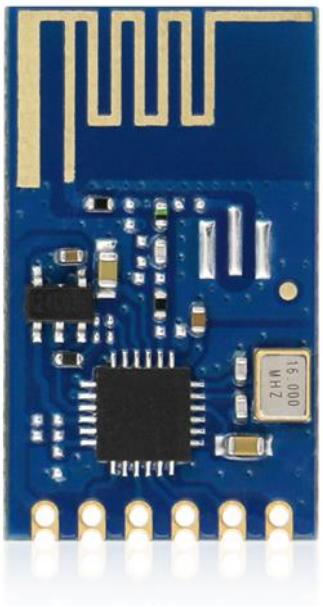
2.4Ghz UART Wireless Module

SPECIFICATION

Model No.: M-BK2461U

Version: V1.1



Before using this module, please pay attention to the following important matters:

This module is an electrostatic sensitive product. Please operate it on an anti-static workbench during installation and testing.

The module is integrated with all RF related devices and has PCB onboard antenna, so excellent RF performance can be obtained without additional antenna configuration. Please do not use metal case above the antenna, otherwise it will lead to serious attenuation of radio frequency signals, which will affect the effective use of distance.

Metal objects and wires should be kept away from the antenna as much as possible.

When installing the module, nearby objects should be kept at a sufficient safety distance from the module to prevent short circuit damage.

This module should be used in a dry environment. Please do not make any liquid substance come into this module.

Please use an independent voltage regulator circuit to supply power to this module, and avoid sharing with other circuits. The tolerance of the power supply should not be less than 5%.

Limitations:

This module is intended to be embedded in the customer's terminal product application, and does not provide a casing itself. It is not recommended that the customer directly resell this module as a final product without permission.

This series of modules are in accordance with commonly used international standards. If there is any special certification needed, we can adjust certain indicators according to your needs.

This module cannot be applied to life rescue, life-support systems, or any occasion where personal injury or life threatening may cause by equipment failure. Any organization or individual carrying out the above-mentioned applications shall bear all risks at their own.

File version & update management

DATE	Software Version	Remarks
2019-9-12	V1.0	M-BK2461U Standard 2.4G UART module
2024-3-6	V1.1	Add more discription for modules communication

1. Brief Introduction

M-BK2461U is a low-power, high-bandwidth wireless digital communication UART module operating in 2.400~2.483GHz global universal ISM band. It adopts Beken BK2461 chip and serial port design, U-UART interface and multi-channel development-free. This module is cost-effective, compact size, stable operation and good product consistency. The maximum wireless transmission rate of these modules can reach 2Mbps, which can be widely used in daily life where wireless connection is required. It can also be used in industries such as industrial control, access control, attendance, monitoring and security.

This M-BK2461U module uses 2.4G serial port technology, which is characterized by development-free, 120m transmission range, switch-free between transmitting and receiving, transparent serial port communication with protocol provided, can greatly shorten your development circle. As long as you know serial communication, you can complete the development of wireless communication products without complex wireless communication knowledge. Each technical index of this 2.4Ghz UART Module is good, which can meet the parameters requirements of FCC application, and can also meet a variety of certification needs.

2. Features

- URAT serial port communication, with protocol provided;
- Integrated transceiver and receiver, half duplex communication, multi-channel, strong anti-jamming capability;
- Communication distance 120m;
- The working frequency can be set and multiple modules can be multiplexed without interference.
- Communication protocol conversion, as well as radio frequency transceiver switching, can be automatically completed by the module itself, without human intervention, simple and easy to use.
- The UART communication rate is 0.6kbps~38.4kbps, which can be configured by the user through the AT command.

3. Typical application

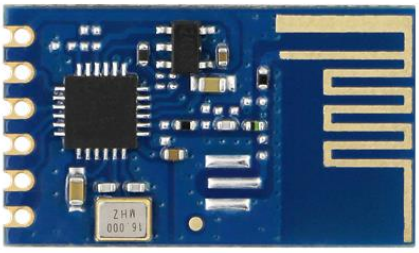
- Wireless toys, Wireless game handles
- Wireless audio and video transmission, wireless headset
- Child finder and tracker

- Medical devices and remote controls
- Logistics tracking, warehouse inspection, RFID, etc
- Consumer electronic wireless applications
- Low power remote sensing and telemetry
- Wireless sensor network applications

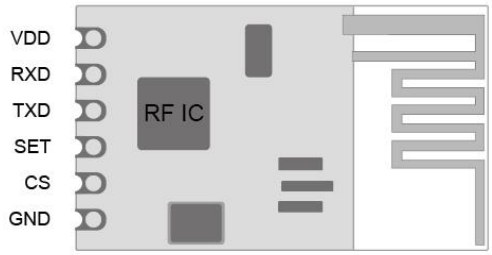
4. Parameters of the 2.4G Module

Working Frequency	2400-2500MHz	Transmission Current	400mA	Power Supply	DC 2.5~3.6V
Modulation Mode	FSK	Receiving Current	20mA	Max. Output Power	12dBm
Transmitting Power	Adjustable	Standby current	<10uA	Operating Temperature	-20~85°C
Receiving Sensitivity	-90dBm	Antenna Impedance	50Ω	Dimension	23.3x13.7x1mm
Transmission Rate	1M	Communication Distance	120M	Antenna	PCB On-board Antenna

5. Pin Description



Front View



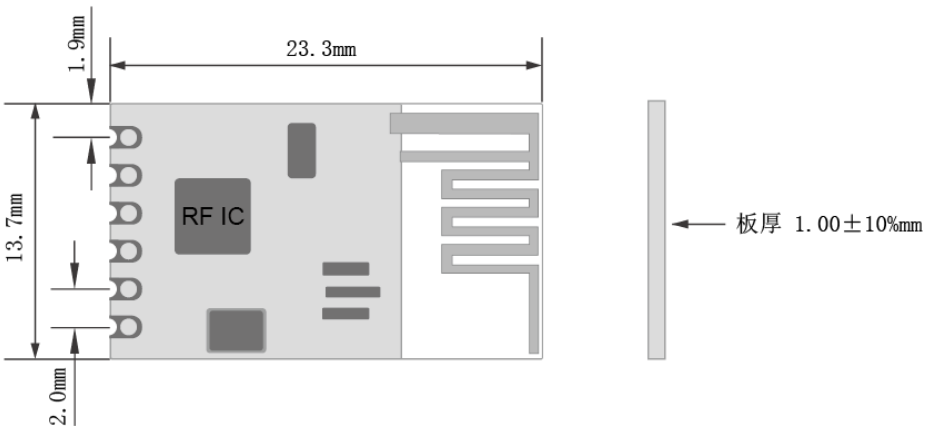
Pin diagram

Pin	Definition	Function
1	VDD	Positive power supply 2.2-3.6V, typical 3.3V
2	RXD	Module Data Output TTL Level (Serial Data Receive)
3	TXD	Module Data Output TTL Level (Serial Data Transmitting)
4	SET	Set pin, Parameters Configuration (low level configuration parameter, high level transparent transmission mode)
5	CS	Chip Selection Pin, working modes enable (low level for low power consumption, high level enters working mode)
6	GND	Grounding, common ground with the system

M-BK2461U Pin Description

*Note: TXD of module UART serial port is connected with RXD of MCU application side, RXD of module is connected with TXD of MCU

6. Product Size



M-BK2461U Dimension

7. Communication protocol

Parameters	Set	Description
1	0XBC	Command header
2	0X50 0X52	Command header: **0X50** setting command (power failure will be saved after this setting command is sent); Vacancy setting command (power failure does not save after this setting command is sent); **0X52** Query Command (returns set parameters)
3	ID3 (Module ID3)	ID (default 00)
4	ID2 (Module ID2)	ID (default 00)
5	ID1 (Module ID1)	ID (default 00)
6	ID0 (Module ID0)	ID (default 00)
7	BAND (Baud rate)	0=1200 ； 1=4800 ； 2=9600； 3=19200； 4=38400； System default 19200 when no settings; Configuration mode baud rate is fixed at 19200;
8	RF-CHAN	0-120 (transmission channel), 121 optional (2400MHZ-2520MHZ). (Default channel 0, 2400MHZ), channel is not recommended to use multiple of 16
9	POWER	Power setting (0-11): 11=12dbm;10=10dbm;9=6dbm;8=3dbm;7=0dbm; 6=-5dbm;5=-10dbm;4=-15dbm;3=-20dbm;2=-25dbm;1=-30 dbm;0=-35dbm, system default 8 files when no settings (default 3dbm)

10	CHECK-SUM	Add all the above bytes, low eight bits

8. Setup Instructions

(1) CS is high level, SET is high level (CS=1, SET=1), Mode: transparent transmission mode
(2) CS is high level, SET is low level (CS=1, SET=0), Mode: configuration mode
(3) CS is low level, SET is low level (CS=0, SET=0), Mode: low power mode (10uA)
Note: Serial TX, RX connected to the module need to be set to low level output at low power consumption;
Note: When mode switching, minimum maintenance time between CS and SET level change should be 30MS, otherwise it may be failed;

9. AT Command

A: Configuration mode: SET low level, CS high level

1. Query Instructions
Send: BC 5200 00 00 00 00 00 000E

2. Setup instructions
Setting ID: 0X01020304
Setting Baud Rate 9600, Channel 100, Power 12DBM
Send: BC 50 01 02 03 04 02 64 0B 87
Return: BC 50 01 02 03 04 02 64 0B 87

Setting ID: 0X01020304
Setting Baud Rate 19200, Channel 100, Power 12DBM
Send: BC 50 01 02 03 03 64 0B 88
Return: BC 50 01 02 03 04 02 64 0B 88

Note: If the AT Command is sent and the instruction is received successfully, the set parameters as above will be returned. If the instruction is not received successfully, there is no serial information been returned.

B: Instructions:

Please refer **Setup Instructions** (Sec 8) for modes setting
1. Configure parameters (e.g.: as ID (ID0-ID4), channel, power, etc.) in configuration mode:
Only when the channels and IDs are consistent, two RF modules can be communicated. If either module's ID is different from the channel, the module cannot communicate.
2. After setting the parameters, switch to transparent transmission mode, and then the two RF modules can be communicated.

10. Contact us

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