



Pyroelectric Infrared Radial Sensor

**TYPE: BS412
NANYANG SENBA OPTICAL AND ELECTRONIC CO., LTD.**

Digital Smart Pyroelectric Detector BS412

BS412 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.

BS412 includes the time setting only.

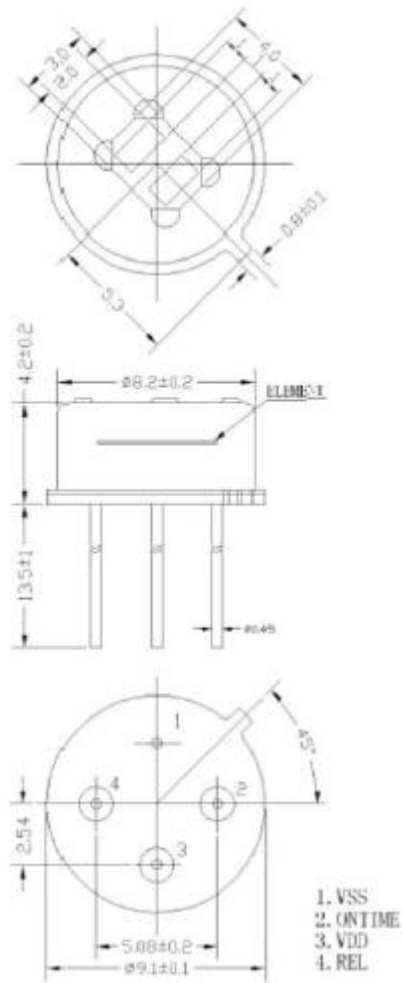
■ Features and Benefits

- Digital signal processing (DSP)
- Power adjustable, save more energy
- Two-way differential high impedance sensor input and temperature compensation
- Built-in filter, screen the interference by other frequency
- Excellent power supply rejection, Insensitive to RF interference
- Schmidt REL output

■ Application

- Intelligent appliance
- Alarms
- Motion detector
- Sensor lamp, Sensor switch
- Security system
- Automatic control etc.

■ Dimension



■ Technical Data

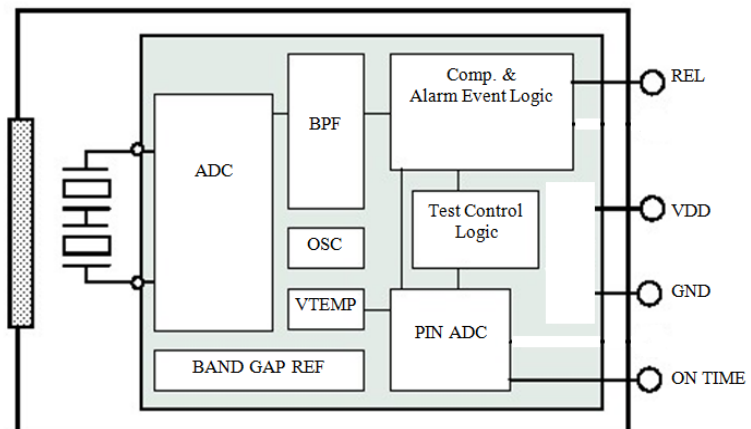
1. Maximum Ratings

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, V_{DD}=3V, Except other requirements)

Characteristics	Symbol	Min.	Type	Max.	Unit	Remarks
Supply Voltage	V _{DD}	2.0	3	3.3	V	IR=0.5mA
Working Current	I _{DD}	9	9.5	11	μA	
Sensitivity	V _{SENS}		90		μA	
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		3600	s	
ONTIME						
Input voltage		0		V _{DD}	V	0V to ¼ V _{DD}
Input Bias Current		-1		1	μA	
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



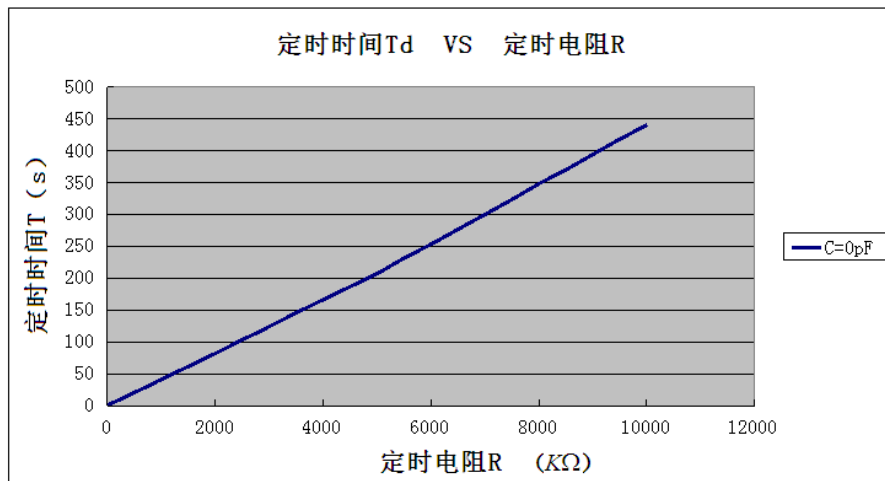
■ On-time Setting

1. Analog setting style for on-time

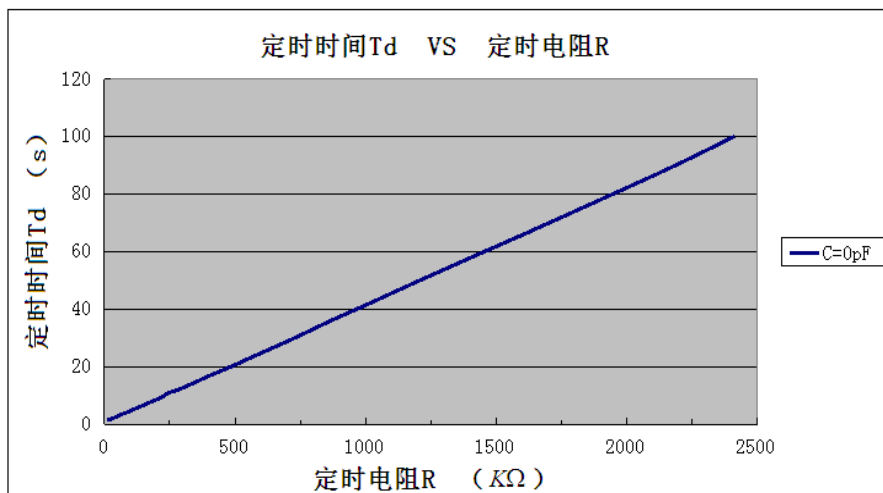
Td: On-time time

R: On-time Resistor

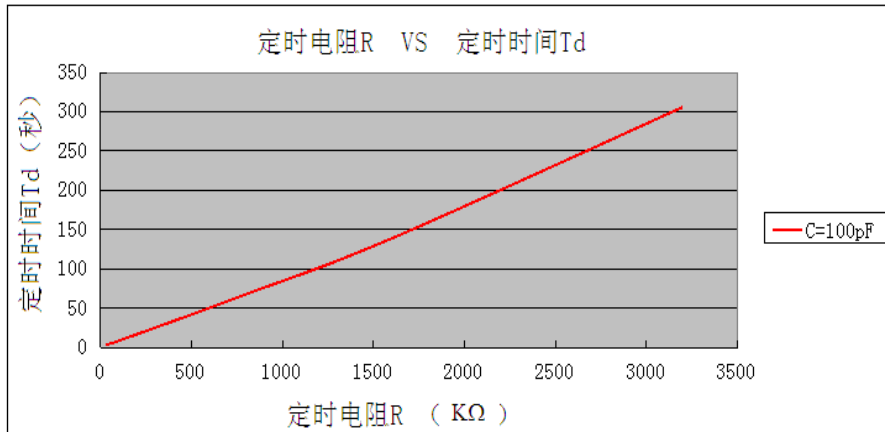
C: On-time Capacitor



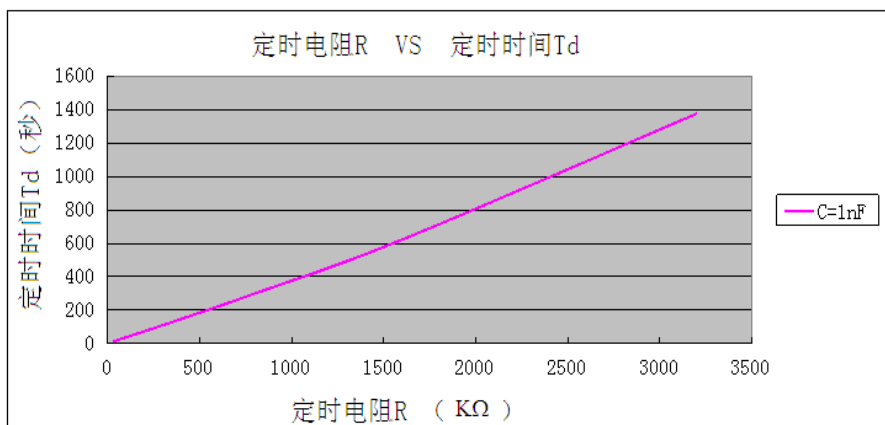
* C=0pF



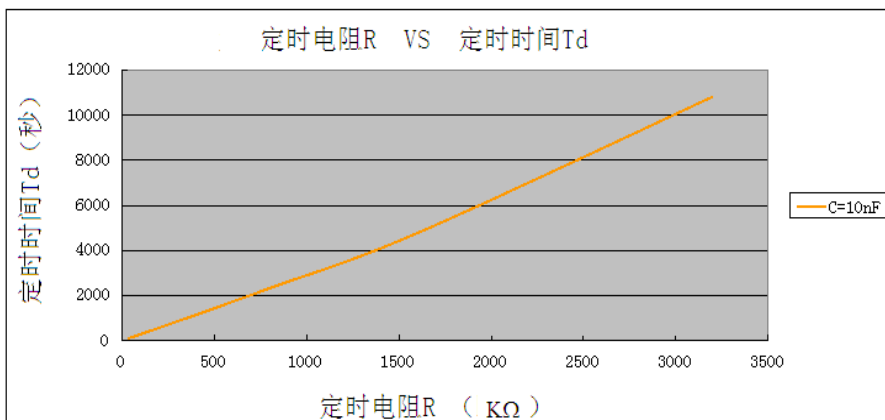
* C=0pF



* **C=100pF**



* **C=1nF**



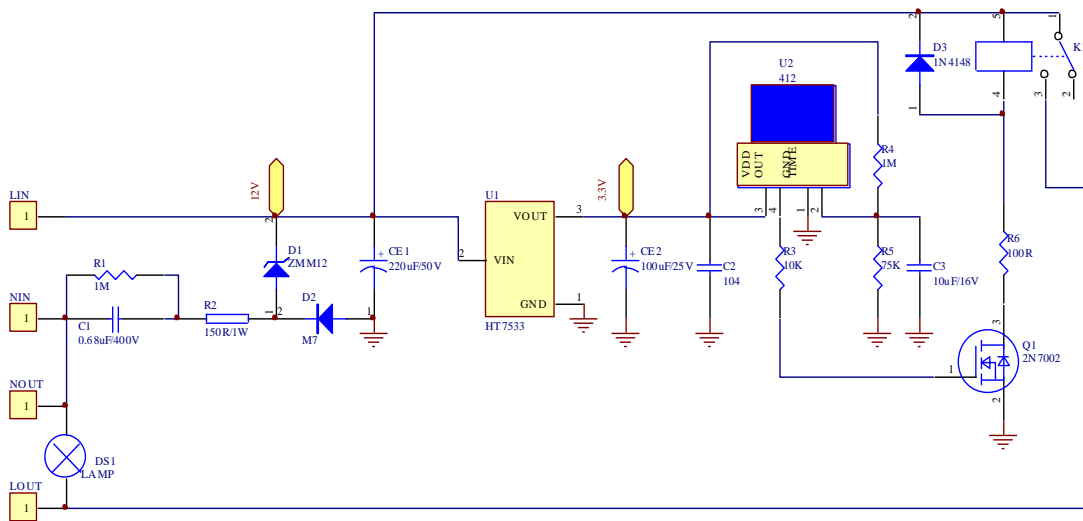
* **C=10nF**



2. Digital setting style for on-time

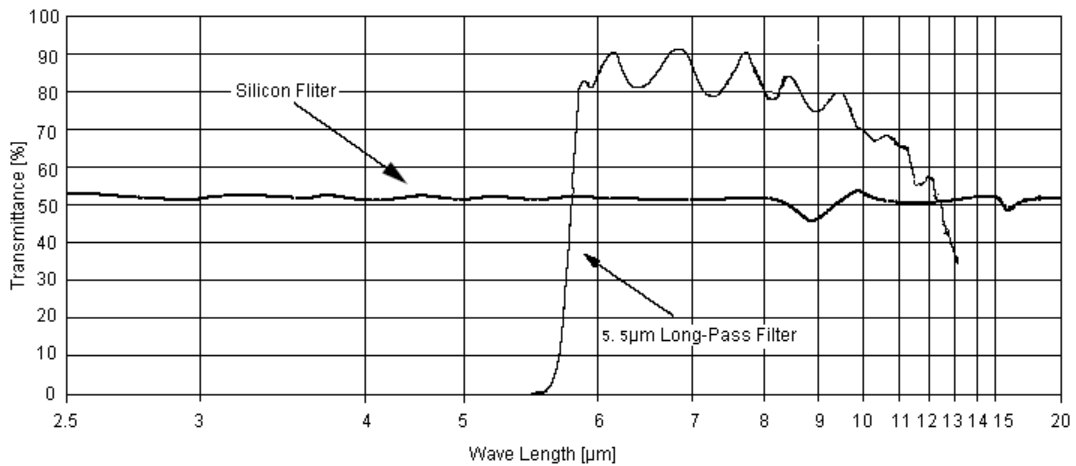
No	On-time Voltage (VDD)	On-time center Voltage (VDD)	Pull-down- Resistor (Ω) (Pull-up=1M)	Time (Td) (sec)
0	0~1/32VDD	1/64VDD	0R	2
1	1/32VDD~2/32VDD	3/64VDD	51K	5
2	2/32VDD~3/32VDD	5/64VDD	82K	10
3	3/32VDD~4/32VDD	7/64VDD	124K	15
4	4/32VDD~5/32VDD	9/64VDD	165K	20
5	5/32VDD~6/32VDD	11/64VDD	210K	30
6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

■ Typical Application



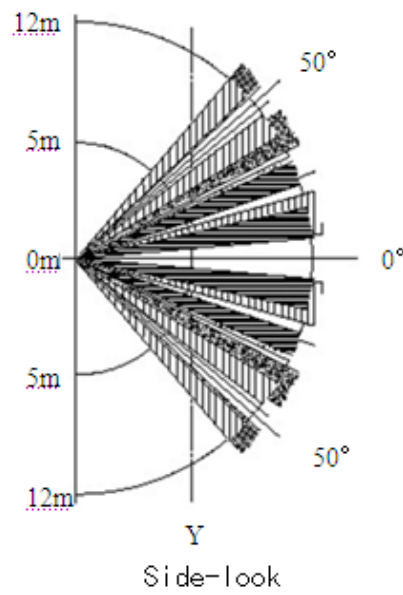
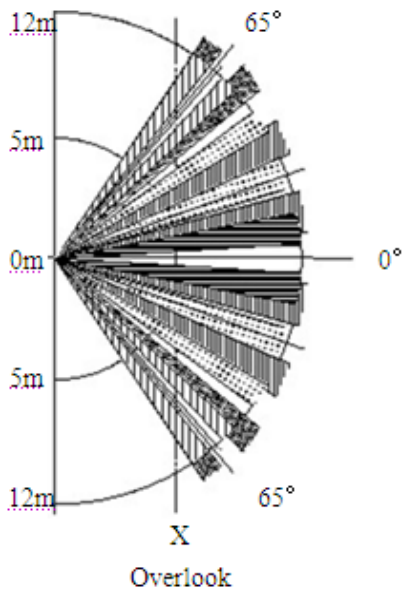
Notes: The circuit design for PIR Sensor BS412 .

■ Spectral Response of Window Materials

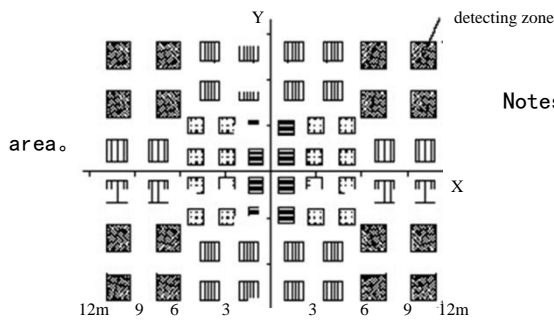


Notes: The average transitivity curve for silicon filter with 5.5μm pass IR filter

■ 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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