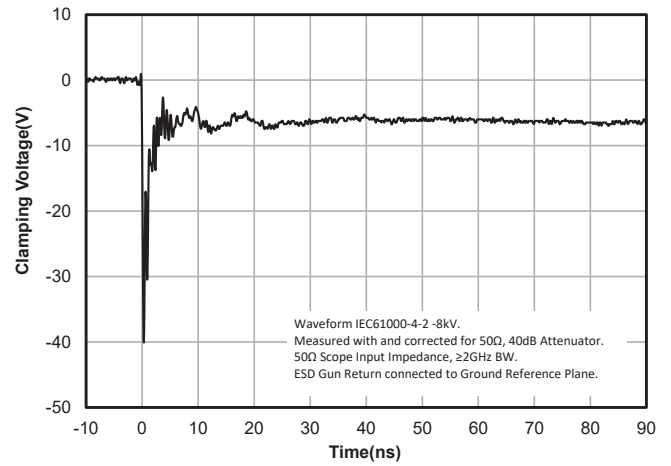
(4): Dynamic resistance calculated from $I_{TLP} = 4A$ to $I_{TLP} = 16A$

Typical Characteristics

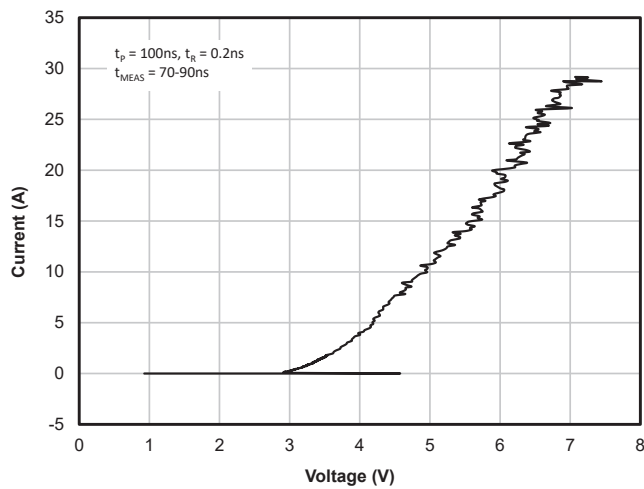
ESD Clamping (+8kV Contact per IEC 61000-4-2)



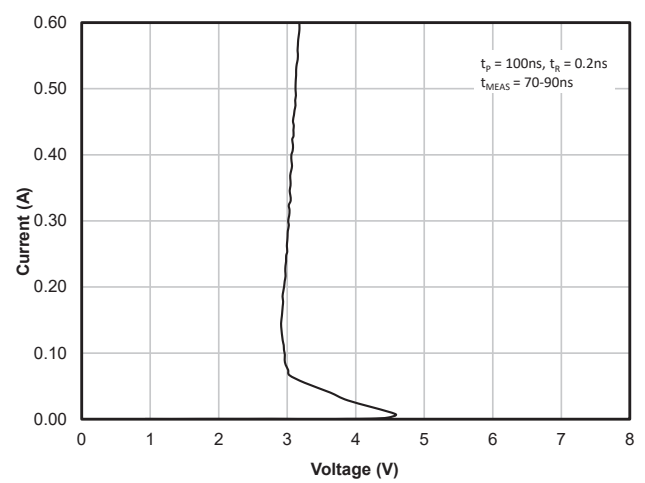
ESD Clamping (-8kV Contact per IEC 61000-4-2)



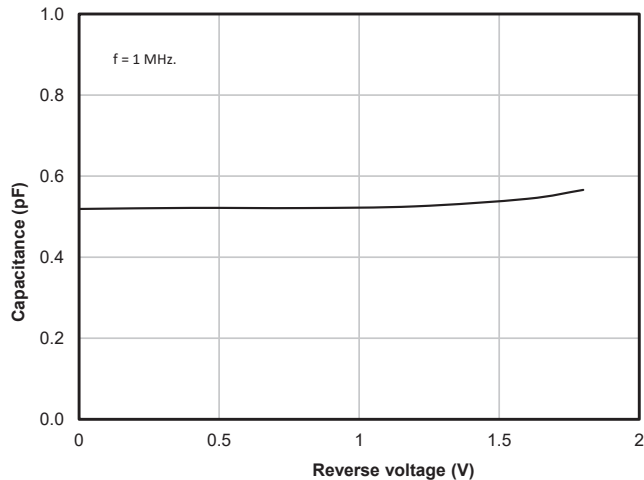
TLP Characteristic (Positive Pulse)



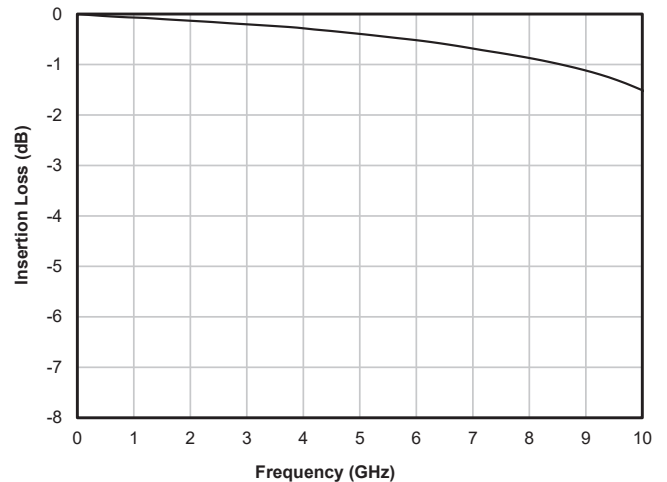
TLP Characteristic (Low Current Detail)



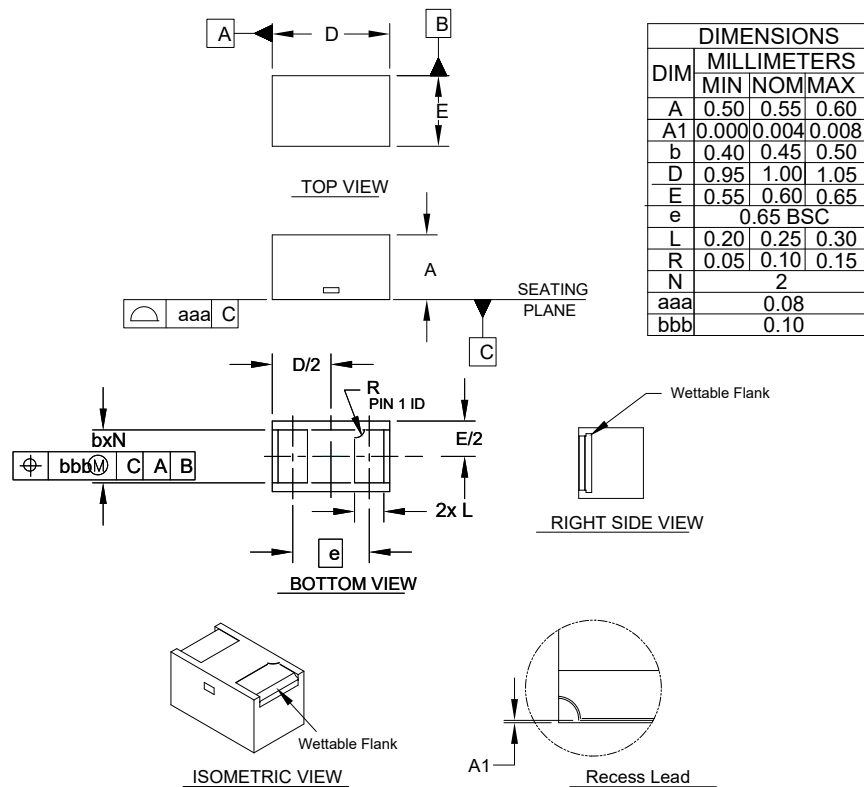
Capacitance vs. Reverse Voltage



Insertion Loss (S21)

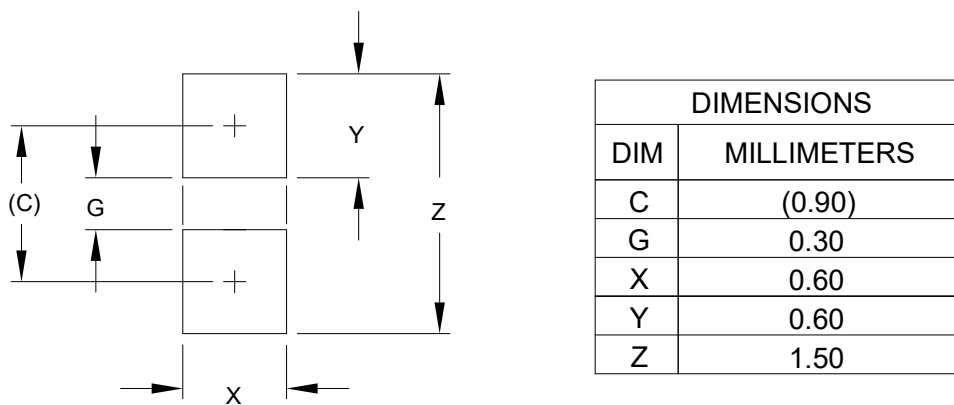


Outline Drawing - DFN 1.0 x 0.6 x 0.55mm 2-Lead



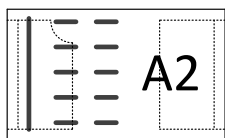
NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

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



NOTES:
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.

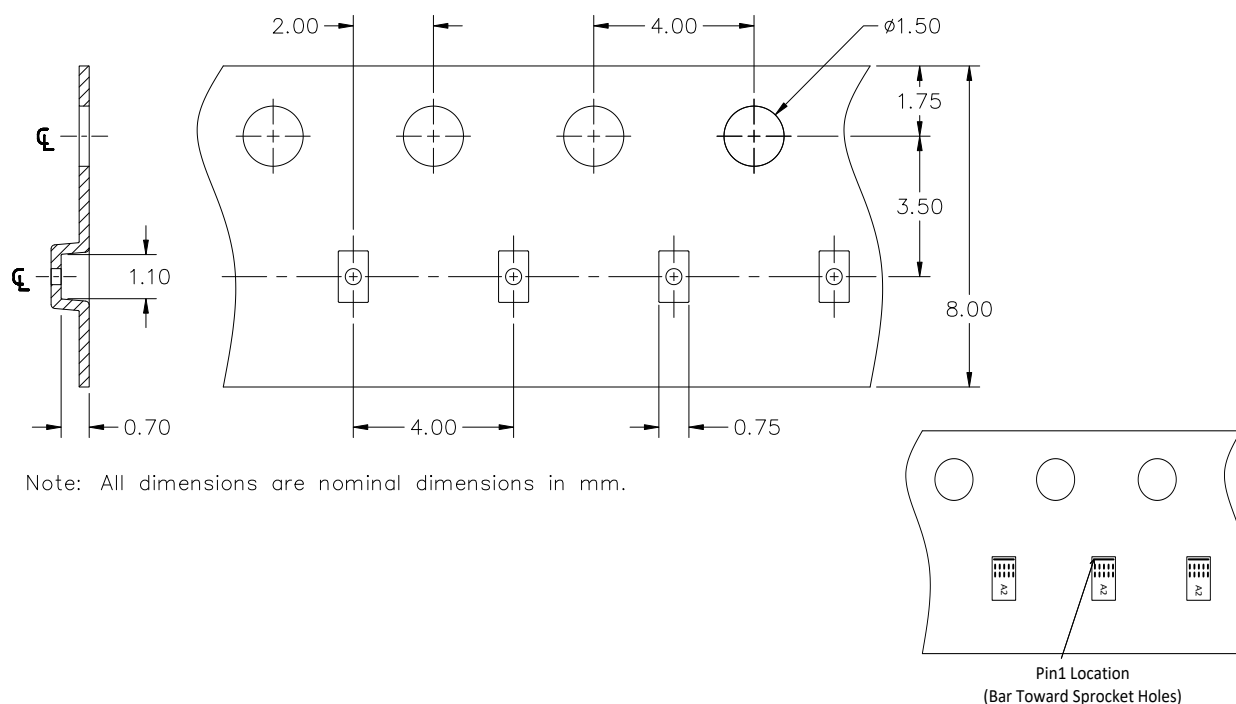
Marking Code



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
RClamp01811PW.C	3,000	7 Inch
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