HC-06 Bluetooth module

technical manual

I. Overview

The HC-06 Bluetooth module is designed for smart wireless data transmission, using the British company CSR company BlueCore4-Ext chip, follow V2.0+EDR   blue tooth regulation Van . This module supports UART, USB, SPI, PCM, SPDIF, etc. Port, and supports SPP Bluetooth serial port protocol, has the advantages of low cost, small size, low power consumption, high sensitivity of sending and receiving, etc. Only a few external components can be used to realize its powerful functions.
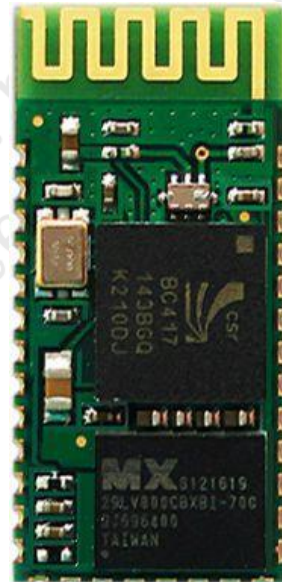
II. Features:

Bluetooth V2.0+EDR
Bluetooth Class 2
Built-in PCB RF antenna

Built-in 8Mbit
Flash supports
SPI programming
interface
Support UART, USB, SPI, PCM and other interfaces
Support master-slave
Support software to control master-slave module
3.3V power supply
REACH, ROHS certification

III. Application areas:

This module is mainly used for short-range wireless data transmission. It can be easily connected to a PC's Bluetooth device, or data can be exchanged between the two modules. Avoid cumbersome cable connections and can directly replace serial cables.

※ Bluetooth Car Handsfree

※ Bluetooth GPS

※ Bluetooth PCMCIA, USB Dongle

※ Bluetooth wireless data transmission;

※ Industrial remote control, telemetry;

※ POS system, wireless keyboard, mouse;

※ Traffic, downhole positioning, alarm;

※ automated data acquisition system;

※ Wireless data transmission; banking system;

※ Wireless data acquisition;

※ Building automation, security, equipment room wireless monitoring, access control system;

※ smart home, industrial control;

※ automotive testing equipment;

※ TV station interactive program voting equipment;

※ Government street lamp energy-saving equipment

※ Wireless LED display system

※ Bluetooth joystick, Bluetooth game controller

※ Bluetooth printer

※ Bluetooth Remote Control Toy

Four. Physical characteristics:

Operating Frequency Band	2.4GHz -2.48GHz unlicensed ISM band

Bluetooth Specification	V2.1+EDR
Output Power Class	Class 2
Operating Voltage	3.3V
Host Interface	USB 1.1/2.0 or UART

Audio Interface	PCM interface
Flash Memory Size	8Mbit
Dimension	27mm (L) x 13 (W) mm x 2mm (H)

V. Electrical characteristics:

Absolute Maximum Ratings		
Rating	Min	Max
Storage temperature	-40℃	+150℃
Supply voltage: VBAT	-0.4V	5.6V
Other terminal voltages	VSS-0.4V	VDD+0.4V

Recommended Operating Conditions		
Operating Condition	Min	Max
Operating temperature range	-40℃	+150℃
Guaranteed RF performance range[a]	-40℃	+150℃
Supply voltage: VBAT	2.2V	4.2V[b]

Six. Power consumption:

| Operation Mode	Connection Type	UART Rate(kbps)	Average	Unit
Page scan	-	115.2	0.42	mA
ACL No traffic	Master	115.2	4.60	mA
ACL With file transfer	Master	115.2	10.3	mA
ACL 1.28s sniff	Master	38.4	0.37	mA
ACL 1.28s sniff	Slave	38.4	0.42	mA
SCO HV3 30ms sniff	Master	38.4	19.8	mA
SCO HV3 30ms sniff	Slave	38.4	19.0	mA
Standby Host connection	-	38.4	40	μA

Seven functional block diagram:
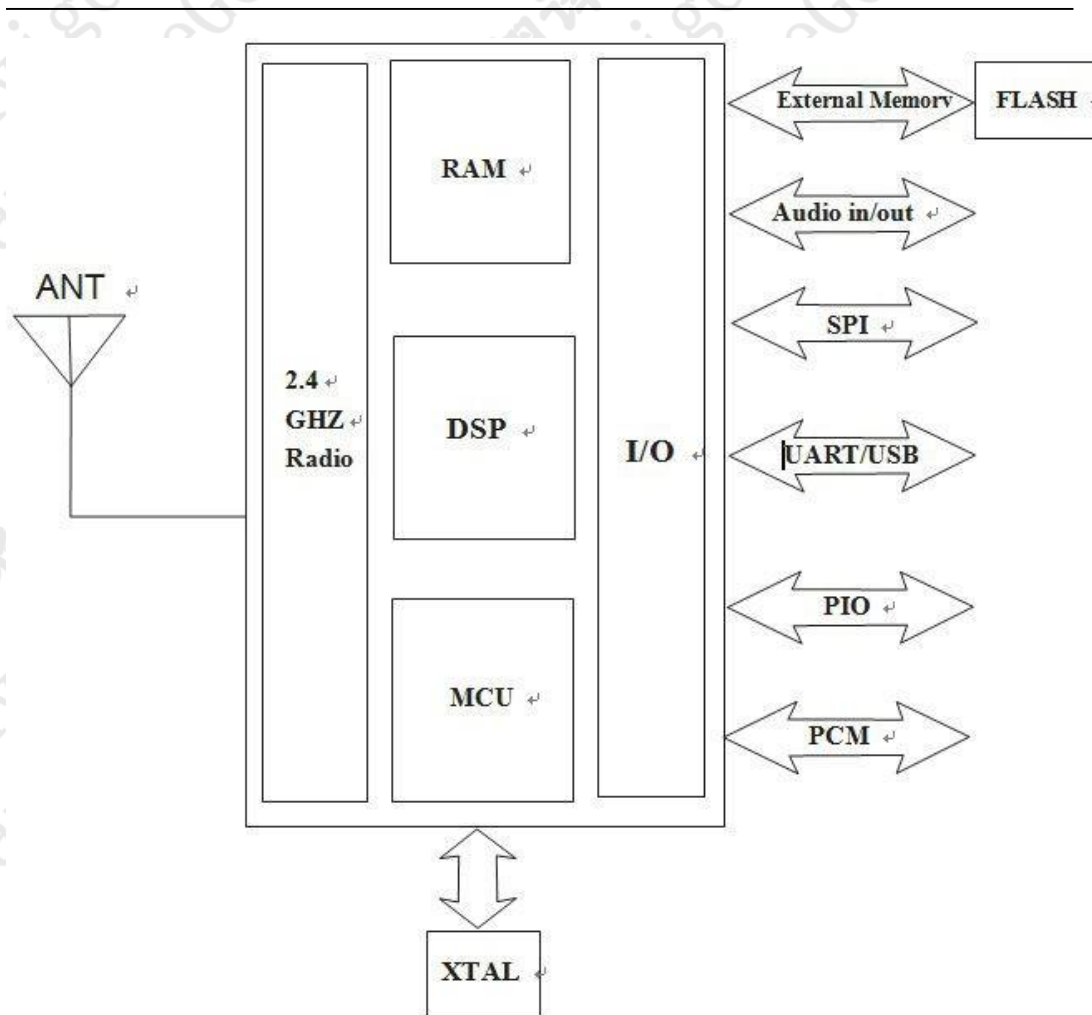
Eight. Application circuit:
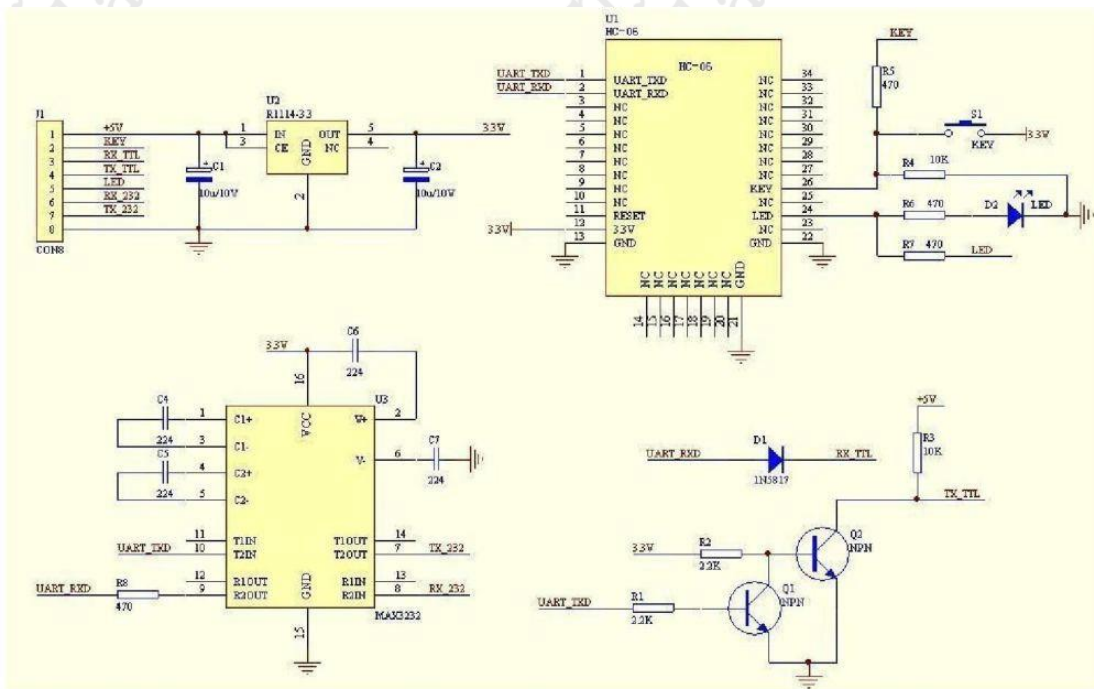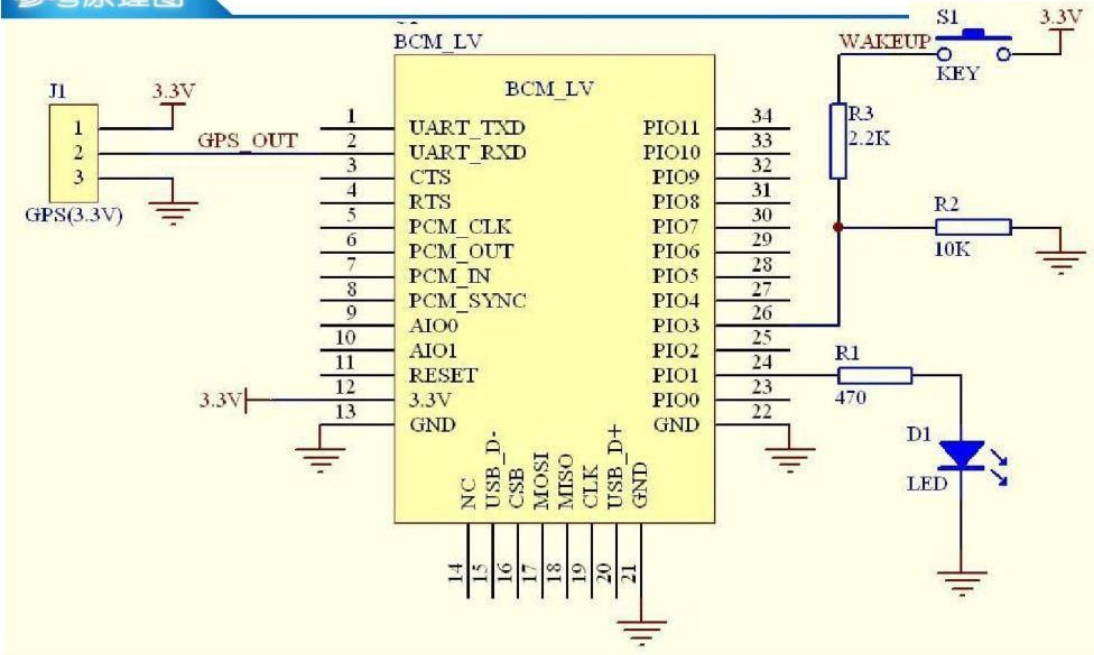
注：蓝牙模块的PIN2：UART-RXD不带上拉，如果单片机TXD无上拉能力的话需要在模块的UART-RXD脚上接个上拉电阻，这个很容易被用户忽略。

## Nine. Pin function description:
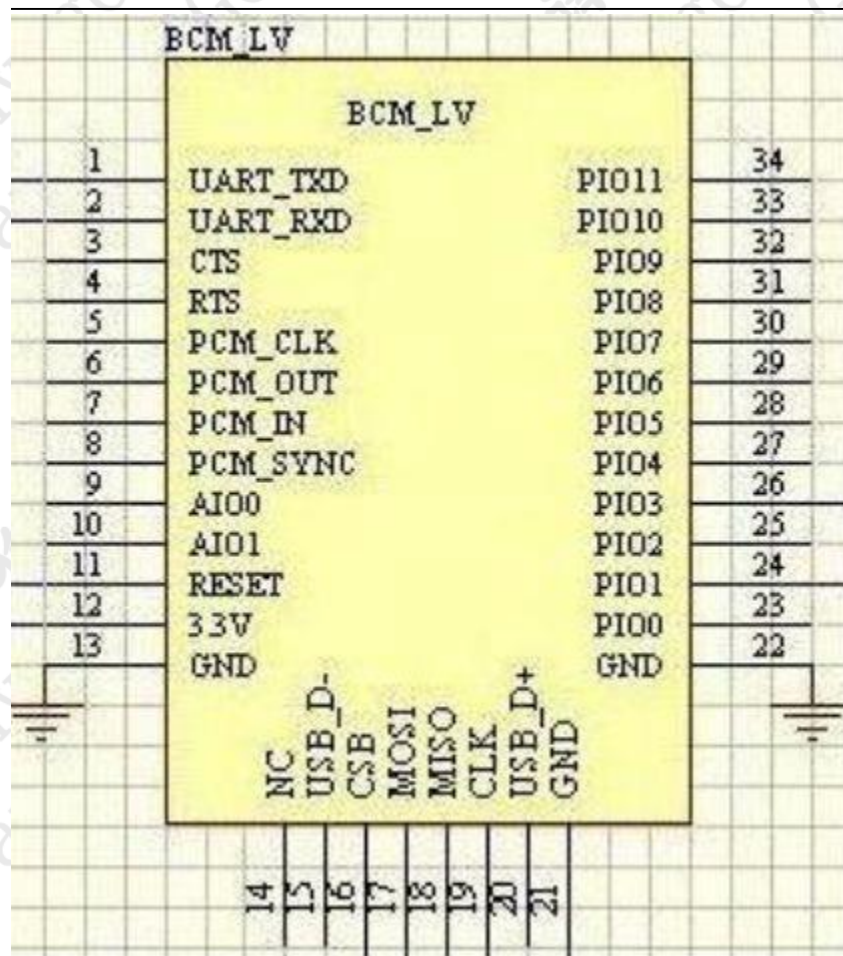
PIN Name	PIN #	Pad type	Description	Note
GND	13 2 21 2	VSS	Ground pot	
1V8	14	VDD	Integrated 1.8V (+) supply with On-chip linear regulator output within 1.7-1.9V	
VCC	12	3.3V		
AIO0	9	Bi-Directional	Programmable input/output line	
AIO1	10	Bi-Directional	Programmable input/output line	
PIO0	23	Bi-Directional RX EN	Programmable input/output line control output for LNA(if fitted)	
PIO1	24	Bi-Directional TX EN	Programmable input/output line control output for PA(if fitted)	
PIO2	25	Bi-Directional	Programmable input/output line	
PIO3	26	Bi-Directional	Programmable input/output line	
PIO4	27	Bi-Directional	Programmable input/output line	
PIO5	28	Bi-Directional	Programmable input/output line	
PIO6	29	Bi-Directional	Programmable input/output line	CLK_REQ

PIO7	30	Bi-Directional	Programmable input/output line	CLK_OUT
PIO8	31	Bi-Directional	Programmable input/output line	
PIO9	32	Bi-Directional	Programmable input/output line	
PIO10	33	Bi-Directional	Programmable input/output line	
PIO11	34	Bi-Directional	Programmable input/output line	
RESETB	11	CMOS Input with weak internal pull-down		
UART_RTS	4	CMOS output, tri-stable with weak internal pull-up	UART r qu st to send, active low	
UART_CTS	3	CMOS input with weak interna pull-down	UART clear to send, active low	
UART_RX	2	CMOS input wit weak internal pull-down	UART Data input	
UART_TX	1	CMOS output, Tri-stable with weak internal pull-up	UART Data output	
SPI_MOSI	17	CMOS input with weak internal pull-down	Serial peripheral interface data input	
SPI_CSB	16	CMOS input with weak internal pull-up	Chip select for serial peripheral interface, active low	
SPI_CLK	19	CMOS input with weak internal	Serial peripheral interface clock	
SPI_MISO	18	CMOS input with weak internal pull-down	Serial peripheral interface data Output	
USB_-	15	Bi-Directional		
USB_+	20	Bi-Directional		
1.8V	14		Externally powered 1.8V	The default is internal Supply 1.8V
PCM_CLK	5	Bi-Directional		
PCM_OUT	6	CMOS output		
PCM_IN	7	CMOS Input		
PCM_SYNC	8	Bi-Directional		

X. Dimensions:
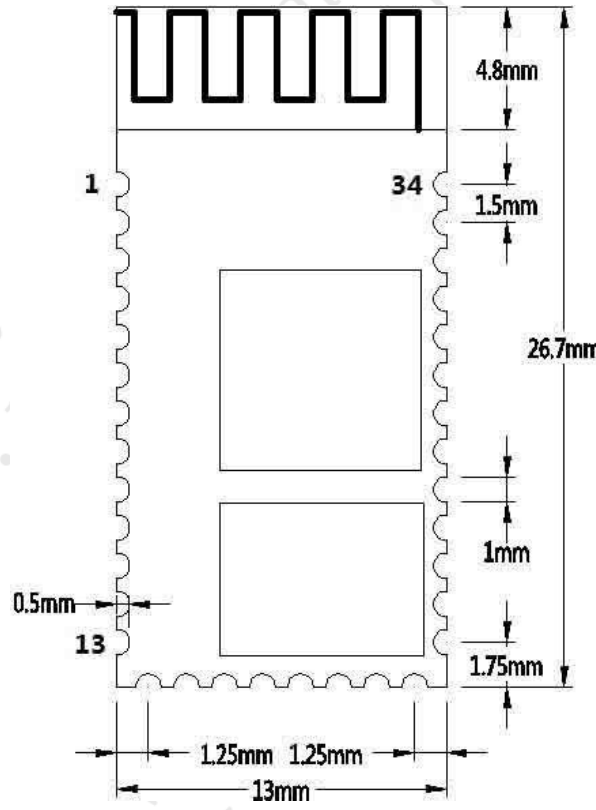
HC-06 Bluetooth module

AT Instruc

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AT instruction set

For HC-06 host, WAKEUP will give up memory after pressing and search for new slaves again. If you do not give up memory, the host will always search for the last paired slave until it is found and pairing is successful. HC- 06 hosts have a feature

It is the memory of the last paired slave. WAKEUP does not make sense for the slave.

Enter the AT command method:

Powering on the module, without pairing, is the AT mode.

The command interval is about 1S factory parameters: baud rate 9600N81, name HC-06, password 1234

1, test communication

Send: AT (return OK, send once every second) Return: OK

2. Change the Bluetooth serial communication baud rate to send:

AT+BAUD1

Returns: OK1200

Cannot be used after the setting exceeds 115200. Use the microcontroller to program above 115200 to use this baud rate and retry AT command to set low baud rate

use **AT** After the command sets the baud rate, it will not need to be re-set for the next power-up. You can save the baud rate after power-off.

Example: Send:

AT+BAUD2 Back:

OK2400

......

1---------1200

2---------2400

3---------4800

4---------9600 (default is this setting)

5---------19200

6---------38400

7---------57600

8---------115200

9---------230400

A---------460800

B---------921600

C---------1382400

3, change the name of the Bluetooth

Send: AT+NAMEname

Back: OKsetname

Parameter name: The current name to be set, that is, the name to which Bluetooth is searched. Within 20 characters. Example: Send

AT+NAMEbill_gates

Return OKsetname

At this time, the Bluetooth name is changed to bill_gates

The parameters can be saved in power-off and only need to be modified once. PDA refresh service can see the changed Bluetooth name, name

The word cannot exceed 20 characters.

4, change the
Bluetooth pairing
password sending:
AT+PINxxxx back:
OKsetPIN

Parameter xxxx: The pairing password to be set, 4 digits. This command can be used for slave or host. When the slave is the adapter or the phone pops up asking for the pairing password window, manually input this parameter to connect the slave. If the master Bluetooth module searches for the slave, if the password is correct, it will be paired automatically. In addition to the master module, the master module can be connected to the slave module. Other products include:

Pairing can also be done from the module, such as a Bluetooth-enabled digital camera, Bluetooth GPS, a Bluetooth serial printer, and more.

Example: Send:
AT+PIN8888 Back:
OKsetPIN

At this time, the Bluetooth pairing password is changed to
8888, and the default pairing password of the module when
shipped from the factory is 1234. The parameters can be saved
in power-off and only need to be modified once. 5, change the
module master-slave work mode: (support master-slave one after
V1.7 version)

Send: AT+ROLE=M (set the module as master)

Return: OK+ROLE:M

Send: AT+ROLE=S (Set the module to the slave Slave, the
module defaults to the slave) Return:OK+ROLE:S

6, no calibration setting instructions: (support after V1.5 version)
   AT+PN (default is this setting)

7. Even parity setting instruction: (Supported after V1.5 version)
   AT+PE

8. Odd parity setting instruction: (supported after V1.5 version)
   AT+PO

LAYOUT considerations

1. The serial port level of the HC-06 Bluetooth module needs 3.3V. If it is connected to a 5V level system, a level conversion chip needs to be added.

2, Bluetooth signal is greatly affected by the surrounding, such as trees, metal, walls and other

obstacles will have a certain absorption or shielding of the Bluetooth signal, it is recommended not

to be installed in a metal case.

3, because the metal will weaken the antenna function, it is recommended that when the module Lay board is provided, do not lay the ground or trace below the module antenna. It is better to knock out the space.