USR-G402tf User Guide

Version: V1.0

Contents

1. Quick Start

This chapter aims at getting start USR-G402tf quickly. It's recommended that user read this chapter systemically and operate it according to instruction to make a scientific knowledge. Following chapter will introduce specific details and instruction, user can read interested chapter according to need.

If you have any question, feed it back to customer center please:

http://h.usriot.com

1.1. Hardware Testing Environment

Please connect the module onto the mini-PCIE slot of the evaluation board, and insert SIM card. And then connect 4G antenna to the IPEX interface of module; At last, please connect with PC by USB port, as shown:

Hardware connection

<Note>:

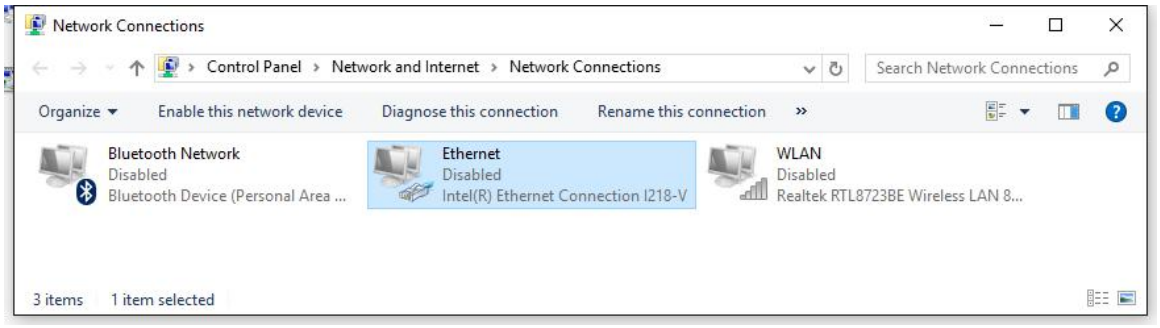
► Ensure that OS of PC is Windows

► Use USB_MOD port to connect with PC's USB port; Don't use USB_UART

► Suggest that user pull down the serial jumpers next to USB_MOD if you dont need it.

1.2. Network Connection

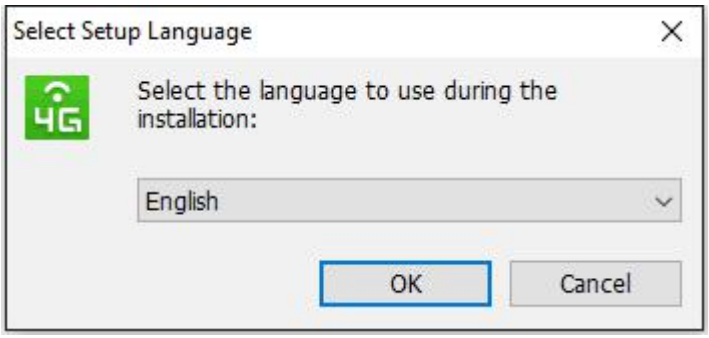
Please disable the local network connect in order to access network by 4G module, such as:

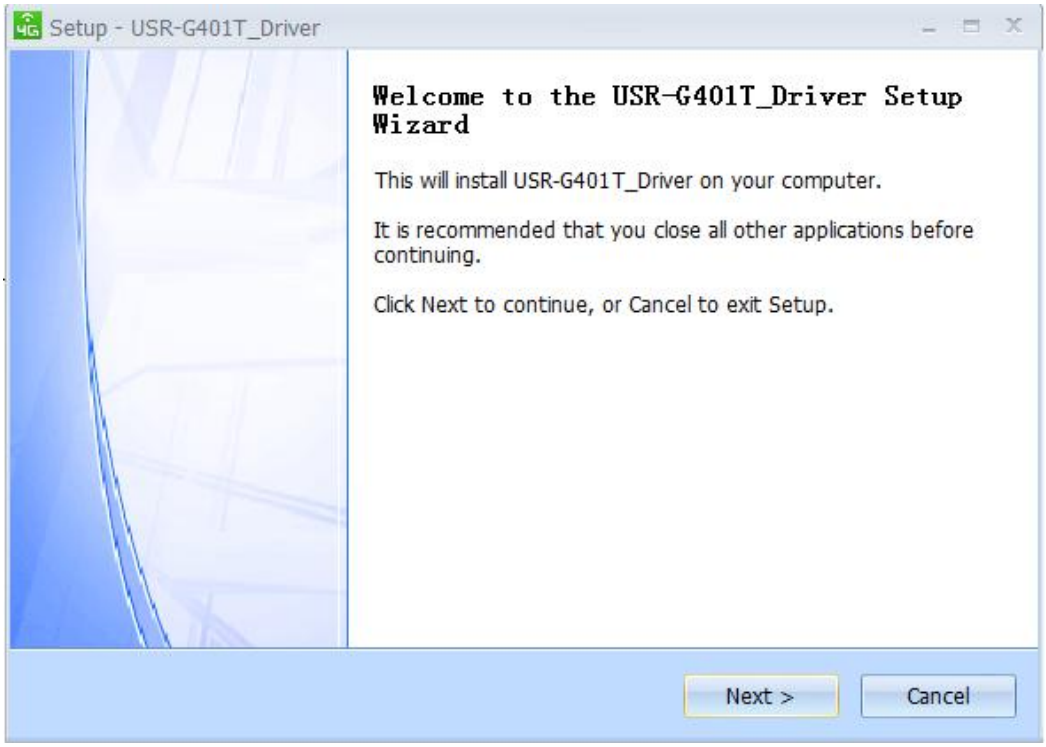


1.3. Install Driver

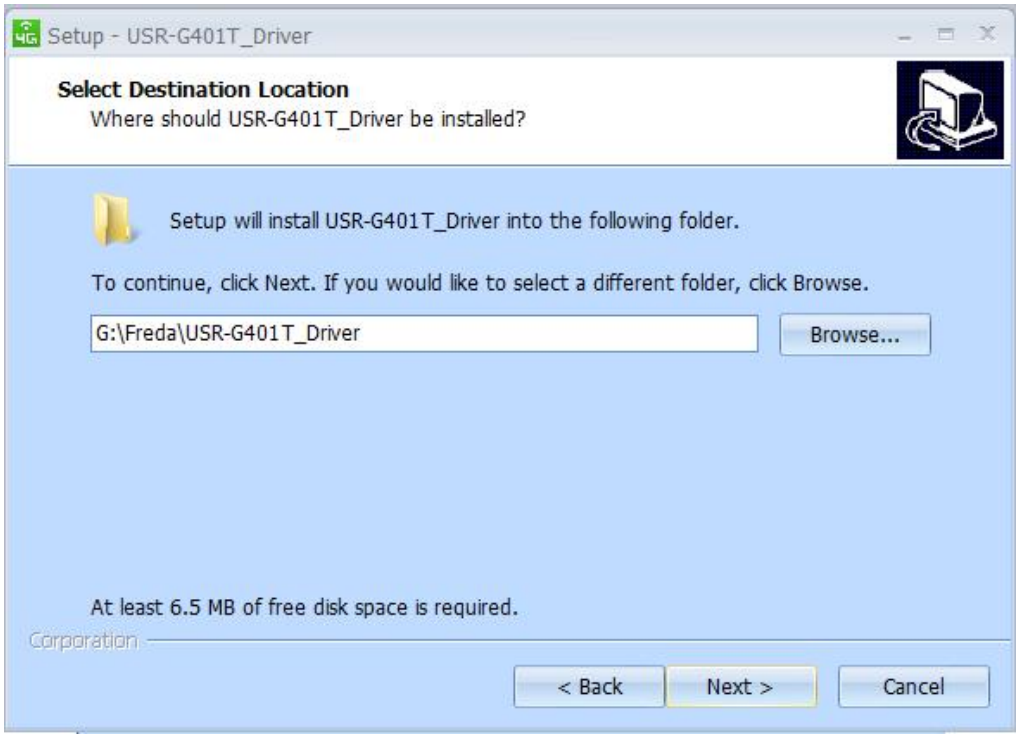
Please download driver from the link: http://www.usriot.com/p/4g-module-mpcie-interface/
Dual click USR-G402tf Driver to install:

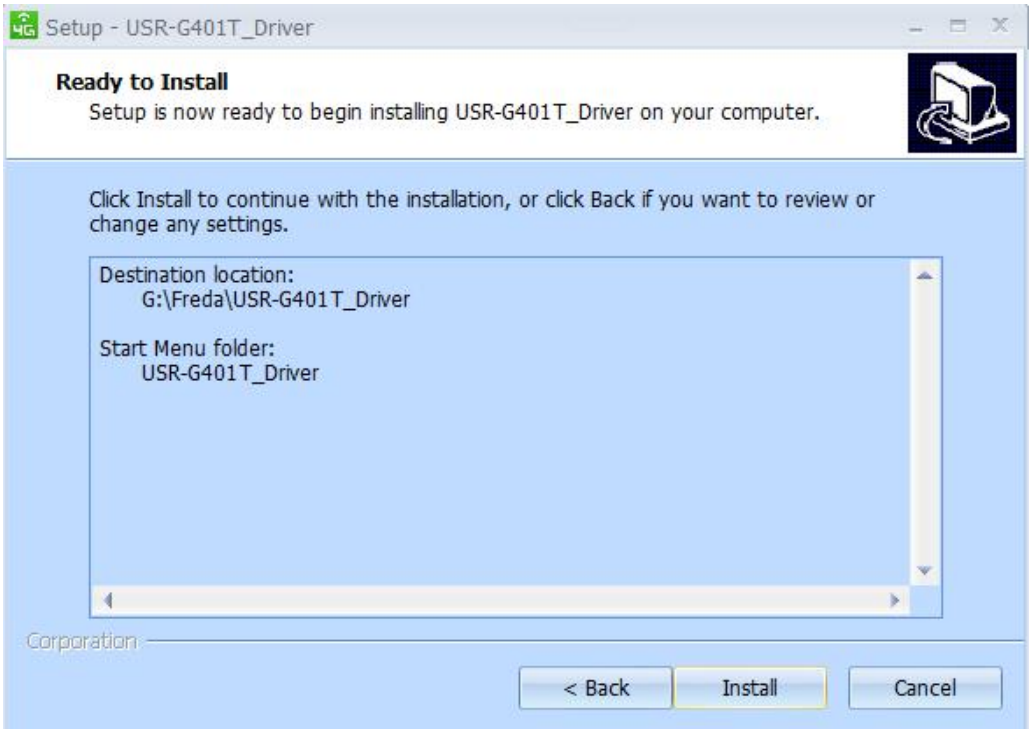
Select Language:



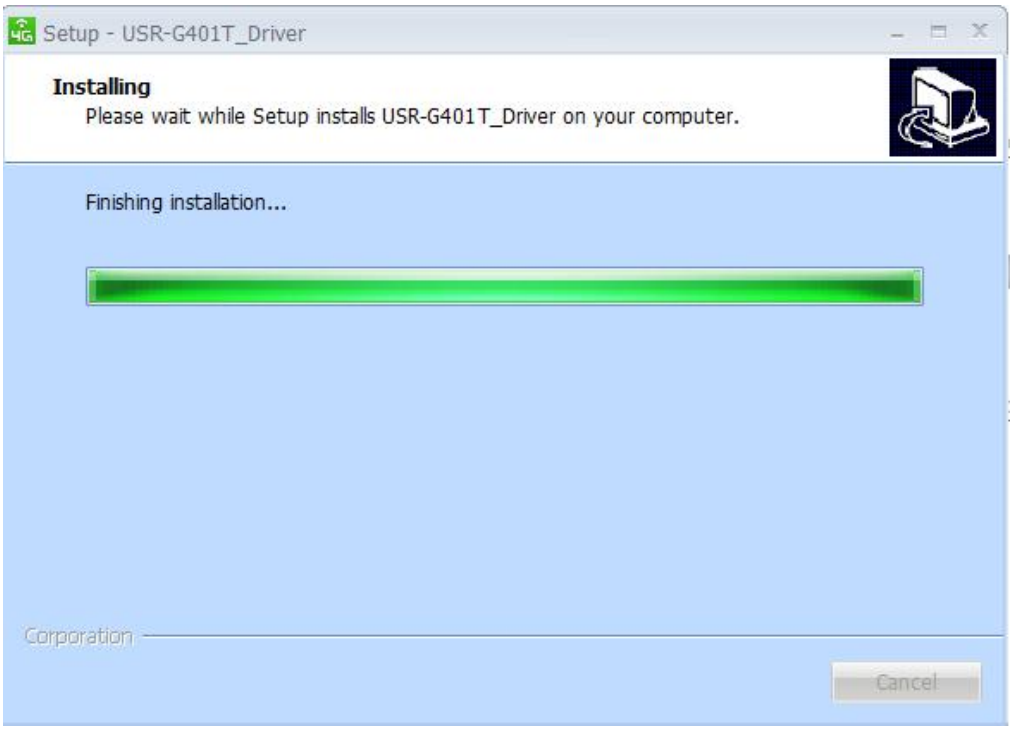


Click “Next” to choose file to save driver, all steps are as follows:



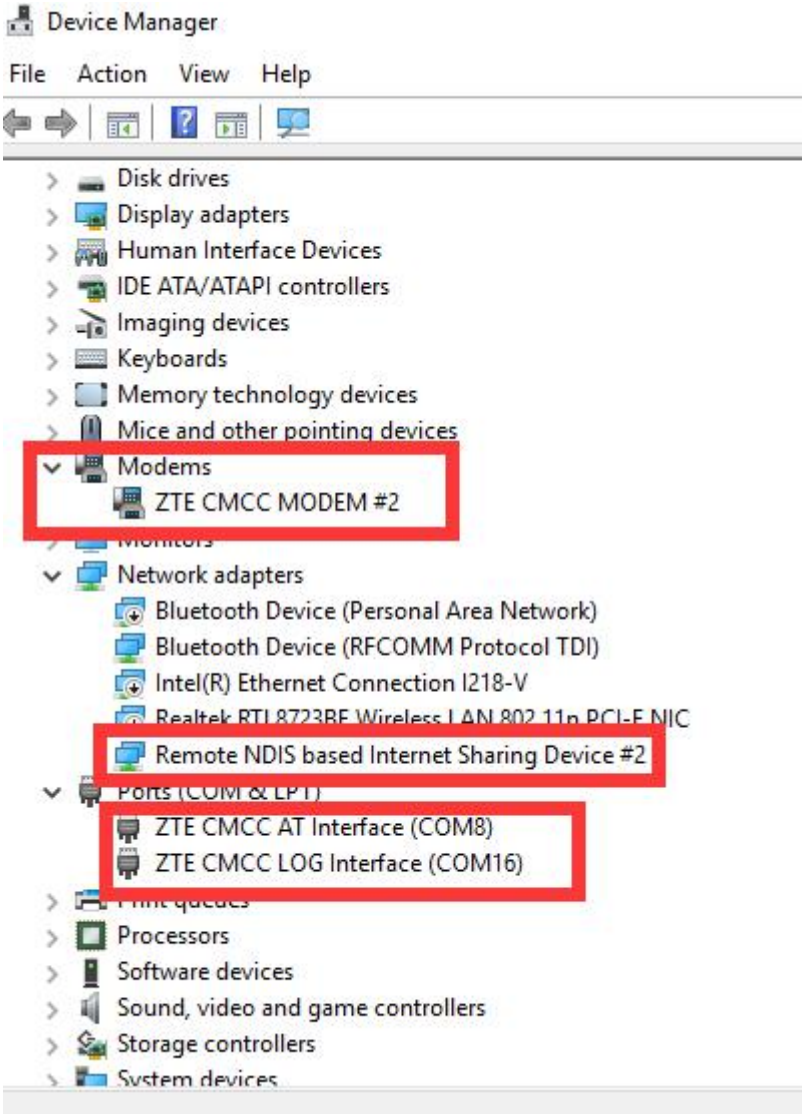


Setup succeeded,



1.4. Dial-up Connection

The following interface will show in the PC's Device Management once you install driver, such as:



<Note>:

► COM11 work as AT command port, which used for connect network by AT command

► Open terminal, select COM11, baud rate 115200, data bit 8, no parity, stop bit 1, no flow control

► Please execute the below command

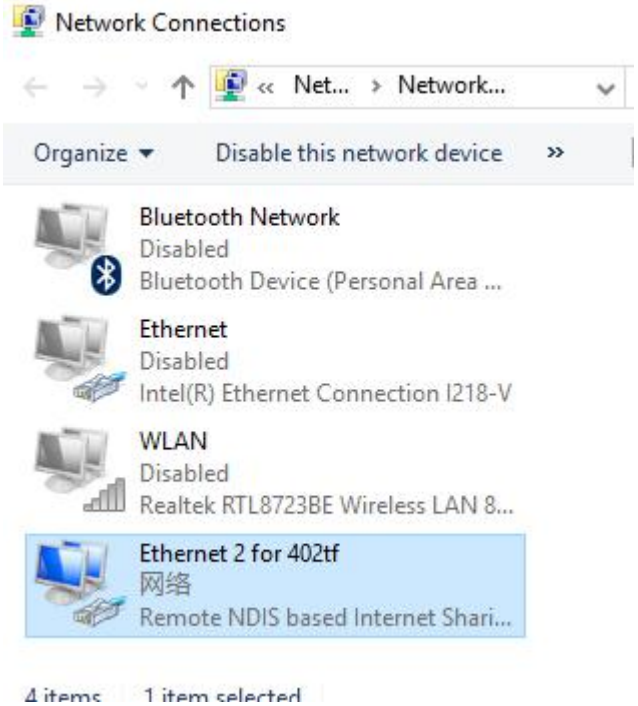
- ATE1 Set character echo
- AT^SYSCONFIG=2,6,1,2 Set module as 4G priority, LTE firstly and then TD at last for GSM; Configure it flexibly according to local signal situation.
- AT^SYSINFO Query if model succeed to register on 4G network。
- AT+CGACT=1,1 PDP context activation
- AT+ZGACT=1,1 Connect RNDIS link; Return +ZCONSTAT:1,1 show that network connected

```
+CEREG: 1
AT^SYSINFO
^SYSINFO: 2,4,0,17,1,,9

OK
AT+CGACT=1,1
OK

+ZGIPDNS: 1,1,"IP","10.218.179.17","0.0.0.0","211.137.191.26","218.201.96.130"
AT+ZGACT=1,1
OK
```

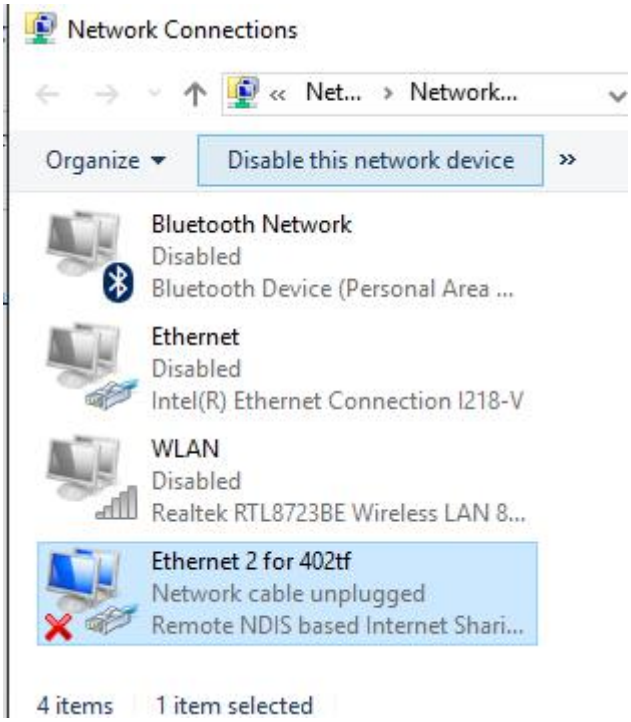
Note: When the last command succeeds, module has already connected to the internet

1.5. Network connected and Network disconnected

PC can access to internet via this card once you run the command AT+ZGACT=1,1



In the connected state, if you run command AT+XGACT=0,1 then the network will be disconnected



2. Product Overview

2.1. Brief Introduction

USR-G402tf is a kind of 4G wireless module, which provides the settlement for user's device connects to 4G/3G/2G network. Adopts technical grade high-performance built-in structure of the industry, possesses fairly high applicable advantage for data transmission fields of intelligent furniture, intelligent power grid, personal medical treatment and industrial control.

Adopt advanced highly integrated design, which embedded RF & base band into one PCB of 3*3 cm to achieve the function of wireless receiving, emission, base band signal and audio signal processing.

Support AT command extension which can realize the personalized solution.

2.2. Features

- 2G.3G/4G network is acceptable
- Support mPCIe or LCC hardware interface
- AT Command configuration
- Voice function
- SMS function
- Support data transmission

- Function of phone book
- Support USB Communication
- Can work on OS of Windows/Linux/Android

2.3. Parameters

Product Specification		
Item		Description
Name	USR G402tf	Support 2G/3G/4G network Mini PCI-E 52PIN module
Standard	TD-LTE	3GPP R9 CAT4 down speed 150 Mbps, up speed 50 Mbps
	FDD-LTE	3GPP R9 CAT4 down speed 150 Mbps，up speed 50 Mbps
	WCDMA	HSPA+ down speed 21 Mbps up speed 5.76 Mbps
	TD-SCDMA	3GPP R9 down speed 2.8 Mbps up speed 2.2 Mbps
	GSM	down speed 384 kbps up speed 128 kbps
Frequency	TD-LTE	Band 38/39/40/41
	FDD-LTE	Band 1/3
	WCDMA	Band 1/8
	TD-SCDMA	Band34/39
	GSM/GPRS/EDGE	Band 3/8
Power Level	TD-LTE Band38/39/40/41	+23dBm (Power class 3)
	FDD-LTE Band 1/3	+23dBm (Power class 3)
	WCDMA Band 1/8	+23dBm (Power class 3)
	TD-SCDMA Band34/39	+24dBm (Power class 2)
	GSM Band8	+33dBm (Power class 4)
	GSM Band3	+30dBm (Power class 1)
Software	Data Service	Dial-up via PPPD/RNDIS/ECM
	Voice Call	Support hard PCM voice
	SMS	Support PDU/TEXT message
	Phone book	Support phone book of SIM/USIM card
	USSD	Support
	TCP/IP Protocol	IPv4, IPv6, IPv4/IPv6
	OS	windows/linux/Android
Hardware	Interface type	Mini PCI-E 52PIN

Interface		LCC 80PIN
	Power	3.2V~4.2V, recommend 3.8V
	LED	Indicator light of module state
	SIM/USIM card	Standard 6 pin SIM card interface, 3V/1.8V SIM card
	USB Protocol	USB 2.0 High speed
	Size(mm)	51mm×30mm×5.15mm（MPCIE） 30mm×30mm×3.5mm（LCC）
	Weight (Kg)	0.11Kg
Power consumption	3G	460mA
	4G	556mA
Temp	Work Temp	-20C~ 70C
	Storage Temp	-40C ~ 85C
Humidity	Work Humidity	5%~95%

2.4. Power Consumption

2.5. Hardware Description

Pin definition of USR-G402tf-MPCIE:

PIN Definition				
Pin	**Pin Name**	**Description**	**I/O**	**Instruction**
1	WAKE#	Motherboard arouses module function signal, low level	I	/
2	VDD_PCIE	DC 3.8V	P	Range: 3.2V~4.2V
3	NC	/	/	/
4	GND	GND	/	/
5	NC	/	/	/
6	NC	/	/	/
7	NC	/	/	/
8	VSIM_1V8_3V0	Power supply of SIM/USIM card	P	DC 1.8V/3.0V
9	GND	GND	/	/
10	SIM_DATA	Data signal of SIM/USIM card	B	/
11	NC	/	/	/
12	SIM_CLK	Clock signal of SIM/USIM card	O	/
13	NC	/	/	/
14	SIM_RST	Reset signal of SIM/USIM	O	/

15	GND	GND	/	/
16	NC	/	/	/
17	NC	/	/	/
18	GND	GND	/	/
19	NC	/	/	/
20	AP_WAKEUP_MODULE	Motherboard arouses module function signal	I	
21	GND	GND	/	/
22	DBB_RST_N	Motherboard gives hard reset signal to module, low level reset	I	/
23	NC	/	/	/
24	NC	/	/	/
25	NC	/	/	/
26	GND	GND	/	/
27	GND	GND	/	/
28	NC	NC	/	/
29	GND	GND	/	/
30	NC	/	/	/
31	NC	/	/	/
32	NC	/	/	/
33	NC	/	/	/
34	GND	GND	/	/
35	GND	GND	/	/
36	USB_D-	Differential signal of USB	B	USB2.0
37	GND	GND	/	/
38	USB_D+	Differential signal of USB	B	USB2.0
39	NC	/	/	/
40	GND	GND	/	/
41	NC	/	/	/
42	LED_WWAN#	LED status indicator	/	Module status
43	GND	GND	/	/
44	/	/	/	/
45	/	/	/	/
46	/	/	/	/
47	/	/	/	/
48	/	/	/	/
49	UART_RXD	Serial port received	I	1.8V
50	GND	GND	/	/
51	UART_TXD	Serial port transmitted	O	1.8V
52	VDD_PCIE	DC 3.3V	P	Range: 3.2V~4.2V

Pin definition of USR-G402tf-LCC:

NO	Signal Definition	Voltage	I/O	PIN Attribute
21	GND			Ground
22	VDD_MAIN	3.4-5V	P	Power supply for MODULE
23	USB_DM			USB data signal D-
24	USB_DP			USB data signal D+
25	USB_STROBE	1.2V		HSIC interface
26	USB_DATA	1.2V		HSIC interface
27	WIFI_RESET_KEY	1.8V	O	WIFI RESET KEY
28	WIFI_WPS	1.8V	O	WIFI WPS KEY
29	LCD_RESET_N	1.8V	O	LCD RESET signal
30	POWERON_FROM_CHARGER	1.8V	I	Charger on signal
31	GND			Ground
32	SPI_MISO_DATA	1.8V	I	SPI interface
33	SPI_MOSI_DATA	1.8V	O	SPI interface. Main output, slave input
34	SPI_CLK	1.8V	O	SPI clock
35	SPI_CS_N	1.8V	O	SPI segment
36	GND			Ground
37	UIM_CLK	1.8/3.0V	O	UIM clock
38	UIM_DATA	1.8/3.0V	I/O	UIM data
39	UIM_RST	1.8/3.0V	O	UIM reset
40	VREG_RUIM	1.8/3.0V	P	Power supply for UIM
61	GND			Ground
62	MAIN_ANT		RF	MAIN antenna interface
63	GND			Ground
64	GPIO3	1.8V	I/O	General input/output
65	GPIO4	1.8V	I/O	General input/output
66	GPIO5	1.8V	I/O	General input/output
67	UART1_RXD	1.8V	I	UART1 Receive Data
68	UART1_TXD	1.8V	O	UART1 Transmit Data
69	WWAN_STATE	1.8V	O	Module working status output signal
70	LED_MODE	1.8V	O	Module status indicator, GPIO type
71	WAKEUP_OUT	1.8V	O	output Wakeup signal
72	WAKEUP_IN	1.8V	I	Sleep/wakeup control
73	I2C_SCL	1.8V	O	I2C serial clock
74	I2C_SDA	1.8V	I/O	I2C serial data
75	GPIO6	1.8V	I/O	General input/output
76	GPIO7	1.8V	I/O	General input/output
77	GPIO8	1.8V	I/O	General input/output
78	GND			Ground
79	DIV_ANT		RF	Diversity antenna interface

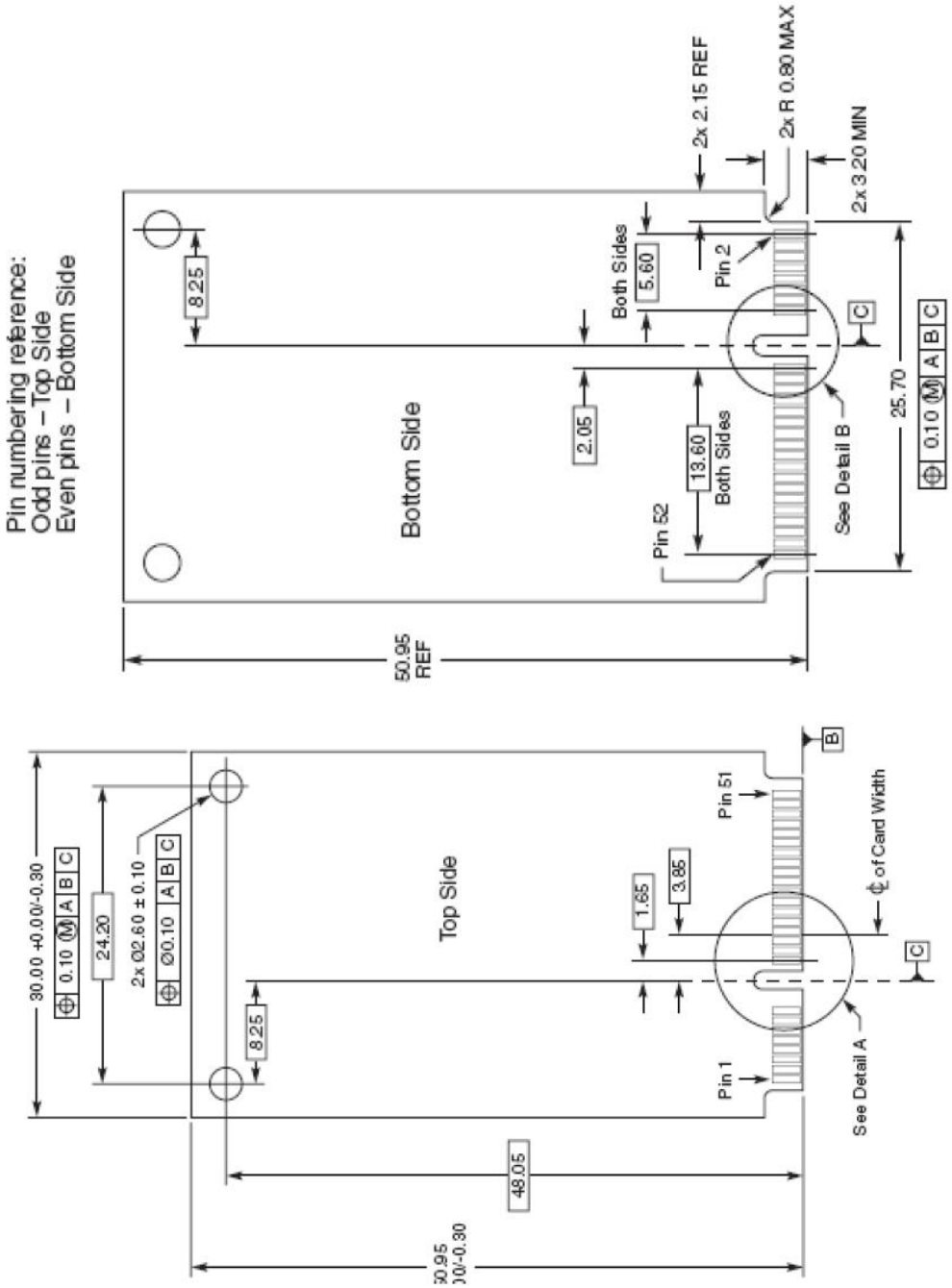
LGA:

NO	Signal Definition	Voltage	I/O	PIN Attribute
1	POWER_ON_KEY	1.8V	I	Power on/off signal
2	RESET_N	1.8V	I	System reset signal
3	GND			Ground
4	POWER_ON_TOBB	1.8V	I	Power on key signal to cpu
5	VREF_1V8	1.8V	P	SMPS output for external Circuit, such as level shift circuit.
6	CODEC_CLK		AO	CODEC CLOCK 26M
7	GPIO1	1.8V	I/O	General input/output
8	GPIO2	1.8V	I/O	General input/output
9	GND			Ground
10	CLK_32K_OUT		AO	32.768K CLOCK
11	GND			Ground
12	SD_DETECT	1.8V	I	SD card detect
13	VREF_SD	2.95V	P	SD POWER
14	SD_CMD	2.95V	O	SDIO control signal
15	SD_DATA0	2.95V	I/O	SDIO0 data signal
16	SD_DATA1	2.95V	I/O	SDIO0 data signal
17	SD_DATA2	2.95V	I/O	SDIO0 data signal
18	SD_DATA3	2.95V	I/O	SDIO0 data signal
19	SD_CLK	2.95V	O	SDIO0 clock signal
20	GND			Ground
41	UIM_DETECT	1.8V	I	UUIM detect
42	PCM_DOUT	1.8V	O	PCM data output
43	PCM_DIN	1.8V	I	PCM data input
44	PCM_CLK	1.8V	O	PCM Clock
45	PCM_SYNC	1.8V	O	PCM interface sync
46	GND			Ground
47	ADC2 0-VCC		AI	analog to digital
48	ADC1 0-VCC		AI	analog to digital
49	GND			Ground
50	VDD_MAIN	3.8V	P	Power supply voltage
51	VDD_MAIN	3.8V	P	Power supply voltage
52	GND			Ground
53	SD1_CMD	1.8V	O	SDIO1 control signal
54	SD1_DATA0	1.8V	I/O	SDIO1 data signal
55	SD1_DATA1	1.8V	I/O	SDIO1 data signal
56	SD1_DATA2	1.8V	I/O	SDIO1 data signal
57	SD1_DATA3	1.8V	I/O	SDIO1 data signal
58	SD1_CLK	1.8V	O	SDIO1 clock signal
59	WIFI_CHIP_EN	1.8V	O	WIFI CHIP EN
60	WIFI_WAKEUP_HOST	1.8V	I	WIFI WAKE UP HOST

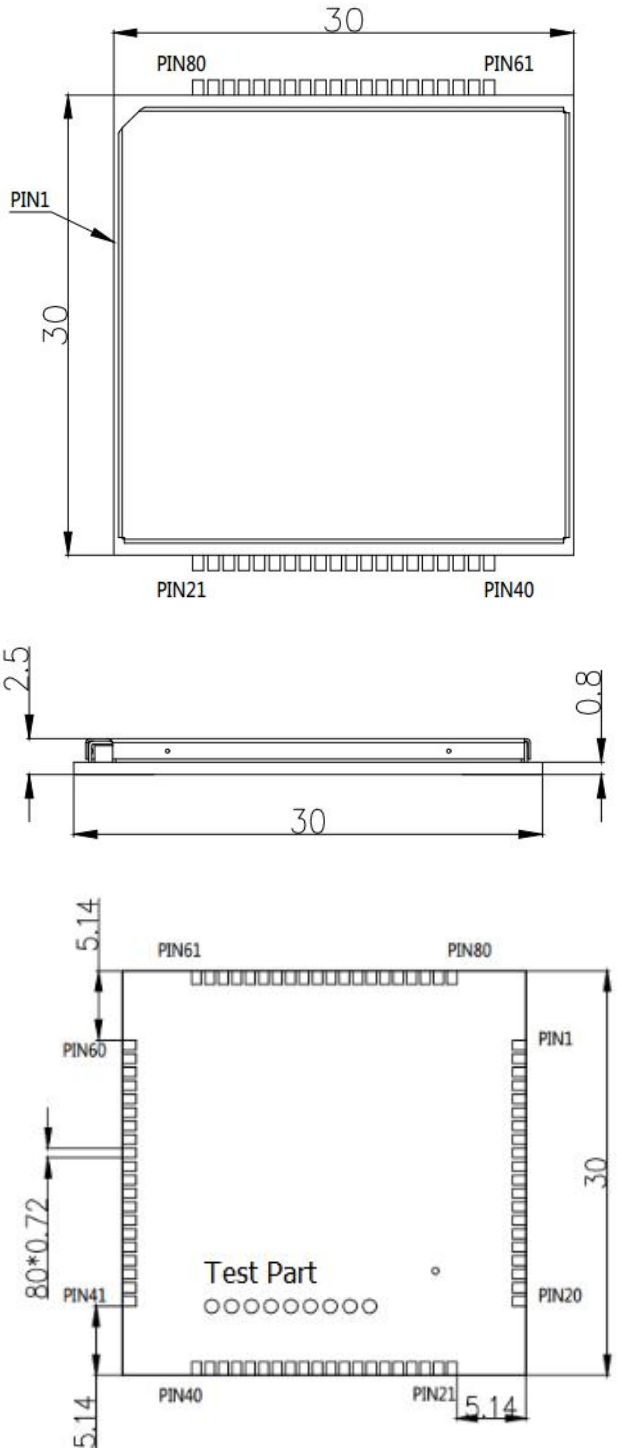
2.6. Size

The size of USR-G402tf as follows:

MPCIE Interface:



Size Picture

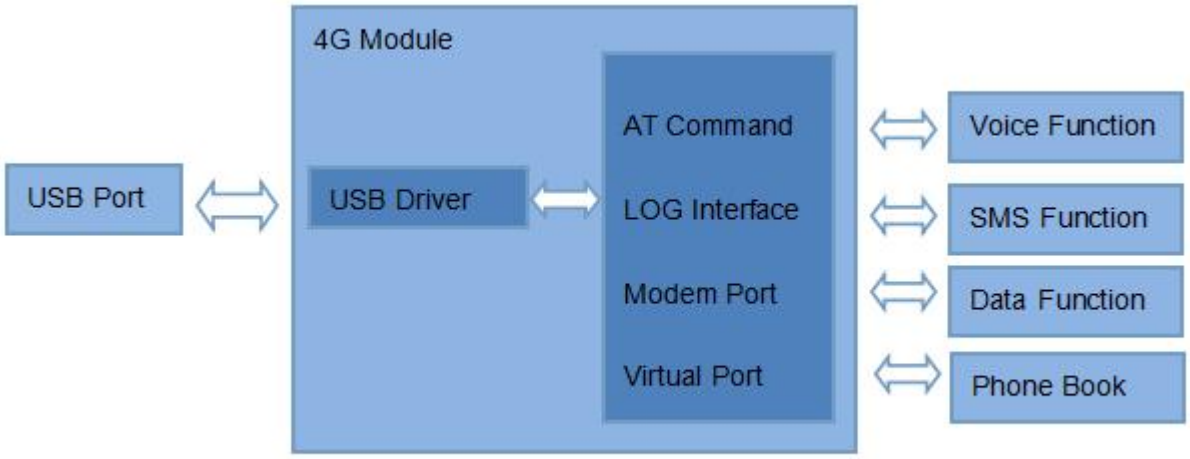


2.7. Product type

Item	Interface
USR-G402tf-LCC	LLC Interface
USR-G402tf-MPCIE	MPCIE Interface

3. Product Function

This chapter introduces USR-G402tf possessed functions, module function:



3.1. Voice Function

Table 1 Voice Function Instruction

Item	Description
Phone call out/Emergency Call	Voice is input/output through voice circuit directly after dial-up
Call in	Voice is input/output through voice circuit after answer
Caller ID display	Display caller ID for calling in
Re-dial	Re-dial the last dialed number
Call History/Call out record/Missed call record	
Telephone Book	

3.2. Message Function

Table 2 Message Function Instruction

Item	Description
Group SMS (Mass Texting)	Can send 50 numbers
Message forwarding	Forward the received message to other numbers
Message replying	Reply the received message to source number
Message storage/Delete	Save/Delete the received message
SMS automatic distribution	Message will be distributed automatically once beyond 160 ASCII

3.3. Data Function

Table 3 Data Function Instruction

Item	Description
Internet record	Record on-line time of historical internet, uploading and downloading traffic statistics
Internet speed display	Constantly refresh the present internet speed according to network situation
Internet traffic display	Display the current uploading and downloading traffic
Internet traffic statistics	Statistics of the internet traffic for this time

4. Setting Method

4.1. AT command configuration

USR-G402tf module has a variety of word modes.

► Using on Windows system, the premise is +ZNCARD=0
► Using on Linux system, the premise is +ZNCARD=1
► AT command can be used only after run drive.
► Have to restart module after run AT+ZNCARD=0/1
► AT command of restart is AT+RESET
► If the work mode is incorrect, even if there is COM port in device management of Windows, it can't be opened. You have to change work mode as Linux

Partial command list:

AT Command	Description
ATE1	Open echo function
AT^SYSCONFIG=2,6,1,2	Set 4G network as priority
AT^SYSINFO	Query if registered to 4G network
AT+CGACT=1,1	PDP context activation
AT+ZGACT=1,1	Connect RNDIS link
AT+ZGACT=0,1	Disconnection

Detailed AT command please refer to < AT command Assemblage.

5. Contact

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