Orbic 4G Module

User Manual
FCC ID: 2ABGH-RC101ML

Revision 0.1

November 8, 2021

Doc Title	Orbic 4G Module Datasheet	Number	2021110801
		Version	0.1

<u>HISTORY</u>

Version	Date	Description
0.1	11/8/2021	Initial version release

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1. Overview

Orbic 4G Module is a 4G universal module, can be used for MIFI, notebook and other products. It integrates the low power Qualcomm SDX12 application processor that is designed for the 4G Module..

The SDX12 uses the 14 nm process for lower active power dissipation and faster peak CPU performance. It includes a 1.28 GHz Cortex-A7 application processor and a 1 GHz Qualcomm® Hexagon™ DSP 6 modem processor.

1.1. Parameter

Type	Items	Performance
Hardware	Working Voltage	3.6-4.2V
	Working Current	200 ~ 650mA
	Standby Current	8mA
	Operating Ambient Temperature	-10℃ ~ 60℃
	Storage Temperature	-20℃ ~80℃

2. Hardware Description

2.1. Description of Hardware Interface

Orbic 4G Module provides 4 RF connectors for external antenna connection. As shown in Figure 2-1, "1" is the RF main antenna, which is used for receiving and receiving RF signals. "4" is the Diversity antenna for receiving the Diversity radio signals. "2" is the B48 main antenna, which is used for receiving and receiving B48 RF signals. "3" is the B48 Diversity antenna for receiving the Diversity radio signals.

P. 2-1

Document No.: WMB202106
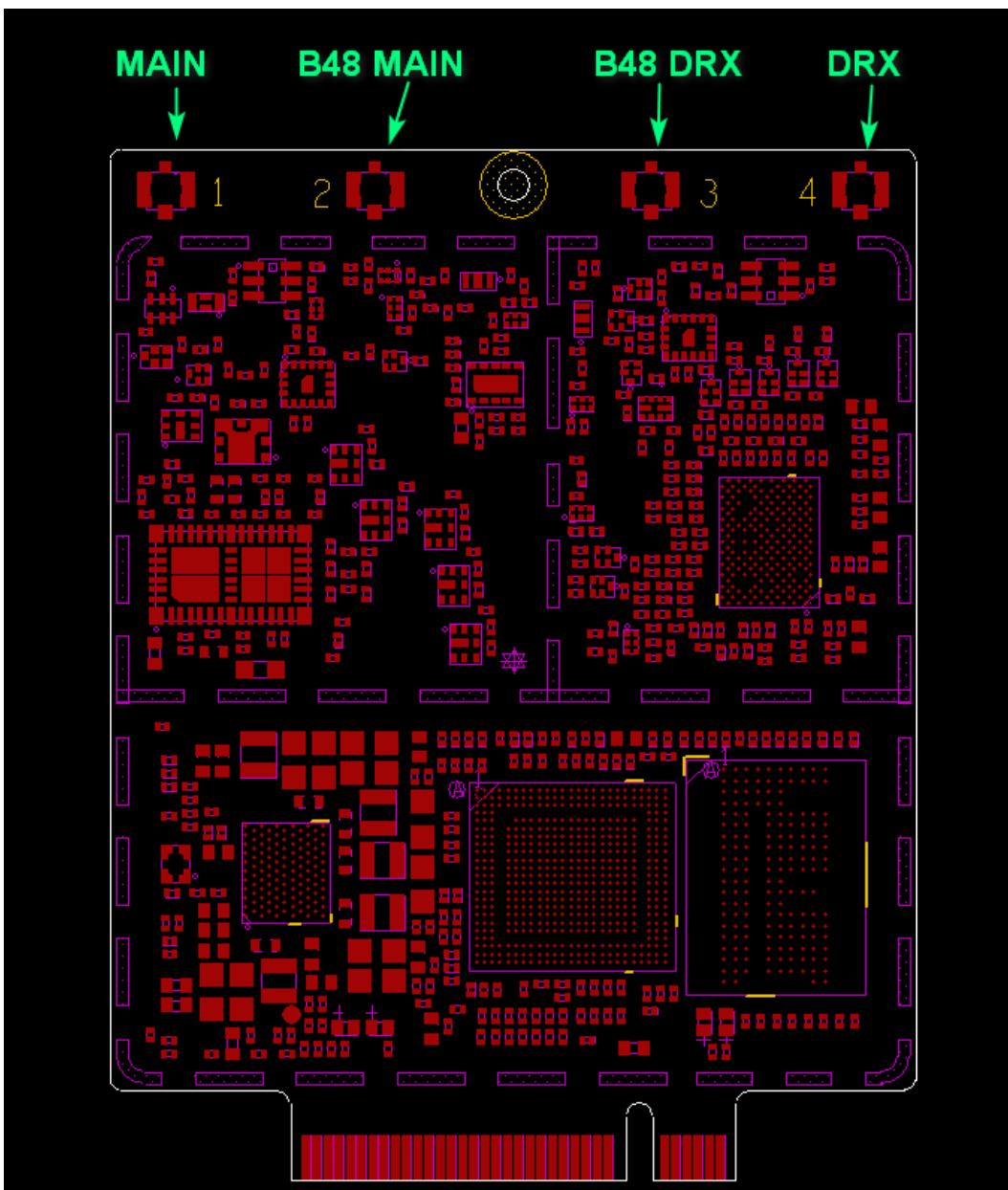
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BAND	MAIN	DRX	B48 MAIN	B48 DRX
LTE TRX: B2/4/5/7/12/13/14/17/25/26/29/41/66/71 WCDMA TRX: B2/4/5	√			
LTE DRX: LTE: B2/4/5/7/12/13/14/17/25/26/29/41/66/71 WCDMA DRX: B2/4/5		√		
B48 TRX: B48			√	
B48 DRX: B48				√

P 2--2 RF Antenna distribution table

2.2 Pin Description.

The following figures is the PIN identification of the module:
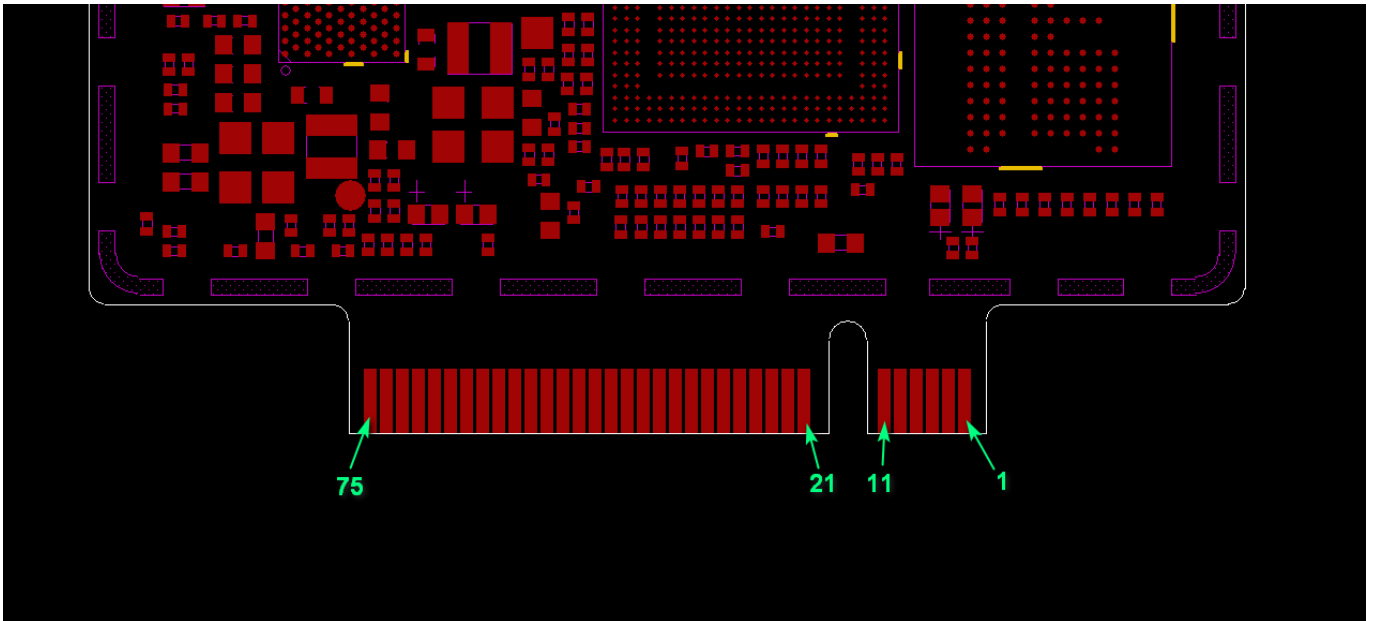
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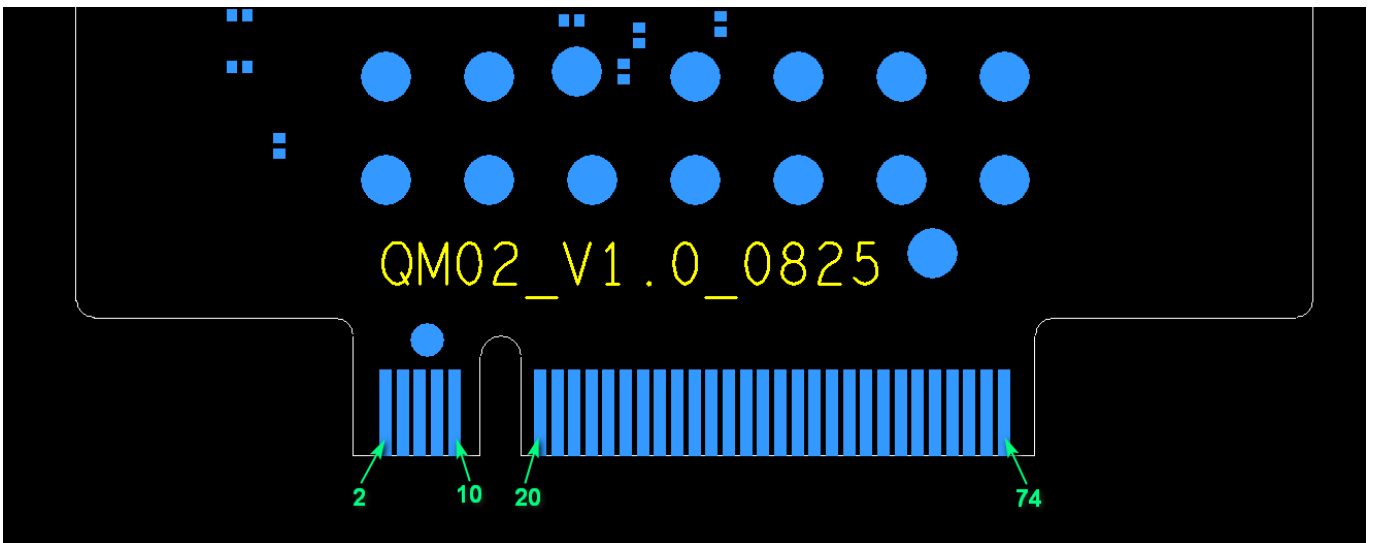
P.2-2-2

Pin Description:

PIN#	PIN name	I/O	Reset Value	PIN description	characterist.
1	CONFIG_3	O	NC	NC，Module internal configuration。	1.8V
2	VCC	PI	-	Power input	Power
3	GND	-	-	GND	Power
4	VCC	PI	-	Power input	Power
5	GND	-	-	GND	Power
6	NC	-	-	-	
7	USB D+	I/O	-	USB 2.0 data +	0.3-3V
8	GPIO_85	I	PU	reserve	
9	USB D-	I/O	-	USB2.0 data -	0.3-3V
10	GPIO_4	O	T	NA	CMOS 1.8V
11	GND	-	-	GND	Power
12	Notch	-	-	Notch	-
13	Notch	-	-	Notch	-
14	Notch	-	-	Notch	-
15	Notch	-	-	Notch	-
16	Notch	-	-	Notch	-
17	Notch	-	-	Notch	-
18	Notch	-	-	Notch	-
19	Notch	-	-	Notch	-
20	GPIO_6	O	PU	reserve	
21	CONFIG_0	-	NC	NC	-
22	GPIO_7	I	PU	reserve	
23	M2_WOWWAN_N	O	PD	NA	CMOS 1.8V
24	GPIO_18	O	PU	reserve	

PIN#	PIN name	I/O	Reset Value	PIN description	characterist
25	M2_DPR	I	PU	reserve	CMOS 1.8V
26	M2_W_DISABLE 2#	I	PU	reserve	CMOS 1.8V
27	GND	-	-	GND	Power
28	GPIO_68	O	PU	reserve	
29	USB_SS -TX-	O	-	USB3.0 reserve	-
30	UIM1_RESET	O	L	SIM 1	CMOS 1.8V
31	USB_SS -TX+	O	-	USB3.0 reserve	-
32	UIM1_CLK	O	L	SIM 1	CMOS 1.8V
33	GND	-	-	GND	Power
34	UIM1_DATA	I/O	L	SIM 1	CMOS 1.8V
35	USB_SS-RX -	I	-	USB3.0 reserve	-
36	UIM1_PWR	PO	-	SIM 1	CMOS 1.8V
37	USB_SS-RX+	I		USB3.0 reserve	-
38	NC	-	-	-	-
39	GND	-	-	GND	Power
40	SIM2_DETECT	I	PU	SIM 2	CMOS 1.8V
41	PCIE_TX0_M	O	-	PCIe	-
42	UIM2_DATA	I/O	L	SIM 2	CMOS 1.8V
43	PCIE_TX0_P	O	-	PCIe	-
44	UIM2_CLK	O	L	SIM 2	CMOS 1.8V
45	GND	-	-	GND	Power
46	UIM2_RESET	O	L	SIM 2	CMOS 1.8V
47	PCIE_RX0_M	I	-	PCIe	-

PIN#	PIN name	I/O	Reset Value	PIN description	characteristi
48	UIM2_PWR	PO	-	SIM 2	CMOS 1.8V
49	PCIE_RX0_P	I	-	PCIe	-
50	PCIE_RST_N	I	PD	PCIe	CMOS 1.8V
51	GND	-	-	GND	Power
52	PCIE_CLKREQ_N	I/O	T	PCIe	CMOS 1.8V
53	PCIE_REFCLK_M	I	-	PCIe	-
54	PXIE_WAKE_N	O	T	PCIe	CMOS 1.8V
55	PCIE_REFCLK_P	I	-	PCIe	-
56	ANTCTL1	O	PD	Antenna switch	CMOS 1.8V
57	GND	-	-	GND	Power
58	ANTCTL2	I/O	PD	Antenna switch	CMOS 1.8V
59	GPIO_43	O	PU	reserve	
60	WLAN_TX_EN	I	-	WLAN switch	CMOS 1.8V
61	GPIO_17	O	PU	reserve	
62	COEX_UART_RX	I	PD	WiFi/BT UART	CMOS 1.8V
63	NC	O	-	-	CMOS 1.8V
64	COEX_UART_TX	O	PD	WiFi/BT UART	CMOS 1.8V
65	NC	O	-	-	CMOS 1.8V

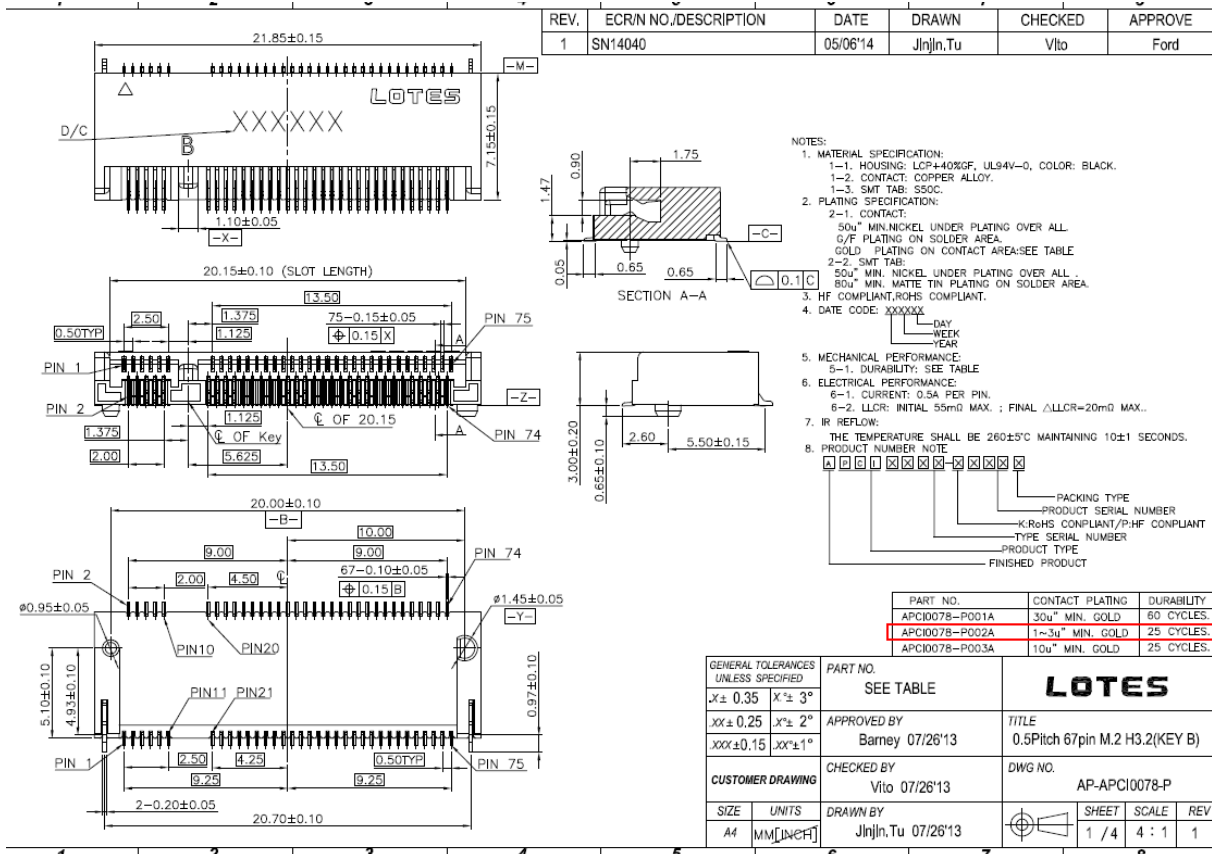| PIN#	PIN name	I/O	Reset Value	PIN description	characteristi
66	SIM_DETECT	I	PU	SIM 1	CMOS 1.8V
67	M2_RESET_N	I	PU	Module reset	CMOS 1.8V
68	FORCE_USB_BOOT			Download mode switch	CMOS 1.8V
69	CONFIG_1	O	GND	NC，	-
70	VCC	PI	-	VCC	Power
71	GND	-	-	GND	Power
72	VCC	PI	-	VCC	Power
73	NC	-	-	-	
74	VCC	PI	-	VCC	Power
75	CONFIG_2	O	NC	NC	

Reset Value：

- H：High level
- L：Low level
- PD：pull down
- PU：pull up
- T： Hi-Z。
- OD：Open drain
- PP：Push-Pull
- PI：Power in
- PO：Power out

2.3 Mechanical Dimension

Module has the dimension of 46mm x 36mm. The detailed layout will be given shortly below. Unit: mm
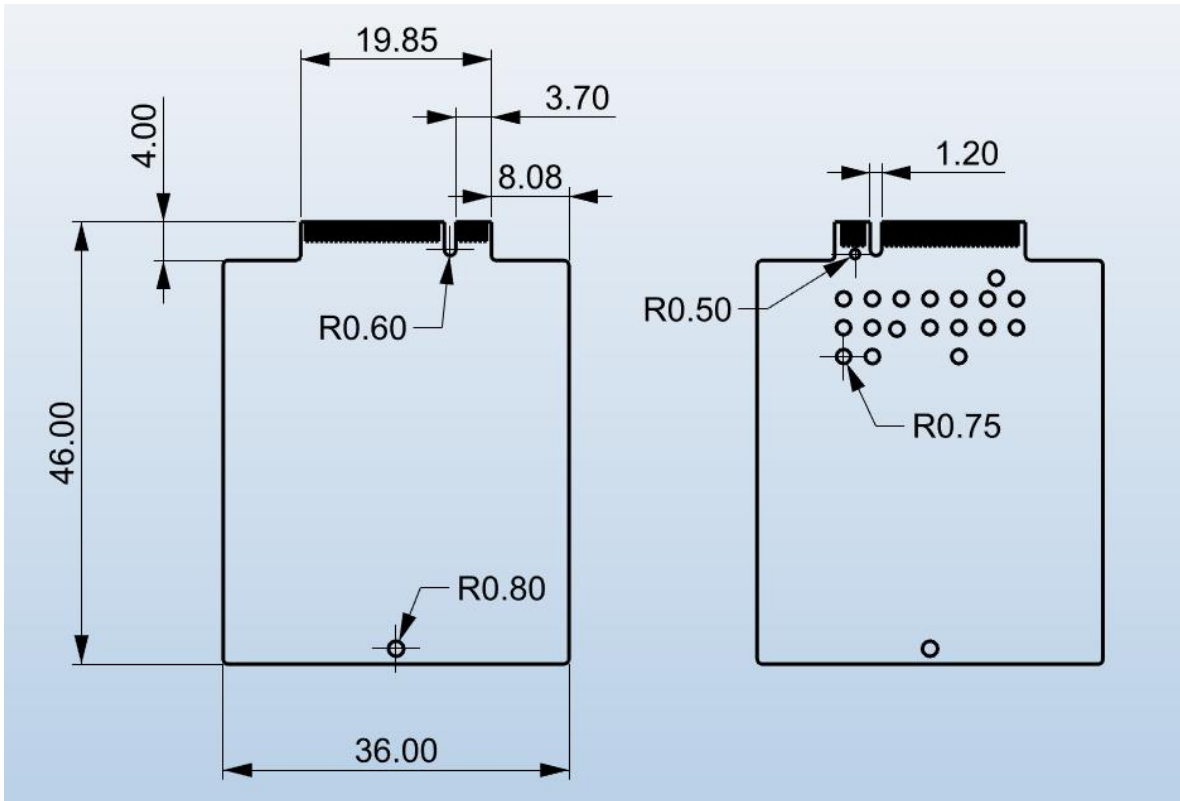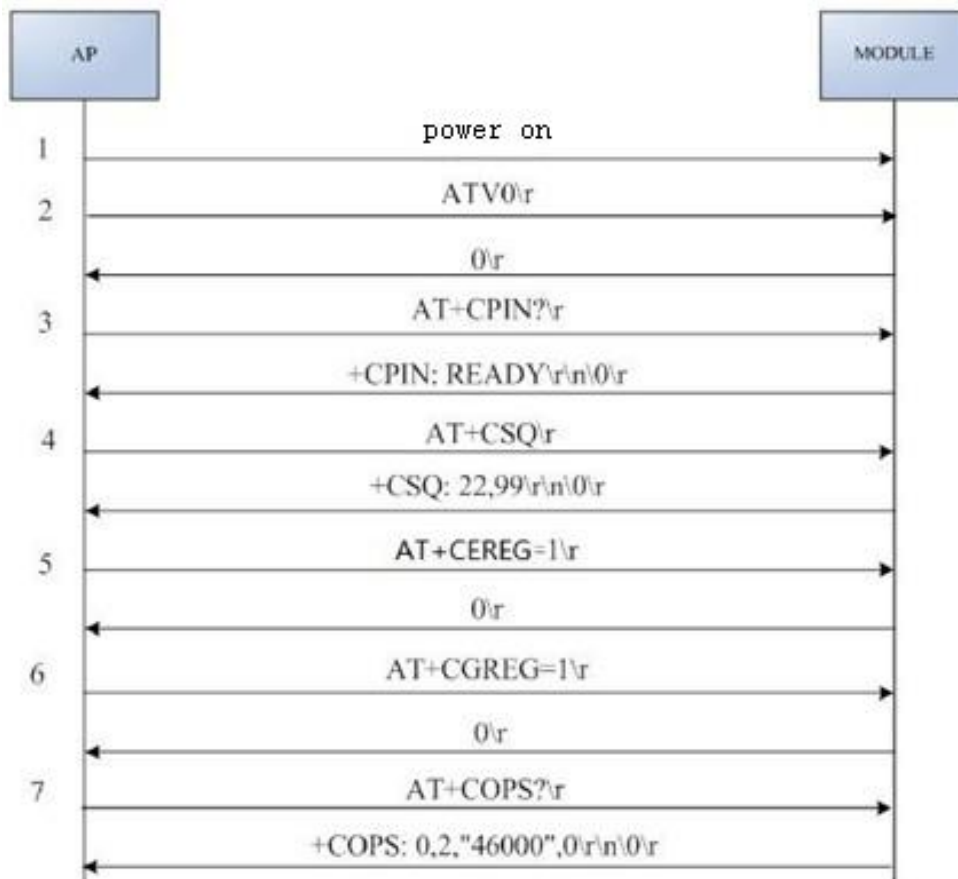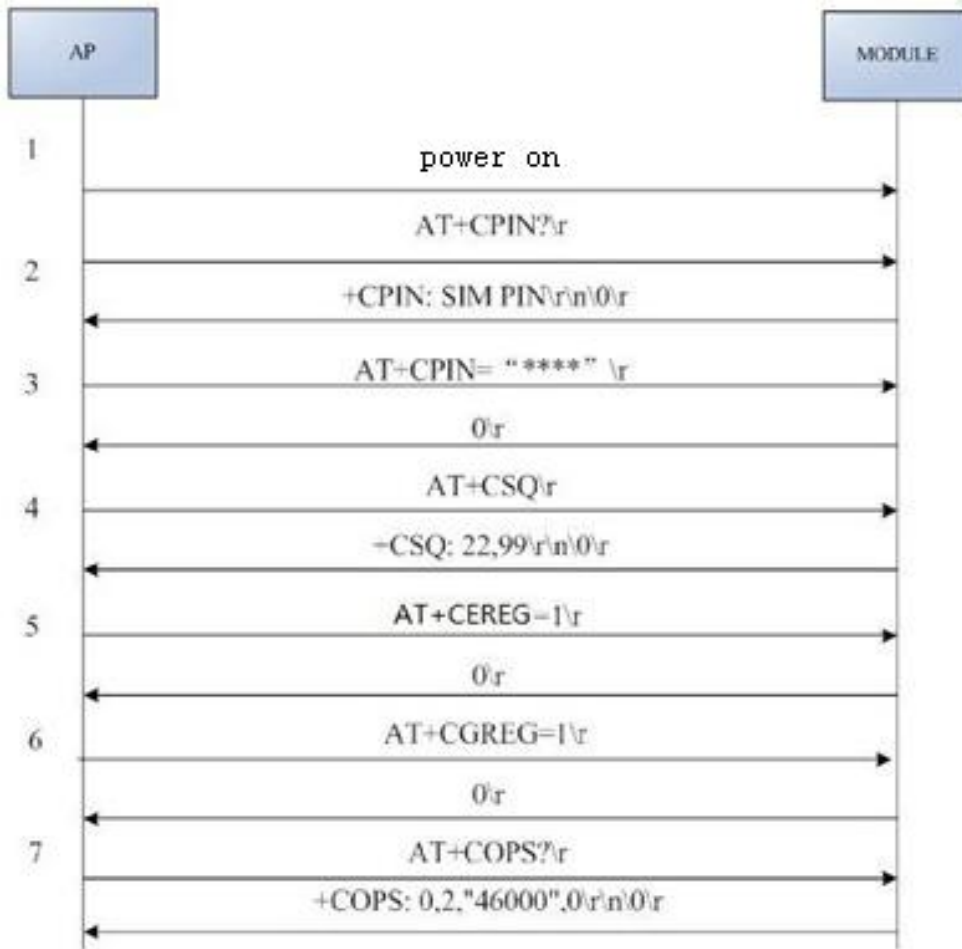

PLUG PCB dimensions:

1. Software Introduction

1.Normal power on

2. PIN code needed power on

AP → MODULE

1. power on
   AT+CPIN?\r
2. AT+CPIN?\r
   +CPIN: SIM PIN\r\n\0\r
3. AT+CPIN= "****" \r
   0\r
4. AT+CSQ\r
   +CSQ: 22,99\r\n\0\r
5. AT+CEREG=1\r
   0\r
6. AT+CGREG=1\r
   0\r
7. AT+COPS?\r
   +COPS: 0,2,"46000",0\r\n\0\r

2. Module Environmental and Package

2.1. Environmental Ratings

The environmental ratings are shown as following table.

Characteristic	Value	Units	Conditions/Comments
Storage Temperature	−20 ~ 80	℃	
Relative humidity	Less than 60	%	Storage
	Less than 80	%	Operation

2.2. Electrostatic Discharge Specifications

Extreme caution must be exercised to prevent electrostatic discharge (ESD) damage. Proper use of wrist and heel grounding straps to discharge static electricity is required when handling these devices. Always store unused material in its antistatic packaging.

ESD Specifications

Type	Symbol	Condition	ESD Rating	Unit
ESD Handling	ESD_HAND_HBM	Human Body Model Contact Discharge per JEDEC EID/JESD22-A114	1000	V
Machine Model (MM)	ESD_HAND_MM	Machine Model Contact	30	V
CDM	ESD_HAND_CDM	Charged Device Model Contact Discharge per JEDEC EIA/JESD22-C101	300	V

3. Ordering Information

Table 5-1 Part Ordering Information

Part Number	Package	Description	Remark

4. FCC Information

RF Exposure Information: To maintain compliance with FCC RF exposure requirements, use the product that maintain a 20cm separation distance between the user's body and the host.

FCC statements:

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

undesiredoperation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by

unauthorizedmodifications or changes to this equipment. Such modifications or changes could void the

user's authority tooperate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device,

pursuantto part 15 of the FCC Rules. These limits are designed to provide reasonable protection against

harmfulinterference in a residential installation. This equipment generates uses and can radiate radio

frequency energyand, 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. Ifthis equipment does cause harmful interference to radio or television reception, which can

be determined byturning the equipment off and on, the user isencouraged to try to correct the

interference by one or more of thefollowing 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 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. 2. The transmitter module may not be co-located with any other transmitter or antenna. As long as the two conditions above are met, additional transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required for the installed module.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Federal Communications Commission of the U.S. Government (FCC) and the Canadian Government authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator shall be responsible for re-evaluating the end-product (including the transmitter) and obtaining a separate FCC authorization in the U.S. and Canada.

OEM Integrators - End Product Labeling Considerations:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains, FCC ID: 2ABGH-RC101ML". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

OEM Integrators - End Product Manual Provided to the End User:

The OEM integrator shall not provide information to the end user regarding how to install or remove this RF module in end product user manual. The end user manual must include all required regulatory information and warnings as outlined in this document.