SuperESD - RCLAMP3331ZA-ES

1. Description

The RCLAMP3331ZA-ES ESD protector is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and PDA's. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, lower operating voltage, lower clamping voltage and no device degradation when compared to MLVs. The RCLAMP3331ZA-ES protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events.

2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±15kV Contact Discharge
  - ±15kV Air Discharge
- 50W Peak pulse Power (8/20us)
- Low clamping voltage
- Working voltage: 3.3V
- Low leakage current
- RoHS compliant
- Protecting one bi-directional lines
- Low Junction capacitance: 0.2pF Typ.

3. Applications

- Cell phone handsets and accessories
- Personal digital assistants
- Cordless phones
- Notebooks, desktops, and servers
- Portable instrumentation
- Digital cameras

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
RCLAMP3331ZA-ES	CSP0603-2L	H	Halogen free	Tape & Reel	10,000 PCS	UL 94V-0	7 inches

Table-1   Ordering information

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5. Pin Configuration and Functions
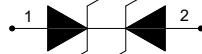
Pin	Name	Description	Outline	Circuit Diagram
1	IO	Connect to IO	H ○	
2	IO	Connect to IO		

<div align="center">Table-2 Pin configuration</div>

6. Specification

6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

Parameters	Symbol	Min.	Max.	Unit
Peak pulse power (tp=8/20us)@25℃	P_{pk}	-	50	W
Peak pulse current (tp=8/20us)@25℃	I_{PP}		9	A
ESD (IEC61000-4-2 air discharge) @25℃	V_{ESD}	-	±15	kV
ESD (IEC61000-4-2 contact discharge) @25℃	V_{ESD}	-	±15	kV
Junction temperature	T_J	-	150	℃
Operating temperature	T_{OP}	-50	125	℃
Storage temperature	T_{STG}	-55	150	℃
Lead temperature	T_L	-	260	℃

<div align="center">Table-3 Absolute Maximum rating</div>

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6.2. Electrical Characteristics

At TA = 25℃ unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	V_{RWM}				3.3	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	6.0	8.8		V
Reverse Leakage Current	I_R	V_{RWM}=3.3V		1	100	nA
Clamping Voltage	V_C	I_{PP}=1A; tp=8/20us		1		V
Clamping Voltage	V_C	I_{PP}=9A; tp=8/20us		5		V
Clamping Voltage	V_C	Ipp=16A，tlp=100ns		6		V
Junction Capacitance	C_J	V_R=0V; f=1MHz		0.2	0.25	pF

Table-4   Electrical Characteristics

Symbol	Parameters
V_{RWM}	Reverse stand-off voltage
I_R	Reverse leakage current
V_{BR}	Reverse breakdown voltage
I_{BR}	Reverse breakdown current
V_{CL}	Clamping voltage
V_{TRIG}	Reverse trigger voltage
I_{TRIG}	Reverse trigger current
V_{HOLD}	Reverse holding voltage
I_{HOLD}	Reverse holding current
I_{PP}	Peak pulse current

7. Typical Characteristic

I-V curve

Leakage Current Curve

C-V:(IO-IO)

IPP Curve:IO-IO


TLP Curve :V-

Pulse Width=100ns

TLP Curve :V+

Pulse Width=100ns
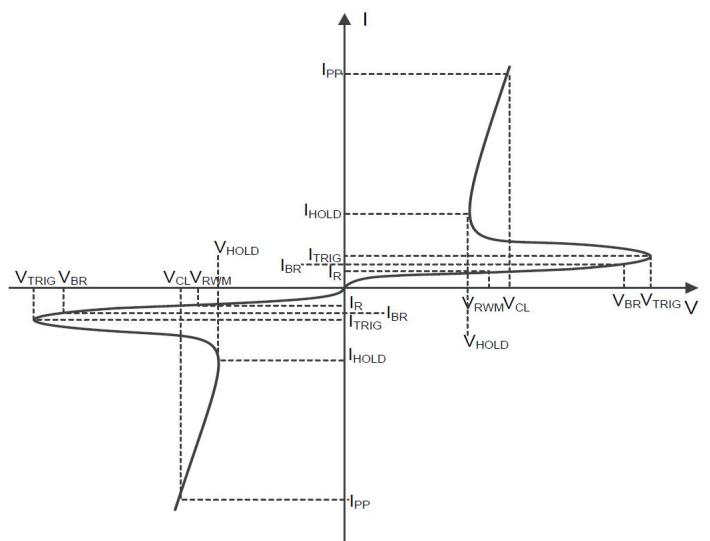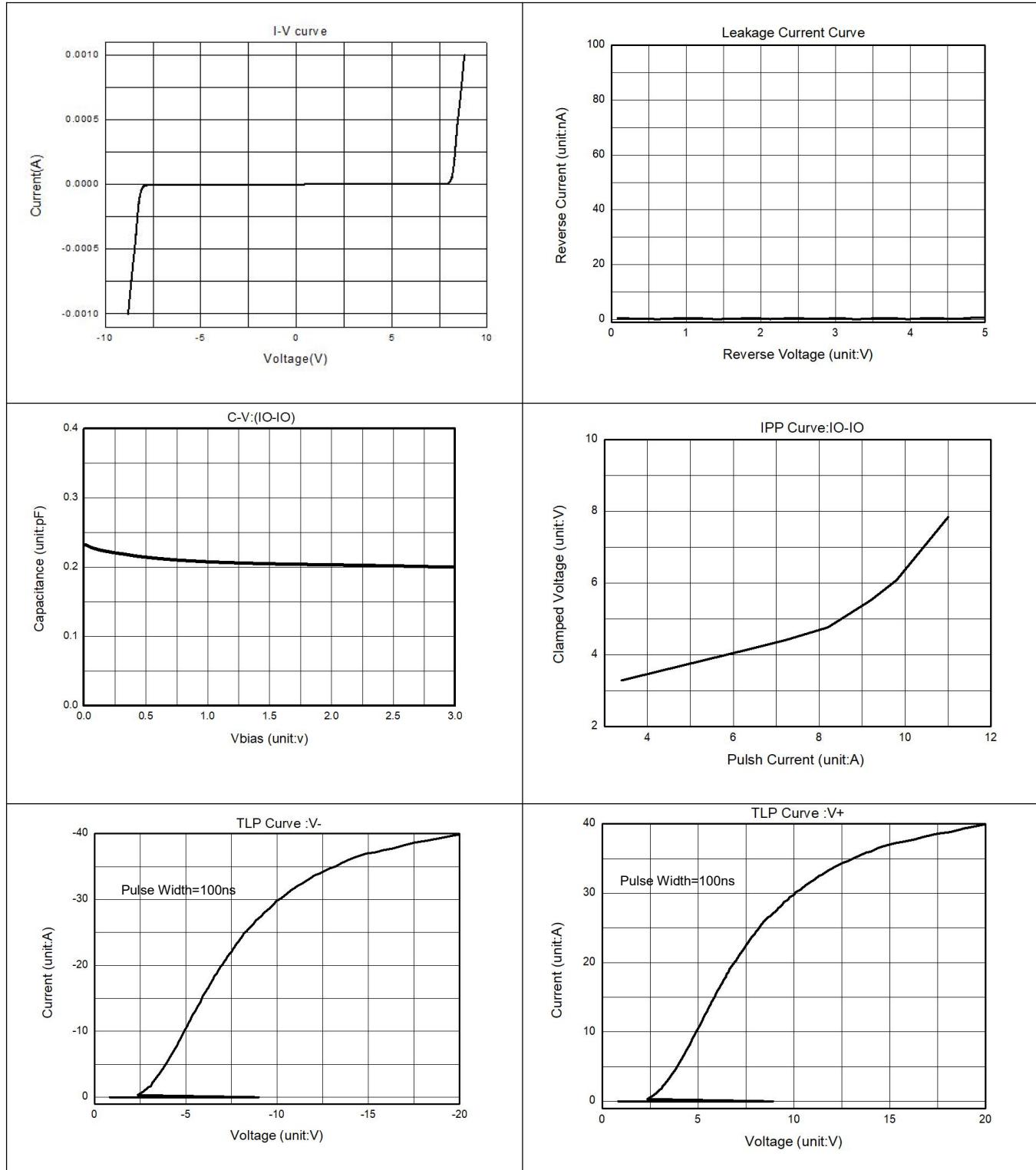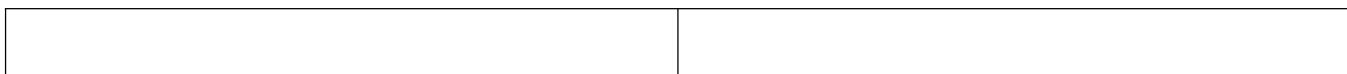
Measurement Wave According to IEC Standard
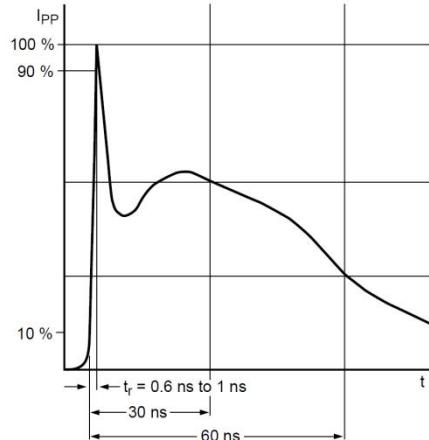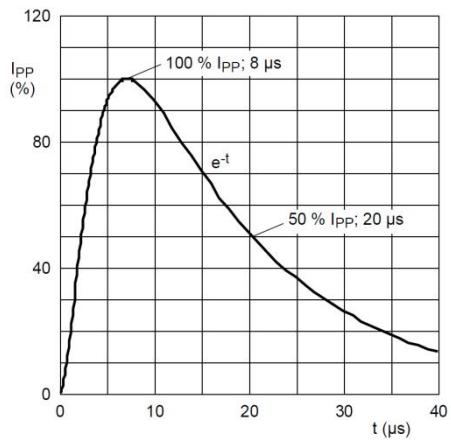
8/20 µs pulse waveform according to IEC 61000-4-5	ESD pulse waveform according to IEC 61000-4-2

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8. Dimension

Top View

Bottom View

Pin 1

Side View
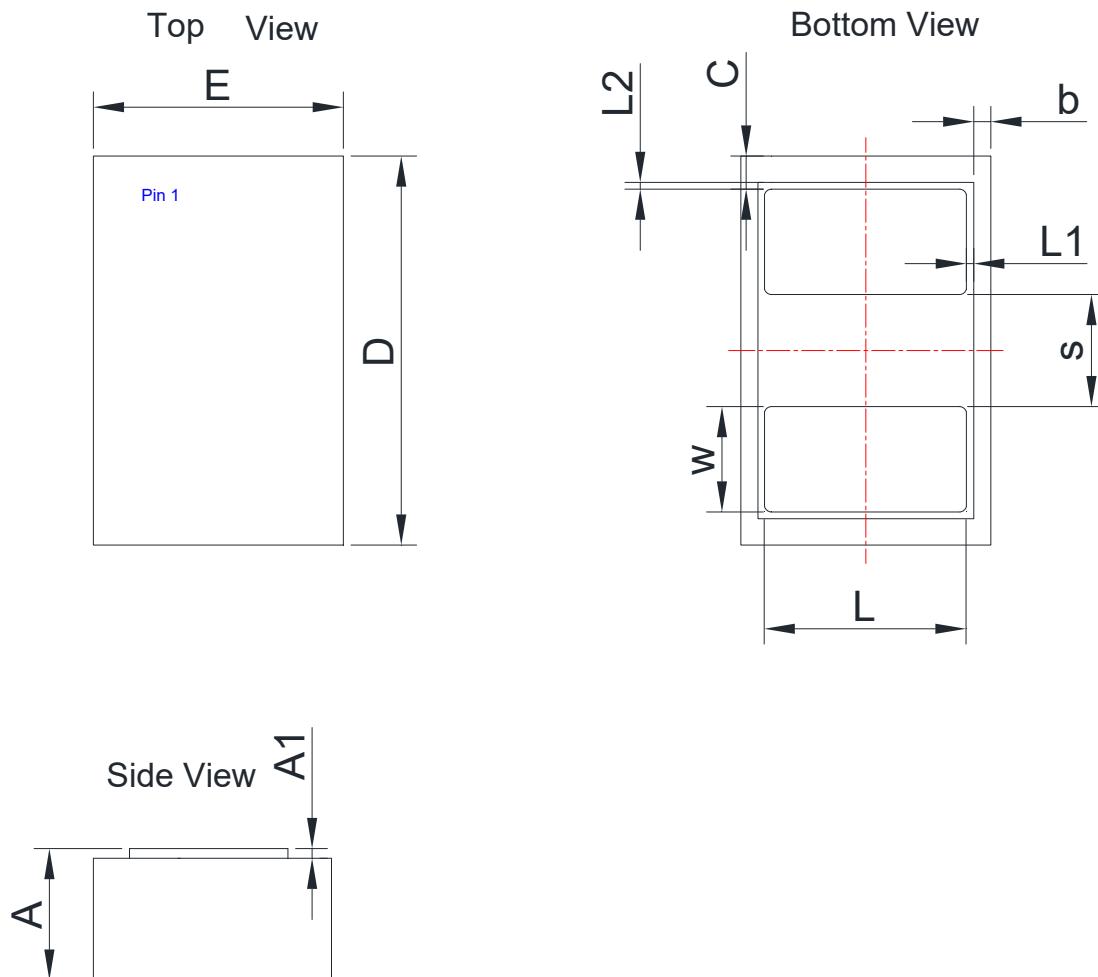
Symbol	Dimensions in Millimeters		Symbol	Dimensions in Millimeters	
	NOM	Toler		NOM	Toler
A	0.202	+0.0305	L1	0.0075	NA
A1	0.011	+0.003	L2	0.005	NA
D	0.600	+0.025	C	0.0375	NA
E	0.300	+0.025	b	0.0375	NA
W	0.1425	+0.008			
L	0.210	+0.008			
S	0.230	NA			

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