LAMPIRAN

1. **Program Arduino Keseluruhan**

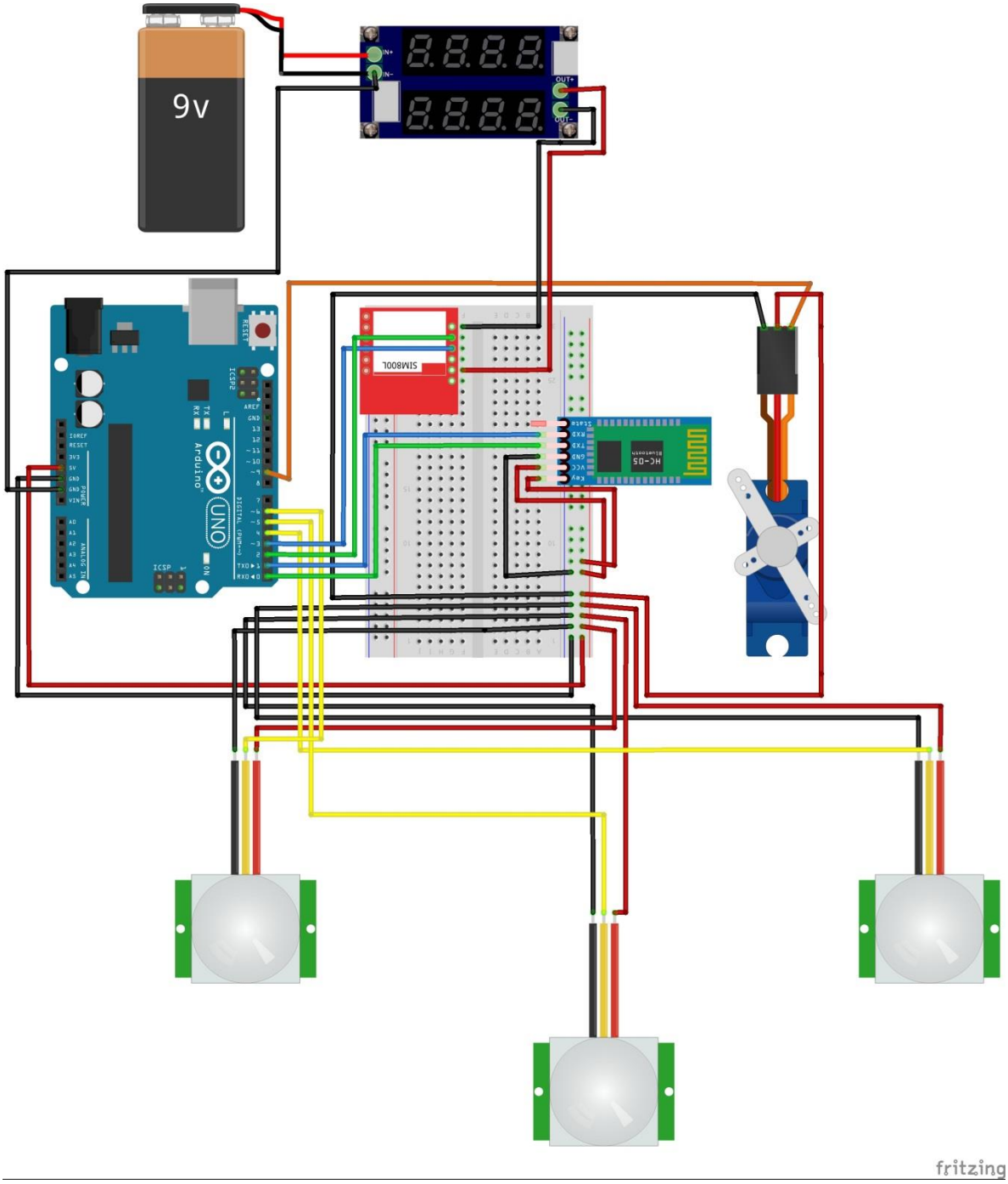
```
#include <SoftwareSerial.h>
#include <GPRS_Shield_Arduino.h>
#include <Wire.h>
#include <EEPROM.h>

#define PIN_TX    2
#define PIN_RX    3
#define BAUDRATE  9600

#define MESSAGE_LENGTH 160
char message[MESSAGE_LENGTH];
int messageIndex = 0;

char phone[16];
char datetime[24];
char telponValid [] = "+6285363575874";
GPRS gprs(PIN_TX,PIN_RX,BAUDRATE);//RX,TX,BaudRate

// Servo motor
#include <Servo.h>
Servo camServo; //
int currentPIRposisi = 0; //

// Sensor PIR
int PIRpin[] = {4,5,6};
int currentPIRpin = 4;
int PIRsebelumnya[] = {1,1,1,1,1};
int PIRposisi[] = {0,90,180};
boolean PIRstatus;

int pinpir = 4;
int pirstate = LOW;
int lastpir = LOW;
int addr=0;
byte value;

///// SETUP ////////////////////////////////////
void setup()  {
  Serial.begin(9600);
```

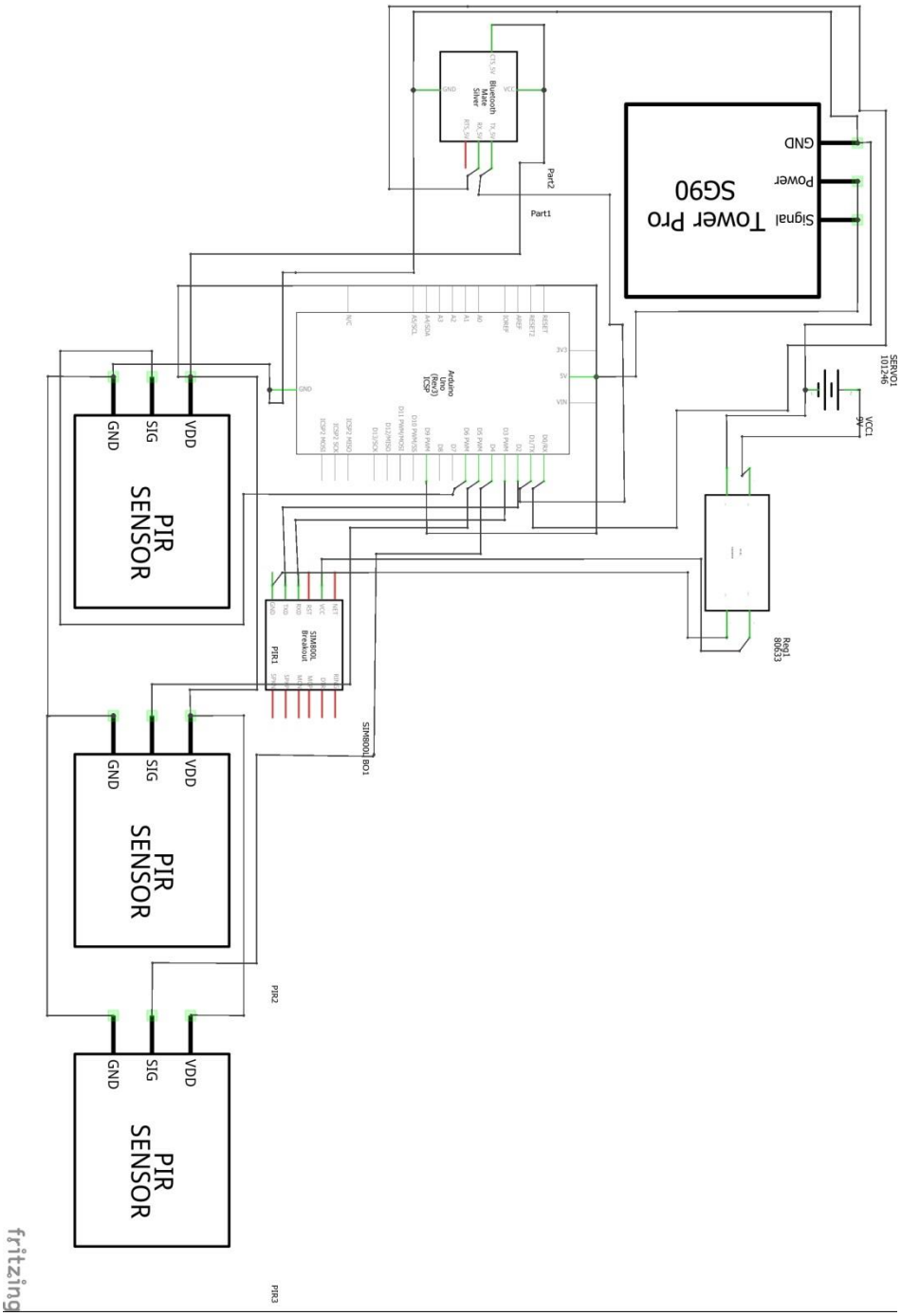
```
  camServo.attach(9); // assign servo
pin
  for (int p = 0; p < 5; p++)  { //
  pinMode(PIRpin[p], INPUT);
  pinMode (pinpir, INPUT);
    } // end 'p' for


  Serial.println(" Sistem Monitoring
Ruangan");
  Serial.println(" Tunggu Sebentar");
  gprs.checkPowerUp();
  Serial.begin(9600);
  while(!gprs.init()) {
     delay(1000);
     Serial.println("Initialization
failed!");
  }

while(!gprs.isNetworkRegistered())
  {
    delay(1000);
    Serial.println("Network has not
registered yet!");
  }


  Serial.println("gprs initialize
done!");


  /////// CALIBRATE PIR SENSORS
///////
  Serial.print("Kalibrasi Sensor PIR
");
    for(int c = 0; c < 10; c++){ //
      Serial.print(".");
      delay(1000); //
      } //
    Serial.println("PIR Sensors
Ready");
  camServo.write(90); //
}
   // end setup


///// MAIN LOOP
////////////////////////////////
void loop()
{

while(!gprs.isNetworkRegistered())
  Serial.begin(2400);
   messageIndex =
gprs.isSMSunread();
  {
    if (messageIndex > 0) {
    {
```

```
    gprs.readSMS(messageIndex,
message, MESSAGE_LENGTH,
phone, datetime);

    gprs.deleteSMS(messageIndex);

    Serial.print("From number: ");

    Serial.println(phone);

    Serial.print("Date time: ");

    Serial.println(datetime);

    Serial.print("Received Message:
");

    Serial.println(message);

    if (strcmp(phone, telponValid))

     strupr (message);

    if(!strcmp(message,"Turn ON
Alarm"))

    {


gprs.sendSMS("085363575874"
,"Alarm is ON");

      EEPROM.write(addr,1);

    }

    if(!strcmp(message,"Turn OFF
Alarm"))

    {


gprs.sendSMS("085363575874","Al
arm is OFF");

      EEPROM.write(addr,0);
      }


    }


  }


 {
  value = EEPROM.read(addr);
  if (value==1)
   {
    pirstate=digitalRead(pinpir);
    if (pirstate!=lastpir)
    {
   if(lastpir==HIGH)
   {


gprs.sendSMS("085363575874","Te
rjadi Pergerakan BOS!!!");
    delay(5000);
   }
   }
  }
  lastpir=pirstate;
}
  for (int PIR = 0; PIR < 5; PIR++) {
//
```

```
   currentPIRpin = PIRpin[PIR]; //
   PIRstatus =
digitalRead(currentPIRpin);
   if (PIRstatus == HIGH) { //
     if(PIRsebelumnya[PIR] == 0) {
//
       if (currentPIRposisi !=
currentPIRpin &&
PIRsebelumnya[PIR] == 0) { //

camServo.write(PIRposisi[PIR]);
         Serial.print("Posisi Terdeteksi
: ");

Serial.println(PIRposisi[PIR]);
         delay(50);
         currentPIRposisi =
currentPIRpin; //
         PIRsebelumnya[PIR] = 1; //
         }
       PIRsebelumnya[PIR] = 1; //
       } //
     } //
   else  { //
     PIRsebelumnya[PIR] = 0;   //
     } //

   } // end [PIR] for loop
                                    }
                                    } // end main loop
```

2. Skematik Alat

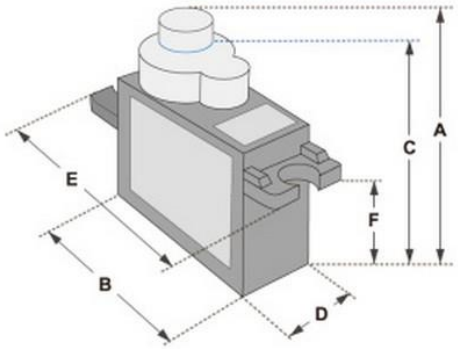



Tower Pro
SG90
Signal
Power
GND
Part1
Part2
Arduino
Uno R3
(Rev3)
ICSP
PIR
SENSOR
GND
SIG
VDD
PIR1
PIR2
PIR3
SERVO1
VCC1
Reg1
fritzing

3. Datasheet

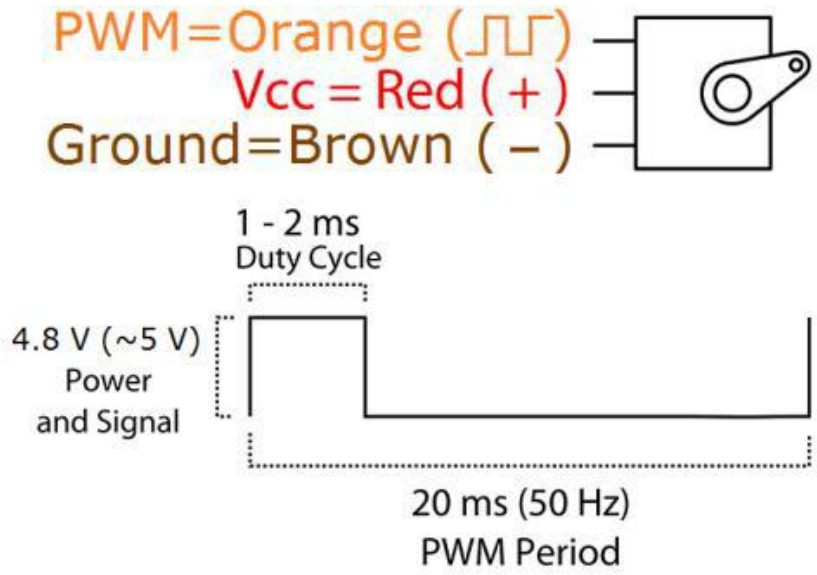
SERVO MOTOR SG90 DATA SHEET

Tiny and lightweight with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds
but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a
motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.
Position "0" (1.5 ms pulse) is middle, "90" (~2ms pulse) is middle,
is all the way to the right, "-90" (~1ms pulse) is all the way to the left.



Dimensions & Specifications
A (mm) : 32
B (mm) : 23
C (mm) : 28.5
D (mm) : 12
E (mm) : 32
F (mm) : 19.5
Speed (sec) : 0.1
Torque (kg-cm) : 2.5
Weight (g) : 14.7
Voltage : 4.8 - 6

Position "0" (1.5 ms pulse) is middle, "90" (~2ms pulse) is middle,
is all the way to the right, "-90" (~1ms pulse) is all the way to the left.



HC-SR501 PIR MOTIONDETECTOR

Product Discription

HC-SR501 is based on infrared technology, automatic control module, using Germany imported LHI778 probe design, high sensitivity, high reliability, ultra-low-voltage operating mode, widely used in various auto-sensing electrical equipment, especially for battery-powered automatic controlled products.

Specification:

- Voltage: 5V – 20V
- Power Consumption: 65mA
- TTL output: 3.3V, 0V
- Delay time: Adjustable (.3->5min)
- Lock time: 0.2 sec
- Trigger methods: L – disable repeat trigger, H enable repeat trigger
- Sensing range: less than 120 degree, within 7 meters
- Temperature: – 15 ~ +70
- Dimension: 32*24 mm, distance between screw 28mm, M2, Lens dimension in diameter: 23mm

Application:

Automatically sensing light for Floor, bathroom, basement, porch, warehouse, Garage, etc, ventilator, alarm, etc.

Features:

- Automatic induction: to enter the sensing range of the output is high, the person leaves the sensing range of the automatic delay off high, output low.
- Photosensitive control (optional, not factory-set) can be set photosensitive control, day or light intensity without induction.
- Temperature compensation (optional, factory reset): In the summer when the ambient temperature rises to 30 ° C to 32 ° C, the detection distance is slightly shorter, temperature compensation can be used for performance compensation.
- Triggered in two ways: (jumper selectable)
  - non-repeatable trigger: the sensor output high, the delay time is over, the output is automatically changed from high level to low level;
  - repeatable trigger: the sensor output high, the delay period, if there is human activity in its sensing range, the output will always remain high until the people left after the delay will be high level goes low (sensor module detects a time delay period will be automatically extended every human activity, and the starting point for the delay time to the last event of the time).
- With induction blocking time (the default setting: 2.5s blocked time): sensor module after each sensor output (high into low), followed by a blockade set period of time, during this time period sensor does not accept any sensor signal. This feature can be achieved sensor output time “and” blocking time “interval between the work can be applied to interval detection products; This function can inhibit a variety of interference in the process of load switching. (This time can be set at zero seconds – a few tens of seconds).
- Wide operating voltage range: default voltage DC4.5V-20V.
- Micropower consumption: static current <50 microamps, particularly suitable for battery-powered automatic control products.
- Output high signal: easy to achieve docking with the various types of circuit.

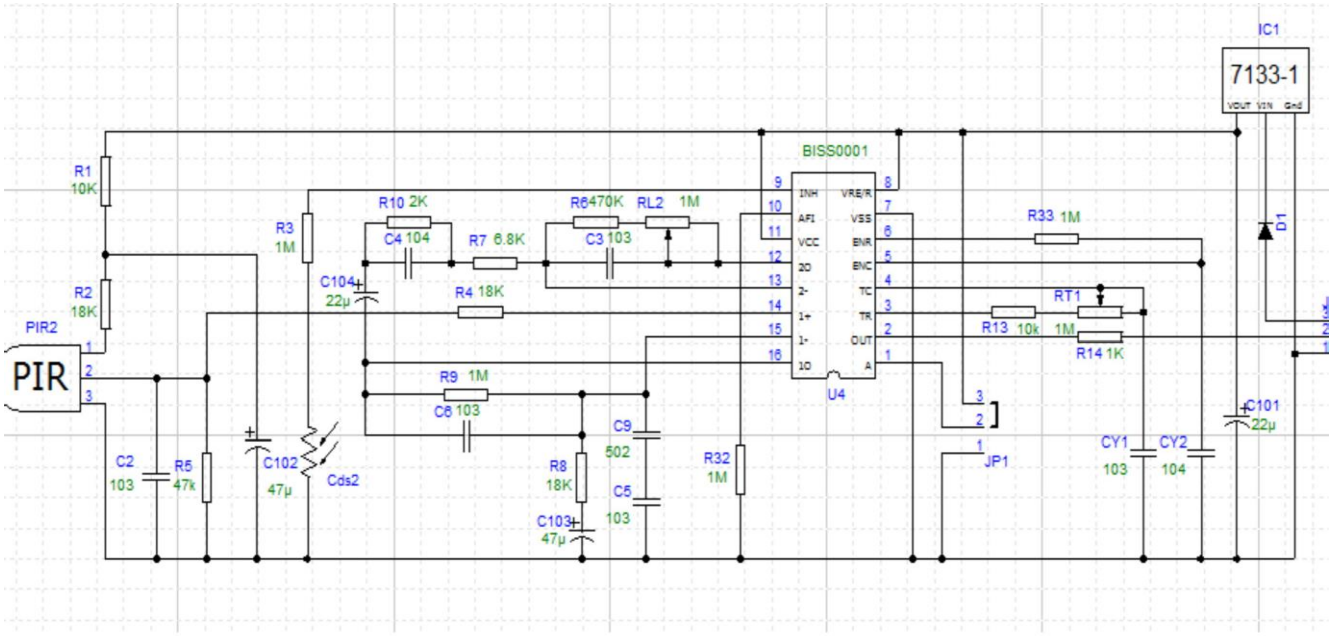
Adjustment:

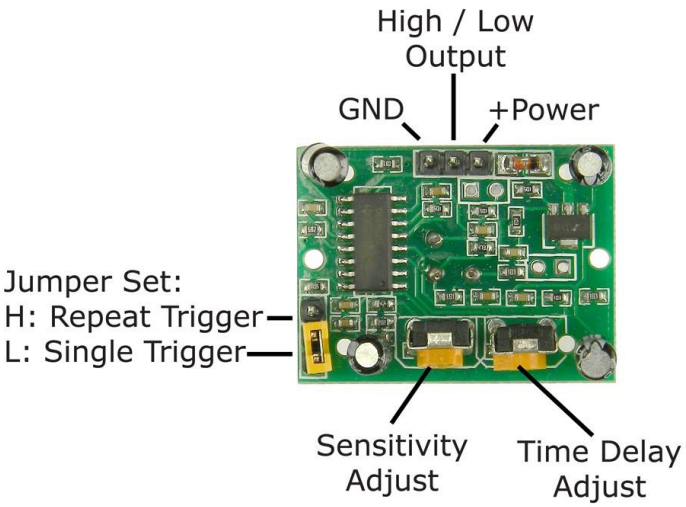
- Adjust the distance potentiometer clockwise rotation, increased sensing distance (about 7 meters), on the contrary, the sensing distance decreases (about 3 meters).
- Adjust the delay potentiometer clockwise rotation sensor the delay lengthened (300S), on the contrary, shorten the induction delay (5S).

Instructions for use:

- Sensor module is powered up after a minute, in this initialization time intervals during this module will output 0-3 times, a minute later enters the standby state.
- Should try to avoid the lights and other sources of interference close direct module surface of the lens, in order to avoid the introduction of interference signal malfunction; environment should avoid the wind flow, the wind will cause interference on the sensor.
- Sensor module with dual probe, the probe window is rectangular, dual (A B) in both ends of the longitudinal direction
  - so when the human body from left to right or right to left through the infrared spectrum to reach dual time, distance difference, the greater the difference, the more sensitive the sensor,
  - when the human body from the front to the probe or from top to bottom or from bottom to top on the direction traveled, double detects changes in the distance of less than infrared spectroscopy, no difference value the sensor insensitive or does not work;
- The dual direction of sensor should be installed parallel as far as possible in inline with human movement. In order to increase the sensor angle range, the module using a circular lens also makes the probe surrounded induction, but the left and right sides still up and down in both directions sensing range, sensitivity, still need to try to install the above requirements.

HC-SR501 PIR MOTIONDETECTOR





1 working voltage range :DC 4.5-20V 2

Quiescent Current :50uA

3 high output level 3.3 V / Low 0V

4. Trigger L trigger can not be repeated / H repeated trigger

5. circuit board dimensions :32 * 24 mm

6. maximum 110 ° angle sensor

7. 7 m maximum sensing distance

Product Type	HC--SR501 Body Sensor Module
Operating Voltage Range	5-20VDC
Quiescent Current	<50uA
Level output	High 3.3 V /Low 0V
Trigger	L can not be repeated trigger/H can be repeated trigger(Default repeated trigger)
Delay time	5-300S(adjustable) Range (approximately .3Sec -5Min)
Block time	2.5S(default)Can be made a range(0.xx to tens of seconds
Board Dimensions	32mm*24mm
Angle Sensor	<110 ° cone angle
Operation Temp.	-15-+70 degrees
Lens size sensor	Diameter:23mm(Default)

Application scope

•Security products

•Body induction toys

•Body induction lamps

•Industrial automation control etc

Pyroelectric infrared switch is a passive infrared switch which consists of BISS0001 ,pyroelectric infrared sensors and a few external components. It can a open all kinds of equipments, inculding incandescent lamp, fluorescent lamp, intercom, automatic, electric fan, dryer and automatic washing machine, etc. It is widely used in enterprises, hotels, stores, and corridor and other sensitive area for automatical lamplight, lighting and alarm system.

Instructions

Induction module needs a minute or so to initialize. During initializing time, it will output 0-3 times. One minute later it comes into standby. Keep the surface of the lens from close lighting source and wind, which will introduce interference.

Induction module has double -probe whose window is rectangle. The two sub-probe (A and B) is located at the two ends of rectangle. When human body to right, or from right to left, Time for IR to reach to reach the two sub-probes differs.The lager the time diffference is, the more sensitive this module is. Wh body moves face-to probe, or up to down, or down to up, there is no time difference. So it does not work. So instal the module in the direction in which mo activities behaves, to guarantee the induction of human by dual sub-probes. In order to increase the induction range, this module uses round lens which ca from all direction. However, induction from right or left is more sensitivity than from up or down.

Product Overview

LM2596: Buck Regulator, Switching, 3.0 A

For complete documentation, see the data sheet.

The LM2596 series of Buck Switching Regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 3A load with excellent line and load regulation.

Requiring a minimum number of external components, these Buck Switching Regulators are simple to use and include internal frequency compensation, and a fixed-frequency oscillator.

The LM2596 series operates at a switching frequency of 150 kHz thus allowing smaller sized filter components than what would be needed with lower frequency switching regulators. Available in a standard 5-lead TO-220 package with several different lead bend options, and a 5-lead D2PAK surface mount package.

A standard series of inductors are available from several different manufacturers optimized for use with the LM2596 series. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed +/-4% tolerance on output voltage under specified input voltage and output load conditions, and +/-15% on the oscillator frequency. External shutdown is included, featuring typically 80 µA standby current. Self protection features include a two stage frequency reducing current limit for the output switch and an over temperature shutdown for complete protection under fault conditions. See LM2595 for 1.0A and LM2594 for 0.5A.

Features

- Adjustable output voltage range, 1.2V to 37V +/-4% max over line and load conditions
- Available in TO-220 and D2PAK packages
- Guaranteed 3A output load current
- Input voltage range up to 40V
- Excellent line and load regulation specifications
- 150 kHz fixed frequency internal oscillator
- TTL shutdown capability
- Low power standby mode, Iq typically 80 µA
- Uses readily available standard inductors
- Thermal shutdown and current limit

For more features, see the data sheet

Benefits

- Flexible to configure for different output voltages and applications
- Different mounting options
- High power designs
- Can be used with several input voltage supplies (+12V, +24V, +36V)
- Provides a stable power supply
- No external component required to set frequency
- Easy to implement low power modes
- Power saving mode
- Quick and easy implementation
- Additional protection against faults

Applications

- Simple high-efficiency step-down (buck) regulator
- On-card switching regulators
- Positive to negative converter

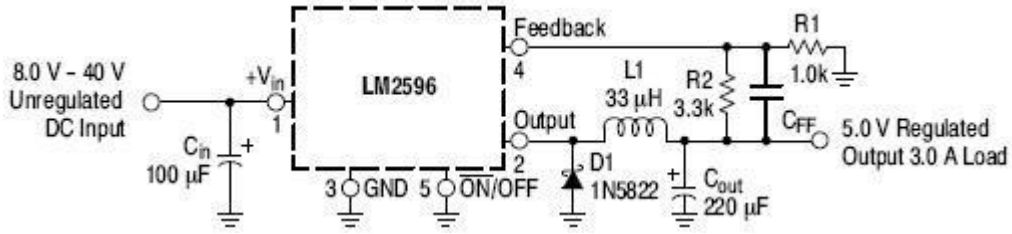
End Products

- LCD-TV SMPS

Part Electrical Specifications

Product	Compliance	Status	Topology	Control Mode	V_{CC} Min (V)	V_{CC} Max (V)	V_O Typ (V)	I_O Typ (A)	Efficiency (%)	f_{SW} Typ (kHz)	Package Type
LM2596DSADJG	Pb-free Halide free	Active	Step-Down	Voltage Mode	4.5	40	1.25 to 37	3	85	150	D^{2}PAK-5
LM2596DSADJR4G	Pb-free Halide free	Active	Step-Down	Voltage Mode	4.5	40	1.25 to 37	3	85	150	D^{2}PAK-5
LM2596TVADJG	Pb-free Halide free	Active	Step-Down	Voltage Mode	4.5	40	1.25 to 37	3	85	150	TO-220-5

Application Diagram



For more information please contact your local sales support at www.onsemi.com.
Created on: 1/23/2019

Version：1005

GSM/GPRS Module

SIM800L

SIM800L is a complete Quad-band GSM/GPRS solution in a LGA type which can be embedded in the customer applications.

SIM800L support Quad-band 850/900/1800/1900MHz, it can transmit Voice, SMS and data information with low power consumption. With tiny size of 15.8*17.8*2.4 mm, it can fit into slim and compact demands of customer design.

Smart Machine Smart Decision

General features

- Quad-band 850/900/1800/1900MHz
- GPRS multi-slot class 12/10
- GPRS mobile station class B
- Compliant to GSM phase 2/2+
  - Class 4 (2 W @ 850/900 MHz)
  - Class 1 (1 W @ 1800/1900MHz)
- FM: 76~109MHz worldwide bands with 50KHz tuning step
- Dimensions: 15.8*17.8*2.4 mm
- Weight: 1.35g
- Control via AT commands (3GPP TS 27.007, 27.005 and SIMCOM enhanced AT Commands)
- Supply voltage range 3.4 ~ 4.4V
- Low power consumption
- Operation temperature:-40℃ ~85℃

Specifications for GPRS Data

- GPRS class 12: max. 85.6 kbps (downlink/uplink)
- PBCCH support
- Coding schemes CS 1, 2, 3, 4
- PPP-stack
- CSD up to 14.4 kbps
- USSD
- Non transparent mode

Specifications for SMS via GSM/GPRS

- Point to point MO and MT
- SMS cell broadcast
- Text and PDU mode

Software features

- 0710 MUX protocol
- Embedded TCP/UDP protocol
- FTP/HTTP
- MMS
- E-MAIL
- DTMF
- Jamming Detection

Specifications for voice

•Tricodec
  – Half rate (HR)
  – Full rate (FR)
  – Enhanced Full rate (EFR)
•AMR
  – Half rate (HR)
  – Full rate (FR)
•Hands-free operation
  （Echo suppression）

Interfaces

88 LGA pads including:
•Analog audio interface
•PCM interface
•RTC backup
•Serial interface
•USB interface
•Interface to external SIM 3V/1.8V
•Keypad interface
•GPIO
•ADC
•GSM Antenna pad
•FM Antenna pad

Compatibility

•AT cellular command interface

Certifications(Plan):
•CE
•GCF
•FCC
•ROHS
•REACH

simcom@sim.com

www.sim.com/wm