

*Intellisea*  
海汇智

BLE 5.0 Low Power Bluetooth Module

hhzRF08a

Datasheet

DS-hhzRF08a

Version: 1.2

Released Date: 07-24-2019

hhzRF08a is a Bluetooth® Module targeted for Bluetooth low energy applications where small size, reliable RF, low-power consumption, and easy application development are key requirements. It is ideal for applications requiring short and medium range Bluetooth connectivity. The hhzRF08a integrates all of the necessary elements required for a Bluetooth application: Bluetooth radio, a software stack, and GATT-based profiles.

#### Key Features

- UART interface with multiple configurable GPIOs
- Support BLE mesh with different firmware
- Supports OTA
- Low power support
- Excellent compatibility with different types of the cell phones

hhzRF08a can be used in a wide variety of applications:

- IoT Sensors and End Devices
- Commercial and Retail
- Health and Wellness
- Industrial, Home and Building Automation

The module supports OTA.

It enters sleep mode with power consumption about 6uA when no data transmission for some period.

The module supports Bluetooth mesh with a different firmware.

## 1. Feature List

*Power supply :* 2.0V-5.0V DC

*Transmission distance :* 50m (Open air static environment)

*Operation temperature :* -40°C ~ +105°C

*Storage temperature :* -40°C ~ +150°C

*Transceiver performance :*

-93 dBm RX sensitivity at 1Mbps mode

-90 dBm RX sensitivity at 2Mbps mode

RF output power levels: 0dBm

*Operation power consumption :* RX at 1Mbps and TX at 0dBm

4.3 mA in RX and 4.4 mA in TX with on chip DCDC Converter at 4.3V

5.5 mA in RX and 5.6 mA in TX with on chip DCDC Converter at 3.3V

*Ultralow power mode*

*Sleep current :* 6 $\mu$ A

*Average current 20uA during 1.28 sec active(broadcasting ADV)/sleep cycle time*

*Average current 46uA during 500msactive(broadcasting ADV)/sleep cycle time*

*Antenna specification :* Onboard serpentine antenna Interface

*Interface :* UART (two-wire serial port)

*Main Service UUID :*

UART\_SVC\_UUID\_128

```

{0x9e,0xca,0xdc,0x24,0x0e,0xe5,0xa9,0xe0,0x93,0xf3,0xa3,0xb5,0x01,0x00,0x
40,0x6e}
UART_SVC_RX_CHAR_UUID_128
{0x9e,0xca,0xdc,0x24,0x0e,0xe5,0xa9,0xe0,0x93,0xf3,0xa3,0xb5,0x02,0x00,0x
40,0x6e}
UART_SVC_TX_CHAR_UUID_128
{0x9e,0xca,0xdc,0x24,0x0e,0xe5,0xa9,0xe0,0x93,0xf3,0xa3,0xb5,0x03,0x00,0x
40,0x6e}

```

*Module size:* 25mm \* 16mm \* 2.0mm.

The module is spliced into a stamp hole pattern, and the aperture of the stamp hole is not less than 1 mm.

## 2. Ordering information

Ordering code	Protocol Stack	MoQ
hhzRF08a	BLE5.0	100
hhzRF08a-m	BLE5.0 /mesh	100

*Note: We can customize the GPIOs based on the under some condition.*

## 3. Communication

The module communicates with external MCU through UART.

Default baud rate is 115, 200 bps.

Byte sequence heading with 'aa5555aa(4 hex bytes)' is a command (set/pollingto/from the Bluetooth module); Sequence other than 'aa5555aa' is data.

*Polling Command Format(hex) :*

<b>Head (4bytes)</b>	<b>Command (1byte)</b>	<b>Length (1byte)</b>	<b>Checksum(1byte)</b>
0xAA, 0x55, 0x55, 0xAA	0x??	0x00	Sum of the data (header excluded)

*Set command Format(hex) :*

<b>Head (4bytes)</b>	<b>Command (1byte)</b>	<b>Length (1byte)</b>	<b>Data (nBytes)</b>	<b>Checksum (1byte)</b>
0xAA, 0x55, 0x55, 0xAA	0x??	0x?? (0~255 bytes)	XXXX (in Hex)	Sum of the data (header excluded)

*Note:*

- Checksum is not included in length calculation
- Checksum = Sum of (Command + Length + Data)
- Big Endian format.

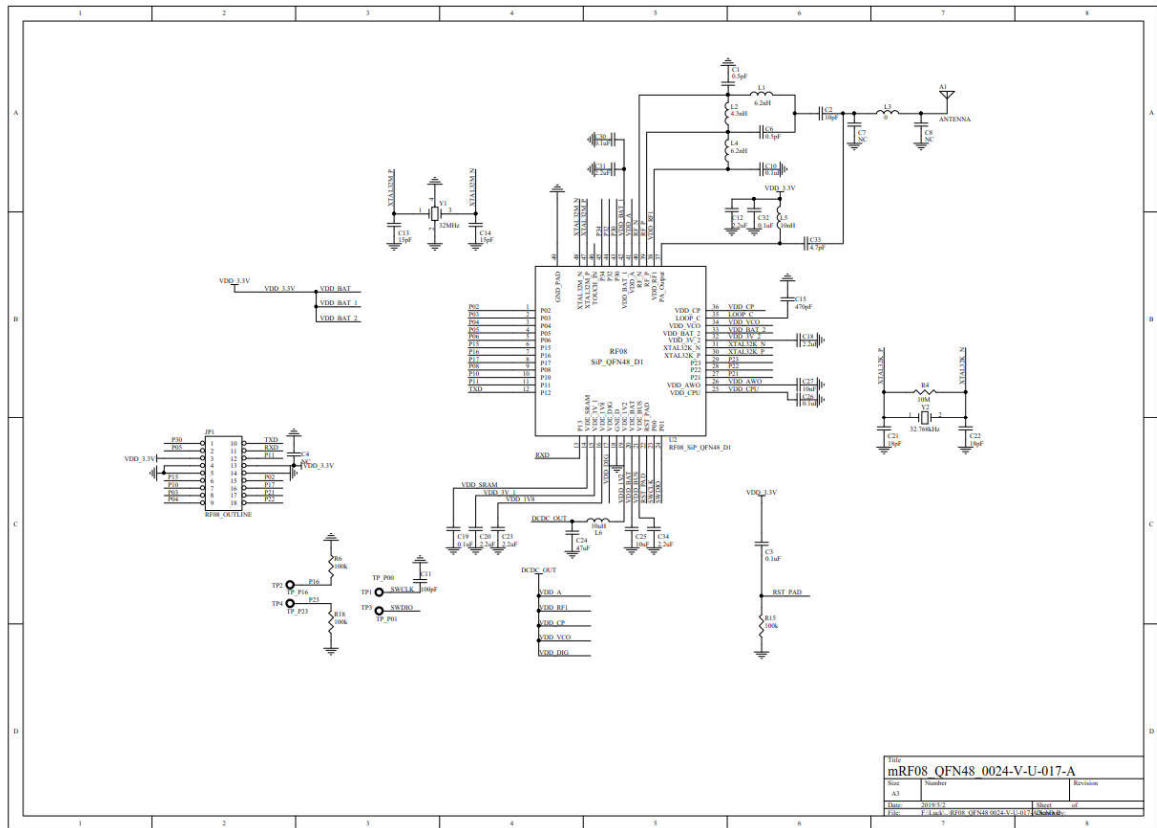
**Command List:**

<b>Command (hex)</b>	<b>Function</b>	<b>Type</b>	<b>Note</b>
00	Set Baudrate	set	Default value: 115,200bps module restarts after setting successfully. Length of the baud rate is 3 bytes.
01	Set device ID	set	Default ID: UART SERVER Module restarts after setting successfully.
02	Get connection status	Poll	0: no connection 1 : connected
03	Reset the module	set	
04	Disconnect the connection	set	
05	Set the MAC address	set	MAC is 6 bytes in hex. Module resets after setting successfully.
06	Get the MAC	Poll	return : 6 bytes MAC
0F	Get the module firmware version	poll	Return: Vxx (version number)

#### 4. Pin definition:

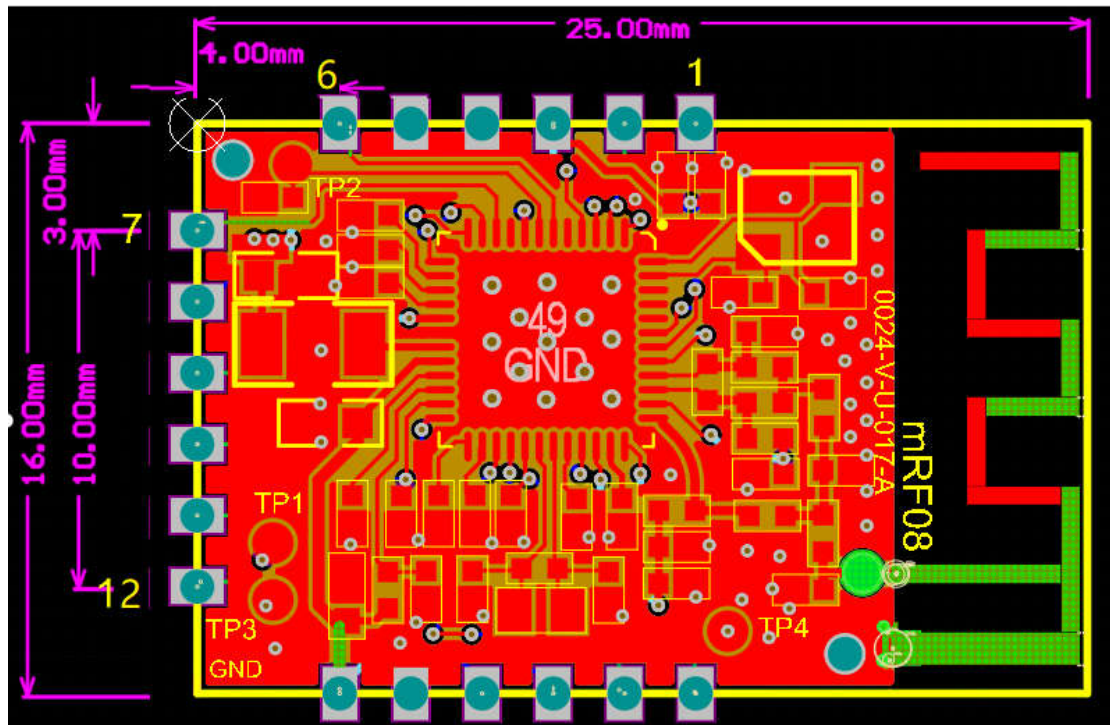
PIN	NAME	Type	Description
1	P30	ADC	TBD (can be customized)
2	P05	DIO	TBD
3	VDD	PowerInput	3.3V input
4	GND	Ground	Reference ground
5	GND	Ground	Reference ground
6	P15	DI	TBD; wake up control.  The module wakes up in high; and enters sleep mode when the pin goes from high to low for 10 seconds.
7	P10	DI	TBD
8	P03	DI	TBD
9	P04	DIO	TBD
10	UART_TX/P12	DIO	series port transit
11	UART_RX/P13	DIO	Series port receive
12	P11	DIO	TBD
13	VDD	PowerInput	3.3V input
14	GND	Ground	Reference ground
15	P02	DIO	TBD
16	P17	DIO	TBD
17	P21	DIO	TBD
18	P22	DIO	TBD

## 5. Schematic





## 6. PCB:



## 7.Contact

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