



Digital Pyroelectric Infrared Sensor (Model: RDA223-F)

User's Manual

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Zhengzhou Winsen Electronics Technology Co., Ltd

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Zhengzhou Winsen Electronics Technology CO., LTD.

RDA223-F Digital Pyroelectric Infrared Sensor

Digital PIR sensor RDA223-F, 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 by differential input 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
- * Wide voltage power supply(2.2~5V) and low power consumption
- * Digital TTL signal output

Applications

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



Technical Parameter

1. Max Limit

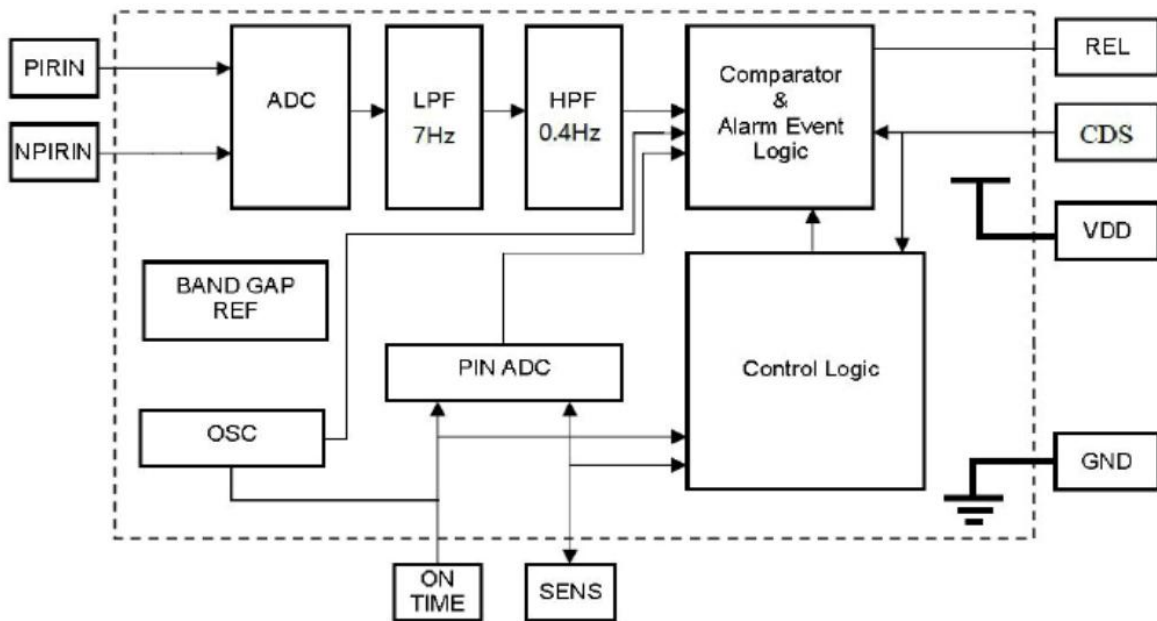
Parameter	Symbol	Min	Max	Unit	Note
Supply voltage	V _{DD}	0.3	5.5	V	25℃
Output voltage	V _{OUT}	V _{SS} -0.3	V _{DD} +0.3	V	25℃
Storage temperature	T _{ST}	-40	+125	℃	

2. Electrical parameter (Unless otherwise specified: T=25 °C, V_{DD} =3.0V)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Working condition						
Voltage	V _{DD}	2.2	3.0	5.0	V	Power supply mode
Current	I _{DD}	8.0	10	15	uA	V _{DD} =3V, non-loaded
Temperature	T _{OPR}	-20		+70	℃	
Output Pin(REL)						
Max output drive current	I _{REL}			10	mA	V _{DD} =5V
REL end outputs high level	V _{OH}			2.7	V	V _{DD} =3V, I _{OH} =10mA
REL end outputs low level	V _{OL}	0.3			V	
Block time			2.0		S	
Delay time	ON _{TIME}		2.0		S	Non-adjustable

Oscillators and filters						
Low filter cut-off frequency	F_{LPF}			7	Hz	
High filter cut-off frequency	F_{HPF}	0.4			Hz	

3. Internal frame



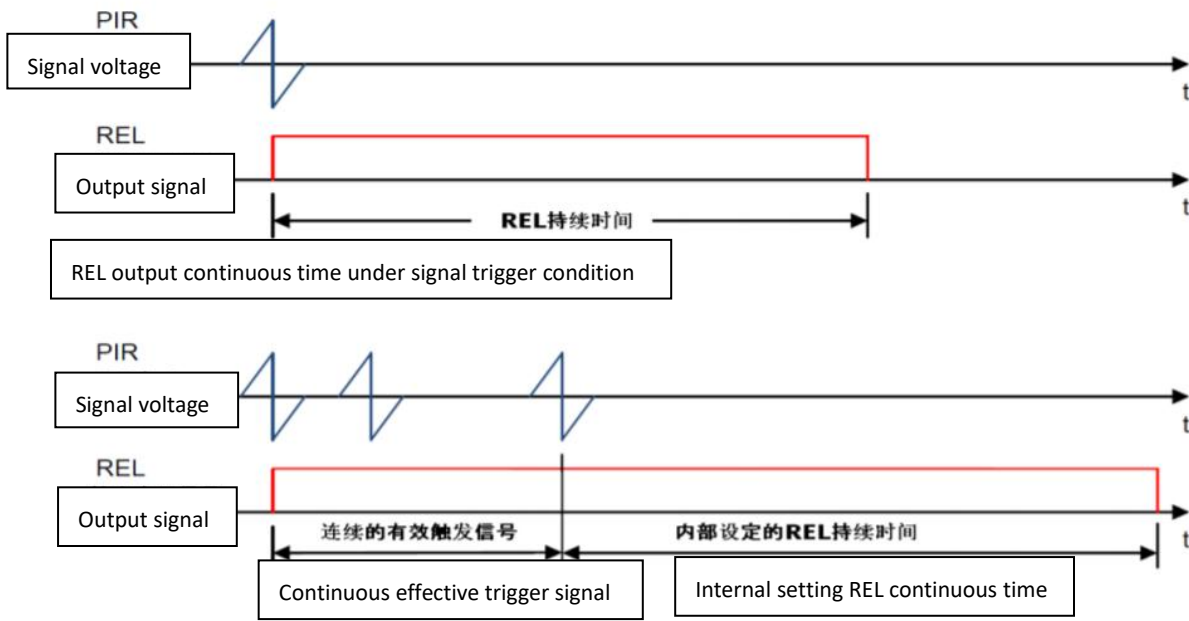
4. Trigger mode

In the normal detection condition, the following two conditions are valid:

- (1) When the signal amplitude successively exceeds the positive and negative thresholds within 4S ;
- (2) The signal amplitude exceeds 5 times the threshold;

After the sensor is effectively triggered, the REL pin outputs 2s high level. During the high level output period, if the effective trigger signal is detected again, the output high time is recalculated.

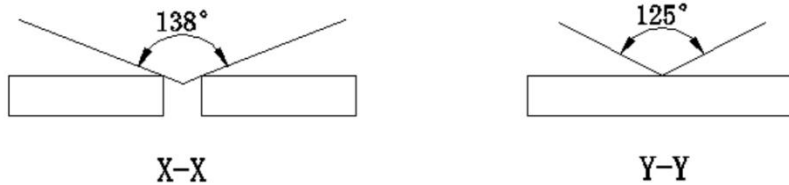
Remark: The sensor has warm-up time. After power on, the REL pin outputs high level for 2 seconds and low level for 2 seconds. Warm-up time has nothing to do with ONTIME



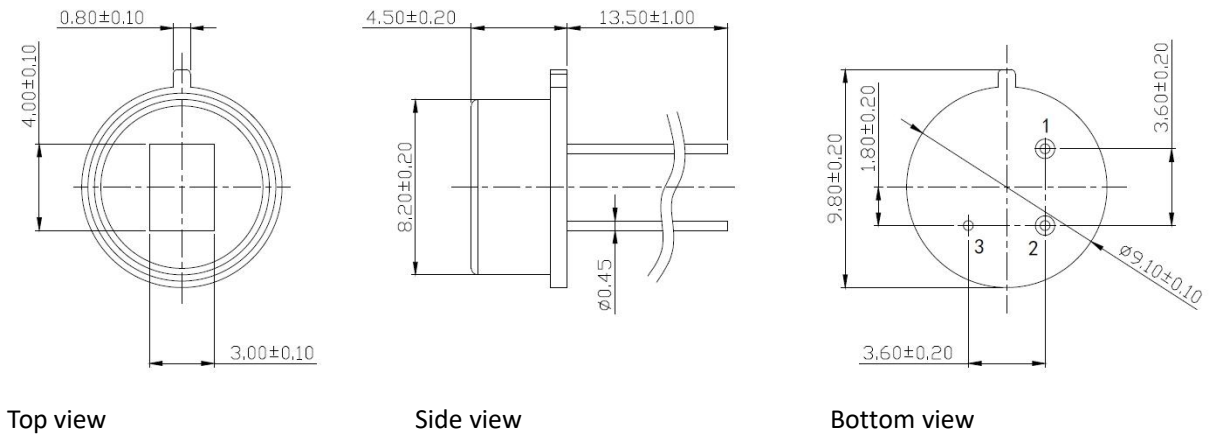
Continuous time of multiple triggering REL output

Note: If the trigger signal is detected again during continuous time, the continuous time will be recalculated.

Sensor Detection Angle



Component Structure (Unit: mm)



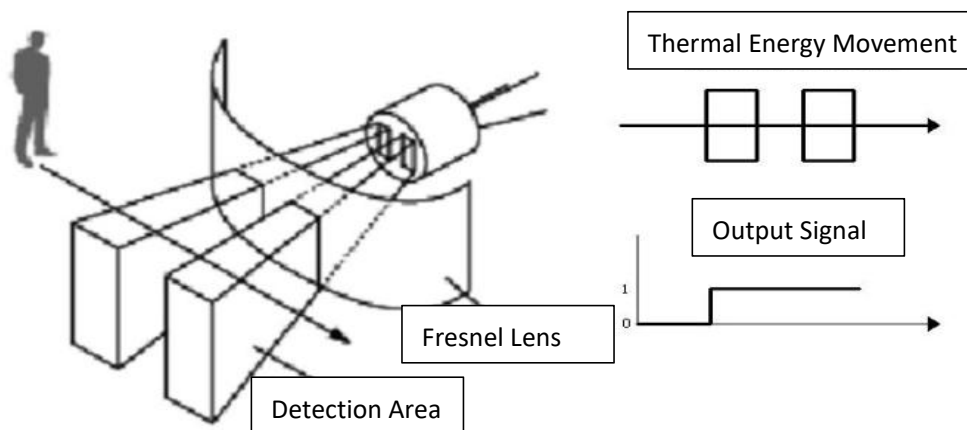
Pin Definition

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

Pictures:

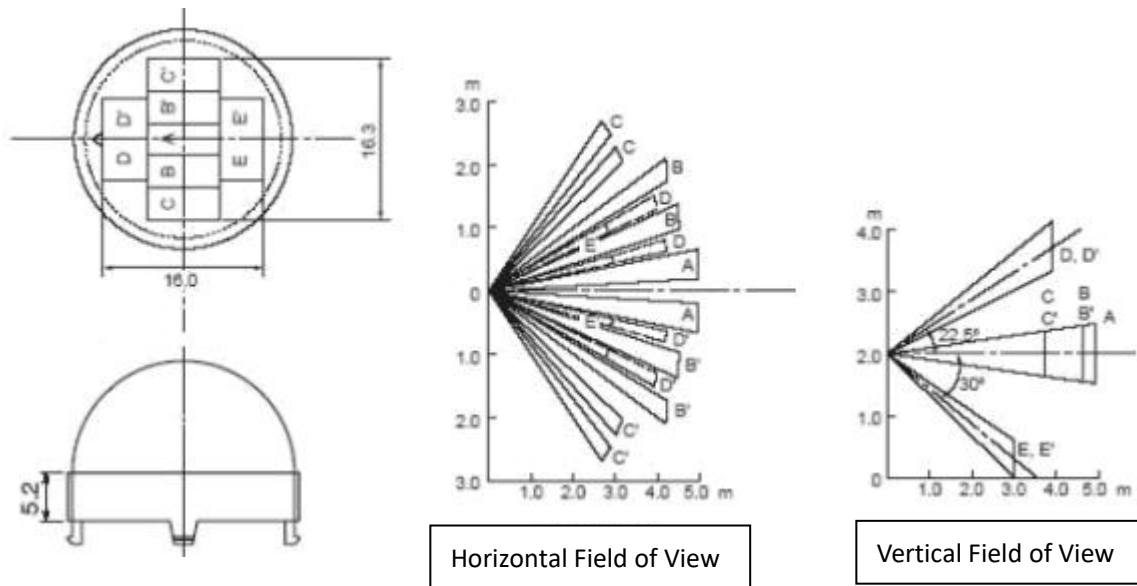


Frequency characteristic

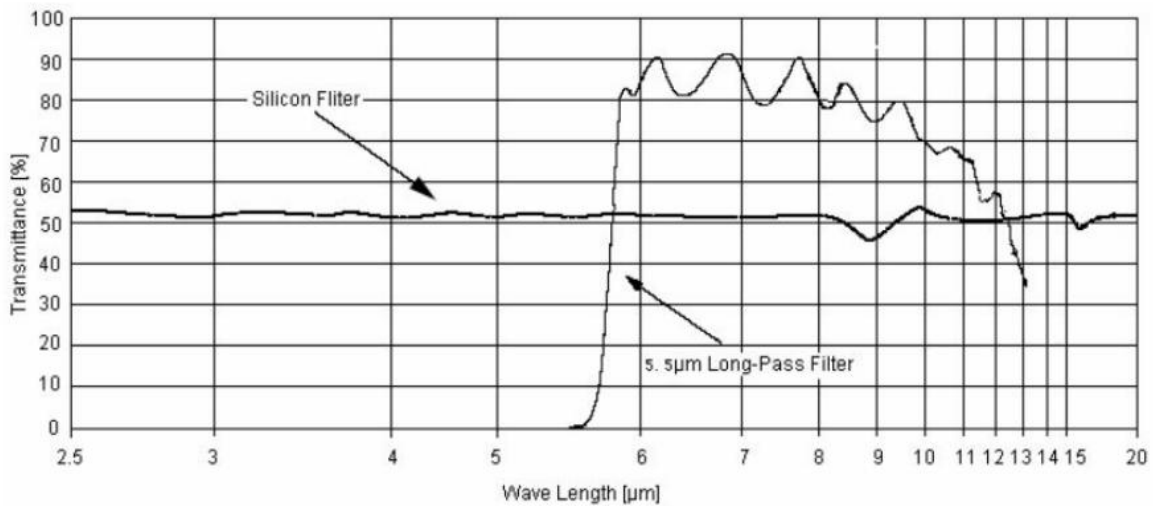


Fresnel Lens:

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.

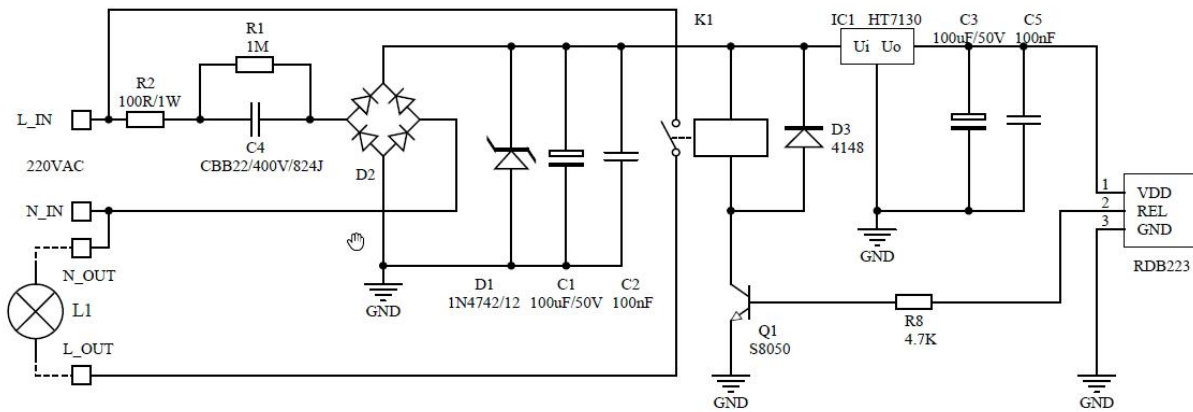


Wave Length



Note: The graph shows a typical 5~14 μm infrared filter reference, and the curve is the average of infrared pass rate. The window material is a special vacuum coating of semiconductor wafers.

Typical Application circuit



RDA223-F Digital Pyroelectric Sensor Typical Reference Circuit

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 ±800V or more may damage the sensor.

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

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