IR remote control experiment

Overview

This is an experiment on the infrared reception. This experiment uses the infrared decoder, which involves the content of complex, so only the introduction of the use of methods.

Specification

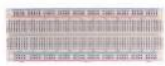
IR Receiver:

Please view "IR Receiver-datasheet.pdf"

Path: \Public_materials\Datasheet\ IR Receiver-datasheet.pdf

Pin definition

Hardware required

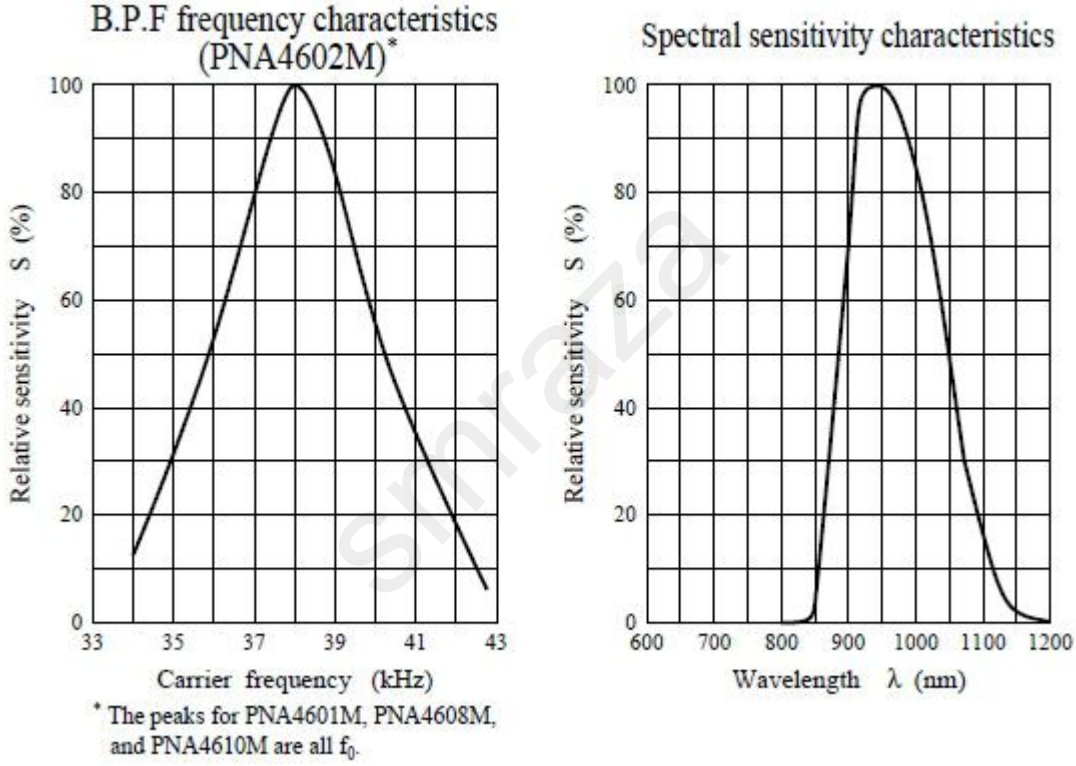
Material diagram	Material name	Number
	IR Remote	1
	IR Receiver Module	1
	USB Cable	1
	UNO R3	1
	Breadboard	1
	Jumper wires	Several

Component Introduction

IR RECEIVER SENSOR:

IR detectors are little microchips with a photocell that are tuned to listen to infrared light. They are almost always used for remote control detection - every TV and DVD player has one of these in the front to listen for the IR signal from the clicker. Inside the remote control is a matching IR LED, which emits IR pulses to tell the TV to turn on, off or change channels. IR light is not visible to the human eye, which means it takes a little more work to test a setup.

What You Can Measure

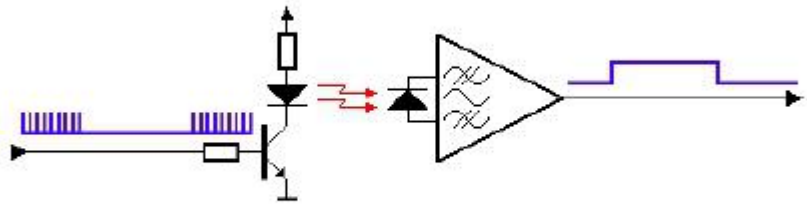


As you can see from these datasheet graphs, the peak frequency detection is at 38 KHz and the peak LED color is 940 nm. You can use from about 35 KHz to 41 KHz but the sensitivity will drop off so that it wont detect as well from afar. Likewise, you can use 850 to 1100 nm LEDs but they wont work as well as 900 to 1000nm so make sure to get matching LEDs! Check the datasheet for your IR LED to verify the wavelength.
Try to get a 940nm - remember that 940nm is not visible light (its Infra Red)!

Principle

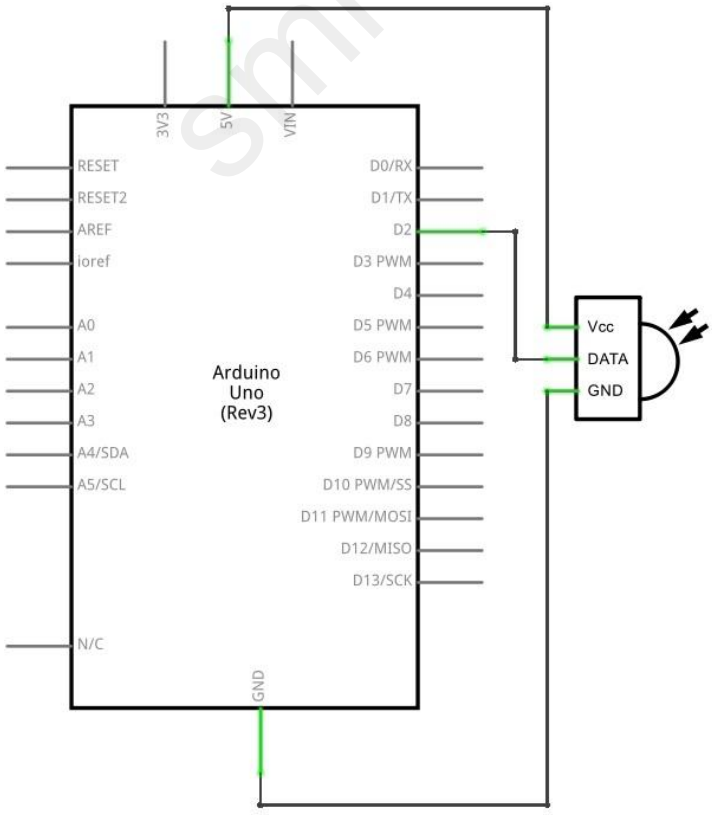
Firstly, let's know the structure of the infrared receiving head: there are two important elements inside the infrared receiving head, IC and PD. IC is receiving head processing components, mainly composed of silicon and circuit. It is a highly integrated device. The main function is filter, plastic, decoding, amplification, etc. PD is a photosensitive diode. The main function is to receive the light signal.

Below is a brief working principle diagram:

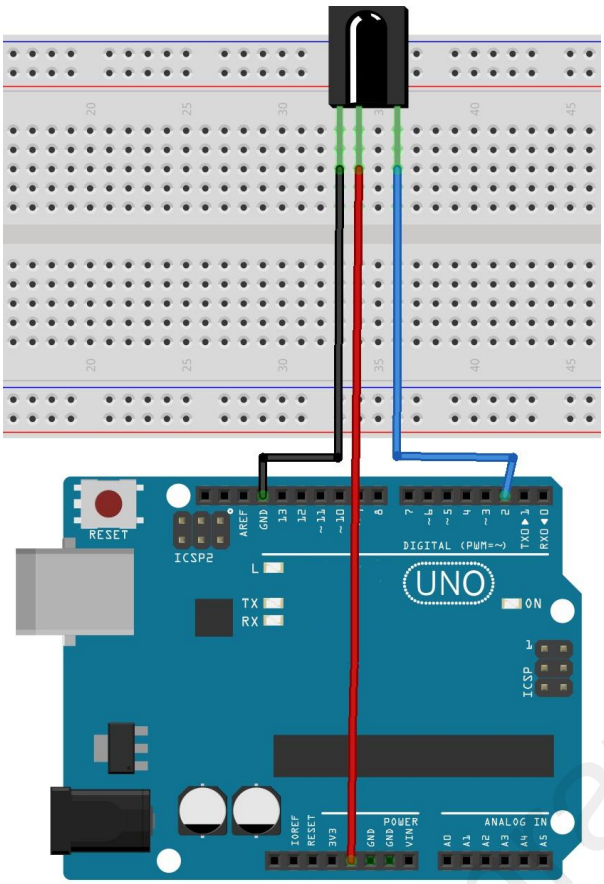


Connection

Schematic



Connection diagram



Note： Please view **Pin definition.**

Connection

UNO R3	IR Receiver
D2	->OUT
GND	->GND
+5V	->VCC

Sample code

Note: sample code under the **Sample code** folder
You need to add the **IRremote** to the Arduino library file directory, otherwise the compiler does not pass. **Please refer to 'How to add library files.docx'.**

```
#include <IRremote.h>
const int irReceiverPin = 2;
IRrecv irrecv(irReceiverPin);

decode_results results;


void setup()
{
    Serial.begin(9600);
    irrecv.enableIRIn();
}

void loop()
{
    if (irrecv.decode(&results))
    {
        Serial.print("IR_Code: ");
        Serial.print(results.value, HEX);
        Serial.print(", Bits: ");
        Serial.println(results.bits);
        irrecv.resume();
    }
    delay(600);
}
/*Tips: Open the serial port monitor, press the button of the remote control, you will see that each button will have the corresponding coding. Because each button has a specific code, so you can write a function, specify the function of the button, to achieve a variety of complex experiments, such as infrared control lights, control servo motor, control relay,etc.
*/
```

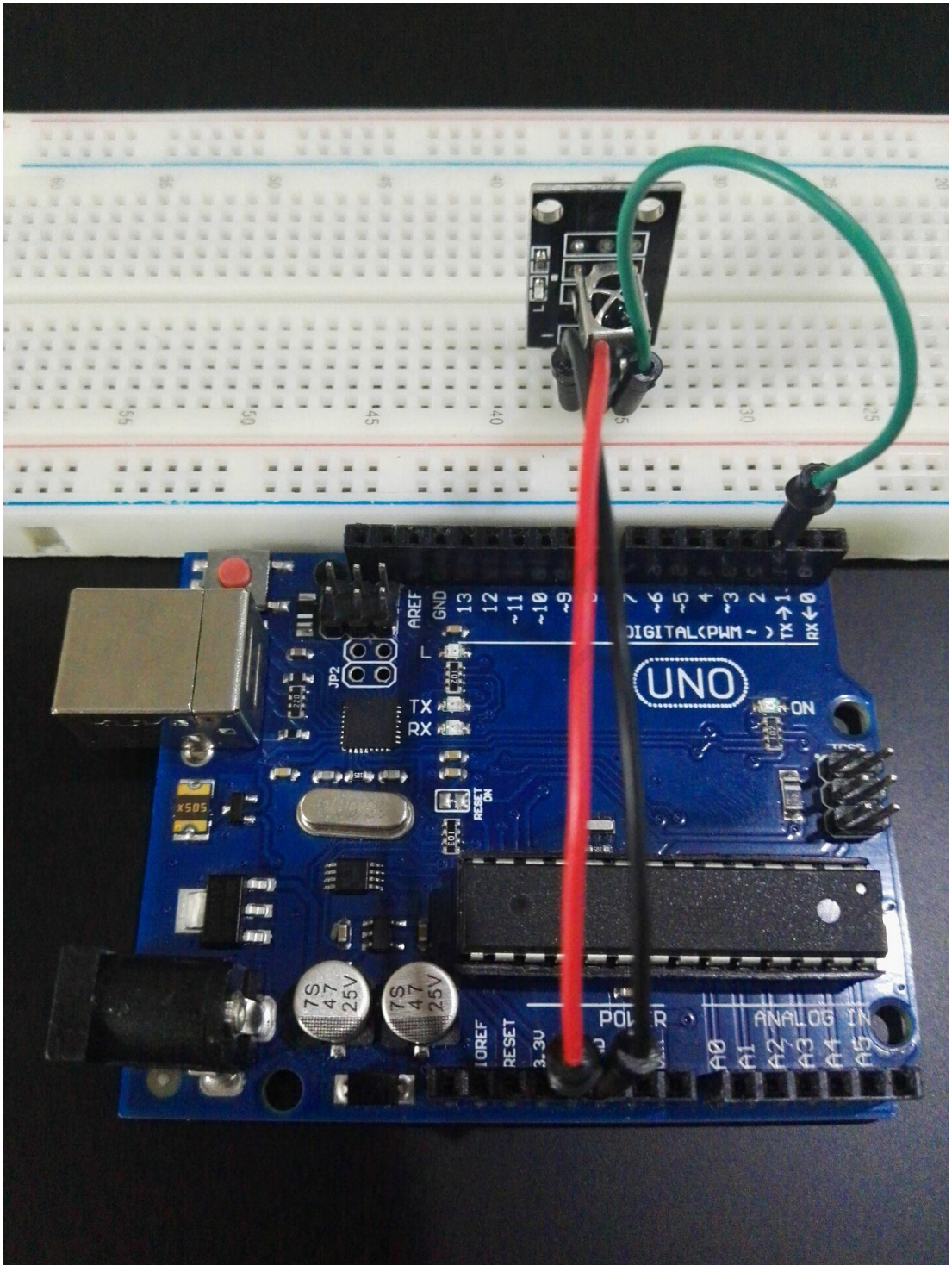
Language reference

Null

Application effect

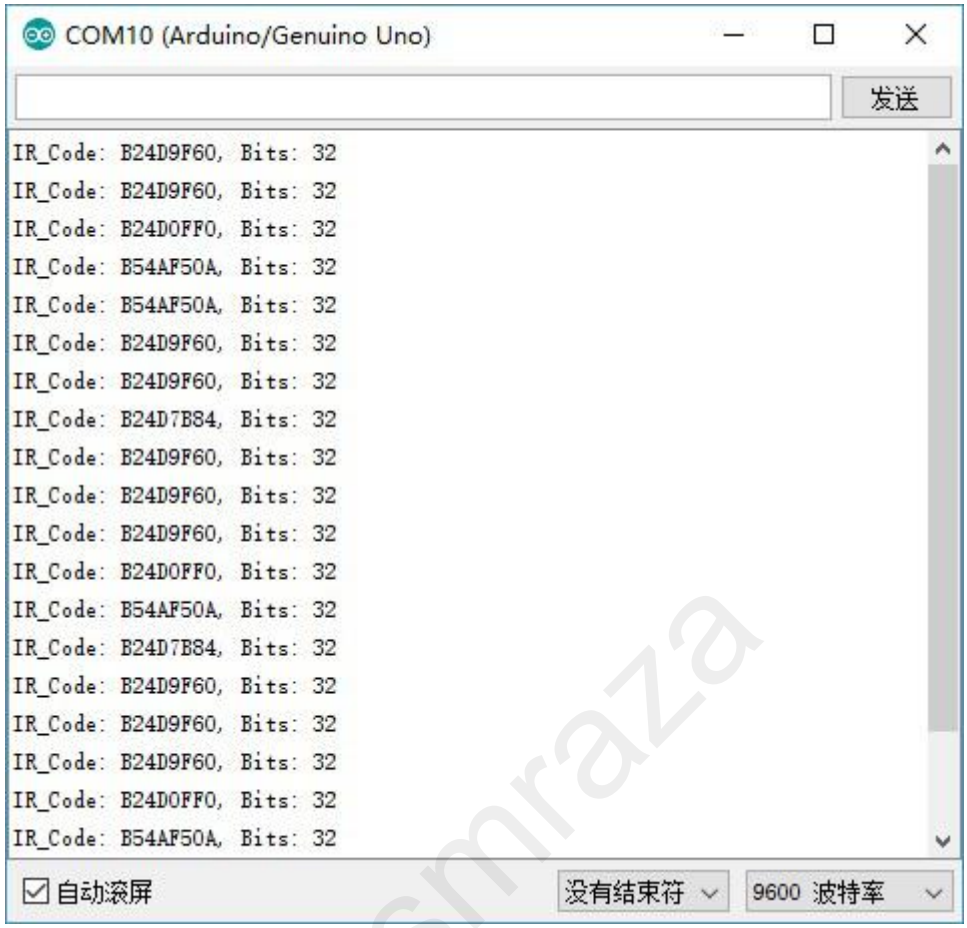
Open the serial port monitor, press the button of the remote control, you will see that each button will have the corresponding coding.

Example picture



Result

Upload the program then open the monitor, we can see the data as below:



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