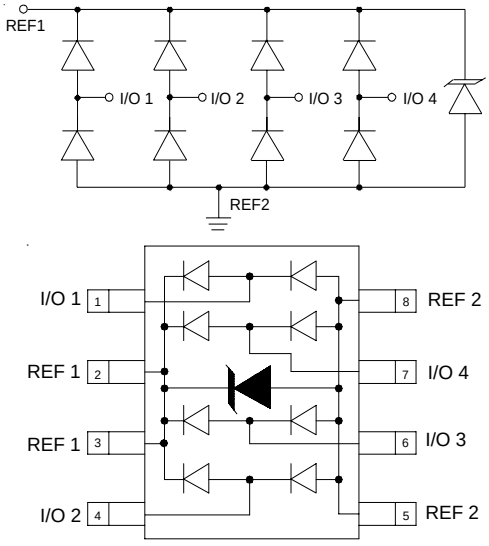
Description

The SRDA70-4 is specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by electrostatic discharge (**ESD**), electrical fast transients (**EFT**), and **lightning.**

The unique design incorporates surge rated, low capacitance steering diodes and a TVS diode in a single package. During transient conditions, the steering diodes direct the transient current to ground via the internal low voltage TVS. The TVS diode clamps the transient voltage to a safe level. The low capacitance array configuration allows the user to protect up to four high-speed data lines. The SRDA70-4 may be used to protect lines operating up to 5 volts.

The device is in a 8-pin SOIC package. It is available with a SnPb or RoHS/WEEE compliant matte tin lead finish. The high surge capability(I_{PP}=24A, tp=8/20μs) means it can be used in high threat environments in applications such as CO/CPE equipment, telecommunication lines, and video lines.

Dimensions and Pin Configuration



Circuit and Pin Schematic

Features

- Transient protection for high-speed data lines to IEC 61000-4-2(ESD) ±15KV(air), ±8KV(contact) IEC 61000-4-4(EFT) 40A(5/50ns)
  IEC 61000-4-5(Lightning) 24A(8/20μs)
- Arrays of surge rated diodes with internal TVS diode
- Protects four I/O lines
- Low capacitance(<3pF)
- Low operating voltages: 70V
- Low clamping voltage
- Solid-state technology

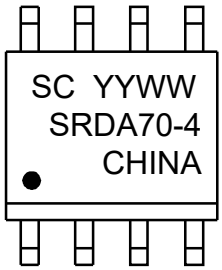
Mechanical Characteristics

- JEDEC SOIC-8 Package
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Lead Finish: Matte Sn
- Packaging: Tape and Reel

Applications

- T1/E1 secondary IC Side Protection
- T3/E3 secondary IC Side Protection
- Analog Video Protection
- Microcontroller Input Protection
- Base stations
- I²C Bus Protection

Marking Information



SRDA70-4 = Device Marking
Code YYWW=Date Code
Dot denotes Pin1

Ordering Information

Part Number	Marking	Packaging	Reel Size
SRDA70-4	SRDA70-4	2500/Tape & Reel	13 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

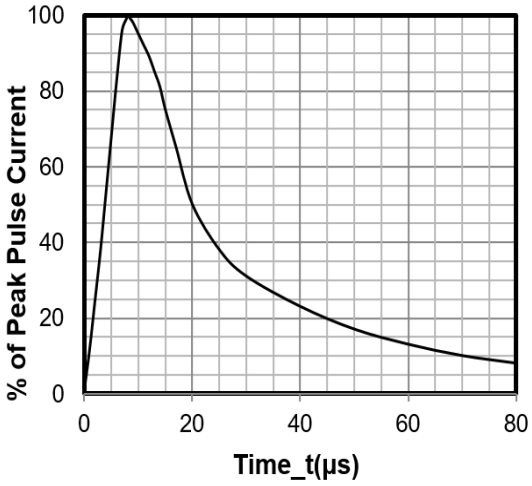
Parameter	Symbol	Value	Unit
Reverse Voltage	VR	70	Vdc
Forward Current	I_F	200	mAdc
Peak Forward Surge Current	I_{FM}	500	mAdc
Repetitive Peak Reverse Voltage	V_{RRM}	70	V
Average Rectified Forward Current （averaged over any 20 ms period）	I_F	715	mA
Repetitive Peak Forward Current	I_{FRM}	450	mA
Non−Repetitive Peak Forward Current t = 1.0 μs t = 1.0 ms t = 1.0 s	I_{FSM}	 2.0 1.0 0.5	A

THERMAL CHARACTERISTICS

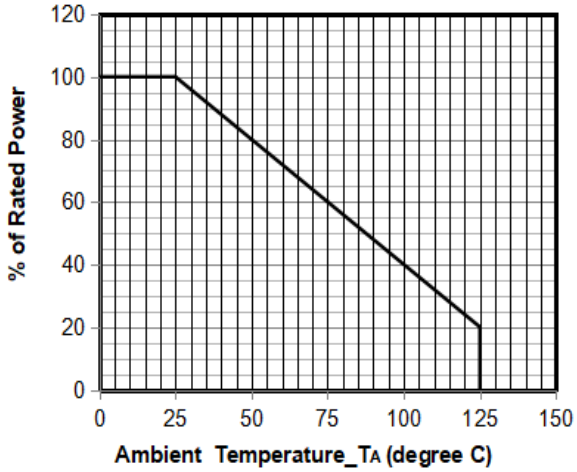
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction−to−Ambient	RθJA	556	°C/W
Lead Solder Temperature, Maximum 10 Seconds Duration	T_L	260	°C
Junction Temperature	T_J	−40 to +125	°C
Storage Temperature	Tstg	−55 to +150	°C

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			70	V	
Breakdown Voltage	V_{BR}	85			V	I_T=1mA
Forward Voltage	V_F			1.2	V	I_F = 10mA
Reverse Leakage Current	I_R			0.2	μA	V_{RWM} = 70V
Junction Capacitance	C_J		0.8	1.5	pF	VR = 0V, f = 1MHz, between I/O
Junction Capacitance	C_J		1.6	3	pF	VR = 0V, f = 1MHz, any I/O to GND

Typical Characteristics



8 X 20μs Pulse Waveform



Power Derating Curve

Applications Information

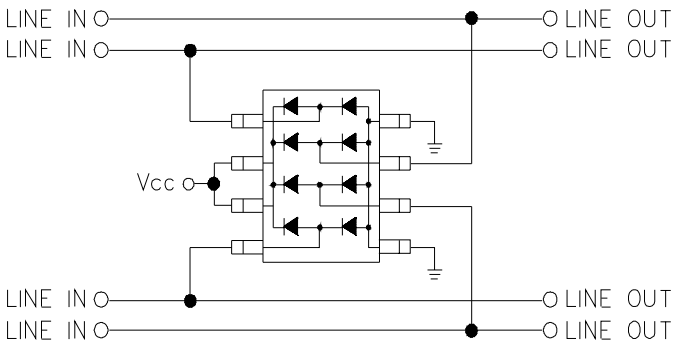
Device Connection Options for Protection of Four High-Speed Data Lines

The SRDA70-4 TVS is designed to protect four data lines from transient over-voltages by clamping them to a fixed reference. When the voltage on the protected line exceeds the reference voltage (plus diode V_F) the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. Data lines are connected at pins 1, 4, 6 and 7. The negative reference (REF2) is connected at pins 5 and 8. These pins should be connected directly to a grou plane on the board for best results. The path length is kept as short as possible to minimize parasitic inductance.

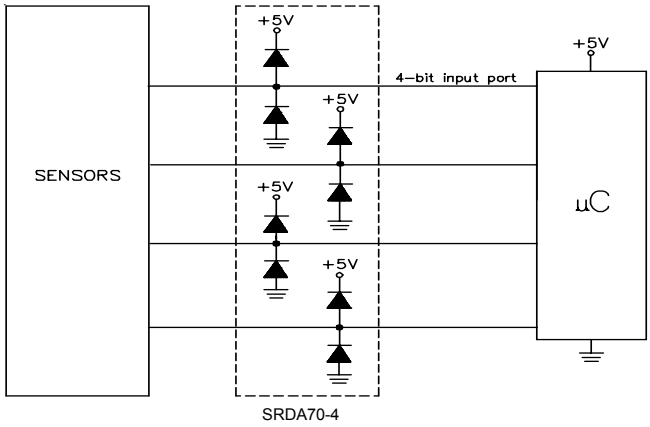
The positive reference (REF1) is connected at pins 2 and 3. The options for connecting the positive reference are as follows:

1. To protect data lines and the power line, connect pins 2 and 3 directly to the positive supply rail (V_{CC}). In this configuration the data lines are referenced to the supply voltage. An external TVS diode may be added between the supply rail and ground in order to prevent over-voltage on the supply rail.
2. The SRDA70-4 can be isolated from the power supply by adding a series resistor between pins 2 and 3 and V_{CC}. A value of 10kΩ is recommended. The internal steering diodes remain biased, providing the advantage of lower capacitance.
3. In applications where no positive supply reference is available, or complete supply isolation is desired, an external TVS diode may be used as the reference. The steering diodes will begin to conduct when the voltage on the protected line exceeds the working voltage of the TVS (plus one diode drop).

I/O Protection



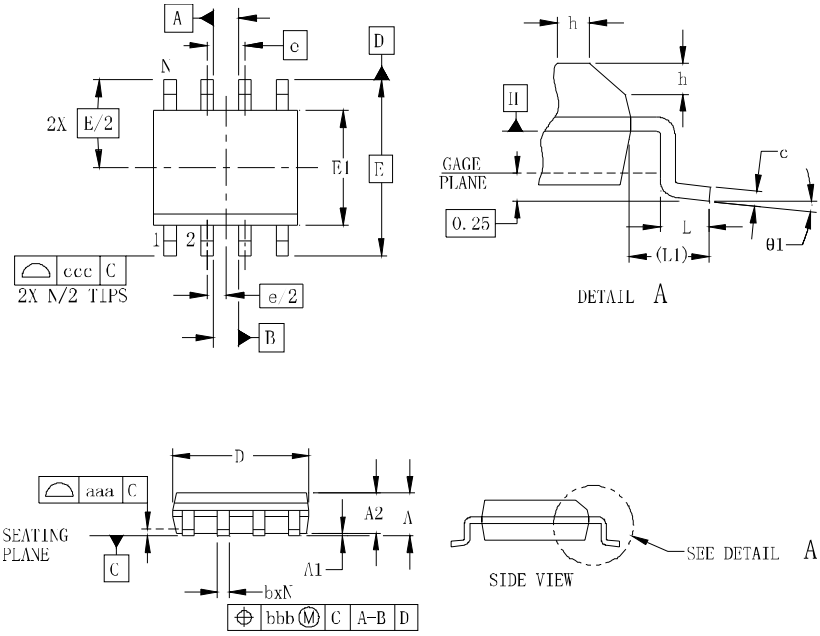
Microcontroller Protection



Matte Tin Lead Finish

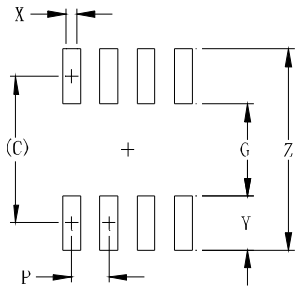
Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

SO-8 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.004		0.010
A2	1.25		1.65	0.049		0.065
b	0.31		0.51	0.012		0.020
c	0.17		0.25	0.007		0.010
D	4.80	4.90	5.00	0.189	0.193	0.197
E1	3.80	3.90	4.00	0.150	0.154	0.157
E	6.00 BSC			0.236 BSC		
e	1.27 BSC			0.050 BSC		
h	0.25		0.50	0.010		0.020
L	0.40	0.72	1.04	0.016	0.028	0.041
L1	(1.04)			(0.041)		
N	8			8		
θ1	0°		8°	0°		8°
aaa	0.10			0.004		
bbb	0.25			0.010		
ccc	0.20			0.008		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	(5.20)	0.205
G	3.00	0.118
P	1.27	0.050
X	0.60	0.024
Y	2.20	0.087
Z	7.40	0.291

Contact Information

Changzhou D-first Electronics CO.,Ltd.
www.first-electronic.com
Email: xhf@first-electronic.cn
Phone: +86（0519）8817 1671