1. Product introduction

1.1 Product overview

CSR1010 Series Smart Bluetooth Modules are designed based on CSR1010 chip, compatible with Bluetooth 4.1 and low power consumption. (BLE) and Bluetooth module of mesh networking function. It is mainly used in intelligent lighting control, home/hotel automation control, Consumer electronics, industrial control, etc. can meet the requirements of low power consumption, low delay, short-range wireless data communication.

1.2 Product characteristics

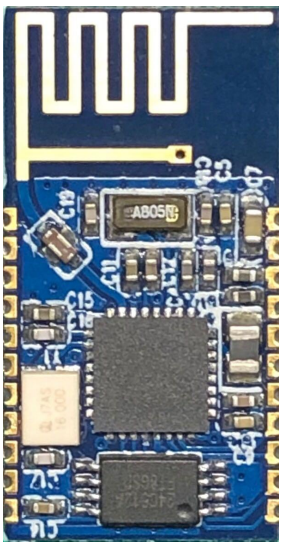
* Maximum Receiving Sensitivity: >-92.5dBm
* Maximum transmit power < 7.5dBm
* Voltage input range: 1.9V~3.6V
* The working temperature of the module used in intelligent lighting: - 40℃ ~85 ℃
* Power consumption: sleep mode is as low as 6uA
* Support BLE mesh, compliant with Bluetooth 4.1 specification
* Various peripheral device interfaces
  - Maximum 5-way PWM output
  - A UART External Communication Interface
  - Maximum four-way switching input and relay control output
  - Max. 11 customized GPIOs
* Support Point-to-Point and Point-to-Multipoint Communication

1.3 Product parameters:

Category	Item	Parameter
Wireless parameters	Wireless standards	Bluetooth 4.1（BLE mode only）
	frequency range	2.4GHz
	Transmitting power	<7.5dBm
	Receiving sensitivity	Min. -92.5dBm
	Antenna type	Onboard antenna
Hardware parameters	Data interface	UART
	Operating Volt	3.3V
	Supplying current	≥50mA
	Low power consumption	≤6uA
	Transmission distance	Outdoor space 80m
	Operating Temperature	-40℃ ~ +85℃
	Size	23.3x12x2.0mm

2. Introduction of Hardware

2.1 Module Shape and Interface



2.2 Pin description

The shape of the module is as above, 22 pins are external, and the detailed pin function is referred to the following table.

PIN	PIN Function	Description
1	GND	Earth input
2	NC	NC
3	GND	Earth input
4	AIO[2]	Simulated IO pins can be customized.
5	AIO[1]	Simulated IO pins can be customized.
6	AIO[0]	Simulated IO pins can be customized.
7	PIO[0]/UART_TX	System debugging serial port can be customized to GPIO function.
8	PIO[1]/UART_RX	System debugging serial port can be customized to GPIO function.
9	WWHITE	Warm white PWM output, high efficiency; 1KHz frequency. Customizable to GPIO functionality.
10	CWHITE	Cool white PWM output, high efficiency; 1KHz frequency. Customizable to GPIO functionality.
11	PIO[5]/SPI_CLK	System debugging port can be customized to GPIO function.
12	PIO[6]/SPI_CS	System debugging port can be customized to GPIO function.
13	PIO[7]/SPI_MOSI	System debugging port can be customized to GPIO function.
14	PIO[8]/SPI_MISO	System debugging port can be customized to GPIO function.
15	PIO[9]/RED	Red PWM output, 3.8KHz frequency, high efficiency; available in two street lamp firmware. Used as cold white PWM. Customizable to GPIO functionality.
16	PIO[10]/Green	Green PWM output, 3.8KHz frequency, high efficiency; available in two street lamp firmware. Used as cold white PWM. Customizable to GPIO functionality.
17	PIO[11]/Blue	Blue PWM output, high efficiency; can be customized to GPIO function.
18	SPI_PIO#_SEL	The system reserves debugging pins for SPI mode. Default needs to be lowered.
19	GND	Earth input
20	GND	Earth input
21	VCC	3.3V DC input
22	GND	Earth input

Note:

1. Pin numbers start from the top left of the module and are arranged counterclockwise.
2. When the module is used for different devices, the function and pin definitions will be slightly different, referring specifically to the detailed description documents of the corresponding firmware.

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2AR7I-CSR1010 Or Contains FCC ID: 2AR7I-CSR1010”

when the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

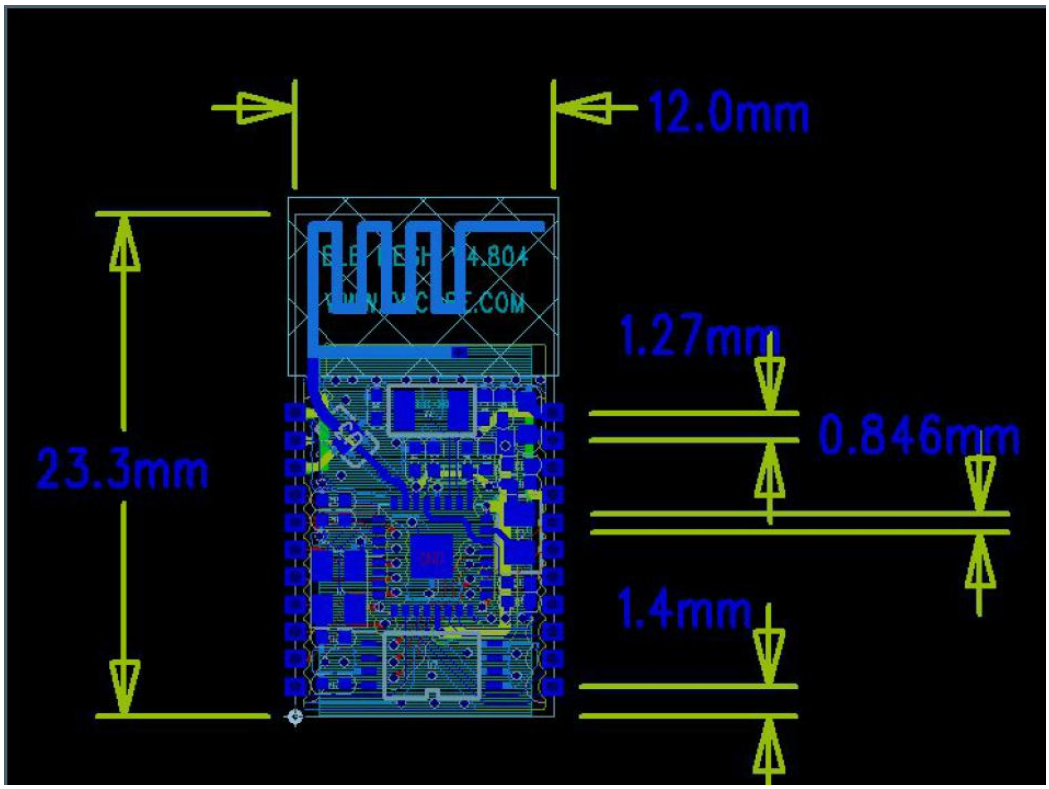
(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product .

Any company of the host device which install this modular with limit modular approval should perform the test of radiated emissionand spurious emission according to FCC part 15C : 15.247 and 15.209 requirement,Only if the test result comply with FCC part 15C : 15.247 and 15.209 requirement , then the host can be sold legally.

2.3 PCB Package size:



Module size is 23.3*12 mm, pin spacing is 1.27 mm, pin foot width is 0.846mm.

2.4 Suggestions on the Use of Module PCB

* LDO is recommended for DC 3.3V supply, providing at least 50mA drive capability. A 10uF capacitor is recommended at the module power supply entrance.
* In PCB layout planning, BLE modules should be placed away from magnetic field sources such as transformers and coils.
* The antenna area should be kept clear of the PCB design and cannot be protected by any enclosure. Antennas must be at least 10mm away from metal or high components.