Product Name	GAOTek Temperature and Humidity IoT Sensor
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Product URL	https://gaotek.com/product/gaotek-temperature-and-humidity-iot-sensor-2/

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Contents

1 Brief Introduction 2
1.1 Features 3
1.2 Technical Specification 3
1.3 Network Access 4
1.4 Structure 4
1.4.1 Power supply 4
1.4.2 LAN port 5
1.4.3 Reset Button 5
1.4.4 Indicate lights 5
2 Steps for usage 5
2.1 Acquire gateway IP 5
2.2 Configure TCP server 6
2.3 Change network mode 7
3 Basic communication formats 7
3.1 TCP transparent communication 8
3.2 MQTT format 9
3.3 HTTP format 10

1 Brief Introduction

With years of development, the IOT (Internet of Things) technology is widely used. IOT is the general term of a system consisting of objects (sensors, chips, and gateways), Internet connection, cloud/data center. Among these, the part of objects can be very fragmental. Gateway can integrate information collected from different objects. Internet can transmit information among each part and cloud/data center can analyze and provide solutions. Combining these 4 parts, it will become a big platform that can achieve deployment, analysis and application. This is the core structure of IOT.

1.1 Features

- **Automatic scanning**

After powered the gateway and built TCP connection with server, the gateway will automatically scan surrounding BLE device. And upload MAC address device name, broadcasting type, broadcasting content and in time signal power to server.

- **Support various devices**

It can monitor the device conforms to the BLE standard.

- **Low operating cost**

Bluetooth applied to the worldwide open 2.4G band, so its operating cost is almost to zero.

1.2 Technical Specification

- **Introduction**

1. Automatically assign IP address
2. 10M/100M adaptive network
3. 360MIPS High-performance processor
4. Average power consumption: 120mA@5V, peak value 500mA when use WIFI
5. Size：106mm x 106mm x 30mm

- **Bluetooth specification**

1. Bluetooth V5.0 standard
2. Frequency range: 2.402G ~ 2.480GHz
3. Class2 Bluetooth module
4. Bluetooth protocols：LC、LM、L2CAP、ATT、GATT

- **Internet protocols:** TCP/IP, DHCP

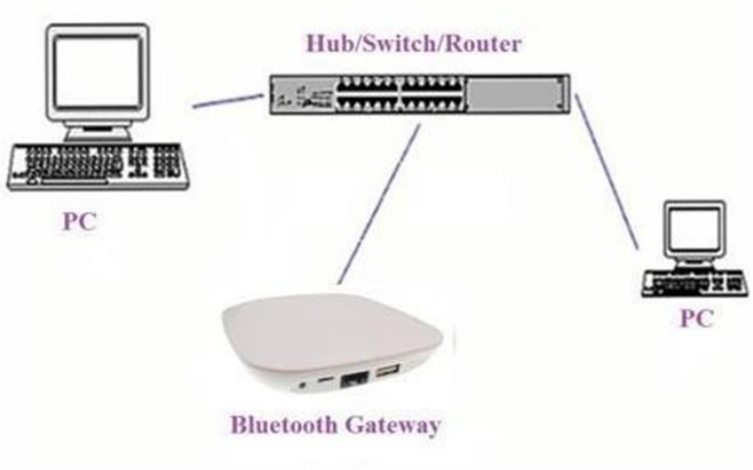
➢ **Authentication:** Support Wi-Fi security authentication

➢ **Internet**

1. RJ45 port
2. 10M/100M adaptive
3. Maximum scan range 30M in open air
4. Maximum scan number 300pcs/s
5. Working temperature -20 to 65℃

1.3 Network Access

By DHCP router connection (Cable/WIFI optional)



1.4 Structure

1.4.1 Power supply

The gateway is powered by 5V Micro USB.

1.4.2 LAN port

Follow the picture of network accesses, plug cable into BLE gateway LAN port. So, the gateway is connected to a local area network.

1.4.3 Reset Button

Reset button can set gateway parameter to default value. After powered the gateway, press reset button for 6s, the red light will flash quickly. Now release the button. When the red light stop flashing, it means the gateway reset successfully.

1.4.4 Indicate lights

There are 3 indicate lights in gateway surface. Red, green and blue.
(1) Red light is system indicating light.
After powered the gateway, the red light will hold on. After initialization, the red light will flash every second.

Note: if use DHCP to distribute IP address to gateway, the gateway must wait until it gets IP address. If the red light always holds on, probably the gateway didn't get IP address.

(2) Green light is network connection indicating light.

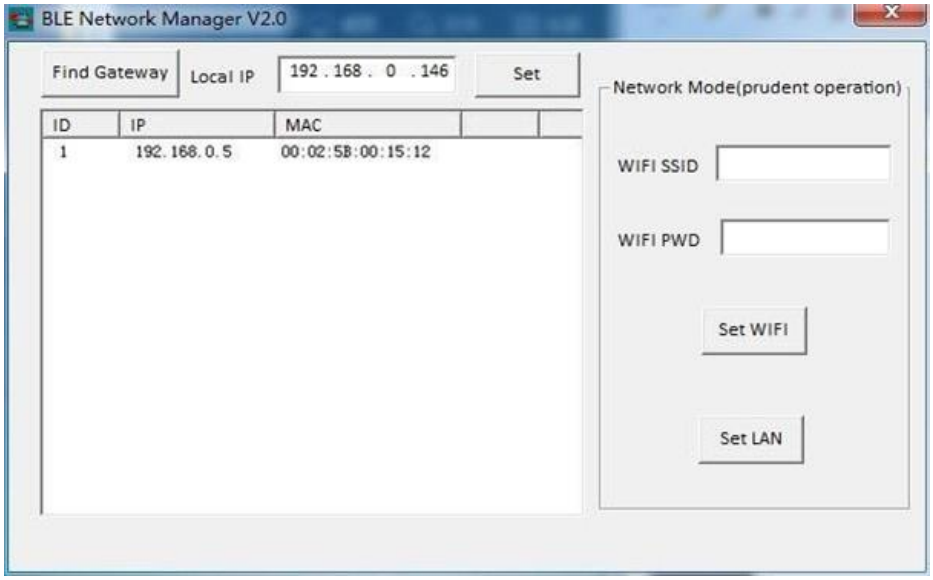
The green light will extinguish after gateway-built TCP connection with server. If the green light holds on, that means the gateway didn't connect with server. Then please check server parameter and check cable.

(3) Blue light is Bluetooth working status indicate light. When the Bluetooth is not scanning surrounding device, the blue light will extinguish. When it starts scanning, the scanned device number will decide flash speed. The more the Bluetooth scanned the fast the blue light will flash.

2 Steps for usage

2.1 Acquire gateway IP

User can use BLE scan gateway management software (BLE Network Manager) to scan gateway. Enter PC IP in local IP, click “Set” to scan gateway.



2.2 Configure TCP server

When first time use gateway or usage environment changed, user need to configure the parameter and re-power it. After acquire gateway IP address, for example: 192.168.0.5, enter http://192.168.0.5 in browser, it will show a login interface. Both user name and password are “admin”.

Click OK to enter, choose “Operation Mode”, and then enter following page:

Enter TCP server IP address and TCP port number. Click “Apply” and wait for a few seconds until the page refreshes. Then re-power the gateway and the gateway will automatically connect to designated server.

2.3 Change network mode

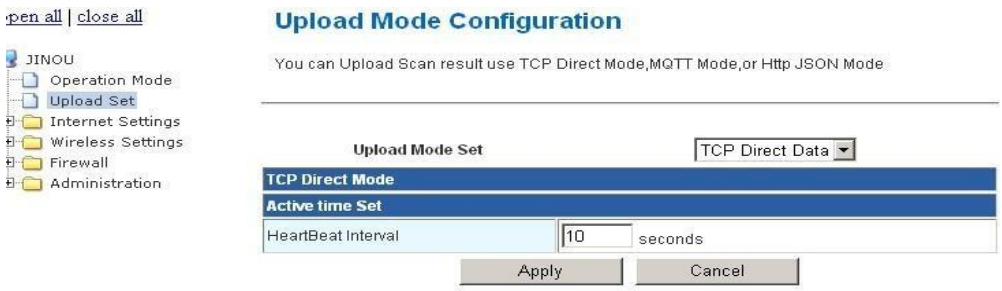
The gateway can connect to network via cable or Wi-Fi. Factory default is via cable. IP address is assigned by DHCP. User can use BLE scan gateway management software (BLE Network Manager) to set network mode. Please keep prudent when set, especially Wi-Fi mode. If set Wi-Fi mode, please first ensure that the gateway is currently in cable mode and can be searched through the gateway management tool. Then enter the Wi-Fi name and password in the network mode, click "set Wi-Fi", and then power on the gateway again. It will take about tens of seconds or one minute to connect to Wi-Fi for the first time.

If Wi-Fi connection is failed within two minutes, power on the gateway again. If still failed, Wi-Fi name and password entered in the Wi-Fi configuration may be incorrect. Please ensure Wi-Fi SSID and password is correct, otherwise Wi-Fi connection will be failed, user needs to press Reset button to restore gateway to factory default setting.

3 Basic communication formats

The gateway supports 3 methods of upload data: TCP transparent communication, MQTT format and HTTP format. User can choose and set in web page.

3.1 TCP transparent communication



Default data upload format is TCP. For TCP upload, user only need to set heartbeat package interval. Default setting is 10s. There are 2 kinds of data packet. One is scanning data packet; another is heartbeat packet.

Scan data packet

\r\n +INQRESULT:<gwaddr>, <addr>, <addrtype>, <name>, <bctype>, <bcdata>, <rssi>\r\n

Parameter description:

gwaddr: The gateway's MAC address adds: scanned BLE device's MAC address
addrtype: scanned BLE device's address type. 0: public 1: random name:
scanned BLE device's name, the value can be blank
bctype: scanned BLE device's broadcast type. Details type refers to Bluetooth specification Core_V4.2 [Vol 2] PartE, 7.7.65.2.

- ADV_IND
- ADV_DIRECT_IND
- ADV_SCAN_IND
- ADV_NONCONN_IND
- SCAN_RSP

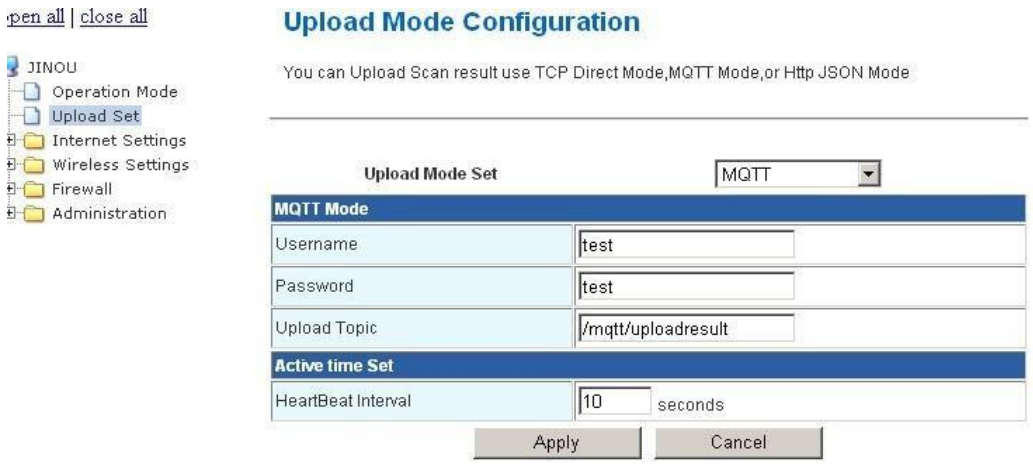
Bc data: scanned BLE device's broadcasting data. Detail format refer to Bluetooth specification Core_V4.2 中 [Vol 3] Part C 11.
rssi: signal strength between BLE device and Bluetooth gateway

Example:

+INQRESULT:001B35142024, C233F291838,0,"",3,0201060303E1FF1216E1FFA10
8643818293F23AC566563696D61, -75
+INQRESULT:001B35142024, D9783C812794,0,"",0,0201060303E1FF1216E1FFA
1083E9427813C78D9566563696D61, -81
+INQRESULT:001B35142024, D9783C812794,0,"iBeacon",4,080969426561636F6E
, -78

After gateway and server-built TCP connection, if there is no scan data packet send in10s, gateway will send a heartbeat packet, so sever can judge if the gateway is working normally.

3.2 MQTT format

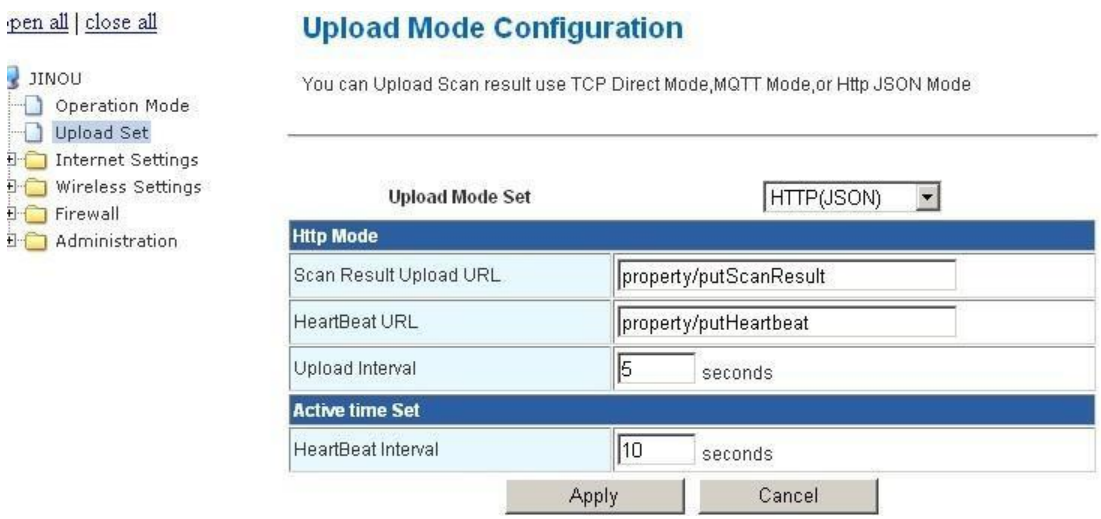


Need to set 3 main parameters: User name, password and upload topic.

In this format, heartbeat interval will work as Keep Alive time parameter in MQTT connection.

Scan data packet is same as TCP format.

3.3 HTTP format

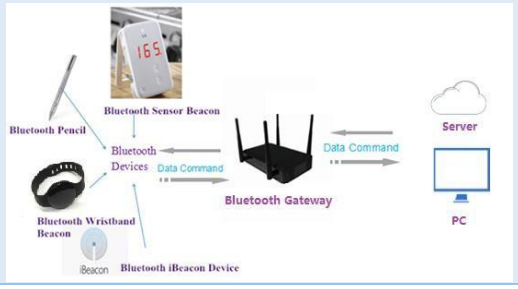


Bluetooth Gateway Management Control

Wireless Data Communication, Intelligent

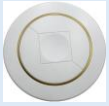
Application

- Positioning education
- Industry
- Medical care
- Remote management of personnel/goods/warehouse



BLE Scan Gateway

Automatically Scan Bluetooth Device via Bluetooth, Upload Data to PC / Server

				
☐ BTP106-2 ☐ BLE5.0 ☐ Distance:30 m ☐ TCP/MQTT/ HTTP	✓ BTP106-S ✓ BLE5.0 ✓ Long distance:100m ✓ Directional antenna	☐ BTP106-SS ☐ BLE5.0 ☐ Long distance:150 m	☐ BTP106 -3 ☐ BLE5.0 ☐ Distance :30m	☐ BTP107 ☐ BLE5.0 ☐ Distance:30 m ☐ Mesh network

Bluetooth Connection Gateway

Connect Target Bluetooth Device via Bluetooth, Upload Data to PC / Server

				
☐ BTP108 ☐ BLE5.0 ☐ Distance:30 m ☐ Connection: 5	☐ BTP110 ☐ BLE5.0 ☐ Long distance:150m ☐ Connection: 15	✓ BTP109 ✓ BLE5.0 ✓ Distance:30 m ✓ Connection: 20 ✓ Explosive-proof	☐ BTP108 -S ☐ BLE5.0 ☐ Distance :30m ☐ Connection: 20	☐ BTP104-S / BTP104-SS ☐ Dual-mode: BT3.0 / BLE ☐ Distance:30 m / 100m ☐ Connection : 28(SPP), 18(BLE)

Multifunctional Gateway




✓ UWB101	✓ BTMG01	☐ BEM01-2	✓ BTP108-2
✓ Distance: 300m	✓ RAM:128M	☐ BLE5.0	✓ BLE5.0
✓ accuracy: 30cm	✓ Distance:100m	☐ Distance:10m	✓ Distance:30m
	✓ eMMC:32M	☐ Connection: 1	✓ Connection: 20
			✓ Support 4G

Support connects to various equipment via Serial Port
Realize wireless data transmission from equipment to PC/tablet/smartphone via BluetoothReplace cable, Optimize wireless transmission

Application

- Printer, POS
- Electronic scale
- Medical equipment
- Bluetooth scanner
- Vehicle, industrial survey CNC equipment, gauge, etc.

Bluetooth RS232 / RS485 Serial Adapter

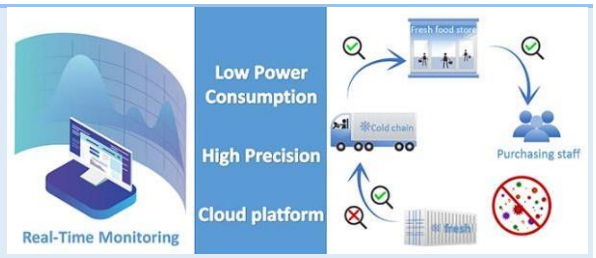




☐ RS232	☐ RS232	☐ RS232	☐ RS232	☐ RS485
☐ 3.0 / BLE5.0	☐ Bluetooth 3.0	☐ 3.0 / BLE5.0	☐ BLE5.0	☐ Bluetooth 3.0
☐ Dual-mode	☐ Distance:	☐ With lithium battery	☐ Distance: 150m	☐ Distance

□ Distance: 10m	100m	□ Distance: 10m/150m		: 10m
CAN to Bluetooth Adapter		USB-UART Adapter	BLE OBD Adapter	BLE Bolt Adapter
				
✓ CAN ✓ 3.0 / BLE5.0 ✓ Distance:10m	✓ CAN ✓ BLE5.0 ✓ Distance: 30m	□ USB □ Bluetooth 3.0 □ Distance: 10m	□ OBD □ BLE5.0 □ Distance: 20m	✓ CAN/ RS485/ RS232 ✓ BLE5.0 ✓ Distance :100m

3.Bluetooth Sensor Beacon Intelligent Sensor Detection, Real-time Data Collection and Monitoring

Application □ Logistics □ Warehouse storage □ Smart home, hospitals, school □ Agriculture, farm, air conditioner, etc.	

Bluetooth Temperature and Humidity Sensor Beacon

Detect Temperature and Humidity Value		
		
□ BEC07-5 □ BLE5.0 □ Size: 34*10mm □ Power:CR2032 battery	✓ BEC07-6 ✓ BLE5.0 ✓ Size: 35.6 x 17.4mm ✓ Power: CR2032 battery	□ BEC07-7 □ BLE5.0 □ Size: 40*14mm □ Power: CR2450 battery

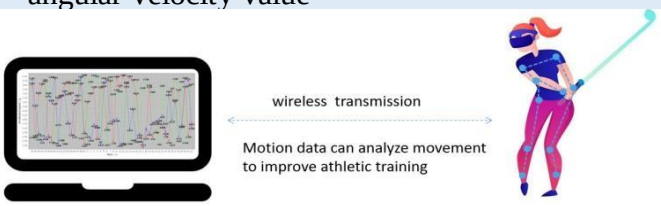
		
✓ BEC07-8 ✓ BLE5.0 ✓ Size: 34 x 10mm ✓ Power: CR2032 battery	✓ BEC07-9 ✓ BLE5.0 ✓ Size: 68mm x 22mm ✓ Power:2 pcs AAA	☐ BEC07-7S ☐ BLE5.0 ☐ Size: 40 x 14mm ☐ Power: CR2450 battery ✓ With data storage function

Bluetooth Accelerometer Sensor Beacon

Detect X, Y, Z acceleration value and angular velocity value

Application

- ☐ Motion monitoring
- ☐ Positioning
- ☐ Motion Capture

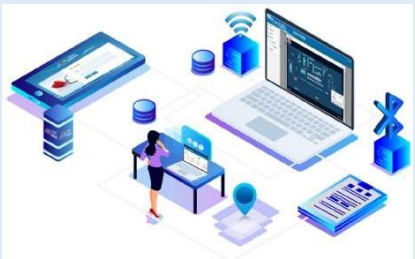


		
☐ BEC12 ☐ 3 Axis ☐ Size:42 x 7mm ☐ Power:CR2032 battery	☐ BEC12-2 ☐ 6 Axis ☐ Size: 34 x 10mm ☐ Power: CR2032 battery	☐ BEC20 ☐ 9 Axis ☐ Size: 57 x 37 x 22mm ☐ Power: lithium

Real-time Data Broadcasting, Wireless Tracking and Monitoring

Application

- ☐ Positioning
- ☐ Logistics
- ☐ Warehouse storage
- ☐ Smart home, hospital, school,
- ☐ shopping mall, etc.



Support I beacon/ Eddystone, App or Bluetooth gateway can scan or connect to obtain broadcast data

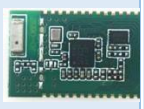
			
☐ BEC01 ☐ BLE5.0 ☐ Size: 35.6 x 17.4mm ☐ Battery: CR2032	☐ BEC05 ☐ BLE5.0 ☐ Size: 29.5 x 10mm ☐ Battery: CR2032	☐ BEC08 ☐ BLE5.0 ☐ Size: 37 x 6mm ☐ Battery: CR2032	☐ BEC09 ☐ BLE5.0 ☐ Size: 34 x 10mm ☐ Battery: CR2032
			
✓ BEC14 ✓ BLE5.0 ✓ Size: 56 x 40 x 15mm ✓ Battery: CR2477 ✓ Long battery life	✓ BEC15 ✓ BLE5.0 ✓ Size: 30 x 22mm ✓ Battery:CR2032 ✓ Waterproof	✓ BEC18 ✓ BLE5.0 ✓ Size: 42 x 7.5mm ✓Battery: CR2032 ✓With ON/OFF button	✓ BEC19 ✓ BLE5.0 ✓ Size: 48.8 x 36.2 x 12.4mm ✓ Battery: rechargeable ✓ Social Distance Alarm Bracelet Beacon
Bluetooth Electronic Price Tag			UWB Tag
			
☐ BLEPT-01 ☐ BLE5.0 ☐ Size: 74 x 39 x 12mm ☐ Battery: 2*CR2450 ☐ Resolution ratio:212*104 ☐ Display: black white	☐ BLEPT-02 ☐ BLE5.0 ☐ Size: 94 x 45 x 12mm ☐ Battery: 2*CR2450 ☐ Resolution ratio:296*128 ☐ Display: black & white & red	☐ BLEPT-03 ☐ BLE5.0 ☐ Size: 105 x 94 x 12mm ☐ Battery:2* CR2450 ☐ Resolution ratio:400*300 ☐ Display: black & white & yellow	☐UWBT01 ☐BLE5.0 ☐Size: 85 x 54 x 7.8mm ☐Battery: Micro-USB

Bluetooth Module

Application

- Printer, Bluetooth scanner
- Medical equipment, gauge
- Smart light, IoT mesh network
- Industrial survey
- Smart wearable devices, smart home application

Wireless Data Transmission

				
☐ BTM4504C1H ☐ Bluetooth 3.0 ☐ Distance: 100m ☐ Size:27.3 x 14.5mm ☐ CE / FCC	☐ BTM6001C2P ☐ Bluetooth 3.0 ☐ Distance: 30m ☐ Size:25* 14.5mm	☐ BTM0613C2P ☐ Bluetooth V4.2EDR BLE ☐ Dual mode ☐ Distance: 30m ☐ Size:25* 14.5mm	☐ BLE0305C2P ☐ BLE5.0 ☐ Distance: 40m ☐ Size:26 x 15.2mm ☐ CE / FCC	☐ BLE0405C1P ☐ BLE5.0 ☐ Distance: 150m ☐ Size:31.8 x 14.5mm

Wireless Data Transmission			Mesh Network	
				
☐ BLE0505C2P ☐ BLE5.0 ☐ Distance: 30m ☐ Size:15.8*12mm	☐ BLE1020C2P ☐ BLE5.0 ☐ Distance: 40m ☐ Size:20.5 x 14.5mm	☐ BLE0705C2P ☐ BLE5.0 ☐ Distance: 25m ☐ Size:16.9 x 11.2mm	☐ BLE0305C2P ☐ BLE5.0 ☐ Distance: 40m ☐ Size:26 x 15.2mm ☐ CE / FCC	☐ BLE0405C1P ☐ BLE5.0 ☐ Distance: 150m ☐ Size:31.8 x 14.5mm