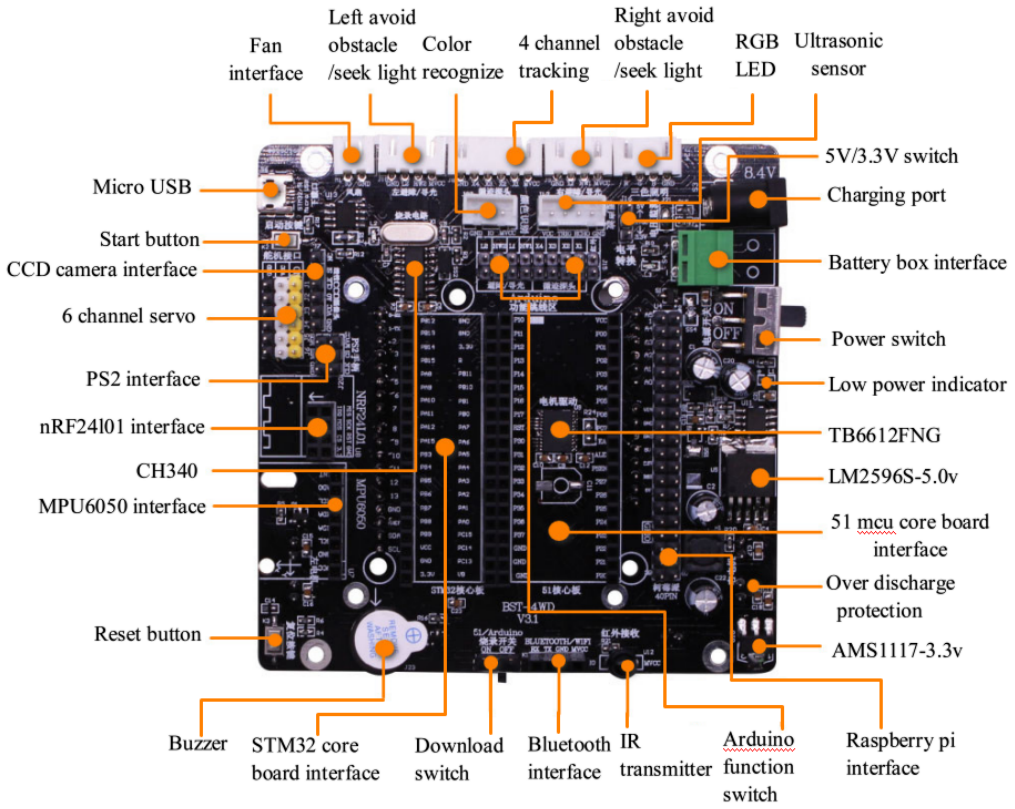
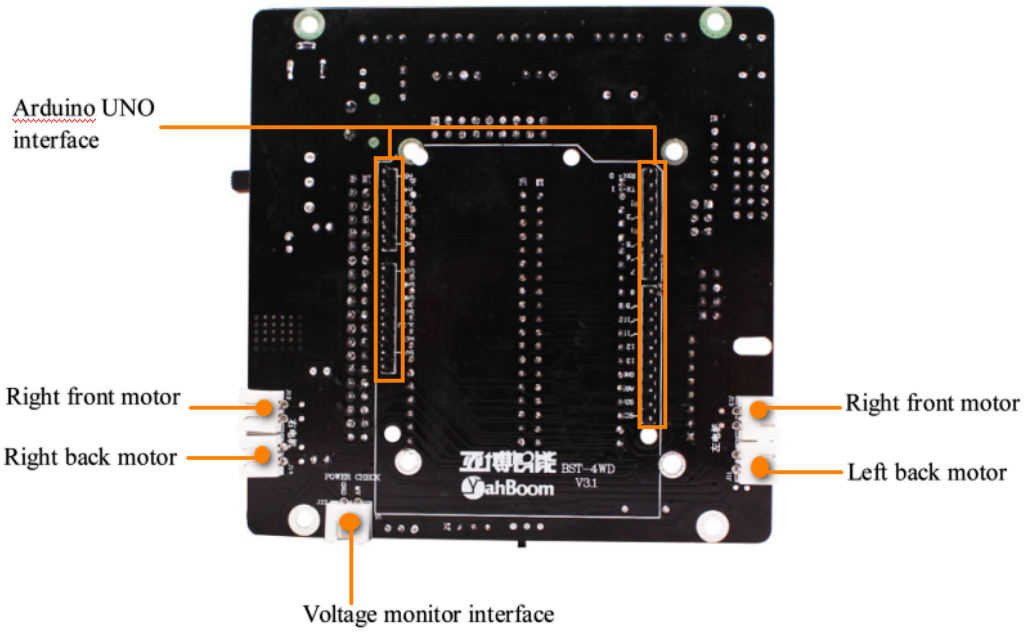
4WD expansion board manual

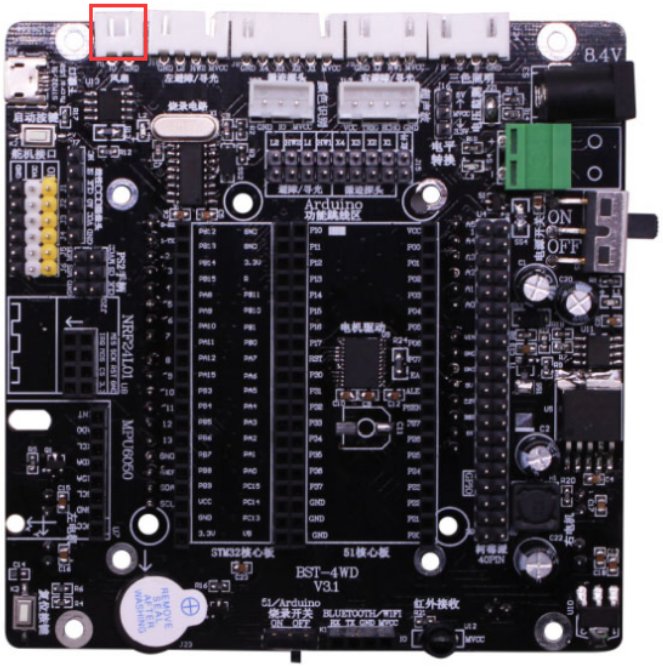
Front：



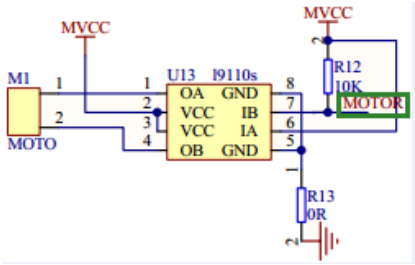
Back：

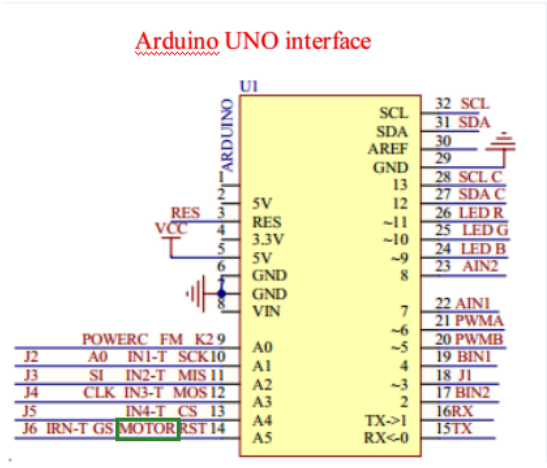


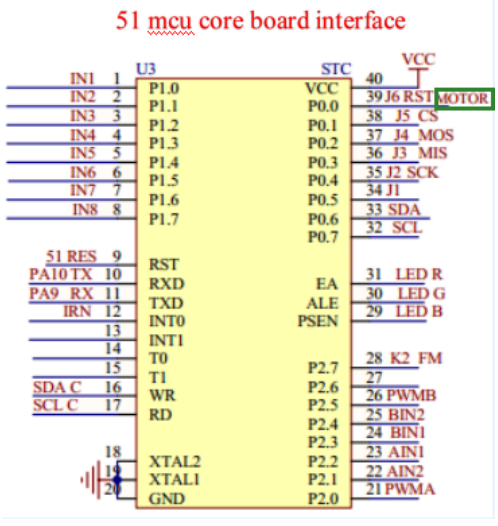
1.Fan interface：

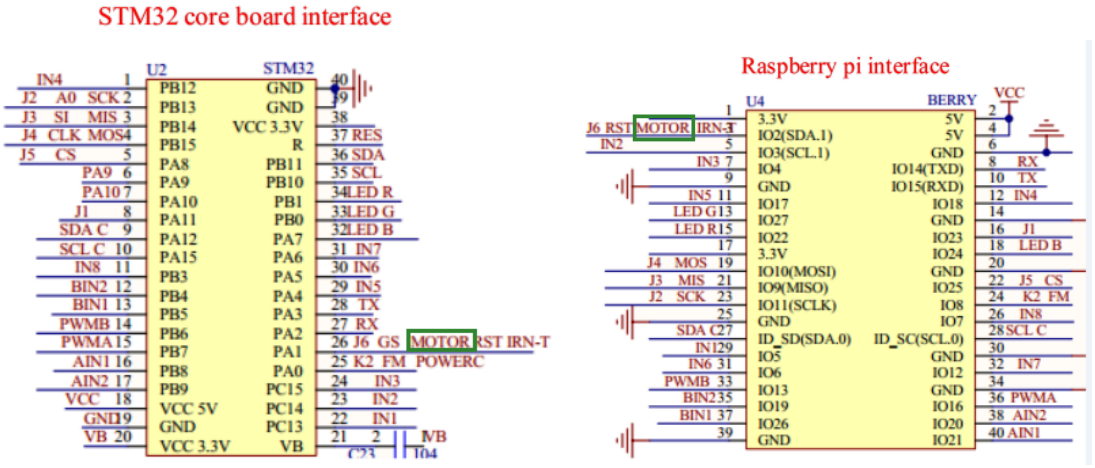

8.4V
ON
OFF
Arduino
BST-4WD
V3.1

1-1 position


MVCC
MVCC
M1
MOTO
U13 l9110s
OA GND
VCC IB
VCC IA
OB GND
R12
10K
MOTOR
R13
0R


Arduino UNO interface
U1
ARDUINO
SCL
SDA
AREF
GND
5V
RES
3.3V
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5
32 SCL
31 SDA
28 SCL C
27 SDA C
26 LED R
25 LED G
24 LED B
23 AIN2
22 AIN1
21 PWMA
20 PWMB
19 BIN1
18 J1
17 BIN2
16RX
15TX
RES
VCC
POWERC FM K2
J2 A0 IN1-T SCK
J3 SI IN2-T MIS
J4 CLK IN3-T MOS
J5 IN4-T CS
J6 IRN-T GS MOTOR RST


51 mcu core board interface
U3
STC
IN1
IN2
IN3
IN4
IN5
IN6
IN7
IN8
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
51 RES
PA10 TX
PA9 RX
IRN
SDA C
SCL C
RST
RXD
TXD
INT0
INT1
T0
T1
WR
RD
XTAL2
XTAL1
GND
VCC
P0.0
P0.1
P0.2
P0.3
P0.4
P0.5
P0.6
P0.7
EA
ALE
PSEN
P2.7
P2.6
P2.5
P2.4
P2.3
P2.2
P2.1
P2.0
VCC
39 J6 RST MOTOR
38 J5 CS
37 J4 MOS
36 J3 MIS
35 J2 SCK
34 J1
33 SDA
32 SCL
31 LED R
30 LED G
29 LED B
28 K2 FM
26 PWMB
25 BIN2
24 BIN1
23 AIN1
22 AIN2
21 PWMA



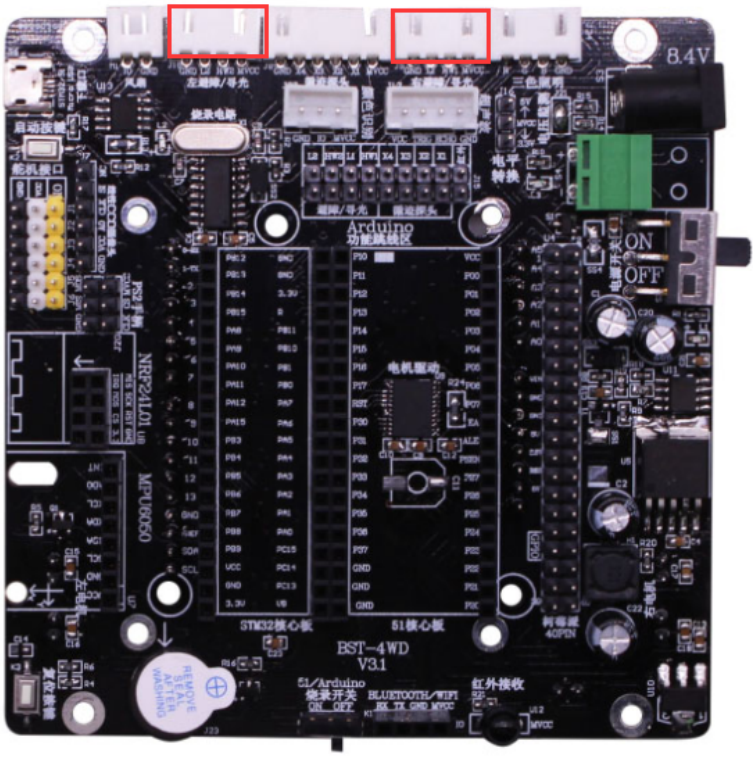
1-2 Schematic diagram

The interface has two pins: GND, IO port. We use l9110s motor drive chip in here. When the IO port gets low level, the fan can rotate.

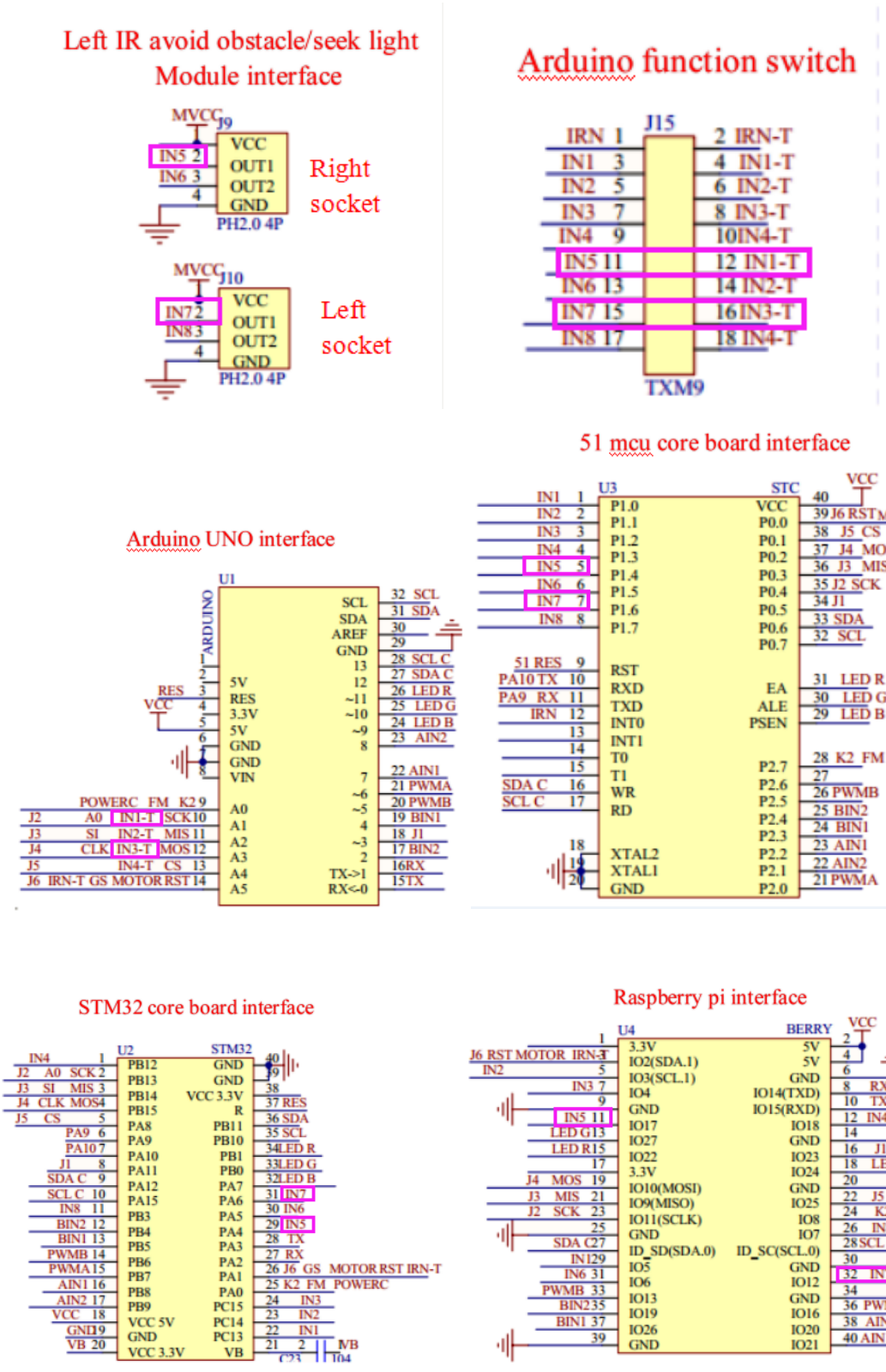
Pin table：

Module interface	Arduino	51controller	STM32	Raspberry Pi
IO port	A5	P0.0	PA1	IO2

2.Left and right infrared obstacle avoidance (light seeking) interface：



2-1 Position



2-2 Schematic diagram

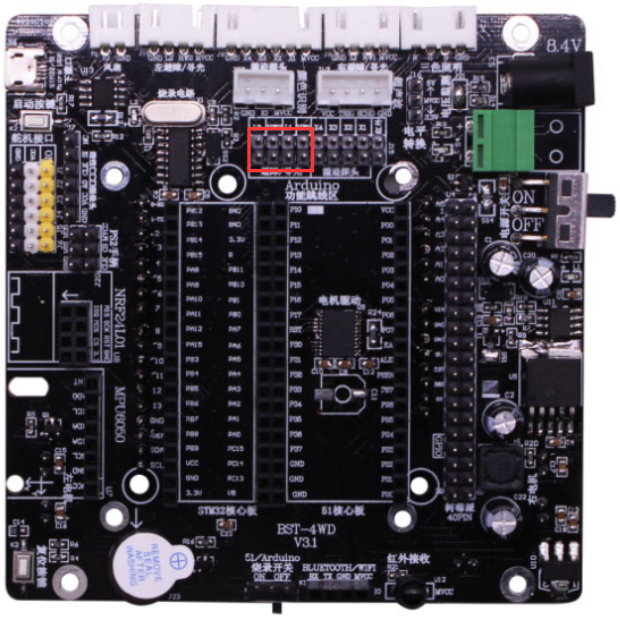
The interface has four pins: VCC, GND, and two OUT ports. Under normal working conditions, VCC is 5V voltage.We can connect the infrared obstacle avoidance sensor module to these two joints, and judge whether the front is an obstacle by detecting the level

of the two OUT1 ports.

Pin table：

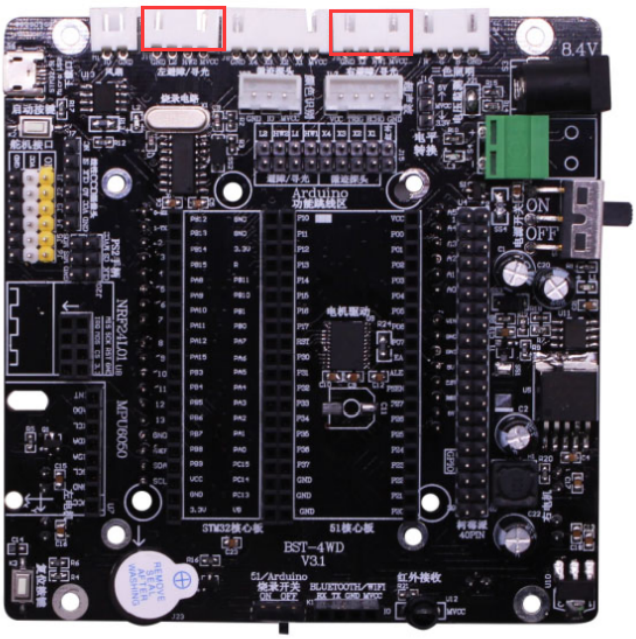
Module interface	Arduino	51 controller	STM32	Raspberry Pi
IN5(OUT1_R)	A1	P1.4	PA4	IO17
IN7(OUT1_L)	A3	P1.6	PA6	IO12

Note：When using the Arduino core controller, the corresponding IN5 and in1-t,IN7 and in3-t need to be connected with the jumper cap.

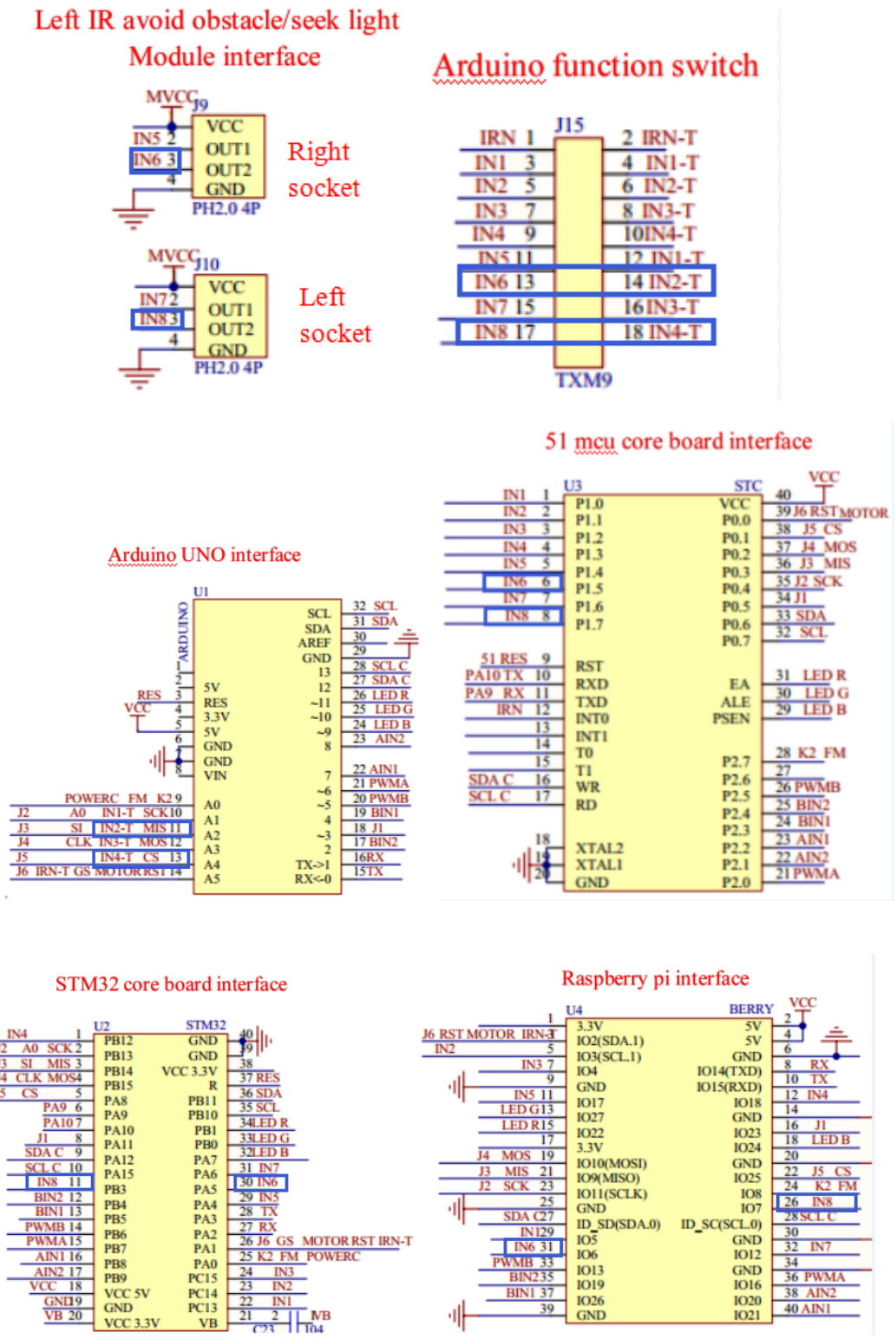


2-3 Position with jumper cap

3. Light seeking (Left and right infrared obstacle avoidance) interface：：



3-1 Position



3-2 Schematic diagram

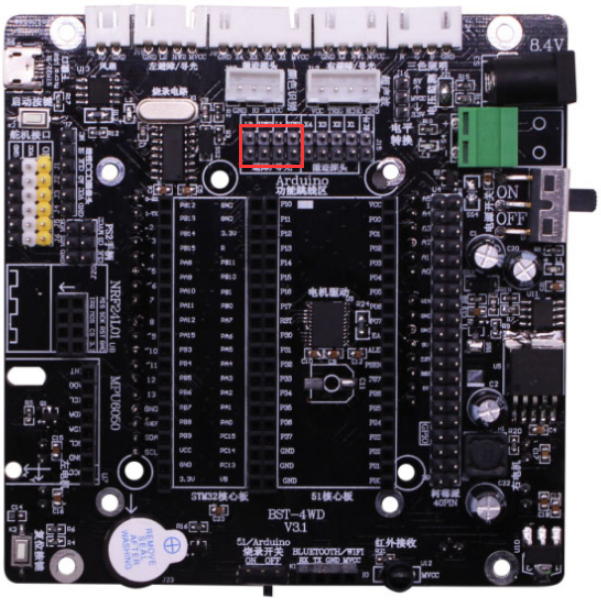
The interface has four pins: VCC, GND, and two OUT ports. Under normal working

conditions, VCC is 5V voltage.We can connect the infrared light-seeking sensor module to these two interfaces, and judge whether there is light by detecting the level of the two OUT2 ports.

Pin table：

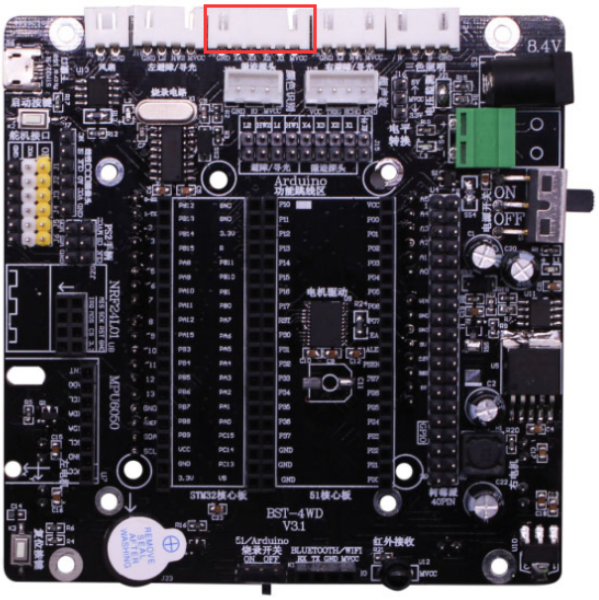
Module interface	Arduino	51controller	STM32	Raspberry Pi
IN6(OUT2_R)	A2	P1.5	PB3	IO6
IN8(OUT2_L)	A4	P1.7	PA5	IO7

Note：When using the Arduino core controller, the corresponding IN6 and in2-t,IN8 and in4-t need to be connected with the jumper cap.

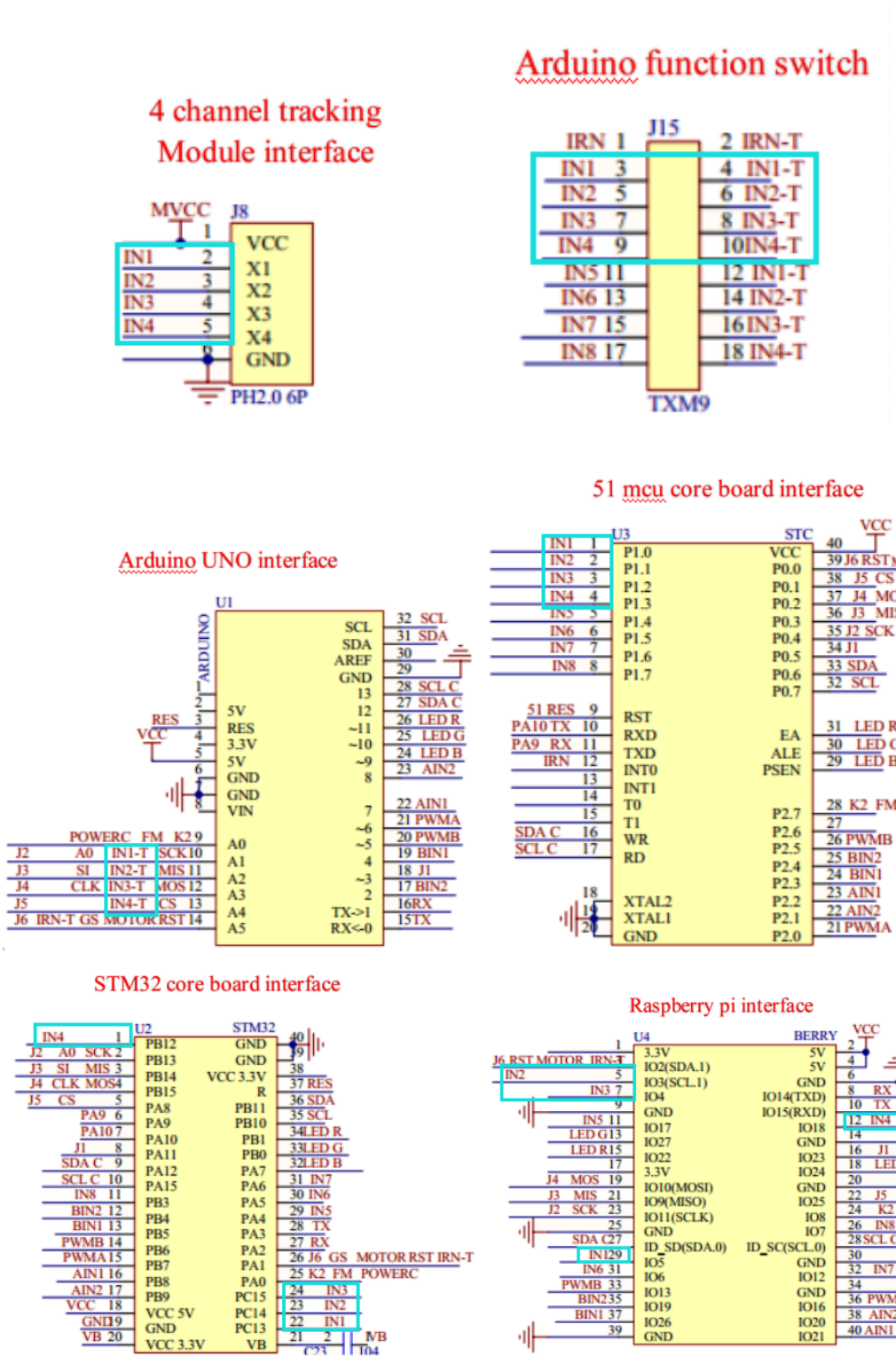


3-3 Position with jumper cap

4. 4-Channel tracking interface



4-1 Position



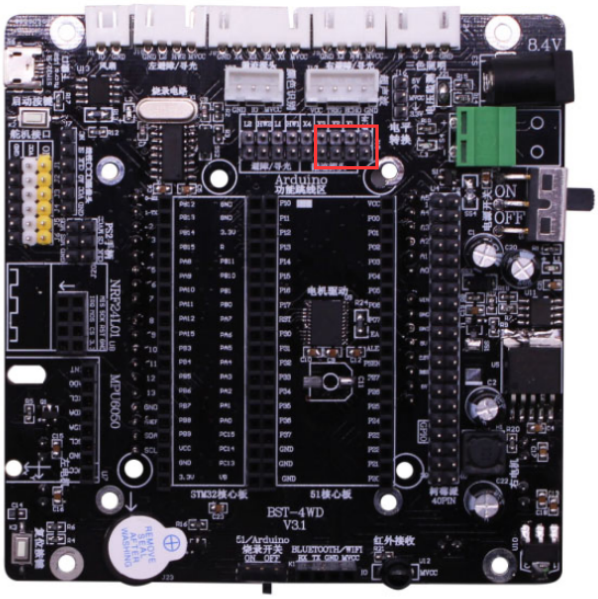
4-2 Schematic diagram

The interface has six pins: VCC, GND, IN1, IN2, IN3, and IN4.VCC is 5V voltage under normal operation.We can connect a four-channel tracking module here, and judge whether it is on the black track by checking the level of IN1, IN2, IN3 and IN4 ports.

Pin table：

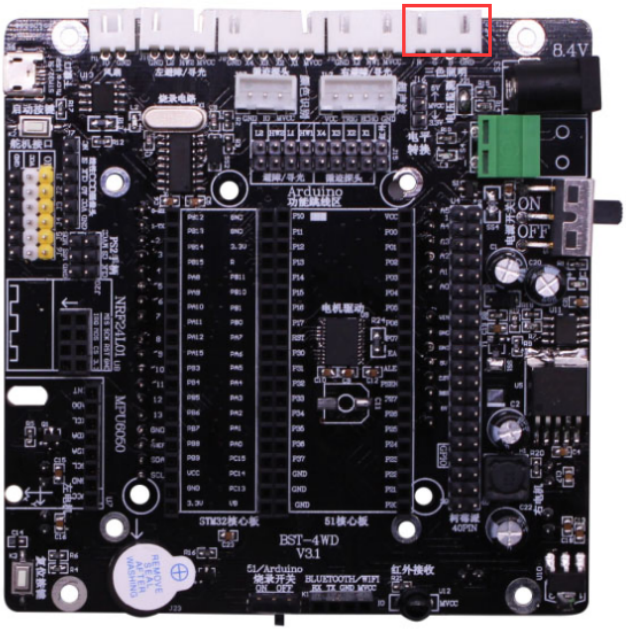
Module interface	Arduino	51controller	STM32	Raspberry
IN1	A1	P1.0	PC13	IO5
IN2	A2	P1.2	PC14	IO3
IN3	A3	P1.3	PC15	IO4
IN4	A4	P1.4	PB12	IO18

Note：When using the Arduino core controller, the corresponding IN1 and in1-t,IN2 and in2-t, IN3 and in3-t, IN4 and in4-t need to be connected with the jumper cap.

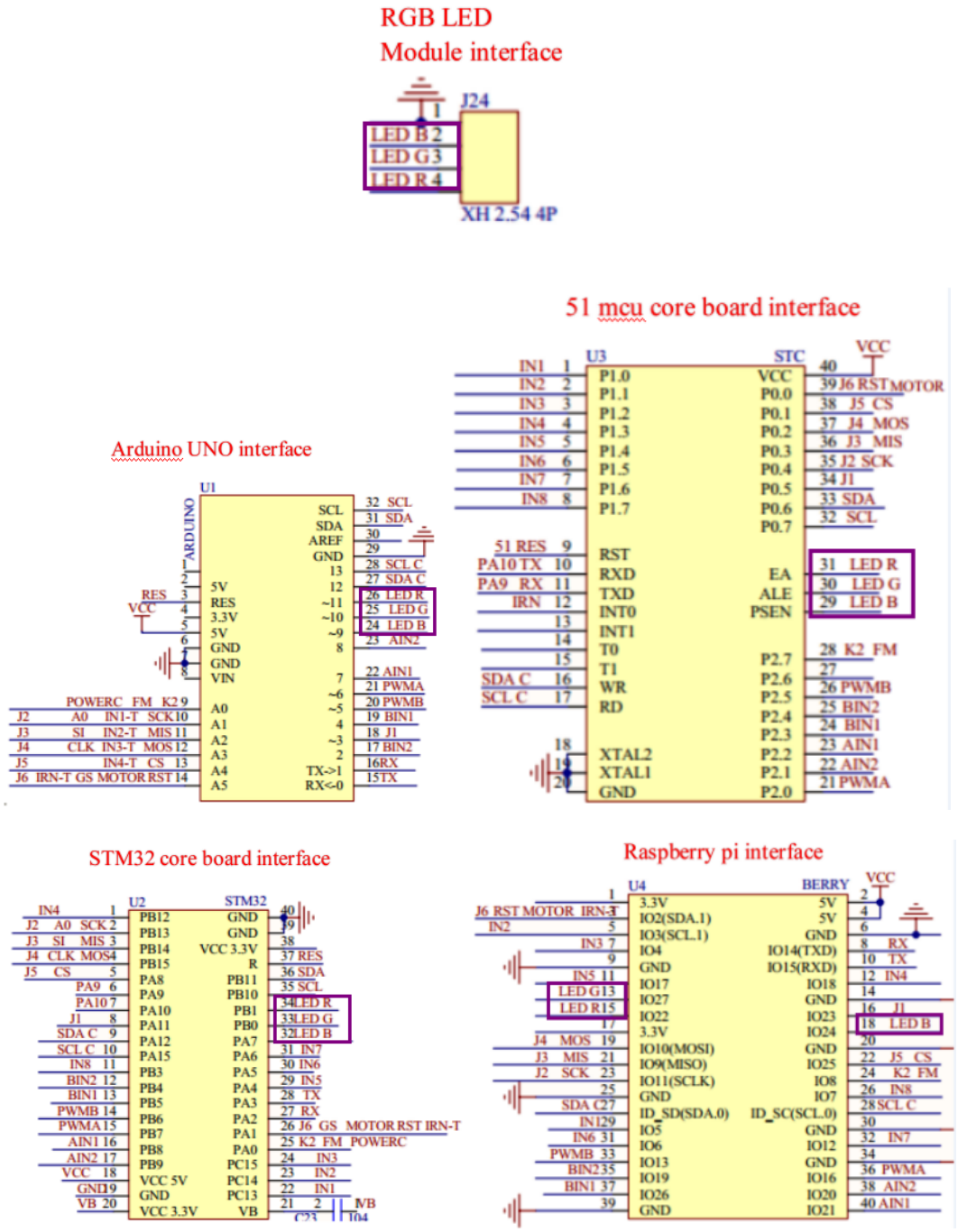


4-3 Position with jumper cap

5.RGB LED module interface



5-1 Position



5-2 Schematic diagram

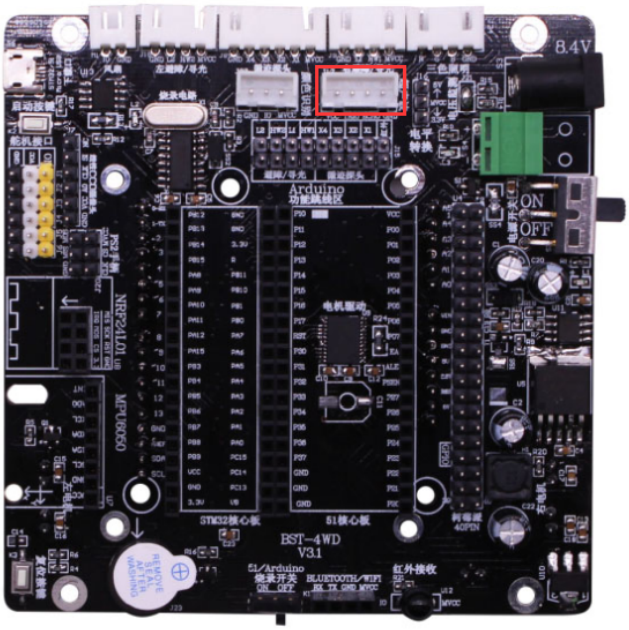
The interface has four pins: GND, LED R, LEDG, LEDB. When the LED R, LED G, and LED B pins are respectively turned on, the corresponding color lights (red, green, and blue) can be lit. When any two of the pins (or three pins) are at a high level, the RGB light will appear in a mixture of two colors (three colors).

Pin table：

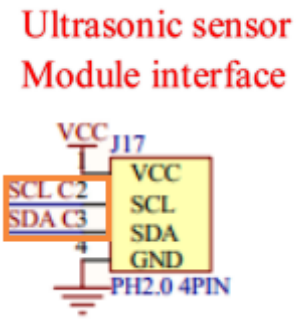
Module interface	Arduino	51 controller	STM32	Raspberry Pi

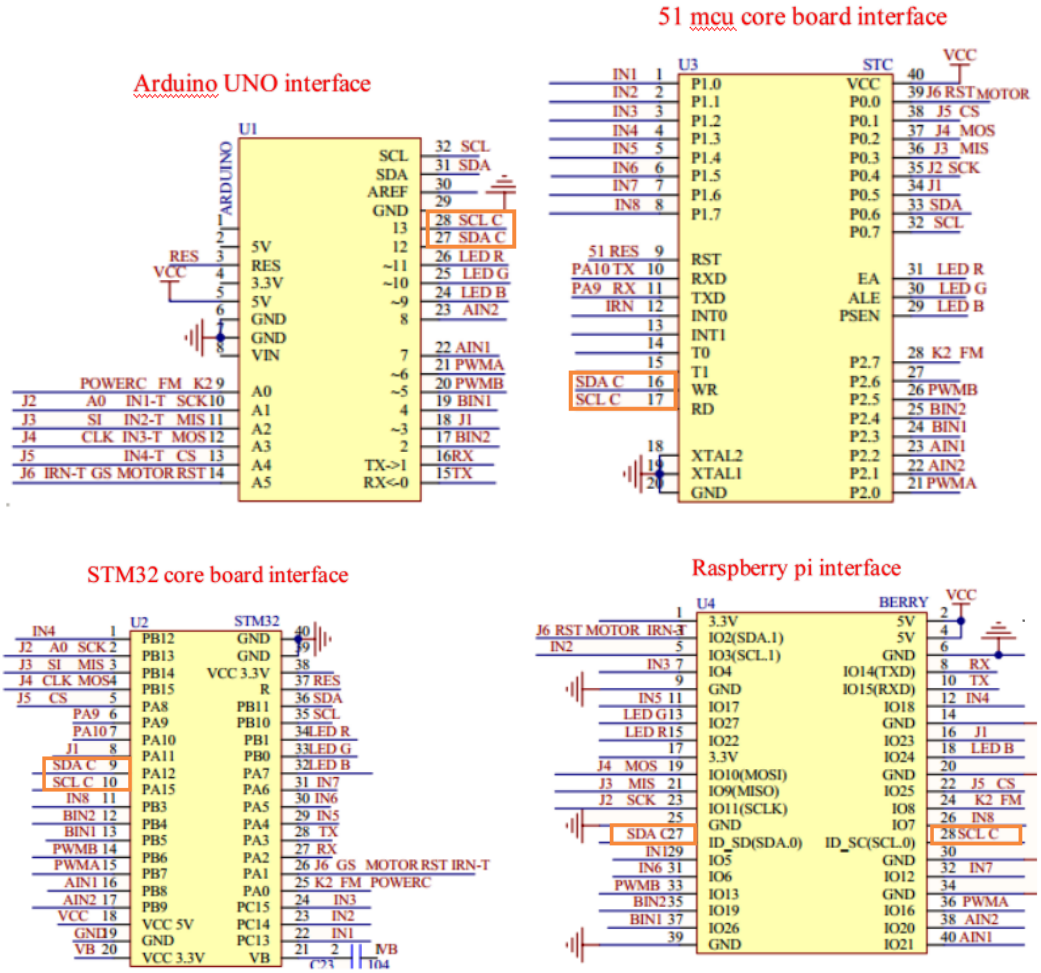
LED R	~11	P4.6 (EA)	PB1	IO22
LED G	~10	P4.5 (ALE)	PB0	IO27
LED B	~9	P4.4 (PSEN)	PA7	IO24

6. Ultrasonic module interface



6-1 Position





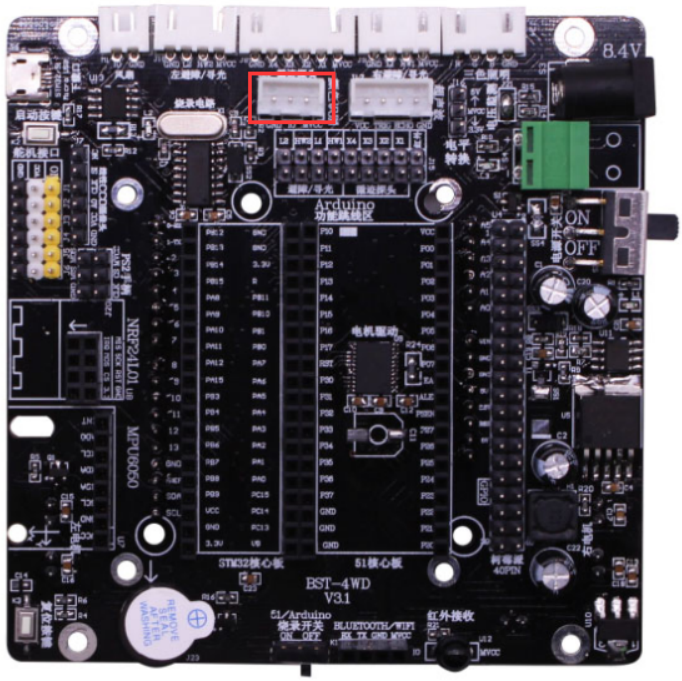
6-2 Schematic diagram

The interface has four pins: VCC, GND, SDA, SCL. Under normal operating conditions, VCC is 5V. When used, the Trig pin of the ultrasonic module is connected to SCL, and the Echo pin is connected to SDA.

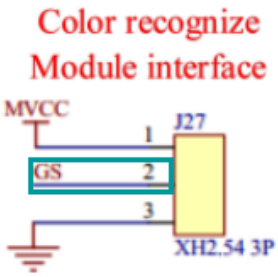
Pin table：

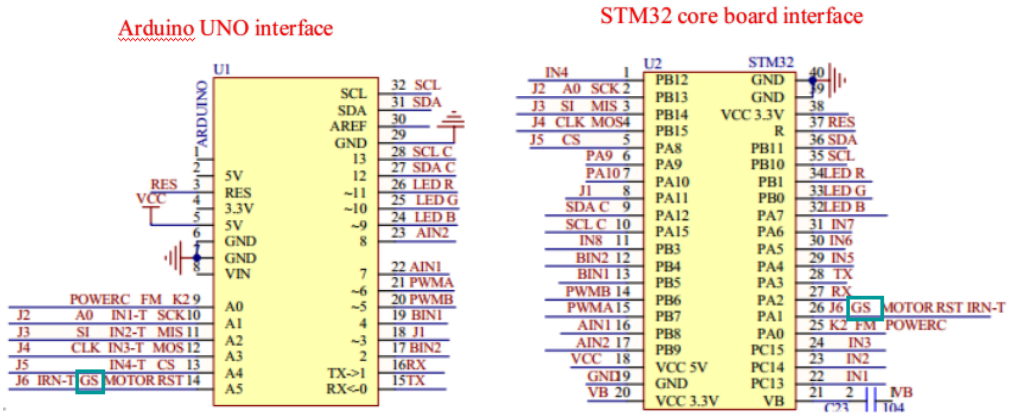
Module interface	Arduino	51controller	STM32	Raspberry Pi
SDA	12	P3.6 (WR)	PA12	ID_SD(SDA.0)
SCL	13	P3.7 (RD)	PA15	ID_SC(SCL.0)

7.Grayscale module (color recognition) interface



7-1Position





7-2 Schematic diagram

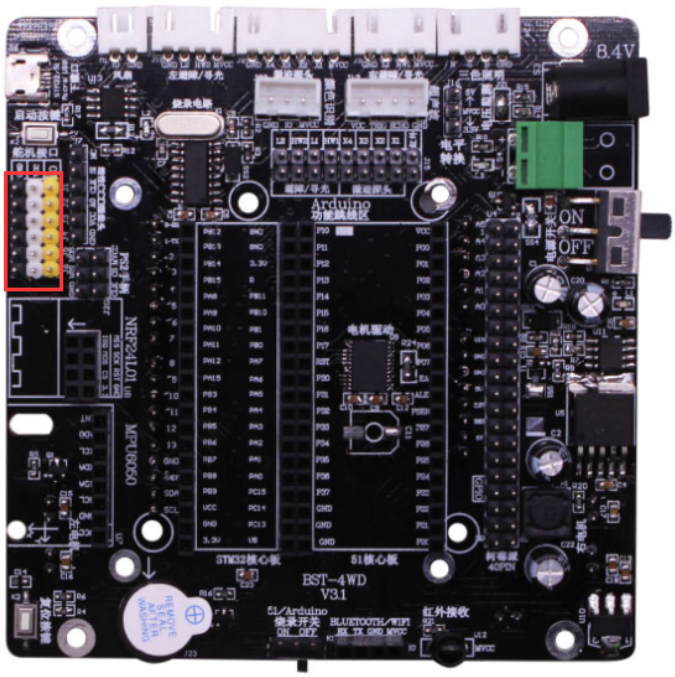
The interface has three pins: VCC, GND, and IO. VCC is 5V under normal operating conditions.

Pin table：

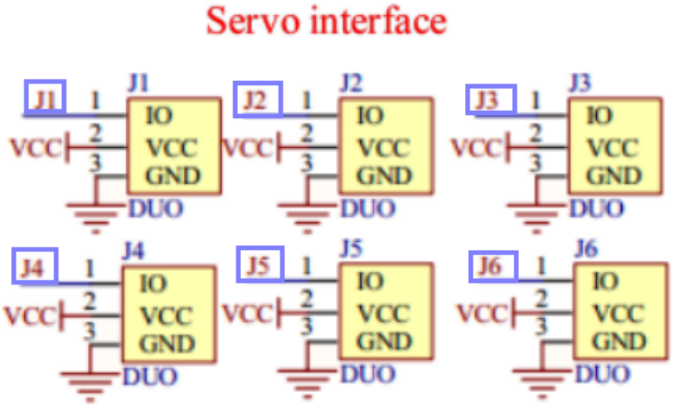
Module interface	Arduino	STM32
GS	A5	PA1

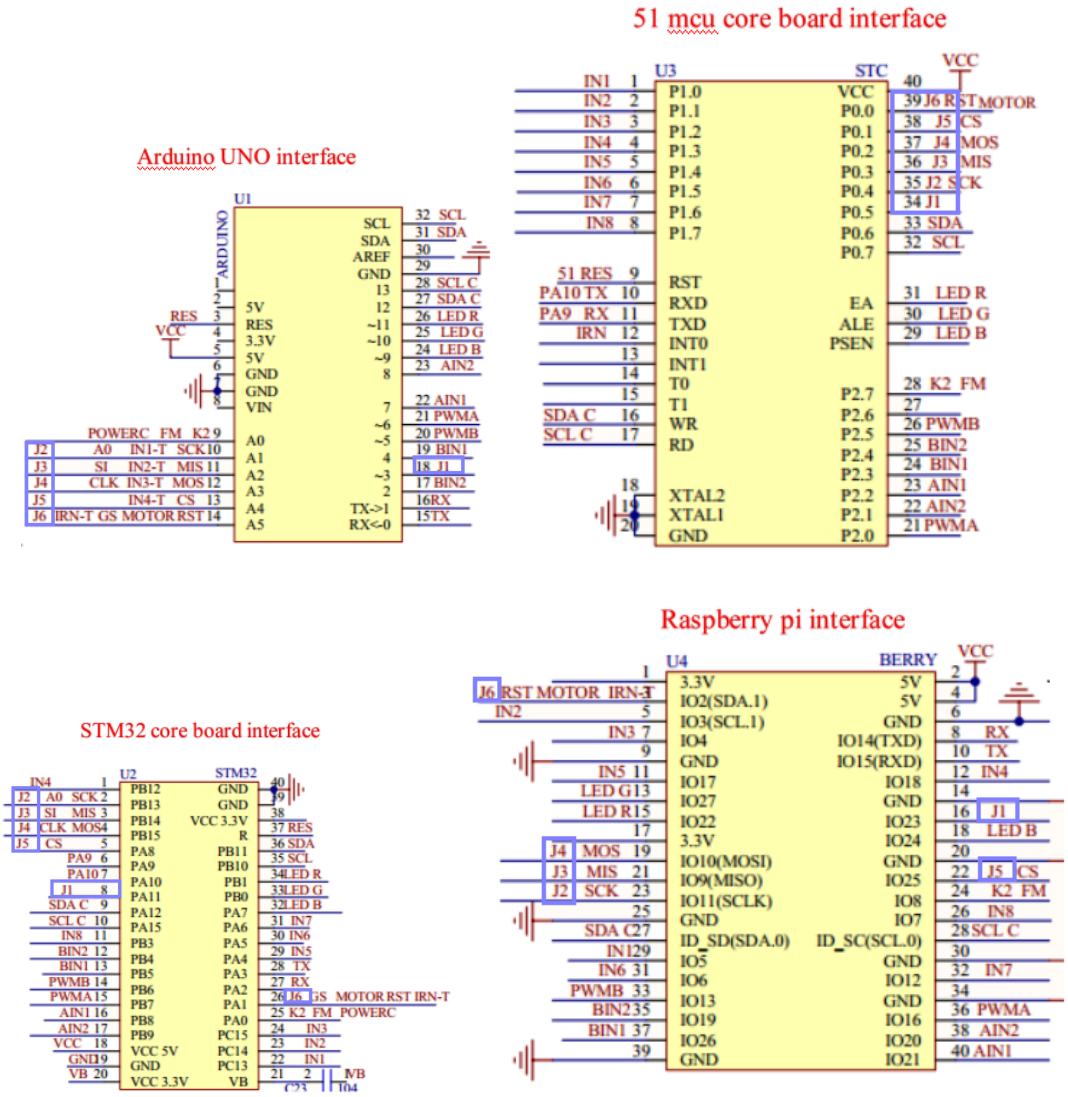
Note：This interface only supports Arduino and STM32 versions. The fan and infrared remote jumper caps need to be removed during use (explained later).

8.Servo interface



8-1 Position





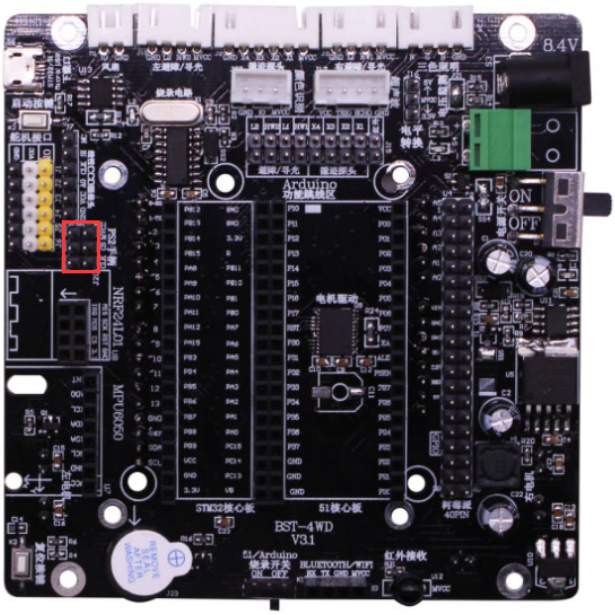
8-2 Schematic diagram

There are 6 servo interfaces, each with three pins: VCC, GND, and IO. VCC is 5V under normal operating conditions. It can simultaneously output 6 PWMs independently to control 6 servos.

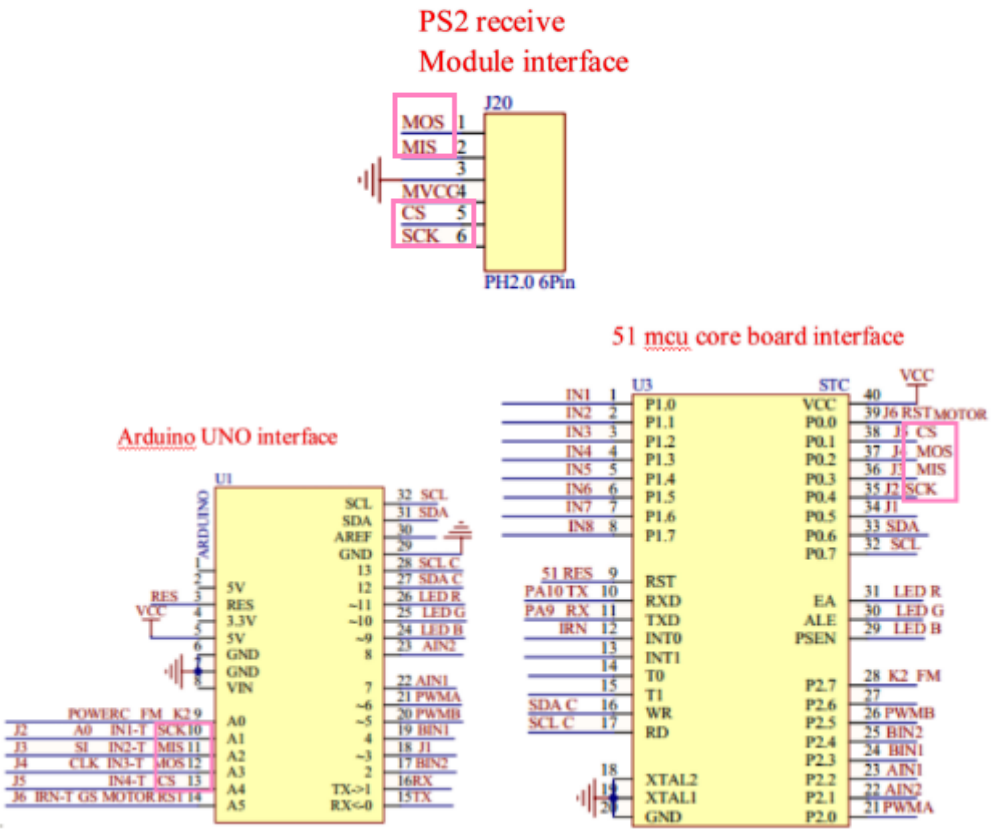
Pin table：

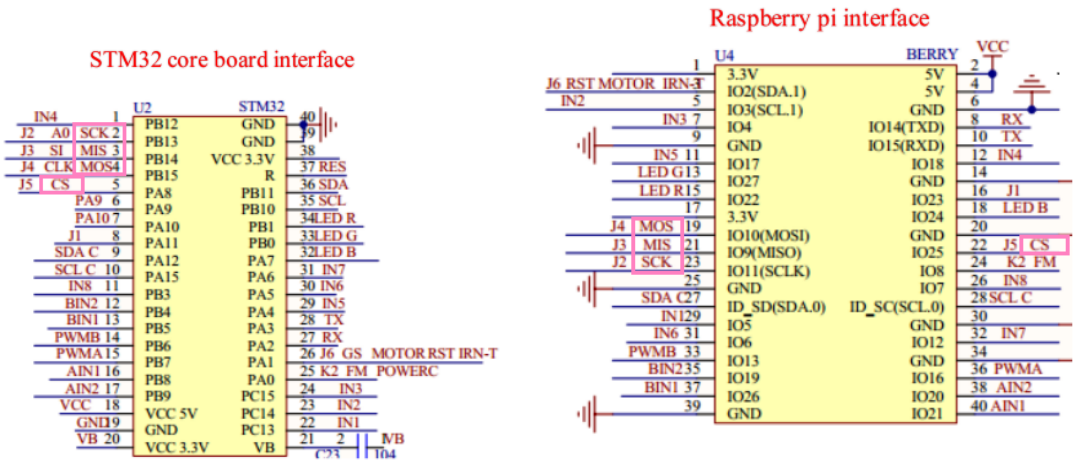
Module interface	Arduino	51 controller	STM32	Raspberry Pi
J1	~3	P0.5	PA11	IO23
J2	A1	P0.4	PB13	IO11
J3	A2	P0.3	PB14	IO9
J4	A3	P0.2	PB15	IO10
J5	A4	P0.1	PA8	IO25
J6	A5	P0.0	PA1	IO2

9. PS2controller receiving module interface



9-1 Position





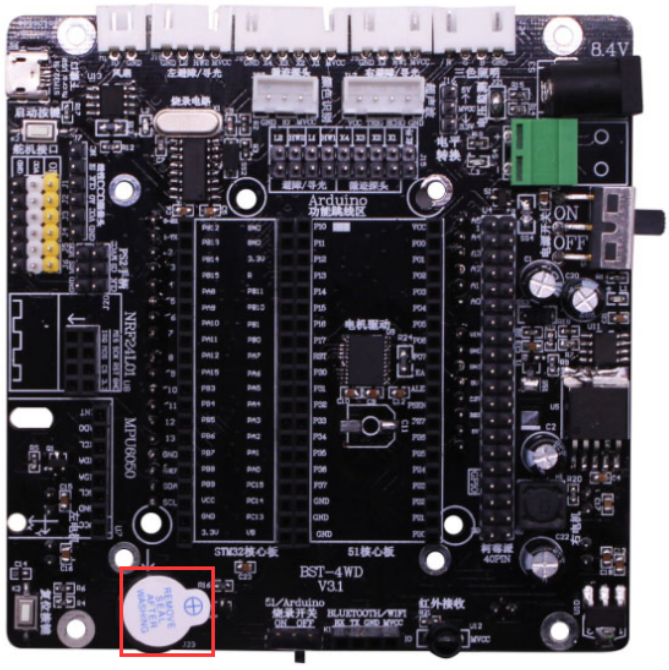
9-2 Schematic diagram

The interface has six pins: VCC, GND, MOS, MIS, CS, SCK. Under normal working conditions, VCC is 5V, and the SPI communication method is adopted between the receiver and the core controller.

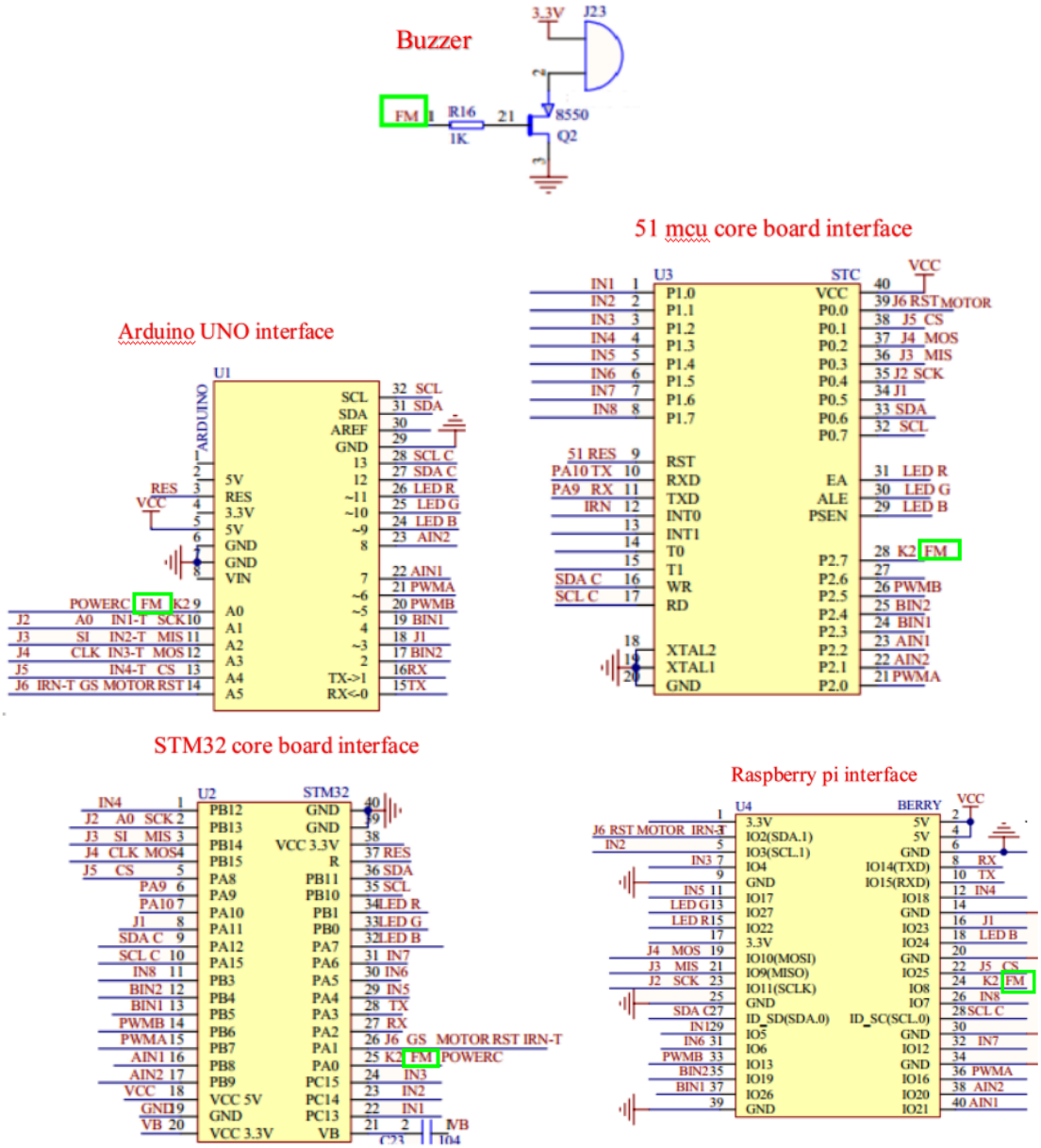
Pin table：

Module interface	Arduino	51controller	STM32	Raspberry Pi
CS	A4	P0.1	PA8	IO25
SCK	A1	P0.4	PB13	IO11
MOS	A3	P0.2	PB15	IO10
MIS	A2	P0.3	PB14	IO9

10.Buzzer



10-1 Position



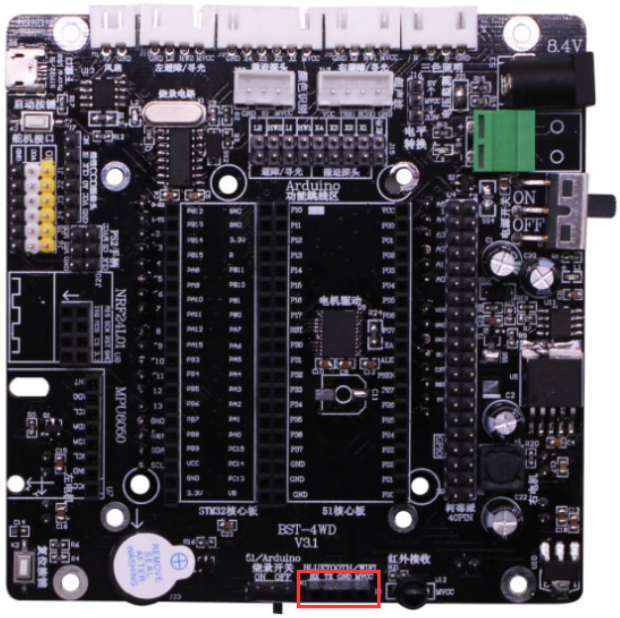
10-2 Schematic diagram

The active buzzer is used here.

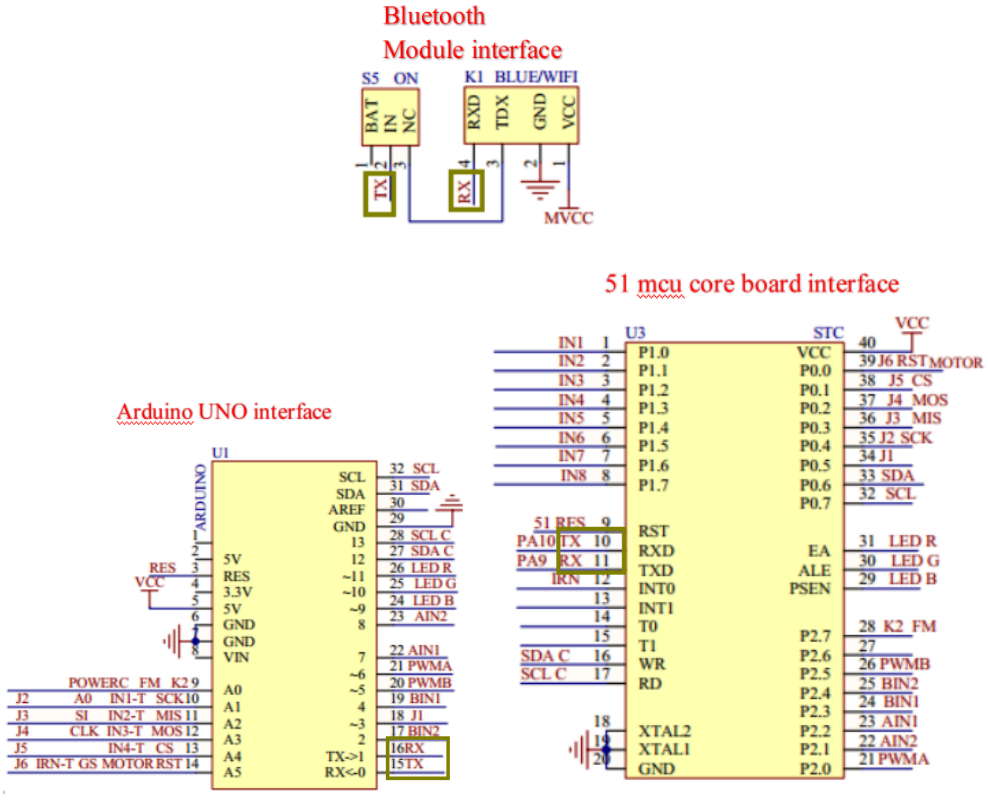
Pin table：

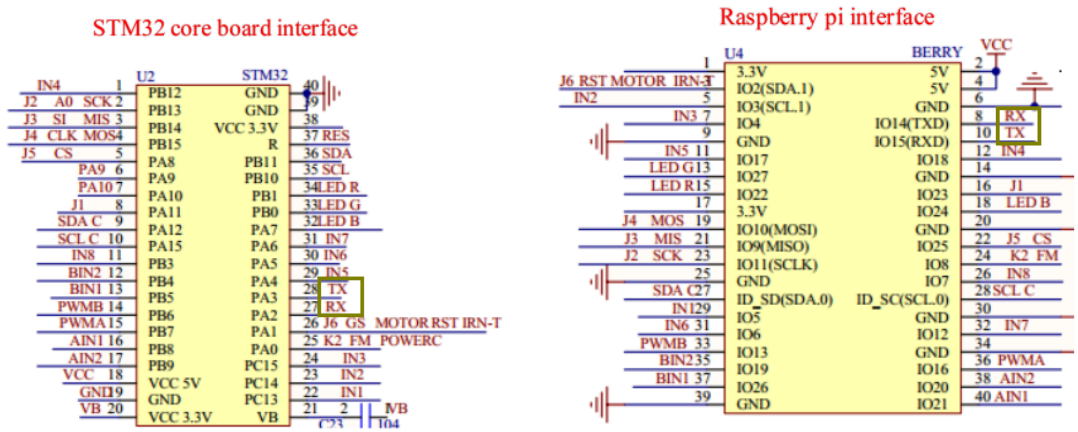
Module interface	Arduino	51controller	STM32	Raspberry Pi
FM	A0	P2.7	PA0	IO8

11.Bluetooth/WIFI module interface



11-1 Position





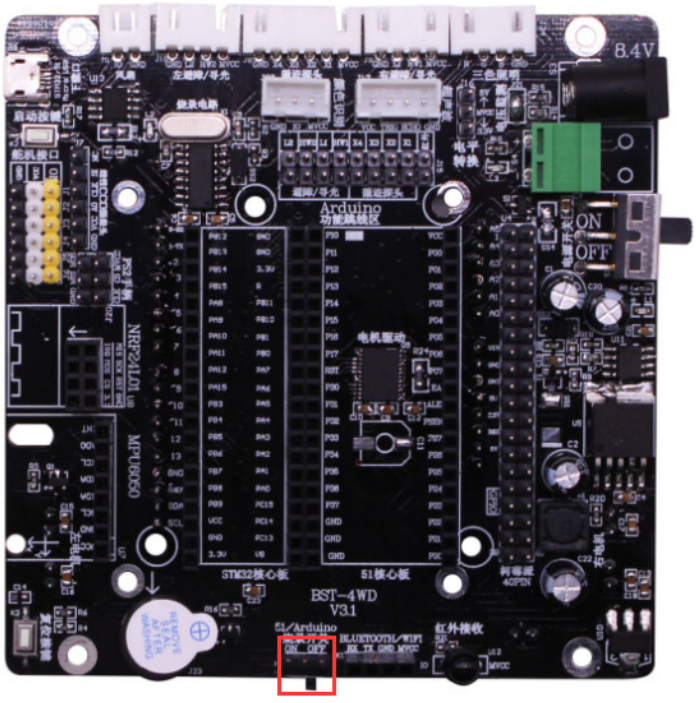
11-2 Schematic diagram

The interface has four pins: VCC, GND, TX, RX. VCC is 5V under normal working conditions, where Bluetooth uses serial communication.

Pin table：

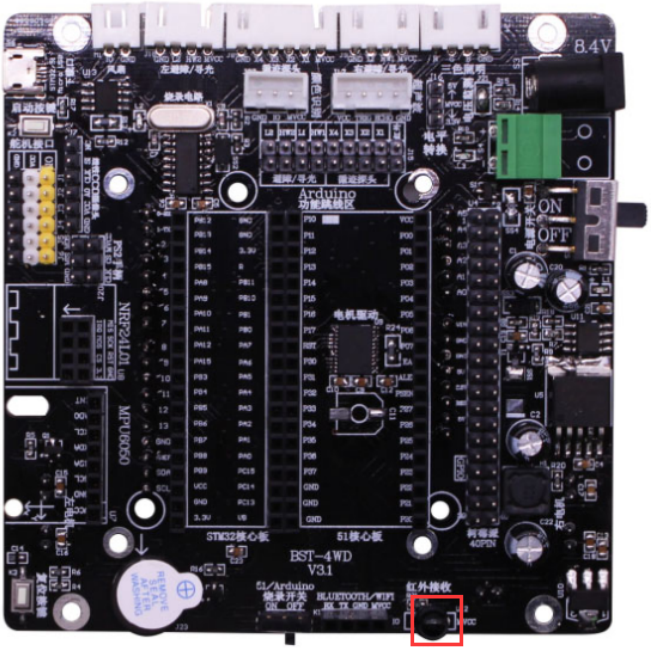
Module interface	Arduino	51controller	STM32	Raspberry Pi
TX	0	P3.0	PA3	IO15
RX	1	P3.1	PA2	IO14

Note： When using the serial port, for example: print data, burn the program through the CH340 serial port, you need to unplug the Bluetooth module. When using the Bluetooth module, you need to turn the programming switch next to the interface to OFF.

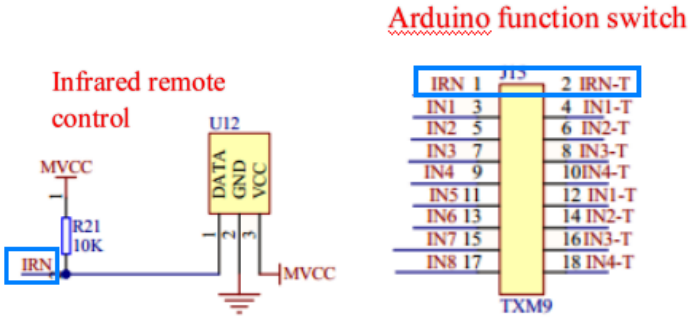


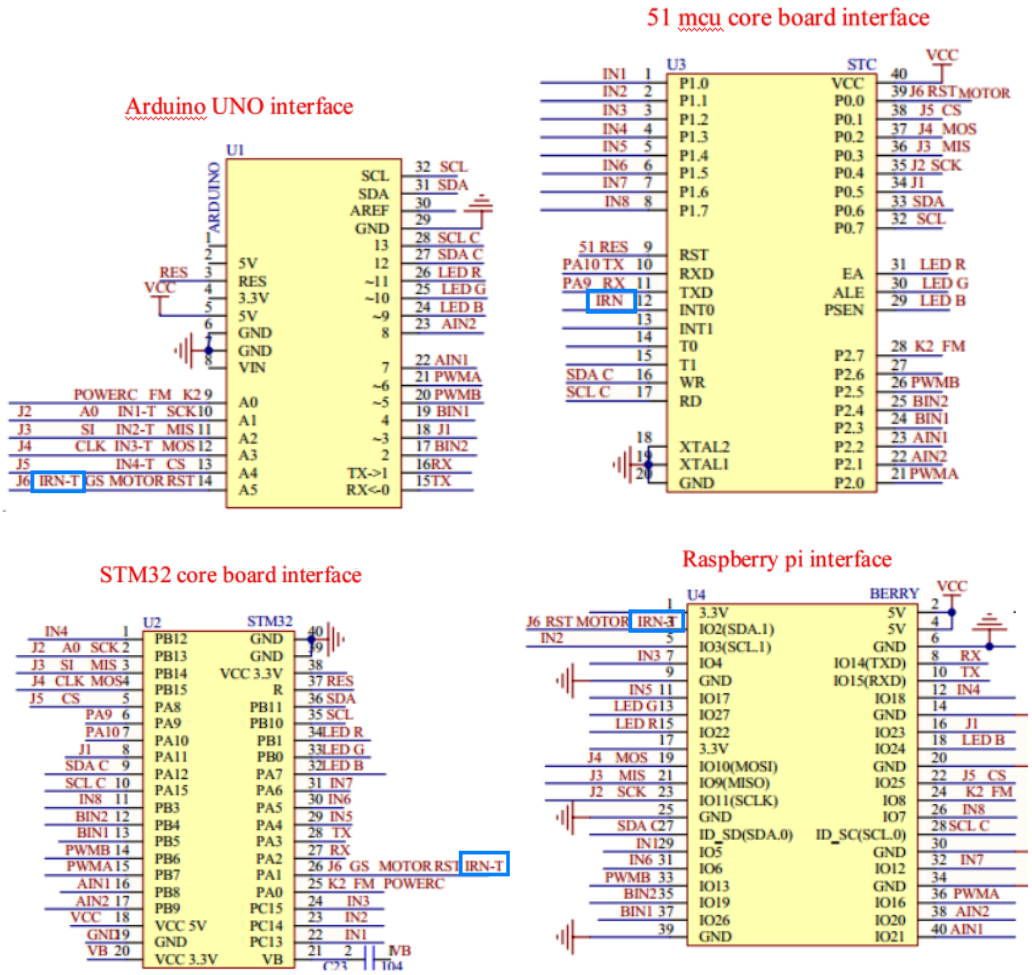
11-3 Switch position for burning

12. Infrared receiver



12-1 Position





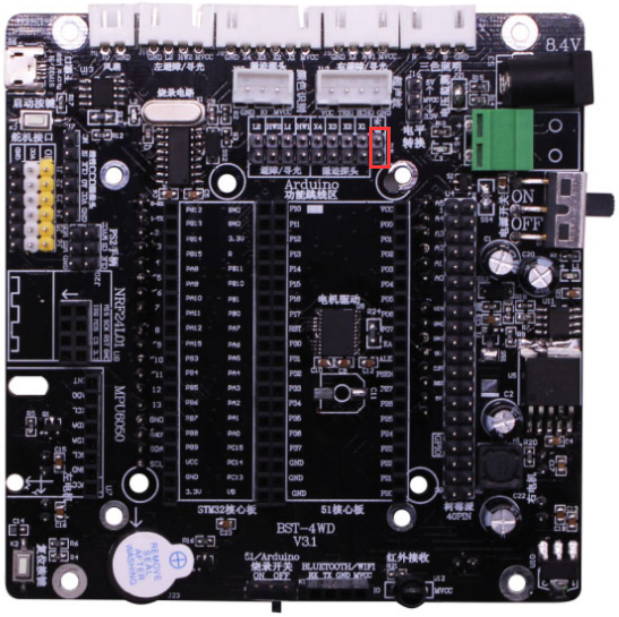
12-2 Schematic diagram

The infrared remote control function needs to use our dedicated remote control to be implemented normally.

Pin table：

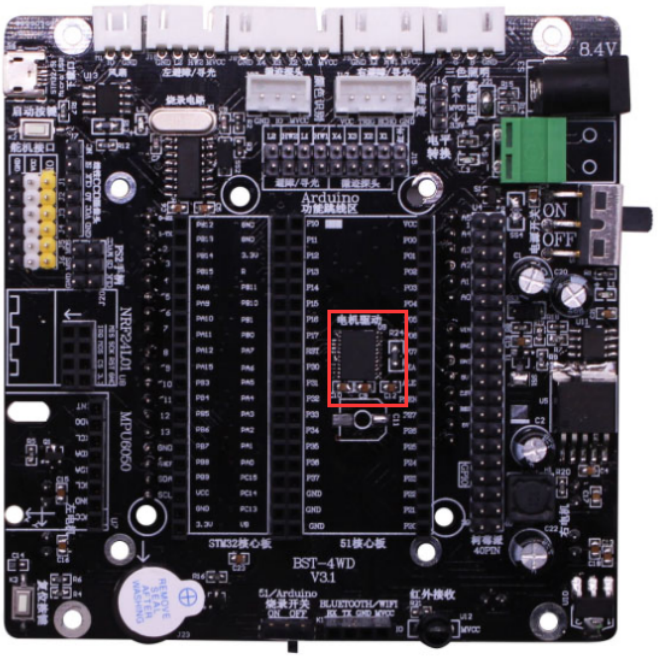
Module interface	Arduino	51controller	STM32	Raspberry Pi
IRN	A5	P3.2(INT0)	PA1	IO2

Note：When using the infrared remote control, you need to connect the infrared jumper cap on the expansion board. And unplug the grayscale (color recognition module) and the small fan.

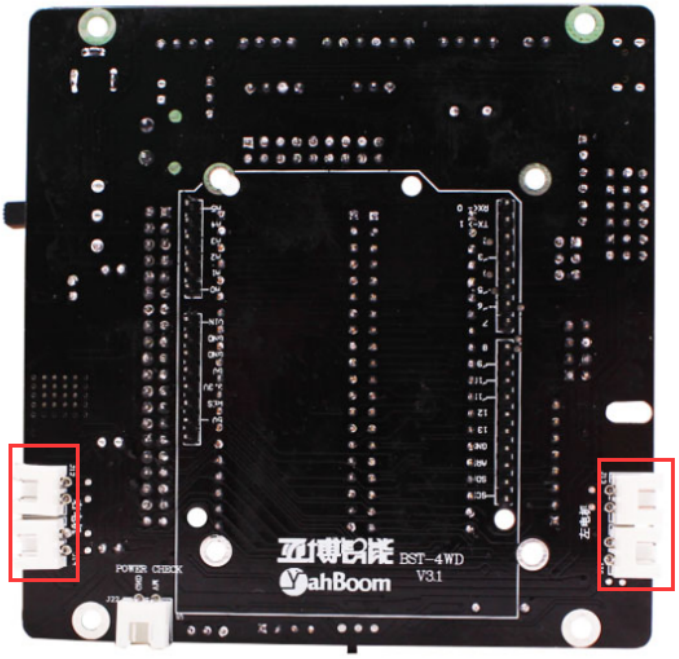


12-3 Position with jumper cap

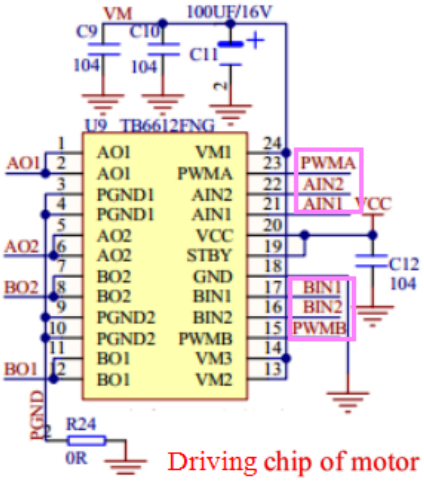
13. Motor driver circuit/interface

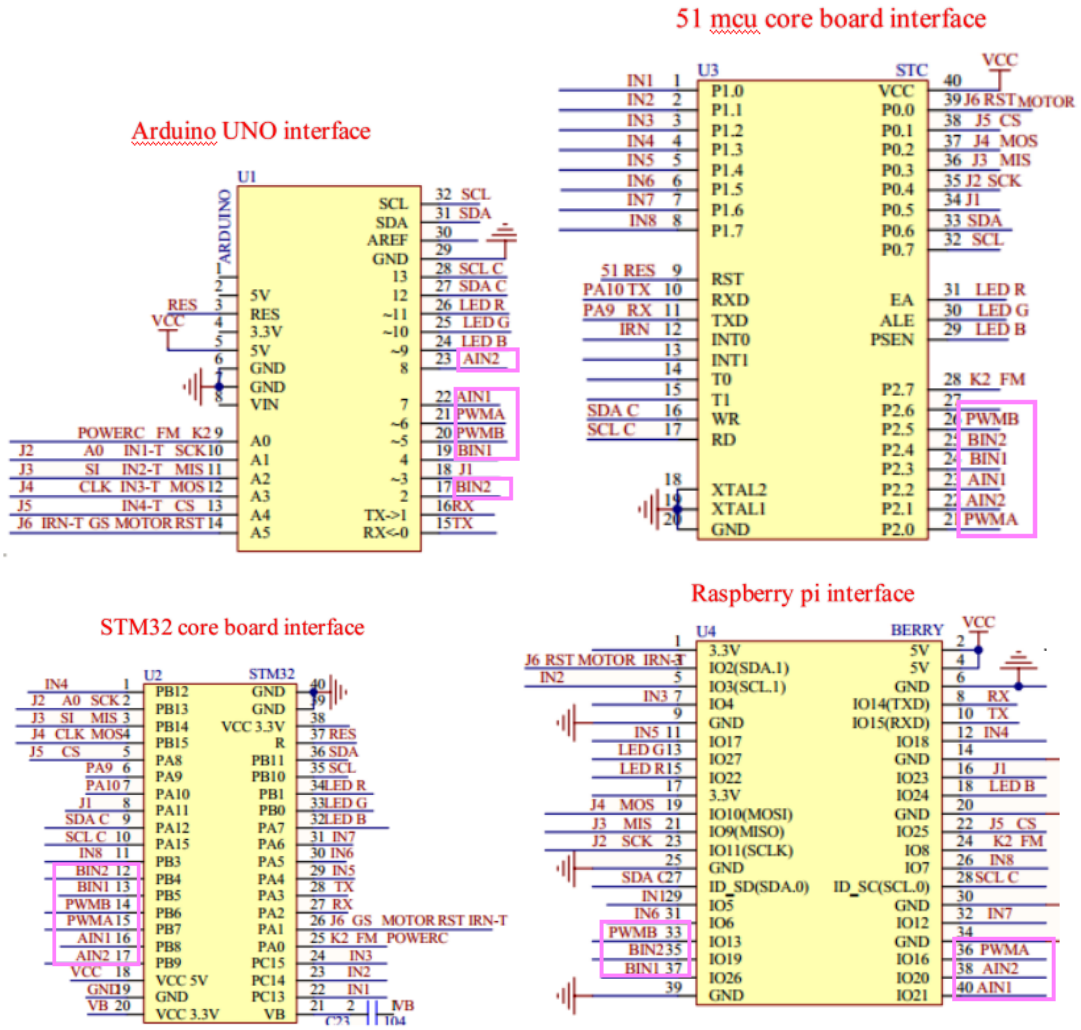


13-1 Motor driver chip position



13-1 Motor interface position





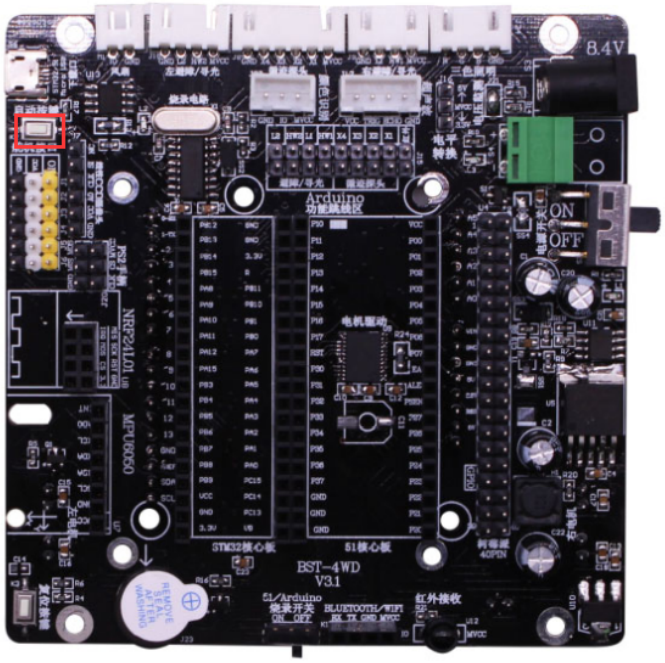
13-3 Schematic diagram

Control two motors with two PWM to adjust the direction and speed of the motor.

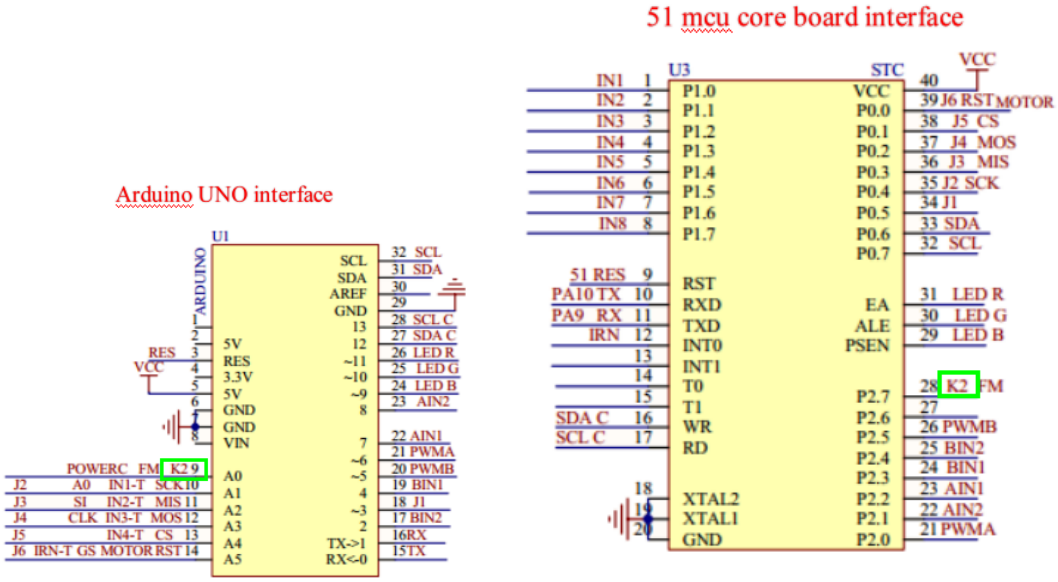
Pin table：

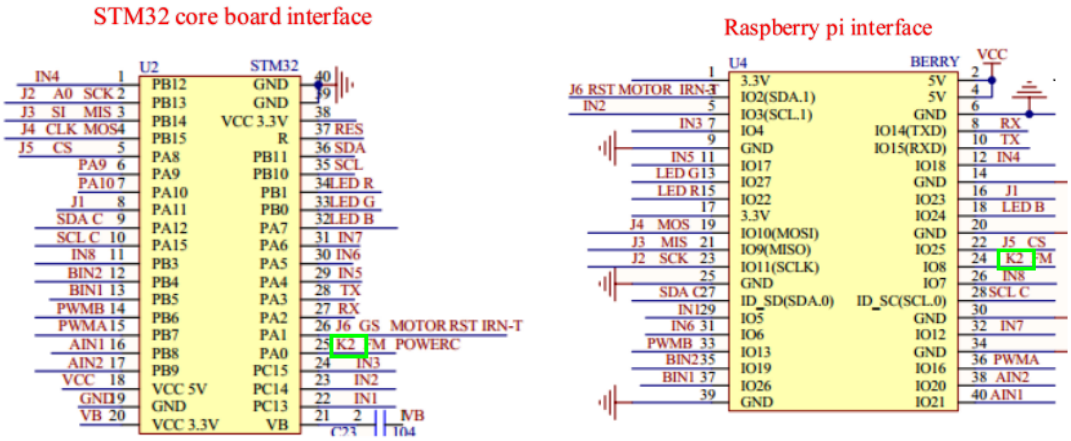
Module interface	Arduino	51controller	STM32	Raspberry Pi
PWMA	~6	P2.0	PB7	IO16
PWMB	~5	P2.5	PB6	IO13
AIN1	7	P2.2	PB8	IO21
AIN2	8	P2.1	PB9	IO20
BIN1	4	P2.3	PB5	IO26
BIN2	2	P2.4	PB4	IO19

14. Start button



14-1 Position





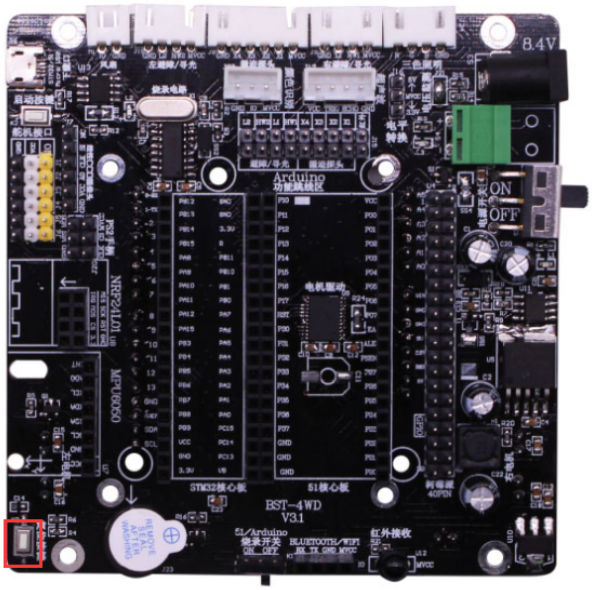
14-2 Schematic diagram

This is a start button that can be defined to turn on a feature.

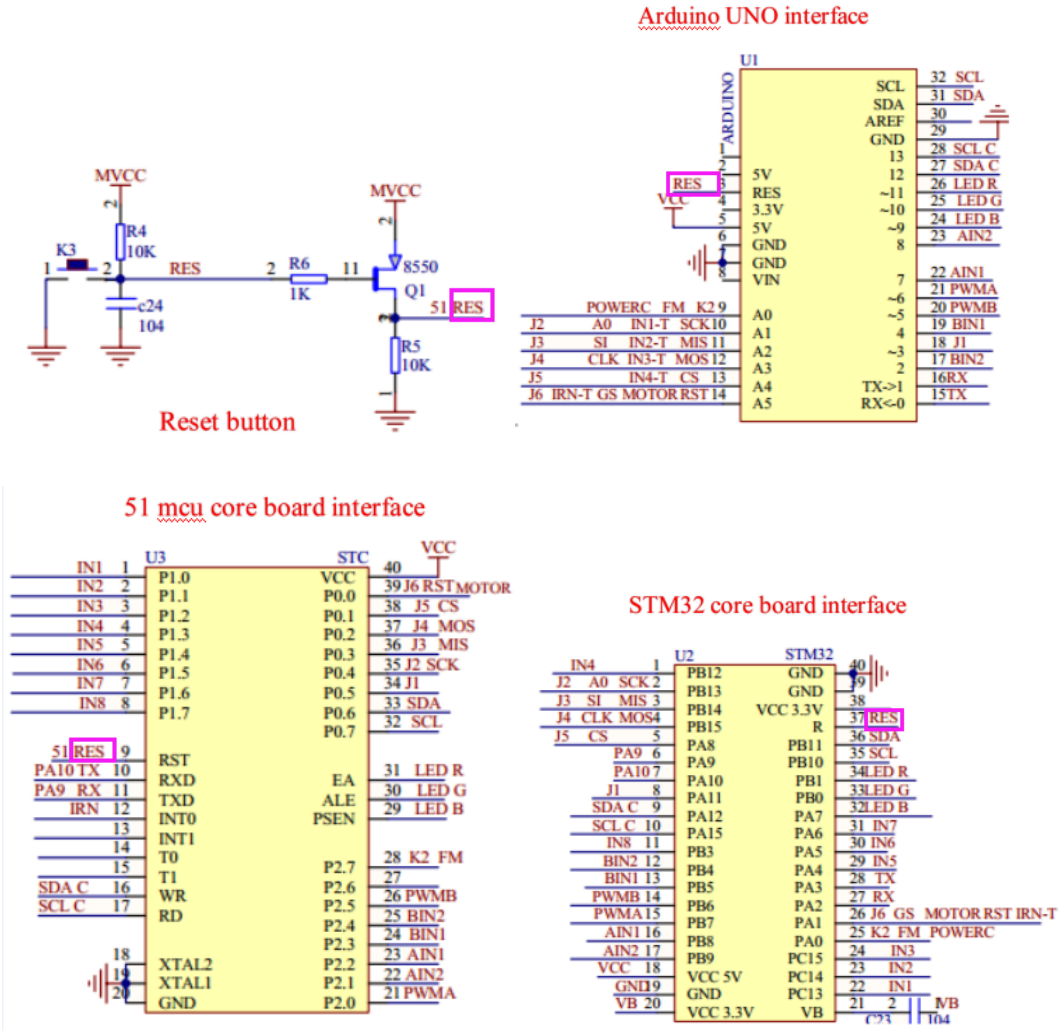
Pin table：

Module interface	Arduino	51controller	STM32	Raspberry Pi
K2	A0	P2.7	PA0	IO8

15. Reset button



15-1 Position

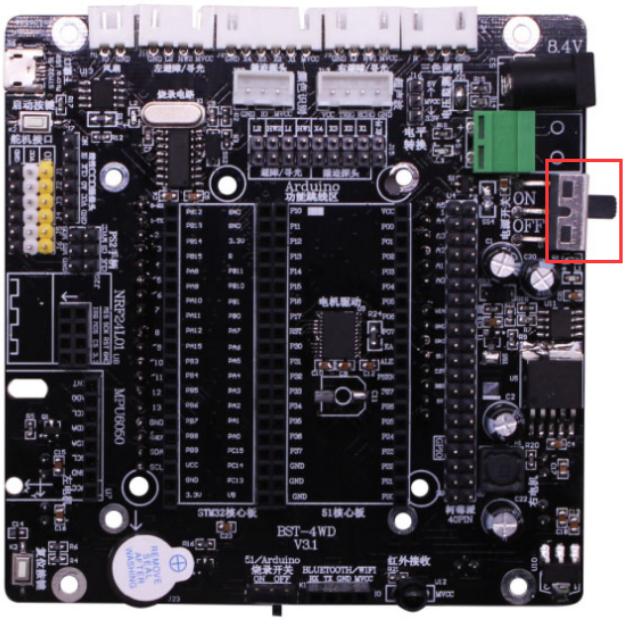


15-2 Schematic diagram

This is a reset button that re-energizes the expansion board, which is equivalent to restarting the expansion board and the core controller.

Note：The Raspberry Pi core controller does not need to connect to this button.

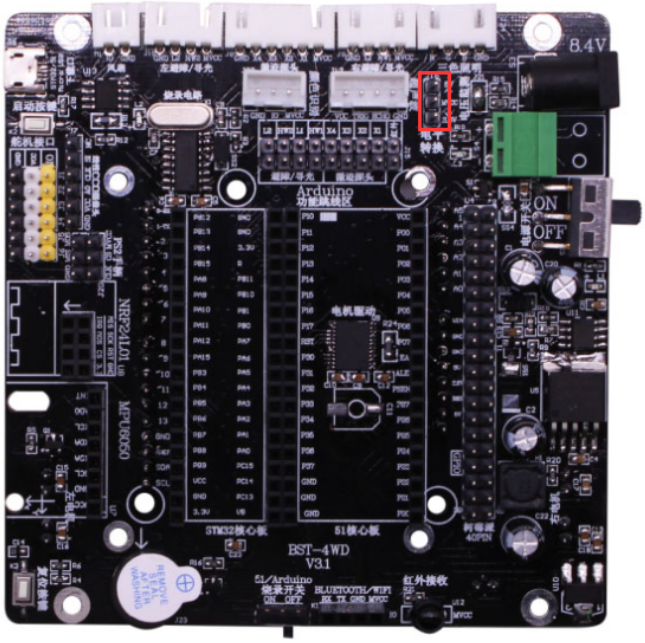
16. Power button



16-1 Position

It is used to control the power switch of the expansion board.

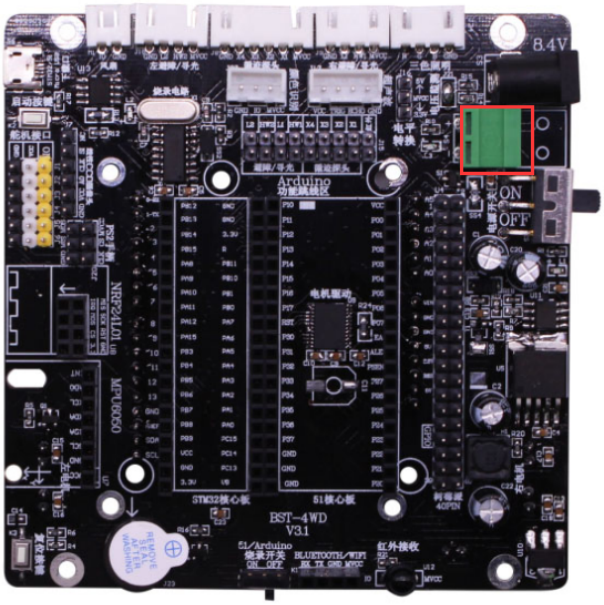
17. 5V/3.3V power switch



17-1 Position

If the top two pin headers are connected by a jumper cap, it is a 5V power supply; if the lower two pin headers are connected, it is a 3.3V power supply.

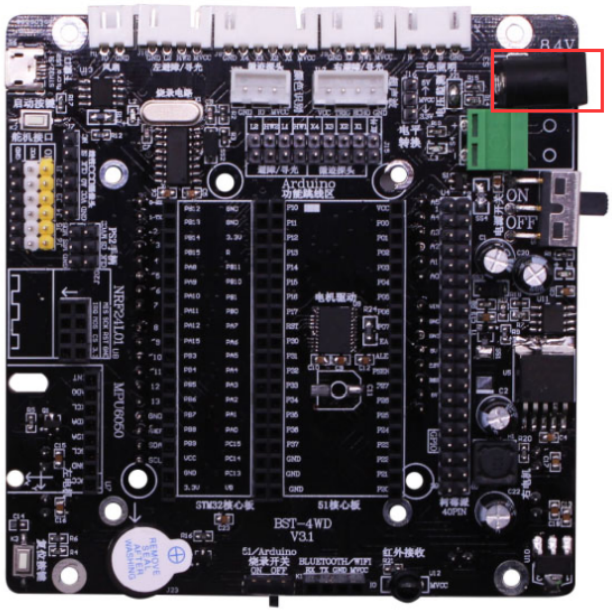
18. Battery box interface



18-1 Position

Plug the special battery box here to supply power to the expansion board. The power supply voltage of the expansion board cannot exceed 12.6v.

19. Charging socket



19-1 Position

Here you can charge the battery with a 12.6V in-line charger.