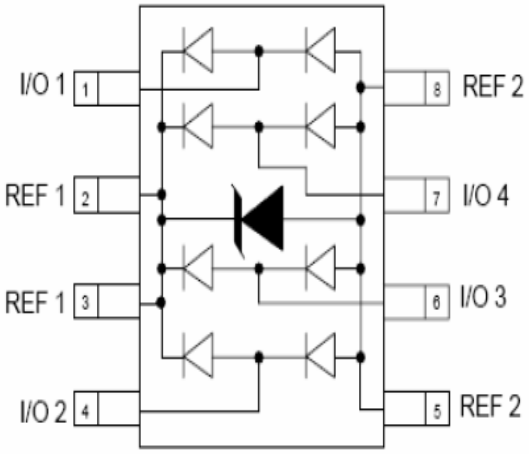
SRDA3.3-4 Utralow Capacitance Transient Voltage Suppressors

Features

- Array of surge rated diodes with internal TVS diode
- Protects four I/O lines and power supply line
- Low capacitance
- Low Leakage Current.
- Low Operating and Clamping Voltages.
- Transient Protection for High Speed Data Lines to
  IEC61000-4-2(ESD)±15kV(air),±8kV(Contact)
  IEC61000-4-4(EFT) 40A(5/50ns)
  IEC61000-4-5(lightning) 24A(8/20us)

General Description

The SRDA3.3-4 is in an SOP-8 package and may be used to protect two high-speed data or transmission line from overvoltage caused by electrostatic dis- charge (ESD), electrical fast transients (EFT), and lightning. During transient conditions, the steering diodes direct the transient to either the positive side of the power supply line or to ground.



Applications

- Ethernet – 10/100/1000 Base T
- WAN/LAN Equipment
- Desktops,Servers,Notebooks & Handhelds
  Laser Diode Protection

Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak Pulse Power (t_p = 8/20μs)	P_{PK}	500	W
Peak Forward Voltage (I_F = 1A, t_p = 8/20μs)	V_{FP}	1.5	V
Lead Soldering Temperature	T_L	260 (10 sec.)	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

Electrical Parameter

Electrical Characteristics

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				3.3	V
Punch-Through Voltage	V_{PT}	I_{PT} = 2uA	3.5			V
Snap-Back Voltage	V_{SB}	I_{SB} = 50mA	2.8			V
Reverse Leakage Current	I_R	V_{RWM} =3.3V, T=25℃			1	uA
Clamping Voltage	V_C	I_{PP} =1A, t_P=8/20us			5.3	V
Clamping Voltage	V_C	I_{PP} =10A, t_P=8/20us			10	V
Clamping Voltage	V_C	I_{PP} =25A, t_P=8/20us			15	V
Junction Capacitance	C_j	Between I/O pins and Ground V_R = 0V, f = 1MHz		7	10	pF
		Between I/O pins V_R = 0V, f = 1MHz		3.5		pF

Typical Characteristics

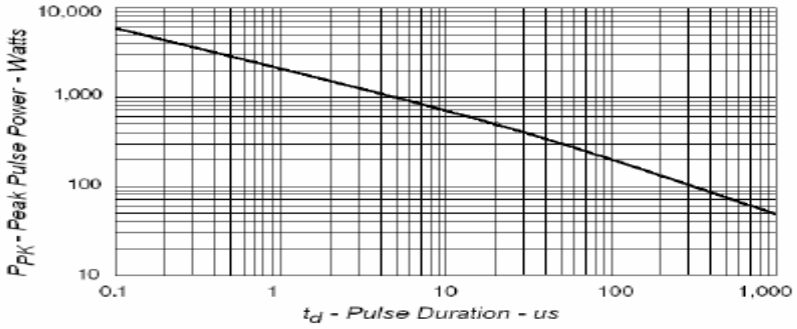


Fig1. Non-Repetitive Peak Pulse Power vs. Pulse Time

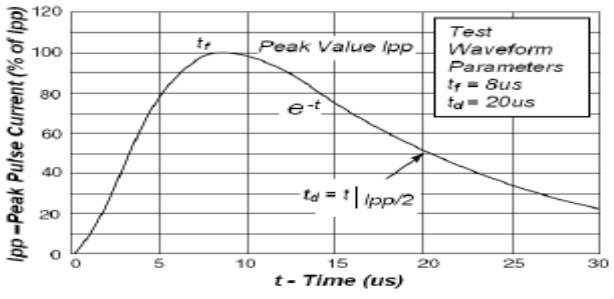


Fig2. Pulse Waveform

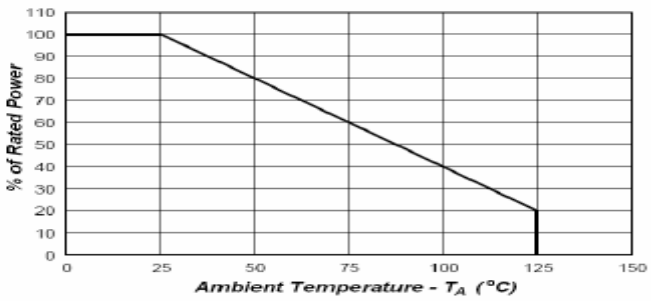


Fig3. Power Derating Curve

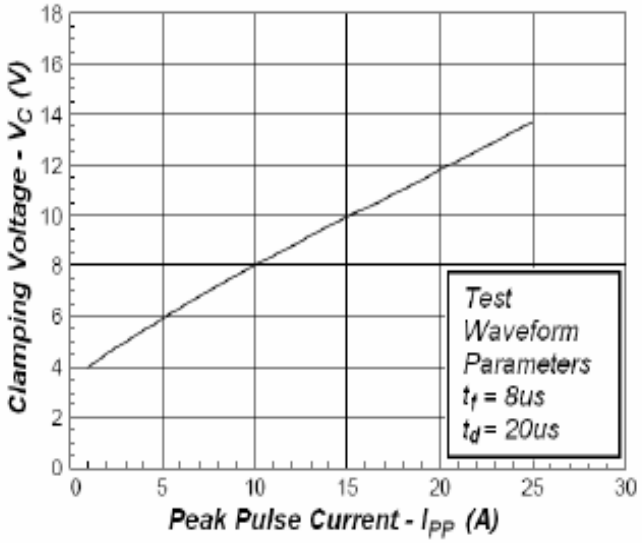


Fig4. Clamping Voltage vs. Peak Pulse Current

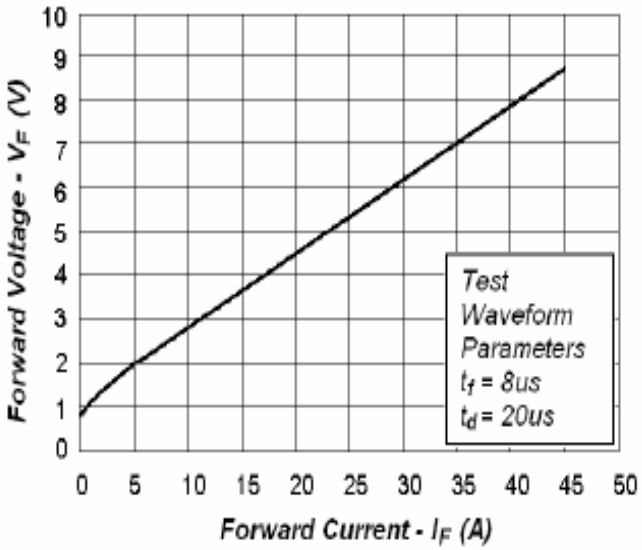


Fig5. Forward Voltage vs. Forward Current

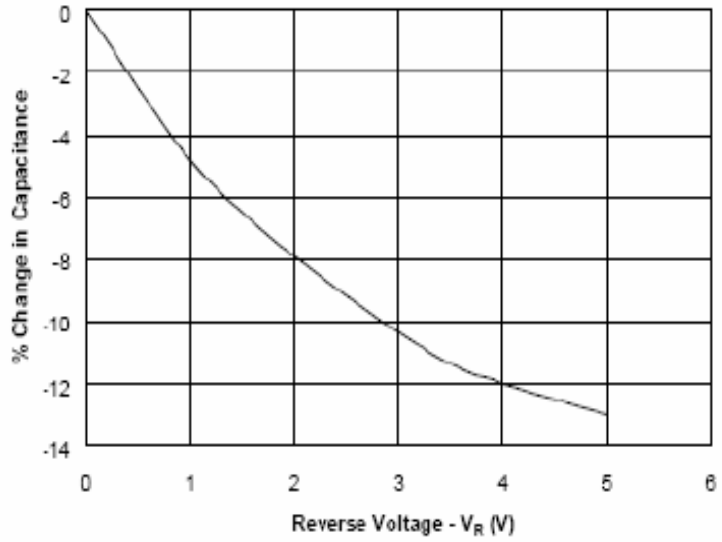


Fig6. Variation of Capacitance vs. Reverse Voltage

Application Note

The SRDA3.3-4 Series are low capacitance, unidirectional TVS arrays that are designed to protect I/O or high speed data lines from the damaging effects of ESD or EFT. This product series has a surge capability of 500 Watts P_{PP} per line for an 8/20μs waveshape.

DIFFERENTIAL-MODE CONFIGURATION (Figure 1)

Ideal for use in USB applications, the SRDA3.3-4 Series rovides up to four (4) lines of protection in a differential-mode configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- ✔ Pins 1, 4, 6 and 7 are connected to the data lines.
- ✔ Pins 5 and 8 are connected to ground.
- ✔ Pins 2 and 3 are connected to the databus.

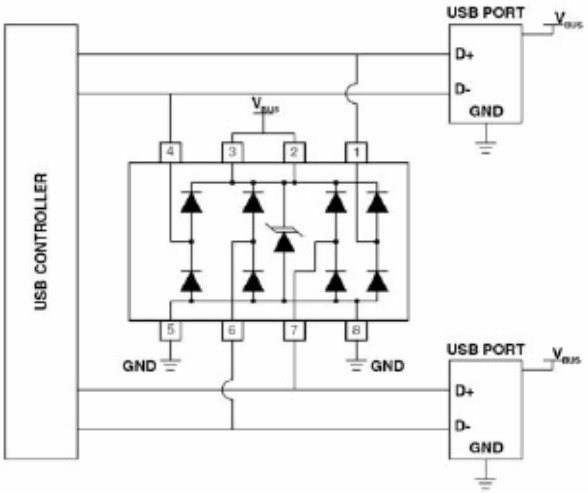


Figure 1. Typical Differential-Mode USB Protection

DIFFERENTIAL-MODE CONFIGURATION (Figure 2)

The SRDA3.3-4 Series also provides up to four (4) lines of protection in a differential-mode configuration as depicted in Figure 2 for T1/E1 applications.

Circuit connectivity is as follows:

- ✔ Pins 1, 4, 6 and 7 are connected to the data lines.
- ✔ Pins 5 and 8 are connected to ground.
- ✔ Pins 2 and 3 are connected to the databus.

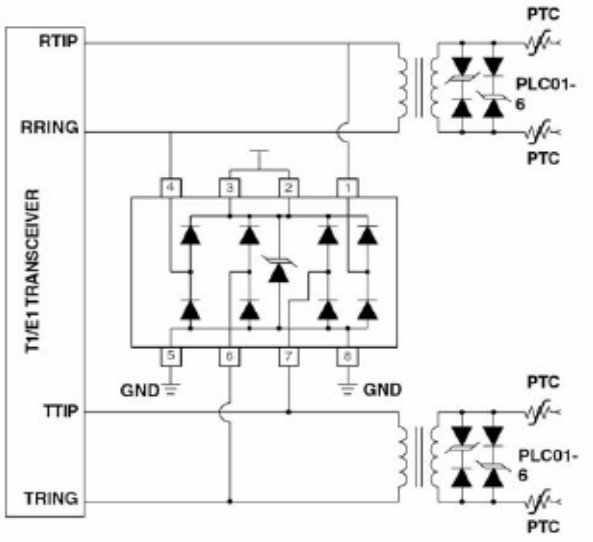


Figure 2. Typical Differential-Mode T1/E1 Protection

CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Circuit board layout is critical for Electromagnetic Compat- ibility (EMC) protection. The following guidelines are recommended:

- ✔ The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- ✔ The path length between the TVS device and the protected line should be minimized.
- ✔ All conductive loops including power and ground

SOP-8 MECHANICAL DATA

DIM	Millimeters		
	MIN	TYP	MAX
A			1.75
A1	0.10		0.25
A2	1.35	1.55	1.75
B	0.35	0.42	0.49
C	0.19		0.25
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.95	4.00
e		1.27	
L	0.40		0.90
K	0°		8°