

Pyroelectric Infrared Radial Sensor



TYPE: S16-L221D

NANYANG SENBA OPTICAL AND ELECTRONIC CO., LTD.



Mini SMD Digital Pyroelectric Infrared Sensor

The product is a digital intelligent PIR sensor. It interfaces directly with up to two conventional PIR sensors via a high impedance different input. The PIR Signal is converted to a 15 bit digital value on chip. A LED output indicates whenever the PIR signal is above the selected threshold. The parameters for sensitivity and timing are set by connecting the corresponding inputs to DC voltages. The voltage levels on the inputs are converted to digital values with 7 bit resolution. All signal processing is performed digitally.

L221Dis SMD package, including the settings for time, sensitivity and ambient light level.

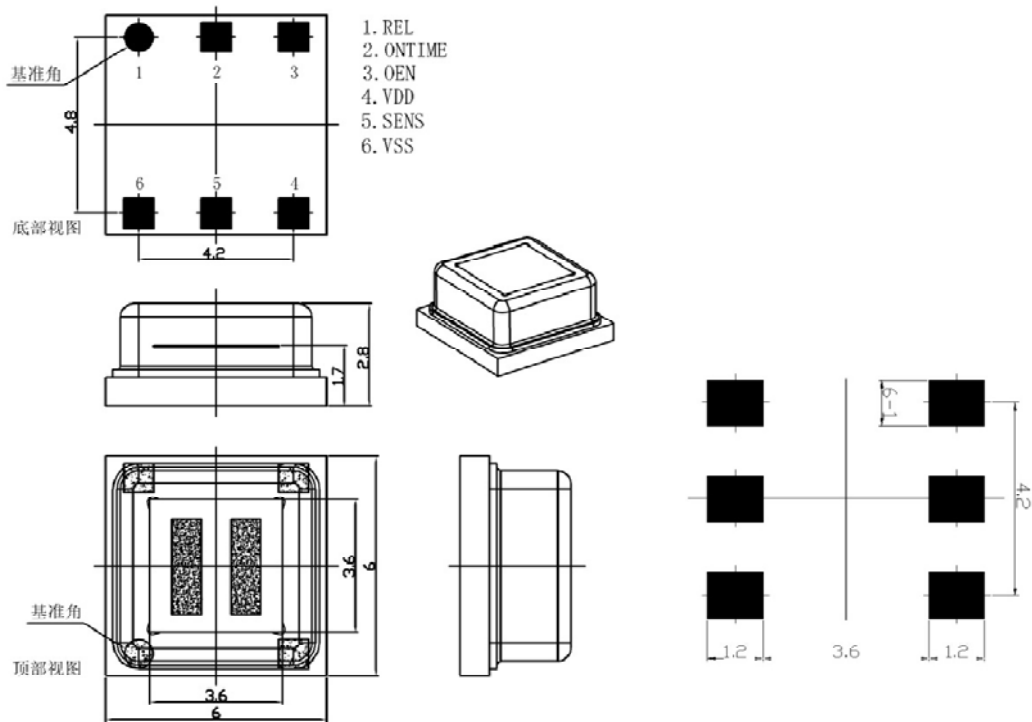
■ Features and Benefits

- Mini SMD with reflowed SMT
- Digital signal processing (DSP)
- Power adjustable, save more energy
- Built-in filter, high immunity to RFI
- Output time, sensitivity and light control adjustable,
- Schmitt REL Output
- Low voltage, low power consumption

■ Applications

- PIR motion detection
- Intruder detection
- Occupancy detection
- Motion sensor lights
- Computer monitor
- Security system
- Automatic control

Dimension



Unit: mm

The chart of recommended welding plate

Technical Data

1. Maximum Ratings

Characteristics	Symbol	Min. Value	Max. Value	Unit	Remarks
Supply Voltage	V _{DD}	-0.3	3.3	V	
Working Temperature	T _{OT}	-30	70	°C	
Storage Temperature	T _{ST}	-40	80	°C	
Max.current for pin	Into	-100	100	mA	
Viewing angle		X=110°	Y=90°		
Detection spectral response	λ	5	14	μm	



2.Working Conditions (T=25°C, Vdd=3V, Except other requirements)

Characteristics	Symbol	Min.	Type	Max.	Unit	Remarks
Supply Voltage	V _{DD}	2.7	3	3.3	V	
Working Current	I _{DD}	12	15	20	μA	
Sensitivity	V _{SENS}	120		530	μV	Adjustable
Output REL						
Output Low Current	I _{OL}	10			mA	V _{OL} <1V
Output High Current	I _{OH}			-10	mA	V _{OL} >(V _{DD} -1V)
Lock time	T _{OL}		2.3		s	
On-time	T _{OH}	2.3		4793	s	
SENS/ONTIME						
Input voltage		0		V _{DD}	V	0V to ¼ V _{DD}
Input Bias Current		-1		1	μA	
OEN						
Input Low Voltage	V _{IL}			0.2	Vdd	
Input High Voltage	V _{IH}	0.4			Vdd	
Input Current	I _I	-1		1	μA	V _{SS} <V _{IN} <V _{DD}
Oscillator &Band Pass Filter(BPF)						
Band Pass Filter(BPF) Low cut-off frequency				7	Hz	
Band Pass Filter(BPF) High cut-off frequency				0.44	Hz	
Oscillator frequency on Chip	F _{CLK}			64	kHz	
Interior Block Diagram						

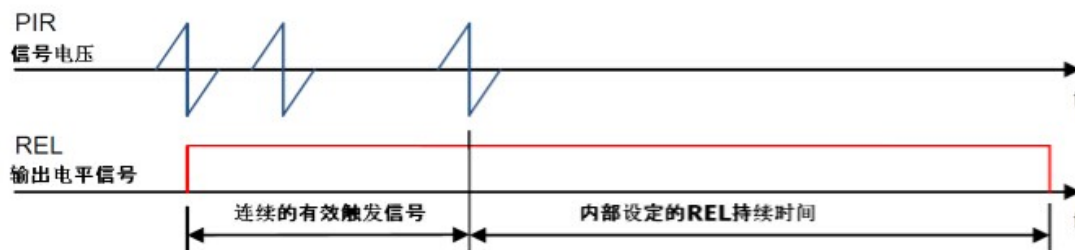
■ TheOutput Trigger Mode

When PIR signal is above the triggered threshold, there will be a count impulse inside. And when PIR sensor receives this impulse signal, it will think this signal as the second impulse. Once the second impulse was received within 4S, the PIR sensor will alarm, meanwhile, the REL pin will be triggered.

Besides, when the PIR signal is above 5 times of the triggered threshold, only one impulse is enough to trigger REL output as below. For multiple triggers, the delay time of REL output begins from the last valid trigger.



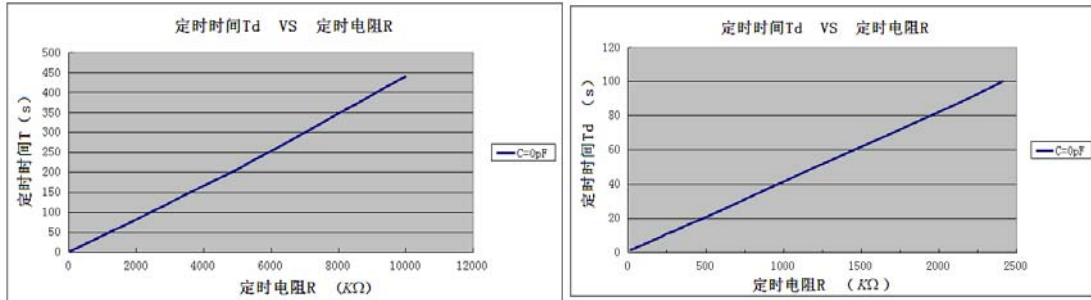
REL delay time



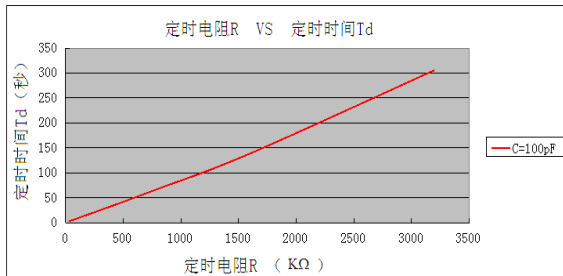
Multiple triggered signals Interior set delay time of REL output

■ **ONTIME Setting**

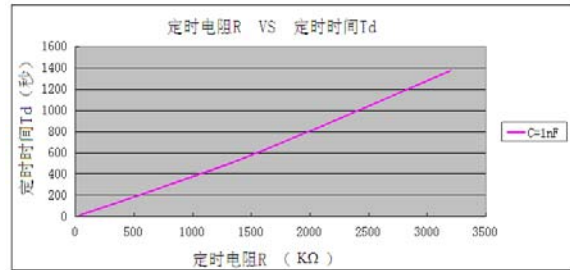
1. The Analog setting style for on-time



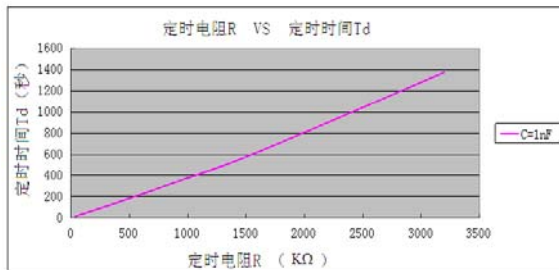
ONTIME PIN non-contact CapacitorThe Enlarged one



C=100pF



C=1nF



C=10nF

2. The Digital setting style for on-time

序号	ONTIME 脚电压中心值 (VDD)	ONRIME 下分压电阻 RL (欧姆)(1%精度)	Time Td (秒)
0	1/64	0K	1.8
1	3/64	51k	3.6
2	5/64	91k	5.4
3	7/64	127k	7.2
4	9/64	169k	14.4
5	11/64	215k	29
6	13/64	261k	43
7	15/64	316k	58
8	17/64	365k	115
9	19/64	430k	230
10	21/64	511k	346
11	23/64	576k	461
12	25/64	665k	922
13	27/64	750k	1843
14	29/64	845k	2765
15	31/64	953k	3686



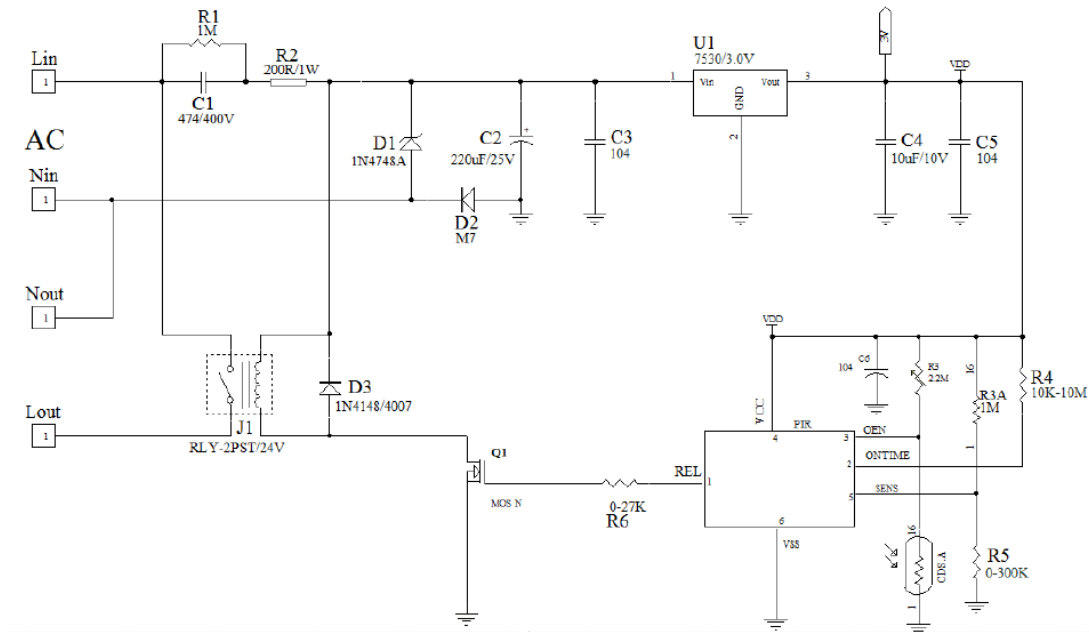
■ Sensitivity Setting

序号	SENS 脚电压		序号	SENS 脚电压	
	电压范围 (VDD)	中心电压 (VDD)		电压范围 (VDD)	中心电压 (VDD)
0	0~1/64	1/128	16	16/64~17/64	33/128
1	1/64~2/64	3/128	17	17/64~18/64	35/128
2	2/64~3/64	5/128	18	18/64~19/64	37/128
3	3/64~4/64	7/128	19	19/64~20/64	39/128
4	4/64~5/64	9/128	20	20/64~21/64	41/128
5	5/64~6/64	11/128	21	21/64~22/64	43/128
6	6/64~7/64	13/128	22	22/64~23/64	45/128
7	7/64~8/64	15/128	23	23/64~24/64	47/128
8	8/64~9/64	17/128	24	24/64~25/64	49/128
9	9/64~10/64	19/128	25	25/64~26/64	51/128
10	10/64~11/64	21/128	26	26/64~27/64	53/128
11	11/64~12/64	23/128	27	27/64~28/64	55/128
12	12/64~13/64	25/128	28	28/64~29/64	57/128
13	13/64~14/64	27/128	29	29/64~30/64	59/128
14	14/64~15/64	29/128	30	30/64~31/64	61/128
15	15/64~16/64	31/128	31	31/64~32/64	63/128

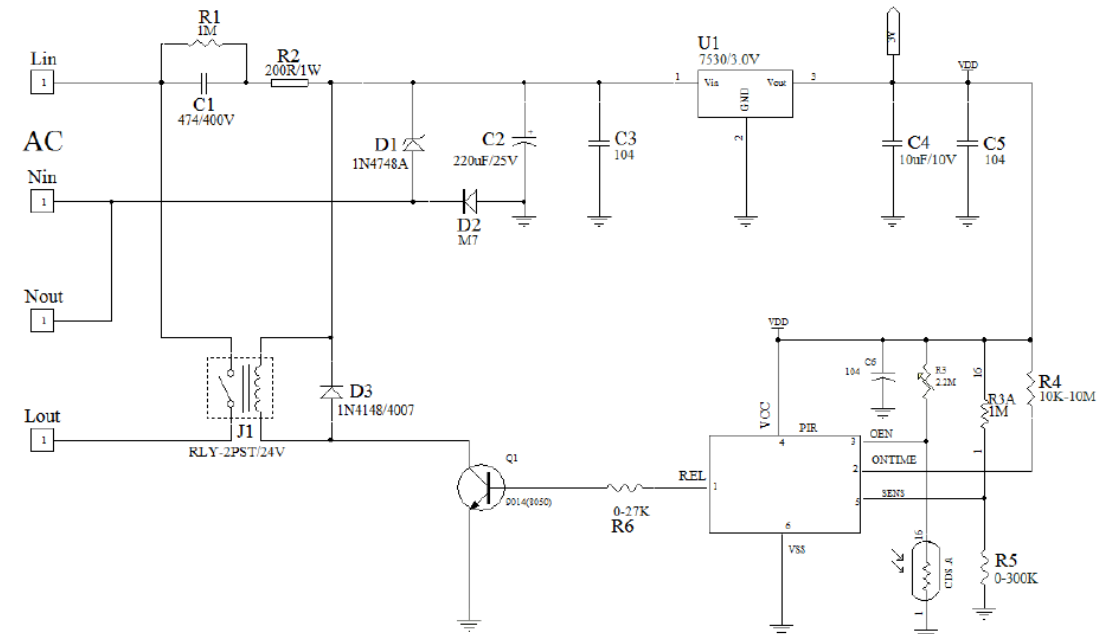
■ Reliable Test

Type	Standard	OK
Salt spray test	GB/T 10125-2012	OK
High temperature test	100°C, 500 hours	OK
Low temperature test	-40°C, 500 hours	OK
Humidity	Relative humidity 95%, 500 hours	OK
Heat resistance	250°C, 10S	OK
Vibration	Frequency: 10Hz-55H, Time: 2 hours	OK
Fall	1m free fall	OK
Air tightness	Soaking in water of 21kpa, 1 hour	NO bubbles

■ Typical Application Circuit

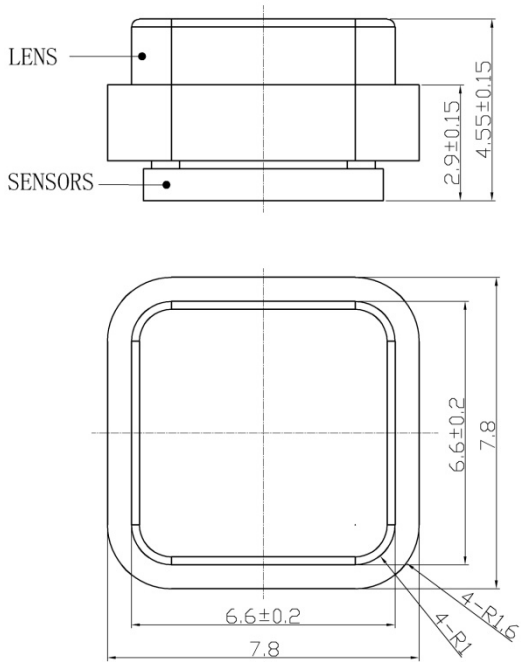


MOS Tube application



Triode application

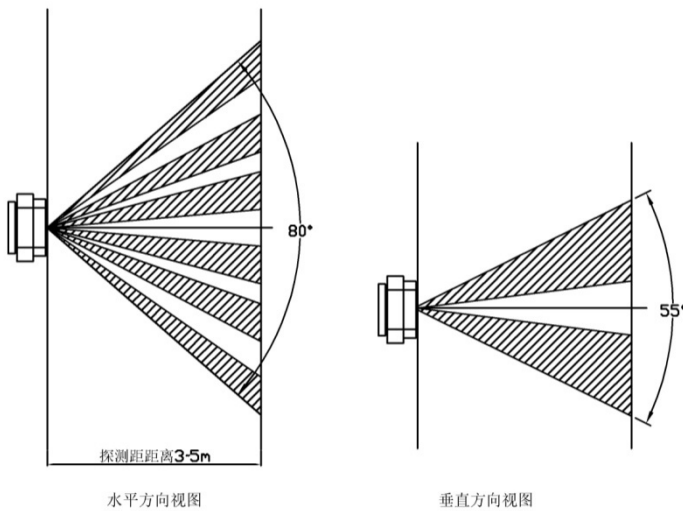
■ Fresnel lens for Mini SMD Digital Pyroelectric Infrared Sensors



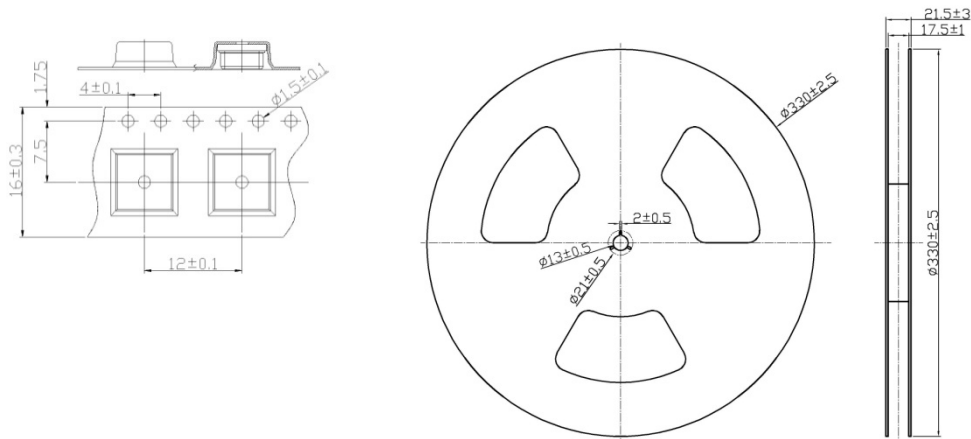
SB-F-011

Unit: mm

■ Field of View (with SB-F-011)



■ Package



Standard package: 1500pcs

■ Directions for Use

- The detection range is influenced by ambient temperature, detection target details, Fresnel lens size, etc.
- There are some sources may make a failure triggering, include small pets, car light, air-condition, etc.
- The welding temperature is 300°C 2-3 seconds.
- Do not touch the window by hand and the hard things directly. Wash by 100% absolute ethanol if need.
- Strong shake and static should be avoided.



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