JNHuaMao Technology Company

Bluetooth V2.1 module

Datasheet V610

² Professional bluetooth products suppliers.

² Remote control module provider

² data transmission module provider

² PIO state acquisition module provider

² Customizable bluetooth module and bluetooth solutions

² Jinan high and new technology enterprise

² SIG members

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The most complete, most convenient, the most stable of bluetooth data transmission, remote control, PIO acquisition module

---- Master and slave role in one

---- Remote control without other MCU

---- The PIO data acquisition without other MCU

1. Product parameters

- Ø BT Version: Bluetooth Specification V2.1+EDR
- Ø Working frequency:2.4GHz ISM band
- Ø Modulation method: GFSK(Gaussian Frequency Shift Keying)
- Ø RF Power:≤4dBm, Class 2
- Ø Sensitivity:≤-84dBm at 0.1% BER
- Ø Speed: Asynchronous: 2.1Mbps(Max) / 160 kbps

    Synchronous: 1Mbps/1Mbps(Max)
- Ø Security: Authentication and encryption
- Ø Service: Bluetooth SPP(Master & Slave)
- Ø Power:+3.3VDC 50mA
- Ø Working temperature:–5 ~ +65 Centigrade
- Ø Size:26.9mm x 13mm x 2.2 mm、27.4*12.5*4.3mm、etc.

2. Product overview

HM Bluetooth module use CSR BlueCore or TI CC2540, Master and slave roles in one, transmission version and remote control version and PIO state acquisition functions in one, Support the AT command modify module parameters, Convenient and flexible.

Transmission version can be used to transmit data between two Bluetooth devices.

Remote Control version can be used to Control PIO ports output high or low level without any other MCU.

The PIO state acquisition version can be used to acquisition PIO ports state without any other MUC. (Only support Bluetooth V2.1)

HM-01, HM-02, HM-03, HM-04, HM-05, HM-06, HM-07, HM-08, HM-09 is Bluetooth V2.1 version. Use CSR Chip.

HM-10, HM-11, HM-12 is Bluetooth V4.0 BLE version. Use TI Chip.

HM-01, HM-02, HM-09, HM-10 have same size and same pins.

HM-05, HM-06, HM-07, HM-11 have same size and same pins.

3. Product model

Models	VDD	Size(mm)	Flash	Chip	BT Version
HM-01	3.3V	26.9*13*2.2	8M	BC417143	V2.1+EDR
HM-02	2.5-3.7V	26.9*13*2.2	6M	BC3/BC4	V2.1
HM-03	2.5-3.7V	27.4*12.5*4.3	6M	BC3/BC4	V2.1
HM-04A	3.3V	Not for sale			
HM-05	2.5-3.7V	13.5*18.5*2.3	6M	BC3/BC4	V2.1
HM-06	2.5-3.7V	13.5*18.5*2.3	6M	BC3/BC4	V2.1
HM-07	2.5-3.7V	13.5*18.5*2.3	8M		V2.1+EDR
HM-08	3.3V	26.9*13*2.5	8M	Class 1	V2.1+EDR
HM-09	2.5-3.7V	26.9*13*2.2	8M		V2.1+EDR
HM-10	2-3.7V	26.9*13*2.2	256Kb	CC2540	V4.0 BLE
HM-11	2.5-3.7V	13.5*18.5*2.3	256Kb	CC2540	V4.0 BLE
HM-15	5V	65*32*16	256Kb	CC2540	V4.0 BLE

4. Product certificate

CERTIFICATE
of Conformity
Reference No.: LCS120702006TS

Applicant	:	Jinan Huamao Technology Co., Ltd.
Address	:	Room 4020, South Area, Building #C, Environmental Science and Technology Park, No.554 Zhengfeng Road, High Tech Zone, Jinan, Shangdong, China
Product	:	Bluetooth Module
Model(s)	:	HM-XX（XX stand for 01-99）
Parameters	:	2.5-3.7V---, 500mA

The submitted products have been tested by us with the listed standards and found in compliance with the following European Directives:
The LVD Directive 2006/95/EC

EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011

The tests are performed in normal operation mode. The test results apply only to the particular sample tested and to the specific tests carried out. This certificate applies specifically to the sample investigated in our test reference number only.

The CE markings as shown below can be affixed on the product after preparation of necessary technical documentation.

Other relevant Directives have to be observed.

CE

Manager
July 04, 2012

Shenzhen LCS Compliance Testing Laboratory Ltd.
Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China
Tel: (86)755-82591330   Fax: (86)755-82591332
Http://www.LCS-cert.com   Email: webmaster@LCS-cert.com

CERTIFICATE
of Conformity
Certificate No.: LCS-12070701

Applicant	:	Jinan Huamao Technology Co., Ltd
Address	:	Room 4020, South Area, Building #C, Environmental Science and Technology Park, No.554 Zhengfeng Road, High Tech Zone, Jinan, Shandong, China
Product	:	Bluetooth Module
Model(s)	:	HM-XX（XX stand for 01-99）
Trade Mark	:	N/A

The submitted products have been tested by us with the listed standards and found in compliance with the following European Directives:

The R&TTE Directive 1999/5/EC

Applied Standards	Report No.
Article 3.2: Effective Use of The Radio Spectrum ETSI EN 300 328 V1.7.1（2006-10）	LCS120702006TE
Article 3.1b): Electromagnetic Compatibility ETSI EN 301 489-17 V2.1.1（2009-05）	LCS120702007TE
Article 3.1a): Health and Safety EN 62479: 2010	LCS120702006TH
EN 60950-1: 2006+A11: 2009+A1:2010+A12:2011	LCS120702006TS

The tests were performed in normal operation mode. The test results apply only to the particular sample tested and to the specific tests carried out. This certificate applies specifically to the sample investigated in our test reference number only.

The CE markings as shown below can be affixed on the product after preparation of necessary technical documentation.

Other relevant Directives have to be observed.

# CE

Manager
July 07, 2012

Shenzhen LCS Compliance Testing Laboratory Ltd.
1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,
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Tel: (86)755-82591330
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Fax: (86)755-82591332
Email: webmaster@lcs-cert.com

5. Product pictures

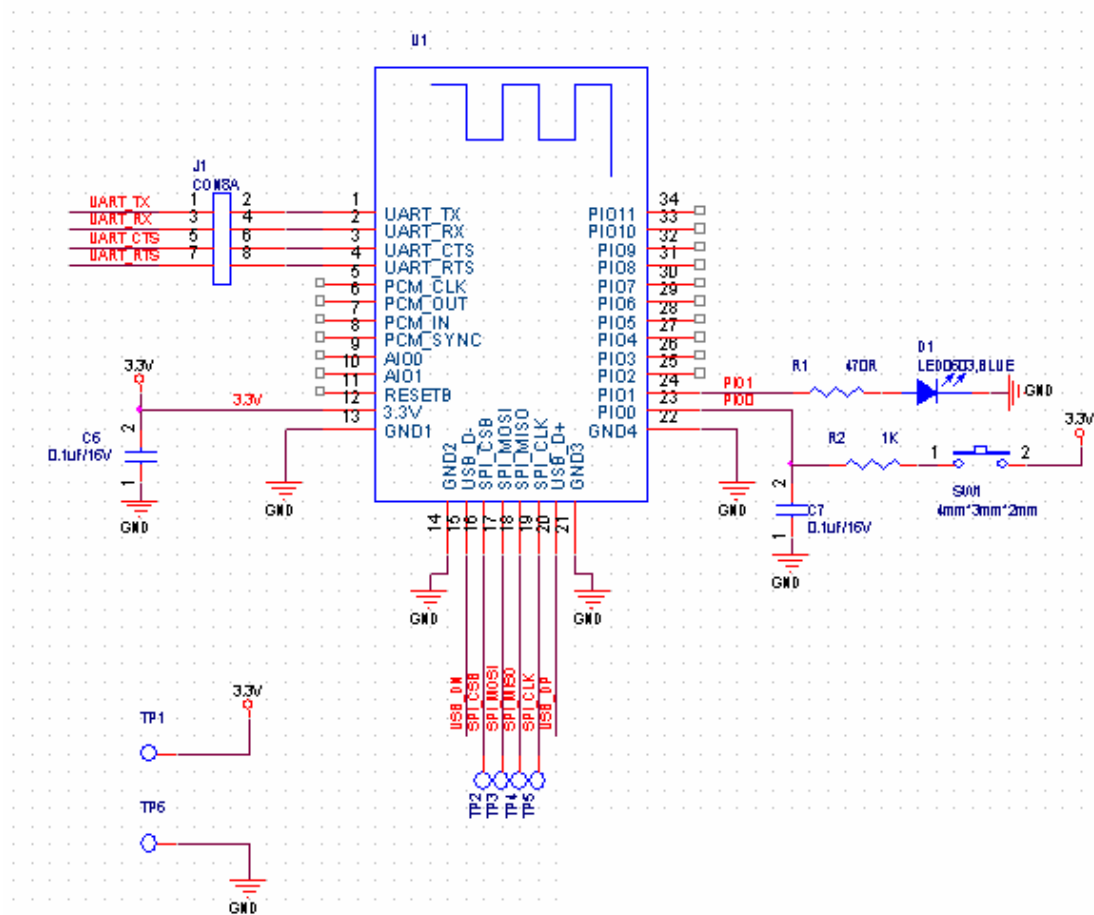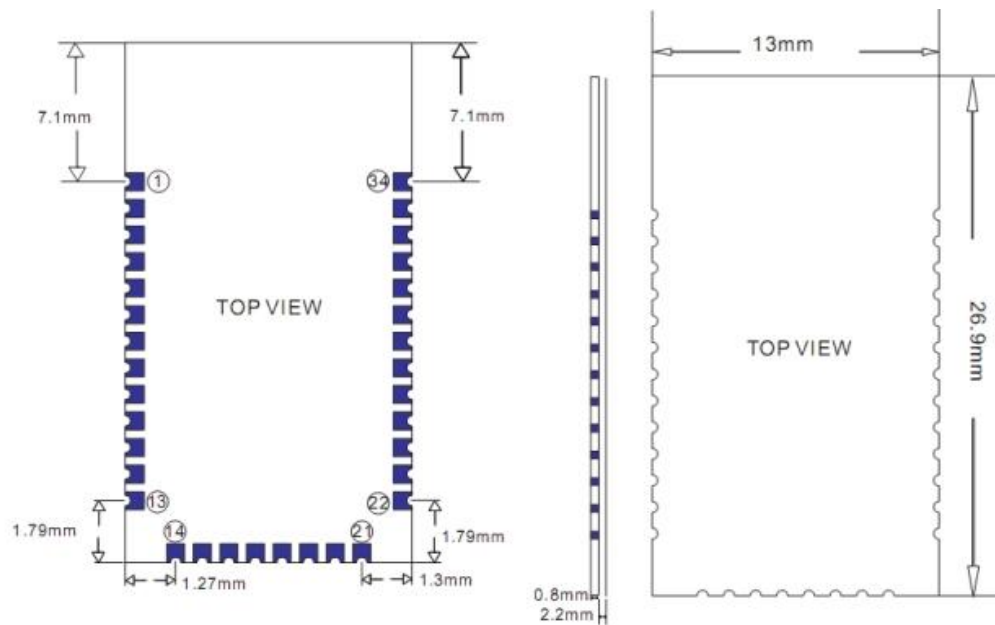|				
			Not for sale	
HM-01 **BT 2.1**	**HM-02** **BT 2.1**	**HM-03** **BT 2.1**	**HM-04** **BT 2.1**	**HM-05** **BT 2.1**
		Class1 **Testing**		
HM-06 **BT 2.1**	**HM-07** **BT 2.1**	**HM-08** **BT 2.1**	**HM-09** **BT 2.1**	**HM-10** **BLE 4.0**
	Dual mode **Testing**			
HM-11 **BLE 4.0**	**HM-12** **HM-13**	**HM-15** **USB Dongle**		

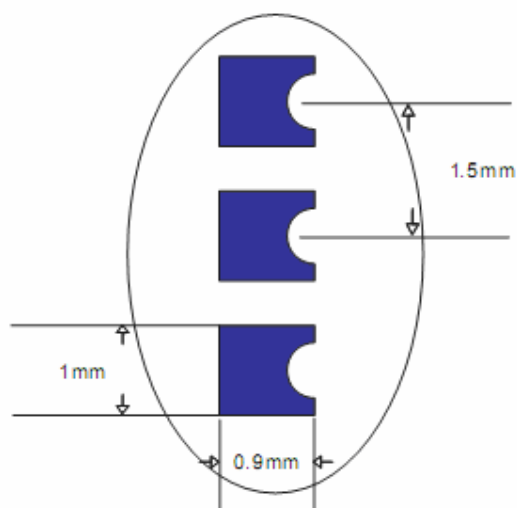## 6. Product technical specifications

6.1 HM-01 Diagram
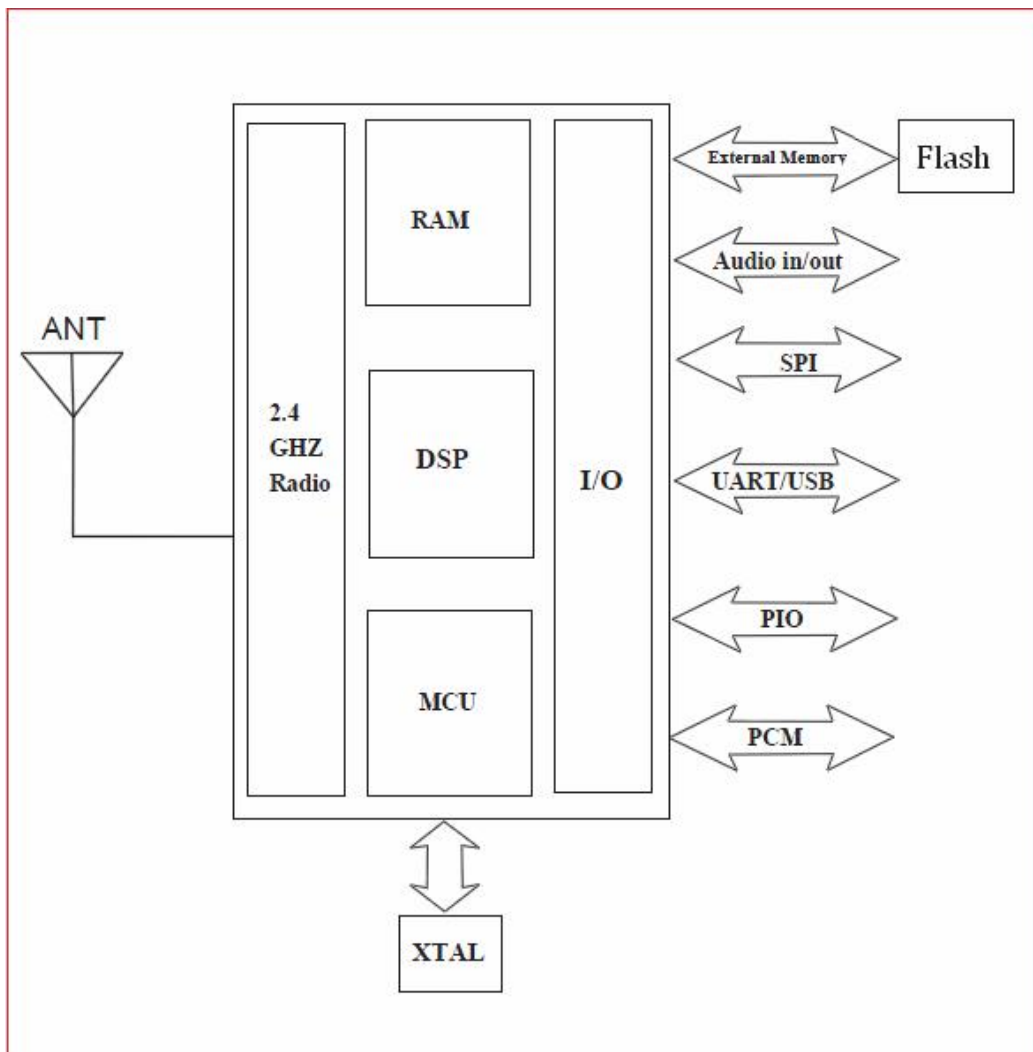
6.2 HM-01 Schematic

6.3 HM-01, HM-02, HM-09, HM-10 Size

6.4 HM-01, HM-02, HM-09, HM-10 package information

6.5 HM-01, HM-02, HM-09, HM-10 Device Terminal Functions

No	Name	Description
1	UART_TX	UART interface
2	UART_RX	UART interface
3	UART_CTS	UART interface
4	UART_RTS	UART interface
5	PCM_CLK	PCM interface
6	PCM_OUT	PCM interface
7	PCM_IN	PCM interface
8	PCM_SYNC	PCM interface
9	AIO0	Bi-directional
10	AIO1	Bi-directional
11	RESETB	Reset if low >100ms.
12	VCC	3.3V
13	GND	Ground
14	GND	Ground

15	USB_D-	USB interface
16	SPI_CSB	SPI interface
17	SPI_MOSI	SPI interface
18	SPI_MISO	SPI interface
19	SPI_CLK	SPI interface
20	UB_D+	USB interface
21	GND	Ground
22	GND	Ground
23	PIO0	System Key
24	PIO1	System LED
25	PIO2	Programmable input/output line
26	PIO3	Programmable input/output line
27	PIO4	Programmable input/output line
28	PIO5	Programmable input/output line
29	PIO6	Programmable input/output line
30	PIO7	Programmable input/output line
31	PIO8	Programmable input/output line
32	PIO9	Programmable input/output line
33	PIO10	Programmable input/output line
34	PIO11	Programmable input/output line

6.6 HM-02, HM-03, HM-09 Diagram

6.7 HM-03 size

连接座
6PIN*2
pitch=2.0mm
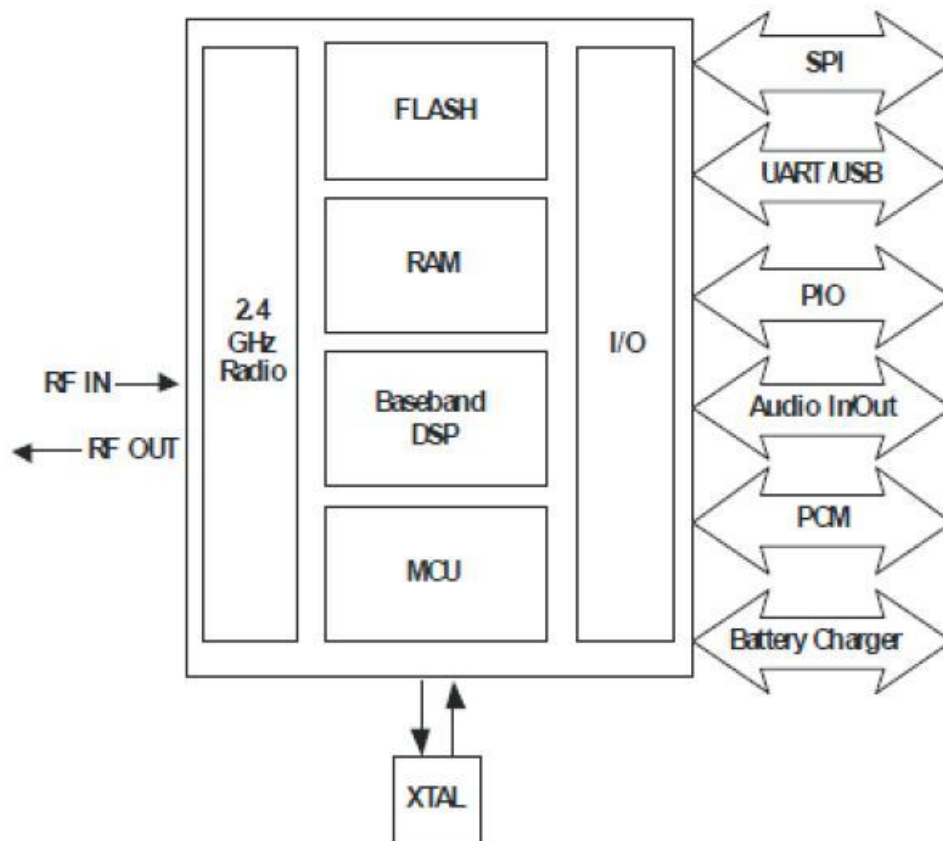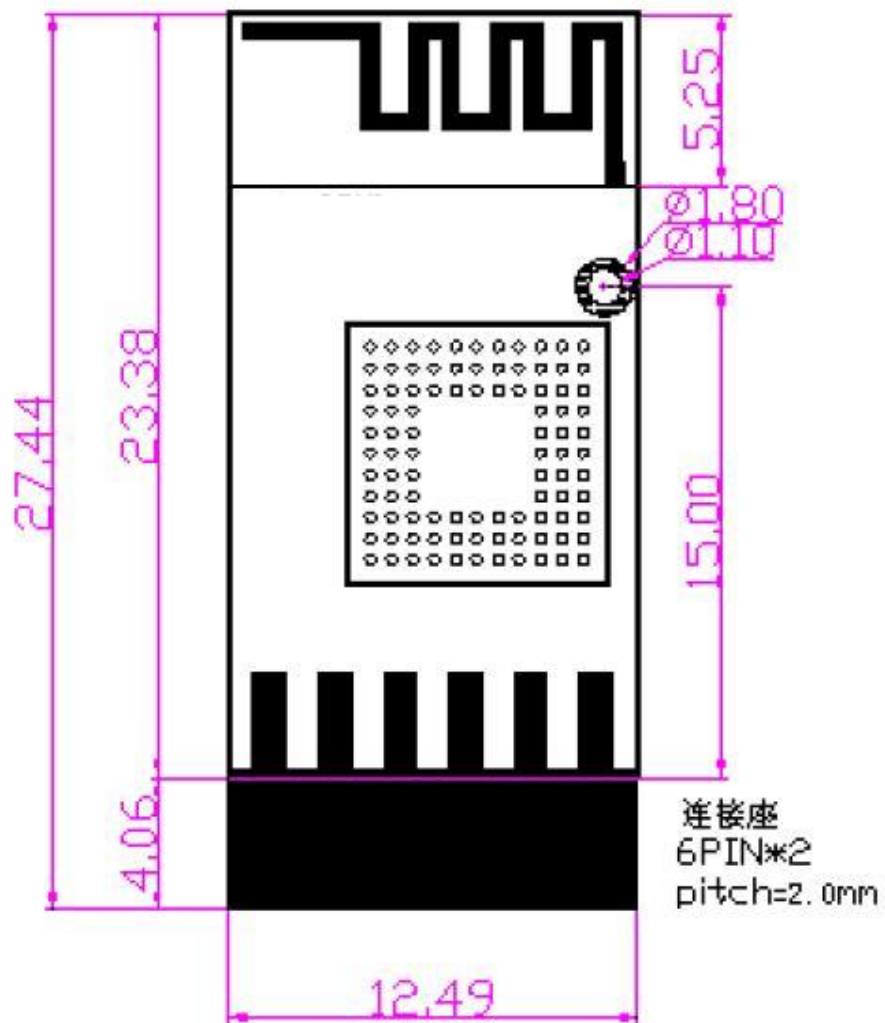
6.8 HM-03 Package information
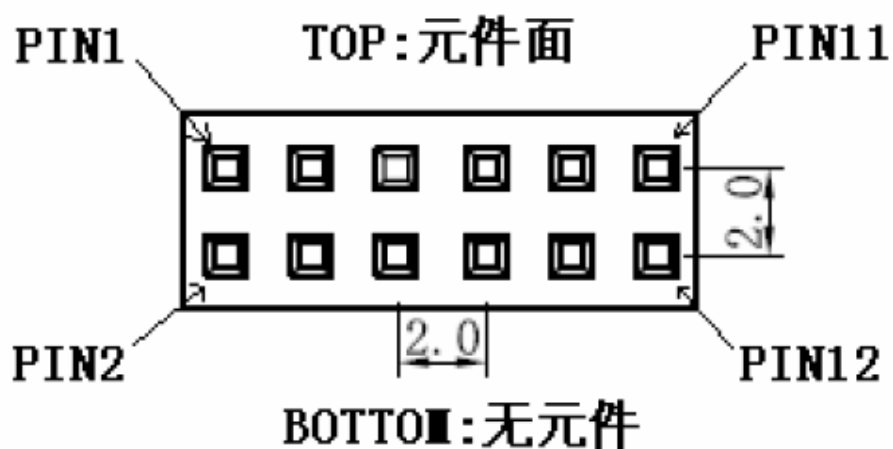
6.9 HM-03 Device Terminal Functions

No	Name	Description
1	PIO1	System LED
2	SPI_CSB	SPI interface
3	UART_CTS	UART interface
4	SPI_MOSI	SPI interface
5	UART_TX	UART interface
6	VCC	V3.3
7	UART_RX	UART interface
8	GND	Ground
9	UART_RTS	UART interface
10	SPI_MISO	SPI interface
11	PIO0	System KEY
12	SPI_CLK	SPI interface

6.10 HM-05 HM-06 Diagram
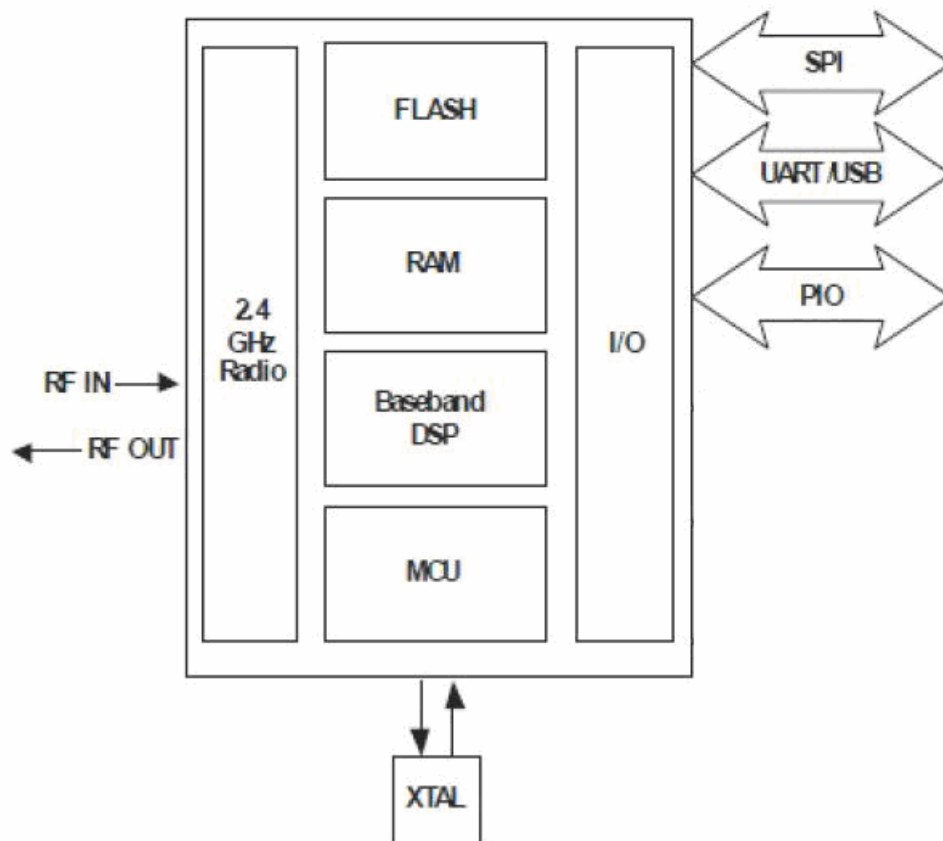
6.11 HM-05, HM-06, HM-07 Size
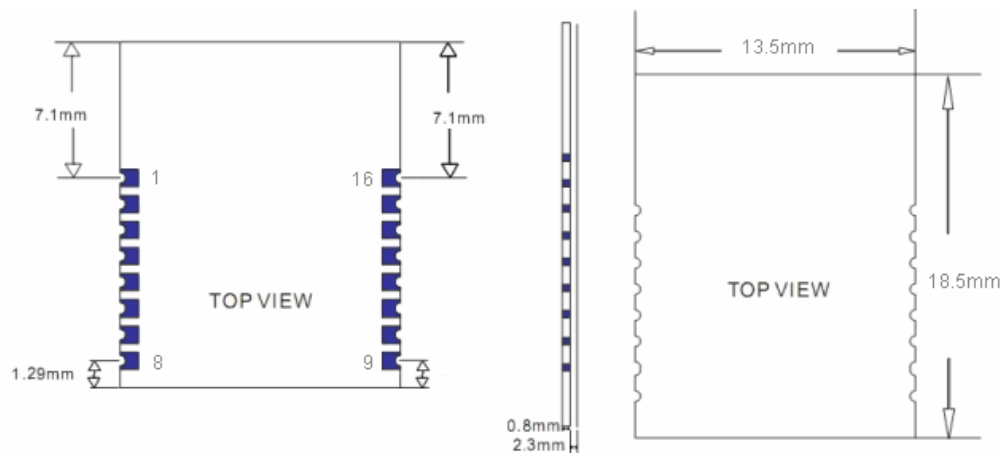
6.12 HM-05, HM-06, HM-07　Package information
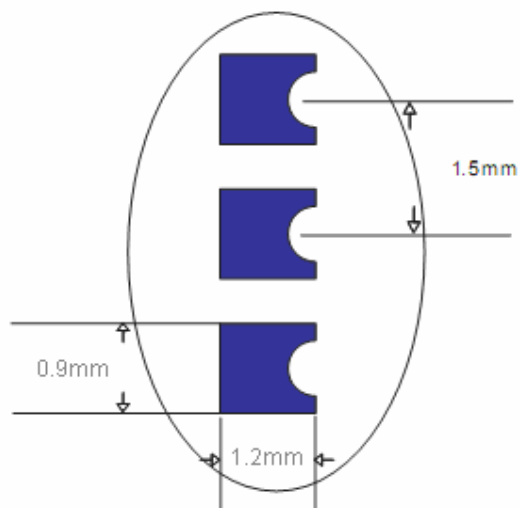
6.13 HM-05, HM-06, HM-07 Device Terminal Functions

No	Name	Description
1	UART_RTS	UART interface
2	UART_TX	UART interface
3	UART_CTS	UART interface
4	UART_RX	UART interface
5	SPI_MOSI	SPI interface
6	SPI_CSB	SPI interface
7	SPI_CLK	SPI interface
8	SPI_MISO	SPI interface
9	VCC	V3.3
10	NC	NC or VCC
11	RESETB	Reset if low <100ms
12	GND	Ground
13	PIO3	Programmable input/output line
14	PIO2	Programmable input/output line

15	PIO1	System LED
16	PIO0	System KEY

6.14 HM-07 Diagram
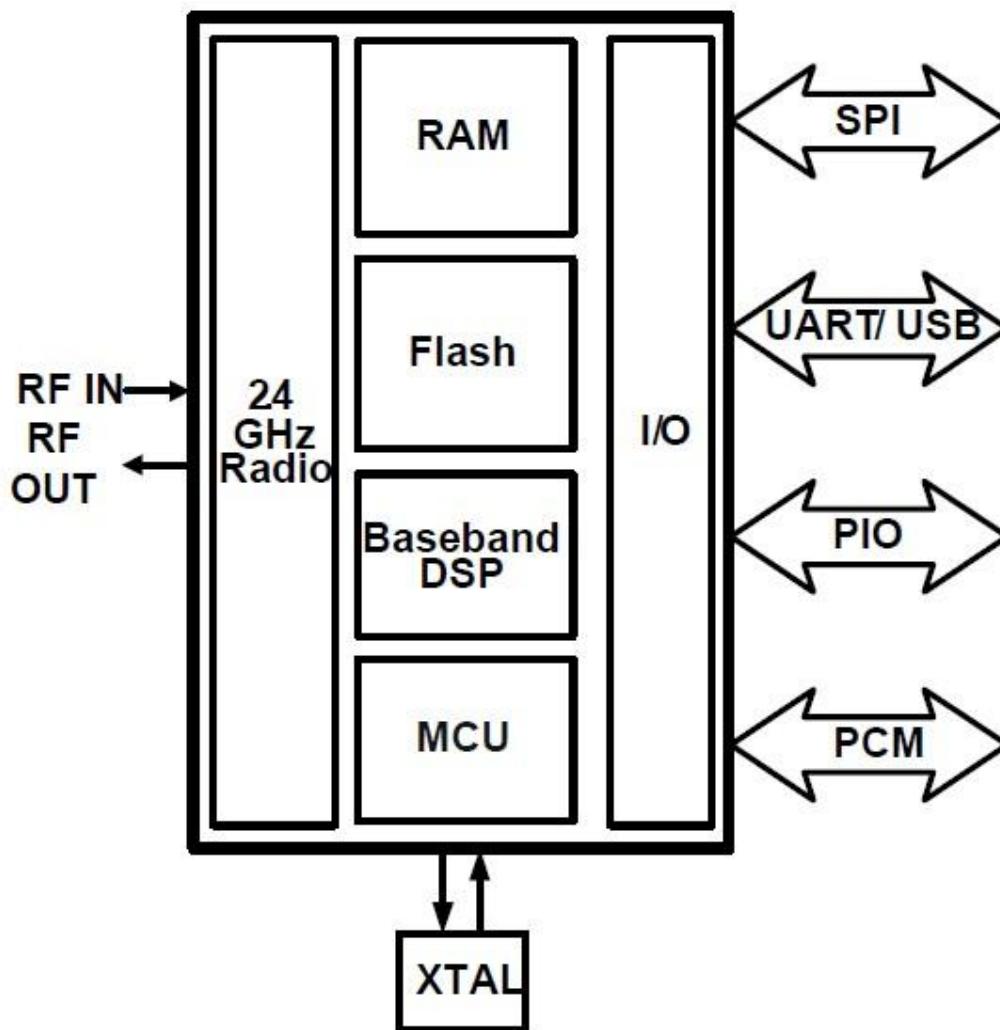
6.15 HM-15

HM-15 is USB Dongle based on HM-10, use USB Interface.
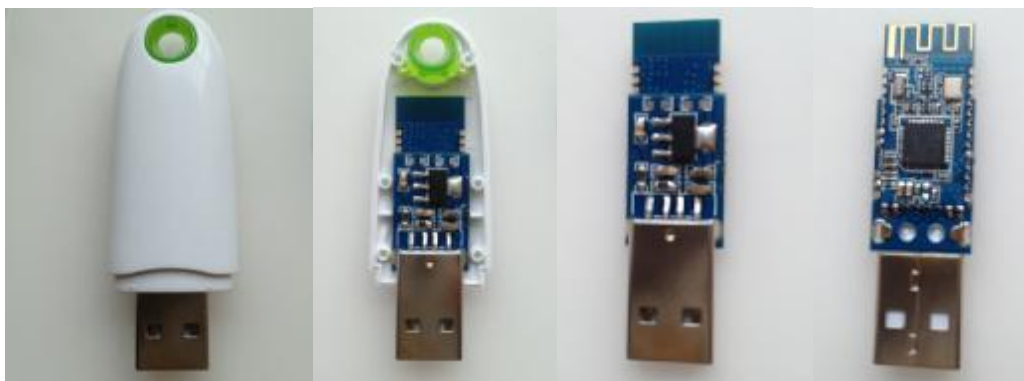
7. System LED and System KEY

7.1 System KEY function (PIO0)

Press if high > 100ms:

7.1.1 If Module role is Master

Unconnected status: Clear last connected remote device address information.

Connected status: Disconnect.

7.1.2 If Module role is Slave

Unconnected status: None.

Connected status: Disconnect.

7.2   System LED function(PIO1)

If AT+KEY0 is setup

Unconnected status: Output High 500 ms, Low 500 ms

Paring status: Output High 100 ms, Low 100 ms

Connected status: Output High

If AT+KEY1 is setup

Unconnected status: Output Low.

Connected status: Output High.

8 AT Commands

Factory default setting:

Name: HMSoft; Baud: 9600, N, 8, 1; Pin code: 1234; transmit Version.

AT Command format:

Uppercase AT command format. string format, without any other

symbol. (e.g. \r or \n).
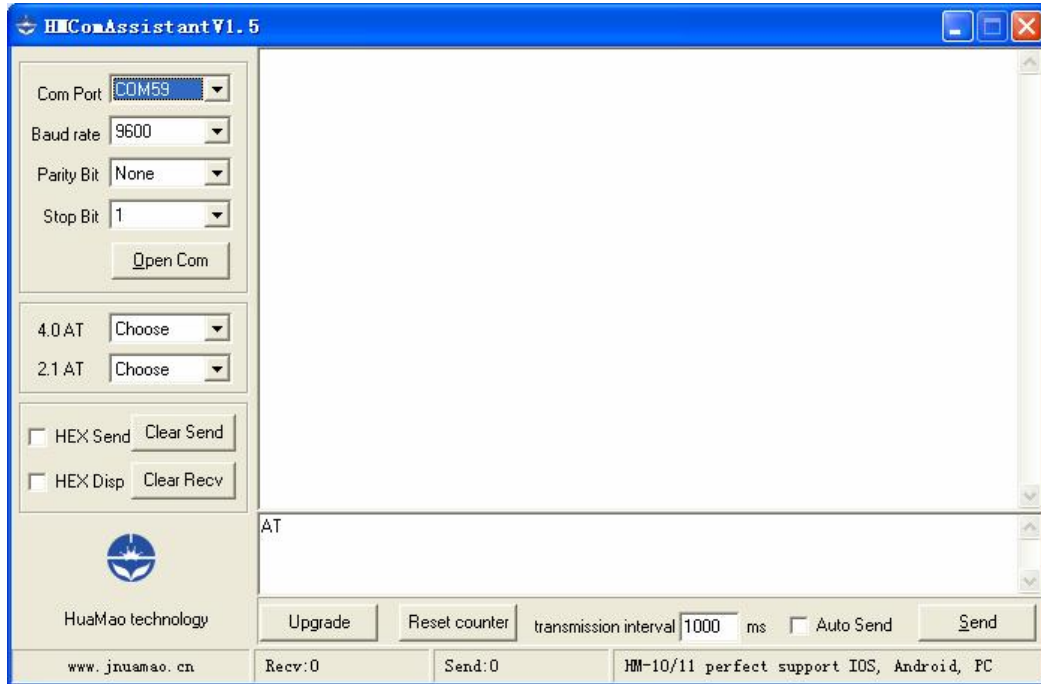
On Transmit version: Only accept AT Command from UART interface when Bluetooth device is not connected with remote device.

On Remote version: Can accept AT Command from UART interface when Bluetooth Device is not connected with remote device, Also can accept AT Command from remote Bluetooth device when connected that.

On PIO collection version: Only accept AT Command from UART interface when Bluetooth device is not connected with remote device.

Bluetooth BLE 4.0 AT Command is not here, please download datasheet from http://www.jnhuamao.cn/Bluetooth40_en.rar

1. Test Command

Send	Receive	Parameter
AT	OK	None

2. Query/Set baud rate

Send	Receive	Parameter

AT+BAUD?	OK+BAUD:[para1]	Para1: Baud rate No.
AT+BAUD[para1]	OK+Set:[para1]	1---------1200
		2---------2400
		3---------4800
		4---------9600
		5---------19200
		6---------38400
		7---------57600
		8---------115200
		9---------230400
		A---------460800
		B---------921600
		C---------1382400
		Default: 4(9600)

e.g.

Query baud:

Send: AT+BAUD?

Receive: OK+BAUD:9600

Setup baud:

Send: AT+BAUD1

Receive: OK+Set:1200

Notice: Computer COM port can not use >115200 baud rate, if you use Computer COM port, setup module rate more than 115200, can not be used.

3. Query/Set Parity bit

Send	Receive	Parameter
Query: AT+CHK?	OK+CHK:[para1]	None
Set: AT+CHK[para1]	OK+Set:[para1]	Para1: 0,1,2
		0:None

		1:ODD
		2:EVEN
		Default: 0 (None)

3. Query/Set Stop bit

Send	Receive	Parameter
AT+STOP?	OK+STOP:[para1]	None
AT+STOP[para1]	OK+Set:[para1]	Para1:1, 2
		1: One stop bit
		2: Two stop bit
		Default: 1 (One stop bit)

4. Query/Set Baud rate, parity bit, stop bit

Send	Receive	Parameter
AT+UART?	OK+UART:[para1],[para2],[para3]	Para1: Baud rate
AT+UART[para1][para2][para3]	OK+Set:[para1] [para2] [para3]	Value: 1~C
		Default: 4(9600)
		Para2: Parity bit
		Value: 0,1,2
		Default: 0 (None)
		Para3: Stop Bit
		Value: 1, 2
		Default: 1(One Bit)

5. Module self check command

Send	Receive	Parameter
AT+SECH?	OK+SECH:OKAY or OK+SECH:FAIL	None

6. Module application sectors check command

Send	Receive	Parameter
AT+APCH?	OK+APCH:OKAY or OK+APCH:FAIL	None

7. Query module temperature command

Send	Receive	Parameter
AT+TEMP?	OK+TEMP:[temp value]	None

8. Query/Set module discoverable status

Send	Receive	Parameter
AT+DISC?	OK+DISC:[para1]	Para1: 0,1,2
AT+ DISC [para1]	OK+Set:[para1]	0: discoverable and connectable 1: only discoverable not connectable 2: only connectable Default: 0

9. Query/Set PIO0 function (System KEY)

Send	Receive	Parameter
AT+KEY?	OK+KEY:[para1]	Para1: 0, 1
AT+ KEY[para1]	OK+Set:[para1]	0: Cancel current status. 1: Cancel current status and restore factory setup. Default: 0

10. Query/Set PIO1 output status (System LED)

Send	Receive	Parameter
AT+LED?	OK+LED:[para1]	Para1: 0, 1
AT+ LED [para1]	OK+Set:[para1]	0:Unconnected Output 500ms High 500ms Low, Connected output High.

		1:Unconnected output Low, Connected output High. Default: 0

11. Query/Set module PIO Pins output status(After setup, when module is power on, PIO pins output status will be setup by this value)

Send	Receive	Parameter
AT+PIO?	OK+PIO:[para1]	None
AT+PIO[para1]	OK+Set:[para1]	HM-03: Not support. HM-05, 06, 07Only have 4 PIO pins can be used. Para1: Length 10, every bit value is 1 or 0. 0: output low; 1:output high Default: 0000000000

HM-01, HM-02, HM-09 has 12 PIO pins PIO0 and PIO1 is used by System.

 So you have 10 Pins to be use.

10 length Value 0000000000 is equal PIO2 to PIO11. per bit only have 0 or

1 value.

e.g.

Query:

Send: AT+PIO?

Receive: OK+PIO0000000000

Setup PIO2 to PIO11 output low

Send: AT+PIO0000000000

Setup PIO2 output high and others output low

Send: AT+PIO1000000000。

Setup PIO2 and PIO3output high and others output low

Send: AT+PIO1100000000

Setup PIO2 to PIO11 all output high

Send: AT+PIO1111111111

This setup value is used by next power on.

12. Query/Set PIO pins output high or low (Only this time, when module next power on, this value is not be used)

Send	Receive	Parameter
AT+PIO[para1]?	OK+PIO:[para1][para2]	Para1: 2~B
AT+PIO[para1][para2]	OK+Set:[para1][para2]	Para2: 0, 1
		HM-03 is not support.
		HM-05, 06, 07 only have
		4 pins.
		Para1 is which PIO pin
		you want to Query/Set
		Value:
		2,3,4,5,6,7,8,9,A,B.
		Para2 is Query or setup
		value.
		0 is low and 1 is high

e.g.

Query PIO2

Send: AT+PIO2?

Setup PIO2 output high

Send: AT+PIO21

Receive: OK+SetPio:21

13. Query/Set Module name

Send	Receive	Parameter
AT+NAME ?	OK+NAME[para1]	Para1: module name, Max length is 12.
AT+NAME[para1]	OK+Set[para1]	

		Default: HMSoft

e.g.

change module name to bill_gates

Send:　　AT+NAMEbill_gates

　Receive: OK+SetName:bill_gates

14. Restore all setup value to factory setup

Send	Receive	Parameter
AT+DEFAULT	OK+DEFAULT	None

15. Restart module

Send	Receive	Parameter
AT+RESTART	OK+RESTART	None

16. Query/Set Master and Slaver Role

Send	Receive	Parameter
AT+ROLE?	OK+ROLE:[para1]	Para1: M, S
AT+ROLE[para1]	OK+Set:[para1]	M: Master
		S: Slaver
		Default: S

17. Query/Set Pin Code

Send	Receive	Parameter
AT+PIN?	OK+PIN:[para1]	Para1 is Pin Code, Max
AT+PIN[para1]	OK+Set:[para1]	length is 12, Allow A~Z,
		a~z, 0~9
		Default: 1234

e.g.

Query Pin Code

Send:　　AT+PIN?

Receive:　OK+PIN:1234

Setup Pin Code 8888

Send: AT+PIN8888

Receive: OK+SetPin:8888

18. Clear Connected device address

Send	Receive	Parameter
AT+CLEAR	OK+CLEAR	None

Notice: Only Master role is used.

19. Query Software Version

Send	Receive	Parameter
AT+VERSION AT+VERSION?	Version Information	None

20. System Help Information

Send	Receive	Parameter
AT+HELP?	Help Information	None

21. Query Last Connected Device Address

Send	Receive	Parameter
AT+RADD?	OK+ADDR:MAC Address	None

22. Query module address

Send	Receive	Parameter
AT+LADD? AT+ADDR?	OK+LADD:MAC Address	None

23. Query/Set Module work type

Send	Receive	Parameter
AT+IMME?	OK+IMME:[para1]	Para1: 0, 1
AT+IMME[para1]	OK+Set:[para1]	0: When module is powered on, only respond the AT Command, don't do anything. until AT + WORK is received 1: When power on, work

		immediately
		Default: 1

This command is only used for Master Role.

24. Work immediately

Send	Receive	Parameter
AT+WORK	OK+WORK	None

This command is only used when AT+IMME1 is setup.

25. Query/Set module connect remote device timeout value

Send	Receive	Parameter
AT+TCON?	OK+TCON:[para1]	None
AT+TCON[para1]	OK+Set:[para1]	Para1 is timeout value. when time is up module will not connect this address anymore, then enter search mode. Para1 allowed value: 0000~9999 Unit is second. Default: 0000 Connect forever

This value is only used for Master Role, when module has Last Connected address.

26. Query/Set Module Work Mode

Send	Receive	Parameter
AT+TYPE?	OK+TYPE:[para1]	None
AT+TYPE[para1]	OK+Set:[para1]	Para1: 0~2 0:Transmission Mode 1:Remote Control Mode 2:PIO Collection Mode

		Default: 0

Remote Control Mode and PIO Collection Mode can use AT+START command switch to Transmission state.

27. Query/Set report PIO states string delay time(unit ms)

Send	Receive	Parameter
AT+TPIO?	OK+TPIO:[para1]	None
AT+TPIO[para1]	OK+Set:[para1]	Para1 value is between 0000 and 9999 ms If value >0, when PIO states is changed, module will send PIO states string to remote device delay this value. Default: 0 send once

1. This value is only used for PIO collection mode.

2. When this value is setup too small, May cause system instability.

28. Switch Remote Control Mode to Transmission Mode(Only this time)

Send	Receive	Parameter
AT+START	OK+START	None

This command is used to change Remote Control Mode or PIO Collection Mode into Transmission state this time.

29. Query/Set Buffer save parameter

Send	Receive	Parameter
AT+BUFF?	OK+BUFF:[para1]	None
AT+BUFF[para1]	OK+Set:[para1]	Para1: 0~1 0: Not save 1:Save Default: 0

When module is in Remote Control Mode or PIO Collection Mode, Module

received and handled command from remote device. If receive any

UART information, use this parameter to setup save or not.

30. Query/Set Search Filter

Send	Receive	Parameter
AT+FILT?	OK+FILT:[para1]	Para1: Allow Type
AT+FILT[para1]	OK+Set:[para1]	Value: 0~C
		Default: C (All)

This value is only used for Master Search Filter.

Para1 values:

0:Miscellaneous

1:Computer (desktop,notebook, PDA, organizers, ...)

2:Phone (cellular, cordless, payphone, modem, ...)

3:LAN /Network Access point

4:Audio/Video (headset,speaker,stereo, video display, vcr.....

5:Peripheral (mouse, joystick, keyboards, ...)

6:Imaging (printing, scanner, camera, display, ...)

7:Wearable

8:Toy

9:Health

A:Uncategorized, specific device code not specified

B:Same Class_Of_Device as self

C:Dont filter

31. Query/Set Module Notification

Send	Receive	Parameter
AT+NOTI?	OK+NOTI:[para1]	None
AT+NOTI[para1]	OK+Set:[para1]	Par1 value is 0, 1.
		0: Don't notify(default)
		1:Notify when connected
		or disconnected

If this value is setup to 1, when connected will send "OK+CONN" string through UART. "OK+LOST" string will be send when lost connection.

32. Query/Set Module Class Of Device

Send	Receive	Parameter
AT+COD?	OK+COD:[para1]	None
AT+COD[para1]	OK+Set:[para1]	Par1 is COD value. Value: 0000~0xFFFF Default: 0x1F00 (unknown device)

This value will worked on next time powered on.