广云物联
GRANWIN
IoT service experts around you

GY-BT2

FCC ID:2A58X-GY-BT2

Bluetooth module manual

Version1.2

Revision history

V1.0	Create version	DarrenZhuang	2021．05
V1.1	Update circuit	JamesChen	2021．06
V1.2	Add platform support	DarrenZhuang	2021．08

1.Product Features

GY-BT2 is a small size BLE 5.0 Bluetooth module.

1.1 Module Features

Based on Jerry's AC6328A Bluetooth Low Energy research and development
Bluetooth 5.0 low power design,
Working voltage: 1.8~3.4V
Working temperature: -40 ℃ ~ +80 ℃ (commercial regulations)
SMD package

1.2 Bluetooth Features

Bluetooth version: BLE5.0
Modulation method: GFSK
Frequency: 2400-2483.5MHz
Bandwidth: ≤2MHz
Transmit power: ≤20dBm(EIRP)
Receive sensitivity: -92dBm

1.3 MCU Features

High performance 32-bit RISC CPU core
Up to 96M main frequency
Maximum 73KBSRAM
Maximum 512KBFLASH
RX mode: 2.0mA
TX mode: 2.8mA@0DB
Deep sleep: 1.9UA (GPIO wake up)
Real time clock RTC
All IO support function mapping

1.4 Main application areas

LED intelligent control
Smart Home Appliances
Sports Health
Sports wearables
Logistics label
consumer products

2.Electrical parameters

2.1 Voltage

Parameter Name	Minimum	Typical value	Maximum value	Unit
Supply voltage	1.8	3.3	3.4	V
1/0 Voltage	0	~	3.4	V
Operating temperature	-40	~	+85	℃
Storage temperature	-40	~	+125	℃

2.2 Power consumption

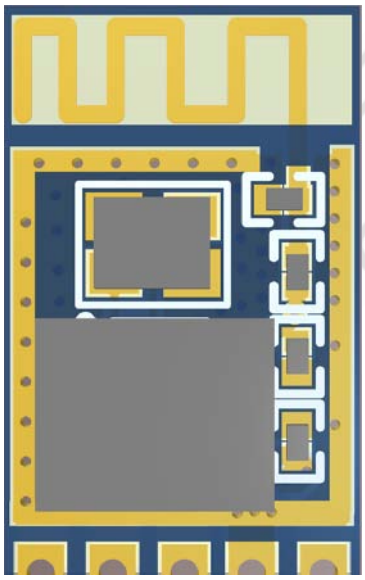
Parameter Name	Typical value	Unit
RX	2.0	mA
TX@0DB	2.8	mA
Deep sleeping	1.9UA(GPIO)	uA

3. Module shape and interface

3.1 Size

16X10X2.8mm (length*width*height)

3.2 Renderings



3.3 Pin definition

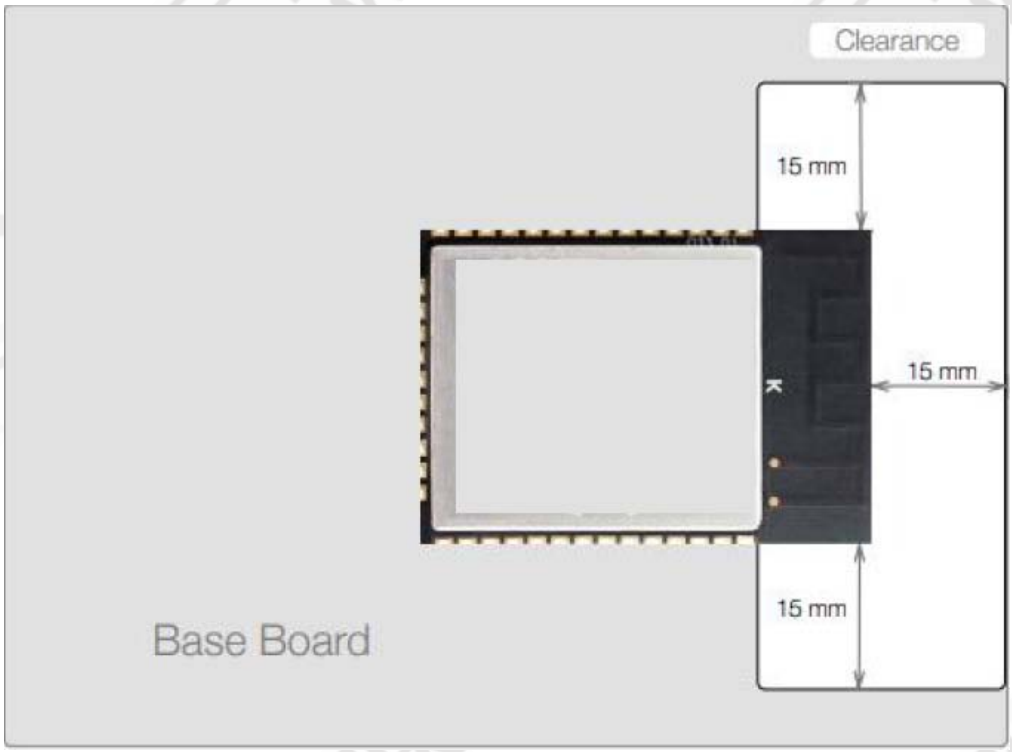
Pin	Name	Description
1	VCC	3.3V
2	GND	GND
3	TX	GPIO/UART TX
4	RX	GPIO/UART RX
5	PA9	GPIO/WAKEUP

4. Precautions

4.1 Power supply

Power supply, try to use a clean power supply, the ripple is controlled within 30mV ;

4.2 Antenna



4.3 The module can choose the on-board antenna or the external wire antenna. When laying the patch, the antenna should be completely clear, and no copper or wiring should be placed ;

4.4 The side with IC on the module should not face the high-frequency components on the driver, but should face the outside of the driver board ;

4.5 The module should be kept away from the high frequency components on the driver ;

4.6 The antenna placement of the module should be taken into account when making the PCB layout of the driver ;

4.7 For the module with the antenna welded, there are front welding and back welding methods. If you find that the module with the antenna welded on the front is not easy to place, you can consider using the module with the antenna welded on the back.

FCC Statement

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.

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

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device.

FCC Radiation Exposure Statement
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. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

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: 2A58X-GY-BT2 Or Contains FCC ID: 2A58X-GY-BT2”

When the module is installed inside another device, the user manual of the host 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.

Any company of the host device which install this modular with Single modular approval should perform the test of radiated emissionand spurious emission according to FCC part 15C : 15.247 and 15.209 requirement,Only if the test result comply with FCC part 15C : 15.247 and 15.209 requirement, then the host can be sold legally.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules
FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

2.3 Specific operational use conditions
The module is a Bluetooth module with BLE function.
Operation Frequency: 2402-2480MHz
Number of Channel: 40
Modulation: GFSK
Type: PCB Antenna
Gain: 2 dBi Max.
The module can be used for mobile or portable applications with a maximum 0dBi antenna. The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operaition. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

2.4 Limited module procedures
Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

2.5 Trace antenna designs
Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.

2.6 RF exposure considerations
The module must be installed in the host equipment such that at least 5mm is maintained between the antenna and users' body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

2.7 Antennas
Antenna Specification are as follows:
Type: PCB Antenna
Gain: 2 dBi
This device is intended only for host manufacturers under the following conditions:
The transmitter module may not be co-located with any other transmitter or antenna;
The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employa 'unique' antenna coupler.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating “Contains FCC ID: 2A58X-GY-BT2” with their finished product.

2.9 Information on test modes and additional testing requirements

Operation Frequency: 2402-2480MHz

Number of Channel: 40

Modulation: GFSK

Host manufacturer must perfom test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is **only** FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Federal Communication Commission Statement (FCC, U.S.)

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 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.

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.

FCC Caution:
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTES

Co-location warning:
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM integration instructions:
This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:
In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:
The final end product must be labeled in a visible area with the following: “Contains Transmitter Module FCC ID: 2A58X-GY-BT2”.

Information that must be placed in the end user manual:
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.