# Pyroelectric Infrared Sensor
# （Model：RD-624）

# User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Please keep the manual properly, in order to get help if you have questions during the usage in the future.

**Zhengzhou Winsen Electronics Technology CO., LTD.**

# RD-624  Pyroelectric Infrared Sensor

Pyroelectric Infrared Sensor detects the infrared radiation by using the temperature-dependent feature. It suppresses the interference caused by temperature change, adopts the method of dual sensing elements complementary which improves the stability of the sensor. This PIR sensor can be widely used in safety device, burglar alarm, automatic door, auto light control and intelligent toys.
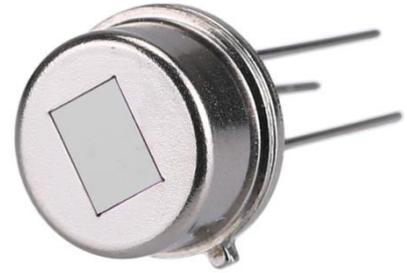
## Features:

* High transmittance and good selectivity filter
* Adopting dual-sensing elements compensation structure, high resistance to external environment interference
* High sensitivity and excellent signal to noise ratio
* High Stability and strong anti-jamming ability (e.g. vibration, radio-frequency interference etc.)

## Applications

 Human body detection lighting;
 Auto control door, toys, switches;
 Anti-crime devices: security camera, alarm;
 Home Appliance;

## Parameters          Table 1

| Model No. | RD-624 |
|---|---|
| Standard Encapsulation: | TO-5 |
| Infrared receiving Electrode | 2×1mm, 2 sensitive elements |
| Window Size: | 3×4mm |
| Receiving Wavelength: | 5～14μm |
| Transmittance | >75% |
| Output signal peak[Vp-p] | ≥3500mV |
| Sensitivity | ≥3200V/W |
| Detection Rate (D*): | $1.4 \times 10^8 \, cmHz^{1/2}/W$ |
| Noise peak[Vp-p]: | <70mV |
| Output balance degree: | <10% |
| Source Voltage: | 0.3～1.1V |
| Working Voltage: | 3～15V |
| Working temperature: | -30～70ºC |
| Storage temperature: | -40～80ºC |
| Incidence angle map: | 138° / 125° X-X Y-Y |

### Component Structure
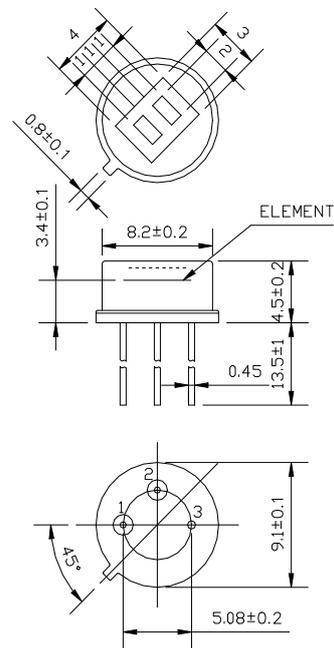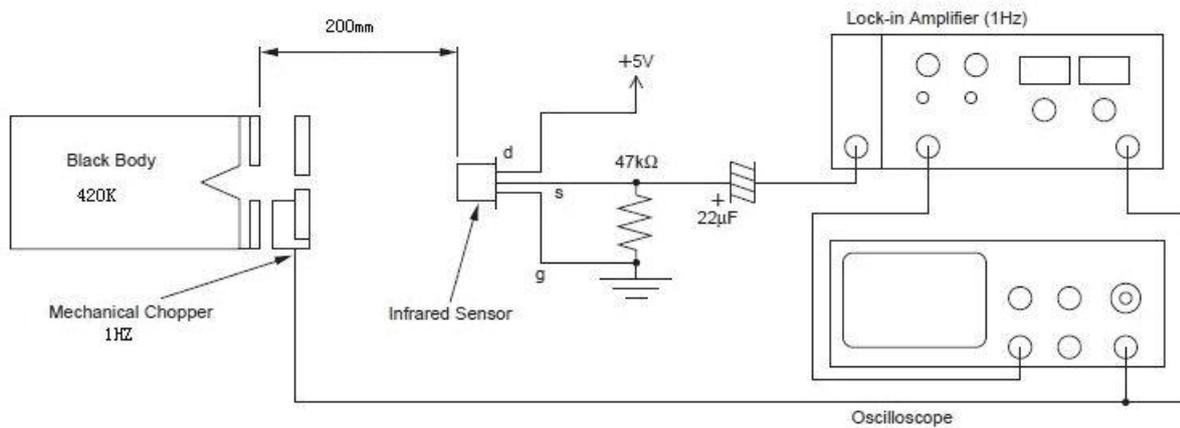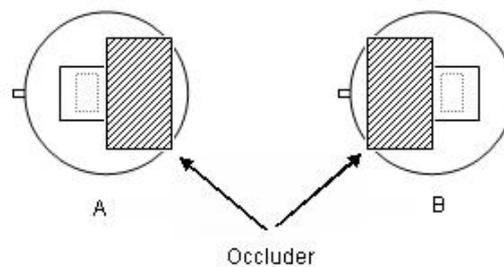
1. Drain
2. Source
3. Ground

## Basic Testing Circuits
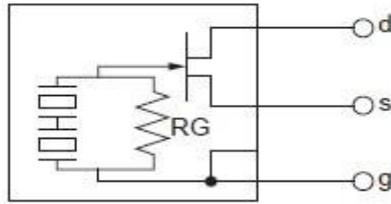


## Test Method:



## Testing Conditions:

♦ Environment Temperature: 25ºC

♦ Blackbody temperature: 420K

♦ Modulation frequency 1HZ, 0.3～3.5HZ △f
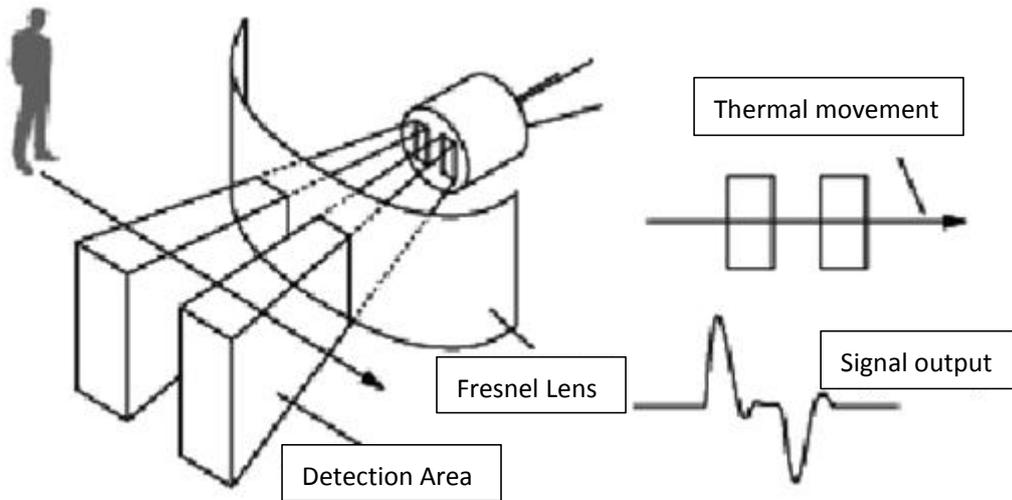
♦ Magnification: 72.5 dB



Dual sensor sensitivity balance degree can be got by detecting each cell's sensitivity (single signal output peak) and calculate in following formula:
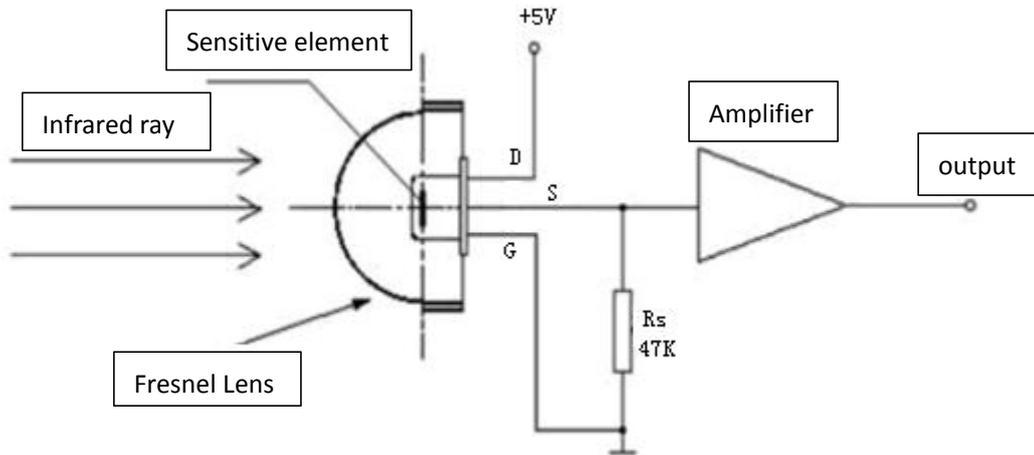
Balance degree = |VA-VB|/(VA+VB) ×100%

VA = Surface A sensitivity ( mVp-p )

VB = Surface B sensitivity ( mVp-p )

**Frequency Characteristic**

Thermal movement

Fresnel Lens

Signal output

Detection Area

**Fresnel Lens**

+5V

Sensitive element

Infrared ray

Amplifier

output

D

S

G

Rs
47K
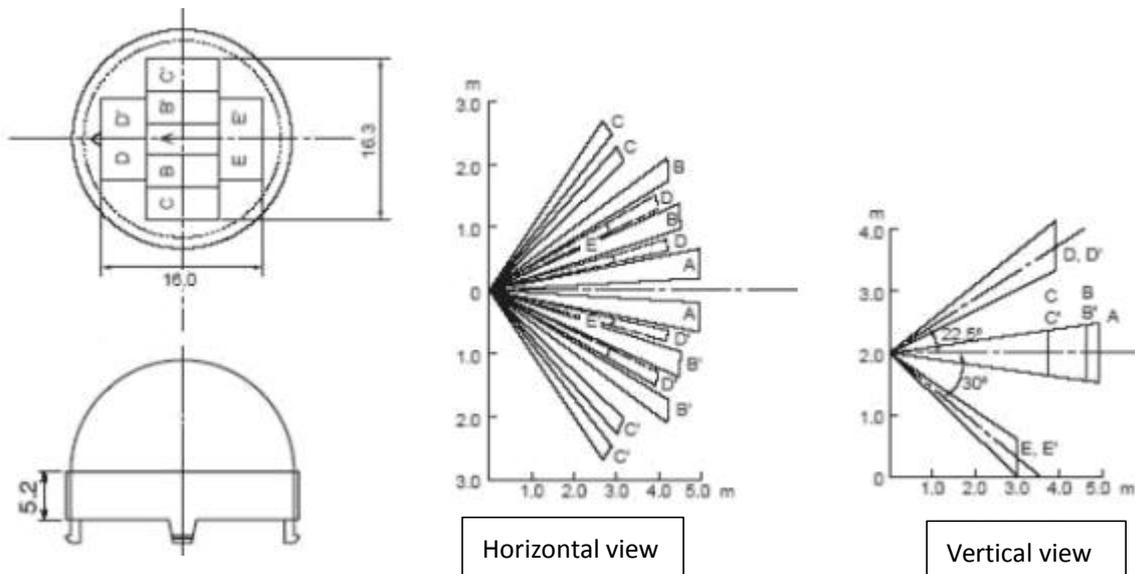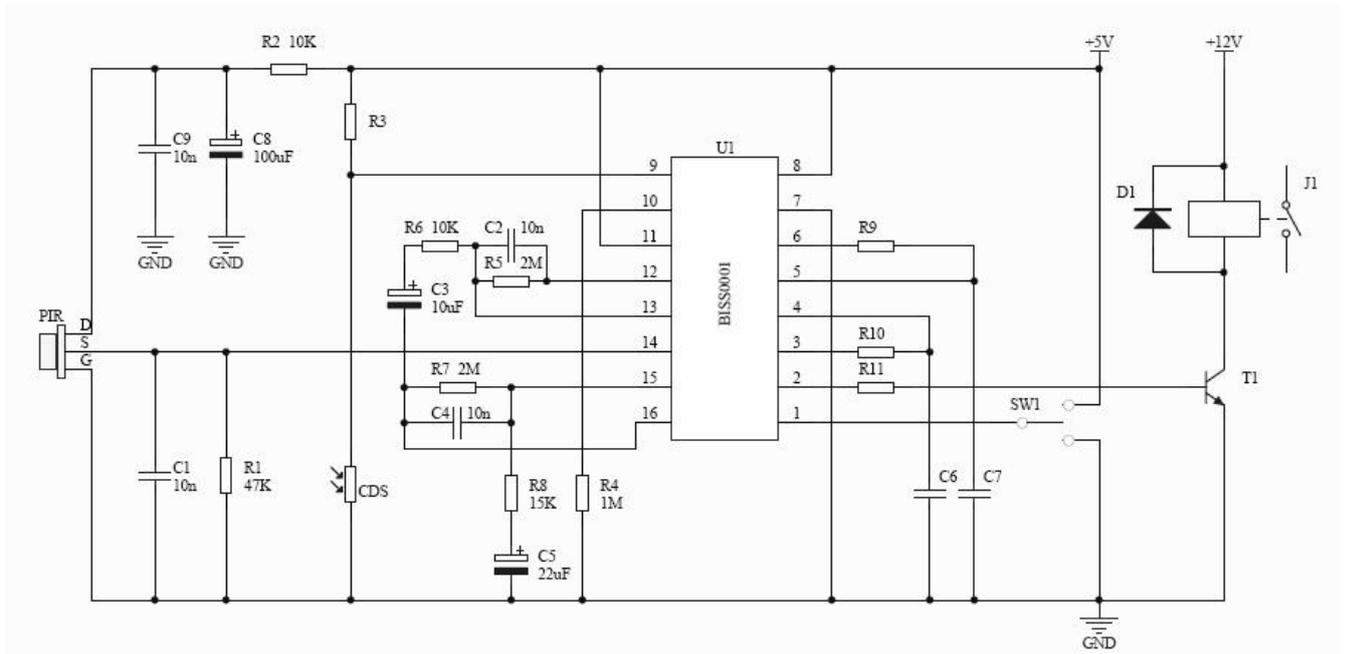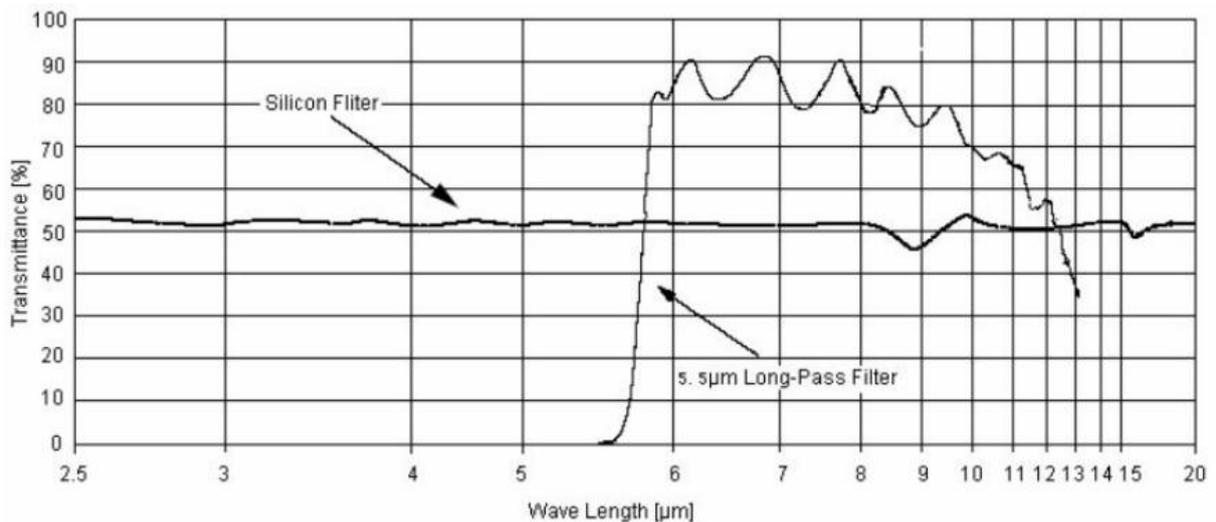
Fresnel Lens

**By using different Fresnel lens, the detection range and distance can be determined. According to customer's requirement, it can response to various detection range and distance.**

Horizontal view

Vertical view

**Typical application circuit:**



# The receiving wavelength of the window material:



**Note: This chart is typical 5um infrared filter, and the curve is the average value of infrared pass rate. This window material is a semiconductor wafer, which is processed by special vacuum coating.**

**Reliability Test**

| Test Items | Test Conditions | Criteria |
|---|---|---|
| High Temperature | **85ºC**, for 500 hours | Within 20% of initial sensitivity value, and 100mV noise value, with naturally normalized at room temperature for 3 Hr. No remarkable damage. |
| Low Temperature | **-40ºC**, for 500 hours | |
| Humidity | **60ºC**, 95%RH, for 500 hours | |
| High Temperature Loading | **85ºC**, 5V applied, 47k load, for 48 hours | |
| Heat Shock | **-10ºC**, 30min ← → 50ºC, 30min*10 cycles | |
| Vibration | **Apply vibration of amplitude of 1.5mm with 10 to 55Hz to each of 3 perpendicular directions for 60min** | |
| Lead Strength | **1kg strain force along lead, 5sec** | |
| Drop Test | **Dropping from 750mm high, 3 times** | |
| Soldering Heat | **260±5ºC, 10±1sec, dipping leads submerge into solder down to 3.0mm below stem** | |
| Hermetic Seal | **125±5ºC** FC-40, **20min** | No bubble visible |

**Cautions:**

1. **The sensor's parameter is obtained by standard testing condition after 1 minute's settling time.**

2. **Please pay attention on Sensor's window direction, must combine with Fresnel lens to get a perfect detecting angle.**

3. **Sensors detecting distance is affected by ambient temperature, moving objects' temperature ,Fresnel lens, Amplifier amplification factor, the comparator threshold voltage setting…etc. please take a comprehensive consideration of various parameters when using the sensors.**

4. **Please do not touch the window area to avoid damaging to the optical filter.**

5. **Please handle the sensor with care when using it.**

6. **Please add Rc filter circuit to the sensor's power supply side when design the circuits.(please take typical application circuits for R2,C8 and C9 as reference)**

7. **Please try to use hand soldering and make the soldering time as short as possible.**

8. **Please get electrostatic protective measures when using this product.**

<u>**Note:**</u> <u>To keep continual product development, we reserve the right to change design features without prior notice.</u>

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