# Handson Technology

RCWL-0516 Microwave Radar Motion Detector

This module has been designed as an alternative to the PIR motion detectors commonly used in burglar alarms. Instead of sensing changes in infrared light emitted by a moving person, this sensor uses a microwave Doppler radar to detect moving objects. It has a sensitivity range of ~7 meters. When triggered its trigger output pin will switch from (LOW) 0V to high (3.3V) for ~ 2 to 3 seconds before returning to its idle LOW state.
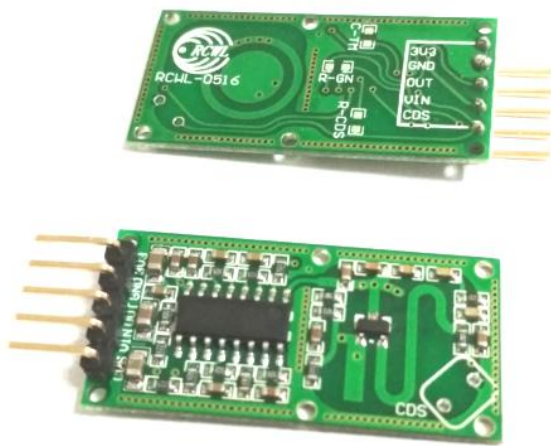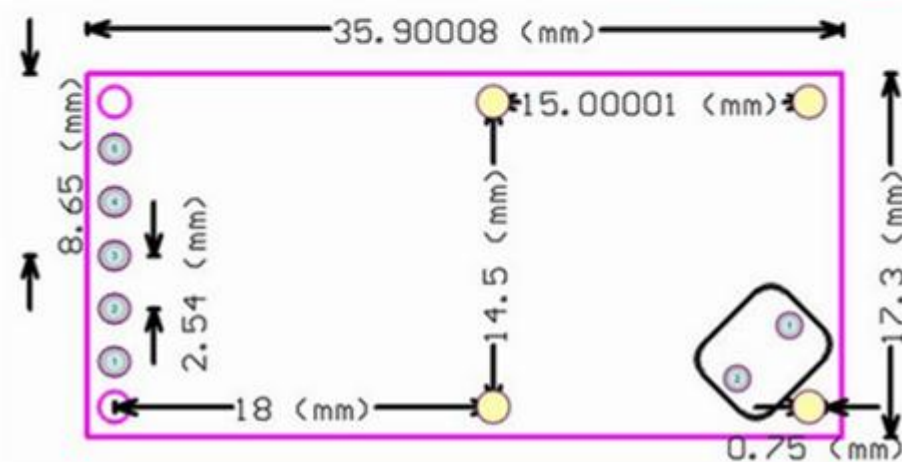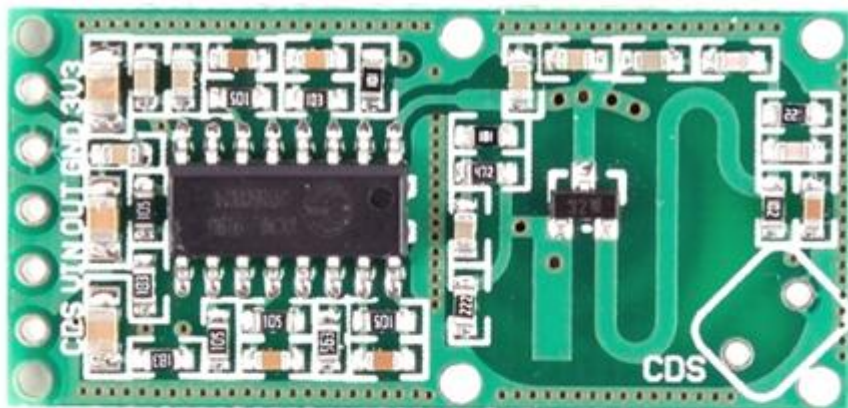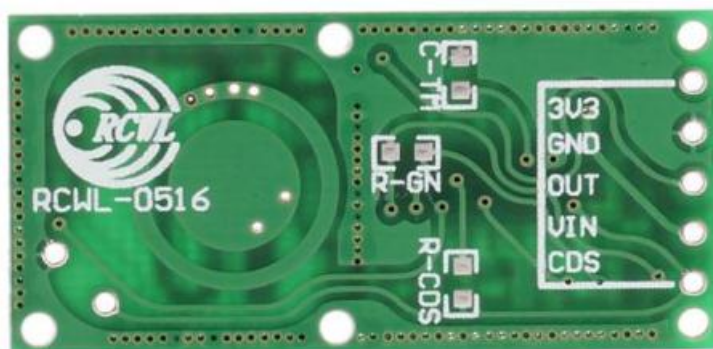
SKU: SSR1018

Brief Data:

- Operating Voltage: 5Vdc.
- Operating Current: >3mA (2.8mA typical).
- Operating frequency: ~3.2GHz.
- Transmit power: 20mW (typical) / 30mW (max).
- Connector: 2.54mm right angle header pin. Breadboard friendly.
- Size: 36mm x 17mm.

Mechanical Dimension:

Unit: mm

Pin Functional Diagram:

Pin Function	Description
3V3	3.3V Output Pin
GND	Ground.
OUT	Logic Output. Motion Detected: H (1). No Notion: L (0)
VIN	5Vdc Supply.
CDS	Out pin enable. OUT pin remain Low if CDS pin lower than 0.7V.

Application with Arduino:

Connect the microwave motion detection module as below schematic:
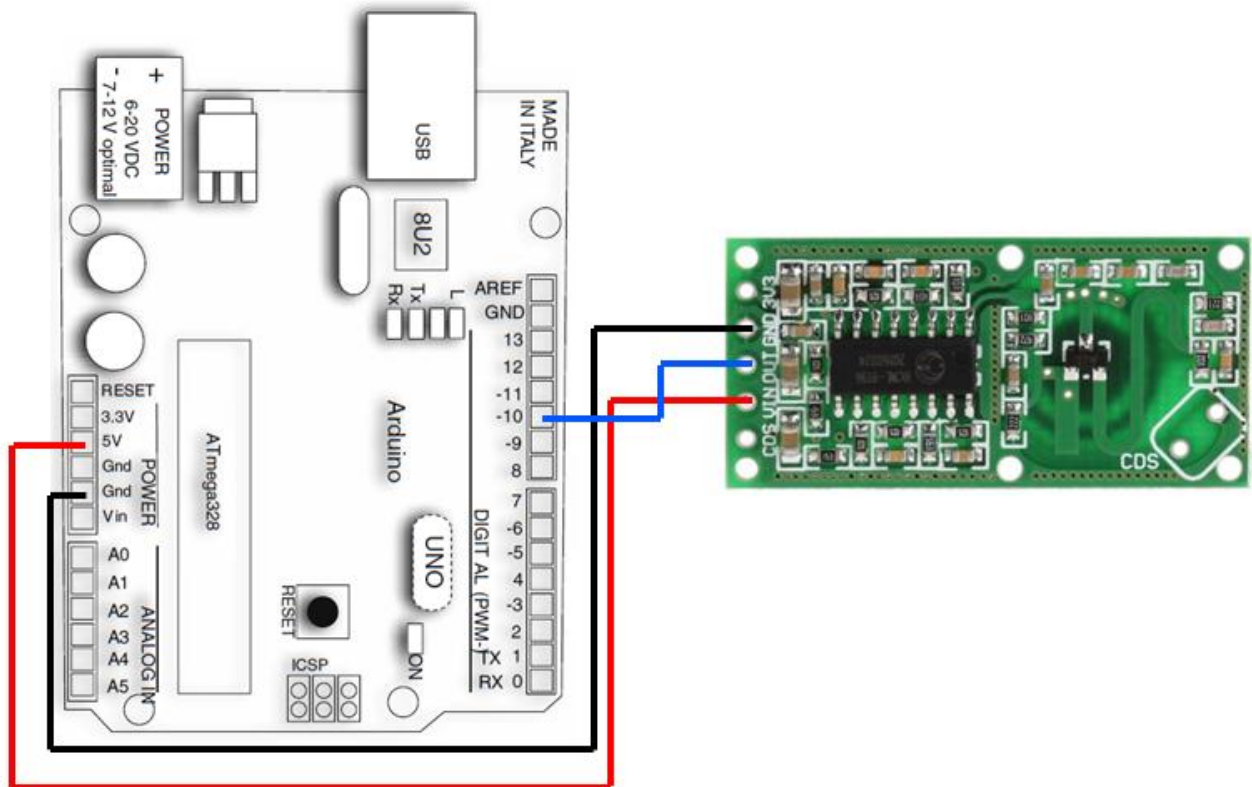
Upload the below sketch to Arduino board:

```
/*==========================================================================
//   Author      : Handson Technology
//   Project     : Arduino Uno
//   Description : MQ2 Gas/Smoke Sensor
//   Source-Code : RCWL-0515.ino
//
//   Arduino sketch demonstrating RCWL-0516 "doppler radar microwave
//   motion sensor module"
//   Connections:
//   RCWL-0516      Arduino Board
//   ---------      ---------
//   3V3            Not connected
//   GND            GND
//   OUT            D10
//   VIN            5V
//   CDS            Not connected
//   ============================================================================
*/

int  detectPin = 10;
bool detect     = false;
int  led        = 13;

void setup() {
  Serial.begin(115200);
  Serial.println("Starting...\n");
  pinMode (detectPin, INPUT);
  pinMode (led, OUTPUT);
}
```

```
void loop() {

  detect = digitalRead(detectPin);

  if(detect == true) {
    digitalWrite(led, HIGH);
    Serial.println("Movement detected");
  }
  else {
    digitalWrite(led, LOW);
  }

  delay(1000);
}
```

For effective motion detection, the component side of the module must be facing toward the moving object.

Open up the Arduino IDE Serial monitor and set the baudrate to 115200, when motion is detected, a message will be display on the Serial Monitor. The onboard LED 'L' will light up at the same time when moving object is detected.
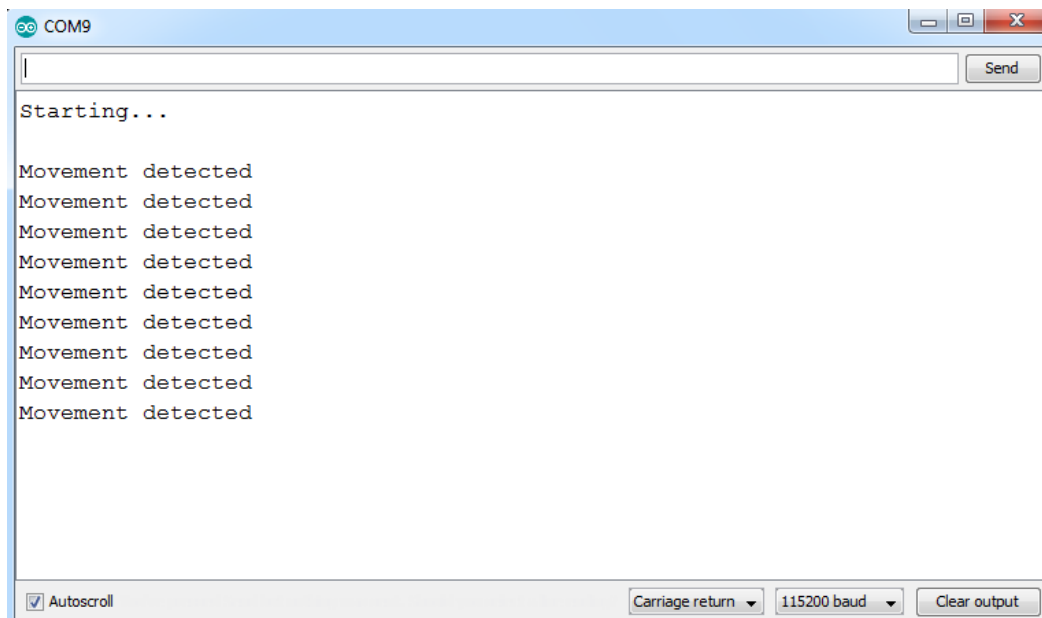
Board Schematic Diagram:

NOTES: UNLESS OTHERWISE SPECIFIED
1. All capacitor values in uF, all resistor values in ohms.
2. R5 and R6 on boards in hand are 22K, 15K in images from web.
3. Parasitic capacitances around Q1 not shown.
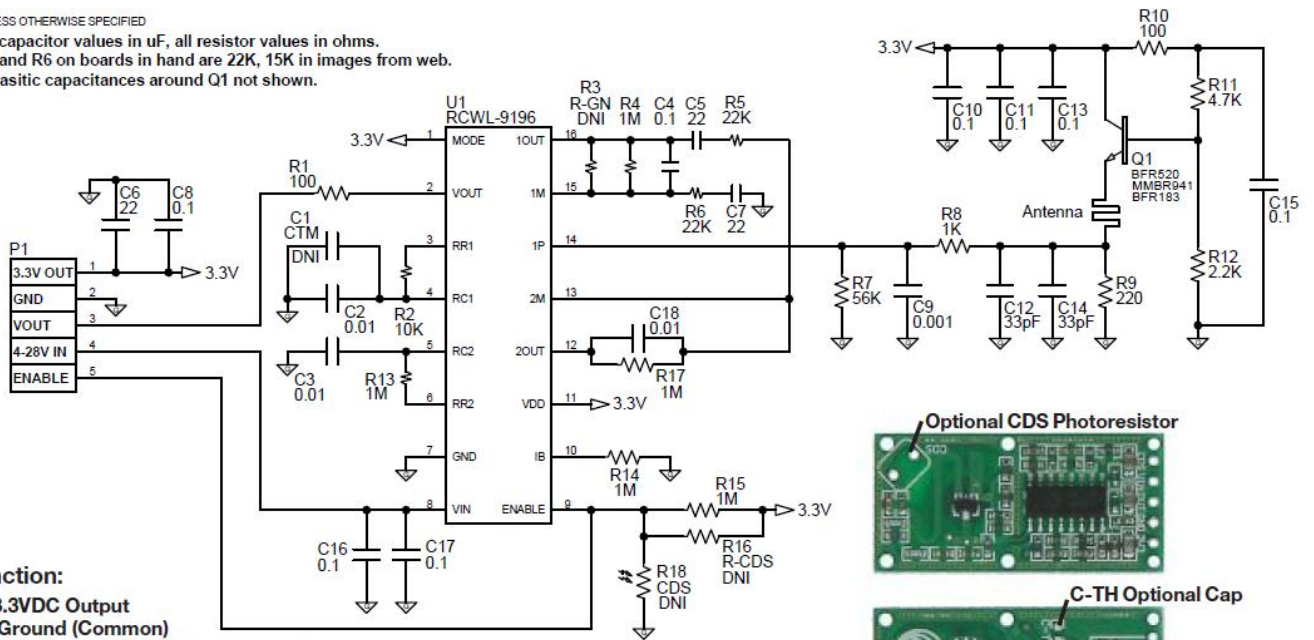
Pin Function:

3V3	3.3VDC Output
GND	Ground (Common)
OUT	Module Output (Hi when triggered)
VIN	4-28VDC Input Power
CDS	External Photoresistor (can pulled low to disable triggering)

Optional CDS Photoresistor

C-TH Optional Cap

Optional R-CDS Resistor

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