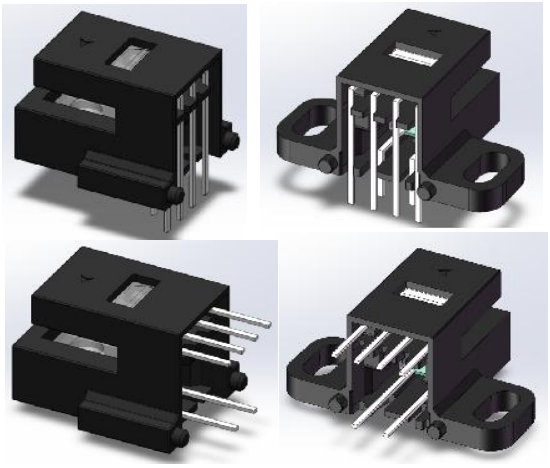
# INCREMENTAL OPTICAL ENCODER MODULES

## RK Series



The RK Series is a high-performance, low-cost optical encoder module designed for wide voltage range operation in motion control applications.

### Applications

Typical applications include: Printers, Plotters, Servo motors, DC motors, Office automation etc.

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

### Features

- Photo-detector Array
- -20°C to +85°C Operating Temperature
- Multiple LPI options
- C-Shape Structure, Easy to Mount
- TTL Compatible
- Single-end 3.3V to 5V Supply

### Description

The RK series is a high-performance, low-cost optical 2-channel incremental encoder module for wide voltage range operation. It consists of a highly collimated light source and a detector IC enclosed in a small C-shaped plastic package, matched with a code-wheel or code-strip, it provides information of rotary or linear position.

The RK Series has linear ( LPI ) options: 20, 37, 45, 75, 90, 120, 150, 180, 254, 300, 360, 450.

### Absolute Maximum Ratings

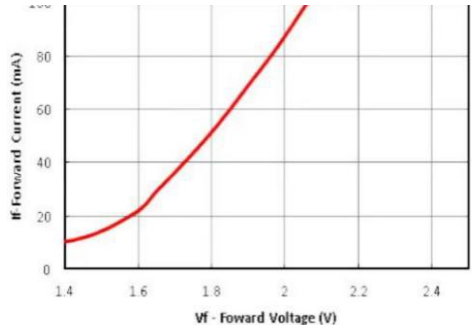
| Parameter | Symbol | Range |
|---|---|---|
| Storage Temperature | $T_s$ | -40°C to +85°C |
| Supply Voltage | $V_{cc}$ | -0.5V to 7V |
| Soldering Temperature | - | ≤260°C ( t ≤ 5s ) |
| Response Frequency | f | 60 KHz |
| Reverse Voltage | $V_r$ | 5V |
| Forward Current (850nm Light Source ) | $I_f$ | 60mA |

## Electrical Characteristics

**Electrical Characteristics Under Recommended Operating Range, Typical at 25 ºC**

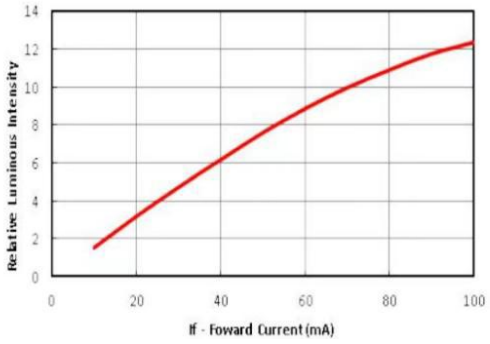
| Parameter | Symbol | Min. | Typ. | Max. | Units | Condition |
|---|---|---|---|---|---|---|
| Operating Temperature | T | -20 | - | +85 | ºC | - |
| Operating Voltage | $V_{cc}$ | 2.7 | 5 | 5.5 | V | Ripple voltage<100mV |
| Light Source (850 nm) Forward Voltage | $V_f$ | 1.4 | - | 1.9 | V | If=20mA |
| Light Source(850 nm) Wavelength | $\lambda_p$ | 840 | - | 860 | nm | - |
| Low Level Output Voltage | $V_{OL}$ | - | 0.2 | 0.4 | V | - |
| High Level Output Voltage | $V_{OH}$ | Vcc*0.8 | Vcc-0.5 | - | V | - |
| AB Duty Ration | $D_t$ | 40 | 50 | 60 | % | - |
| A/B Phase Difference | θ | 60 | 90 | 120 | °e | - |
| Response Frequency | f | - | - | 60 | KHz | - |

## Light Source Characteristic Curve




I-V Graph

Fig.1 850nm Forward Voltage And Forward Current




L-I Graph

Fig.2 850nm Forward Current And Relative Luminous Intensity

## A/B Output Waveform Diagram

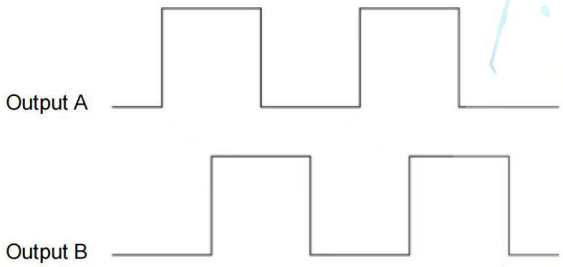



Fig.3 A/B Output Wave Form---Arrow direction

## Straight Lead Dimensions ( Unit: mm )

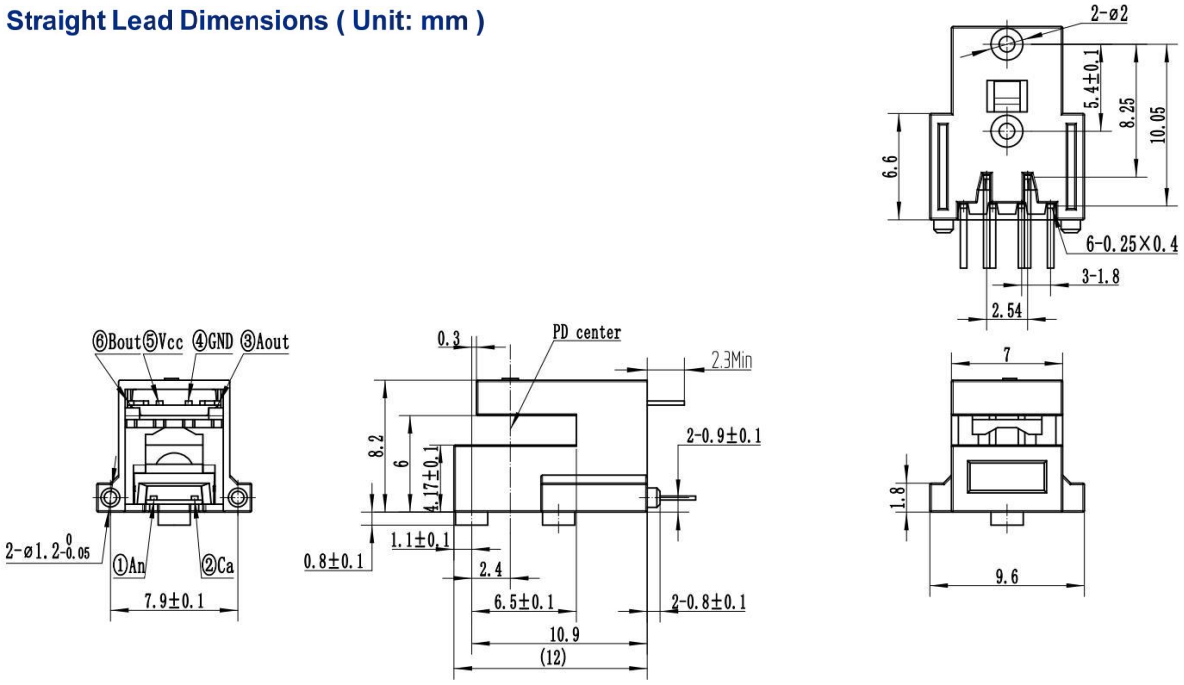



Fig.4 Straight Lead Dimensions Without Mounting Holes

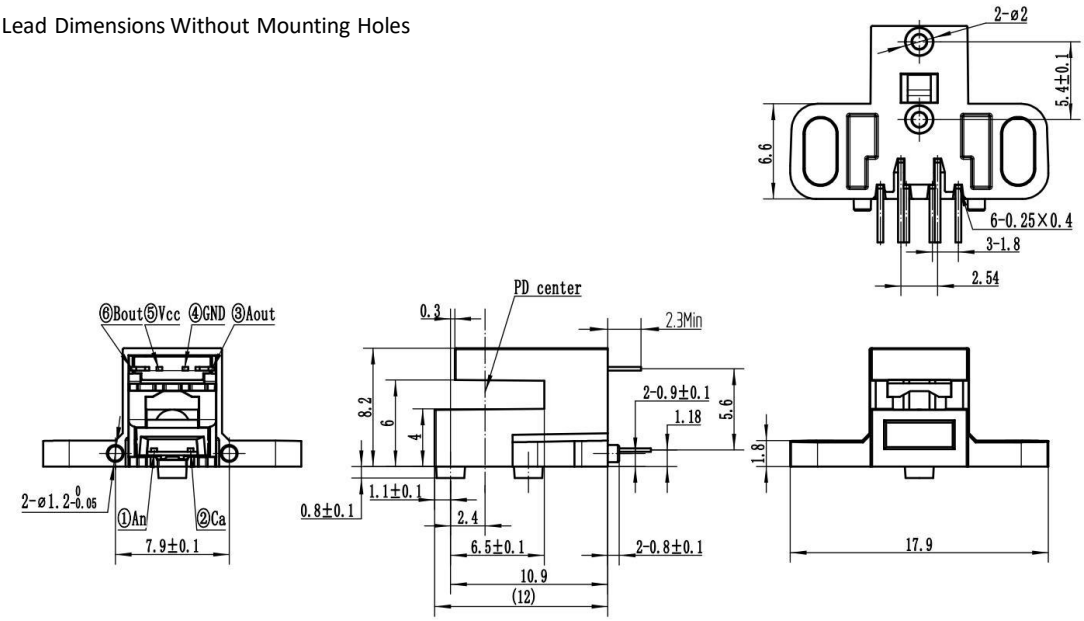



Fig.5 Straight Lead Dimensions With Mounting Holes

## Bent Lead Dimensions ( Unit: mm )

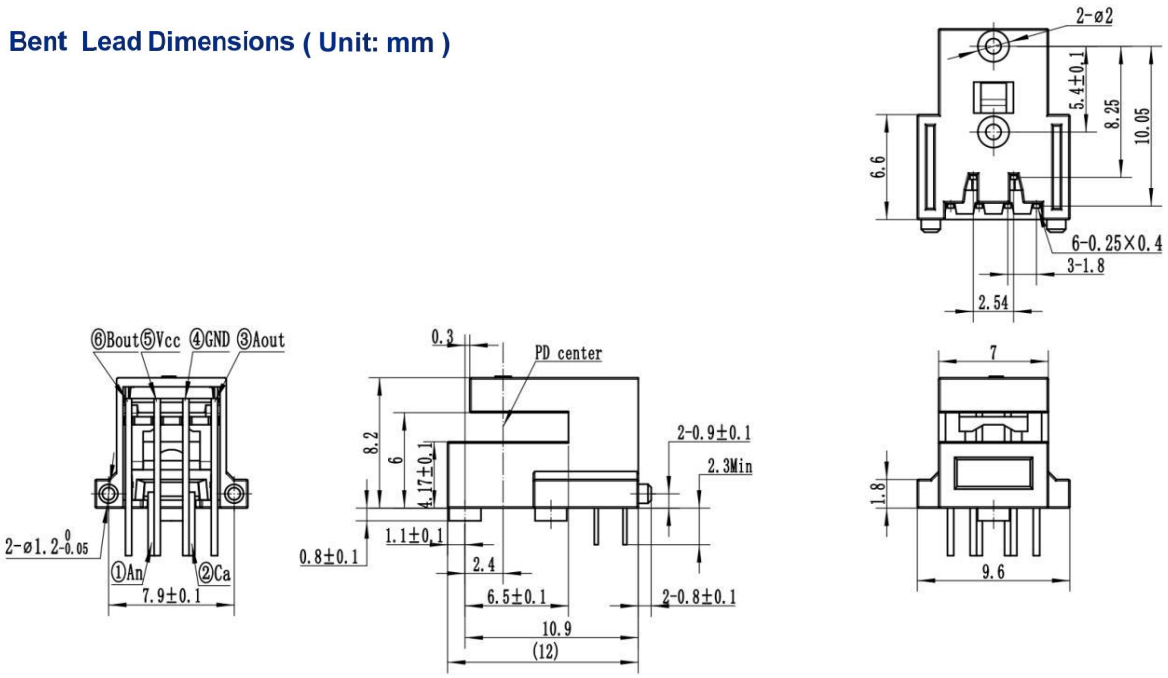



Fig.6 Bent Lead Dimension Without Mounting Holes

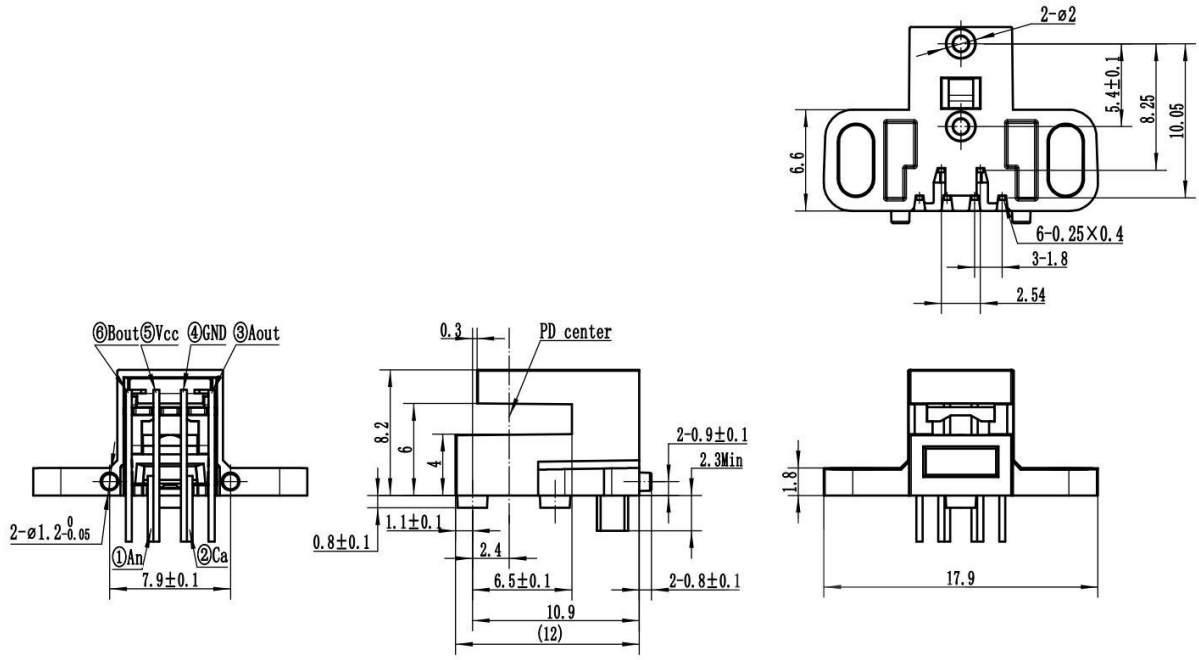


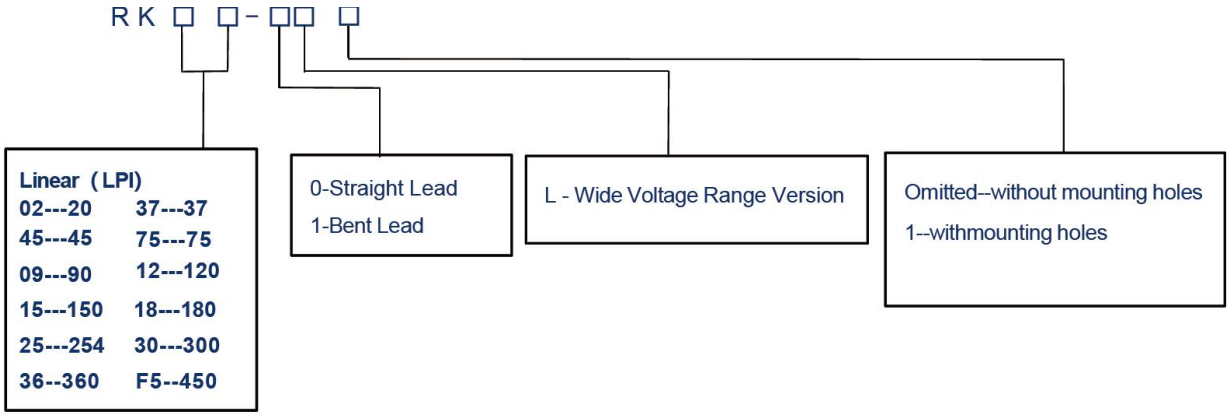

Fig.7 Bent Lead Dimension With Mounting Holes

## Pin Definition

| Pin Name | Function | Input / Output |
|---|---|---|
| An | Positive pole of light source ( recommended If = 10mA ) | - |
| Ca | Negative pole of light source | - |
| Vcc | Power Supply + | Power Supply |
| Aout | A Channel output | Output |
| Bout | B Channel output | Output |
| Gnd | Ground | Ground |

## ORDERING INFORMATION / PART NUMBER

RK_L series is available in a variety of options, as shown in the table below.




*When the 450LPI module is used, the code-wheel needs to be placed within the 1/3 area of the C port close to the receive chip.

## Module Printing