EC200A_M.2_通信板规 格说明及使用指导手册

EC200A_M.2_Communication board Specification and User manual

简介： EC200A_M.2_通信板规格说明及使用指导手册

Introduction：EC200A_M.2_Communication board Specification and User manual

声明 Statement

《EC200A_M.2_通信板规格说明及使用指导手册》(以下简称本手册) 仅适用于搭载移远 CAT4 模组EC200A 进行二次开发的通信板。

EC200A_M.2_Communication board Specification and User manual (hereinafter referred to as this manual) is only applicable to the Dongle core board equipped with Quectel CAT4 Module EC200A series for secondary layout.

目录 Contents

1、关于本文档 About the document

1.1 、修订历史 Revision History

版本Version	修订人Reviser	日期 Date	修订内容Revised content
V1.0	Bruce	2021-09-03	创建文件 Create a file
V1.1	Bruce	2021-10-07	修改连接器规格 Modify the specification of connector
V1.2	Bruce	2022-01-12	更新版本，修改插图 Updated version, modified illustration
V1.3	Bruce	2022-03-15	更新产品规格及注意事项 Update product specifications and attentions
V1.4	Bruce	2022-09-13	更新产品定义 Update product definition

2、关于主模组 About main module

EC200A 系列是移远通信专为M2M和IoT领域设计的LTE Cat 4 无线通信模块，采用3GPPRel. 9 LTE 技术，支持最大下行速率150 Mbps 和最大上行速率50 Mbps。同时，EC200A系列在封装上兼容移远通信的多网络制式LTE Standard EC25 系列、EC21 系列、EC20-CE、EG25-G、EC200D-CN、EC200U 系列、EC200N- CN 和UMTS/HSPA+ UC200T 系列模块，实现了从3G 网络向4G 网络的轻松平滑过渡。

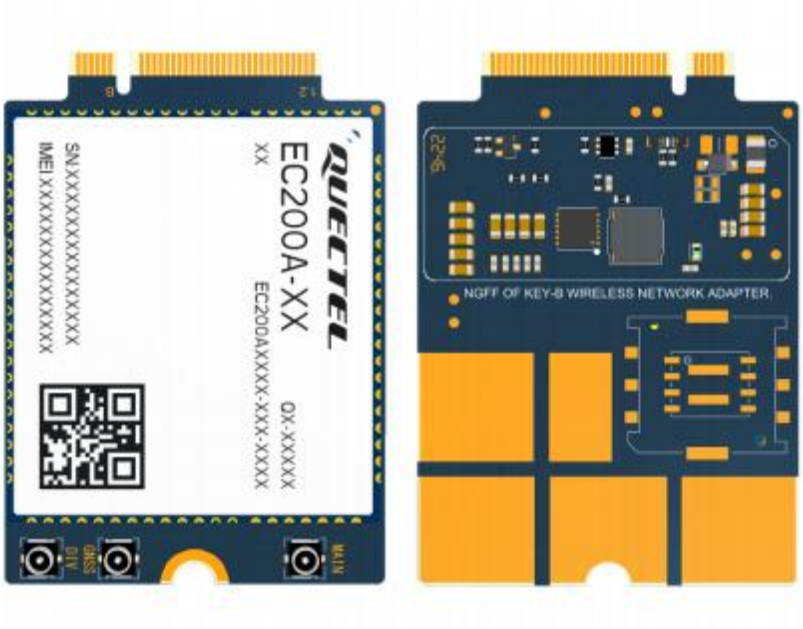
The EC200A series is an LTE Cat 4 wireless communication module designed for the M2M and IoT fields. It uses 3GPPRE.9 LTE technology and supports a maximum downlink rate of 150 Mbps and a maximum uplink rate of 50 Mbps. Meanwhile, EC200A series is compatible with multi-network Standard LTE EC25 series, EC21 series, EC20-CE, EG25-G, EC200D-CN, EC200U series, EC200N-CN and UMTS/HSPA+ UC200T in package Series module, to achieve an easy and smooth transition from 3G network to 4G network.

EC200A系列内置丰富的网络协议， 集成多个工业标准接口，并支持多种驱动和软件功能（适用于 Windows7/8/8.1/10 、Linux 、Android 等操作系统下的 USB 驱动），极大地拓展了其在M2M 领域的应用范围， 如MIFI、OTT、CPE 、路由器、数据卡、平板电脑、安防以及工业级PDA 等。

EC200A series has rich built-in network protocols, integrates multiple industry standard interfaces, and supports a variety of drivers and software functions (such as Windows7/8/8.1/10, Linux, Android and other operating systems under the USB virtual serial driver). It has greatly expanded its application scope in the field of M2M and IoT, such as OTT, CPE, POS, data card, security and industrial PDA.

3、通信板规格 Specification of communication boards

3.1、外观 Appearance



（上图仅供参考，实际外观请参照实物）

(The above image is for reference only. Please refer to the actual product appearance.)

板厚： 0.8mm

board thickness:0.8mm

带有 EC200A 模组的一面为正面，以图示为例，正面 MAIN 口为模组主天线，DIV口为模组分集天线。关于主分集天线的注意事项， 请参照移远模组相关手册。

The side with EC200A module is the front side. Take the figure as an example. The MAIN interface on the front side is the main antenna of the module. The DIV port is the diversity antenna of module. For the attention items of the antenna, please refer to the relevant manual.

3.2、器件型号 Device Model

主模块： Quectel EC200A　　Main module: Quectel EC200A

IPEX天线：一代IPEX射频座,3mm*3mm,高度 1.15，口径(直径)2.0mm(±0.05mm)

IPEX antenna: First generation IPEX RF base,3mm*3mm, height 1.15, diameter (diameter)2.0mm(±0.05mm)

SIM卡座： Nano SIM插拔式卡座，ESIM贴片卡(可选)

SIM Card holder: Nano SIM self-ejecting card holder, ESIM card (optional)

3.3、电气特征 Electrical features

1、正常工作电压范围： ≤4.5:3A；≥3.4:2A，标准值： 3.8V

1.normal working voltage range: ≤4.5:3A; ≥3.4:2A, standard value: 3.8V

2、3.3V 供电版本：≤3.6:3A；≥3.3:2A，标准值： 3.3V

2. 3.3V power supply version: ≤3.6:3A; ≥3.3:2A, standard value: 3.3V

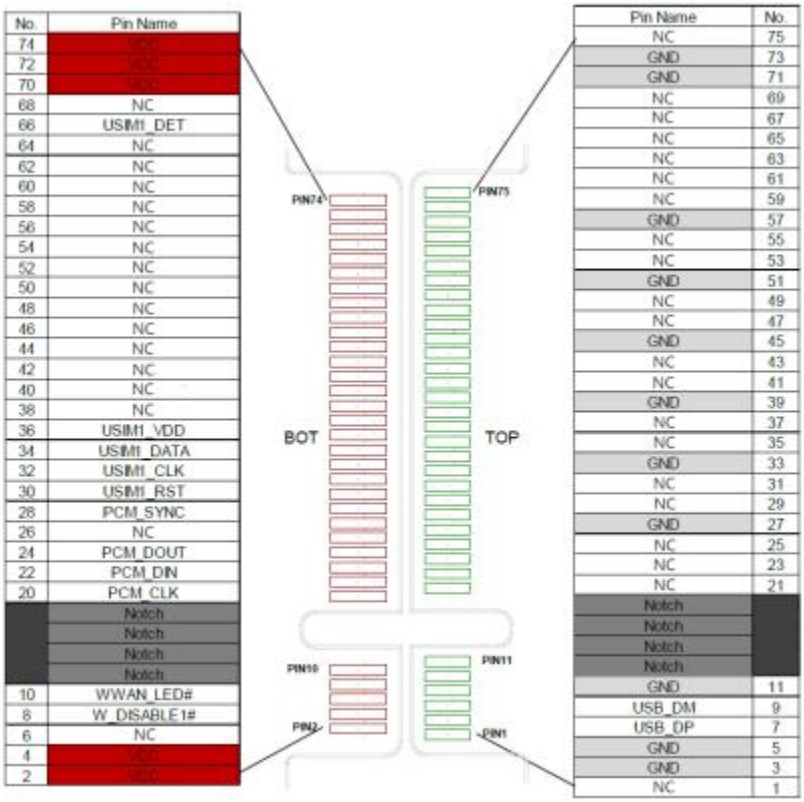
***注：** 3.3V供电版本和普通版本供电需根据客户主板而定。

* Note: 3.3V power supply version and ordinary version depends on the customer's motherboard.

3.4 、M.2 引脚分配 M.2 pin allocation

下图给出了EC200A_M.2 通信板接口引脚分配，其中贴有 EC200A 模块和天线连接器为 TOP 面，反面为 BOT 面。

The following figure shows the interface pin allocation of the EC200A_M.2 communication board, where the EC200A module and antenna connector are the TOP side, and the reverse side is the BOT side.


No.
Pin Name
74
VCC
72
VCC
70
VCC
68
NC
66
USIM1_DET
64
NC
62
NC
60
NC
58
NC
56
NC
54
NC
52
NC
50
NC
48
NC
46
NC
44
NC
42
NC
40
NC
38
NC
36
USIM1_VDD
34
USIM1_DATA
32
USIM1_CLK
30
USIM1_RST
28
PCM_SYNC
26
NC
24
PCM_DOUT
22
PCM_DIN
20
PCM_CLK
Notch
Notch
Notch
Notch
10
WWAN_LED#
8
W_DISABLE1#
6
NC
4
VCC
2
VCC
PIN74
PIN75
BOT
TOP
PIN10
PIN11
PIN2
PIN1
Pin Name
No.
NC
75
GND
73
GND
71
NC
69
NC
67
NC
65
NC
63
NC
61
NC
59
GND
57
NC
55
NC
53
GND
51
NC
49
NC
47
GND
45
NC
43
NC
41
GND
39
NC
37
NC
35
GND
33
NC
31
NC
29
GND
27
NC
25
NC
23
NC
21
Notch
Notch
Notch
Notch
GND
11
USB_DM
9
USB_DP
7
GND
5
GND
3
NC
1

3.4.1、引脚描述 Pin description

引脚名Pin name	引脚号Pin number	功能描述 Function Description	备注 Remarks
	2、4、70、72、74	模块电源 Module Power supply	3.4~4.5 电源输入，典型值3.8 3.4 4.5 ， 3.8 3.3 版本供电范围为 3.3~3.6 3.3 3.3~3.6
_	66	(U) 卡插拔检测 (U)SIM card insertion and removal detection	1.8 电压域,不用则悬空 1.8V voltage range, if not used, suspended
_	36	(U) 卡供电电源(U) Power supply for the SIM card	模块自动识别1.8 或3.0 卡 Module automatically recognizes 1.8V or 3.0VSIM cards
_	34	(U) 数据 (U)SIM data	
_	32	(U) 时钟 (U)SIM clock	
_	30	(U) 复位 (U) The SIM Resets	
_	28	帧同步 PCM frame synchronization	
_	24	数据输出 PCM data output	1.8 电压域。 1.8V voltage domain 不用则悬空。 If not used, suspended
_	22	数据输入 PCM data output	
_	20	时钟	
_	10	网络状态指示 Network status Indicator	网络状态指示Network status Indicator
_#	8	飞行模式控制 Flight mode control	
	23	振铃输出 Ringing output	1.8 电压域 1.8V voltage domain
_	9	差分数据（-） USB differential data (-)	90 Ω 差分特性阻抗 90Ω differential characteristic impedance
_	7	差分数据（+） USB differential data (+)	90 Ω 差分特性阻抗 90Ω differential characteristic impedance

	73、71、57、51、 45、39、33、27、 11、5、3	地 Ground

注：

1. 除(U)SIM 接口外，模块其他数字接口电压域均为 1.8V，(U)SIM 接口电压支持 1.8V 和 3.0V。
2. 所有 NC 以及未使用引脚请悬空。

Note:

1.Except for the (U)SIM interface, the voltage domain of other digital interfaces of the module is 1.8V, and the voltage of the (U)SIM interface supports 1.8V and 3.0V.

2.Leave all NCS and unused pins blank.

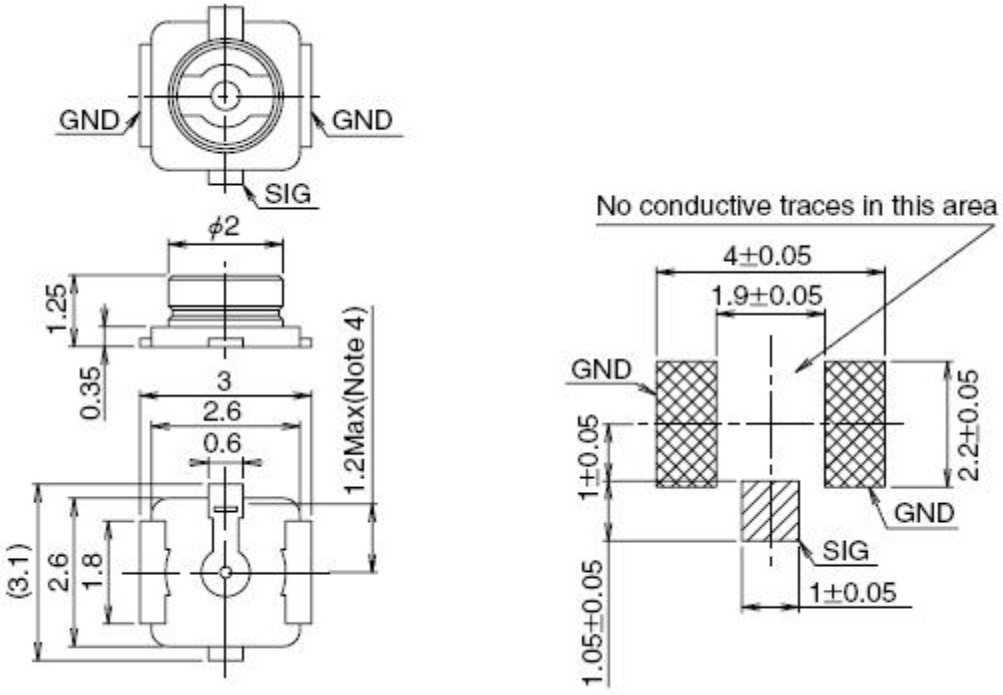
3.5、工作模式 Working mode

模式 Mode	功能 Function
正常工作模式 Normal operating mode	网络连接正常工作。此模式下，模块功耗取决于网络设置和数据传输速率。 Talk/Data Network connection is working properly. In this mode, the module power consumption depends on the network Settings and data transfer rate. 软件正常运行。模块注册上网络，能够接收和发送数据。 Idle software runs properly. The module is registered on the network and can receive and send data.
飞行模式 Flight mode	**+=4** 命令或_#引脚可以将模块设置成飞行模式。此模式下射频不工作。 AT+CFUN=4 command or W_DISABLE# pins can set the module to
最小功能模式 Minimum function mode	不断电情况下，使用**+=0** 命令可以将模块设置成最小功能 模式。此模式下，射频和() 卡不工作。 AT+CFUN=0 command can be used to set the module to minimum function mode when the power is not on. In this mode, RF and (U)SIM cards do not work.
睡眠模式Sleep mode	此模式下，模块的功耗将会降到非常低，但模块仍然可以接收寻呼、 短消息、电话和/ 数据。 In this mode, the power consumption of the module is reduced to a very low level, but the module can still receive paging, short messages, calls, and TCP/UDP data.

3.6、天线接口 Antenna interface

通信板安装有射频连接器（插座），便于天线连接。天线连接器的尺寸如下图所示。

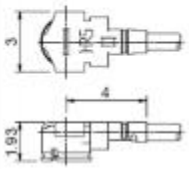
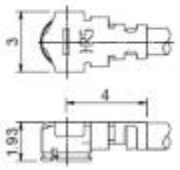
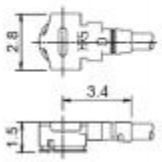
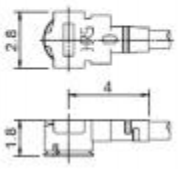
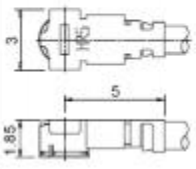
Communication board is fitted with an RF connector (socket) for easy antenna connection.The size of the antenna connector is shown in the following figure.



天线连接器尺寸（单位：毫米）Antenna connector size (unit: mm)

下图中列出的 .- 系列的连接线可用来和天线连接器配合使用。

The cables of the U.F-LP series listed below can be used with antenna connectors.

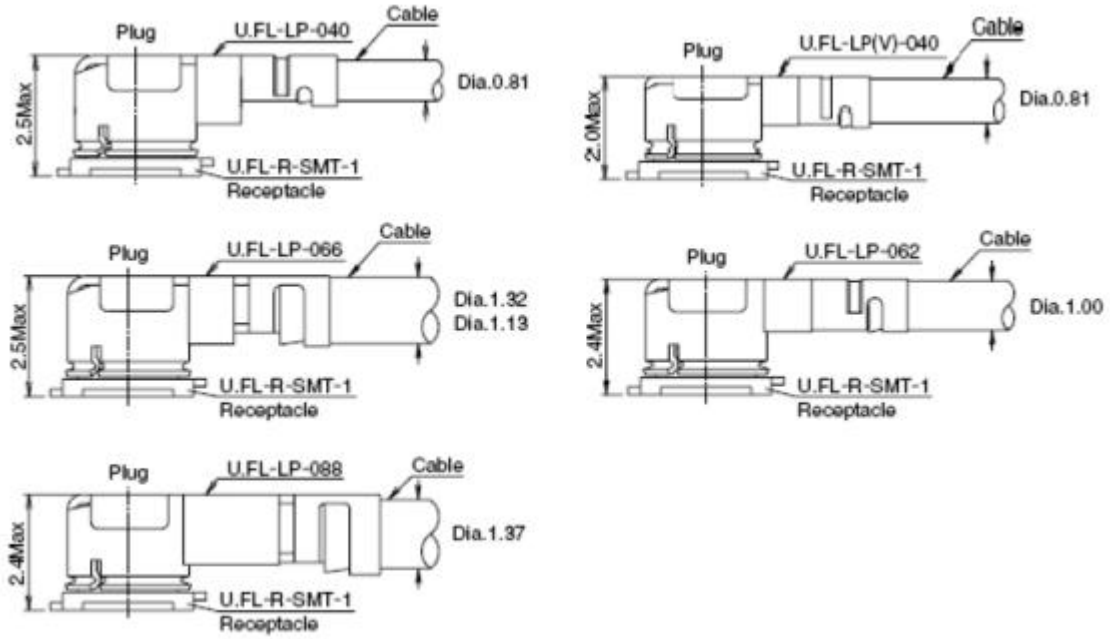
Part No.	U.FL-LP-040	U.FL-LP-066	U.FL-LP(V)-040	U.FL-LP-062	U.FL-LP-088
					
Mated Height	2.5mm Max. (2.4mm Nom.)	2.5mm Max. (2.4mm Nom.)	2.0mm Max. (1.9mm Nom.)	2.4mm Max. (2.3mm Nom.)	2.4mm Max. (2.3mm Nom.)
Applicable cable	Dia. 0.81mm Coaxial cable	Dia. 1.13mm and Dia. 1.32mm Coaxial cable	Dia. 0.81mm Coaxial cable	Dia. 1mm Coaxial cable	Dia. 1.37mm Coaxial cable
Weight (mg)	53.7	59.1	34.8	45.5	71.7
RoHS	YES				

U. **FL-LP** 连接线系列

U.FL-LP Connecting cable series

下图为连接线和连接器安装尺寸：

The following figure shows the installation dimensions of the cable and connector:



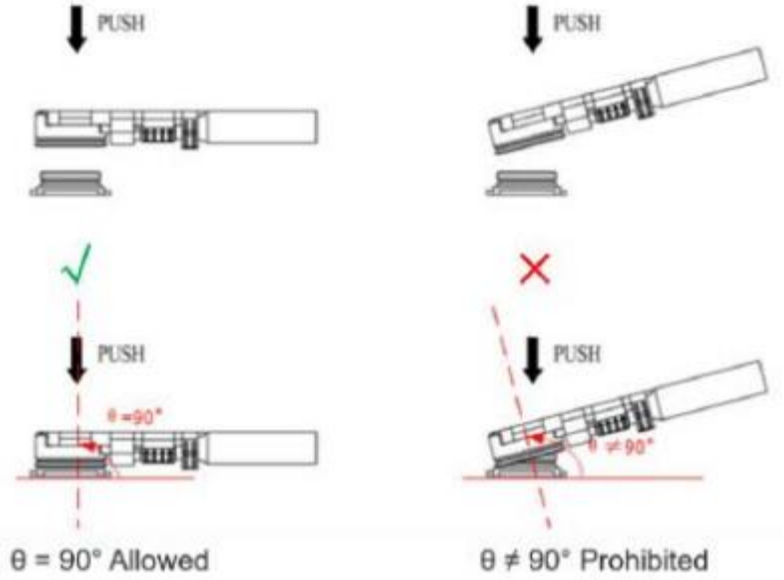
安装尺寸（单位：毫米）
installation size (unit:mm)

3.6.1、手动插拔同轴电缆插头

Manually plug and unplug the coaxial cable

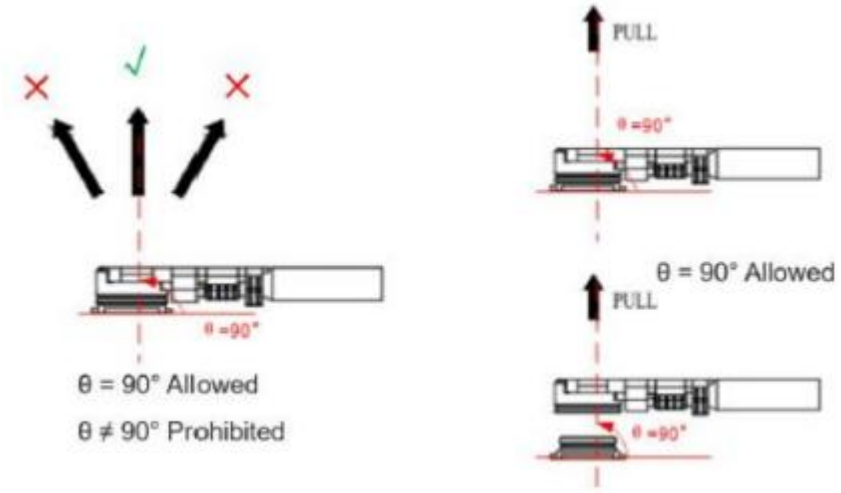
手动插入同轴电缆插头示意图如下，θ 须为90°。

The following diagram shows the manual insertion of the coaxial cable plug, θ must be 90°.

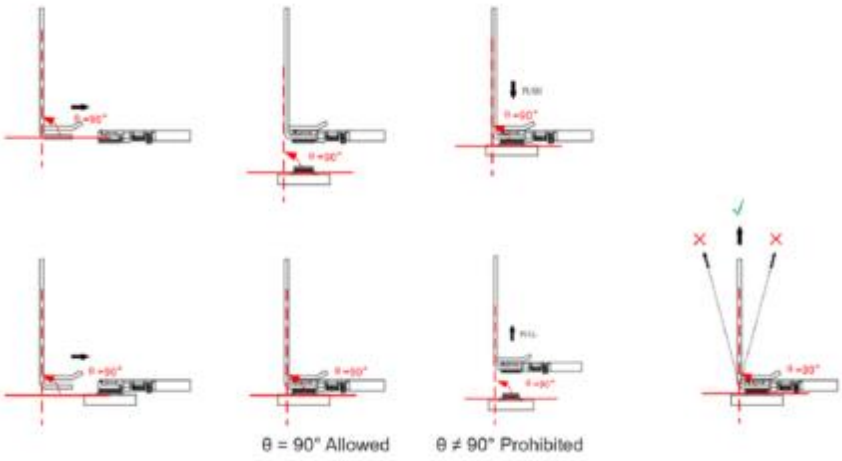


手动拔出同轴电缆插头示意图如下，θ 须为90。

The following diagram shows the manual pulling out the coaxial cable plug, θ must be 90°.



3.6.2、治具插拔同轴电缆插头 Fixture plug and unplug coaxial cable



4 、可靠性、射频特性和电气性能

Reliability,Radio-frequency characteristic and electrical performance

本章主要介绍 200_.2 系列模块接口电气特性和射频特性，包括：

- 电源特性 Power Supply features
- 射频性能 Radio-frequency characteristic
- 静电防护 Electrostatic Protection
- 工作和存储温度 Operating and storage temperature

4.1 、电源特性 Power Supply features

EC200D_M.2 通信板输入电压为 3.4~4.5V 直供模块， 电源要求如下表所示：

输入电源范围 Input power range

参数	描述	最小值	典型值	最大值	单位Unit
VCC	供电 Power supply	3.4	3.8	4.5	V

I/O 要求 I/O requirements

参数	描述	最小值	最大值	单位 Unit

vIH	输入高电平	0.7 × VCC	VCC + 0.3	V
vIL	输入低电平	-0.3	0.3 × VCC	V
vOH	输出高电平	VCC - 0.5	VCC	V

vOL	输出低电平	0	0.4	V

*注： VCC 典型值为 1.8V

Note: The typical VCC value is 3.8V

4.2、射频性能 Radio-frequency characteristic

传导性能如下图所示： (仅供参考)

Conductivity is shown in the following figure: (for reference only)

UE Maximum OutputPower:@ULCH: 18050, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.71	dBm	Passed
UE Maximum OutputPower:@ULCH: 18050, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.47	dBm	Passed
UE Maximum OutputPower:@ULCH: 18300, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.09	dBm	Passed
UE Maximum OutputPower:@ULCH: 18300, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.93	dBm	Passed
UE Maximum OutputPower:@ULCH: 18550, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.41	dBm	Passed
UE Maximum OutputPower:@ULCH: 18550, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:HIGH)	20.30	25.70	23.07	dBm	Passed

UE Maximum OutputPower:@ULCH: 19250, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	18.80	25.70	22.73	dBm	Passed
UE Maximum OutputPower:@ULCH: 19250, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.55	dBm	Passed
UE Maximum OutputPower:@ULCH: 19250, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	18.80	25.70	23.59	dBm	Passed
UE Maximum OutputPower:@ULCH: 19575, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.77	dBm	Passed
UE Maximum OutputPower:@ULCH: 19575, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.25	dBm	Passed
UE Maximum OutputPower:@ULCH: 19575, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.61	dBm	Passed
UE Maximum OutputPower:@ULCH: 19900, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.24	dBm	Passed
UE Maximum OutputPower:@ULCH: 19900, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	18.80	25.70	22.58	dBm	Passed
UE Maximum OutputPower:@ULCH: 19900, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.03	dBm	Passed

UE Maximum OutputPower:@ULCH: 20450, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.83	dBm	Passed
UE Maximum OutputPower:@ULCH: 20450, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.55	dBm	Passed
UE Maximum OutputPower:@ULCH: 20525, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.93	dBm	Passed
UE Maximum OutputPower:@ULCH: 20525, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.72	dBm	Passed
UE Maximum OutputPower:@ULCH: 20600, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	22.67	dBm	Passed
UE Maximum OutputPower:@ULCH: 20600, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:HIGH)	20.30	25.70	23.34	dBm	Passed

UE Maximum OutputPower:@ULCH: 21500, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	18.80	25.70	23.54	dBm	Passed
UE Maximum OutputPower:@ULCH: 21500, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.46	dBm	Passed
UE Maximum OutputPower:@ULCH: 21500, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	18.80	25.70	24.55	dBm	Passed
UE Maximum OutputPower:@ULCH: 21625, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.85	dBm	Passed
UE Maximum OutputPower:@ULCH: 21625, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.37	dBm	Passed
UE Maximum OutputPower:@ULCH: 21625, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.29	dBm	Passed
UE Maximum OutputPower:@ULCH: 21750, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.95	dBm	Passed
UE Maximum OutputPower:@ULCH: 21750, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	18.80	25.70	23.36	dBm	Passed
UE Maximum OutputPower:@ULCH: 21750, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.67	dBm	Passed

UE Maximum OutputPower:@ULCH: 36250, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.24	dBm	Passed
UE Maximum OutputPower:@ULCH: 36250, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.90	dBm	Passed
UE Maximum OutputPower:@ULCH: 36275, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.23	dBm	Passed
UE Maximum OutputPower:@ULCH: 36275, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.09	dBm	Passed
UE Maximum OutputPower:@ULCH: 36300, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.78	dBm	Passed
UE Maximum OutputPower:@ULCH: 36300, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:HIGH)	20.30	25.70	23.44	dBm	Passed

UE Maximum OutputPower:@ULCH: 37800, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.31	dBm	Passed
UE Maximum OutputPower:@ULCH: 37800, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.24	dBm	Passed
UE Maximum OutputPower:@ULCH: 38000, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.88	dBm	Passed
UE Maximum OutputPower:@ULCH: 38000, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.57	dBm	Passed
UE Maximum OutputPower:@ULCH: 38200, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	24.39	dBm	Passed
UE Maximum OutputPower:@ULCH: 38200, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:HIGH)	20.30	25.70	24.20	dBm	Passed

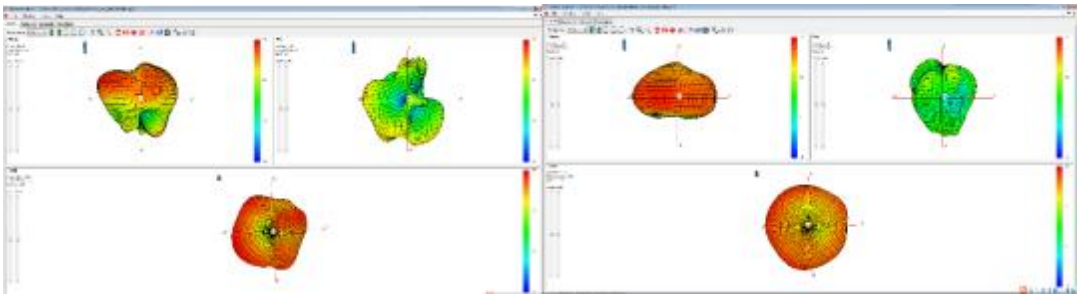
UE Maximum OutputPower:@ULCH: 38300, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.33	dBm	Passed
UE Maximum OutputPower:@ULCH: 38300, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.00	dBm	Passed
UE Maximum OutputPower:@ULCH: 38450, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.42	dBm	Passed
UE Maximum OutputPower:@ULCH: 38450, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.12	dBm	Passed
UE Maximum OutputPower:@ULCH: 38600, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.44	dBm	Passed
UE Maximum OutputPower:@ULCH: 38600, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:HIGH)	20.30	25.70	23.12	dBm	Passed

UE Maximum OutputPower:@ULCH: 38700, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.30	dBm	Passed
UE Maximum OutputPower:@ULCH: 38700, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.03	dBm	Passed
UE Maximum OutputPower:@ULCH: 39150, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	22.70	dBm	Passed
UE Maximum OutputPower:@ULCH: 39150, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.53	dBm	Passed
UE Maximum OutputPower:@ULCH: 39600, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.45	dBm	Passed
UE Maximum OutputPower:@ULCH: 39600, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:HIGH)	20.30	25.70	23.02	dBm	Passed

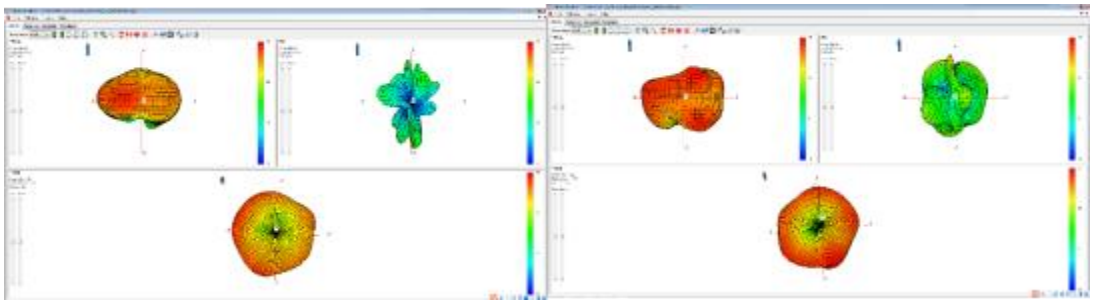
UE Maximum OutputPower:@ULCH: 40290, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.21	dBm	Passed
UE Maximum OutputPower:@ULCH: 40290, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	23.56	dBm	Passed
UE Maximum OutputPower:@ULCH: 40290, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	22.99	dBm	Passed
UE Maximum OutputPower:@ULCH: 40740, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	24.01	dBm	Passed
UE Maximum OutputPower:@ULCH: 40740, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	24.47	dBm	Passed
UE Maximum OutputPower:@ULCH: 40740, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.77	dBm	Passed
UE Maximum OutputPower:@ULCH: 41190, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:LOW)	20.30	25.70	23.32	dBm	Passed
UE Maximum OutputPower:@ULCH: 41190, BW: 10 MHz; UL_MOD_RB: QPSK, 1 (RB_Pos:HIGH)	20.30	25.70	22.73	dBm	Passed
UE Maximum OutputPower:@ULCH: 41190, BW: 10 MHz; UL_MOD_RB: QPSK, 12 (RB_Pos:LOW)	20.30	25.70	23.02	dBm	Passed

射频OTA 数据如下图所示：(仅供参考)

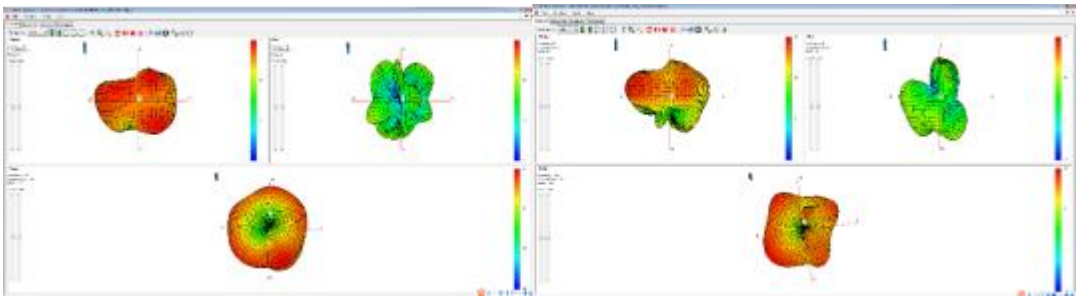
Rf OTA data is shown in the following figure: (for reference only)

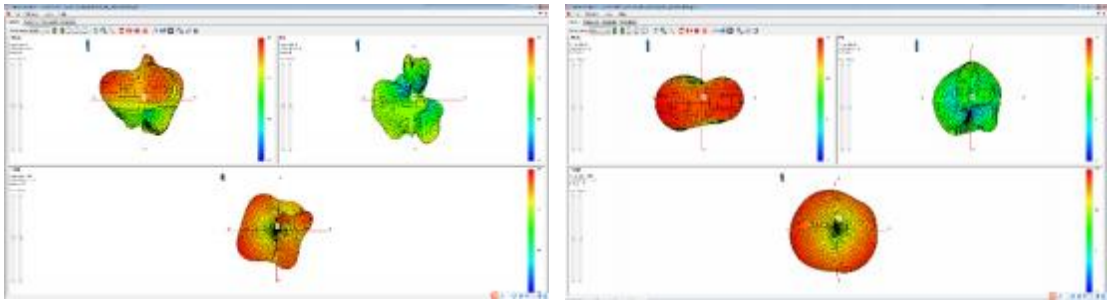


BAND1

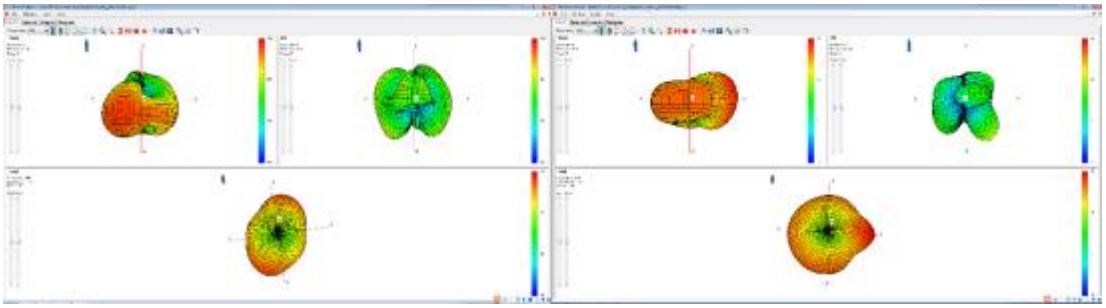


BAND3

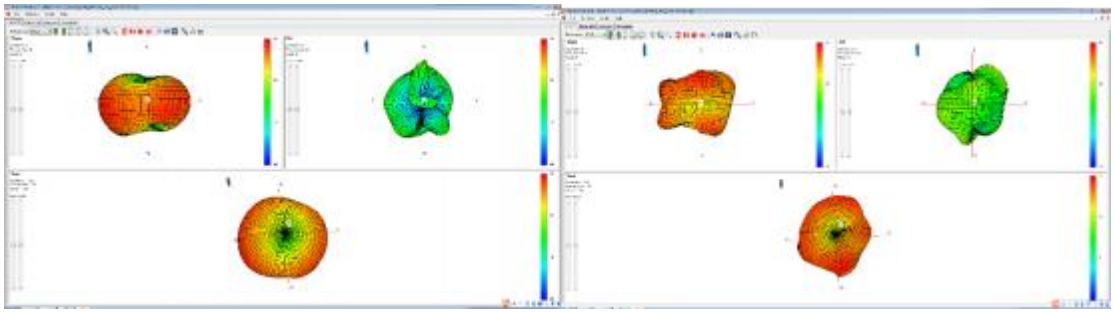




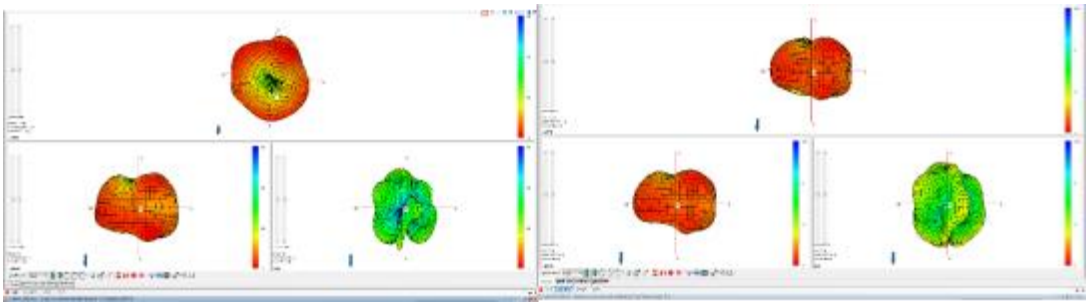
BAND5



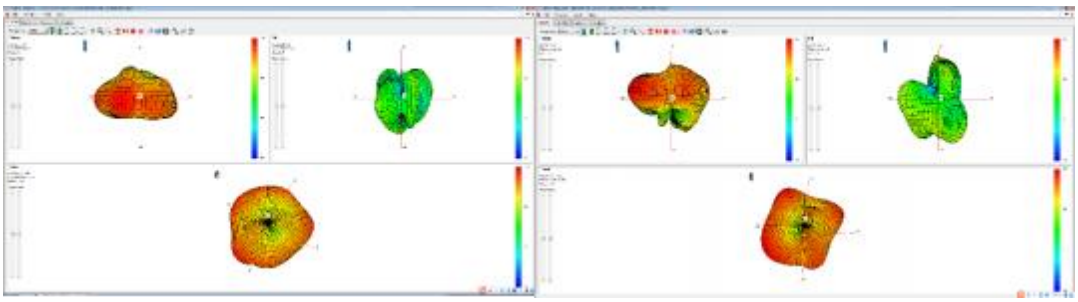
BAND8



BAND39



BAND40



BAND41

BAND	Channel	TRP	建议值Suggested value	TIS	建议值Suggested value
B1	18050	21.12			
	18300	20.14			
B3	18550	18.9		-96.18	
	19250	21.88			
	19575	21.32			
B5	19900	20.22		-93.68	
	20450	18.83			
	20525	19.62			
B8	20600	18.32		-94.75	
	21500	21.64			
	21625	19.66			
B34	21750	20.26		-95.08	
	36250	21.18	18		-88
	36275	21.48			
B38	36300	21.22		-94.39	
	37850	19.2			
	38000	21.18			
B39	38150	22.62		-90.79	
	38350	21.36			
	38450	20.95			
B40	38550	20.37		-91.52	
	38750	22.11			
	39150	21.75			
B41	39550	21.79		-92.45	
	40340	21.26			
	40740	21.77			
	41140	19.43		-91.8	

4.3 、静电防护 Electrostatic Protection

由于人体静电、微电子间带电摩擦等产生的静电会通过各种途径放电给模块，并可能对模块造成一定的损坏，因此应重视静电防护并采取合理的静电防护措施。例如：在研发、生产、组装和测试等过程中，佩戴防静电手套；设计产品时，在电路接口处和其他易受静电放电影响的点位增加防静电保护器件。

The static electricity generated by the static electricity of the human body and the charged friction between microelectronics will discharge to the module through various ways, and may cause certain damage to the module. Therefore, pay attention to ESD prevention and take reasonable ESD prevention measures. For example, wear ESD gloves during R&D, production, assembly, and testing. When designing products, add anti-static protection devices at circuit interfaces and other interfaces susceptible to electrostatic discharge.

下表为模块引脚的 耐受电压情况。

The following table shows the ESD withstand voltage of the module pins.

模块本身静电防护值如下表：

The electrostatic protection values of the module are as follows:

测试接口	接触放电	空气放电	单位
电源和地接口	±4000	±8000	
天线接口	±4000	±8000	
其他接口	±500	±1000	

4.4、工作和存储温度 Operating and storage temperature

工作和存储温度 Operating and storage temperature

参数	最小值	典型值	最大值	单位
正常工作温度 1 1	-35	+25	+75	º
扩展工作温度2 2	-40		+80	º
存储温度 Storage	-40		+90	º

*注： 1、表示当模块在此温度范围工作时，模块的相关性能满足3GPP 标准要求。

* Note:1.Indicates that when the module works in this temperature range, the relevant performance of the module meets the 3GPP standard requirements.

2、表示当模块在此温度范围工作时， 模块仍能保持正常工作状态， 具备语音、短信、数据传输等功能； 不会出现不可恢复的故障； 射频频谱、网络基本不受影响。仅个别指标如输出功率等参数的值可能会超出3GPP 标准的范围。当温度返回至正常工作温度范围时， 模块的各项指标仍符合3GPP 标准。

2.Indicates that when the module works in this temperature range, the module can still maintain normal working status, with voice, SMS, data transmission and other functions; There will be no unrecoverable failure; The radio frequency spectrum and network are basically unaffected. Only the values of individual indicators such as output power may be outside the range of the 3GPP standard. When the temperature returns to the normal operating temperature range, the indicators of the module still meet the 3GPP standard.

5、注意事项 Attentions

使用通信板时，请注意以下事项。

Note the following when using the communication board。

5.1 、喷涂 Spraying

如需对通信板进行喷涂， 请确保所用喷涂材料不会与模块屏蔽罩或 发生化学反应，同时确保喷涂材料不会流入模块内部。

If you need to spray the communication board, make sure that the spray material used does not react chemically with the module shield or PCB and that the spray material does not flow into the module interior.

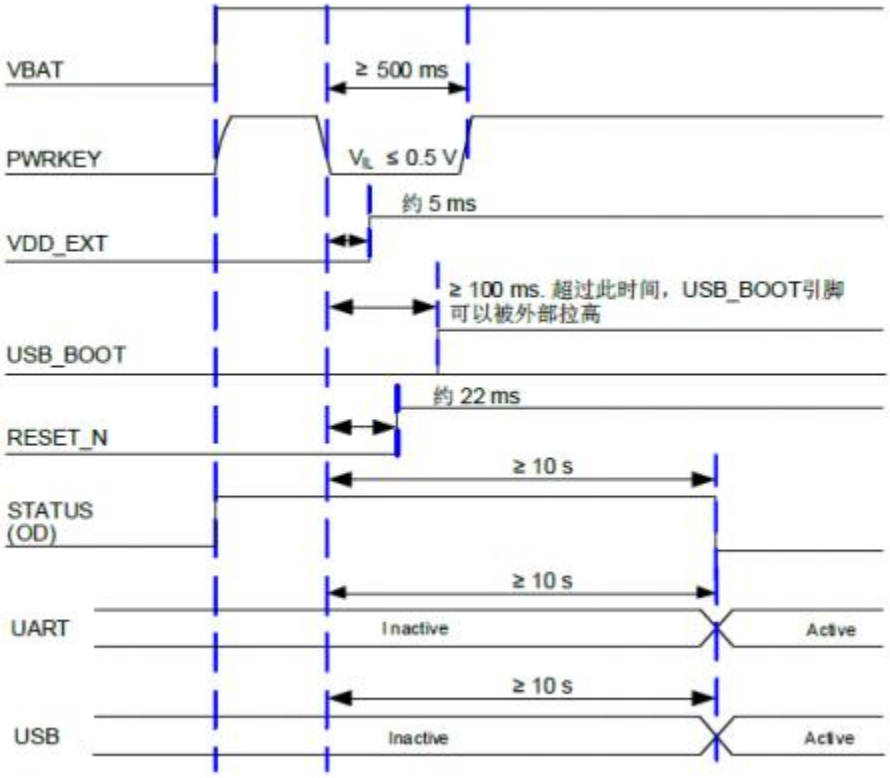
5.2、清洗 Cleaning

请勿对通信板上搭载的通信模块进行超声波清洗， 否则可能会造成模块内部晶体损坏。

Donot clean the Quectel communication module by ultrasonic waves; otherwise, the crystals inside the module may be damaged.

5.3、关于上电开机 Powering on and starting up

开机时序图如下所示：The startup timing diagram is as follows:

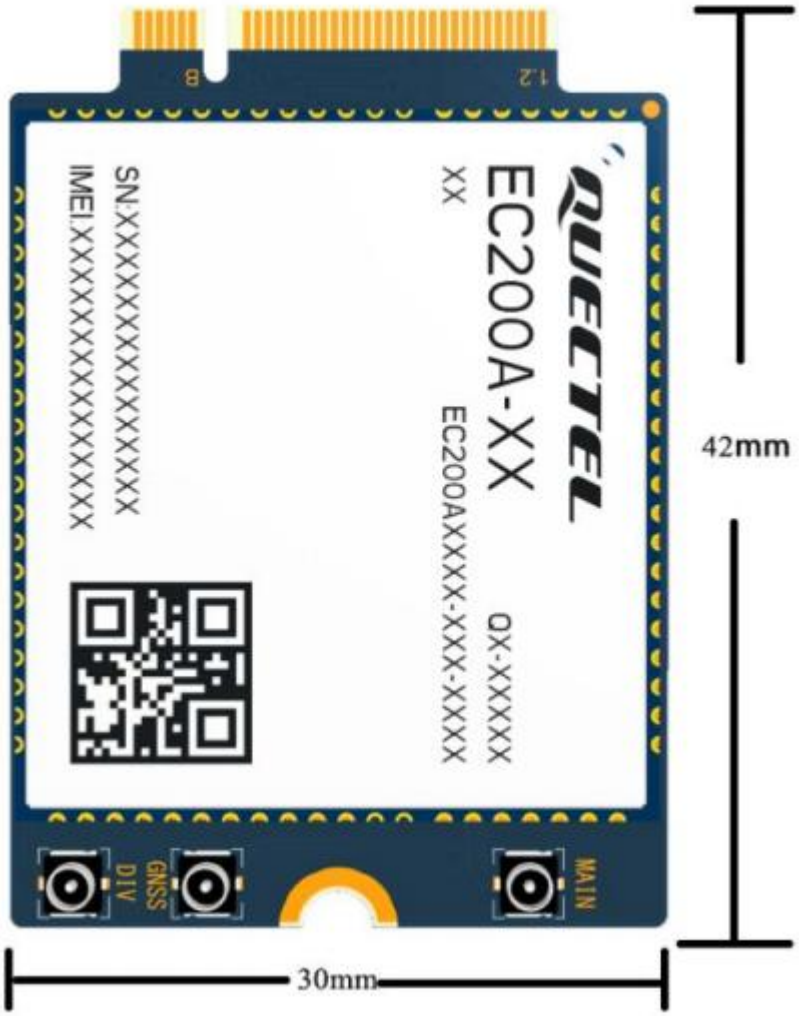


***注：本产品上电后自动开机，请勿进行其他操作，以免误操作导致模组无法开机。**

***Note: This product automatically turns on after power-on. Do not perform other operations to avoid the failure of the module to turn on due to misoperation.**

6、机械尺寸与包装规格
Mechanical Size & Packaging specification

6.1、机械尺寸 Mechanical Size



注：

. M.2 Key-B

. 尺寸：42mm*30mm

. 固定半孔直径： 3.2mm

上图尺寸仅供参考，可能存在0.05mm左右的误差

Note:
M.2 Key-B
Size: 42mm*30mm
Fixed half-hole diameter: 3.2mm
The dimensions above are for reference only, and there may be an error of about 0.05mm

6.2、 包装规格 Packaging specification

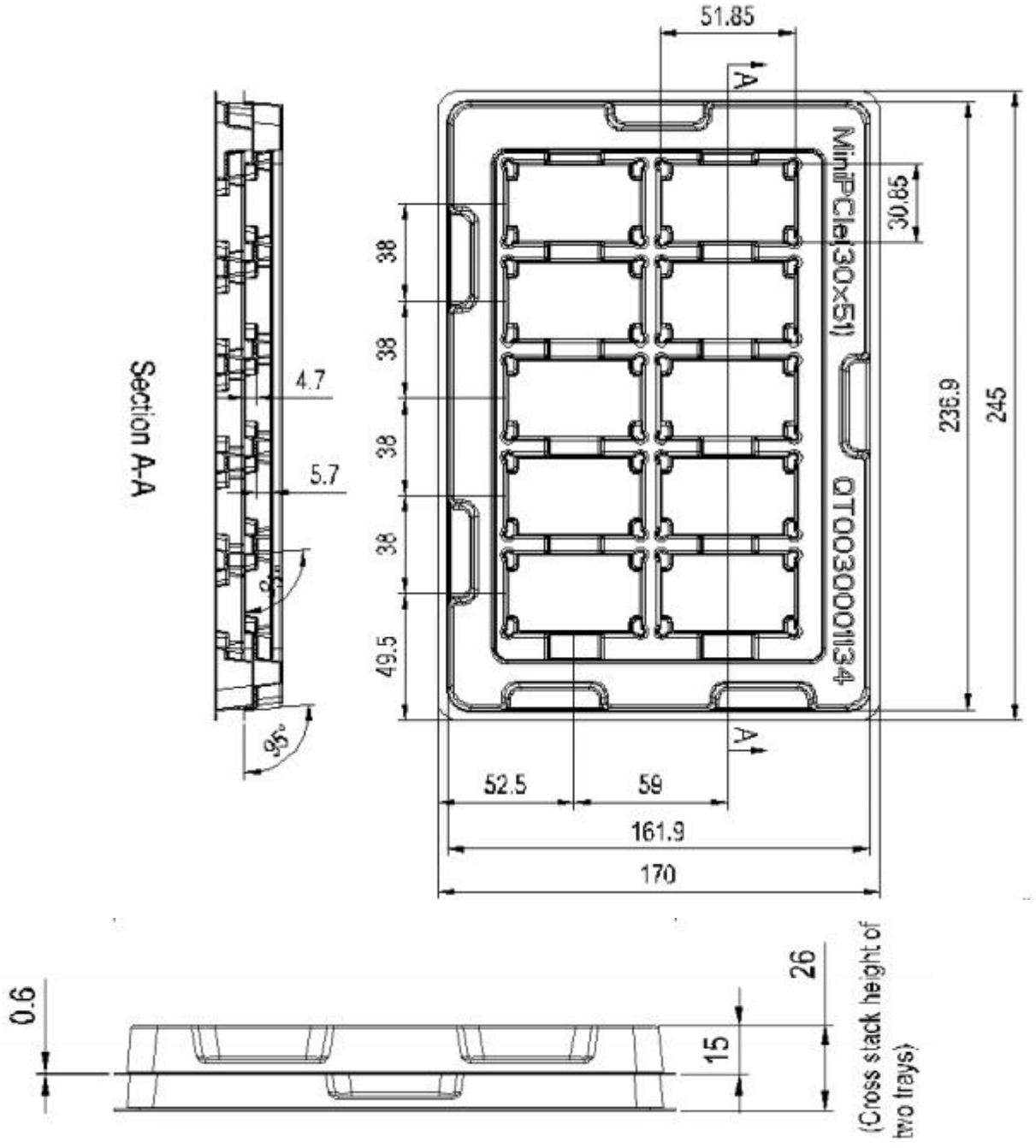
本模块采用吸塑盘包装，具体方案如下：

This module adopts blister tray packaging, the specific scheme is as follows:

6.3、 吸塑盘 Blister tray

吸塑盘包装的尺寸图表如下：

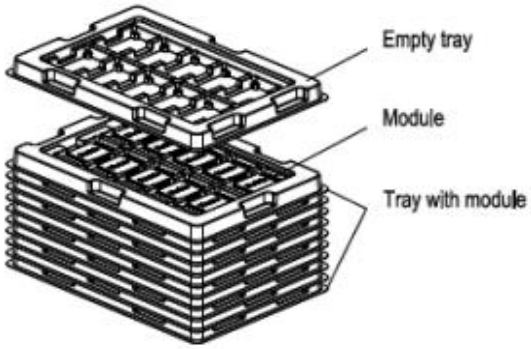
The size chart of the blister tray package is as follows:

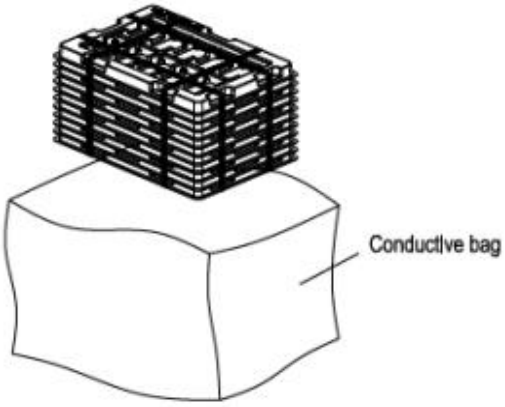


吸塑盘尺寸图

6.4、包装流程 Packaging process

包装流程



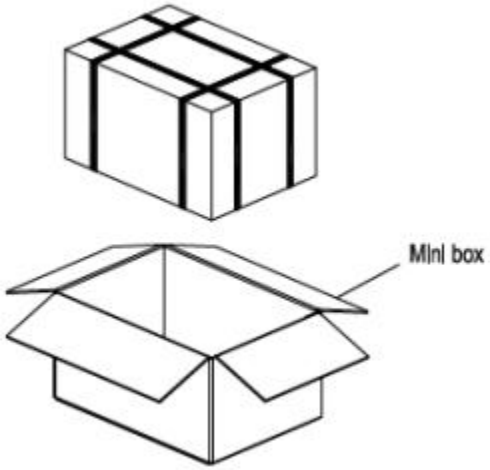


每个吸塑盘放 10 片模块。然后将 10 个装满通信板的吸塑盘堆叠在一起，再于顶部放置 1 个空托盘。

Each blister tray contains 10 modules. Ten plastic trays filled with Dongle are then stacked on top of each other and an empty tray is placed on top.

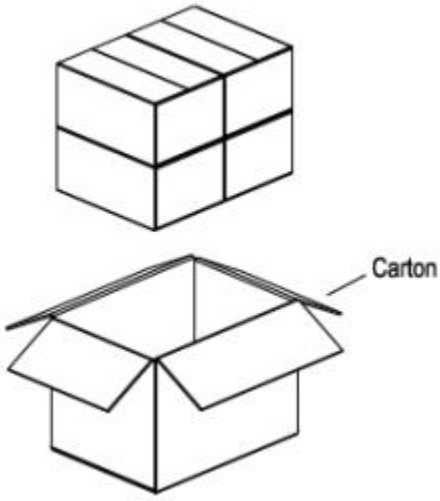
把 11 个吸塑盘打包在一起， 然后把吸塑盘使用纸带固定并打包。

Pack 11 pieces of blister disks together, and then put the blister disks into a conductive bag, which is sealed and packed.



把密封后的吸塑盘放到小盒中， 1 个小盒可包装100片通信板。(小盒尺寸： 25.5*18*14 单位：cm)

Put the sealed blister tray into a small box. One small box can pack 100 pieces of communication board.



把 4 个小盒放到 1 个卡通箱中并封箱。1 个卡通箱可包装 400 片通信板。(卡通箱尺寸： 37*27*30 单位：cm)

Put the 4 small boxes into a cartoon box and seal the box. One cartoon box can pack 400 pieces of communication boards.(Cartoon box size: 37*27*30 Unit: cm)

7、附录Appendix

7.1、参考文档 Reference document

参考文档 Reference document

文档名称 Document name
[1] ____用户指导 ____
[2] _ ()____
[3] _200 系列_硬件设计手册_1.0 _200 Series_HardwareDesign Manual_1.0