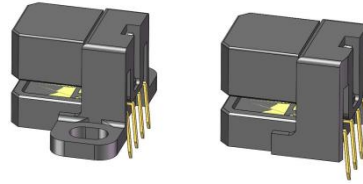




## RS971 Series

### Optical Encoder

### Data Sheet



#### Description

RS971 series are a high performance, optical 2-channel incremental encoder modules. With an integrated precision encoder phase matrix receiver chip and light source (red light source), the module is capable of sensing rotational position and speed information in conjunction with a code disc.

RS971 series includes CPR: 500, 1000.

RS971 series has linear (LPI) options: 20, 45, 90, 150, 180, 300, 360.

#### Features

- Photo-detector Array
- -40 °C ~ +85 °C Operating Temperature
- Multiple CPR/LPI options
- C-Shape Structure, Easy to Mount
- TTL Compatible
- 3.3/5V Supply

#### Applications

Typical applications include printers, plotters, servo motors, factory automation etc.

*Note: Not recommended for use in safety critical application. Eg. ABS braking system.*

#### Absolute Maximum Ratings

Parameter	Symbol	Range
Storage Temperature	T <sub>S</sub>	-40 °C ~ +85 °C
Operating Temperature	T <sub>A</sub>	-40 °C ~ +85 °C
Supply Voltage	V <sub>CC</sub>	-0.5 ~ 7 V
Soldering Temperature		≤260 °C (t ≤ 5s)
Response Frequency	f	60 KHz
Reverse Voltage	V <sub>r</sub>	5V



## Recommended Use Environment

Parameter	Symbol	Range
Operating Temperature	T	-40 °C ~ +85 °C
Power Supply	V <sub>CC</sub>	Ripple voltage <100mV 2.7V ~ 5.5V

## Electrical Characteristics

### Electrical Characteristics Under Recommended Operating Range, Typical at 25 °C

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition
Light Source Forward Voltage	V <sub>f</sub>	1.9	2	2.3	V	I <sub>f</sub> =20mA
Light Source Wavelength	λ <sub>p</sub>	650		660	nm	
Receiver Chip Operating Current	I <sub>CC</sub>		2	3	mA	
Low Level Output Voltage	V <sub>OL</sub>		0.2	0.4	V	Internal 10kΩ pull-up resistor
High Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> *0.8	V <sub>CC</sub>		V	Internal 10kΩ pull-up resistor
A/B Rising Edge Time	t <sub>r</sub>		300		ns	Internal 10kΩ pull-up resistor CL=8PF
A/B Falling Edge Time	t <sub>f</sub>		20		ns	Internal 10kΩ pull-up resistor CL=8PF
AB Duty Cycle	D <sub>t</sub>	40	50	60	%	
A/B Phase Difference	θ	60	90	120	°e	

## A/B Output Waveform Diagram

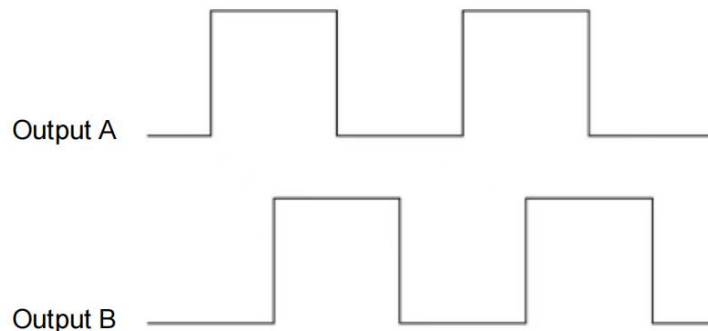


Fig.1 (Top View Module) Counterclockwise Rotation A/B Output Waveforms

## Straight Lead Without Mounting Holes Dimensions

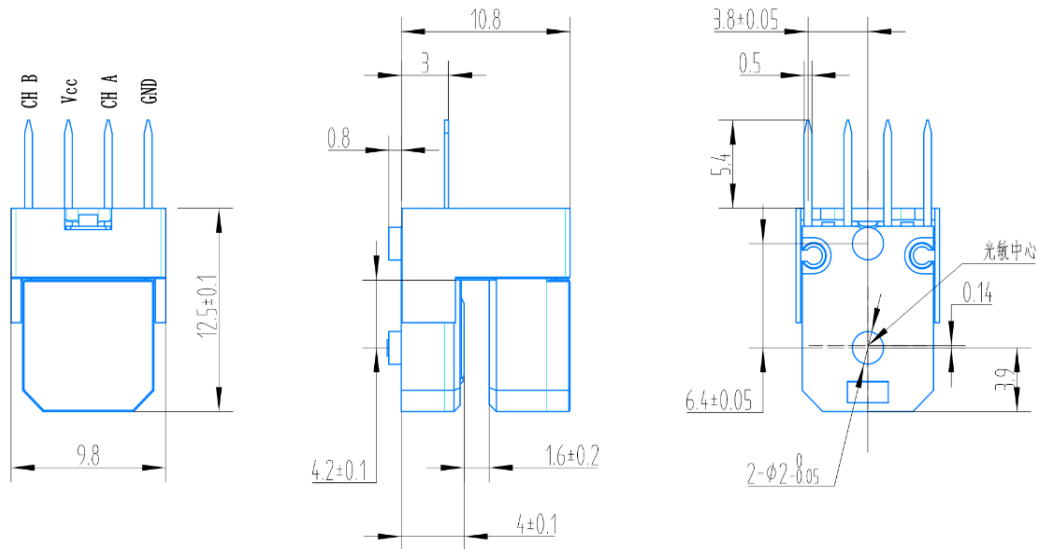


Fig.2 Straight Lead Without Mounting Holes Dimensions

## Straight Lead With Mounting Holes Dimensions

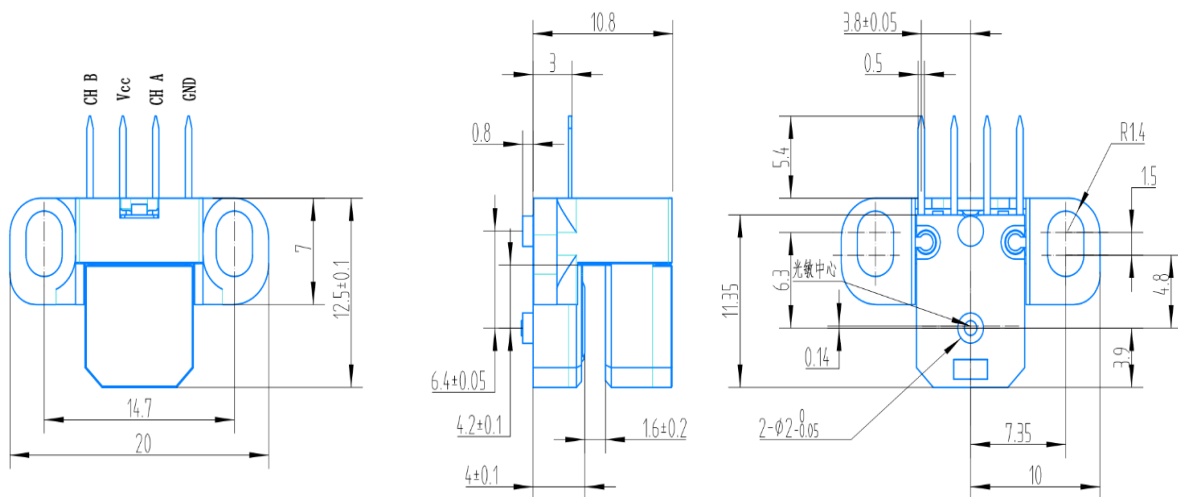


Fig.3 Straight Lead With Mounting Holes Dimensions

## Bent Lead Dimensions

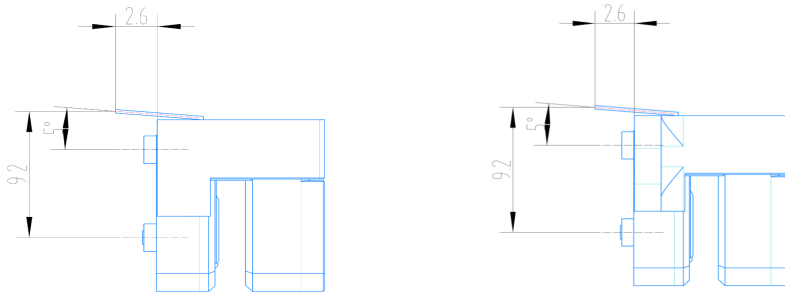


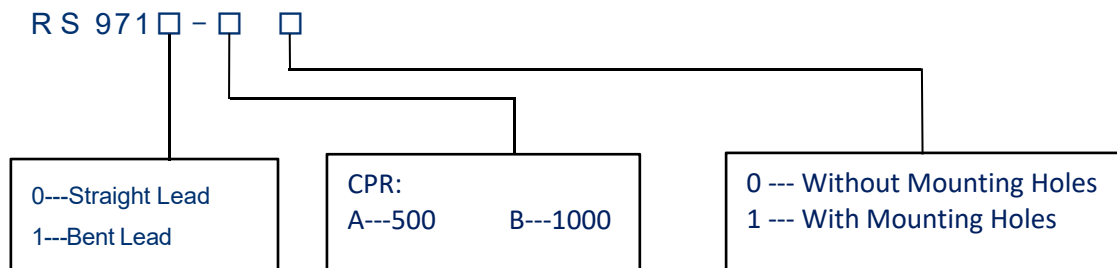
Fig.4 Bent Lead Dimension

## Pin Definition

Pin Name	Function	Input/Output
Vcc	Power Supply + 5V	Power Supply
CH A	A Channel output	Output
CH B	B Channel output	Output
GND	Ground	Ground

## Ordering Information

RS971 series is available in a variety of options, and the specific CPR selection is as follows. based on the optical radius(ROP)= 11mm.





## Ordering Information

RS971 series linear type by LPI options are as follows.

RS 971 □ - □ □

0---Straight Lead  
1---Bent Lead

Linear ( LPI )  
02---20                      09---90  
15---150                    18---180  
30---300                    36---360  
45---45

0 --- Without Mounting Holes  
1 --- With Mounting Holes

## Module Printing

