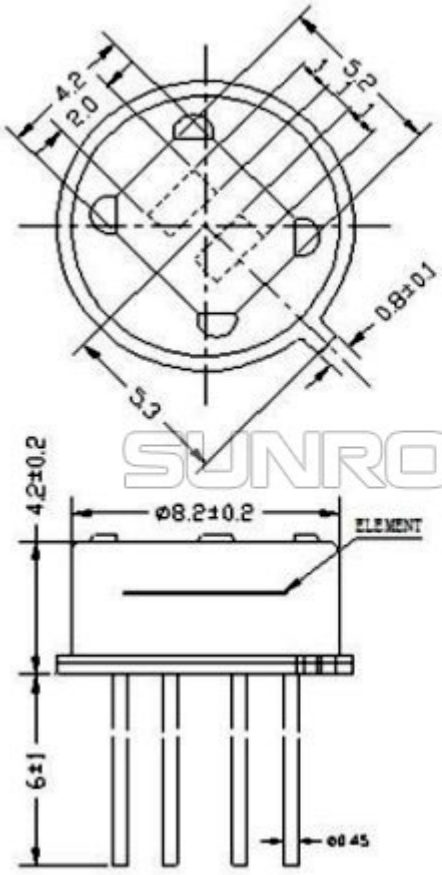
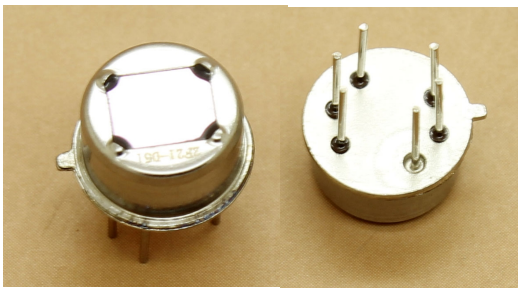
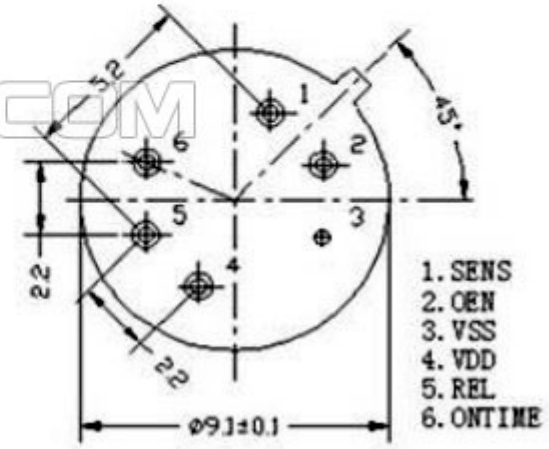
# PIR612 - INTEGRATED PIR SENSOR FOR MOTION SENSING

PIR612 is the latest in PIR sensing, to be used in motion sensing applications with built in signal processing and digital output. Creating custom motion sensor can now be easily achieved. Some pins are output to adjust sensitivity and timings. LDR ambient light level can be added to switch off sensor during day time. Applications are security systems, burglar alarms, visitor acknowledgement, light switch control and smart toys.

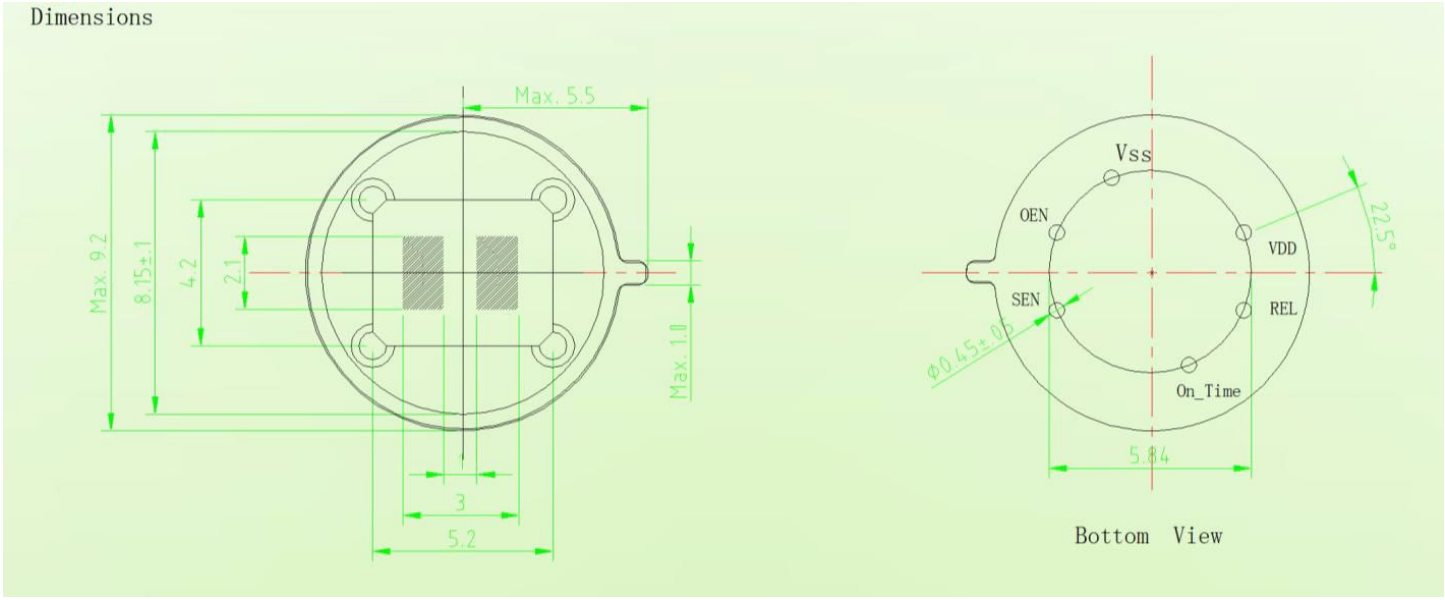
## DIMENSIONS & PINOUTS







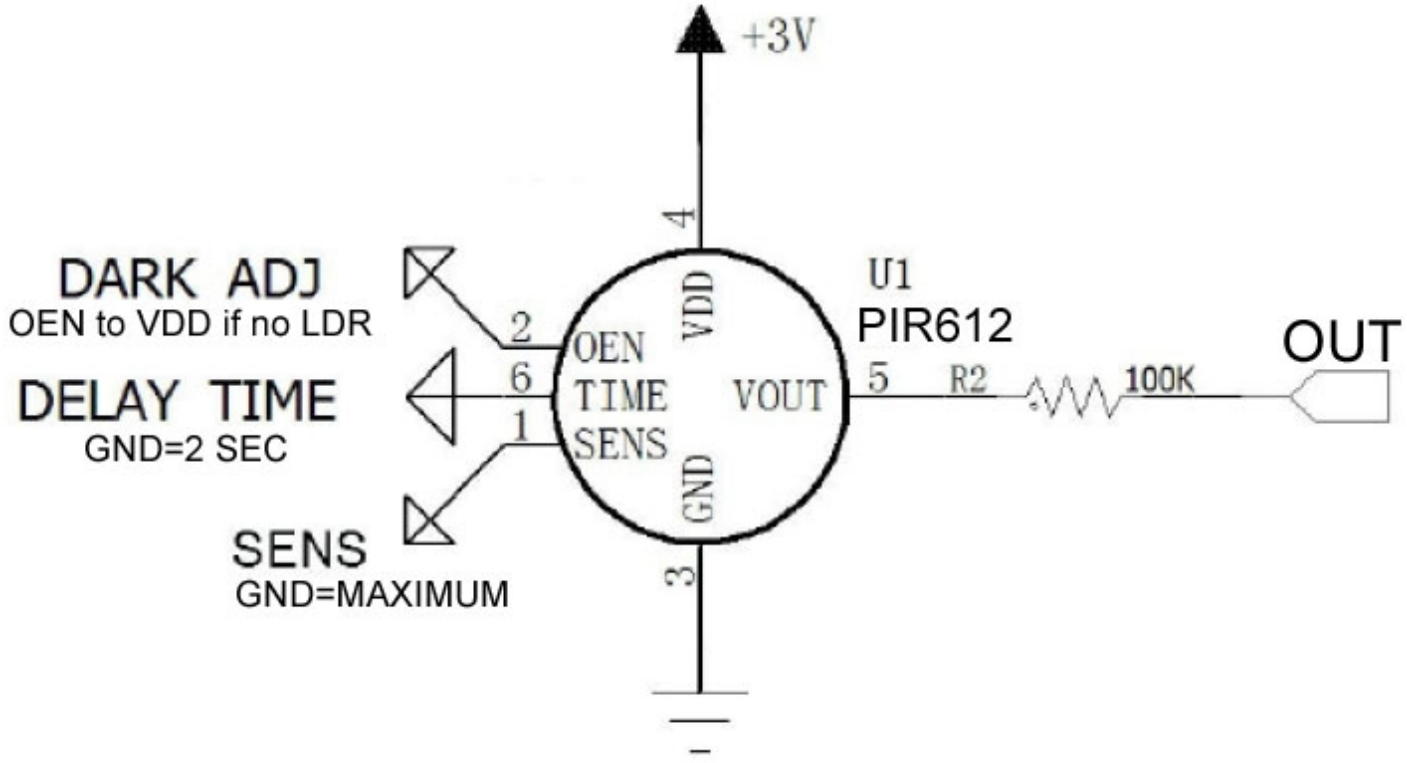



## SPECIFICATIONS

| | |
|---|---|
| Product Name | PIR Sensor with built in signal processing |
| Operating Voltage | 2.7-3.3V DC |
| Operating Current | 5mA |
| Window Size | 4.2x5.2mm |
| Detecting Distance | 6 to 8 meters |
| Type | Pyroelectric Infrared Sensor |
| Delay Time | 2S-70min adjustable |
| Settling Time | At start up 15 seconds settling time/warm up |
| Operating Temperature | -20 C to +55 C |
| Humidity | 10%-85% |
| Output Current | 10mA Source/Sink maximum |

| Characteristics | Symbol | Min. | Type | Max. | Unit | Remarks |
|---|---|---|---|---|---|---|
| Supply Voltage | $V_{DD}$ | 2.7 | | 3.3 | V | $I_R$=0.5mA |
| Regulated Current | $I_R$ | | | 5 | mA | |
| Working Current ENREG=VDD | $I_{DD}$ | | 25 | 30 | μA | $V_{DD}$ >3.3V |
| Working Current ENREG=VSS | $I_{DD}$ | | 12 | 15 | μA | $V_{DD}$ <3.3V can not active |
| **OEN** | | | | | | |
| Input Low Voltage | $V_{IL}$ | | | 0.6 | V | |
| Input High Voltage | $V_{IH}$ | 1.2 | | | V | |
| Input Current | $I_I$ | -1 | | 1 | μA | $V_{SS}$<$V_{IN}$<$V_{DD}$ |
| **Output REL/LED** | | | | | | |
| Output Low Current | $I_{OL}$ | 10 | | | mA | $V_{OL}$<1V |
| Output High Current | $I_{OH}$ | | | -10 | mA | $V_{OL}$>($V_{DD}$-1V) |
| **Input SENS/ONTIME** | | | | | | |
| Voltage Input Range | | 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 | |

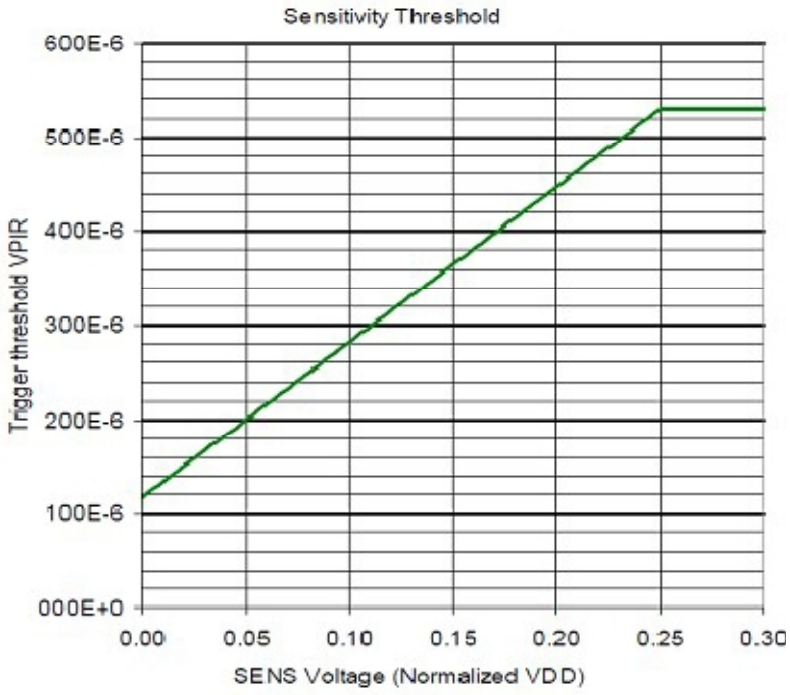
## ADJUSTING PARAMETERS




## SENS: SENSITIVITY ADJUSTMENT

SENS pins decides how sensitive it is. Default put it to Ground (Maximum)

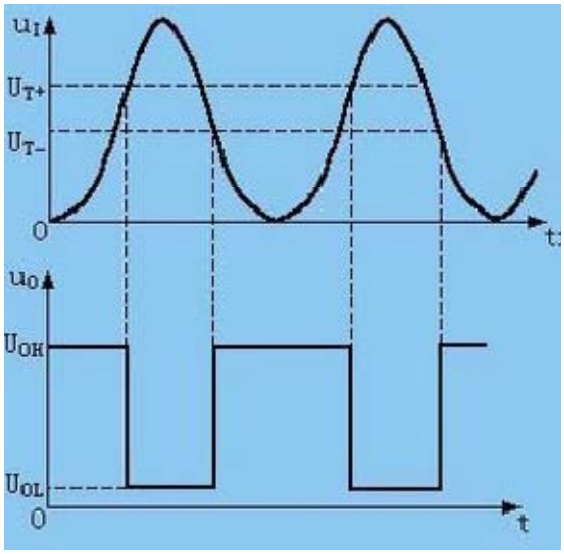
A voltage applied to the SENS input sets the threshold used to detect a PIR Signal. VSS selects the minimum threshold voltage. Any voltage above VDD/4 will select the maximum threshold, which is the least sensitive setting for PIR signal detection.



## OEN: LDR LIGHT ADJUSTMENT

OEN pins switches off sensor for example during day time with help of an external LDR.
Connect OEN pin to VDD if not using LDR function.

If VDD=3V, and voltage rises from low to high, when it is higher than 0.4DD(1.2V), Vout enables. Voltage decreases from high to low, when lower than 0.2VDD(0.6V), Vout disables.

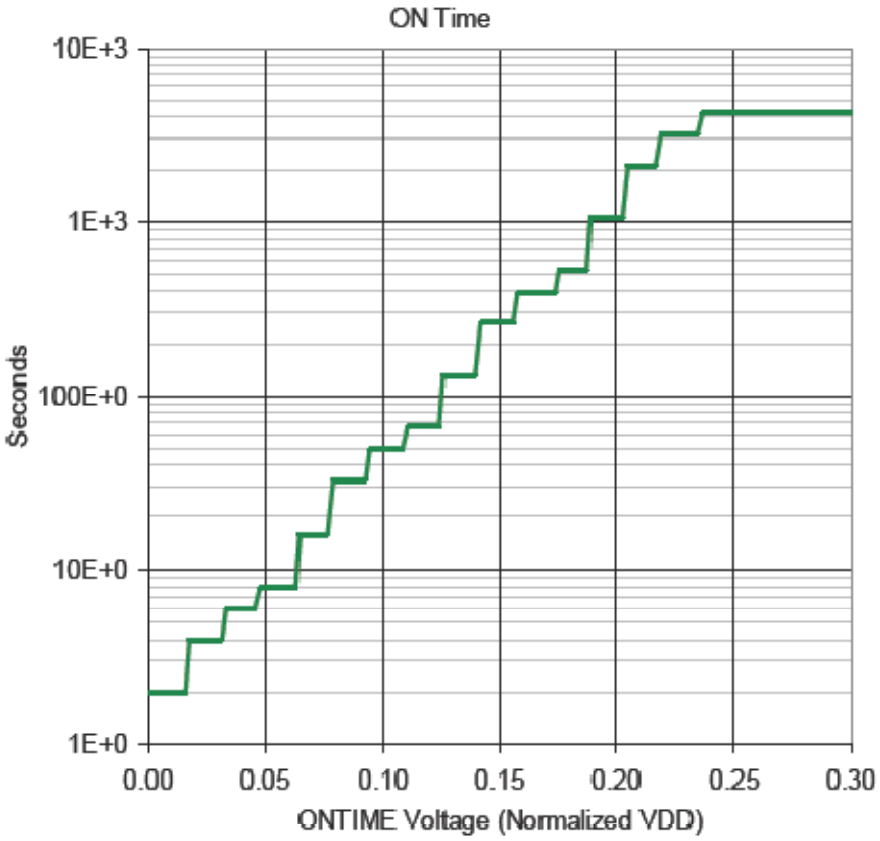



## TIME: DELAY TIME

TIME pin decides how much time the output is high after trigger. Connect pin to ground for 2 seconds after trigger

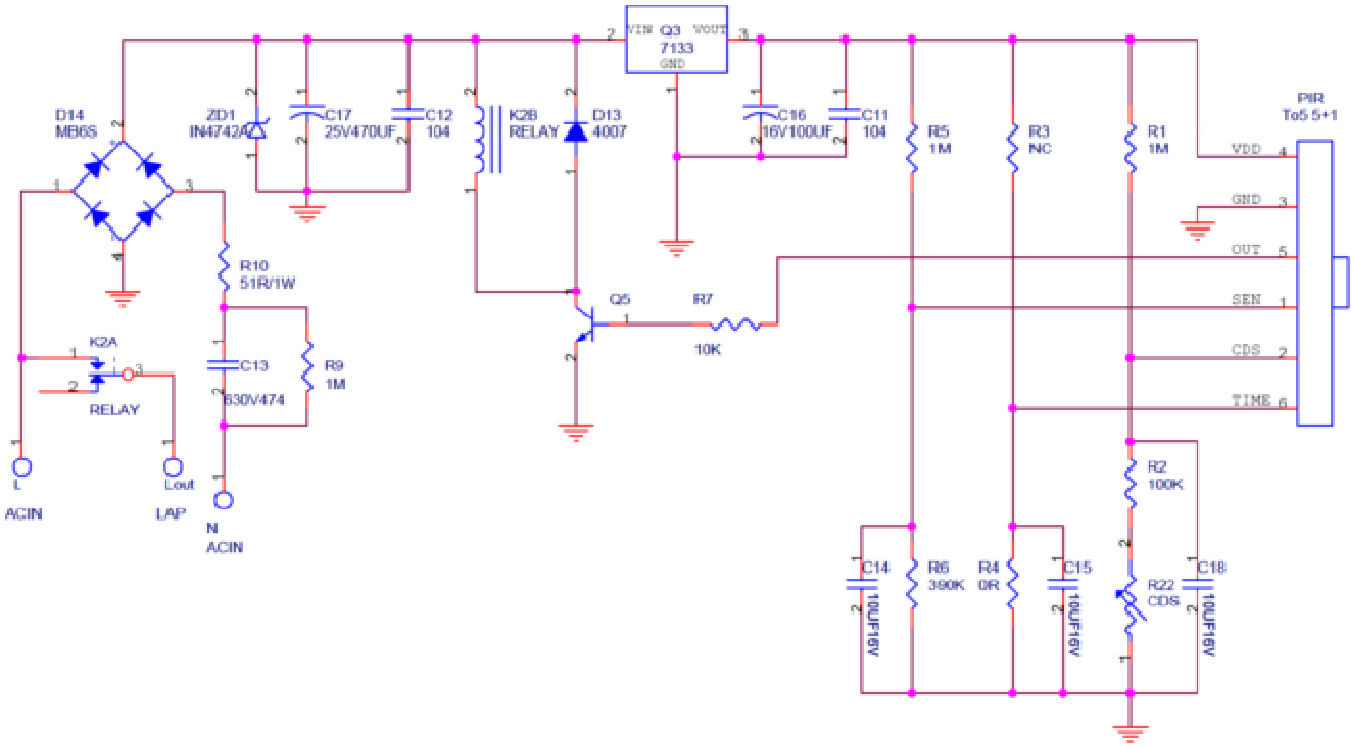
**Delay time adjustment**

| Pin voltage | PIN ADC count | On time in seconds | On time | Pull-up resistor | Pull-down resistor |
|---|---|---|---|---|---|
| Vdd*1/128 or less | 0 | 2 | 2 sec | Connect GND | |
| Vdd*3/128 | 1 | 4 | 4sec | | |
| Vdd*5/128 | 2 | 6 | 6sec | | |
| Vdd*7/128 | 3 | 8 | 8 sec | 1M | 62K |
| Vdd*9/128 | 4 | 16 | 16sec | 1M | 75K |
| Vdd*11/128 | 5 | 33 | 32 sec | 1M | 91K |
| Vdd*13/128 | 6 | 49 | 49 sec | 1M | 110K |
| Vdd*15/128 | 7 | 66 | 1mini 5 sec | 1M | 130K |
| Vdd*17/128 | 8 | 131 | 2 min 11 sec | | |
| Vdd*19/128 | 9 | 262 | 4 min 22 sec | | |
| Vdd*21/128 | 10 | 393 | 6 min 33 sec | | |
| Vdd*23/128 | 11 | 524 | 8 min 44 sec | | |
| Vdd*25/128 | 12 | 1049 | 17 min 28 sec | | |
| Vdd*27/128 | 13 | 2097 | 34 min 57 sec | | |
| Vdd*29/128 | 14 | 3146 | 52 min 25 sec | | |
| Vdd*31/128 or above | 15 | 4194 | 1hour 10min | Connect VDD | |

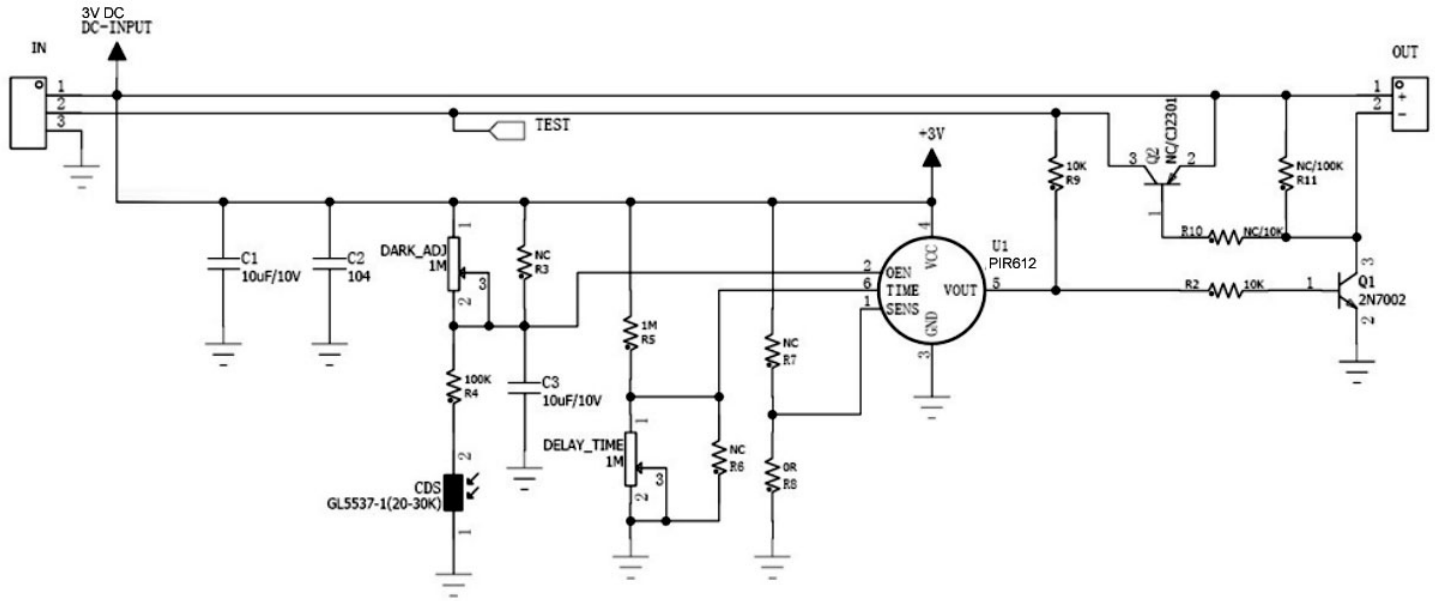



*Graph 2: REL Output On Time in seconds vs. ONTIME pin voltages normalized to VDD.*

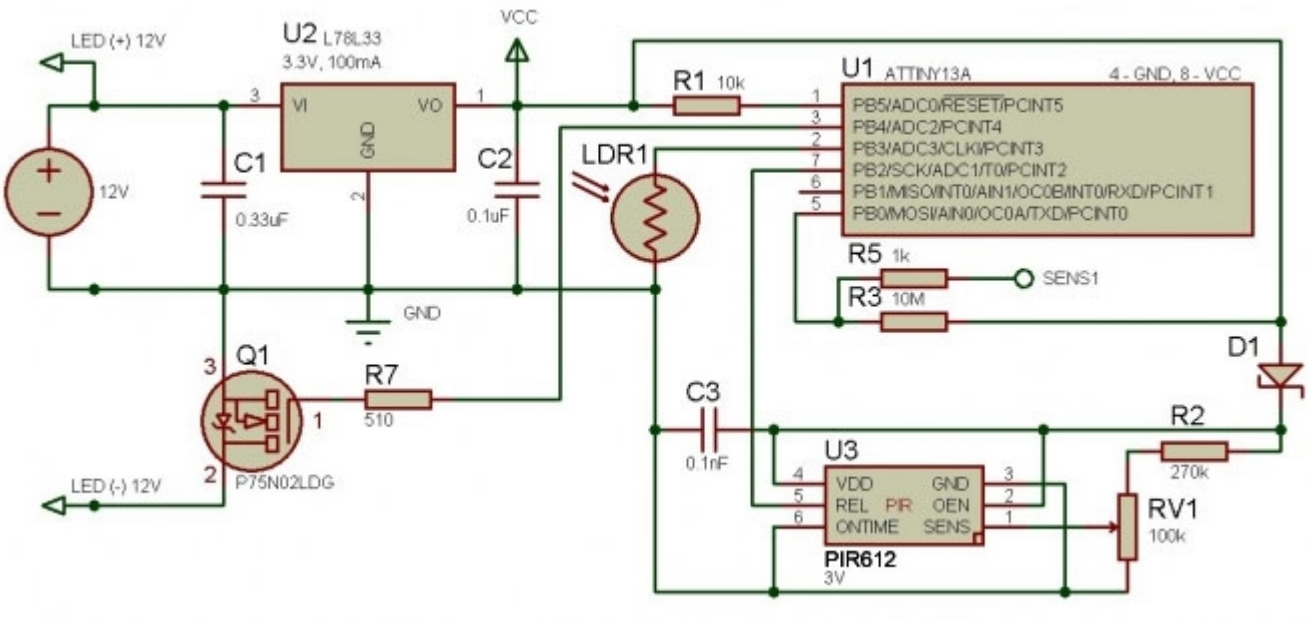
## REFERENCE DESIGN #1: AC OPERATED PIR LIGHT SWITCH




## REFERENCE DESIGN #2: DC OPERATED RELAY



## REFERENCE DESIGN#3: MICROCONTROLLER INTEGRATION




Note

Due to the high sensitivity of PIR sensor device, it is not recommended to use the module in the following or similar condition.
A) in rapid environmental changes
B) in strong shock or vibration
C) in a place where there are obstructing material (eg. glass) through which IR cannot pass within detection area.
D) exposed to direct sun light
E) exposed to direct wind from a heater or air condition

## ORDERING DETAILS

| Sunrom Part# | Item | Ordering Page |
|---|---|---|
| 5466 | PIR612 | http://www.sunrom.com/m/5466 |
| | RELATED PRODUCTS | |
| 5467 | PIR Lens 9mm | http://www.sunrom.com/m/5467 |
| 4811 | HT7533-1 SOT-89 | http://www.sunrom.com/m/4811 |