

KG200Z TE-B

User Guide

LoRa Module Series

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Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any terminal or mobile incorporating the module. Manufacturers of the terminal should notify users and operating personnel of the following safety information by incorporating these guidelines into all manuals of the product. Otherwise, Quectel assumes no liability for customers' failure to comply with these precautions.



Full attention must be paid to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a handsfree kit) causes distraction and can lead to an accident. Please comply with laws and regulations restricting the use of wireless devices while driving.



Switch off the terminal or mobile before boarding an aircraft. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. If there is an Airplane Mode, it should be enabled prior to boarding an aircraft. Please consult the airline staff for more restrictions on the use of wireless devices on an aircraft.



Wireless devices may cause interference on sensitive medical equipment, so please be aware of the restrictions on the use of wireless devices when in hospitals, clinics or other healthcare facilities.



Terminals or mobiles operating over radio signal and cellular network cannot be guaranteed to connect in certain conditions, such as when the mobile bill is unpaid or the (U)SIM card is invalid. When emergency help is needed in such conditions, use emergency call if the device supports it. In order to make or receive a call, the terminal or mobile must be switched on in a service area with adequate cellular signal strength. In an emergency, the device with emergency call function cannot be used as the only contact method considering network connection cannot be guaranteed under all circumstances.



The terminal or mobile contains a transmitter and receiver. When it is ON, it receives and transmits radio frequency signals. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.



In locations with explosive or potentially explosive atmospheres, obey all posted signs and turn off wireless devices such as mobile phone or other terminals. Areas with explosive or potentially explosive atmospheres include fueling areas, below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles such as grain, dust or metal powders.

About the Document

Revision History

Version	Date	Author	Description
-	2024-01-05	Paul YU	Creation of the document
1.0.0	2024-01-05	Paul YU	Preliminary

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1 Introduction

To help you to develop applications with Quectel KG200Z conveniently, Quectel supplies corresponding development board (KG200Z TE-B) to test the module. This document can help you quickly understand KG200Z TE-B interface specifications, RF characteristics, electrical and mechanical details and know how to use it.

2 Product Overview

KG200Z TE-B is a development board that supports a series of interfaces. It can be used to test basic functionality or further development of the module.

2.1. Top and Bottom Views

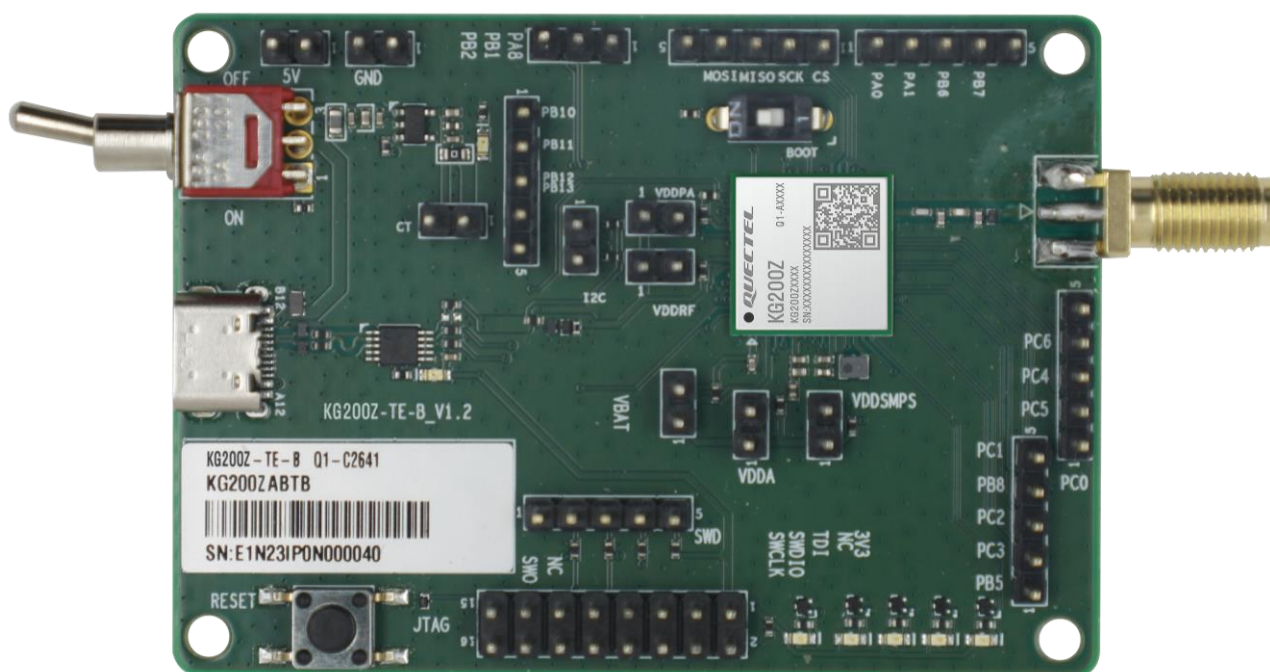


Figure 1: Top View

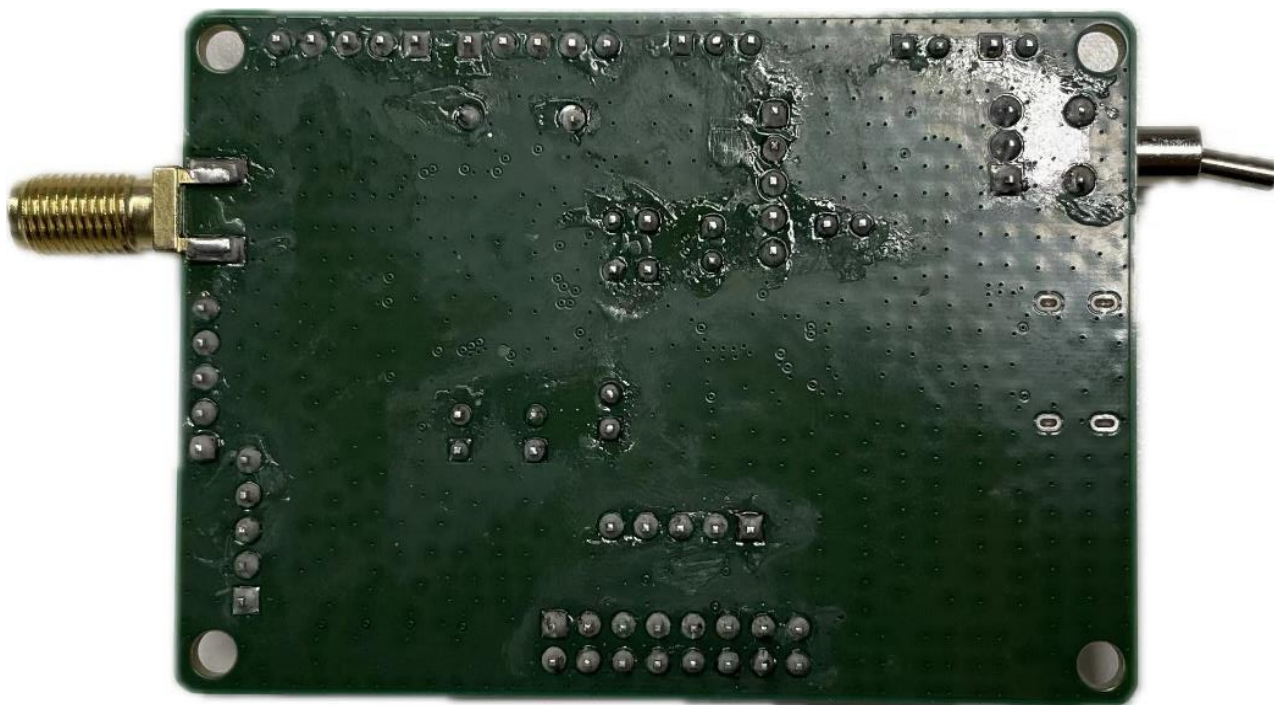


Figure 2: Bottom View

2.2. Component Placement

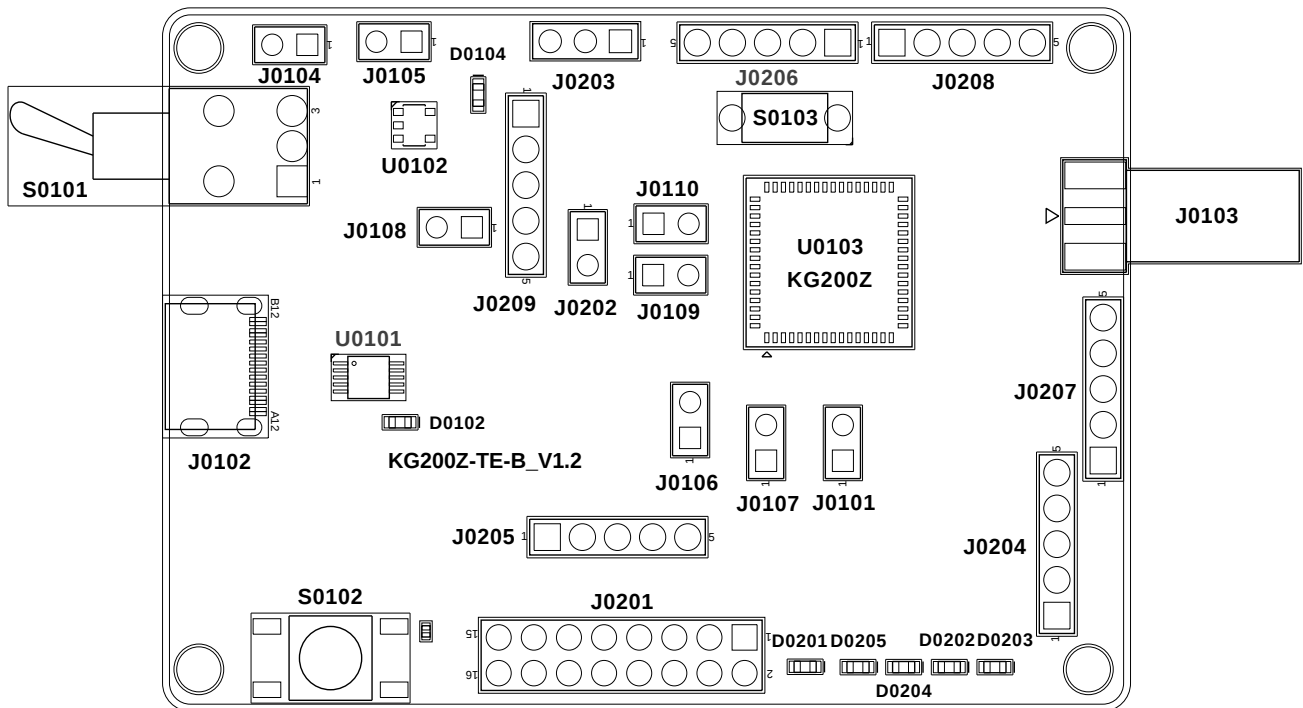


Figure 3: Component Placement

Table 1: Component Information

Interface	Reference No.	Description
KG200Z	U0103	The KG200Z module
Bridge IC	U0101	USB-to-UART bridge IC
LDO	U0102	5 V to 3V3
Power Supply Interfaces	J0102	USB Type-C power supply interface Typical supply voltage: +5 V
	J0104	External +5 V power supply interface
	J0105	GND
Power Switch	S0101	VBAT ON/OFF control
Reset Button	S0102	Resets the module

BOOT Button	S0103	Controls the module to enter the download mode
USB Connector	J0102	Connected to the main UART of the module via USB-to-UART bridge U0101
RF Connector	J0103	RF SMA connector
ST-LINK Connector	J0201	ST-LINK connector
Test Points	J0101, J0106, J0107, J0108, J0109, J0110, J0202, J0203, J0204, J0205, J0206, J0207, J0208, J0209	Test basic function of the module
Status LEDs	D0102	Indicates the power status of U0101
	D0104	Indicates the power status of VBAT
	D0201	Indicates the power status of GPIO29
	D0202	Indicates the power status of GPIO11
	D0203	Indicates the power status of GPIO18
	D0204	Indicates the power status of GPIO28
	D0205	Indicates the power status of GPIO23

3 Kit Accessories & Assembly

3.1. Accessory Assembly



Figure 4: TE-B Kit Accessory Assembly

3.2. Accessory List

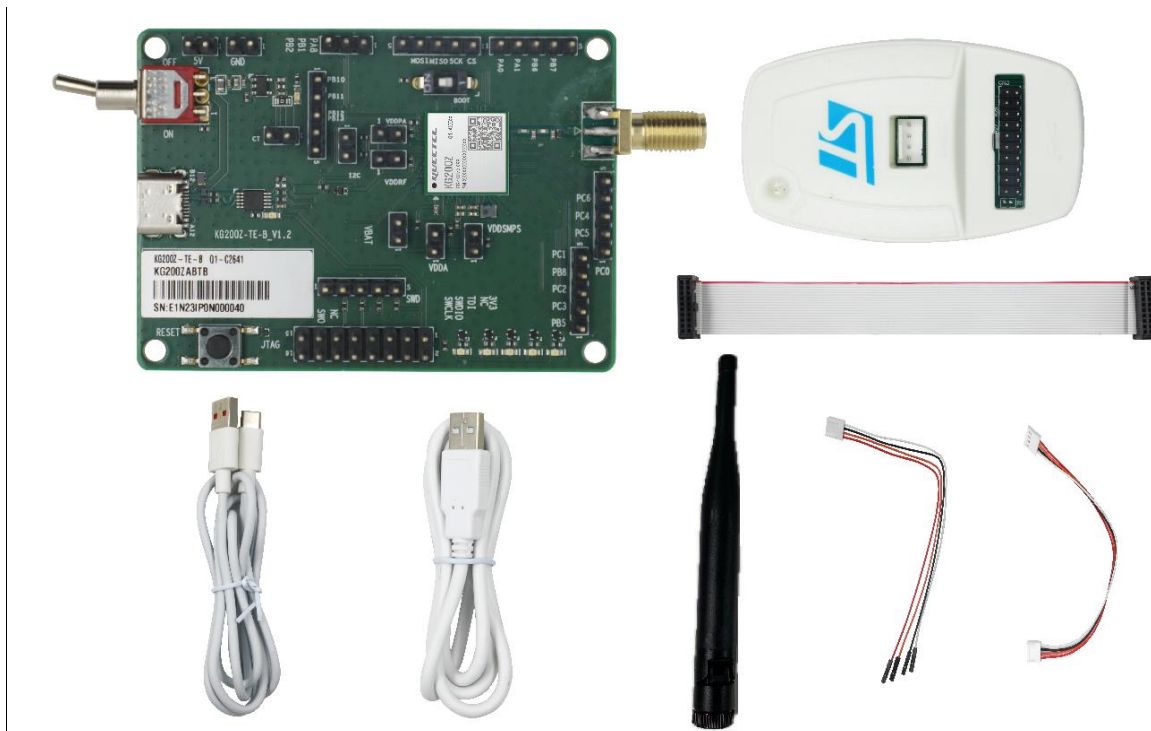


Figure 5: TE-B Kit Accessories

Table 2: Accessory List

Item	Description	Quantity (pcs)
Cable	Micro-B cable	2
	Main cable	3
Antenna	LoRa antenna	1
Kit	ST-LINK	1

4 Interface Applications

This chapter outlines the information and applications of some hardware interfaces of KG200Z TE-B.

4.1. Power Supply Interfaces

KG200Z can be power by J0102 (USB Type-C power supply interface) or J0105/J0405 (2pin header).

The simplified schematic of KG200Z-TE-B is shown in the following figure.

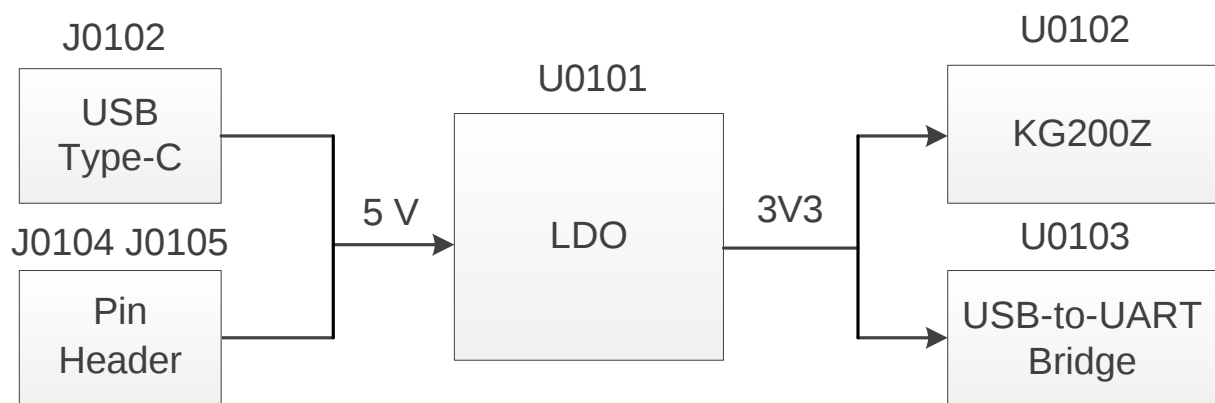


Figure 6: Power Supply for KG200Z-TE-B

4.2. Power Switch and Reset Button

KG200Z-TE-B includes one power switch (S0101) and one reset button (S0102) as shown in the following figure.



Figure 7: Power Switch



Figure 8: Reset Button

Table 3: Description of Power Switch and Reset Button

Reference No.	Description
S0101	VBAT ON/OFF control
S0102	Used for resetting the module

4.3. USB Connector

KG200Z-TE-B Integrated with J0102 (USB connector), which is connected with the main UART of the module via U0101 (USB-to-UART bridge). When you use the UART interface, place the jumper as shown in the following figure.

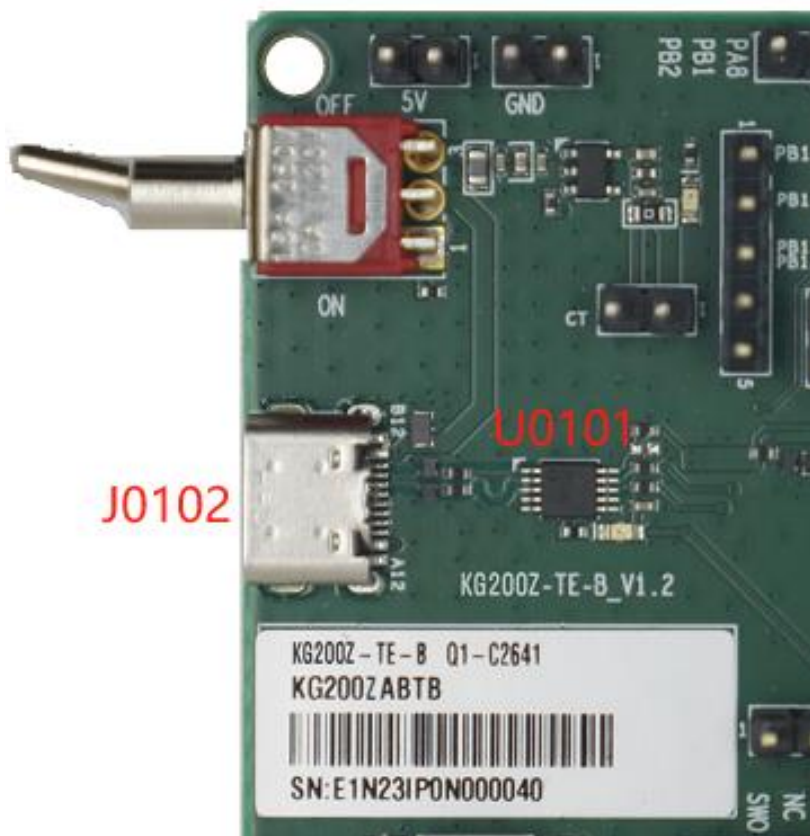


Figure 9: USB Connector

J0102 supports 9600 bps baud rate by default. It is intended for data transmission between the module and the host. It also can be used for AT command communication

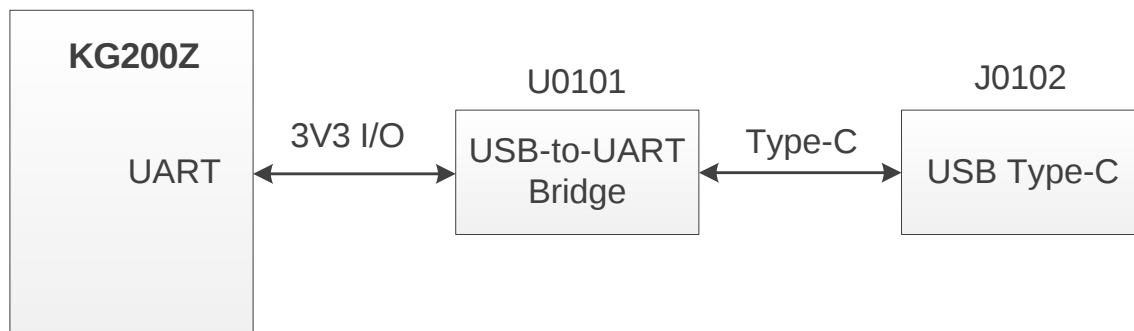


Figure 10: USB-to-UART Connection

4.4. BOOT Button

KG200Z TE-B features S0103 (BOOT button) as shown as follow.

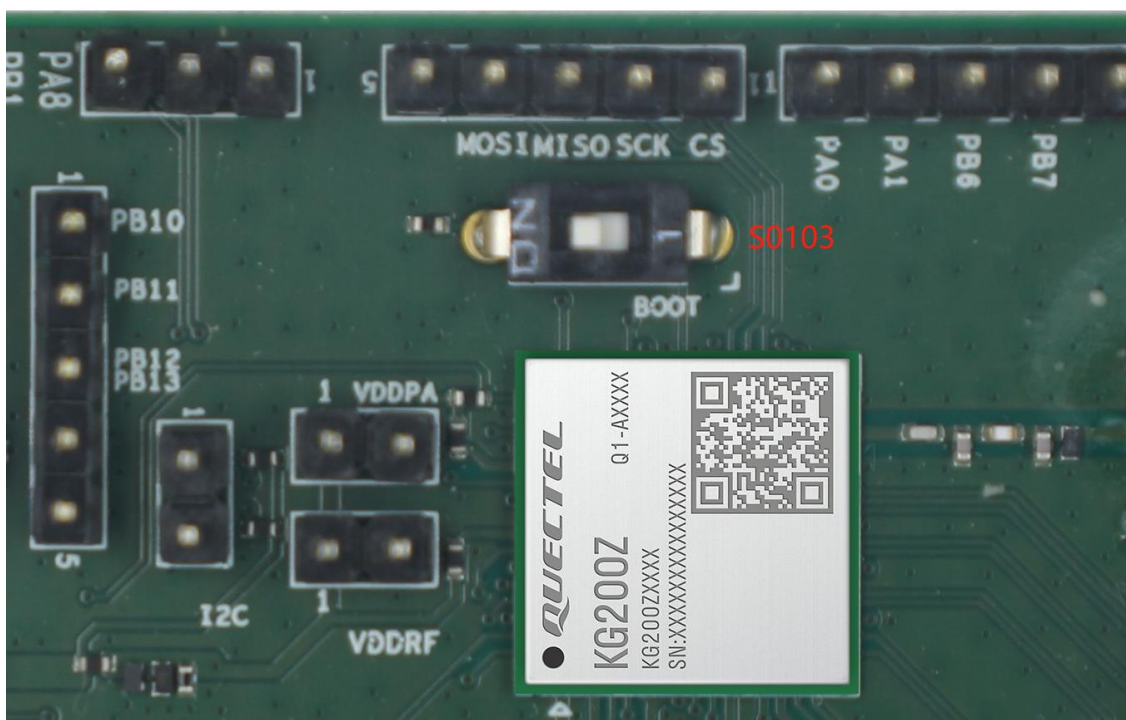


Figure 11: BOOT Button

4.5. RF Connector

KG200Z TE-B features J0103 (RF SMA connector) which connected to ANT_LoRa of the module via an external antenna or an instrument for RF signal test.

The simplified schematic of RF connection is shown in the following figure.

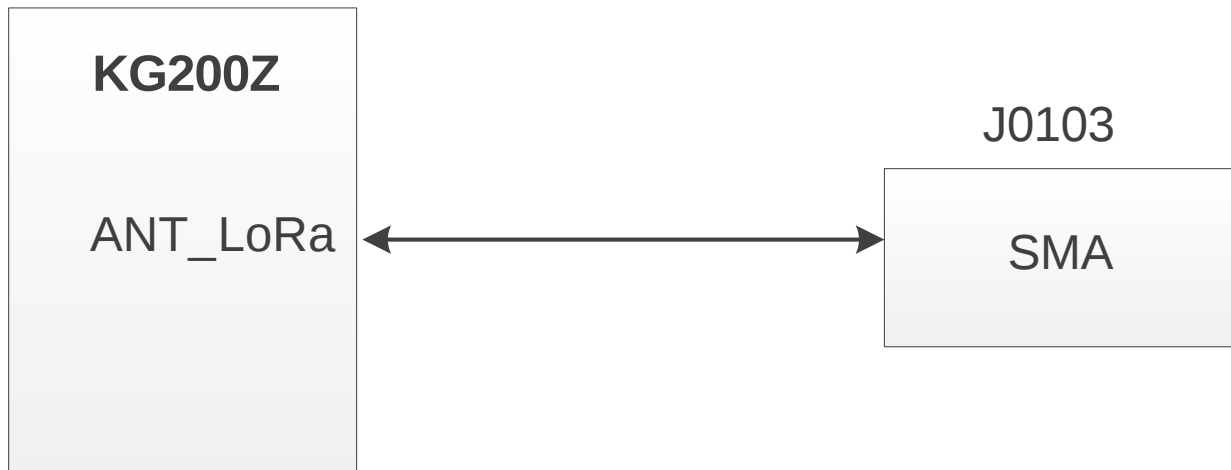


Figure 12: RF Connection

4.6. Test Points

KG200Z-TE-B features a series of test points. which can help you to obtain the corresponding waveform of some signals.

J0104, J0105, J0108, J0203, J0206, J0208, J0209, J0202, J0110, J0109, J0106, J0107, J0101, J0207, J0204, J0205 are illustrated in the following figures.

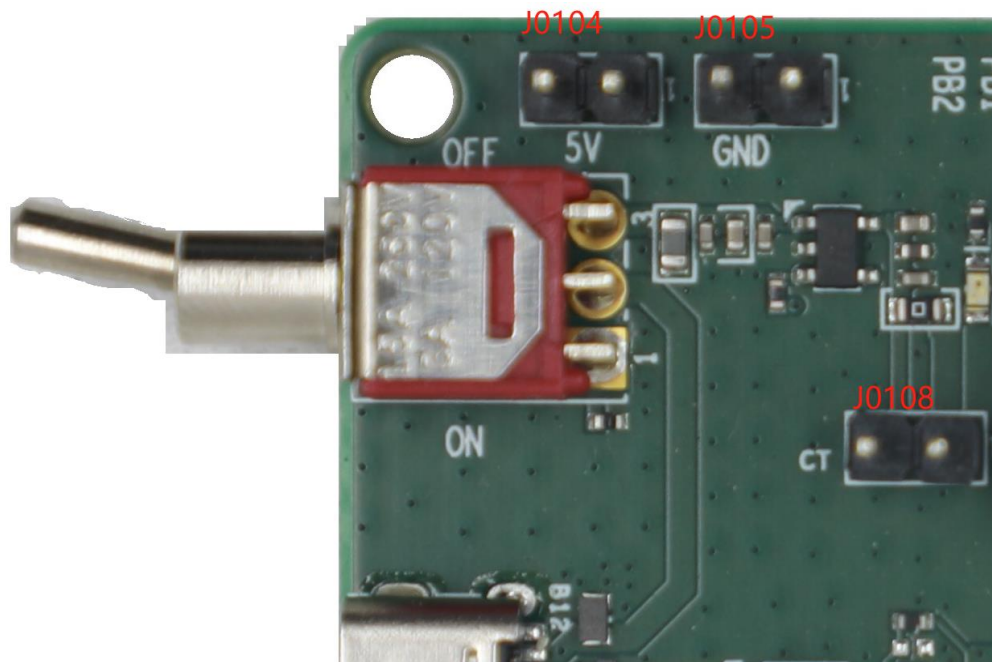


Figure 13: Test Points (1)

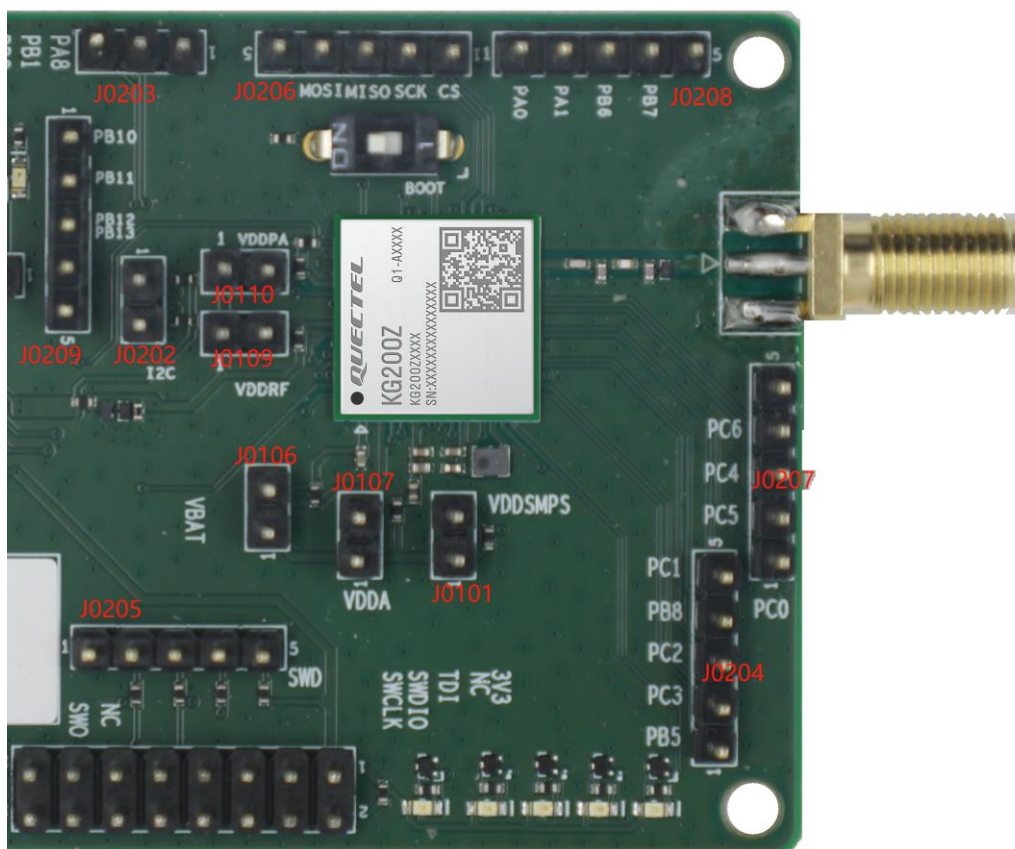


Figure 14: Test Points (2)

Table 4: Description of Test Points

J0104		
Pin No.	Pin Name	Description
1	VCC_5V	5 V power supply
2	VCC_5V	5 V power supply
J0105		
Pin No.	Pin Name	Description
1	GND	Ground
2	GND	Ground
J0108		
Pin No.	Pin Name	Description
1	VDD_3V3	3V3 power supply
2	VDD_3V3	3V3 power supply
J0203		
Pin No.	Pin Name	Description
1	GPIO8	Connected directly to GPIO8 of the module
2	GPIO15	Connected directly to GPIO15 of the module
3	GPIO16	Connected directly to GPIO16 of the module
J0204		
Pin No.	Pin Name	Description
1	GPIO19	Connected directly to GPIO19 of the module
2	GPIO33	Connected directly to GPIO33 of the module
3	GPIO32	Connected directly to GPIO32 of the module
4	GPIO22	Connected directly to GPIO22 of the module
5	GPIO31	Connected directly to GPIO31 of the module
J0205		

Pin No.	Pin Name	Description
1	GND	Ground
2	SWDIO	Serial wire debug input/output
3	SWCLK	Serial wire debug clock
4	RESET_N	Reset the module
5	VDD_3V3	3V3 power supply

J0206

Pin No.	Pin Name	Description
1	GPIO4	Connected directly to GPIO4 of the module
2	GPIO5	Connected directly to GPIO5 of the module
3	GPIO6	Connected directly to GPIO6 of the module
4	GPIO7	Connected directly to GPIO7 of the module
5	GND	Ground

J0207

Pin No.	Pin Name	Description
1	GPIO30	Connected directly to GPIO30 of the module
2	GPIO35	Connected directly to GPIO35 of the module
3	GPIO34	Connected directly to GPIO34 of the module
4	GPIO36	Connected directly to GPIO36 of the module
5	GND	Ground

J0208

Pin No.	Pin Name	Description
1	GPIO0	Connected directly to GPIO0 of the module
2	GPIO1	Connected directly to GPIO1 of the module
3	GPIO20	Connected directly to GPIO20 of the module
4	GPIO21	Connected directly to GPIO21 of the module

5	GND	Ground
---	-----	--------

J0209		
Pin No.	Pin Name	Description
1	GPIO24	Connected directly to GPIO24 of the module
2	GPIO25	Connected directly to GPIO25 of the module
3	GPIO26	Connected directly to GPIO26 of the module
4	GPIO27	Connected directly to GPIO27 of the module
5	GND	Ground

4.7. ST-LINK Interface

KG200Z-TE-B provides J0201 (ST-LINK connector), which is connected to the ST-LINK pin of the module for downloading firmware and debugging.



Figure 15: ST-LINK Interface

Table 5: Description of J0201

J0201		
Pin No.	Pin Name	Description
1、2	VDD_3V3	Power input pin
5	TDI	Test Data Input
7	SWDIO	Serial wire debug input/output
9	SWCLK	Serial wire debug clock

13	TDO	Test data output
15	RESET_N	Reset
4、6、8、10、12、14、16	GND	Ground
3、11	NC	Not Connect

4.8. Status LEDs

KG200Z TE-B features 7 status LEDs as shown as the following figure.

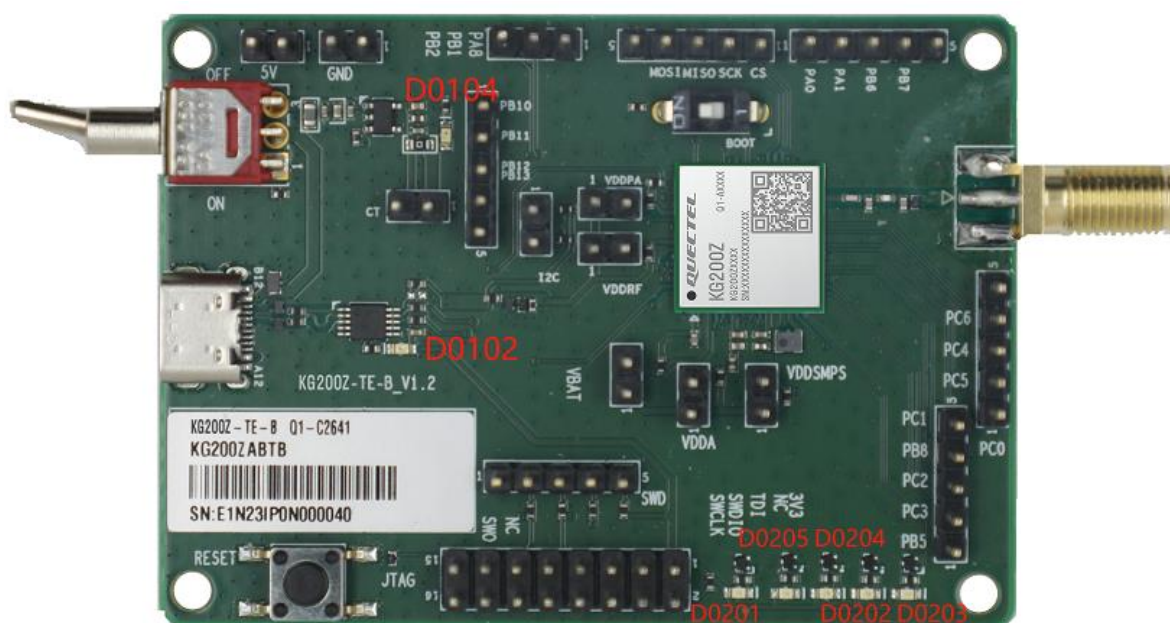


Figure 16: Status LEDs

Table 6: Description of Status LEDs

RefDes.	Description
D0102	Indicates the power status of U0101 Light on: high level Light off: low level
D0104	Indicates the power status of VBAT Light on: high level Light off: low level

5 Operating Procedures

The chapter outlines how to use the KG200Z-TE-B for testing and evaluating the module.

5.1. Power Up

1. Connect J0102 (USB connector) of KG200Z-TE-B to PC with the USB Type-C cable.
2. Switch S0101 (Power Switch) to ON state, then D0104 (VBAT ON/OFF indicator) will light up.
3. Connect the pin interface of ST-LINK to J0201 (ST-LINK connector) of KG200Z-TE-B with ST-LINK main cable.
4. Connect the USB interface of ST-LINK to PC with the USB Mini-B cable.

5.2. Communication via USB Connector

1. Turn on the module according to the procedure mentioned in **Chapter 5.1**.
2. “STM32 STLink” can be viewed through the PC Device Manager as shown below.

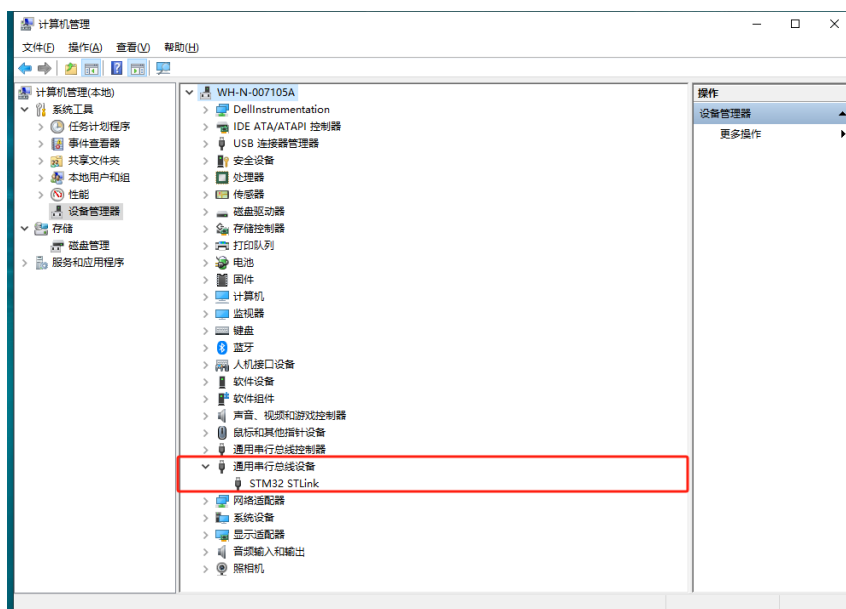


Figure 17: USB Serial Port

5.3. Firmware Upgrade

You can use the STM32CubeProgrammer tool provided by Quectel to establish the communication between the module and the PC via J0201 (ST-LINK interface). There are specific steps as below.

1. Turn on the STM32CubeProgrammer tool, and power up the module as shown as **Chapter 5.1**.
2. Select the ST-LINK port, and click **“Connect”** until there is **“Data read successfully”**.
3. Choose the firmware package from **“Open file”**.

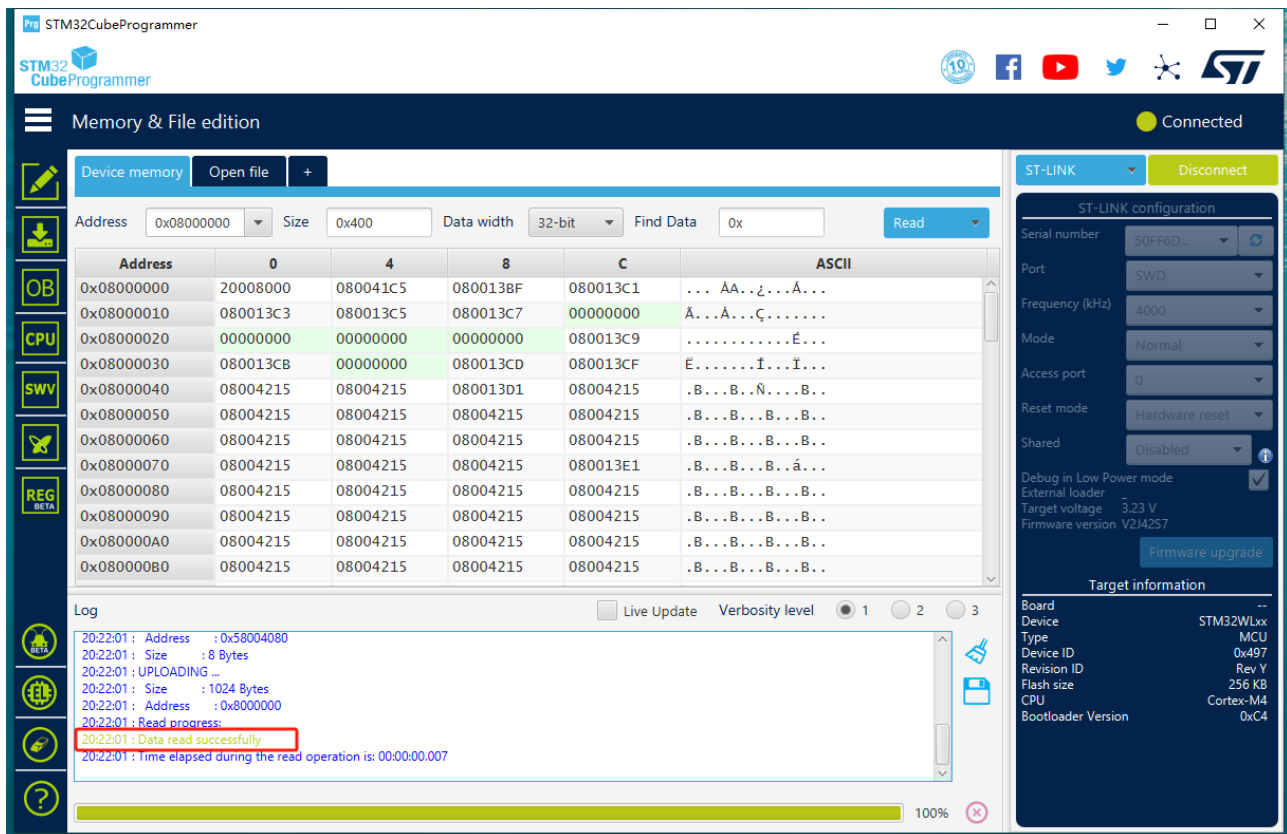


Figure 18: Firmware Upgrade Configurations

4. Click **“Download”** on the STM32CubeProgrammer of PC. Then the KG200Z Module on KG200Z TE-B to upgrade firmware until there is **“File download complete”** on the PC.

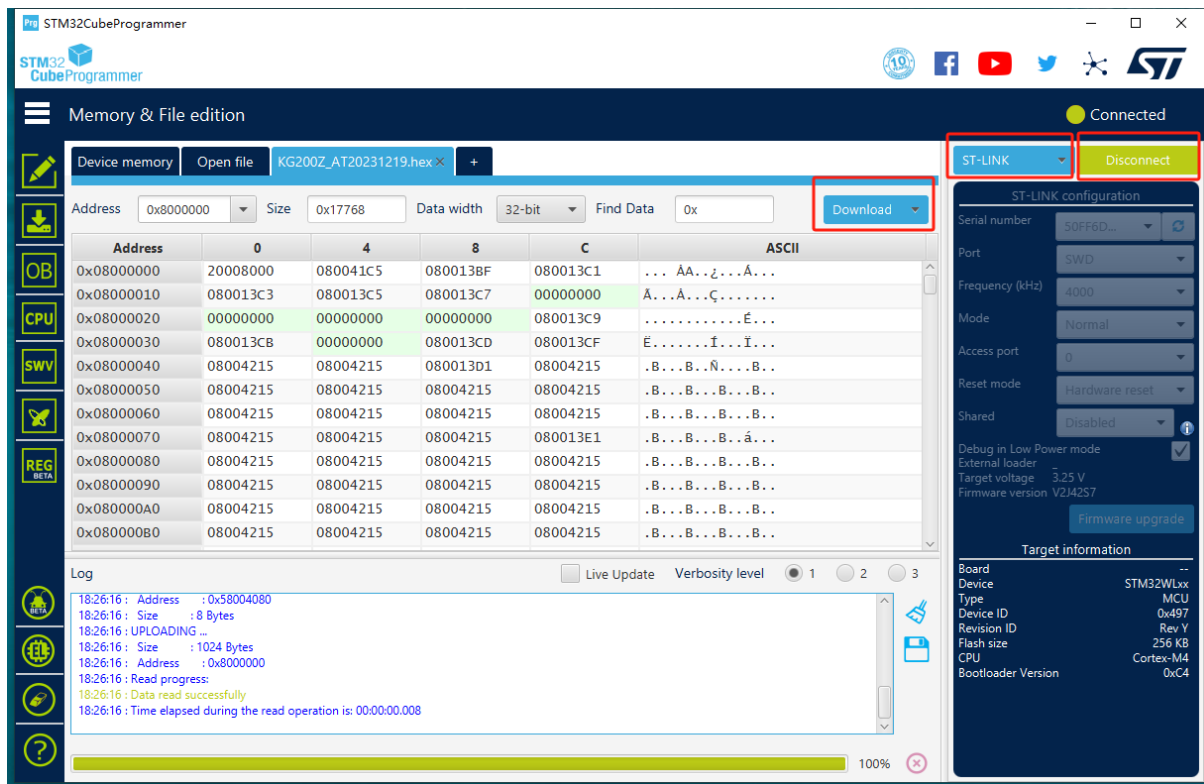


Figure 19: Firmware Upgrade (1)

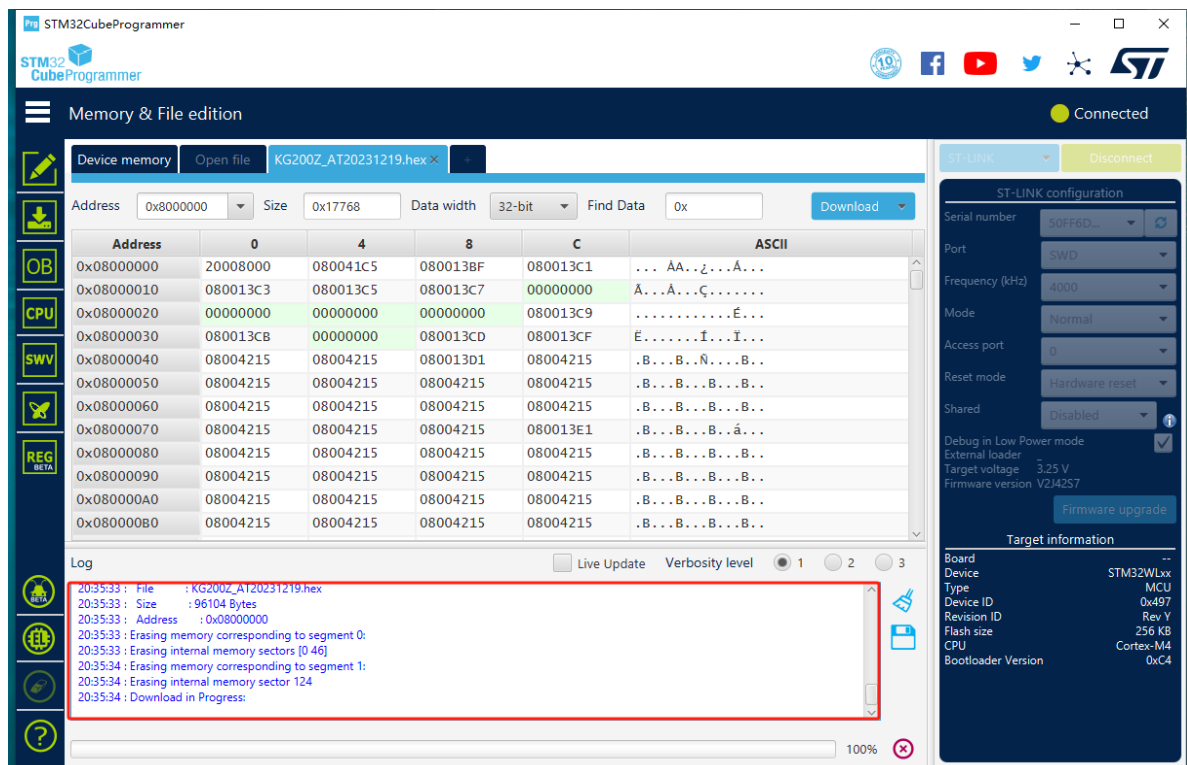


Figure 20: Firmware Upgrade (2)

- The progress bar at the bottom of the page represents the progress of the firmware upgrade. “File download complete” represents the progress of the firm upgrade is finished.

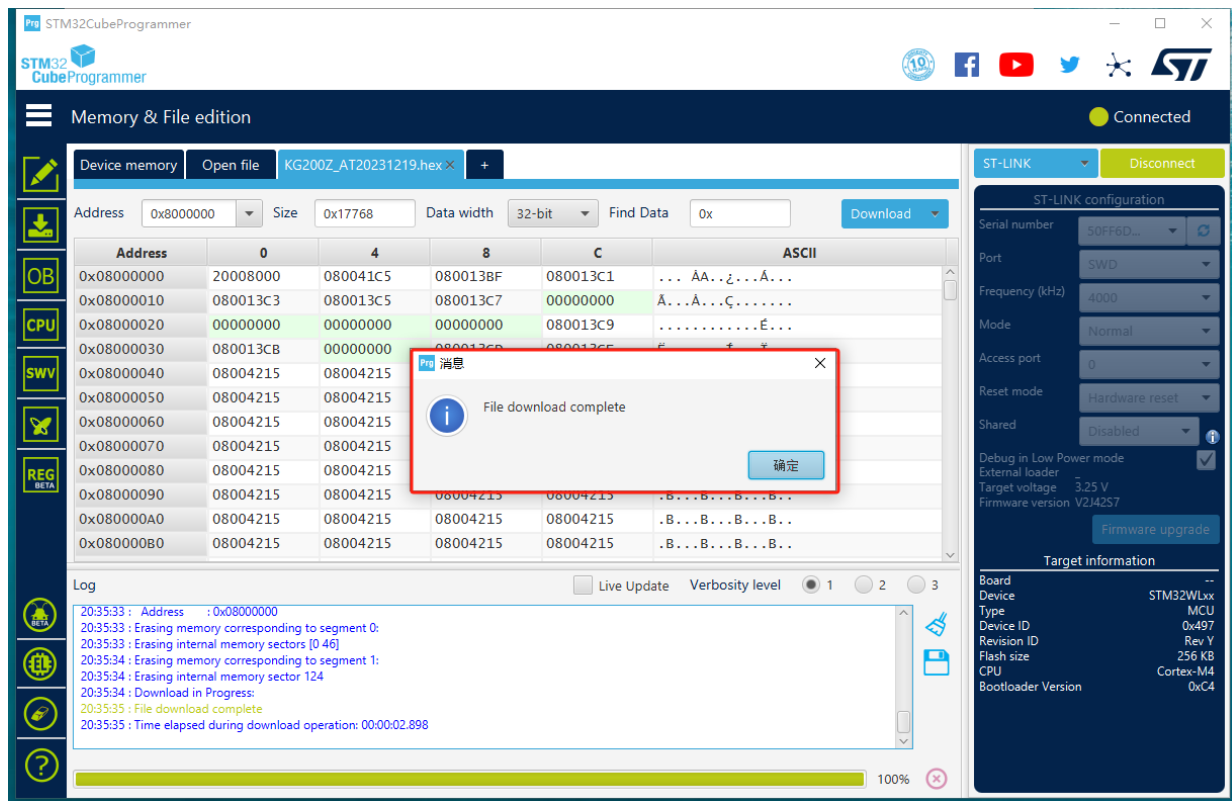


Figure 21: Firmware Upgrade (3)

NOTE

The KG200Z support bootloader download firmware form UART.For more details of bootloader and the STM32CubeProgrammer tool, please contact to Quectel Technical Support.

5.4. Reset

Press S0102 (reset button) for more than 100 ms and then release it to reset the module.

6 Appendix References

Table 7: Related Documents

Document Name
[1] Quectel_KG200Z_QuecOpen_Hardware_Design
[2] Quectel_QCOM_User_Guide

Table 8: Terms and Abbreviations

Abbreviation	Description
GND	Ground
GPIO	General Purpose Input/Output
LDO	Low-dropout Regulator
LED	Light Emitting Diode
NC	Not Connect
PC	Personal Computer
RF	Radio Frequency
SMA	SubMiniature Version A
UART	Universal Asynchronous Receiver & Transmitter
USB	Universal Serial Bus
VBAT	Voltage at Battery (Pin)
VDD	Drain Voltage