PIR Controller IC Specification

GENERAL DESCRIPTION

The PIR0002 IC is a CMOS chip designed to PIR controller IC. It can use PHOTO transistor or CDS application. The chip is equipped with amplifiers, comparator, timer, control circuits, system oscillator, and output timing oscillator. Its PIR sensor detects infrared power variation induced by the motion of a human body and transforms it to a voltage variation. If PIR output voltage variation conforms to the criteria, then the lamp is turned on with an adjustable duration.

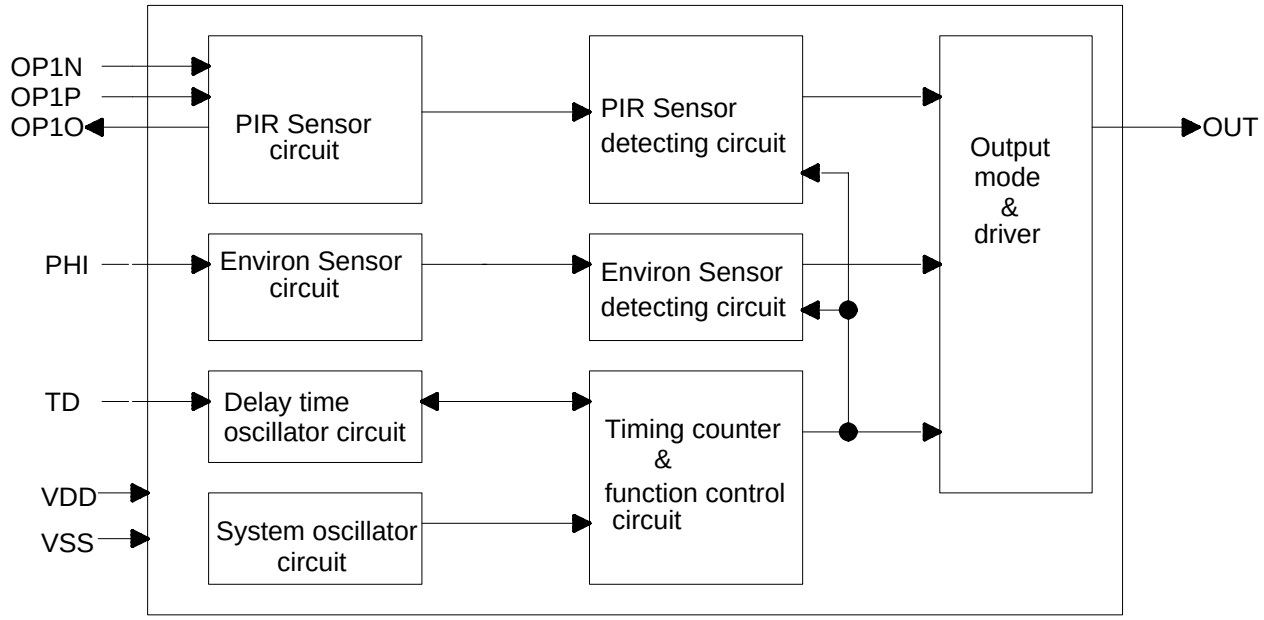
FEATURES

- Operating voltage 2.6V~5.5V
- Built-in 16Khz oscillator for system clock
- Operating current @VDD=4.5V, no load standby current< 20uA
- Provides **PHOTO** or **CDS** sensor detect environment **Day_time** or **Night_time**.
- Provide **Turn_on_delay_time** depend on TD pin RC timer 3 sec～220 sec
- After power-on have typical 1 sec stable time and 16 sec warm up time after stable time. The warm up time will recount when **PIR active.**
- When lamp turn on change to turn off, then disable PIR 1sec

APPLICATION

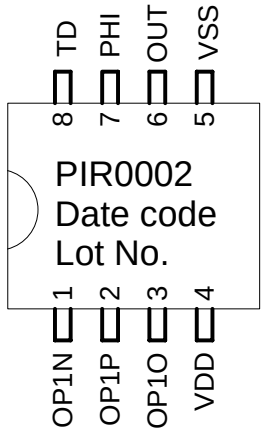
- Wide consumer products

BLOCK DIAGRAM



PACKAGE LIST

PIR0002A : DIP 8 pin
PIR0002B : SOP 8 pin



PAD DESCRIPTION

Pad No.	Pad Name	I/O Type	Pad Description
1	OP1N	I	PIR first OP AMP(-) input pin
2	OP1P	I	PIR first OP AMP(+), 0.4VDD voltage input pin
3	OP1O	O	PIR first OP AMP (out) output pin
4	VDD	P	Positive power supply, power pin
5	VSS	P	Negative power supply, ground
6	OUT	O	CMOS output pin, active high
7	PHI	I	Detect environment sensor input pin. If PHI short to VDD, don't judge environment to keep **Night_time**
8	TD	I	Turn_on_delay_time RC timer oscillator input pin

Pin Type

I : CMOS input only
O : CMOS output
P : Power / Ground

ELECTRICAL CHARACTERISTICS

• Absolute Maximum Ratings

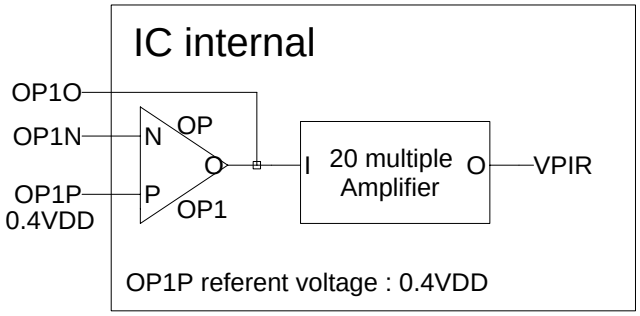
Parameter	Symbol	Conditions	Value	Unit
Operating Temperature	T_{OP}	—	-20 ~ +60	℃
Storage Temperature	T_{STG}	—	-50 ~ +125	℃
Power Supply Voltage	VDD	Ta=25°C	VSS-0.3 ~ VSS+5.5	V
Input Voltage	V_{IN}	Ta=25°C	VSS-0.3 ~ VDD+0.3	V
Human Body Mode	ESD	—	4	KV
Note：VSS symbolizes for system ground				

• DC/AC Characteristics：(Test condition at room temperature=25℃)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Voltage	VDD		2.6	4.5	5.5	V
System oscillator	Fsys	VDD=4.5V		16K		Hz
Standby Current	Istby	VDD=4.5V		20	30	uA
TD delay time	T_{dly1}	VDD=4.5V, VR1=0, C9=500P		3		Sec
	T_{dly2}	VDD=4.5V, VR1=2M, C9=500P		220		Sec

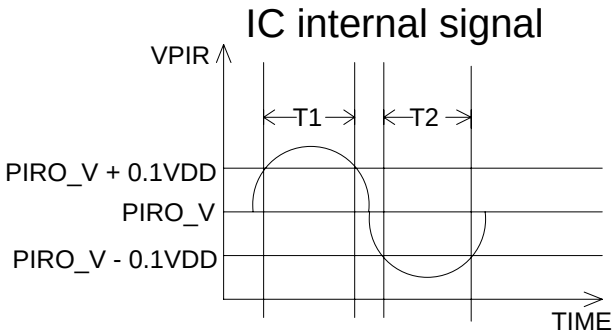
FUNCTION DESCRIPTION

1. **PIR active** condition.
   1-1.T1 or T2 > 200mS
   1-2.T1 or T2 > 50mS two times within 2 sec
   1-3. When lamp turn on change to turn off , then disable PIR 1 sec.



When the OP1 is unit gain application,
then VPIR voltage is PIRO_V

PIRO_V voltage range : 0.3VDD ~ 0.5VDD

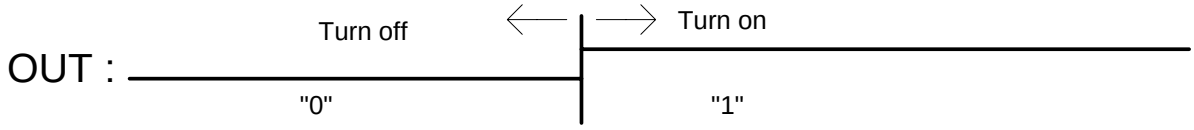


T1 = VPIR > PIRO_V + 0.1VDD
T2 = VPIR < PIRO_V - 0.1VDD
Window : PIRO_V ± 0.1VDD

2. The PHI is a CMOS schmitt trigger input structure**.** It can use PHOTO transistor or CDS sensor to distinguish between **Day_time and Night_time.**
   2-1. PHI voltage ≧ 2/3VDD debounce 2sec, judge environment is **Night_time**
   2-2. PHI voltage ≦1/3VDD debounce 2sec, judge environment is **Day_time**
   2-3. 1/3VDD ＜ PHI voltage ＜ 2/3VDD, keep last state (**Day_time or Night_time**)
   2-4. PHI debounce noise
   2-5. The initial state is **Night_time** after power on
   2-6. When lamp turn on, keep environment **Night_time** state .
   2-7. When PHI short to VDD, the environment be detected **Night_time**

3. Lamp turn on and turn off condition and **Turn_on_delay_time**.
   3-1. Turn on condition : **Night_time** and **PIR active**
   3-2. Turn off condition : **Turn_on_delay_time** end.
   3-3. **Turn_on_delay_time** depend on TD pin RC timer 3 sec(VR3=0)～220 sec(VR3=2M), the **Turn_on_delay_time** will recount when **PIR active**

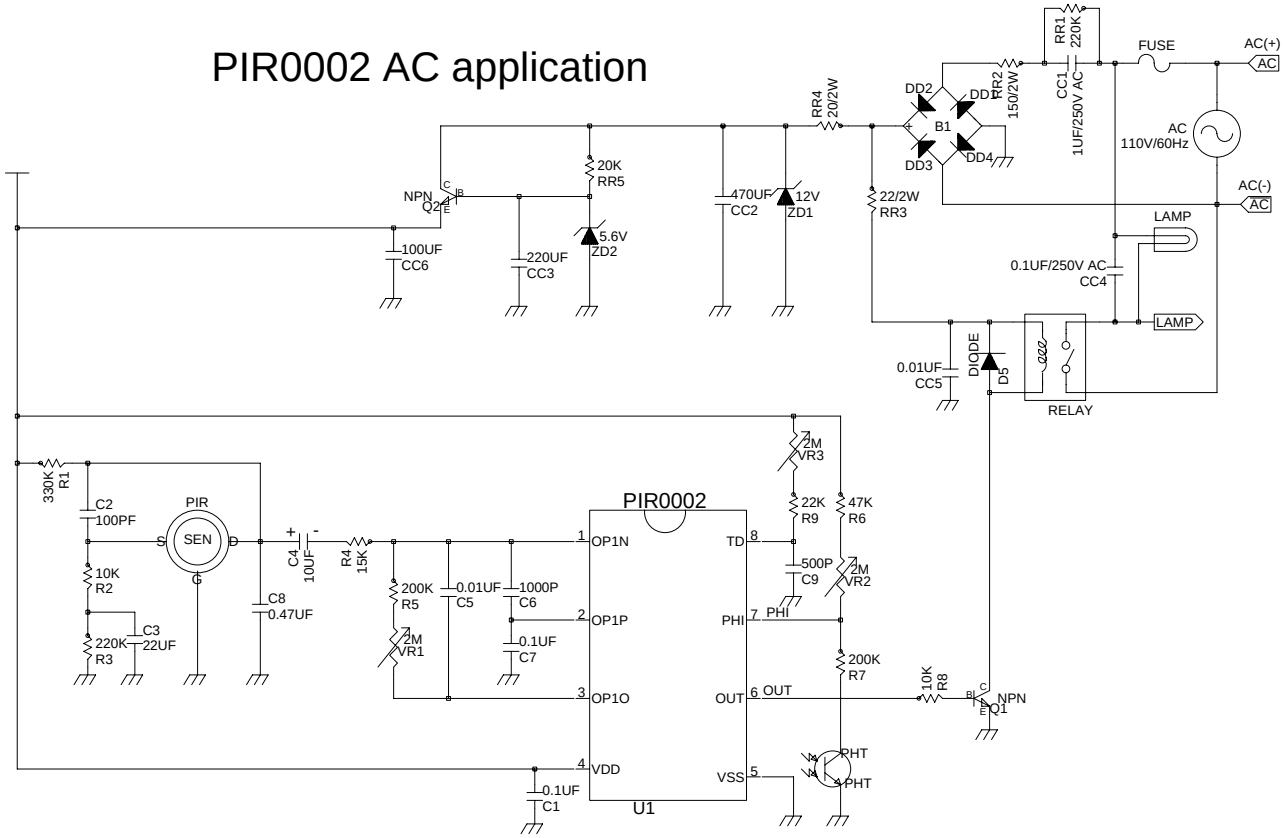
4.PIR0002 OUT pin turn on and turn off state and timing as below :
Turn off : OUT pin is low.
Turn on : OUT pin is high.



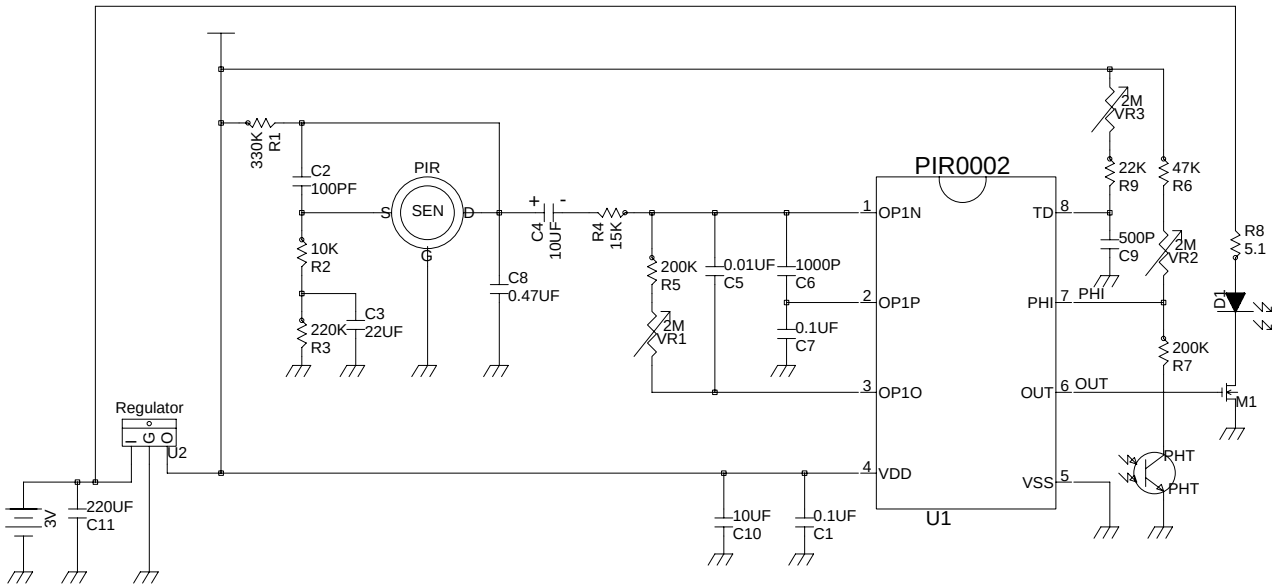
5. After power on have typical 1 sec stable time and 16 sec warm up time after stable time.
   5-1 : During stable time lamp turn off.
   5-2 : During warm up time lamp turn on, the warm up time will recount when **PIR active.**

APPLICATION CIRCUIT

PIR0002 AC application



PIR0002 DC application



ORDER INFORMATION

A: Package form:
PIR0002A : DIP 8 pin
PIR0002B : SOP 8 pin

REVISE HISTORY

1. 2011/03/24
-Original version：V_1.0

2. 2011/04/15
-Modify function description , Add timing diagram

3. 2013/01/15
1. Modify page 5 PIR0002 application, R9 resistor 47KΩ change to 22 KΩ
2. T**urn_on_delay_time** 3sec～110sec change to 3sec～220sec

4. 2013/07/25
1. Modify Operating voltage 3.6V~5.5V change to 2.6V~5.5V
2. Add PIR0002 DC application
3. Add 2-7. When PHI short to VDD, the environment be detected **Night_time**