



HonqTech

HQ308 TE kit User Guide

LTE Module

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FCC MODULAR APPROVAL INFORMATION EXAMPLES for Manual

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.

CAUTION: 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.

FCC 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 & your body.

Version History

Date	Version	Description of change	Author
2024-12-17	1.00	Initial	

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1. Introduction

This document describes the interface and usage of the TE kit. With the help of this document, customers can quickly use the TE Kit.

1.1. Documentation Overview

Table 1: Documents Overview

No.	Document	Description
1	HQ308_Hardware_Design	Mainly introducing interface functions, Recommend circuit, PCB layout guideline, packaging and other hardware components, as well as the use of AT commands
2	HQ308_Reference_Design	Reference circuit applications
3	HQ308-TE_DL&PCB	TE SCH&PCB PDF Document
4	MOD_HQ308_109	Reference Package (Pads)
5	HQ308_Series_AT_Command Manual	AT Command Manual
6	HQ308_TE kit_User Guide (This document)	The use of TE board, forced download, startup, reset, and the location of other measurement points, as well as the use method in conjunction with EVB

NOTE

1. This current revision is an early release to support initial product developers. The content is subject to change without advance notice.
2. The functions supported by the module depend on the actual hardware model and software version.

1.1 The Introduction of TE

The top view and bottom view of TE board is shown as follows.

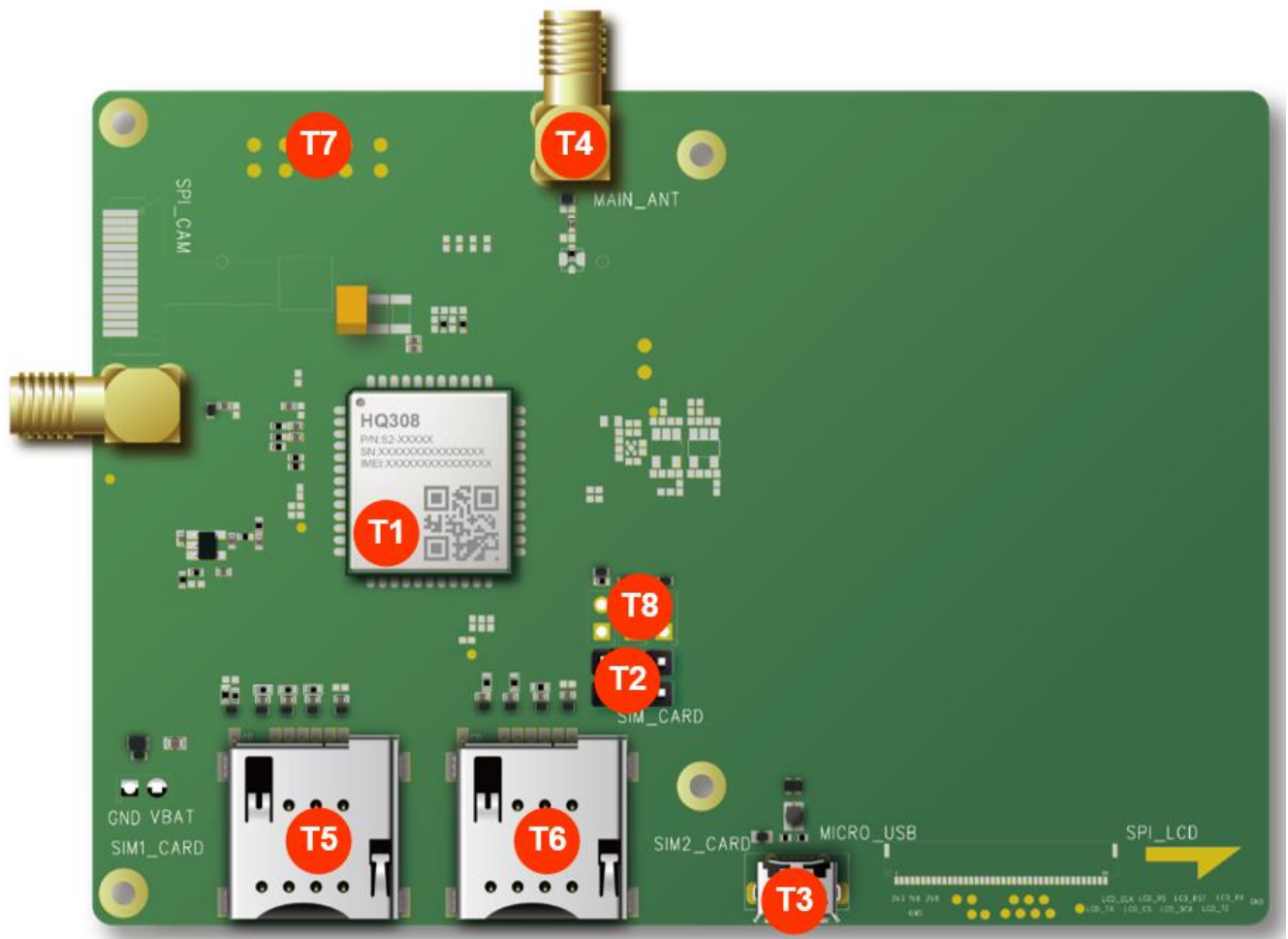


Figure 1: TE Top View

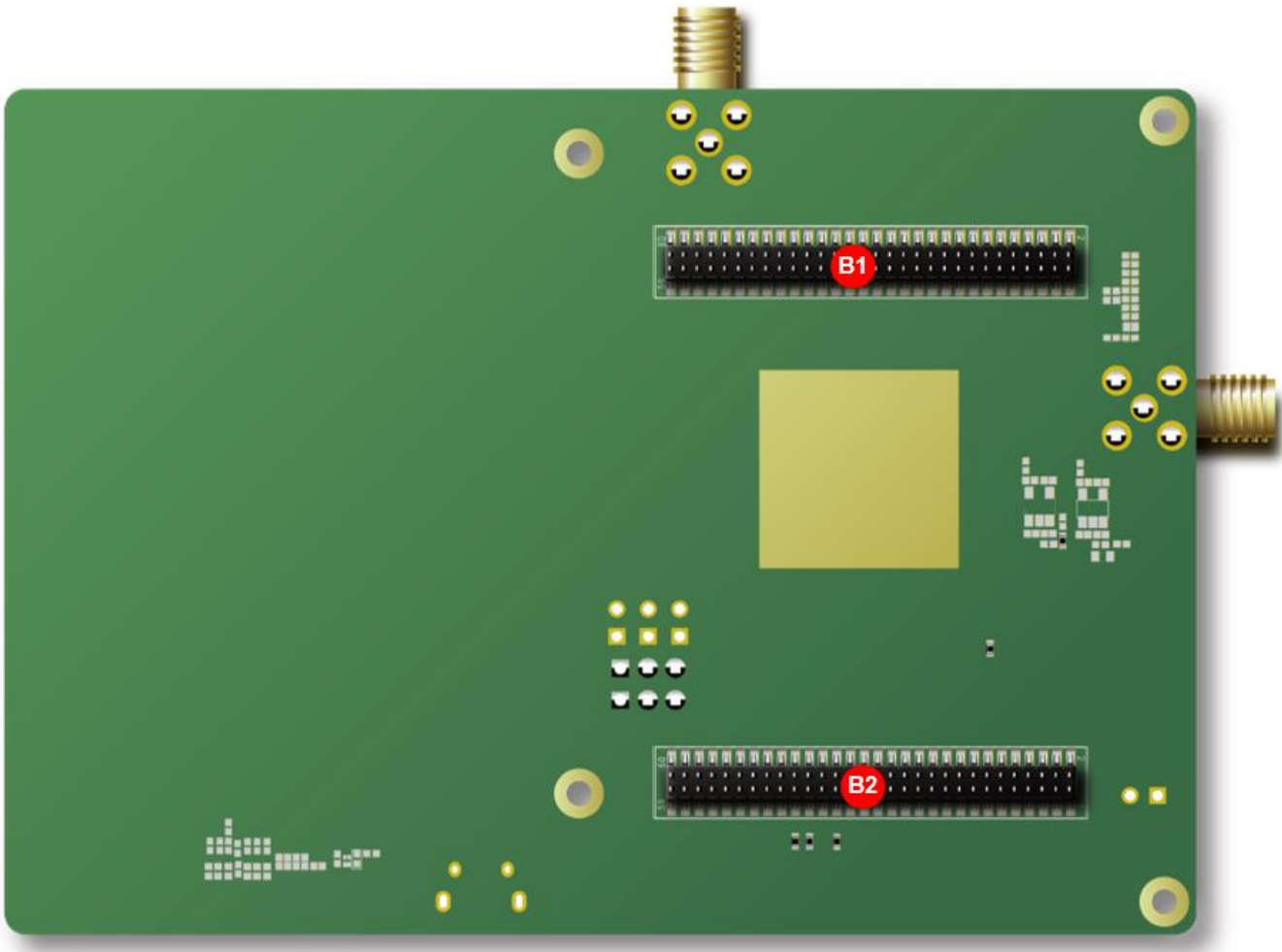


Figure 2: TE Bottom View

Table 2: The Interface on the TE

Attachment Label	Description
T1	Module
T2	UART Switch
T3	Micro USB connector
T4	Main Antenna connector (SMA)
T5	USIM1 card holder
T6	USIM2 card holder
T7	Test points
T8	Test points
B1	Connector (Connect to EVB)
B2	Connector (Connect to EVB)

Table 3: The Description of Interface T2/T7/T8

Interface	Description
T2	

UART3_RXD	UART3 data input
UART3_TXD	UART3 data output
RX	EVB_UART data input
TX	EVB_UART data output
DBG_RXD	DEBUG UART data input
DBG_TXD	DEBUG UART data output
T7	
IN1	WAKEUP
IN2	NC
IN3	GPIO_07
IN4	SLEEP_IND
IN5	NC
OUT1	GPIO_09
OUT2	NC
OUT3	GPIO_08
OUT4	USB_BOOT
OUT5	NC
T8	
GND	GND
PWRKEY	Power ON/OFF input
BOOT	Firmware download guide control input
RESET	System reset control input

2. Operation Procedures

2.1. Accessory Installation

Install the necessary accessories and perform functional tests.

- 1) Install the TE to the EVB board, pay attention to the installation direction to prevent short circuit;
- 2) Insert the SIM card to the **T5** position of the main card slot on the front;
- 3) Install the LTE antenna to the **T4** position;
- 4) For serial AT communication, grab the debug log and upgrade the software, insert the micro USB cable to the interface **T3** position;
- 5) Connect the **T2** jumper as required by referring to Chapter 2.5.2.
- 6) Insert the 5V DC power supply to the **T** position of the EVB board.

The picture of TE board installed on EVB board is shown as below.

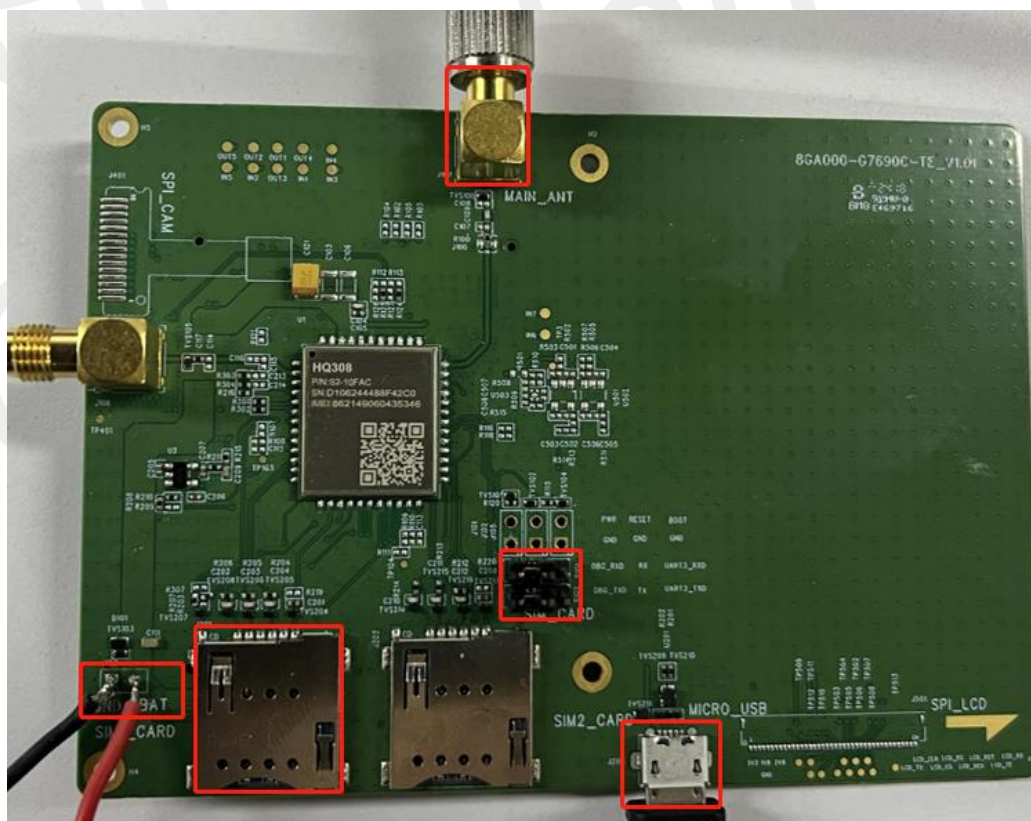


Figure 3: The Picture of TE Board

2.2. Power On/Off the Module

2.2.1. Power on the Module

The module power on procedure is shown in the following:

1. Supply the 3.4V-4.2V power to the VBAT.
2. Pull down the PWRKEY to the GND.

2.2.2. Power off the Module

1. Power off the module by pulling down the PWRKEY for 2.5s, after the module saving the data, the module will be powered off automatically and all lights will be extinguished.
2. Power off the module by AT command "AT+CPOF", the module will powered off automatically after saving the data.
3. Power off the module by disconnecting the power supply of VBAT. This method is not recommended when the module is working normally, it may cause damage to the module FLASH.

2.3. USB Driver Installation

1. Use USB cable to connect the PC to the Micro-USB port on the TE board. Then several devices should be listed under other devices in device manager.

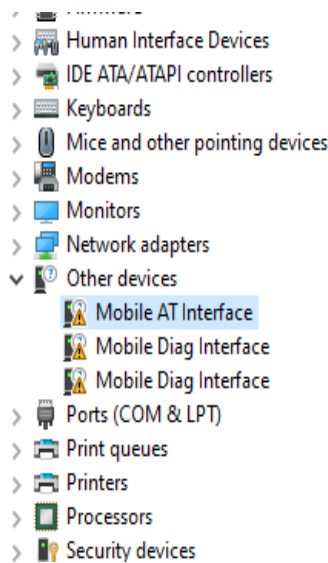


Figure 4: Devices Recognized by the Operating System

- 2. Right click the “Mobile AT Interface” devices and select “Update driver”.
- 3. Select “Browse my computer for drivers”.
- 4. Select “Let me pick from a list of available drivers on my computer”. Click “Browse”, manually search the driver folder, and then click “Next”. Locate the folder where the driver is and click OK.
- 5. Drivers need to be installed in the same way for each device. If you install successfully, you will see one HonqTech device under Modems and three HonqTech devices under Ports (COM & LPT) as shown in follows.

Table 4: USB Port

USB Ports	Description
HonqTech HS-USB AT Port 9011	AT Command Communication Port
HonqTech HS-USB Diagnostics 9011	Software Debug and Firmware Update Port

2.4. Firmware Update

Customers can update firmware by USB. The firmware update process of the module is as follows.

- 1. Connect the VBAT to 3.8V power supply or connect the TE board to the EVB board, and connect the TE to the PC through a Micro-USB cable.
- 2. Pull down the BOOT to the GND, and the pull down the PWRKEY, the module will enter to the download mode.

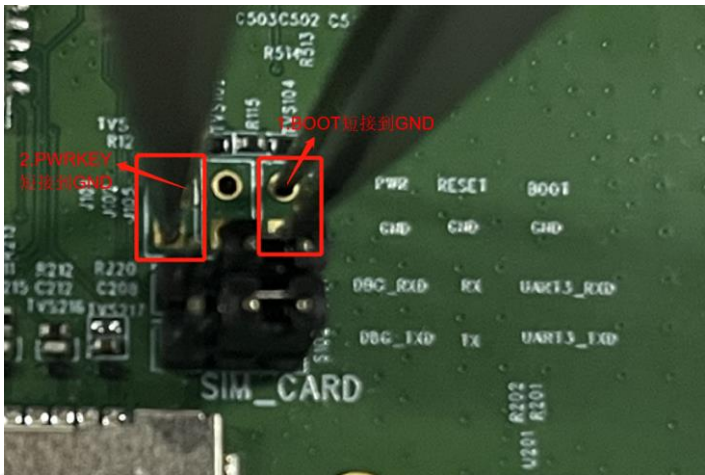


Figure 5: The Module Enter to the Download Mode

- 3. Open the download tool, select the firmware package, and the click the “GO”.

NOTE

Before updating the firmware, please contact the HonqTech technical support team and the supplier to obtain the correct firmware upgrade file and the tool.

2.5. UART Application Guide

The customers can test the UART by connecting the UART interface on the EVB or the interface on the bottom of the TE.

2.5.1. UART Interface

Table 5: UART Information

UART Interface	Support Baud Rate (bps)	Default Baud Rate (bps)	Function Description
MAIN_UART	300 600 1200 2400 4800 9600 19200 38400 57600 115200 230400 460800 921600 1842000 and 3686400	115200	Data transmission and AT command transmission
DBG_UART	115200	115200	Module partial log output
AUX_UART	115200	115200	Used to communicate with peripherals

2.5.2. The Jumper Application Guide

The UART interfaces are connected to the bottom of the TE.

The Jumper on the TE is shown as follows.

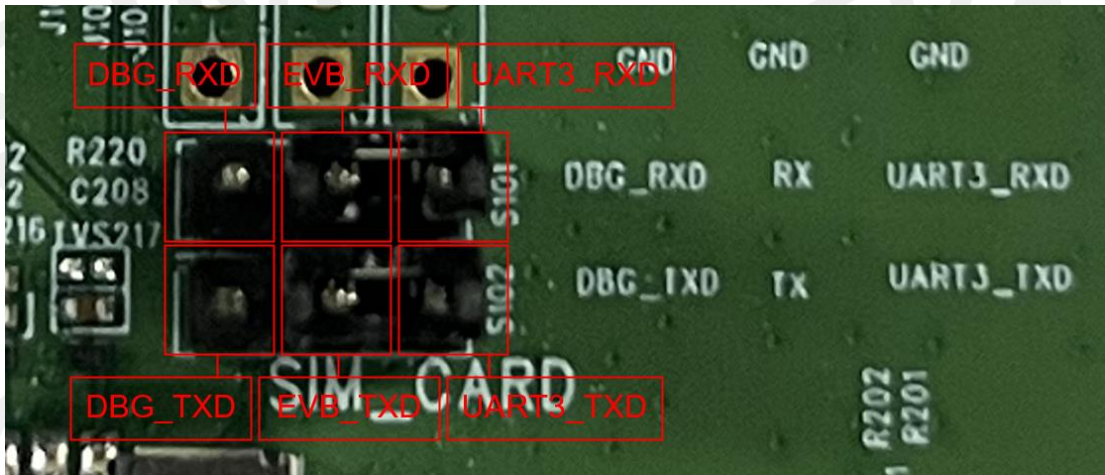


Figure 6: The Jumper on the TE

The setting of the Jumper when using DEBUG_UART is shown as follows.

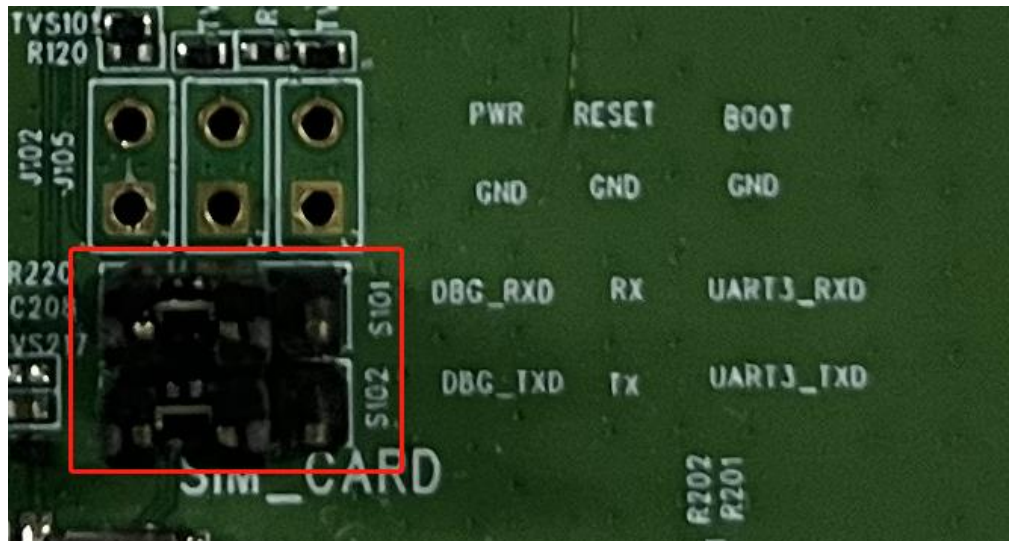


Figure 7: The Setting of the Jumper When Using DBG_UART

The setting of the Jumper when using UART3 is shown as follows.

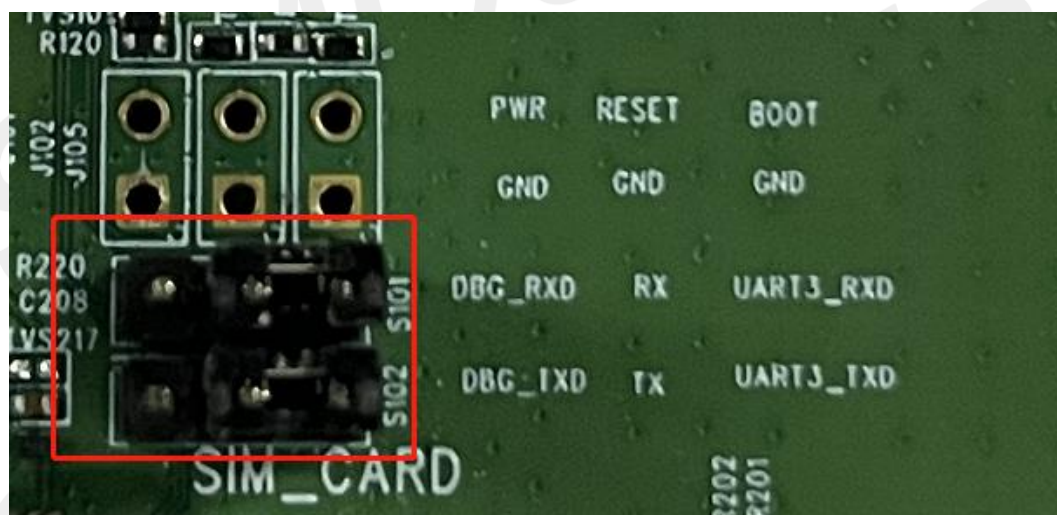


Figure 8: The Setting of the Jumper When Using UART3

2.6. (U)SIM Application Guide

The TE board provides two (U)SIM card holder, and the standard version software of module only support (U)SIM1 by default.

Insert the SIM card into the slot (**T5**) and connect the antenna, and pull down the PWRKEY, the module will automatically register with the network.

The customer can query (U)SIM card and network status through the following command.

Table 6: AT Command for Network and (U)SIM

AT command	Description
AT+CICCID	Read ICCID from SIM card
AT+CPSI	Inquiring UE system information
AT+CSQ	Query signal quality
AT+CPIN	Enter PIN
AT+UIMHOTSWAPON	Enable the SIM card hot swap function
AT+UIMHOTSWAPLEVEL	Set the SIM card detection level

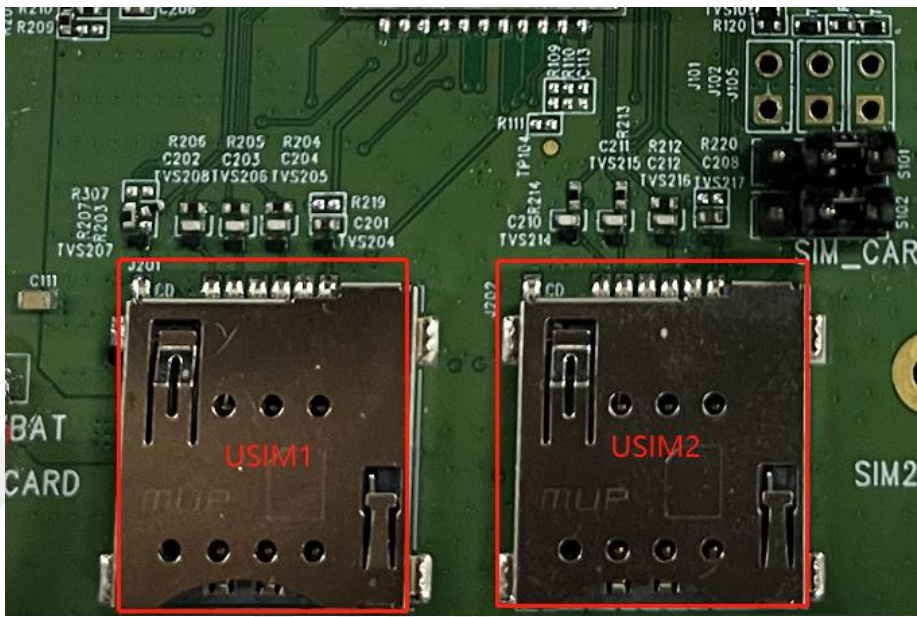


Figure 9: The (U)SIM Card Holder

NOTE

1. The standard version software of module only support (U)SIM1 by default, if the customer need dual-SIM card function, please contact the HongTech technical support team.
2. The (U)SIM2 do not support the SIM card hot swap function.

2.7. ADC

The TE board provides two test points of ADC (TP103 and TP104). The TP103 is the test point of ADC1 (0-1.8V).

The TP104 is the test point of ADC2 (0-1.8V), if the customer needs to test the ADC2, it needs to attach R109 and R110 for voltage division

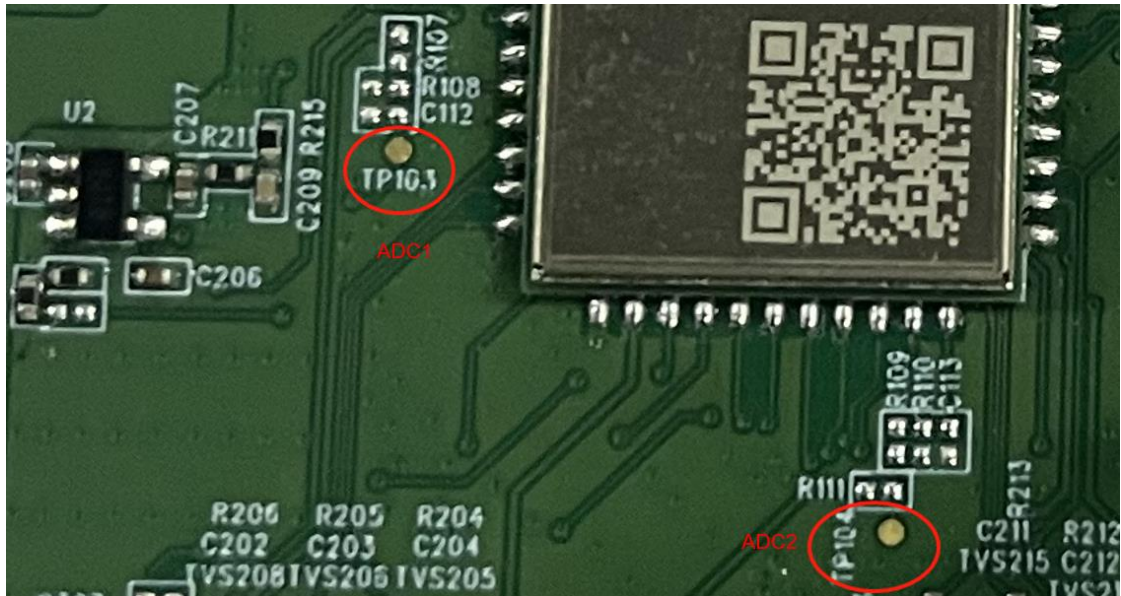


Figure 10: The Test Point of ADC

3. Current Consumption

3.1. Preparation for Test

Firstly, connect the power supply with the “VBAT and GND” on the TE board, connect the TE board with the USB, power on the module, and then send the command to query valid information such as module version and software version.

3.2. The Current of Sleep Mode Consumption Test

1. Insert the SIM card, register the network, and query the network registration status through "AT+CREG?"
2. After the network is registered successfully, turn off functions (such as indicator lights, log, etc.) related to leakage through AT commands.
3. Enable sleep mode by "AT+CSCLK=1", and unplug USB.
4. Measure the current in sleep mode.

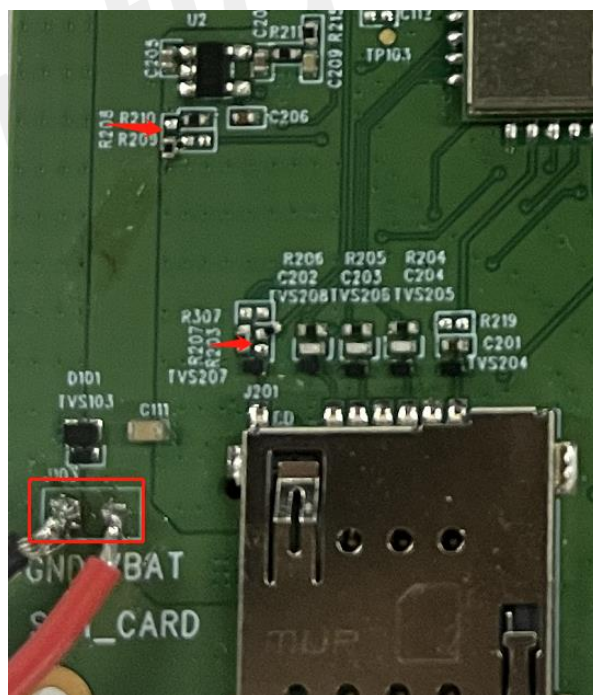


Figure 11: The Method of Test Current Consumption

NOTE

1. The standard version software of module only support (U)SIM1 by default, if the customer need dual-SIM card function, please contact the HongqTech technical support team.
2. The (U)SIM2 do not support the SIM card hot swap function.

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4. Appendix

4.1. Related Documents

Table 7: Related Documents

No.	Title	Description
[1]	HQ308 Hardware Design	Hardware Design document
[2]	HQ308_Series_AT_Command Manual	AT Command Manual document

4.2. Terms and Abbreviations







Table 8: Terms and Abbreviations

Abbreviation	Description
LDO	low dropout regulator
LTE	Long Term Evolution
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
USIM	Universal Subscriber Identity Module

4.3. Safety Caution

Pay attention to the following security precautions when using or repairing any terminal or mobile phone containing modules. The user shall be informed of the following security information on the terminal device. Otherwise, HonqTech will not be responsible for any consequences arising from the user's failure to follow these warnings.

Table 9: Safety Caution

Marks	Requirements
	When in a hospital or other health care facility, observe the restrictions about the use of mobiles. Switch the cellular terminal or mobile off, medical equipment may be sensitive and not operate normally due to RF energy interference.
	Switch off the cellular terminal or mobile before boarding an aircraft. Make sure it is switched off. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. Forgetting to think much of these instructions may impact the flight safety, or offend local legal action, or both.
	Do not operate the cellular terminal or mobile in the presence of flammable gases or fumes. Switch off the cellular terminal when you are near petrol stations, fuel depots, chemical plants or where blasting operations are in progress. Operation of any electrical equipment in potentially explosive atmospheres can constitute a safety hazard.
	Your cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference can occur if it is used close to TV sets, radios, computers or other electric equipment.
	Road safety comes first! Do not use a hand-held cellular terminal or mobile when driving a vehicle, unless it is securely mounted in a holder for hands free operation. Before making a call with a hand-held terminal or mobile, park the vehicle.
	GSM cellular terminals or mobiles operating over radio frequency signals and cellular networks cannot be guaranteed to connect in all conditions, especially with a mobile fee or an invalid SIM card. While you are in this condition and need emergent help, please remember to use emergency calls. In order to make or receive calls, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength. Some networks do not allow for emergency call if certain network services or phone features are in use (e.g. lock functions, fixed dialing etc.). You may have to deactivate those features before you can make an emergency call. Also, some networks require that a valid SIM card be properly inserted in the cellular terminal or mobile.