Digital Pyroelectric Infrared Sensor
（Model：RDA223）

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD.

RDA223 Digital Pyroelectric Infrared Sensor

Digital PIR sensor RDA223, is an integrated design of sensitive element and signal processing chip, packaged sensitive element and IC chip into sensor shield. Sensitive element transfer the human movement signal to high-precision digital chip for data processing. Then the sensor gives digital signal for easy using.

Features:
* High-precision AD signal process
* Differential signal input mode, anti-interference ability
* Low working voltage and power consumption
* Digital TTL signal output

Applications
Security product
Human body induction toys
Human body induction lamps, switches, and home appliance
Industrial automation control
Smart home
IOT terminals
Intelligent appliance

Technical Parameter

Max Limit

Parameter	Symbol	Min	Max	Unit	
Voltage	V_{DD}	-0.3	3.6	V	
Pin limit	I_{nto}	-100	100	mA	
Storage temperature	T_{ST}	-40	125	℃	

Working condition

Parameter	Symbol	Min	Typical	Max	Unit	Note
Working condition						
Voltage	V_{DD}	2.7	3	3.3	V	
Current	I_{CC}	12	15	20	uA	
Sensitivity	V_{SENS}		110		uV	
Temperature	W_{ST}	-20		85	℃	
Input enable						
High voltage	V_{IH}	80			%V_{DD}	
Low voltage	V_{IL}			20	%V_{DD}	
Current	I_I	-1		1	uA	
Output						
Low current	I_{OL}	10			mA	
High current	I_{OH}			-10	mA	
Block time			2.3		S	
Delay time	ON_{TIME}		2.3		S	
Oscillators and filters						

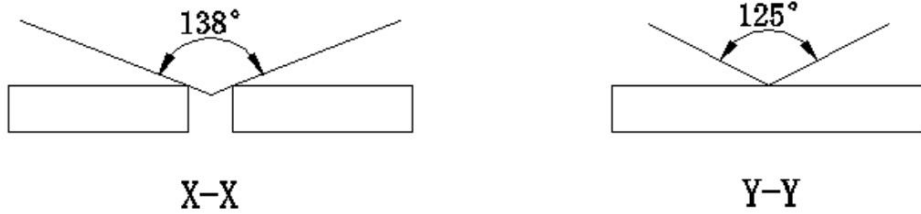| Low filter cut-off frequency				7	Hz	
High filter cut-off frequency				0.44	Hz	
Chip oscillator frequency	F_{clk}			64	KHz	

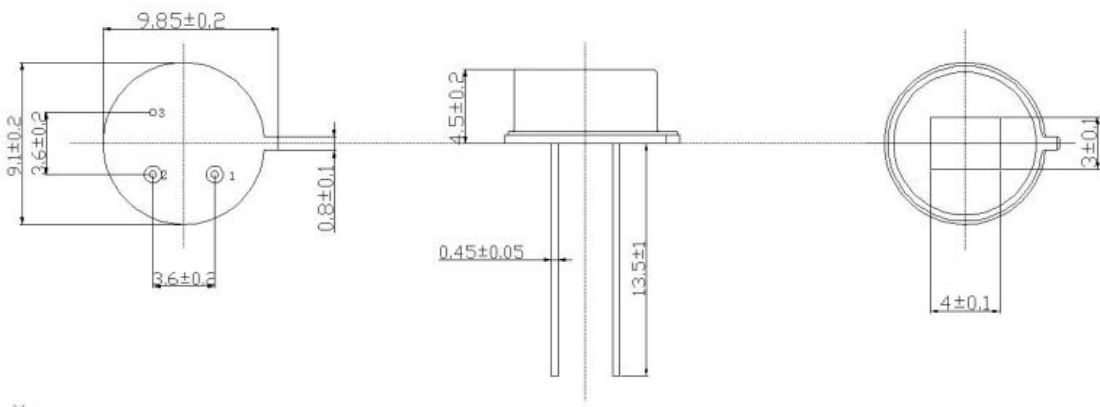**Internal frame**
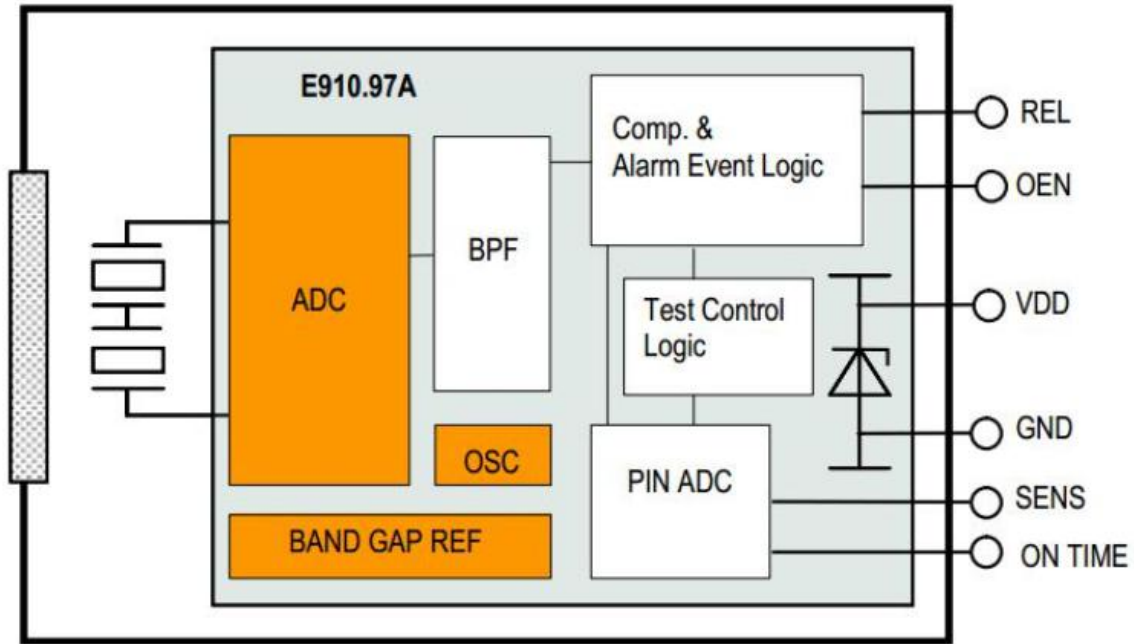
Trigger mode

When the sensor receives a signal that exceeds the set threshold, a count pulse is generated internally. When the sensor receives the signal again, it generates a second count pulse. When two counts are generated within 2 seconds, the sensor gives high-level TTL output on REL pin.

PIR
Signal voltage

t

REL
Output signal

t

REL持续时间

REL output continuous time under signal trigger condition

PIR
Signal voltage

t

REL
Output signal

t

连续的有效触发信号   内部设定的REL持续时间

Continuous effective trigger signal   Internal setting REL continuous time

Sensor Detection Angle

138°

125°

X-X

Y-Y

Structure (Unit: mm)

9.85±0.2

9.1±0.2

3.6±0.2

0.8±0.1

3.6±0.2

4.5±0.2

0.45±0.05

13.5±1

3±0.1

4±0.1
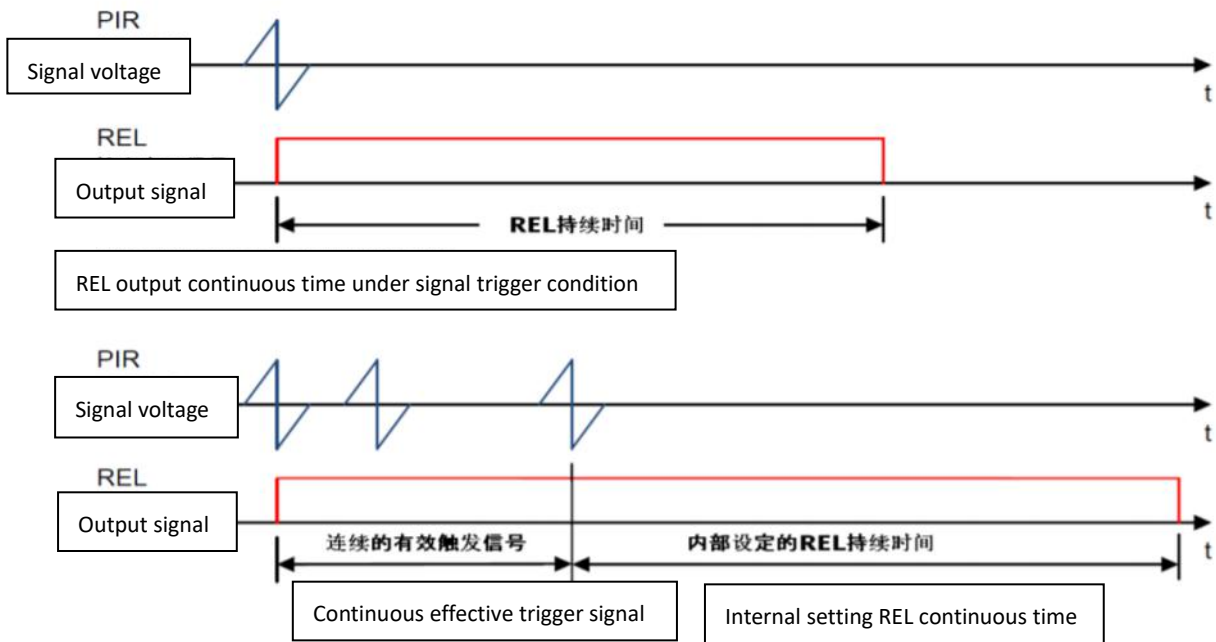
Pin Definition

| Item	Name	Definition
1	VDD	sensor power supply pin
2	REL	sensor output pin, TTL high/low level output
3	VSS	power ground

Frequency characteristics

Thermal Energy Movement
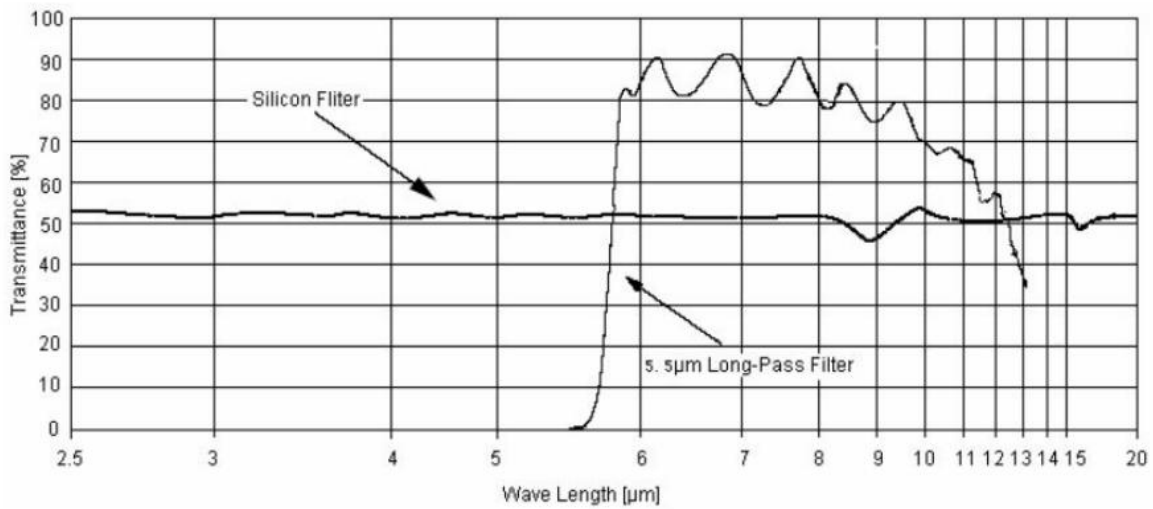
热能源的移动

Output Signal

Fresnel Lens
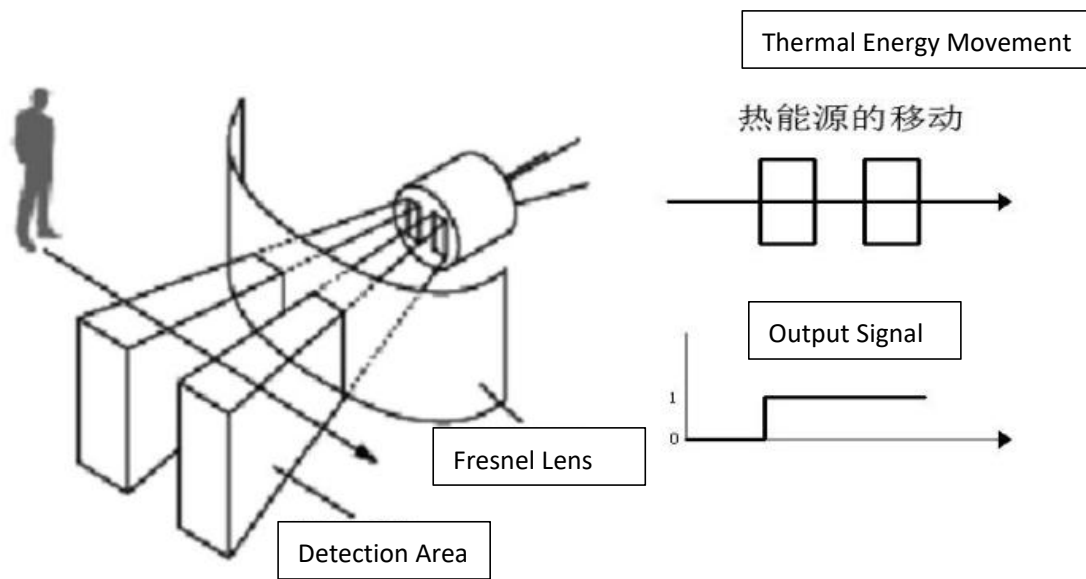
Detection Area

Fresnel Lens:

Fresnel Lens used, would determine the sensor's detection angle and distance, which can correspond to a variety of detection range and distance, according to customers' requirement.
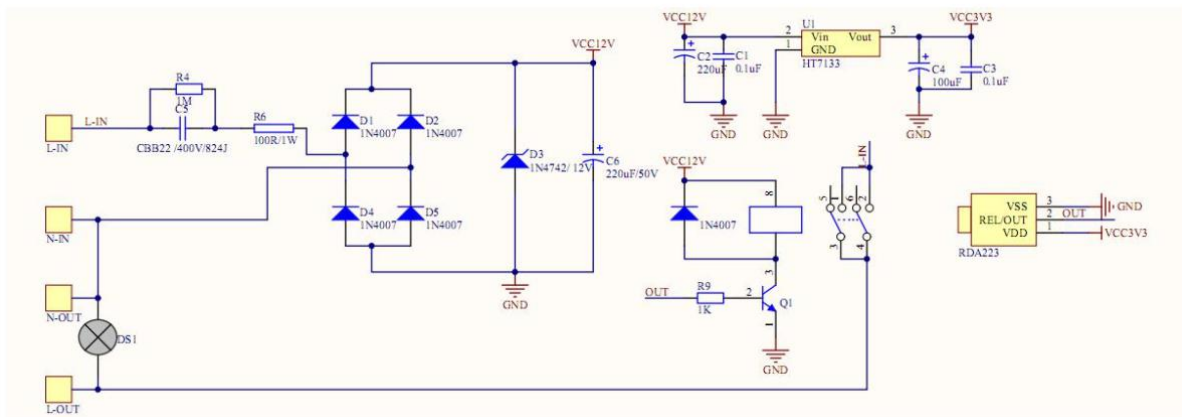
水平视场图

Horizontal Field of View

垂直视场图

Vertical Field of View
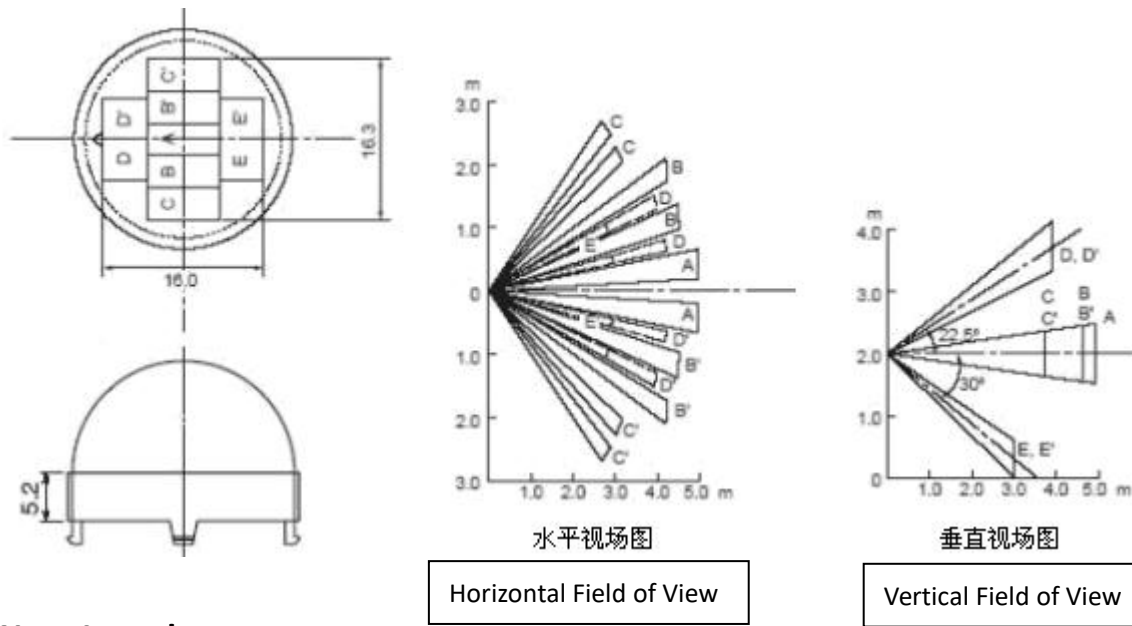
Wave Length

Note: The graph shows a typical 5um infrared filter reference, and the curve is the average of infrared pass rate. The window material is a special vacuum coating of semiconductor wafers.

Application

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 try to use hand soldering and make the soldering time as short as possible. Soldering temperature should be less than 300°C, and soldering time be less than 3 seconds.**
7. **Please get electrostatic protective measures when using this product, as applying static electricity of ±100V or more may damage the sensor.**

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