Pyroelectric Infrared Radial Sensor

TYPE: BM612

SENBA SENSING TECHNOLOGY CO., LTD

Digital Smart Pyroelectric Detector BM612

BM612 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.

BL612 includes the setting for time, sensitivity and ALbient light level.

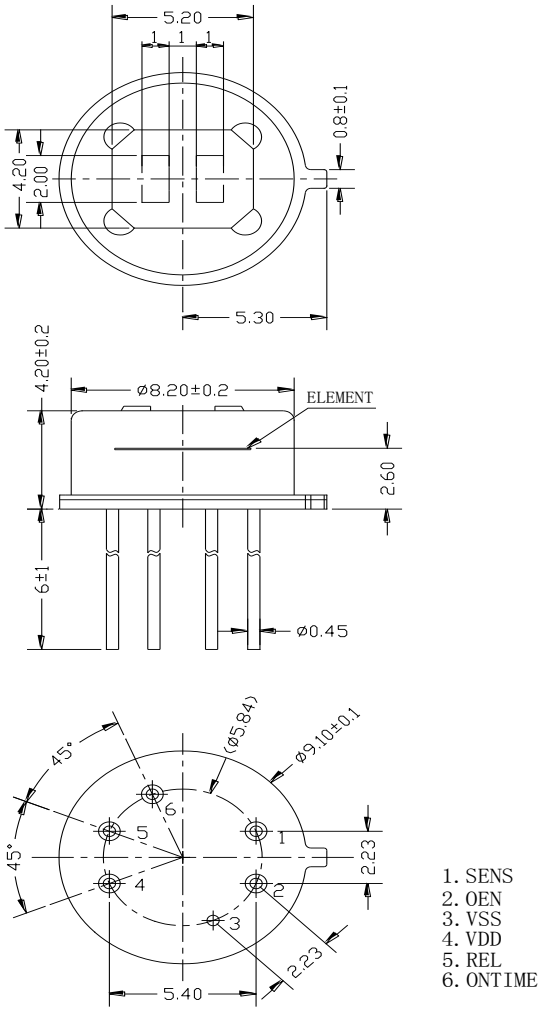
■ Features and Benefits

- 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

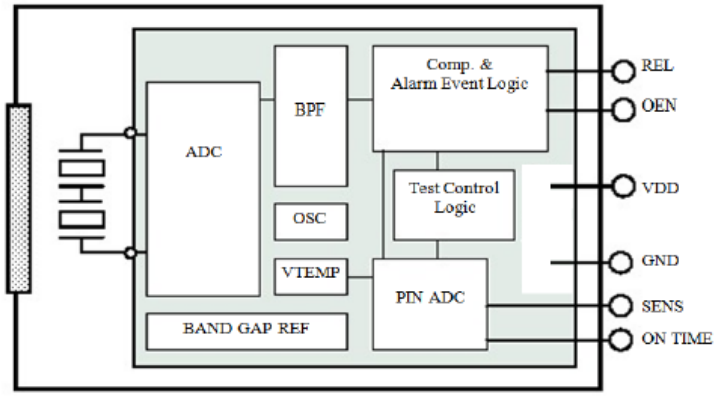
■ Technical Data

1. Maximum Ratings

Characteristics	Symbol	Min. Value	Max. Value	Unit	Remarks
Supply Voltage	V_{DD}	-0.3	3.6	V	
Working Temperature	T_{ST}	-20	85	˚C	
Max.current for pin	Into	-100	100	mA	
Storage Temperature	T_{ST}	-40	125	˚C	

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

Characteristics	Symbol	Min.	Type	Max.	Unit	Remarks
Supply Voltage	V_{DD}	2.2	3	3.7	V	IR=0.5mA
Working Current	I_{DD}	9	9.5	11	μA	
Sensitivity	V_{SENS}	90		2000	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		4793	s	
SENS/ONTIME						
Input voltage		0		V_{DD}	V	0V to V_{DD}/2
Input Bias Current		-1		1	μA	
OEN						
Input Low Voltage	V_{IL}	0.8V-1.2VEnable area		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	

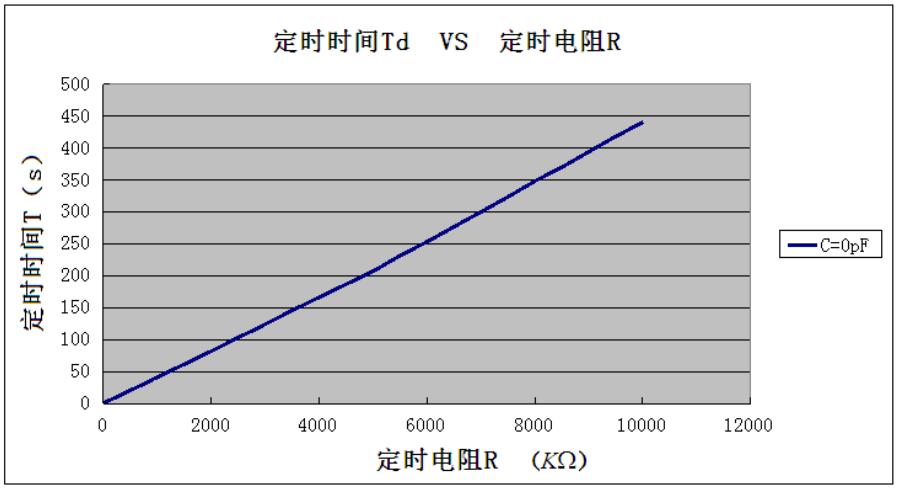
■ Ontime Setting

1. Analog setting style for on-time

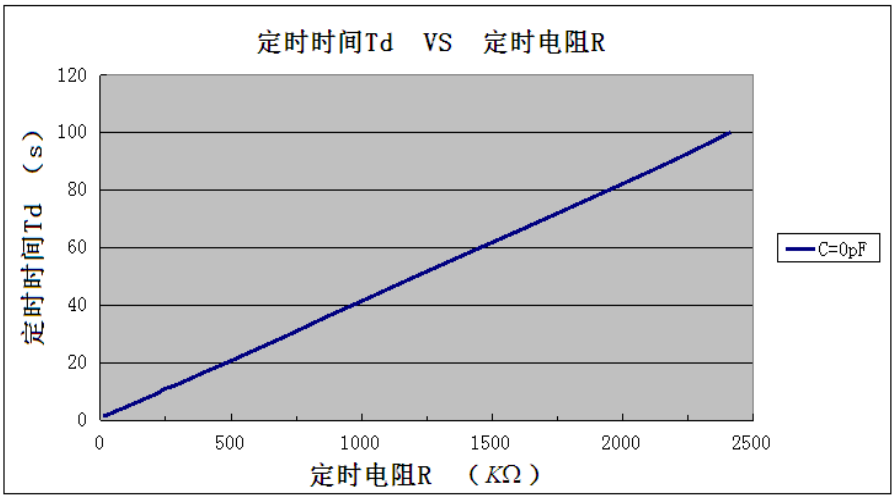
Td: On-time time

R: On-time Resistor

C: On-time Capacitor



*** C=0pF**



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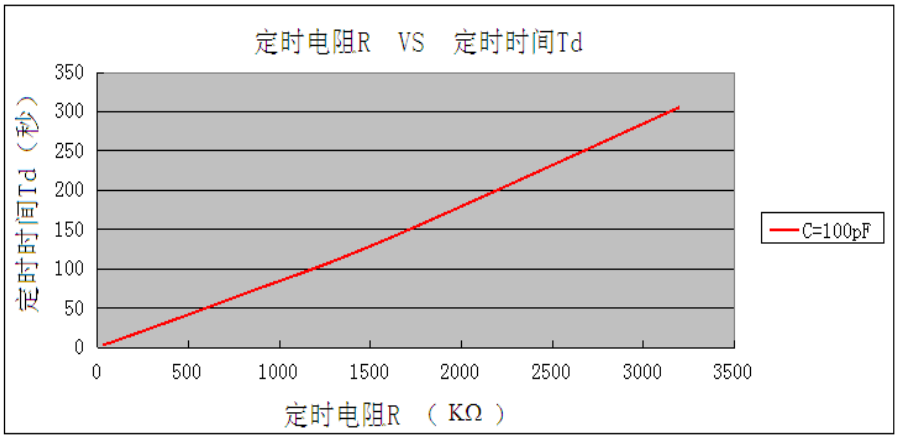

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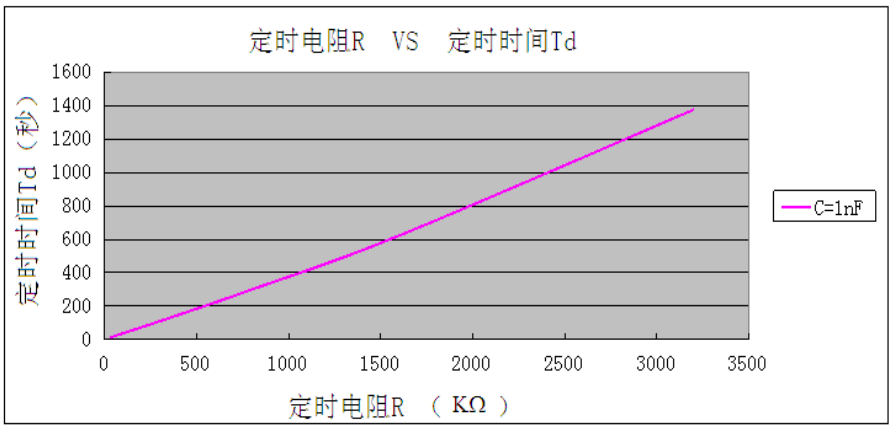

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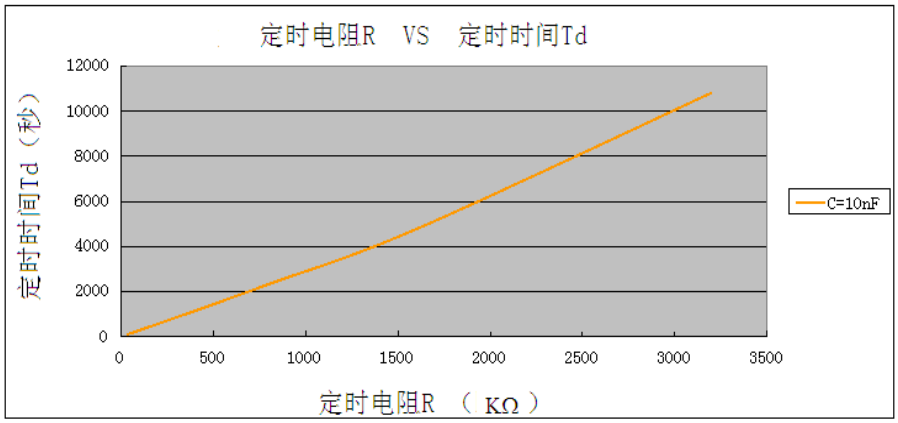


*** C=10npF**

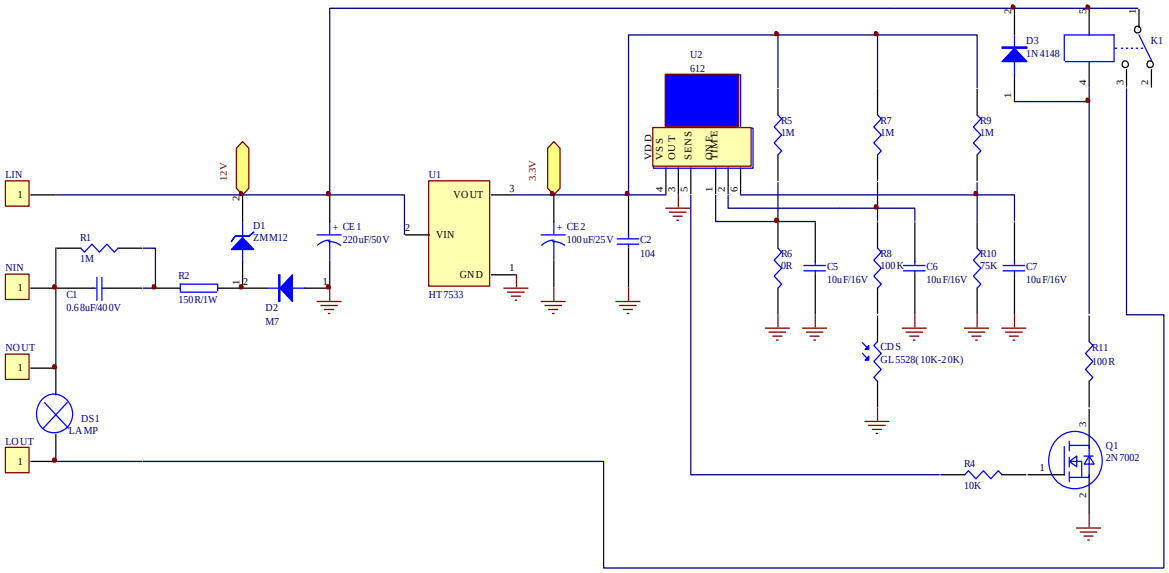
2. Digital setting style for on-time

No	Time (Td) （sec）(典型值)	On-time Voltage （VDD）	On-time center Voltage（VDD）	Pull-down- Resistor (Ω) (Pull-up=1M)	
				上拉电阻 RH	下拉电阻 RL
1	2	0~1/32VDD	1/64VDD	不贴/1M	0R
2	5	1/32VDD~2/32VDD	3/64VDD	1M	51K
3	10	2/32VDD~3/32VDD	5/64VDD	1M	82K
4	15	3/32VDD~4/32VDD	7/64VDD	1M	124K
5	20	4/32VDD~5/32VDD	9/64VDD	1M	165K
6	30	5/32VDD~6/32VDD	11/64VDD	1M	210K
7	45	6/32VDD~7/32VDD	13/64VDD	1M	255K
8	60	7/32VDD~8/32VDD	15/64VDD	1M	309K
9	90	8/32VDD~9/32VDD	17/64VDD	1M	360K
10	120	9/32VDD~10/32VDD	19/64VDD	1M	422K
11	180	10/32VDD~11/32VDD	21/64VDD	1M	487K
12	300	11/32VDD~12/32VDD	23/64VDD	1M	560K
13	600	12/32VDD~13/32VDD	25/64VDD	1M	634K
14	900	13/32VDD~14/32VDD	27/64VDD	1M	732K
15	1800	14/32VDD~16/32VDD	29/64VDD	1M	825K
16	3600	15/32VDD~16/32VDD	31/64VDD	1M	953K

■ Sensitivity Setting

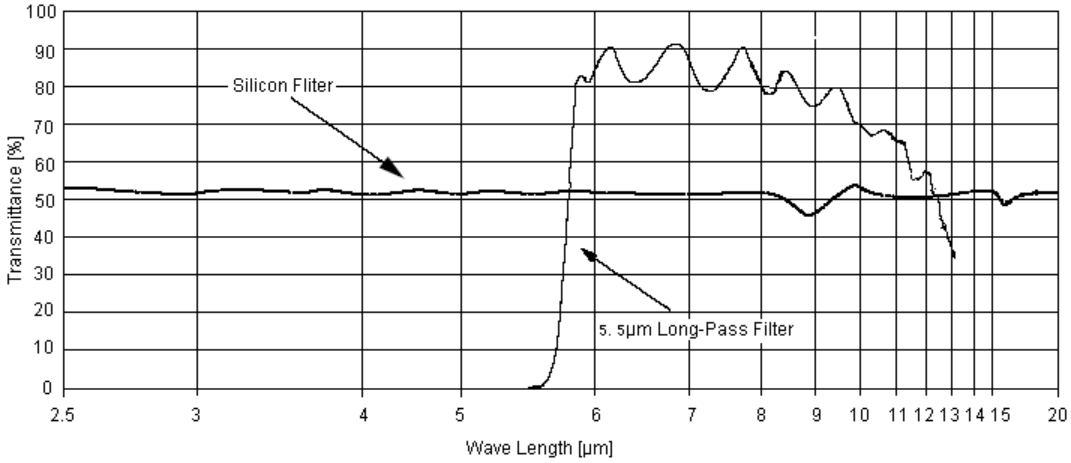
	V_{SENS}			V_{SENS}	
	Voltage Range (V_{DD})	Center Voltage (V_{DD})		Voltage Range (V_{DD})	Center Voltage (V_{DD})
0	0~1/64	1/128	16	16/64~17/64	33/128
1	1/64~2/64	3/128	17	17/64~18/64	35/128
2	2/64~3/64	5/128	18	18/64~19/64	37/128
3	3/64~4/64	7/128	19	19/64~20/64	39/128
4	4/64~5/64	9/128	20	20/64~21/64	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

■ Typical Application



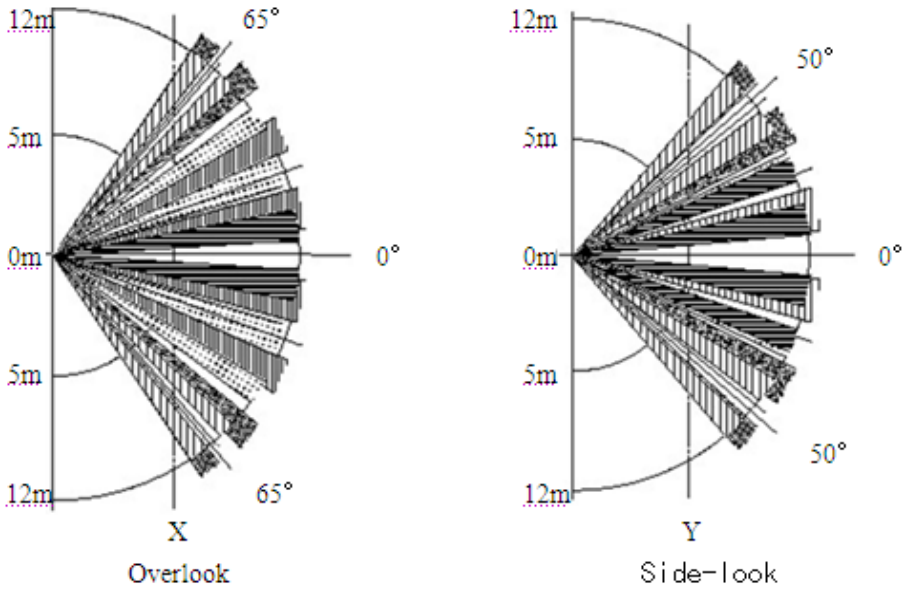
Notes: The circuit design for PIR Sensor BM612 .

■ Spectral Response of Window Materials

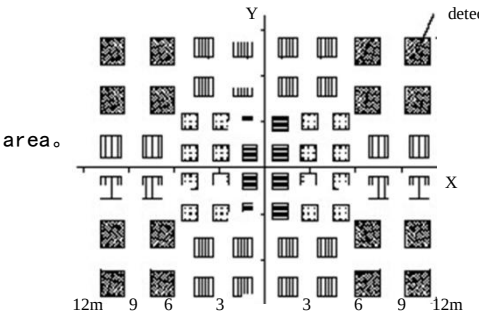


Notes: The average transitivity curve for silicon filter with 5.5μm pass IR filter

■ Detection View



X-Y sectional view



Notes: 1. X-Y sectional view represent the detecting area。

2. Objects with temperature difference can be Detected in the vertical level.

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