

PIR CONTROLLER

M7612

PIR CONTROLLER

GENERAL DESCRIPTION

The M7612 is a PIR (passive infra-red) controller , using analog mixing digital design technique and manufactures by CMOS Process which can either drive TRIAC or RELAY depending on user's choice. With special noise immunity technique , M7612 is the most stable PIR controller you can find on the market. More than this , there are few components needed in its application circuit which can reduce material cost and increase competitive.

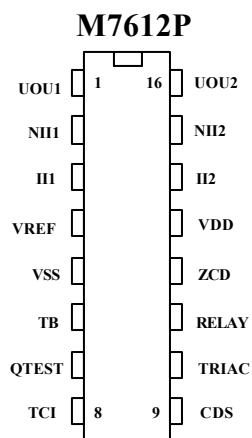
FEATURES

- High noise immunity.
- Drive either RELAY or TRIAC.
- Adjustable light on duration.
- TRIAC can be either shunt or serial connected.
- PIR input.
- CDS input.
- Auto change on / auto mode by bonding option.
- 16 pin DIP or SOP package.

APPLICATIONS

PIR light controller, Motion Detector, Alarm system, Auto-door bell.

PIN ASSIGNMENT



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PIN DESCRIPTION

Pin No	Pin Name	Description
1	UOU1	First stage OP amp output.
2	NII1	First stage OP amp positive input.
3	II1	First stage OP amp negative input.
4	VREF	Stable reference voltage.
5	VSS	System ground.
6	TB	Time base for: The delay time of receiving PIR signal to sent a pulse to trigger TRIAC or a high signal to trigger relay. The delay time = $R * C * 32$. The PIR signal patented and accepted only if the signal cycle greater than $R * C * 768$. When state of RELAY or TRIAC is changing form active into inactive mode. It takes more than $R * C * 4069$, then system is able to receive PIR signal again. $10K < R < 1M \text{ Ohm}$ $100p \text{ F} < C < 0.1\mu\text{f}$ (Reference Diagram 1)
7	QTEST	For testing only.
8	TCI	To set up the timing of how long TRIAC or RELAY is active. During the period, if the system receives the PIR signal, then it restarts counting the timing again. The flash cycle show the beginning of auto mode. Note:width of TRIAC pulse = $R * C * 2$ Flash cycle: $R * C * 32768$ The range for R: $4.7K < R < 1M \text{ Ohm}$ $C:100pF < C < 0.1\mu\text{F}$ (Reference Diagram 2)
9	CDS	Connected to a CDS for inhibiting RELAY or TRIAC being triggered. If TRIAC or RELAY has already being triggered by PIR signal and turned into activemode, then CDS can not inhibit PIR again.
10	TRAIC	To trigger TRIAC, active low. Sink current: 15 mA max.
11	RELAY	To drive relay, active high. Sink current:10 mA max. Source current:10 mA max.
12	ZCD	Detect zero cross of AC line under remote mode function.
13	VDD	Operation voltage:5V, stand by current: 0.5 mA
14	II2	2 nd stage OP amp negative input.
15	NII2	2 nd stage OP amp positive input.
16	UOU2	2 nd stage OP amp output.

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DIAGRAM 1

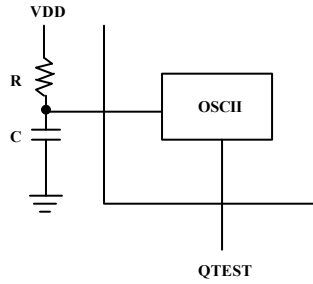
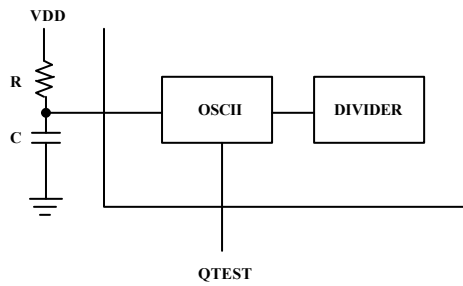
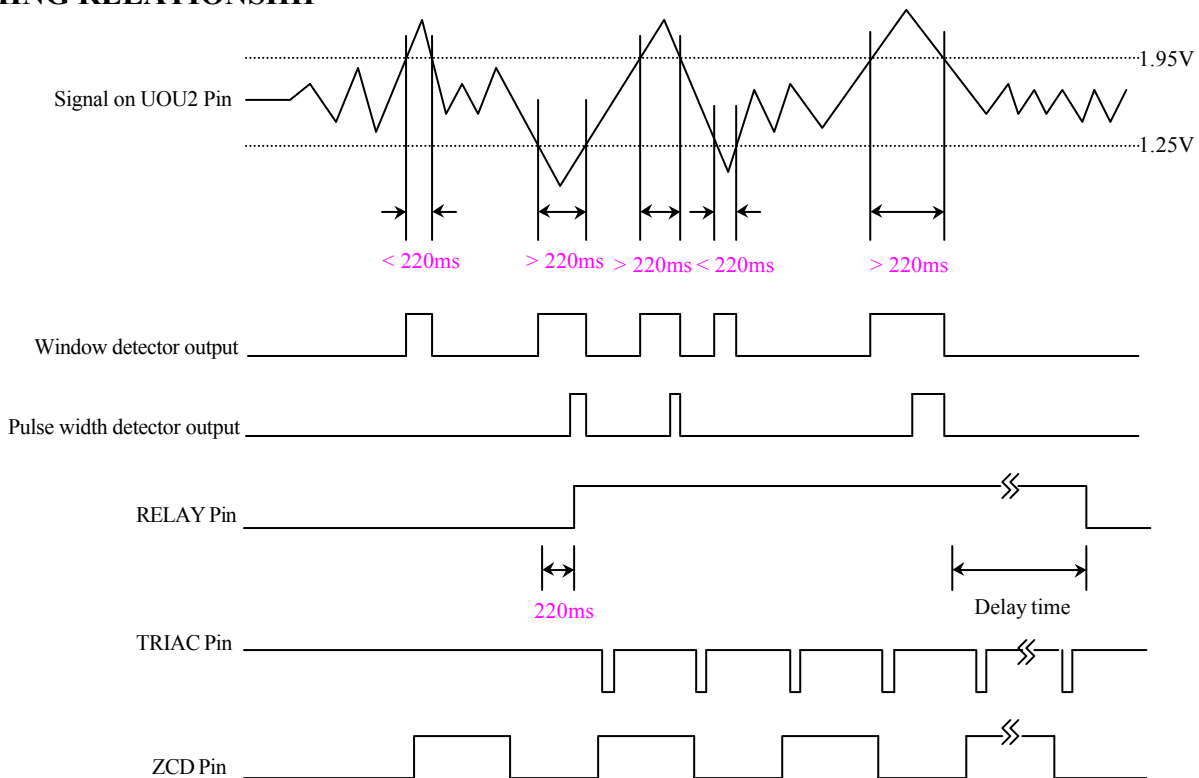


DIAGRAM 2



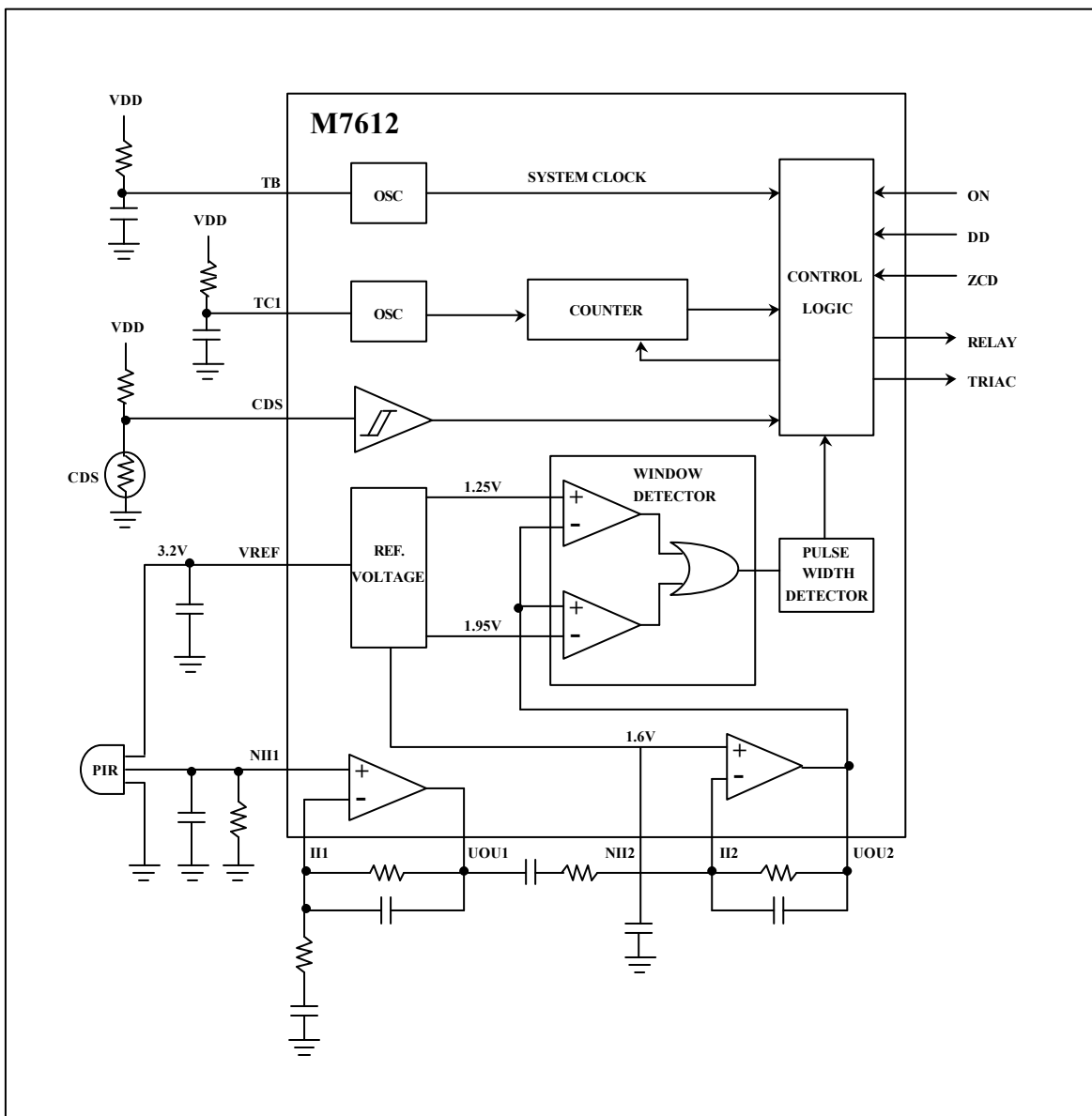
TIMING RELATIONSHIP



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BLOCK DIAGRAM



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SHENZHEN SALENS TECHNOLOGY PIR CONTROLLER

ABSOLUTE MAXIMUM RATING

(TA=25)

Parameter	Sym.	Rating	Unit
Power Supply V_{DD} With Respect to V_{SS}	$V_{DD} - V_{SS}$	5.6	V
Voltage On Any Pin		-0.3 to 5.6	V
Operating Temperature	Top	-20 to 70	
Storage Temperature		-65 to 150	

ELECTRICAL CHARACTERISTICS

Characteristics	Sym.	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	V_{DD}	4.2	5	5.5	V	
Stand by Current	I_{ST}	0.9	1.0	1.2	mA	
Operating Current	I_{DD}	1.8	—	2.5	mA	1.8mA , TRIAC / 2.5mA , RELAY
Stable Voltage	V_{REF}	3.0	3.2	3.4	V	$V_{DD} > 4.2V$
Source Current of V_{REF}	I_{REF}	200	—	—	uA	
Ripple of V_{REF}		—	—	0.5	mV	
Input and Output Regulation of V_{REF}		—	—	0.3%		
Time Base Operating Frequency	F_{TB}	15	16	17	KHz	
CDS Operating Trigger	V_{T+}	1.3	1.7	2.1	V	
CDS Operating Trigger	V_{T-}	0.6	0.9	1.1	V	
CDS Source Current	I_{CDS}	2.6	3.5	4.4	uA	
CDS Output Source Current	I_{SOURCE}	9	10.4	17.4	mA	
CDS Output Sink Current	I_{SINK}	11.6	13	21	mA	
Timer Duration of Out 1	T_{OUT1}	10	—	1300	SEC	C=0.01uF , R=4.7K-1M
		0.1	—	13		C=100pF , R=4.7K-1M
Relay Source Current	I_{RS}	—	—	10	mA	
Relay Sink Current	I_{RSINK}	—	—	10	mA	
Relay Operating Voltage	V_{RO}	13.1	—	18.8	V	
TRIAC Sink Current	I_{TSINK}	—	—	15	mA	
TRIAC Source Current	$I_{TSOURCE}$	—	—	50	uA	

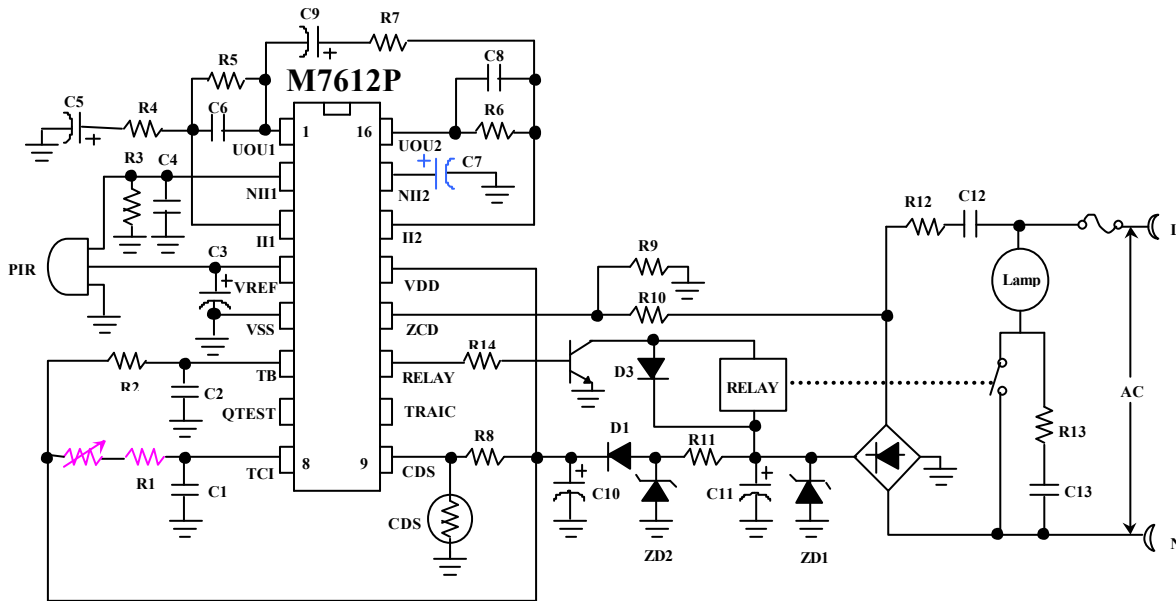
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ELECTRICAL CHARACTERISTICS

RELAY APPLICATION



C1	0.01uF	VR1	1M	R13	100ohm 1/2W
C2	100pF	R1	4.7K	R14	5.6K
C3	100uF	R2	620K	D1	1N4001
C4	0.01uF	R3	47K	D3	1N4148
C5	33uF	R4	15K	ZD1	12V
C6	0.1uF	R5	820K	ZD2	5.6V
C7	47uF	R6	560K		
C8	0.047uF	R7	15K		
C9	47uF	R8	51K		
C10	100uF/10V	R9	470K		
C11	220uF/25V	R10	1M		
C12	0.47uF/400~600V	R11	2.4K		
C13	0.047uF/400~600V	R12	47ohm 1/2W		

M7612 TCI PIN The relation of capacity,resistance and delay time

capacity	resistance	frequency	delay time(second)
103	4.7K	40KHz	10
103	10K	20KHz	16
103	20K	10KHz	28
103	100K	2KHz	130
103	200K	0.8KHz	260
103	1M	0.2KHz	1300

Note :

- (1) To adjust delay time , change VR1 value. (VR1=1M , delay time is about 10 sec)
- (2) For different CDS , R8 value should be adjusted.

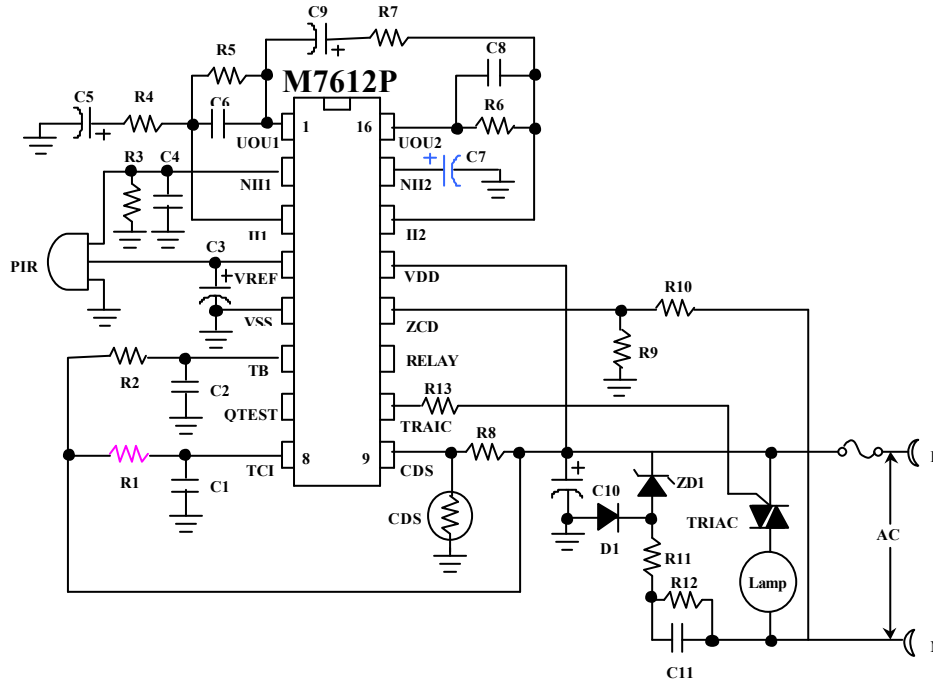
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TRIAC APPLICATION

(A)



C1	0.01uF	R1	見附表
C2	100pF	R2	620K
C3	100uF	R3	47K
C4	0.01uF	R4	15K
C5	33uF	R5	820K
C6	0.1uF	R6	560K
C7	47uF	R7	15K
C8	0.047uF	R8	51K
C9	47uF	R9	470K
C10	100uF/10V	R10	1M
C11	0.1uF/400~600V	R11	47 ohm 1/2W
D1	1N4004	R12	100K
ZD1	5.6V	R13	330 ohm

M7612 TCI PIN The relation of capacity, resistance and delay time

capacity	resistance	frequency	delay time(second)
103	4.7K	40KHz	10
103	10K	20KHz	16
103	20K	10KHz	28
103	100K	2KHz	130
103	200K	0.8KHz	260
103	1M	0.2KHz	1300

Note :

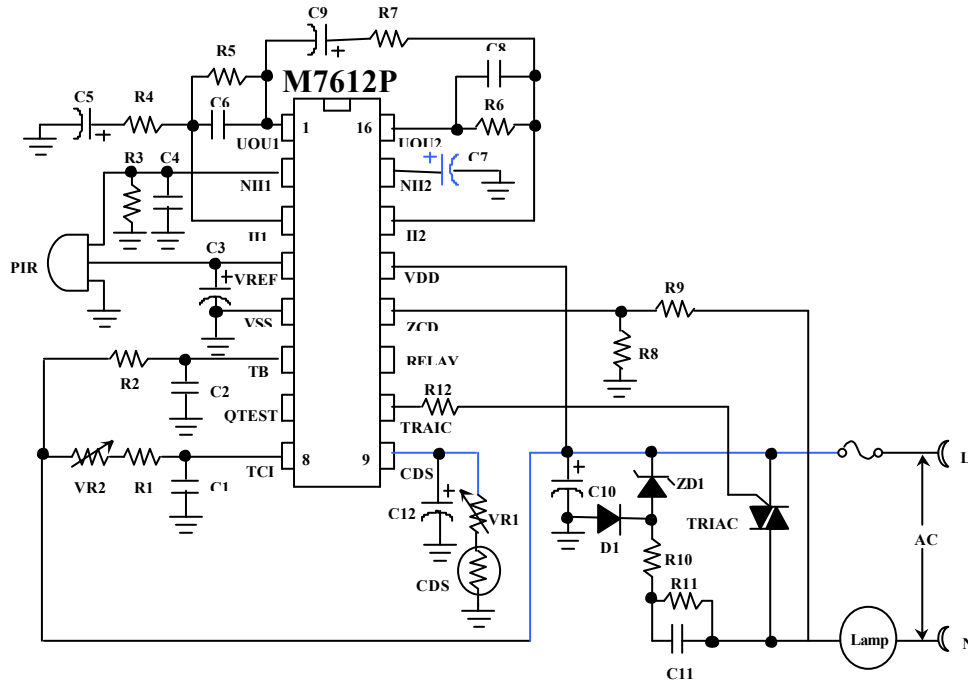
- (1) To adjust delay time , change R1 value. (Delay time is about 10 sec)
- (2) For different CDS , R8 value should be adjusted.

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(B) 應用二



C1	0.01uF	VR1	1M
C2	100pF	VR2	1M
C3	100uF / 16V	R1	4.7K
C4	0.01uF	R2	620K
C5	220uF / 10V	R3	47K
C6	0.1uF	R4	47K
C7	22uF / 16V	R5	220K
C8	683 pF	R6	470K
C9	47uF / 16V	R7	56K
C10	470uF / 16V	R8	800K
C11	0.15uF / 400~600V	R9	720K
C12	1uF / 50V	R10	47ohm 1/2W
D1	1N4007	R11	100K
ZD1	6.2V	R12	100 ohm

capacity	resistance	frequency	delay time(second)
103	4.7K	40KHz	10
103	10K	20KHz	16
103	20K	10KHz	28
103	100K	2KHz	130
103	200K	0.8KHz	260
103	1M	0.2KHz	1300

Note :

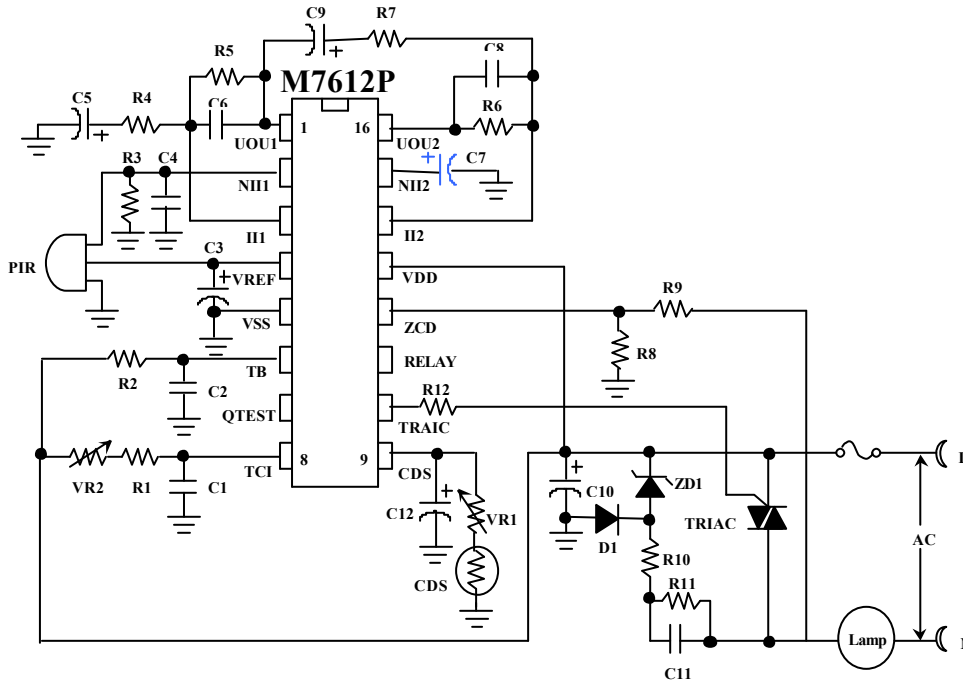
- (1) To adjust delay time , change VR2 value. (VR2=1M , delay time is about 10 sec)
- (2) For different CDS , VR1 value should be adjusted.
- (3) Distance = 4m.

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(C) 應用三



C1	0.01uF	VR1	1M
C2	100pF	VR2	1M
C3	100uF / 16V	R1	4.7K
C4	0.01uF	R2	620K
C5	33uF / 16V	R3	47K
C6	0.033uF	R4	15K
C7	22uF / 16V	R5	820K
C8	0.033 uF	R6	820K
C9	33uF / 16V	R7	15K
C10	470uF / 16V	R8	800K
C11	0.33uF / 400~600V	R9	720K
C12	1uF / 50V	R10	47 ohm 1/2W
D1	1N4007	R11	100K
ZD1	6.2V	R12	100 ohm

capacity	resistance	frequency	delay time(second)
103	4.7K	40KHz	10
103	10K	20KHz	16
103	20K	10KHz	28
103	100K	2KHz	130
103	200K	0.8KHz	260
103	1M	0.2KHz	1300

Note

- (1) To adjust delay time, change VR2 value. (VR2=1M, delay time is about 10 sec)
- (2) For different CDS, VR1 value should be adjusted.
- (3) Distance = 8m.

* All specs and applications shown above subject to change without prior notice.