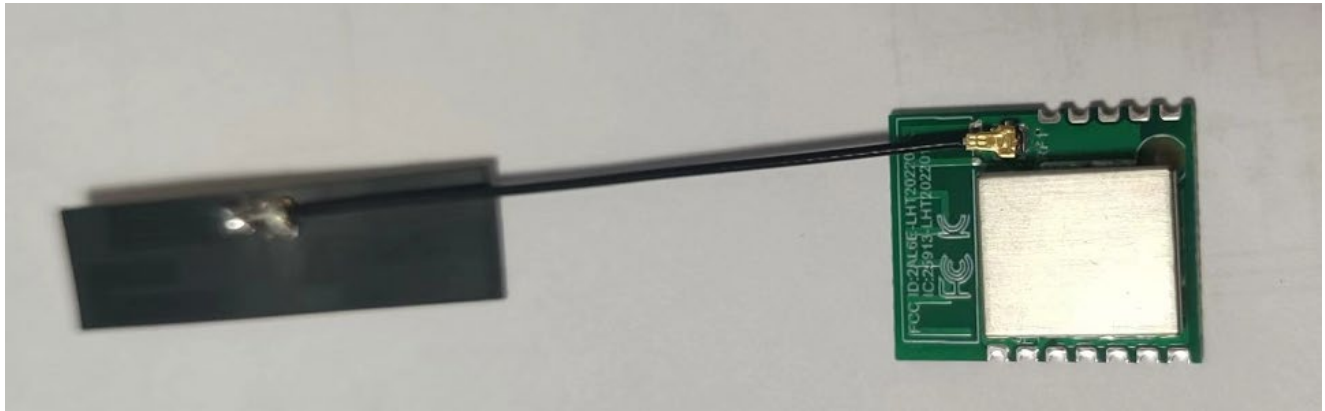


# LiHua\_BLE\_002

## Bluetooth module hardware specification

### V1.2



## Catalogue

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## WARNINGS

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.

Caution: Changes or modifications to this unit 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.

### **Information for the OEM Integrators**

This device is intended for OEM integrators only. Please see the full grant of equipment document for restrictions.

### **Label Information to the End User by the OEM Integrators**

If this certified module is installed inside the host device, then the outside of the host must be labeled with “Contains FCC ID: 2AL6E-LHT202201K” and “Contains IC ID: 25913-LHT202201K”.

The requirement for KDB 996369 D03:

**1 List of applicable FCC rules**

FCC Part 15. 247.

**2 Summarize the specific operational use conditions**

None

**3 Limited module procedures**

The module is a single module, so this requirement is not applicable to the product.

**4 Trace antenna designs**

The module uses the permanent external antenna, so this requirement is not applicable to the product.

**5 RF exposure considerations**

After evaluation, the SAR requirement is deemed to be satisfied without test. Please check the report for detail information.

**6 Antennas**

PCB antenna, Antenna Gain:0dBi.

**7 Label and compliance information**

If this certified module is installed inside the host device, then the outside of the host must be labeled with “Contains FCC ID: 2AL6E-LHT202201K” and “Contains IC ID: 25913-LHT202201K” .

**8 Information on test modes and additional testing requirements**

The host manufacturer can use the software of SmartRF Studio 7 to make the Bluetooth transmit continuously.

**9 Additional testing, Part 15 Subpart B disclaimer**

The module only complies with the FCC Part 15.247. If the module is installed in the host device, the host manufacturer is responsible for the compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. For example, if the host manufacturer markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the host manufacturer shall provide a notice stating that the final

## For Both FCC & IC application:

This device complies with Part 15 of the FCC Rules / Industry Canada licence-exempt RSS standard(s). 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.

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

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

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.

### **MPE Requirements**

To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operations at closer than this distance is not recommended.

*Les antennes installées doivent être situées de façon à ce que la population ne puisse*

*y être exposée à une distance de moins de 20 cm. Installer les antennes de façon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l'antenne.*

*La FCC des états-unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son fonctionnement.*

**Region Selection**

Limited by local law regulations, version for North America does not have region selection option.

## 1. revision record

| edition | Revised content   | Revised by / date   |
|---------|---|---------------------|
| V1.0    | First edition   | YangPeng/2022-3-10  |
| V1.1    | Adjust format   | YangPeng /2022-3-19 |
| V1.2    | 1.Adjust Bluetooth chip packaging and Bluetooth schematic diagram<br>2.Adjust Bluetooth module interface definition | YangPeng /2022-4-13 |
|         |   |                     |
|         |   |                     |

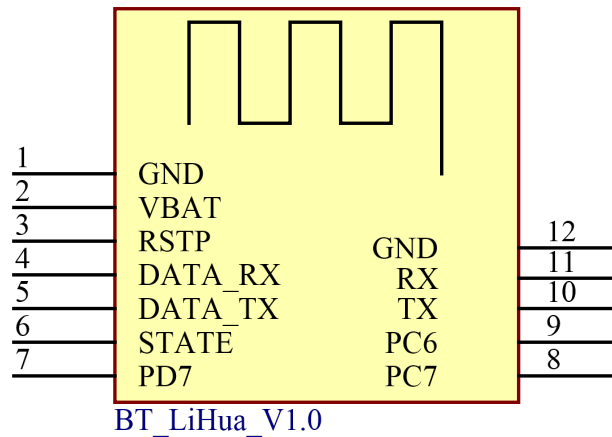
## 2. Bluetooth module parameters

| Category | parameter                           | explain                          |
|----------|-------------------------------------|----------------------------------|
| Wireless | Bluetooth version                   | BLE 5.0                          |
|          | Operating frequency band            | 2402MHz ~ 2480MHz                |
|          | Maximum transmit power              | +10 dBm ( Normal 10 dBm output ) |
|          | Receiving sensitivity               | -94dBm (1M)                      |
|          | authentication                      | FCC/CE/ICES                      |
| Hardware | Module Size                         | 23.0mmX15.8mmx4mm                |
|          | Module Bluetooth chip               | FR8012HAQ                        |
|          | Bluetooth chip SRAM                 | 48KB                             |
|          | Bluetooth chip ROM                  | 150KB                            |
|          | Bluetooth chip interface peripheral | GPIO\UART\SPI\I2C\LED            |
|          | working voltage                     | 2.5~4.3V(typical 3.3V)           |
|          | I/O Voltage                         | 1.6~3.3V(typical 2.9V)           |
|          | Operating current                   | <10mA                            |
|          | working temperature                 | -20~+105℃                        |
|          | Storage temperature                 | -40~125℃                         |



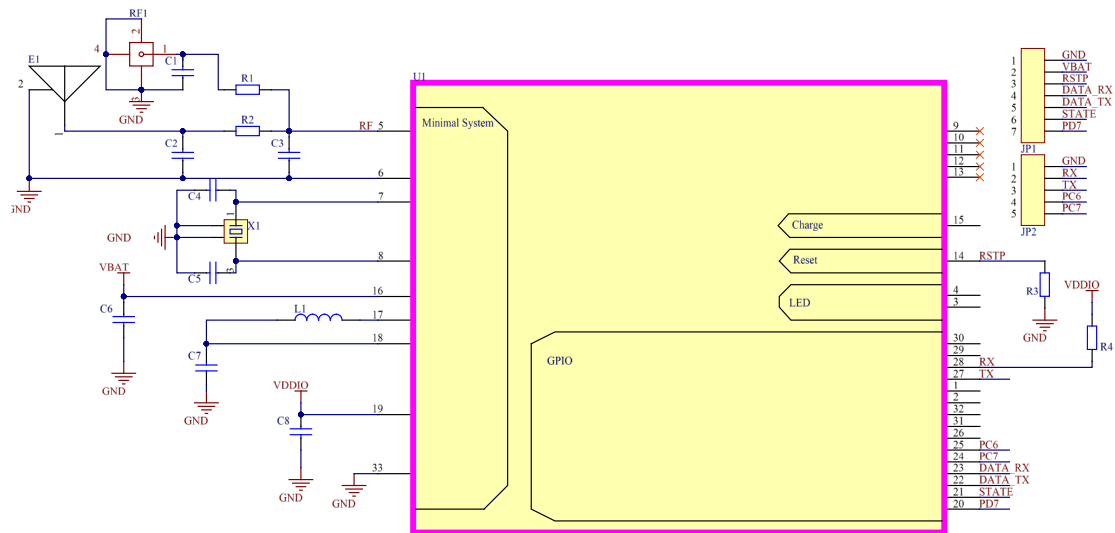
## 3. Bluetooth module pin definition and module schematic diagram

### 3.1 pin definition of Bluetooth module

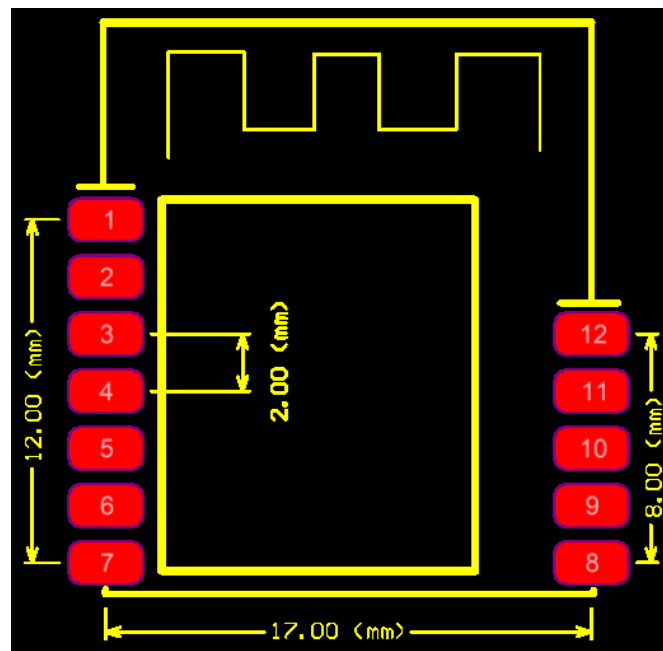


| Pin | name    | explain                                     |
|-----|---------|---|
| 1   | GND     | Negative pole of power supply               |
| 2   | VBAT    | Positive pole of power supply               |
| 3   | RSTP    | reset                                       |
| 4   | DATA_RX | Data transparent transmission and reception |
| 5   | DATA_TX | Data transparent transmission               |
| 6   | STATE   | Bluetooth connection status indicator       |
| 7   | PD7     | Reserved IO                                 |
| 8   | PC7     | Reserved IO                                 |
| 9   | PC6     | Reserved IO                                 |
| 10  | TX      | Firmware upgrade port                       |
| 11  | RX      | Firmware upgrade port                       |
| 12  | GND     | Negative pole of power supply               |

### 3.2 Schematic diagram of Bluetooth module



### 4. Bluetooth module size



### 5. Bluetooth module electrical parameters

| Serial number | condition         | value                  |
|---------------|-------------------|------------------------|
| 1             | working voltage   | 2.5~4.3V(typical 3.3V) |
| 2             | I/O Voltage       | 1.6~3.3V(typical 2.9V) |
| 3             | Operating current | <10mA                  |

|   |                     |           |
|---|---------------------|-----------|
| 4 | working temperature | -20~+105℃ |
| 5 | Storage temperature | -40~125℃  |

## 6. Bluetooth module power consumption

| Operating mode                                       | average value | Maximum | Company |
|--|---------------|---------|---------|
| TX peek current<br>(0dB)                             | --            | 8       | mA      |
| RX peek current                                      | --            | 9.7     | mA      |
| Deep sleep current<br>(include 48K<br>retention RAM) | 6.1           | --      | uA      |
| Power off  | 2.7           | --      | uA      |

## 7. Bluetooth module service UUID and service feature

### UUID attribute

| features                        | characteristic value                | attribute                                   |                                      |
|---------------------------------|-------------------------------------|---|--------------------------------------|
| bluetooth<br>service UUID       | 0x49535343FE7D4AE58FA99FAFD205E455  |   |                                      |
| Service UUID<br>characteristics | 0x495353431E4D4BD9BA6123C647249616  | write & write<br>without response<br>Notify | TX<br>Mobile APP end<br>reading data |
| Service UUID<br>characteristics | 0x 49535343884143F4A8D4ECBE34729BB3 | write & write<br>without response           | RX Mobile APP<br>terminal write data |

## 8. welding temperature

1. heating method: conventional convection or IR convection
2. allowable reflow times: 2 times, based on the following inclined heating conditions
3. maximum temperature: 250° C。

