



Focus on Software and Hardware Services for Consumer and Industrial IoT

Granwin IoT

GY-BT2G Series

Bluetooth Hexadecimal UART
Communication Solution Manual

Version 1.2

© Granwin IoT Technology (Guangzhou) Co., Ltd.

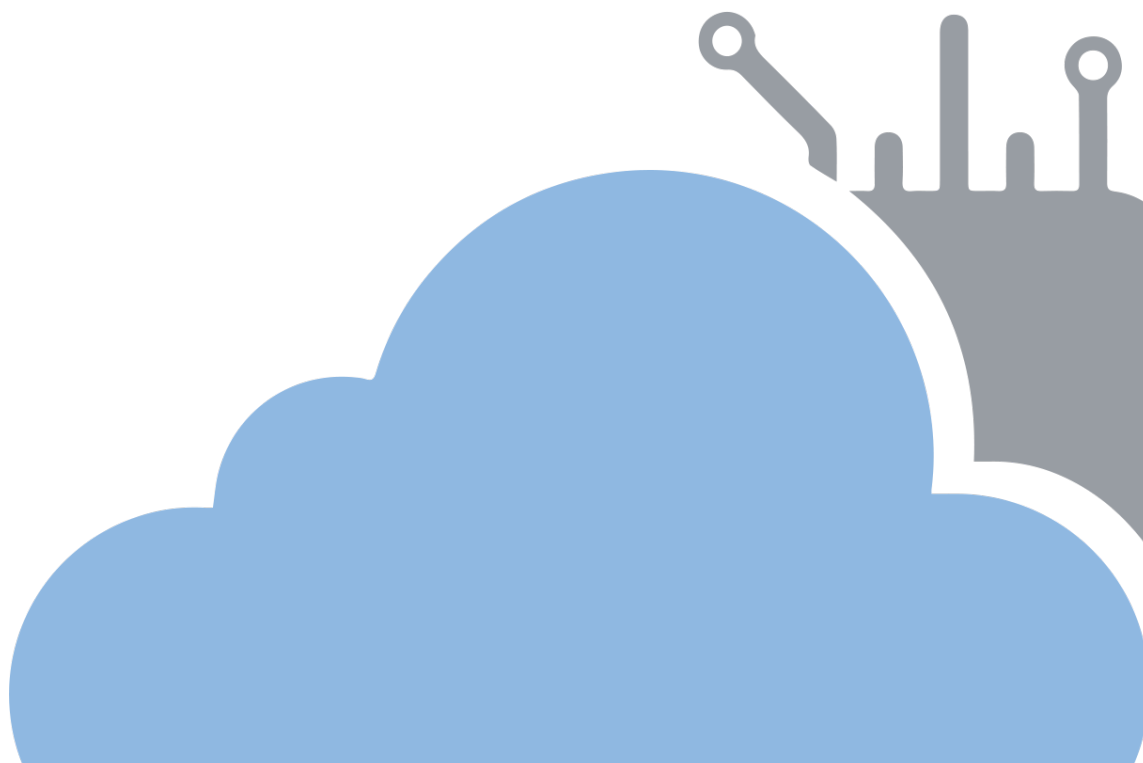


Table of Contents

Revision History	3
1 Solution Overview	4
1.1 Solution Introduction	4
1.2 Module Performance Parameters	4
2 Module Hardware Description	5
2.1 Hardware Images	5
2.2 Solution Model Description	5
2.3 Pin Definition	5
2.3.1 GY-BT2G Hardware Image and Pin Definition	5
2.4 Dimension Drawing	6
2.4.1 GY-BT2G Dimension Drawing	6
3 Product Design Description	6
3.1 Reference Schematic	6
3.2 IoT Product Design Reference (UED Guidelines)	6
3.3 Antenna Design	7
3.4 Reflow Soldering Temperature Profile	7
Appendix A: Contact Information	9

Revision History

Version	Date	Modifier	Modification Content
1.0	2024/12/2	Jacky Huang	1. Document creation
1.1	2025/02/08	Jacky Huang	Updated power consumption parameters
1.2	2025/04/02	Steven	Added description of core operating frequency range

1 Solution Overview

1.1 Solution Introduction

The Granwin IoT GY-BT2G Series Bluetooth Module is a hexadecimal UART communication Bluetooth module solution launched by Granwin IoT. It is equipped with Granwin IoT's mini-program, IoT APP, and IoT cloud platform development services, providing enterprises with fast, efficient, and one-stop IoT solution services.

Designed based on Granwin IoT's years of experience in IoT industry solutions, this module has the following advantages:

- **Compact Size**

Granwin IoT adopts a small-sized and highly integrated chip for this module solution, enabling the Bluetooth module to be compressed to a size of 16*10*2.8mm

- **Complete Certifications**

To adapt to domestic and overseas IoT modules, this module has passed certifications such as SRRC, FCC, CE, and RoSH, and supports BQB affiliation. Currently, overseas certifications for various countries are being gradually improved.

- **Rapid Development**

Targeting IoT product applications, Granwin IoT has designed and simplified the hexadecimal UART communication protocol, reducing the development workload of MCU engineers and lowering MCU resource requirements.

- **Supporting WeChat Mini-Program, Android/iOS APP, and Cloud Platform Development Services**

Granwin IoT simultaneously provides customized development, maintenance, and launch services for IoT WeChat mini-programs (domestic), IoT Android/iOS APPs (domestic and overseas), and IoT cloud platforms (domestic and overseas) based on this Bluetooth module.

1.2 Module Performance Parameters

Table 1. Module Performance Parameters

Category	GY-BT2G
Module Size	16*10*2.8mm
Package	SMD (Surface Mount Device)
Antenna	On-board
Wireless Certifications	China SRRC US FCC ID (RF) EU CE RED (DOC)
Electrical Performance Certification	US FCC SDOC (EMC)
Environmental Certification	EU RoSH
Wireless Communication Modes	BLE, Beacon
Operating Mode	UART
Hardware Interfaces	UART, I/O
Supply Voltage	3.3V or 5V
Operating Current	TX Mode @ 0dB: 8.6mA
Reserved Peak Current	30 mA
Operating Temperature Range	-40-85°C

Storage Temperature Range	-40-125°C
Operating Channel Center Frequency Range	2400—2483.5MHz

Operating Mode	Average Current
Static Operation (100ms Advertising Interval)	4.3 mA
Deep Sleep (2s Advertising Interval)	42uA

2 Module Hardware Description

2.1 Hardware Images



Figure 1. GY-BT2G Front Side

2.2 Solution Model Description

Solution Model	Module Hardware	Module Firmware
GY-BT2G	GY-BT2G	Granwin Hexadecimal Standard Firmware

2.3 Pin Definition

2.3.1 GY-BT2G Hardware Image and Pin Definition



Figure 2. GY-BT2G Pin Definition Diagram

Table 2. GY-BT2G Pin Definition Table

Pin Number	Pin Name	Pin Function	Function Description
1	3.3V	Power Supply 3.3V	3.3V input (select either 3.3V pin or 5V pin)
2	GND	Ground	GND input
3	TX	GPIO/UART TX	UART TX
4	RX	GPIO/UART RX	UART RX
5	5V	Power Supply 5V	5V input (select either 3.3V pin or 5V pin)

2.4 Dimension Drawing

2.4.1 GY-BT2G Dimension Drawing

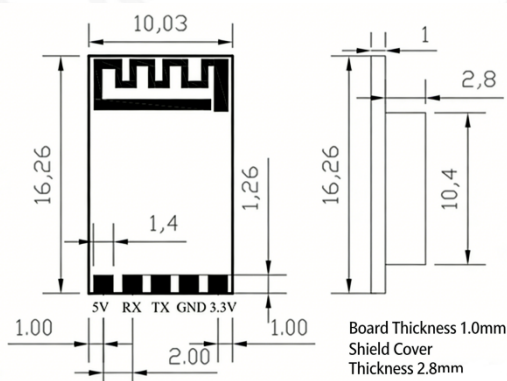


Figure 3. GY-BT2G Front Side Dimension Drawing

3 Product Design Description

3.1 Reference Schematic

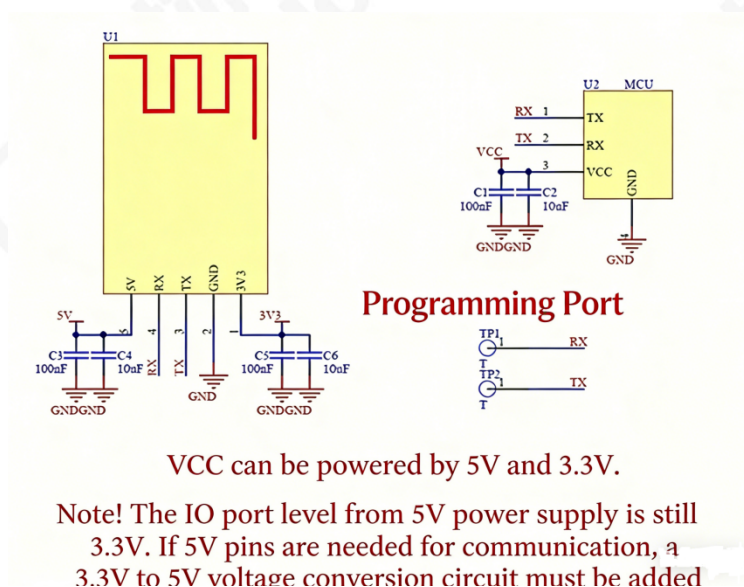


Figure 4. GY-BT2G Module Peripheral Design Schematic

3.2 IoT Product Design Reference (UED Guidelines)

Table 3. IoT Product Design Reference Table

Function Category	UED Requirements
Device Pairing Status Trigger Method	1.When the device is unbound, it enters pairing status upon power-on startup (implemented by the module, no MCU processing required)

	2.Users trigger the module product to enter pairing status via a button (implemented by the MCU sending commands)
Device Pairing Status Window Time	30 minutes (implemented by the module, no MCU processing required)
Trigger Bluetooth Pairing	Long press a single button or combination buttons for 7 seconds (implemented by the MCU)
Bluetooth Pairing Status	Indicator light blinking: on for 0.4s, off for 0.2s (implemented by the MCU) (Note: Please perform the fast blinking action only after receiving the command that the module has successfully entered pairing status. Do not start blinking immediately after the button is triggered successfully; otherwise, the module may not enter pairing status but the product indicator light is blinking, which will mislead users and cause customer complaints due to unsuccessful pairing.)
Bluetooth Connected Status	Indicator light always on (implemented by the MCU)
Bluetooth Disconnected Status	Indicator light always off (implemented by the MCU)

3.3 Antenna Design

When the module uses an on-board PCB antenna, the area directly below the antenna must be completely clear of obstacles. The area around the antenna should be kept away from metal to avoid affecting the antenna radiation efficiency and thus the communication distance.

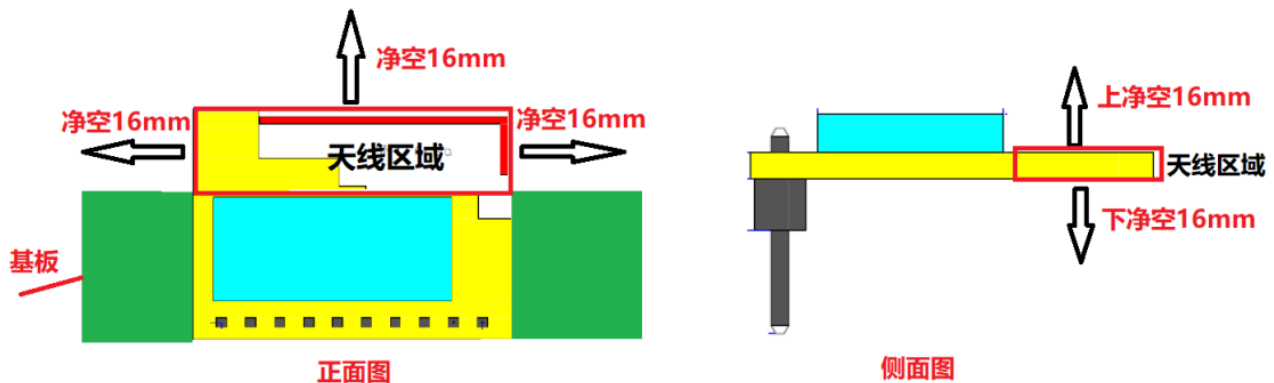


Figure 5. Recommended Module Placement Area

3.4 Reflow Soldering Temperature Profile

Soldering Instructions: During double-sided SMT, after the first reflow soldering of components on the T-side (topside), the circuit board needs to be flipped for reflow soldering of the other side. During the second reflow soldering, the components already soldered on the original T-side will be fixed by the surface tension of the solder paste to prevent the components from falling off due to gravity.

The mother board designed with yin-yang panel layout has passed furnace testing (furnace temperature 240-260°C) with no defects. For stability, dispensing is recommended.

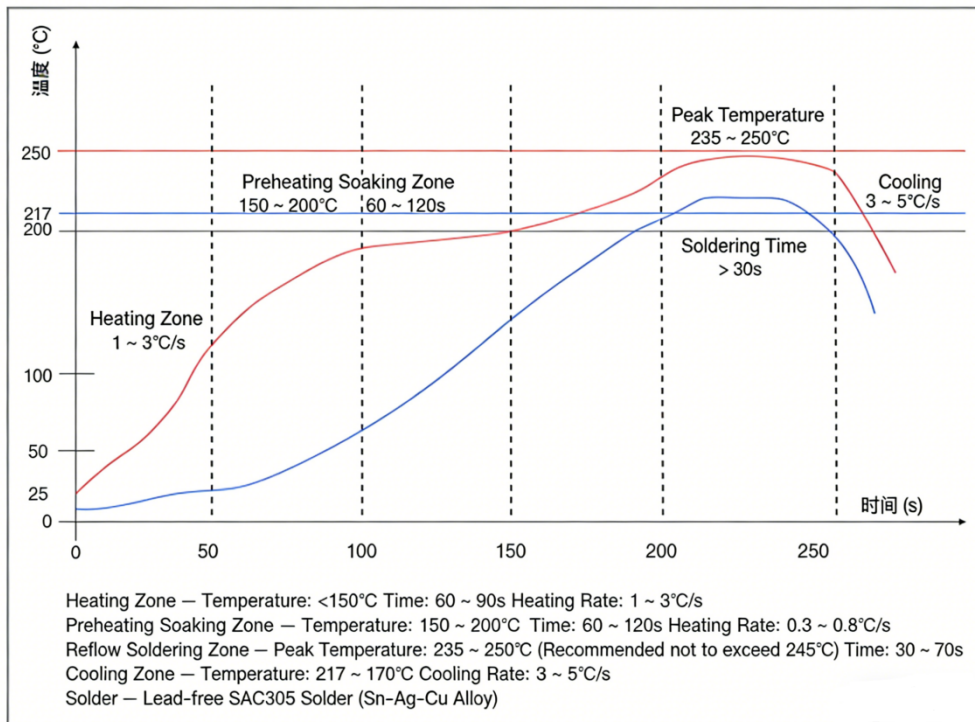


Figure 6. Reflow Soldering Temperature Profile

Appendix A: Contact Information

Granwin IoT Technology (Guangzhou)
Co., Ltd.

Guangzhou Headquarters:

Room 412, Building B1, Chuangxingang AI Valley,
Huangpu District, Guangzhou

Hangzhou Office:

3109, Building 4, Euro-American Financial City,
Yuhang District, Hangzhou

Official Website:

<http://www.granwin.com>

Phone:

400-833-2500

Shenzhen Office:

7th Floor, Building B, Tower 10, Shenzhen Bay
Science and Technology Ecology Park, Nanshan
District, Shenzhen

Changsha R&D Center:

805, Building A2, Lucgu New Changhai Center,
Yuelu District, Changsha

Email:

support@granwin.com

QQ:

1260407179

WeChat Consultation:



Corporate WeChat Official Account:



Disclaimer and Copyright Notice

Disclaimer and Copyright Notice Due to the inability to synchronize updates to relevant information after document release, the information in this document, including the referenced URL addresses, is subject to change without prior notice. This document may reference third-party information, and all referenced information is provided "as is". Granwin IoT does not guarantee the accuracy or authenticity of the information. All rights reserved © Granwin IoT Technology (Guangzhou) Co., Ltd.

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.

Changes or modifications 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 important announcement

Important Note:

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

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

Country Code selection feature to be disabled for products marketed to the US/Canada.

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

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna,
3. For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change. (if modular only test Channel 1-11)

As long as the three conditions above are met, further transmitter testing 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.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID 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 FCC ID: **2A58X-GY-BT2G** "

Manual Information to the End User

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.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

2.7 Antennas

This radio transmitter **FCC ID:2A58X-GY-BT2G** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna No.	Model No. of antenna:	Type of antenna:	Gain of the antenna (Max.)		Frequency range:
			Antenna 1	Antenna 2	
Bluetooth	/	PCB Antenna	0	N/A	2402-2480MHz

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains **FCC ID:2A58X-GY-BT2G**".

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.

2.11 Note EMI Considerations

Host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties.

2.12 How to make changes

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system. According to the KDB 996369 D02 Q&A Q12, that a host manufacture only needs to do an evaluation (i.e., no C2PC required when no emission exceeds the limit of any individual device (including unintentional radiators) as a composite. The host manufacturer must fix any failure.