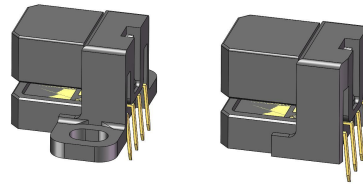




## RS972 Series

### Optical Encoder

### Data Sheet



#### Description

RS972 series are a high performance, optical 2-channel incremental encoder modules. With an integrated precision encoder phase matrix receiver chip and light source (infrared light source), the module is capable of sensing rotational position and speed information in conjunction with a code disc.

RS972 series has linear (LPI) options: 20, 45, 90, 150, 180, 300, 360.

#### Features

- Photo-detector Array
- -40 ~ +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   | $T_s$    | -40 ~ +85 °C                                    |
| Operating Temperature | $T_A$    | -40 ~ +85 °C                                    |
| Supply Voltage        | $V_{cc}$ | -0.5 ~ 7 V                                      |
| Soldering Temperature |          | $\leq 260^\circ\text{C}$ ( $t \leq 5\text{s}$ ) |
| Response Frequency    | $f$      | 60 KHz  |
| Reverse Voltage       | $V_r$    | 5V  |



## Recommended Use Environment

| Parameter             | Symbol          | Range                                |
|-----------------------|-----------------|--------------------------------------|
| Operating Temperature | T               | -40 ~ +85 °C                         |
| Power Supply          | V <sub>cc</sub> | Ripple voltage <100mV<br>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>  | 1.4                  |                 | 1.9  | V     | I <sub>f</sub> =20mA |
| Light Source Wavelength         | λ <sub>p</sub>  | 840                  |                 | 860  | 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     |                      |
| High Level Output Voltage       | V <sub>OH</sub> | V <sub>cc</sub> *0.8 | V <sub>cc</sub> |      | V     |                      |
| A/B Rising Edge Time            | t <sub>r</sub>  |                      | 300             |      | ns    |                      |
| A/B Falling Edge Time           | t <sub>f</sub>  |                      | 20              |      | ns    |                      |
| AB Duty Cycle                   | D <sub>t</sub>  | 40                   | 50              | 60   | %     |                      |
| A/B Phase Difference            | θ               | 60                   | 90              | 120  | °e    |                      |

## A/B Output Waveform Diagram

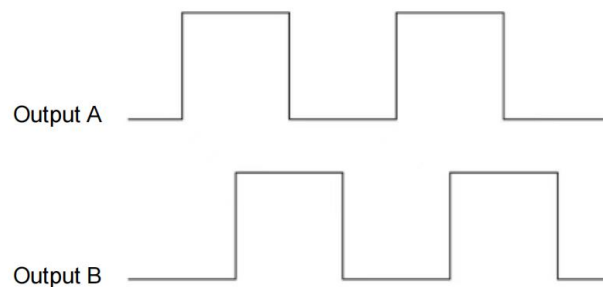


Fig.1 (Top View Module) Counterclockwise Rotation A/B Output Waveforms

## Straight Lead Without Mounting Holes Dimensions

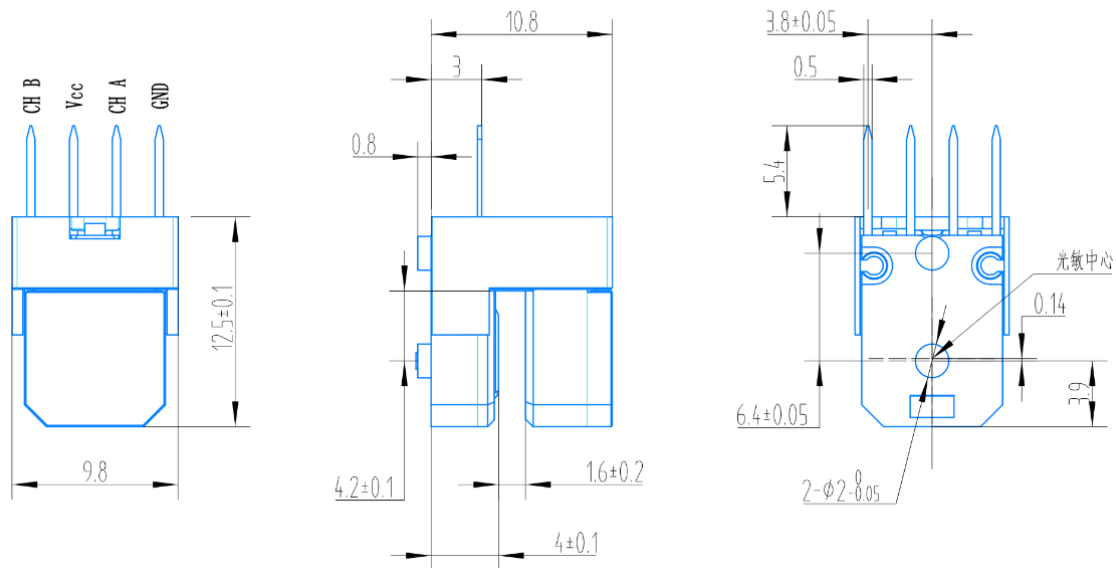


Fig.2 Straight Lead Without Mounting Holes Dimensions

## Straight Lead With Mounting Holes Dimensions

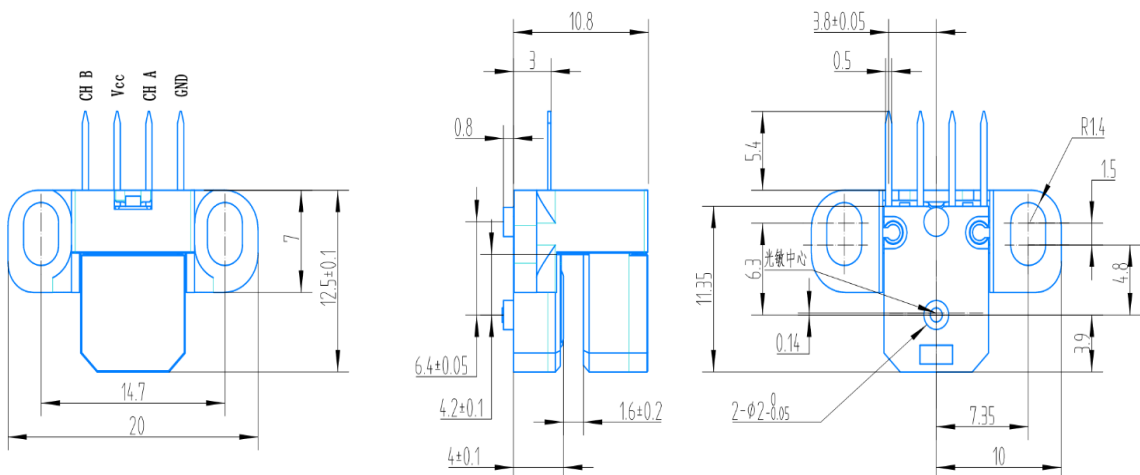


Fig.3 Straight Lead With Mounting Holes Dimensions

## Bent Lead Dimensions

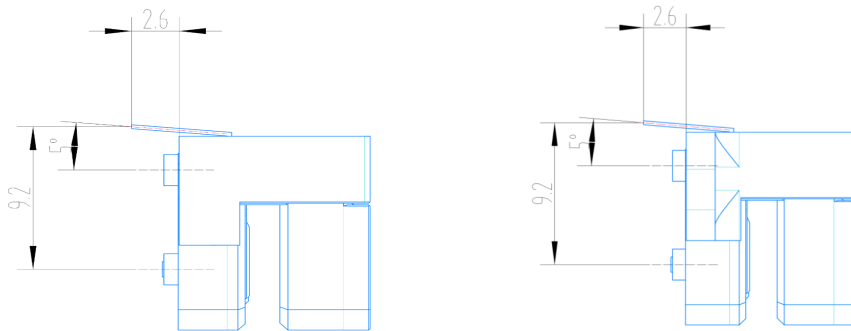


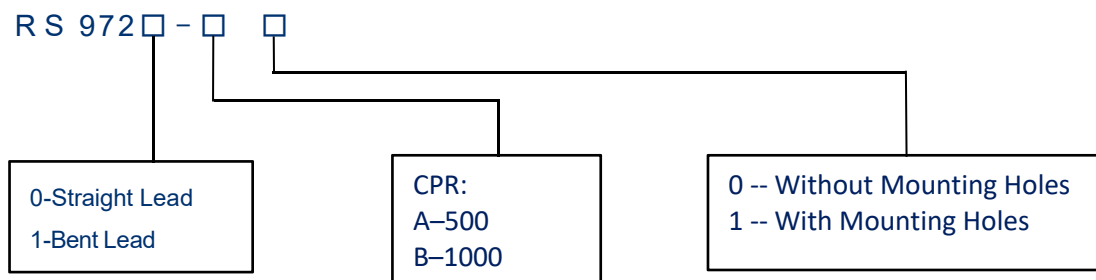
Fig.4 Bent Lead Dimension

## 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

RS972 series is available in a variety of options, and the specific CPR selection is as follows, based on the optical radius (ROP) = 11mm.



RS972 series linear type by LPI options are as follows.

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