

SuperESD - RCLAMP0504M

1. Description

The RCLAMP0504M is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium.

2. Features

- IEC 61000-4-2 Level 4 ESD Protection
 - $\pm 25\text{kV}$ Contact Discharge
 - $\pm 25\text{kV}$ Air Discharge
- 350W Peak pulse Power (8/20us)
- Low clamping voltage
- Working voltage: 5V
- Low leakage current
- RoHS compliant
- Protecting 4 unidirectional lines
- Ultra-low capacitance: 1.5pF Typ.

3. Applications

- USB 2.0
- Monitors and flat panel displays
- 10/100/1000 ethernet
- Notebook computers
- SIM ports
- ATM interface

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
RCLAMP0504M	MSOP-10L	504M/LOT	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	13 inches

Table-1 Ordering information

5. Pin Configuration and Functions

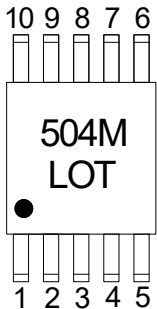
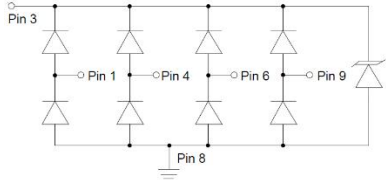
Pin	Name	Description	Outline	Circuit Diagram
1	IO1	Connect to I/O		
3	VCC	Connect to Vcc		
4	IO2	Connect to I/O		
6	IO3	Connect to I/O		
8	GND	Connect to GND		
9	IO4	Connect to I/O		
2/5/7/10	NC	NO Connecting		

Table-2 Pin configuration

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°C	P _{pk}	-	350	W
Peak pulse current (tp=8/20us)@25°C	I _{PP}		15	A
ESD (IEC61000-4-2 air discharge) @25°C	V _{ESD}	-	±25	kV
ESD (IEC61000-4-2 contact discharge) @25°C	V _{ESD}	-	±25	kV
Junction temperature	T _J	-	125	°C
Operating temperature	T _{OP}	-40	125	°C
Storage temperature	T _{STG}	-55	150	°C
Lead temperature	T _L	-	260	°C

Table-3 Absolute Maximum rating

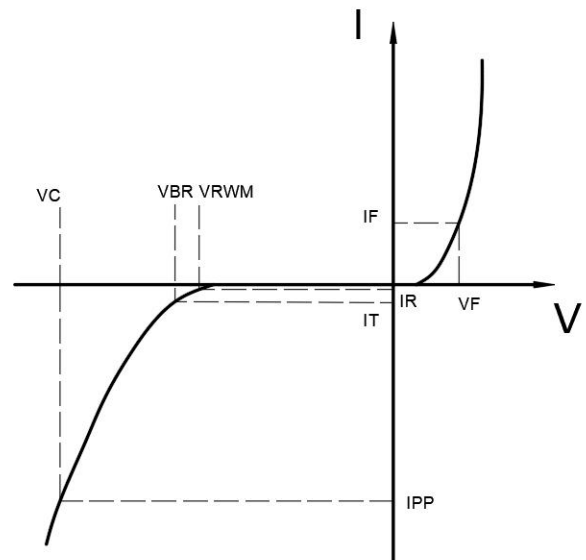
6.2. Electrical Characteristics

At TA = 25°C unless otherwise noted

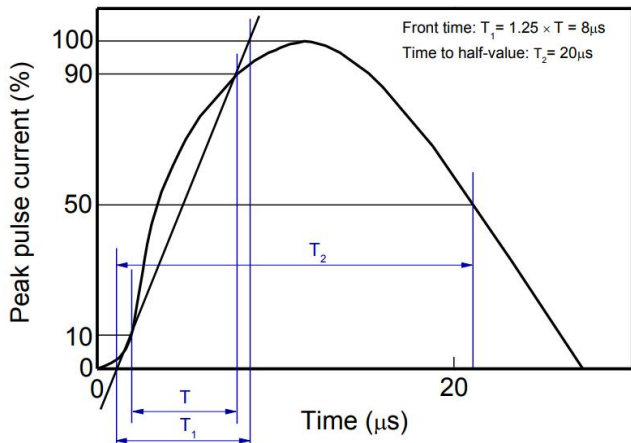
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	V_{RWM}				5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	6.0.			V
Reverse Leakage Current	I_R	$V_{RWM}=5V$			10	μA
Clamping Voltage	V_C	$I_{PP}=1A$; $t_p=8/20\mu s$		8.0	10.0	V
Clamping Voltage	V_C	$I_{PP}=15A$; $t_p=8/20\mu s$		21.0	23.0	V
Junction Capacitance	C_J	I/O to GND; $V_R=0V$; $f=1MHz$		1.5	2.0	pF
		Between I/O; $V_R=0V$; $f=1MHz$		0.6	1.0	pF

Table-4 Electrical Characteristics

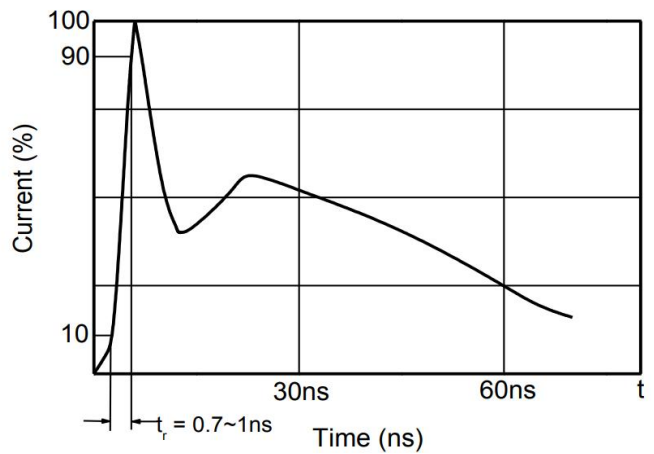
Symbol	Parameters
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
I_F	Forward Current
V_F	Forward Voltage @ I_F



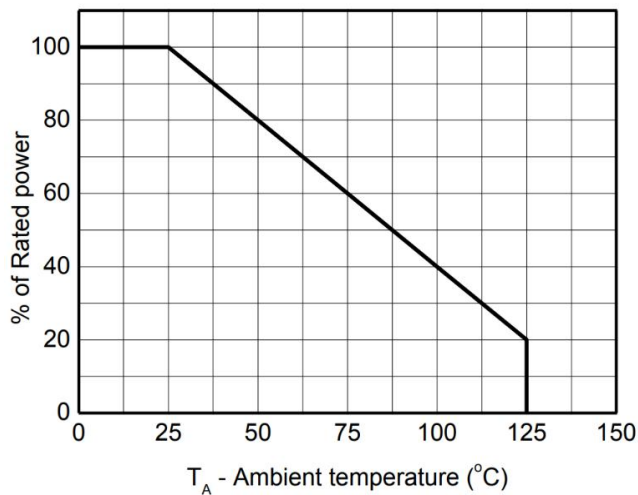
7. Typical Characteristic



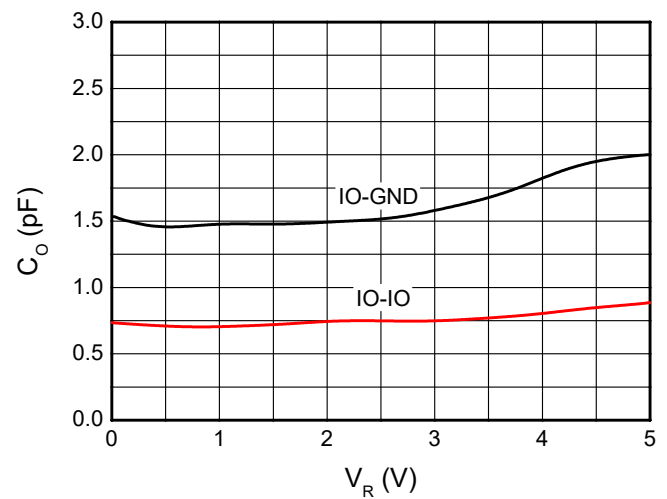
8/20 μs waveform per IEC61000-4-5



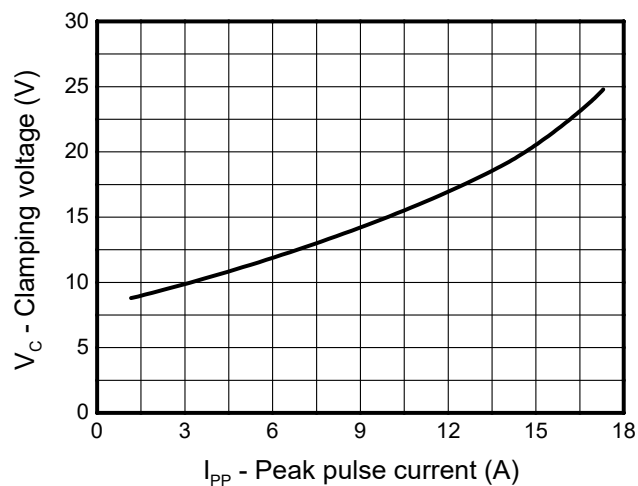
Contact discharge current waveform per IEC61000-4-2



Power derating vs. Ambient temperature



Capacitance vs. Reverse voltage

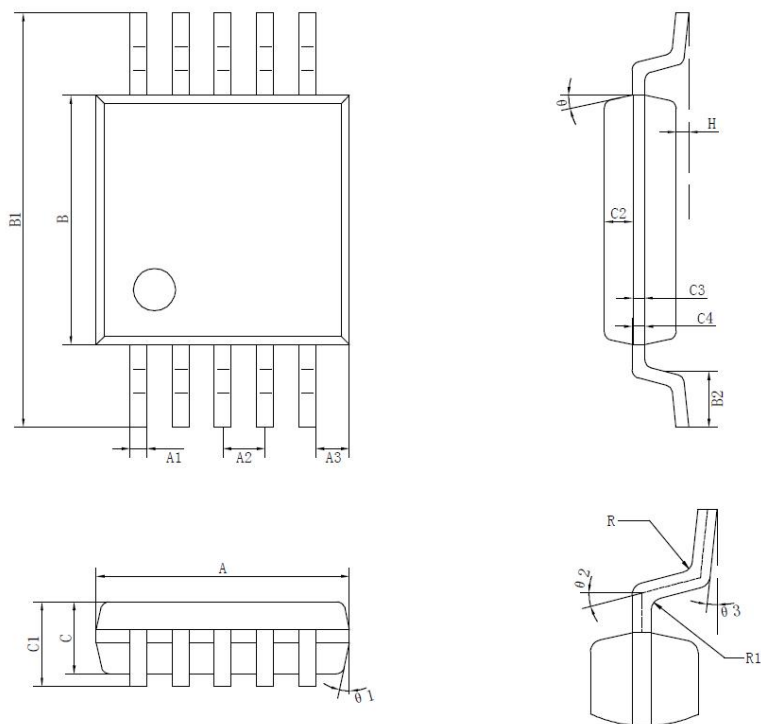


Clamping voltage vs. Peak pulse current

8. Dimension (MSOP-10L)

RCLAMP0504M

Rev-1.3



Unit: mm

Symbol	Min	Max	Symbol	Min	Max
A	2. 90	3.10	C3	0. 152	
A1	0. 18	0. 25	C4	0. 15	0. 23
A2	0.50 TYP		H	0. 00	0. 09
A3	0.40 TYP		0	15° TYP4	
B	2. 90	3. 10	01	12° TYP4	
B1	4. 70	5.10	0 2	14° TYP	
B2	0. 45	0.75	03	0° ~ 6°	
c	0. 75	0. 95	R	0. 15TYP	
c1	--	1. 10	R1	0. 15TYP	
C2	0. 328TYP				

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