UMW RCLAMP3321P

1.Description

The RCLAMP3321P provides ESD protection for USB3.0, HDMI1.3/1.4, and other high-speed ports. It may be used to meet the ESD immunity requirements of IEC 61000-4-2. The RCLAMP3321P is designed to minimize both the ESD peak clamping and the TLP clamping.The dynamic resistance is minimized (0.47 Ohms typical) for optimum protection of sensitive circuits.

2.Applications

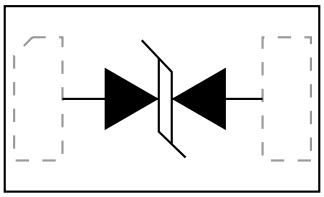
- USB 3.0
- HDMI 1.3/1.4
- V-By-One
- Display Port
- MHL / MDDI
- LVDS Interfaces
- eSATA Interfaces

3.Features

- Transient protection for data lines to
- IEC 61000-4-2 (ESD) ±17kV (air), ±12kV (contact)
- IEC 61000-4-4 (EFT) 40A (tp = 5/50ns)
- Cable Discharge Event (CDE)
- Ultra-small package (1.0 x 0.6 x 0.5mm)

  Protects one data or I/O line
- Low capacitance: 0.35pF
- Dynamic Resistance: 0.47 Ohms Typical
- Low ESD clamping voltage
- Operating voltage: 3.3V
- Solid-state silicon-avalanche technology

4.Pinning information



SLP1006P2

5.Absolute Maximum Rating

Parameter	Symbol	Value	Units
Peak Pulse Power (t_p=8/20μs)	P_{PK}	25	W
Maximum Peak Pulse Current (t_p=8/20μs)	I_{PP}	3	A
ESD per IEC 61000-4-2(Air)	V_{ESD}	±17	kV
ESD per IEC 61000-4-2(Contact)		±12	kV
Junction Temperature	T_J	-55 to 125	°C
Storage Temperature	T_{STG}	-55 to 150	°C

6.Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse Stand-Off Voltage	V_{RWM}				3.3	V
Breakdown Voltage	V_{BR}	I_{BR}=1mA	5.5	7	8.5	V
Reverse Leakage Current	I_R	V_{RWM}=3.3V		10	50	nA
Clamping Voltage	V_C	I_{PP}=1A (t_p=8/20μs)		9.5	10	V
Clamping Voltage	V_C	I_{PP}=4A (t_p=8/20μs)		10.5	13	V
ESD Clamping Voltage [2]	V_C	I_{PP}=4A, tlp=0.2/100ns		8.8		V
ESD Clamping Voltage [2]	V_C	I_{PP}=16A, tlp=0.2/100ns		14.5		V
Trigger Voltage [2]	V_{TRIG}	tlp=0.2/100ns		8		V
Dynamic Resistance [2, 3]	R_{DYN}	tlp=0.2/100ns		0.47		Ω
Junction Capacitance	C_J	V_R=0V, f=1MHz		0.22	0.35	pF

Notes:

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

2) TLP Settings: t_p=100ns, t_r=0.2ns, I_{TLP} and V_{TLP} sample window: t_1=70ns to t_2=90ns.

3) Dynamic resistance calculated from I_{PP}= 4A to I_{PP}=16A using “Best Fit”.

4) Device is electrically symmetrical.

7.1Typical characteristic

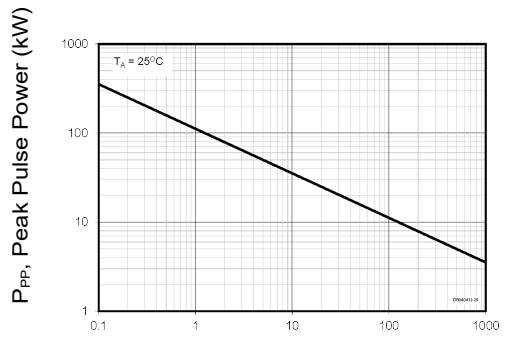


Figure 1: Non-Repetitive Peak Pulse Power vs. Pulse Time

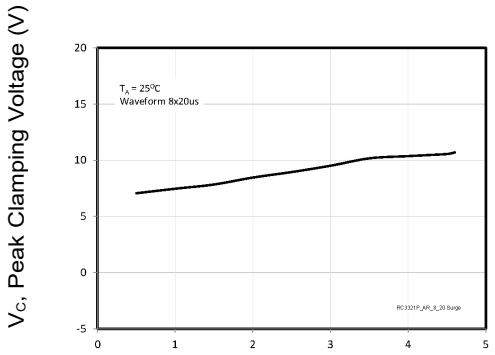


Figure 2: 8x20us Peak Clamping Voltage vs Peak Current

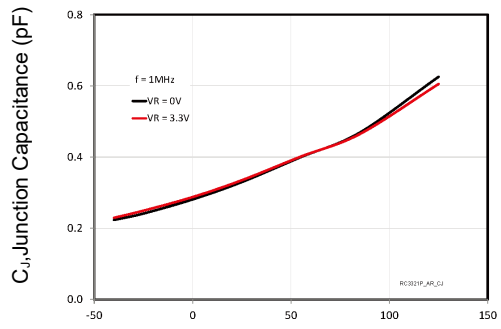


Figure 3: apacitance vs. Temperature vs. Bias Voltage

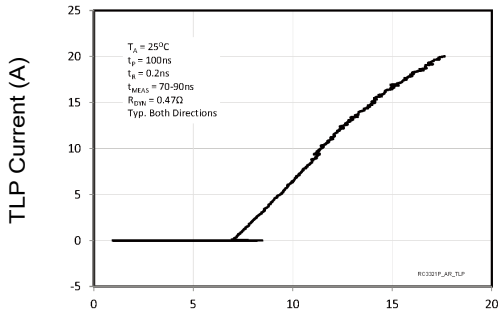


Figure 4: TLP Characteristic

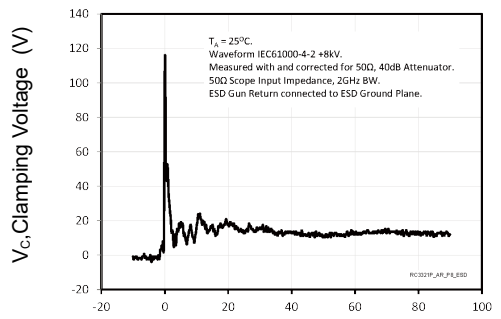


Figure 5: ESD Clamping (+8kV Contact per IEC 61000-4-2)

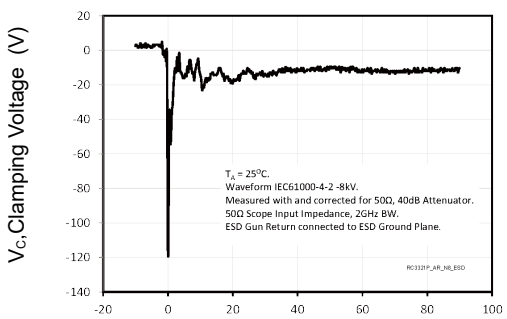


Figure 6: ESD Clamping (-8kV Contact per IEC 61000-4-2)

7.2Typical characteristic

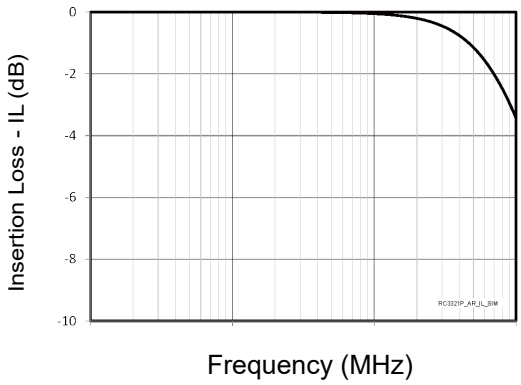
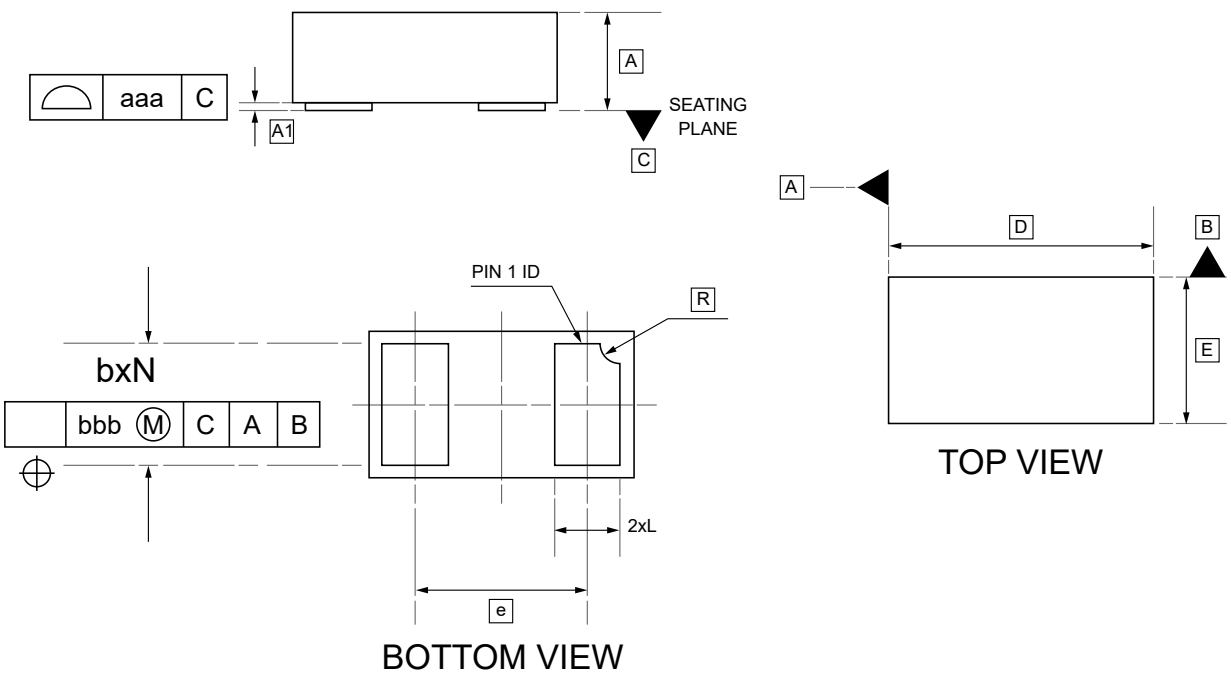


Figure 7: Typical Insertion Loss (S21)

8.SLP1006P2 Package Outline Dimensions

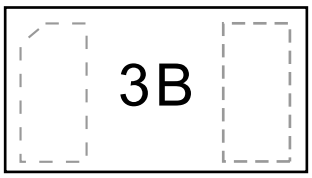


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	b	D	E	e	L	R	N	aaa	bbb
Min	0.37	0.00	0.45	0.90	0.50	0.65	0.20	0.05	2	0.08	0.10
Max	0.43	0.05	0.55	1.10	0.70	BSC	0.30	0.15			

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

9.Ordering information



Order Code	Package	Base QTY	Delivery Mode
UMW RCLAMP3321P	SLP1006P2	10000	Tape and reel

10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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