

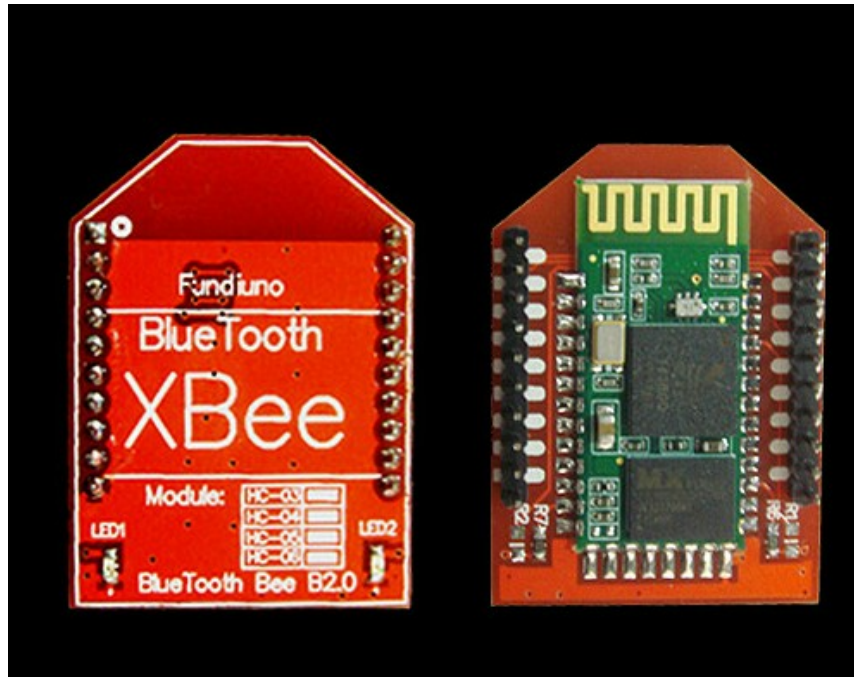
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## bluetooth module

### **Contents**

1. Product's picture
  2. Feature
  3. Pins description
  4. The parameters and mode of product
  5. Block diagram
  6. Debugging device
  7. Characteristic of test
  8. Test diagram
  9. AT command set
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## 1. Product's picture



### Specifications:

|                        |                         |
|------------------------|-------------------------|
| Microprocessor         | CSR BC417               |
| PCB size               | 33.7mm * 25.2mm * 1.6mm |
| Indicators             | PWR State               |
| Power supply           | 3.3V DC                 |
| Communication Protocol | UART Bluetooth2.0       |
| RoSH                   | Yes                     |

Bluetooth Bee is an easy to use Bluetooth SPP module compatible

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with existing Xbee sockets.

## 2. Feature

### Wireless transceiver

Sensitivity (Bit error rate) can reach -80dBm.

### Function description (perfect Bluetooth solution)

- Has an EDR module; and the change range of modulation depth::2Mbps-3Mbps
  - Has a build-in 2.4GHz antenna; user needn't test antenna.
  - Has the external 8Mbit FLASH
  - Can work at the low voltage (3.1V~4.2V). The current in pairing is in the range of 30~40mA.
  - The current in communication is 8mA.
  - Standard HCI Port (UART or USB)
  - USB Protocol: Full Speed USB1.1, Compliant With 2.0
  - This module can be used in the SMD.
  - It's made through RoHS process.
  - The board PIN is half hole size.
  - Has a 2.4GHz digital wireless transceiver.
  - Bases at CSR BC04 Bluetooth technology.
  - Has the function of adaptive frequency hopping.
  - Small (27mm×13mm×2mm)
  - Peripherals circuit is simple.
  - It's at the Bluetooth class 2 power level.
  - Storage temperature range: -40 °C - 85°C , work temperature range: -25 °C - +7
  - Any wave inter Interference: 2.4MHz, the power of emitting: 3 dBm.
  - Bit error rate: 0. Only the signal decays at the transmission link, bit error may be example, when RS232 or TTL is being processed, some signals may decay.
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**Low power consumption**

**Has high-performance wireless transceiver system**

**Low Cost**

**Application fields:**

- Bluetooth Car Handsfree Device
- Bluetooth GPS
- Bluetooth PCMCIA , USB Dongle
- Bluetooth Data Transfer

**Software**

- CSR
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### 3. Pins description

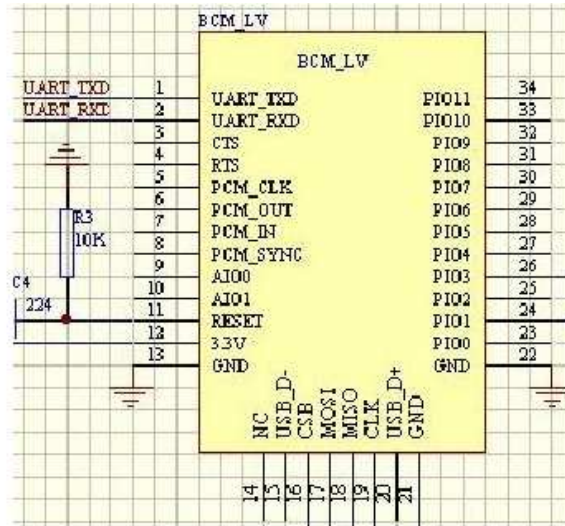


Figure 3 PIN configuration

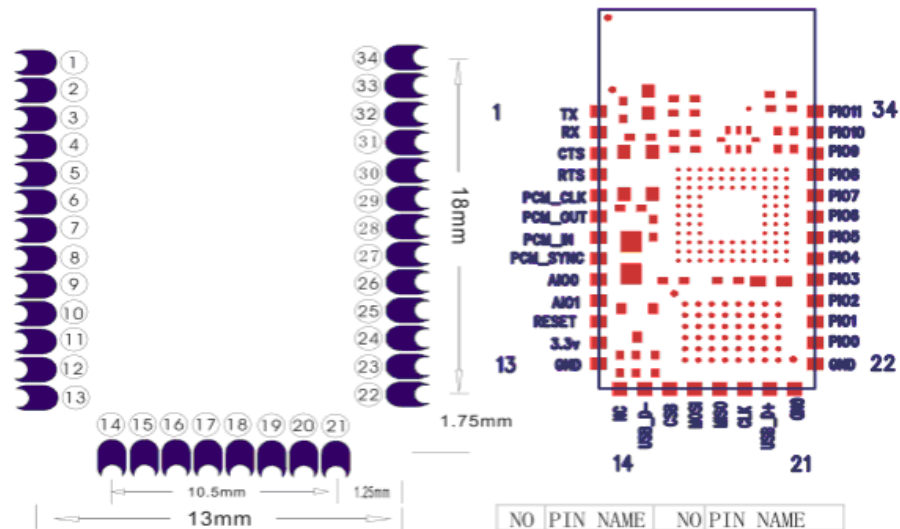
The PINs at this block diagram is as same as the physical one.

| PIN Name | PIN #    | Pad type       | Description   | Note |
|----------|----------|----------------|---|------|
| GND      | 13 21 22 | 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  |      |

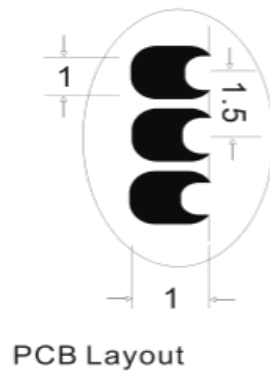
|          |    |   |  |         |
|----------|----|---|--|---------|
| PIO0     | 23 | Bi-Directional<br>RX EN                                     | Programmable input/output line,<br>control output for LNA(if fitted) |         |
| PIO1     | 24 | Bi-Directional<br>TX EN                                     | Programmable input/output line,<br>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<br>weak internal<br>pull-down               |  |         |
| UART_RTS | 4  | CMOS output,<br>tri-stable with weak<br>internal pull-up    | UART request to send, active low                                     |         |
| UART_CTS | 3  | CMOS input with<br>weak internal<br>pull-down               | UART clear to send, active low                                       |         |
| UART_RX  | 2  | CMOS input with<br>weak internal<br>pull-down               | UART Data input  |         |
| UART_TX  | 1  | CMOS output,<br>Tri-stable with<br>weak internal<br>pull-up | UART Data output   |         |
| SPI_MOSI | 17 | CMOS input with<br>weak internal<br>pull-down               | Serial peripheral interface data input                               |         |
| SPI_CSB  | 16 | CMOS input with<br>weak internal                            | Chip select for serial peripheral<br>interface, active low           |         |

|          |    |   |   |                                       |
|----------|----|---|---|---------------------------------------|
|          |    | pull-up                                 |   |                                       |
| SPI_CLK  | 19 | CMOS input with weak internal pull-down | 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 |   | 1.8V external power supply input        | Default : 1.8V internal power supply. |
| PCM_CLK  | 5  | Bi-Directional                          |   |                                       |
| PCM_OUT  | 6  | CMOS output                             |   |                                       |
| PCM_IN   | 7  | CMOS Input                              |   |                                       |
| PCM_SYNC | 8  | Bi-Directional                          |   |                                       |

## 4. The parameters and mode of product



| NO | PIN NAME | NO | PIN NAME |
|----|----------|----|----------|
| 1  | TX       | 20 | USB D+   |
| 2  | RX       | 21 | GND      |
| 3  | CTS      | 22 | GND      |
| 4  | RTS      | 23 | PIO0     |
| 5  | PCM CLK  | 24 | PIO1     |
| 6  | PCM OUT  | 25 | PIO2     |
| 7  | PCM IN   | 26 | PIO3     |
| 8  | PCM SYNC | 27 | PIO4     |
| 9  | AIO0     | 28 | PIO5     |
| 10 | AIO1     | 29 | PIO6     |
| 11 | RESET    | 30 | PIO7     |
| 12 | 3.3V     | 31 | PIO8     |
| 13 | GND      | 32 | PIO9     |
| 14 | NC       | 33 | PIO10    |
| 15 | USB D-   | 34 | PIO11    |
| 16 | CSB      |    |          |
| 17 | MOSI     |    |          |
| 18 | MISO     |    |          |
| 19 | CLK      |    |          |





## 5. Block diagram

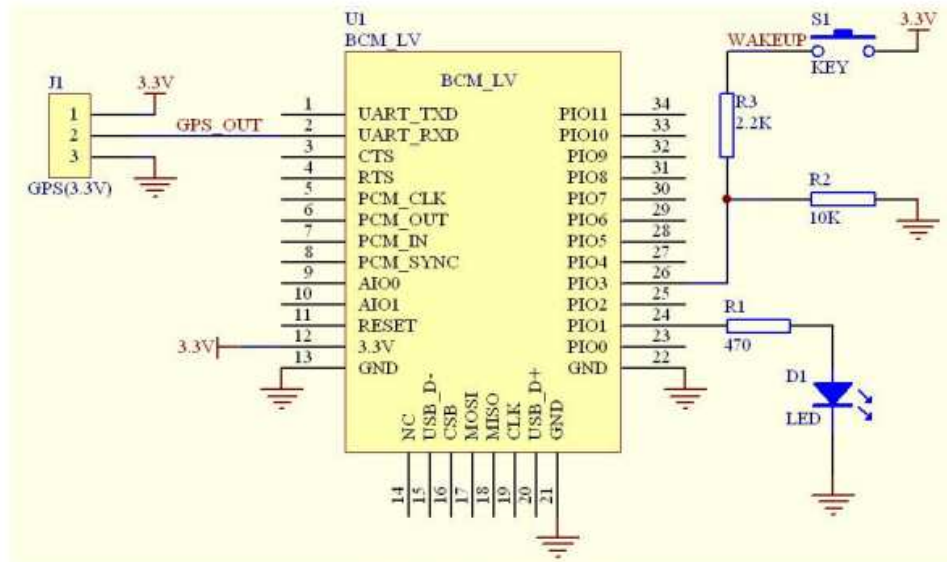


Figure 5 Block diagram 1

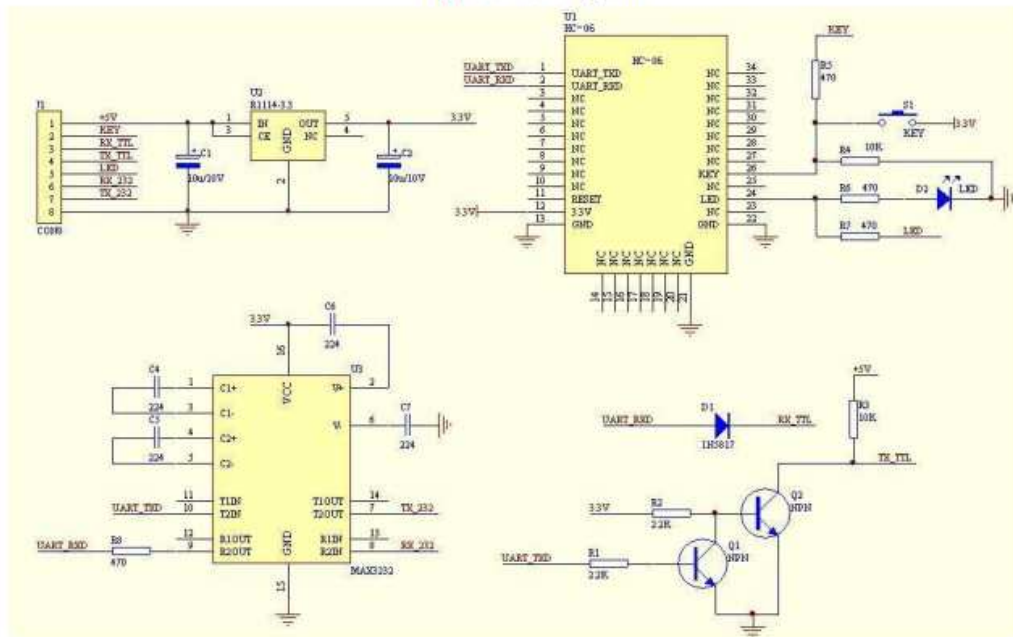


Figure 5 Block diagram 2

HC-04/06 master device has a function of remembering the last paired slave device. As a master device, it will search the last paired slave device until the connection is built. But if the WAKEUP button is pressed, HC-04/06 will lose the memory and research the new slave device.

## 6. Debugging device

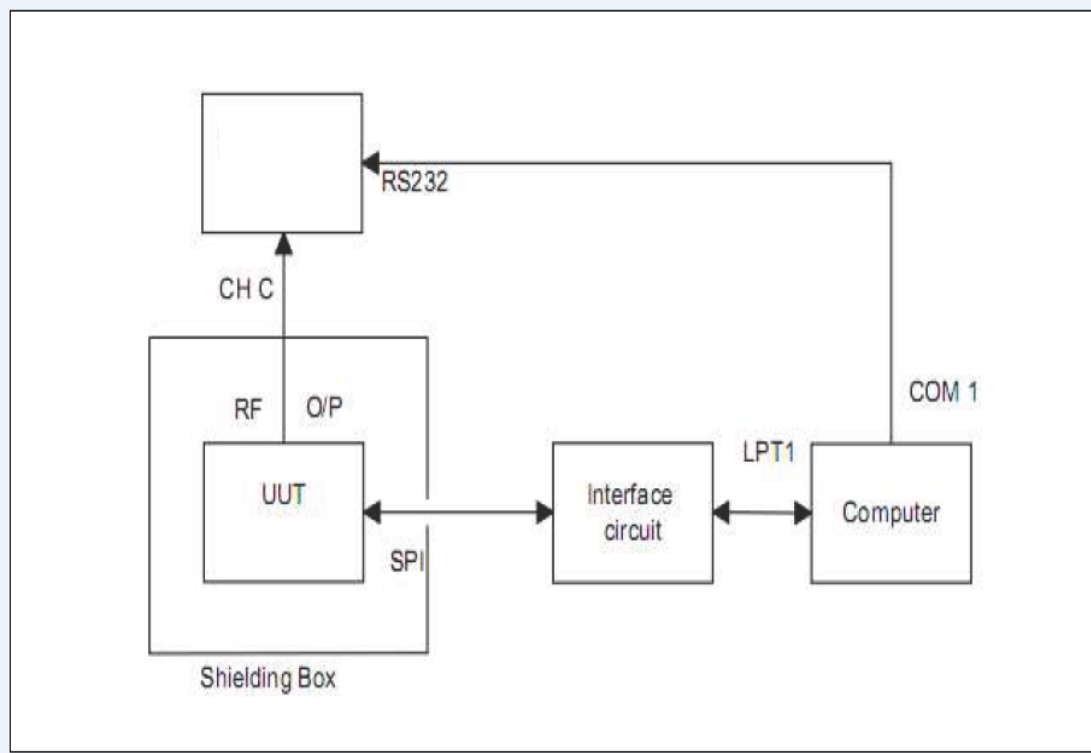
### 6.1 Device

PC, hardware , 3.15V DC power supply, Shielding, Bluetooth Test box.

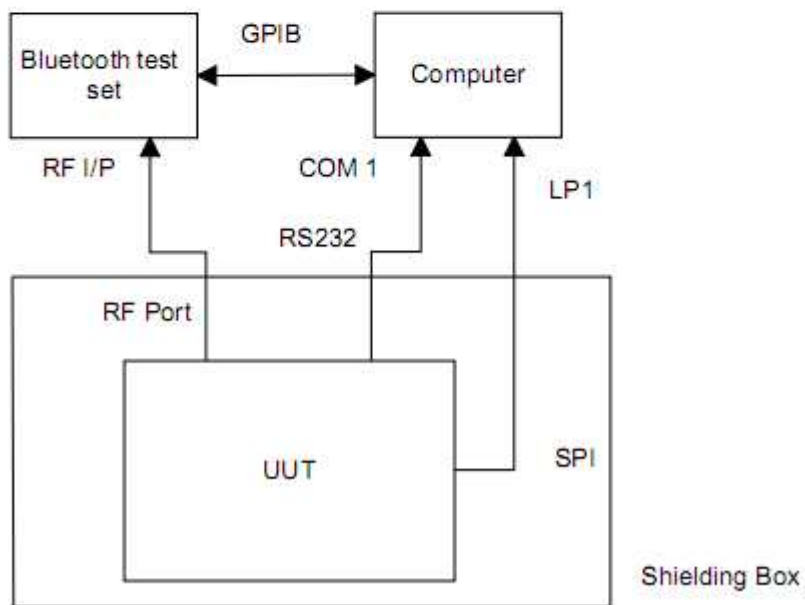
### 6.2 Software

## 7. Characteristic of test

|  | Test Condition 25°C RH 65% |     |        | Unit |
|--|----------------------------|-----|--------|------|
|  | Min                        | Typ | Max    |      |
| 1. Carrier Freq. ( <i>ISM Band</i> )                           | 2.4                        |     | 2.4835 | MHz  |
| 2. Step size of Power control                                  | 2                          |     | 8      | dB   |
| 3. Freq. Offset ( <i>Typical Carrier freq.</i> )               | -75                        |     | 75     | KHz  |
| 4. Carrier Freq. drift ( <i>Hopping on, drift rate/50uS</i> )  | -20                        |     | 20     | KHz  |
| 1 slot packet  | -25                        |     | 25     | KHz  |
| 3 slot packet  | -40                        |     | -40    | KHz  |
| 5. Average Freq. Deviations ( <i>Hopping off, modulation</i> ) | 140                        |     | 175    | KHz  |
| Freq. Deviation  | 115                        |     |        | KHz  |
| Ratio of Freq. Deviation                                       | 0.8                        |     |        |      |
| 6. Receive Sensitivity @< 0.1% BER ( <i>Bit error rate</i> )   | -83                        |     |        | dBm  |



**Fig 1. Programming and Freq. Alignment**



**Fig 2 RF parameter Test Procedure**

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## 9. AT command set

The way to the AT command mode: supply power to the module, it will enter to the AT mode if it needn't pair. The interval of command is about 1 second.

Default parameter: Baud rate:9600N81, ID: linvor, Password:1234

### 1. Test communication

Send: AT (please send it every second)

Back: OK

### 2. Reset the Bluetooth serial baud rate

Send: AT+BAUD1

Back: OK1200

Send: AT+BAUD2

Back: OK2400

.....

1-----1200

2-----2400

3-----4800

4-----9600 (Default)

5-----19200

6-----38400

7-----57600

8-----115200

9-----230400

A-----460800

B-----921600

C-----1382400

PC can't support the baud rate lager than 115200. The solution is: make the MCU have higher baud rate (lager than 115200) through programming, and reset the baud rate to low level through the AT command.

The baud rate reset by the AT command can be kept for the next time even though the power is cut off.

### 3. Reset the Bluetooth name

Send: AT+NAMEname

Back: OKname

Parameter name: Name needed to be set (20 characters limited)

Example:

Send: AT+NAMEbill\_gates

Back: OKname

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Now, the Bluetooth name is reset to be “bill\_gates”

The parameter can be kept even though the power is cut off. User can see the new Bluetooth name in PDA refresh service. (Note: The name is limited in 20 characters.)

4. change the Bluetooth pair password

Send: AT+PINxxxx

Back: OKsetpin

Parameter xxxx: The pair password needed to be set, is a 4-bits number. This command can be used in the master and slave module. At some occasions, the master module may be asked to enter the

password when the master module tries to connect the slave module (adapter or cell-phone). Only if the password is entered, the successful connection can be built. At the other occasions, the pair can be finish automatically if the master module can search the proper slave module and the password is correct. Besides the paired slave module, the master can connect the other devices who have slave module, such as Bluetooth digital camera, Bluetooth GPS, Bluetooth serial printer etc.

Example:

Send: AT+PIN8888

Back: OKsetpin

Then the password is changed to be 8888, while the default is 1234.

This parameter can be kept even though the power is cut off.

5. No parity check ( The version, higher than V1.5, can use this command )

Send: AT+PN (This is the default value)

Back: OK NONE

6. Set odd parity check ( The version, higher than V1.5, can use this command )

Send: AT+PO

Back: OK ODD

7. Set even parity check( The version, higher than V1.5, can use this command )

Send: AT+PE

Back: OK EVEN

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*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.*

*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: 2ADMF-HC06 or Contains FCC ID: 2ADMF-HC06 "*

*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.*