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Pyroelectric Infrared Radial Sensor



TYPE: BS612

NANYANG SENBA OPTICAL AND ELECTRONIC CO., LTD.

Digital Smart Pyroelectric Detector BS612 is a newest smart digital motion detector with a small window size.



It offers a complete motion detector solution, with all electronic circuitry built into the detector housing. Only a power supply and power-switching components need to be added to make the entire motion switch.

BS612 includes the setting for time, sensitivity and ambient light level.

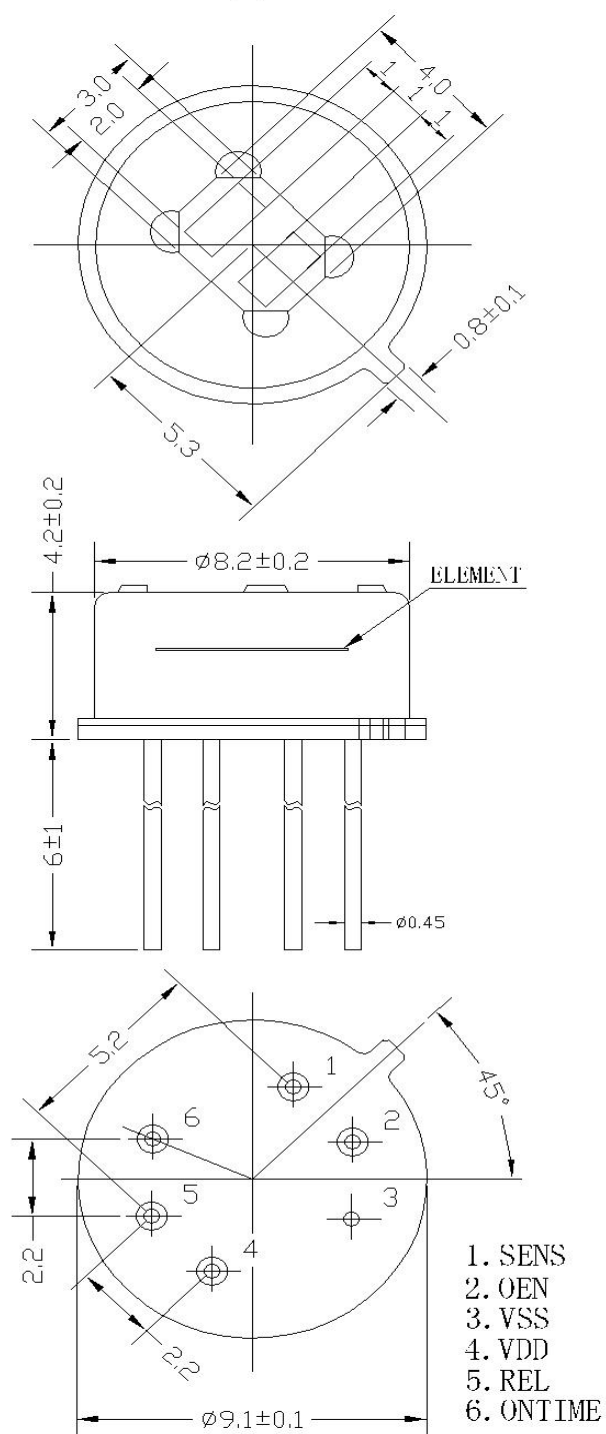
■ Features and Benefits

- Digital signal processing (DSP)
- Power adjustable, save more energy
- Two-way differential high impedance sensor input
- Built-in filter, screen the interference by other frequency
- Excellent power supply rejection, Insensitive to RF interference
- Schmidt REL output
- Low voltage, low power consumption, instantaneous settling after power up

■ Applications

- Toys
- Digital photo frame
- TV, Refrigerator, Air-conditioner
- USB Alarms
- PIR motion detection
- Intruder detection
- Occupancy detection
- Motion sensor lights
- Computer monitor
- Security system
- Automatic control
- Corridor
- Stairs Lights etc.

■ Dimension



PIR Dimension

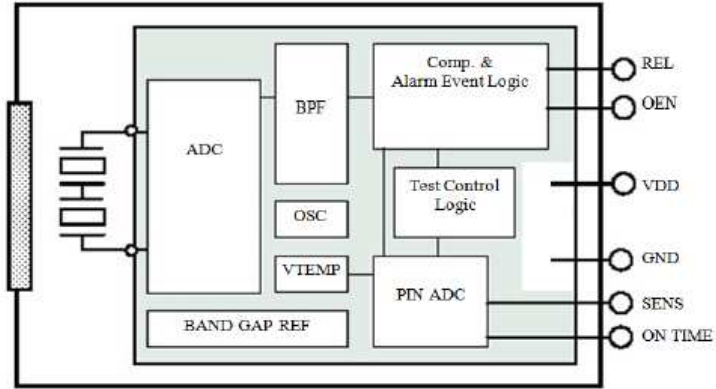
■ Technical Data

1. Maximum Ratings

Characteristic s	Symbo l	Min. Value	Max. Value	Unit	Remarks
Supply Voltage	VDD	-0.3	3.6	V	
Working Temperature	TST	-20	85	°C	
Max.current for pin	Into	-100	100	mA	
Storage Temperature	TST	-40	125	°C	

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

Characteristics	Sym bol	Min.	Typ e	Max.	Unit	Remarks
Supply Voltage	V _{DD}	2.7	3	3.3	V	IR=0.5mA
Working Current	I _{DD}	9	9.5	11	μA	
Sensitivity	V _{SENS}	90		2200	μV	
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		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}	0.8-1.2		0.8	Vdd	
Input High Voltage	V_{IH}	1.2			Vdd	
Input Current	I_I	-1		1	μA	$V_{SS} < V_{IN} < V_{DD}$
Oscillator & Filter						
Low pass filter cut-off frequency				7	Hz	
High pass filter cut-off frequency				0.44	Hz	
Oscillator frequency on Chip	F_{CLK}			64	kHz	
Interior Block Diagram						

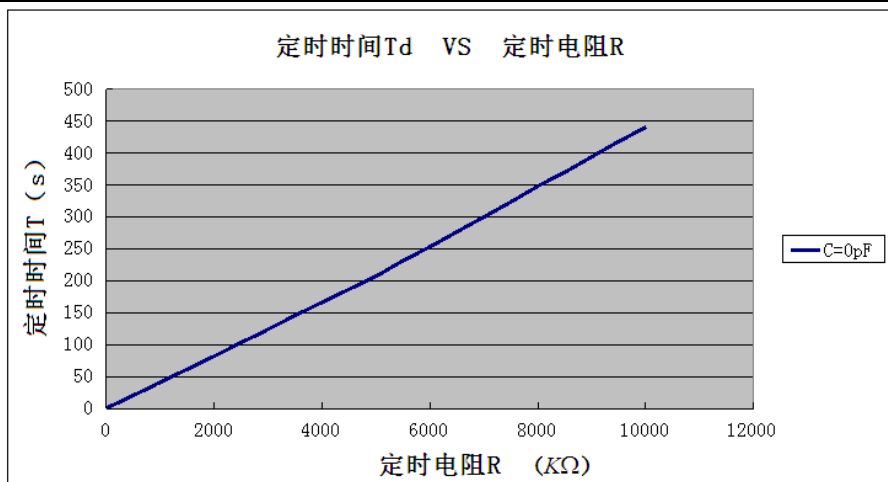
On-time Setting

1. Analog setting style for on-time

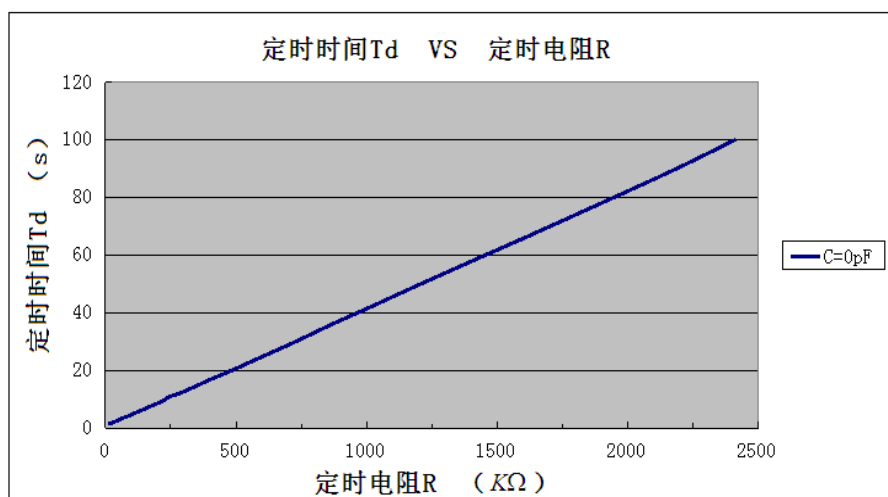
Td: On-time time

R: On-time Resistor

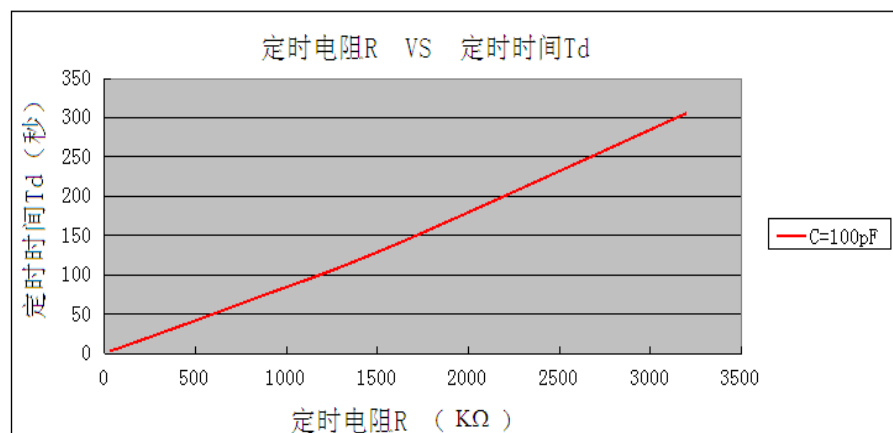
C: On-time Capacitor



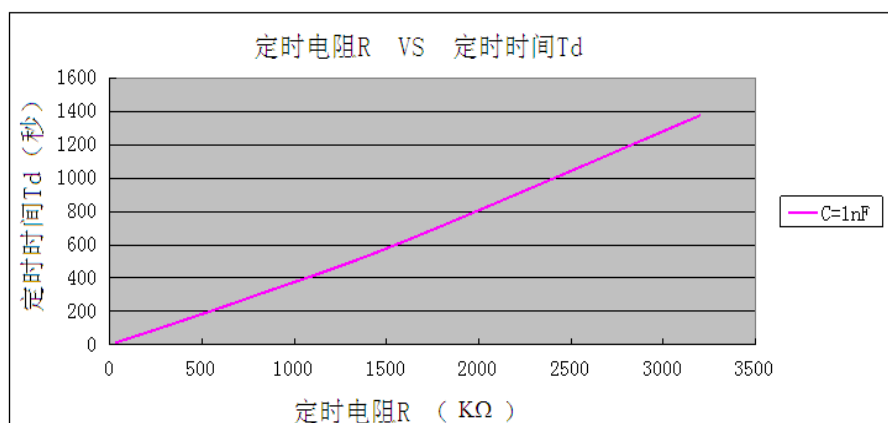
* $C=0pF$



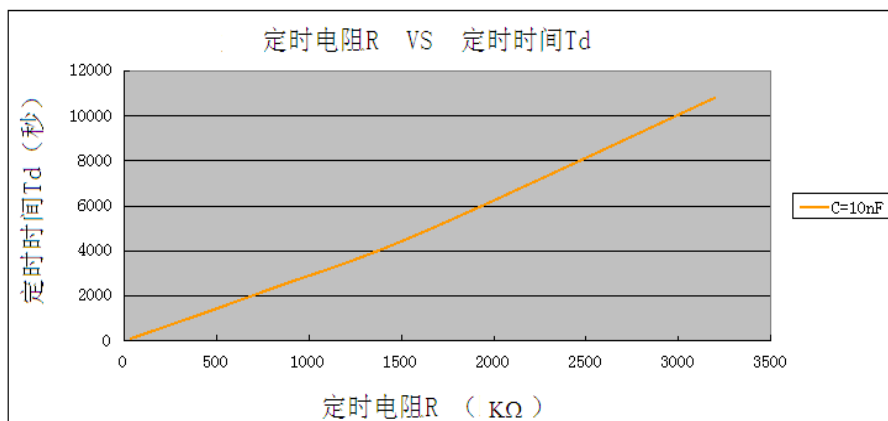
* $C=0pF$



* $C=100pF$



* C=1nF



* C=10nF

2. Digital setting style for on-time

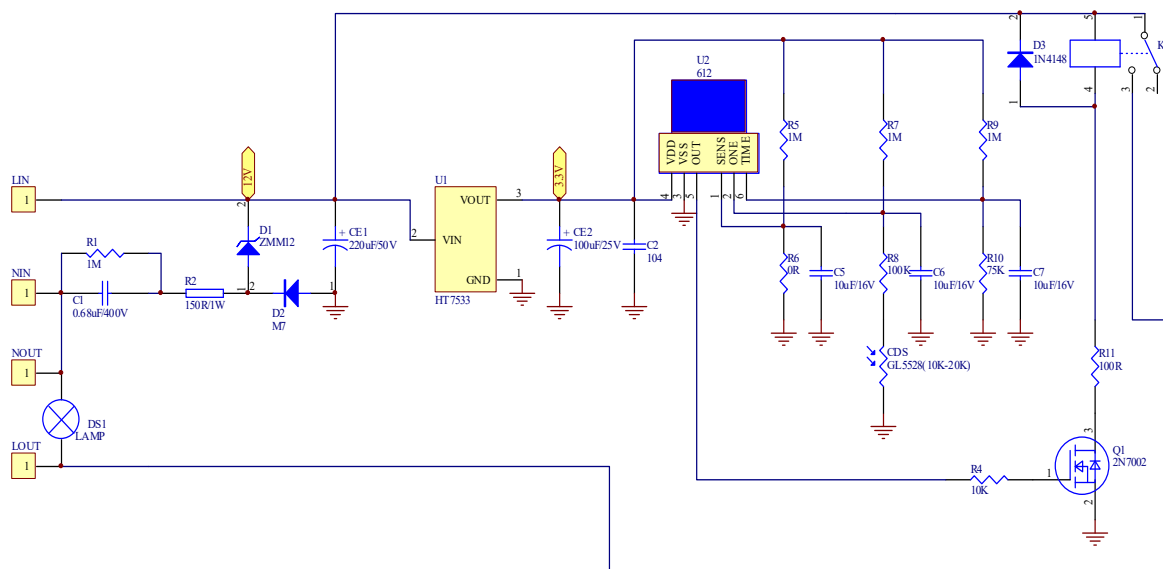
No	On-time Voltage (VDD)	On-time center Voltage (VDD)	Pull-down- Resistor (Ω) (Pull-up=1M)	Time (Td) (sec)
0	0~1/32	1/64	0K	1.8
1	1/32~2/32	3/64	51k	3.6
2	2/32~3/32	5/64	91k	5.4
3	3/32~4/32	7/64	120k	7.2
4	4/32~5/32	9/64	180k	14.4
5	5/32~6/32	11/64	220k	29
6	6/32~7/32	13/64	270k	43
7	7/32~8/32	15/64	330k	58
8	8/32~9/32	17/64	360k	115
9	9/32~10/32	19/64	430k	230
10	10/32~11/32	21/64	510k	346
11	11/32~12/32	23/64	560k	461
12	12/32~13/32	25/64	680k	922
13	13/32~14/32	27/64	750k	1843
14	14/32~15/32	29/64	910k	2765
15	15/32~16/32	31/64	1M	3686

Sensitivity Setting

	V_{SENS}			V_{SENS}	
	Voltage Range (V_{DD})	Center Voltage (V_{DD})		Voltage Range (V_{DD})	Center Voltage (V_{DD})
0	0~1/64	1/128	1 6	16/64~17/64	33/128
1	1/64~2/64	3/128	1 7	17/64~18/64	35/128
2	2/64~3/64	5/128	1 8	18/64~19/64	37/128
3	3/64~4/64	7/128	1 9	19/64~20/64	39/128
4	4/64~5/64	9/128	2 0	20/64~21/64	41/128
5	5/64~6/64	11/128	2 1	21/64~22/64	43/128
6	6/64~7/64	13/128	2 2	22/64~23/64	45/128
7	7/64~8/64	15/128	2 3	23/64~24/64	47/128
8	8/64~9/64	17/128	2 4	24/64~25/64	49/128
9	9/64~10/64	19/128	2 5	25/64~26/64	51/128
10	10/64~11/64	21/128	2 6	26/64~27/64	53/128
11	11/64~12/64	23/128	2 7	27/64~28/64	55/128
12	12/64~13/64	25/128	2 8	28/64~29/64	57/128

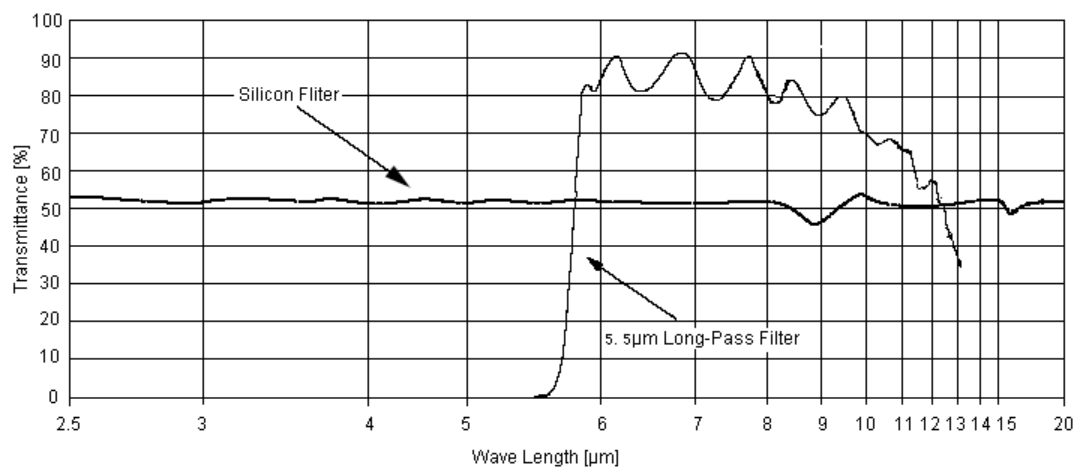


■ Typical Application



Notes: The circuit design for PIR Sensor BS612 .

■ Spectral Response of Window Materials



Notes: The average transitivity curve for silicon filter with 5.5μm pass IR filter