深圳市鑫恒阳科技有限公司

Shenzhen XINHENGYANG Technology Co., Ltd

承　认　书

SPECIFICATION FOR APPROVAL

客户名称 Customer Name：　致瓴科技（Zhiling Technology）

产品型号 Product Model：　C9X11

客户料号Customer P/N ：

鑫恒阳料号 XINHENGYANG P/N：　CP.21.0000252

产品规格 SPECIFFCATIONS:　WiFi/2400MHZ-2500MHZ/φ1.13 L=45MM

制作日期 Production date：　2025.05.22

封样版本 Sample Version：　R1

鑫恒阳（XINHENGYANG）		
编制（FICTION）	结构（SE）	研发（R&D）
客户（Customer）		
采　购（PUR）	结构（SE）	研发（R&D）

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三、变更履历（Change history）

编号 Number	有效日期 Effective date	更改记录 Change record
R1	2025.05.22	Initial release

四、基本参数（The basic parameters）

A. 电气参数/Electrical Characteristics	
频率/Frequency	2400MHZ-2500MHZ
驻波比/VSWR	< 2.0
效率/Avg Efficiency	>50%
阻抗/Impedance	50 ± 25 Ohm
极化方向/Polarization	Linear
最大增益/Peak Gain	2400MHZ:2.12dBi
B. 材料和机械特性/Material & Mechanical Characteristics	
天线材料/Material of Radiator	PCB green
电缆类型/Cable Type	Φ1.13 L=45MM
连接器类型/Connector Type	One generation
尺寸/Dimension	51.50MM*14.00MM±0.15MM
C. 环境Environmental	
工作温度Operation Temperature	- 20 ℃ ~ + 60 ℃
储存温度Storage Temperature	- 30 ℃ ~ + 70 ℃

五、测试设备 Introduction:

微波暗室，吸波室，电波暗室。微波暗室由电磁屏蔽室、滤波隔离室、接地装置、通风管道、室内配电系统、监控系统、吸波材料部分组成。它基于吸波材料作为屏蔽室的衬里，可以将大部分电磁能吸收到六面墙中，是一种更好的模拟自由空间条件的方法。

Microwave darkroom and no reflection chamber, absorbing short wave darkroom dark room. Microwave darkroom by electromagnetic shielding room, filtering and isolation, grounding device, the ventilation duct, indoor distribution system, monitoring system, ceiling wave material part. It is based on the wave absorbing material as the lining of the shield room, it can absorb the most of the electromagnetic energy into the six wall is a better simulation of the free space conditions.

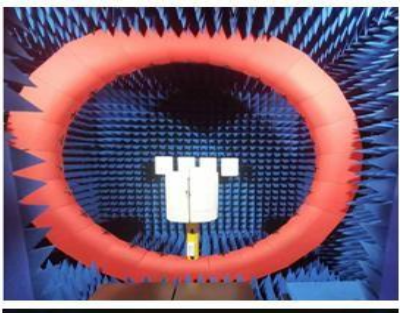
微波暗室的主要工作原理是根据电磁波在介质中从低磁导向高磁导方向传播的规律，利用高磁导率吸波材料引导电磁波，通过共振，大量吸收电磁波的辐射能量，再通过耦合把电磁波的能量转变成热能。

The main working principle of microwave anechoic chamber is according to the electromagnetic wave in the medium from the low magnetic guide magnetic direction of propagation rules, absorbing materials to guide the electromagnetic wave using high permeability, through resonance, a substantial absorption of electromagnetic wave radiation energy, by coupling the electromagnetic energy into heat energy.

主要性能 main performance：

频率范围：400MHz~6GHz天花板反射波损耗材料：400MHHz~6GHz等于或大于15dB（微波吸收材料由复合吸波材料制成，即锥形含碳海绵吸波材料在铁氧体中粘贴）。

Frequency range:400MHz ~ 6GHz ceiling reflected wave loss materials: 400MHz ~ 6GHz is equal to or more than 15dB (microwave absorbing material by composite wave absorbing materials, namely tapered containing carbon sponge suction wave material paste in ferrite).

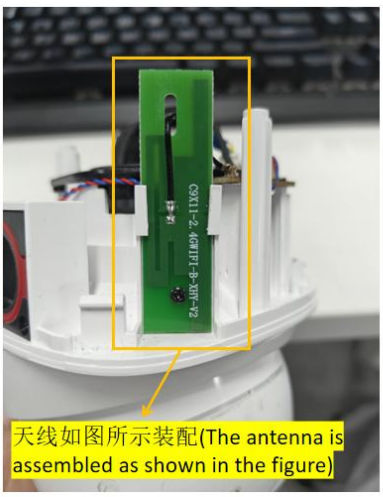



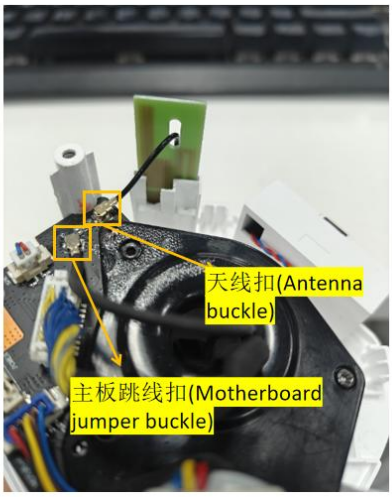
六、性能测试报告（Test Report）

这些规格是专门为 C9X11 定义的模型。

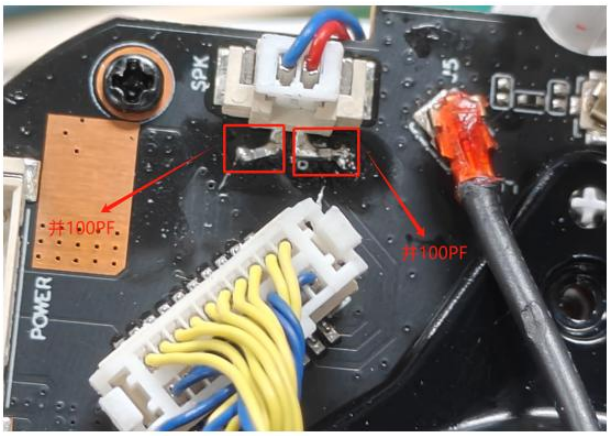
Those specifications were specially defined for C9X11 model.

1.天线位置Prototype position:

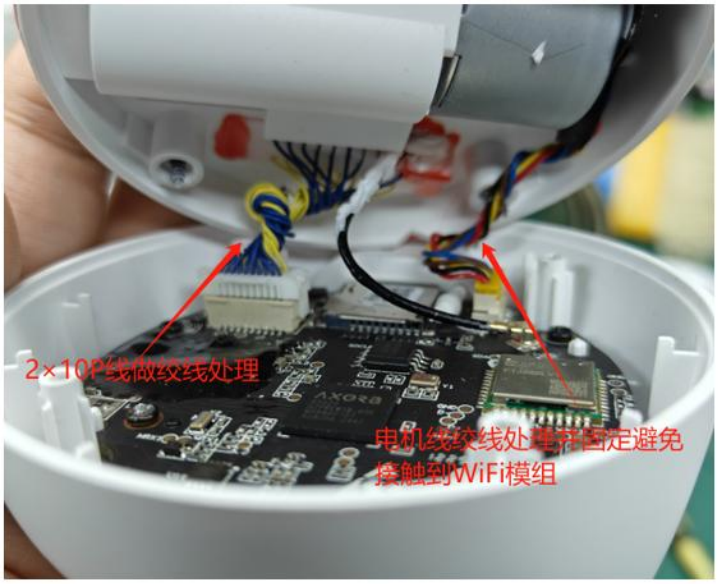




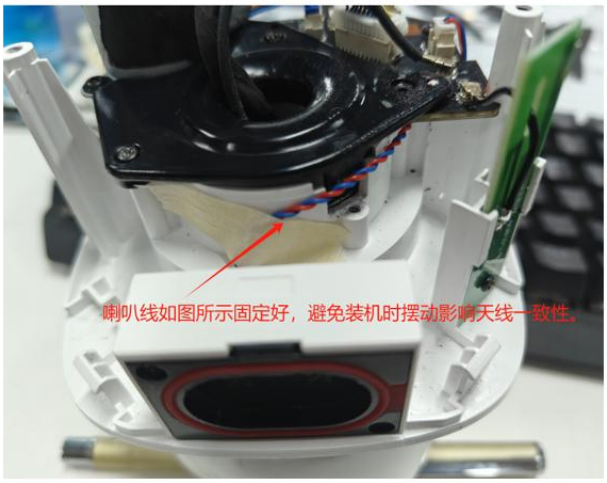
2.环境处理Environmental treatment:



喇叭layout线两边并(100PFConnect 100PF to both sides of the speaker layout line)



电机线和2×10P线做绞线处理并固定好避免接触到芯片和WiFi模组
(The motor wires and 2×10P wires should be twisted and fixed properly to avoid contact with the chip and WiFi module)



喇叭线固定好，避免摆动影响天线一致性。(Fix the speaker wire well to avoid swinging and affecting the consistency of the antenna.)

3.电压驻波比VSWR

1. 测量方法Measuring Method

1.50Ω同轴电缆连接到天线，然后将该电缆连接到网络分析仪以测量电压驻波比 。

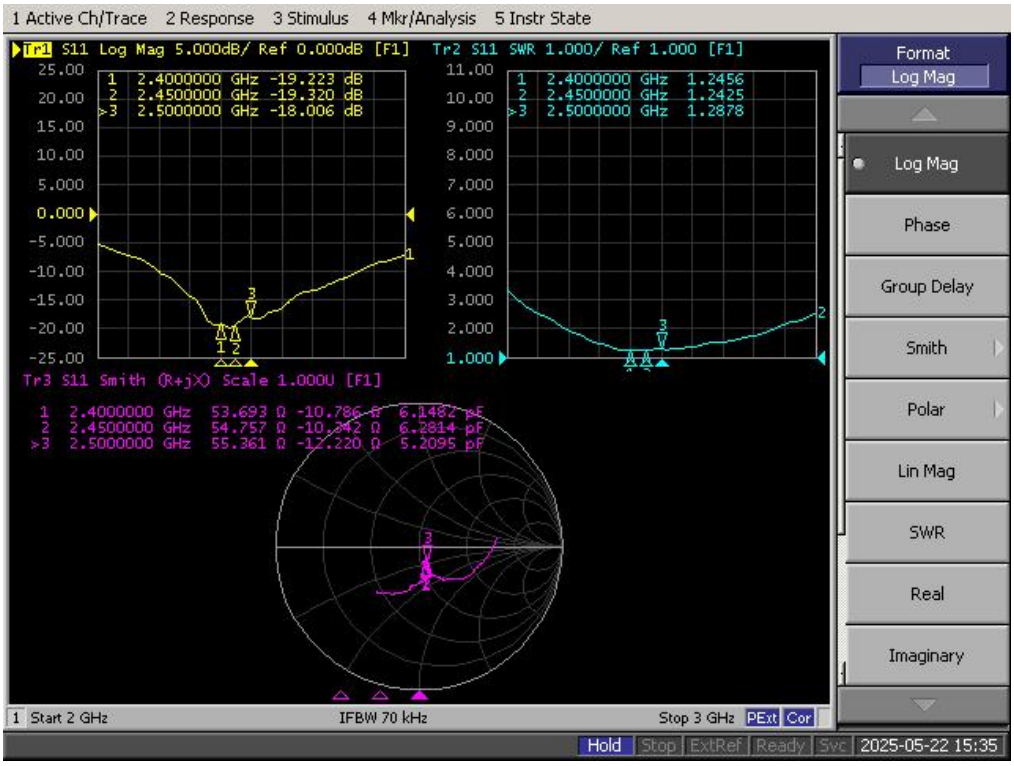
A 50Ωcoaxialcable is connected to the antenna.Then this cable is connected to a network analyzer to measurethe VSWR.

2.夹具与金属保持至少20cm的距离。

Keeping this jig away from metal at least 20cm

2.测量频率点和驻波比

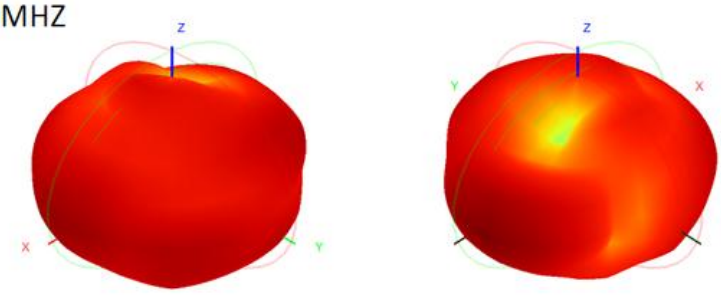
Measurement frequency points and VSWR value



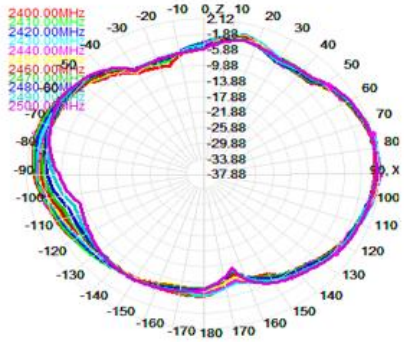
3.2D/3D场型图

2D/3D field pattern diagram

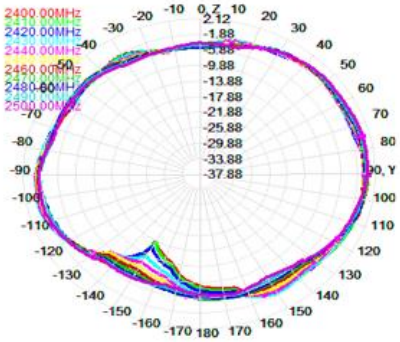
2400MHZ-2500MHZ



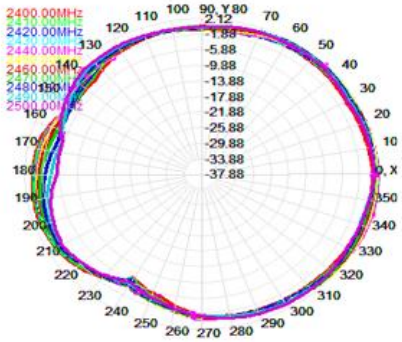
Total(E1-XZ)



Total(E2-YZ)



Total(H-XY)



4.无源效率&增益

Passive efficiency & Gain

Frequency (MHz)	Efficiency (%)	Efficiency (dBi)	Gain (dBi)
2400	61.27	-2.13	2.04
2410	62.56	-2.04	2
2420	60.95	-2.15	2.06
2430	60.91	-2.15	2.12
2440	58.23	-2.35	2.05
2450	57.28	-2.42	1.98
2460	56.93	-2.45	1.87
2470	57.85	-2.38	1.82
2480	58.14	-2.35	1.99
2490	58.62	-2.32	2.01
2500	60.17	-2.21	2.1

5.OTA有源

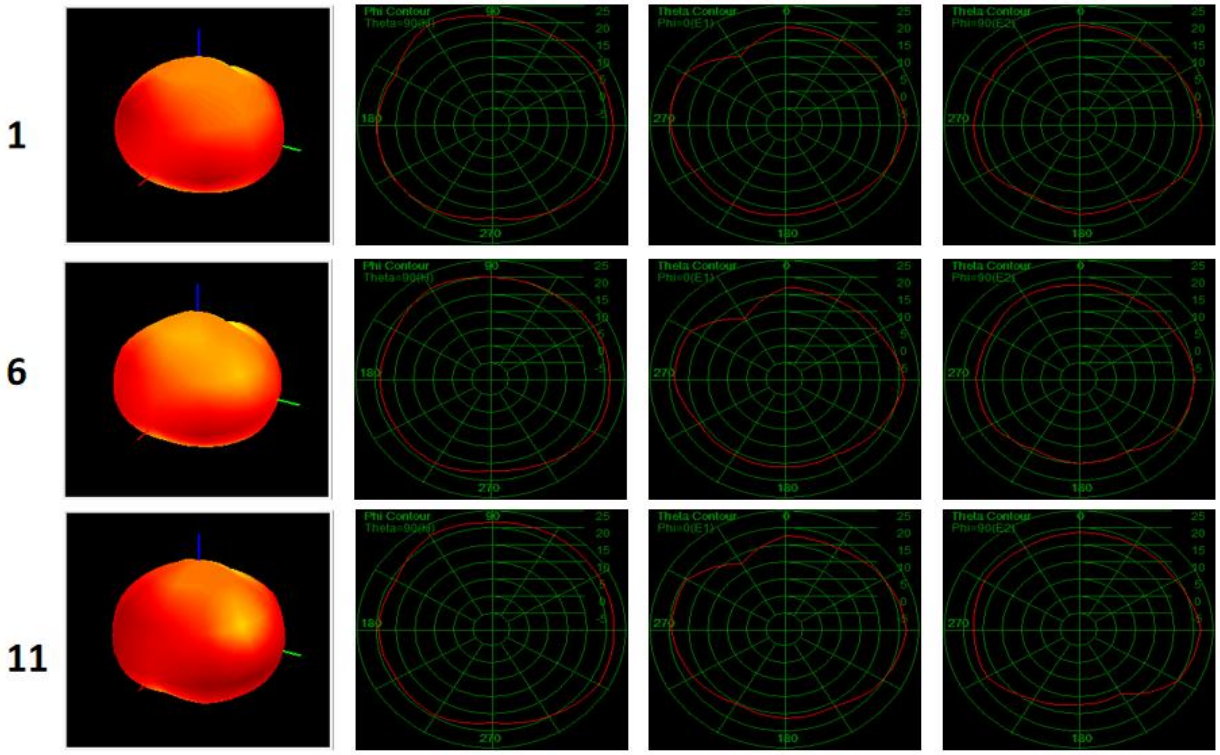
OTA active

OTA有源			
Test Condition		OTA	
band	Channel	TRP (dBm)	TIS (dBm)
802.11B.11M	1	19.58	-86.49
	6	18.4	-86.11
	11	19.3	-87.4
802.11G.54M	1	15.55	-73.3
	6	14.54	-74.37
	11	15.82	-74.82
802.11N.MCS7	1	15.08	-68.06
	6	14.26	-69.11
	11	15.26	-69.85

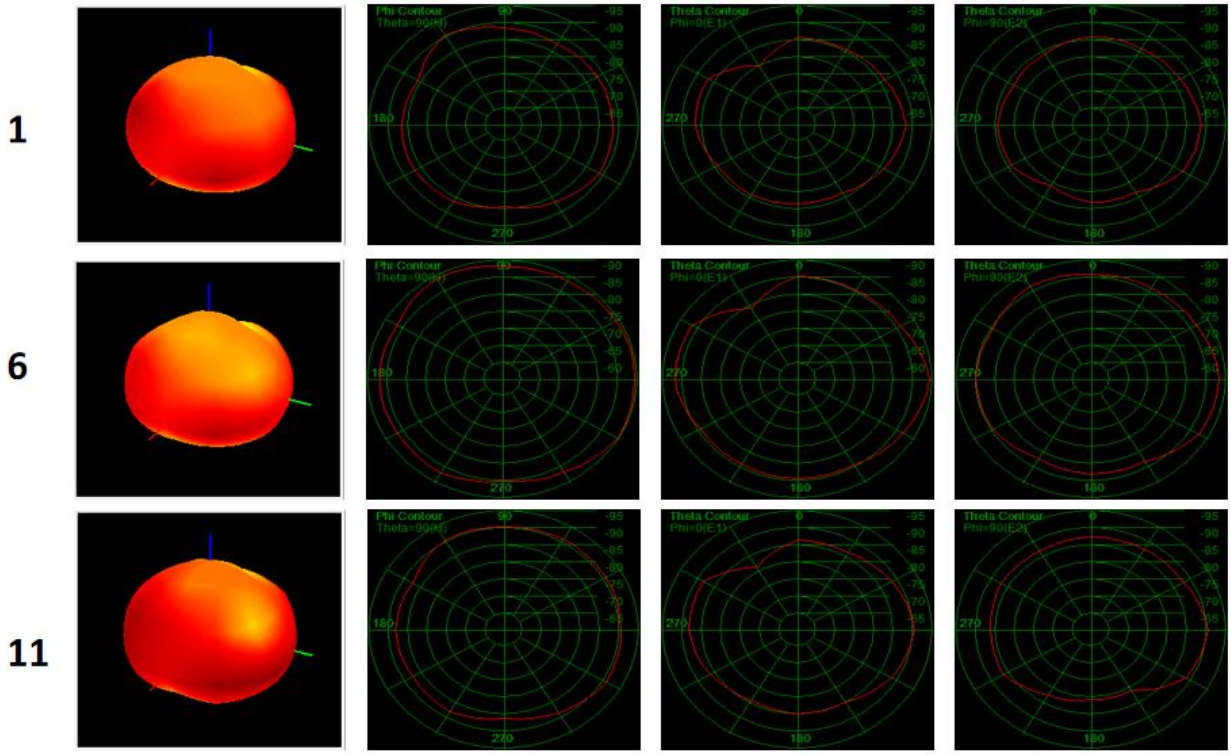
6.有源3D&2D场型图

Active 3D&2D field pattern diagrams

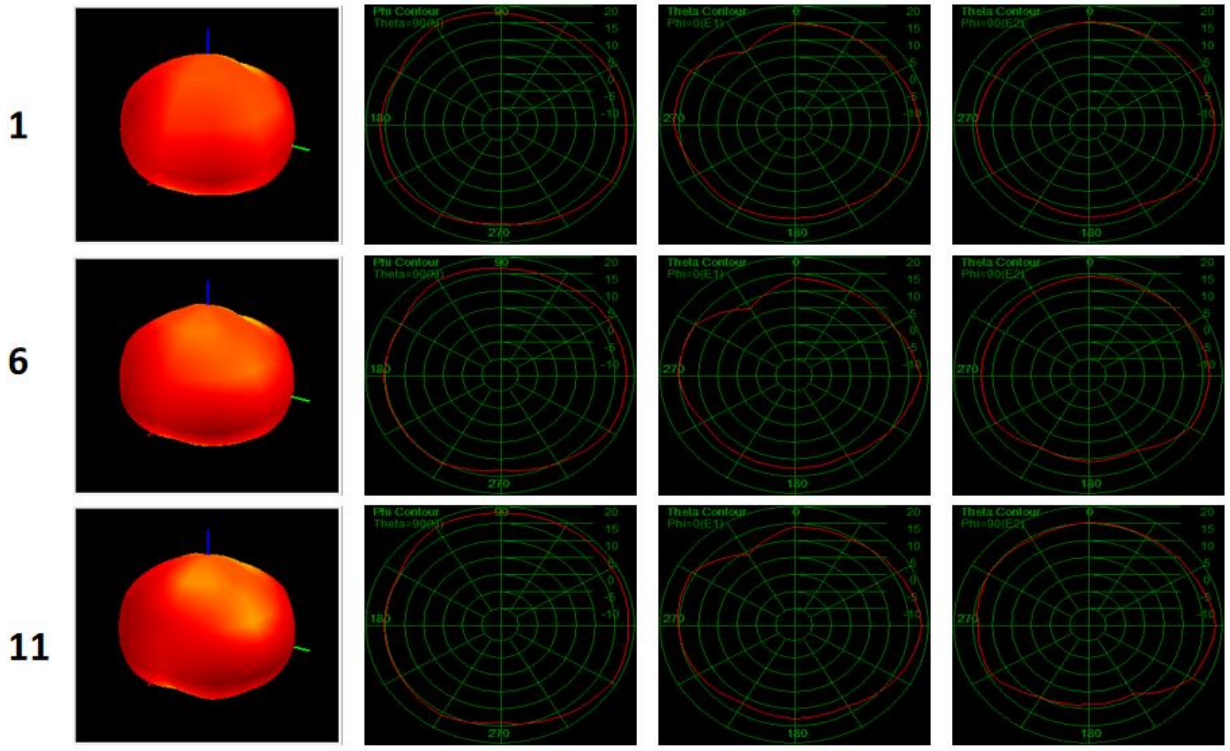
11B-11M-TRP



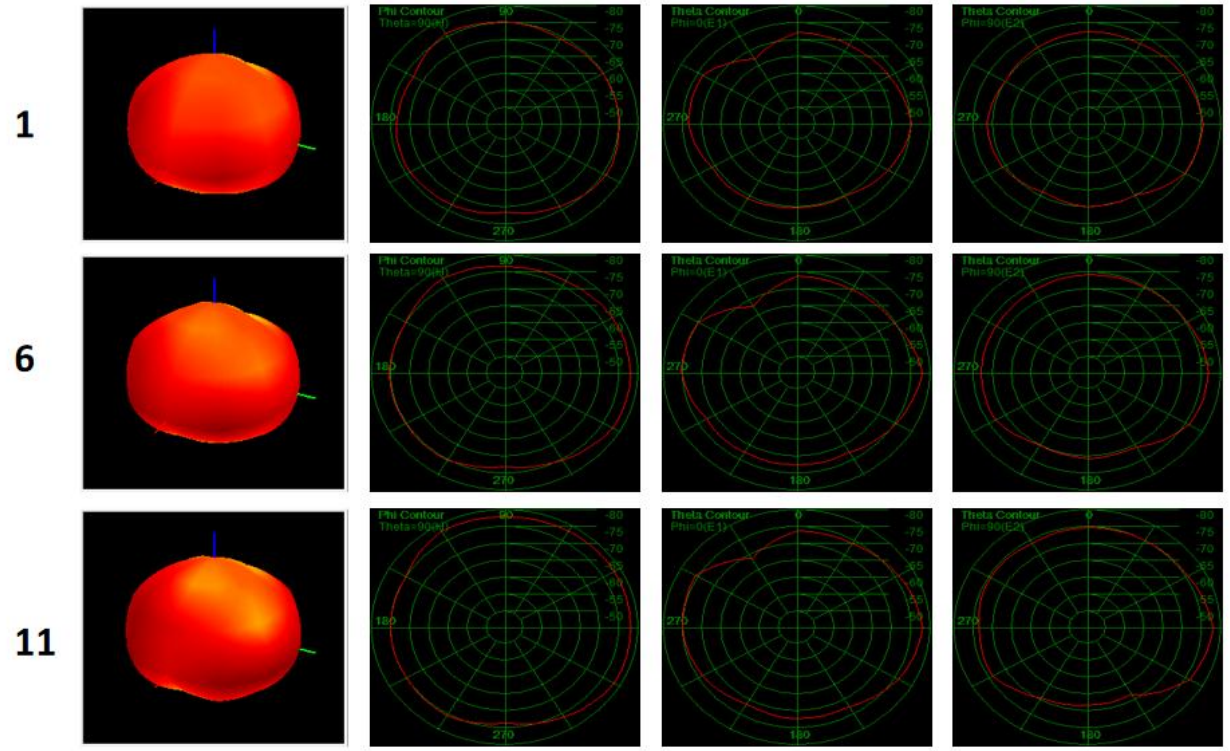
11B-11M-TIS



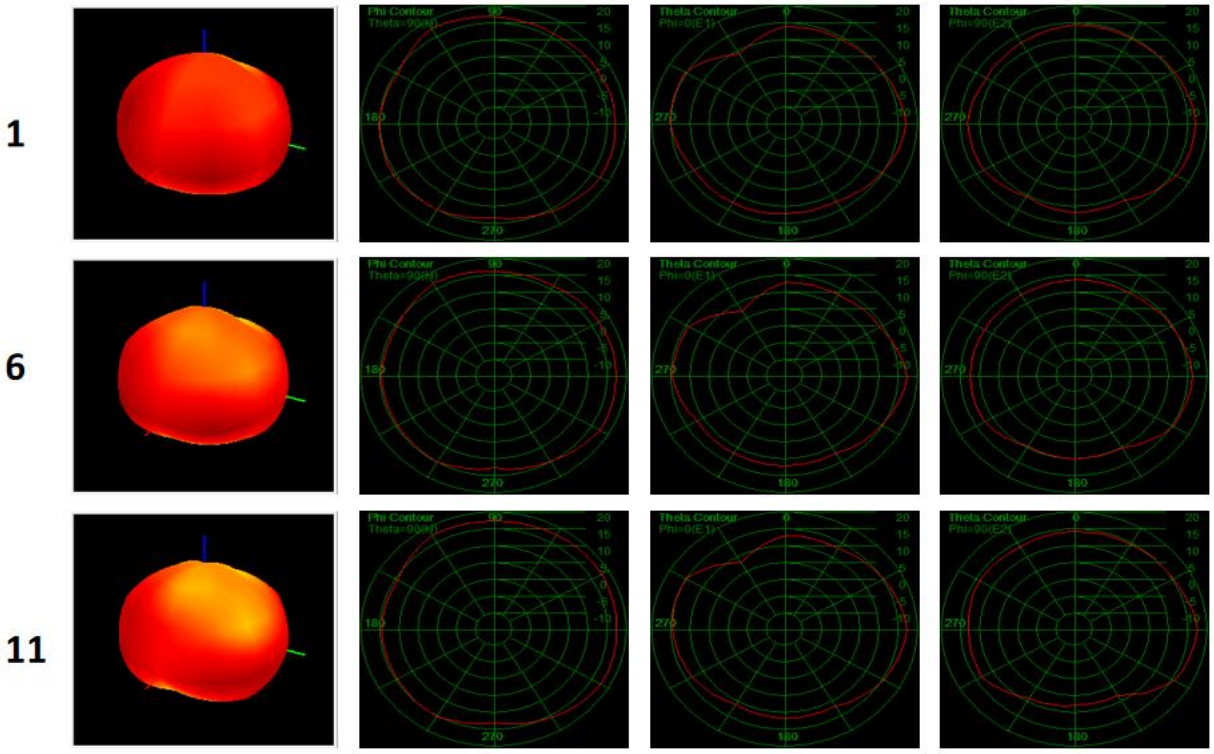
11G-54M-TRP



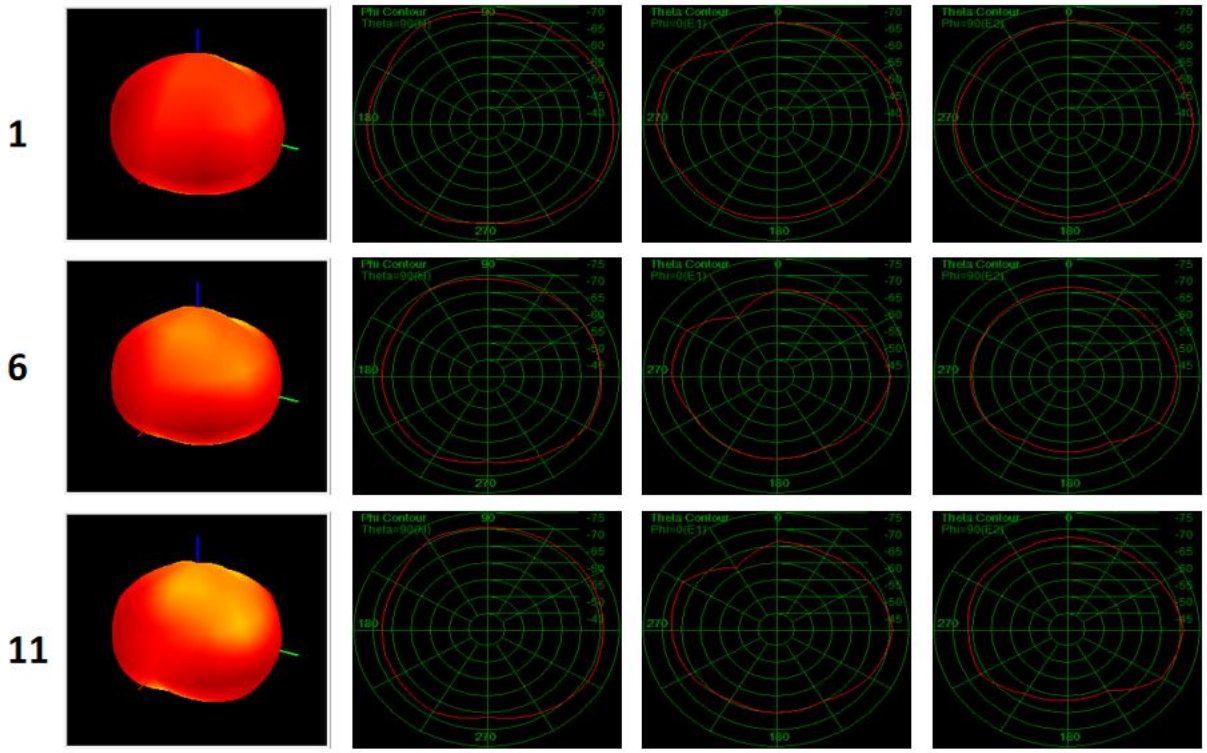
11G-54M-TIS



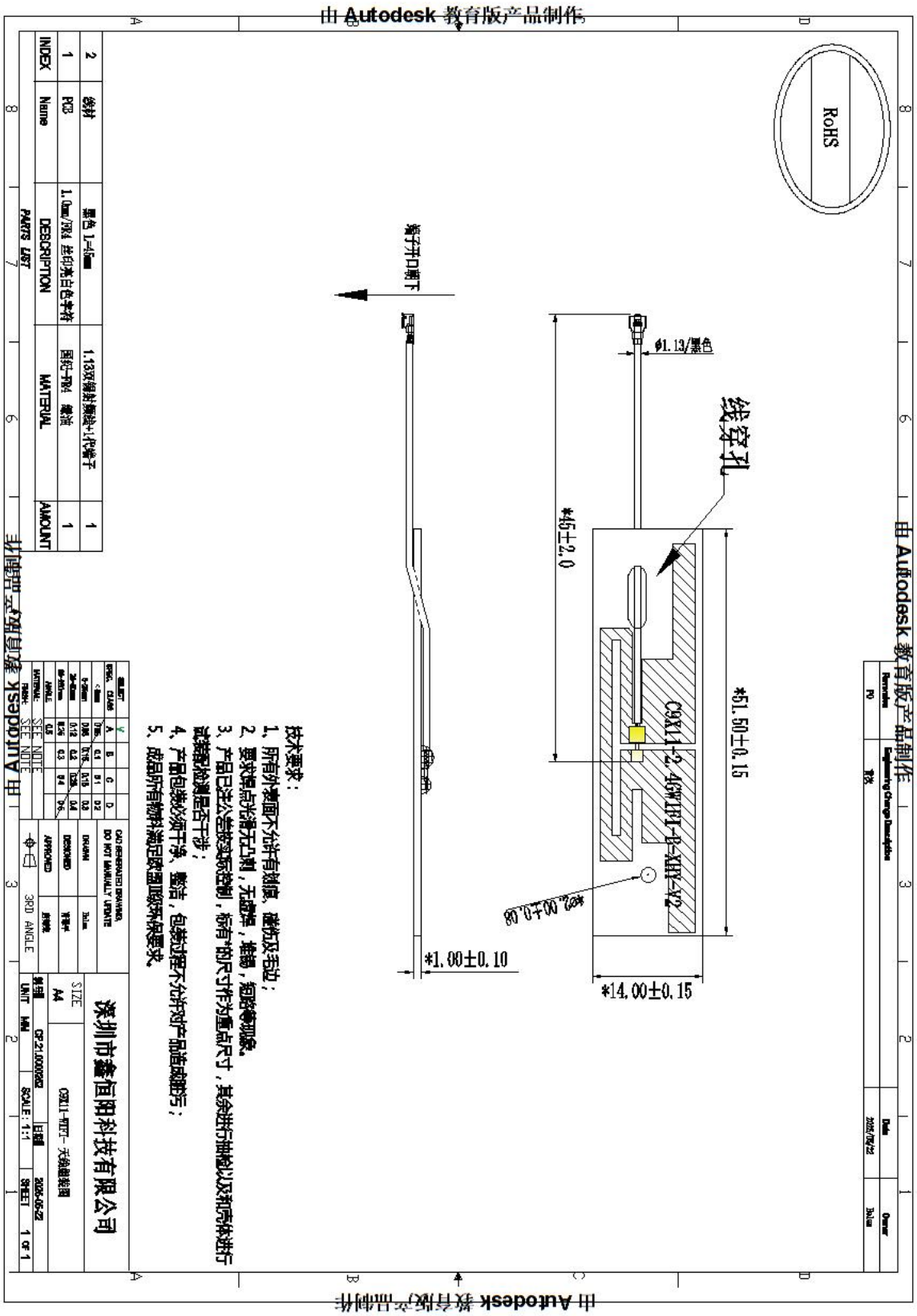
11N-MCS7-TRP



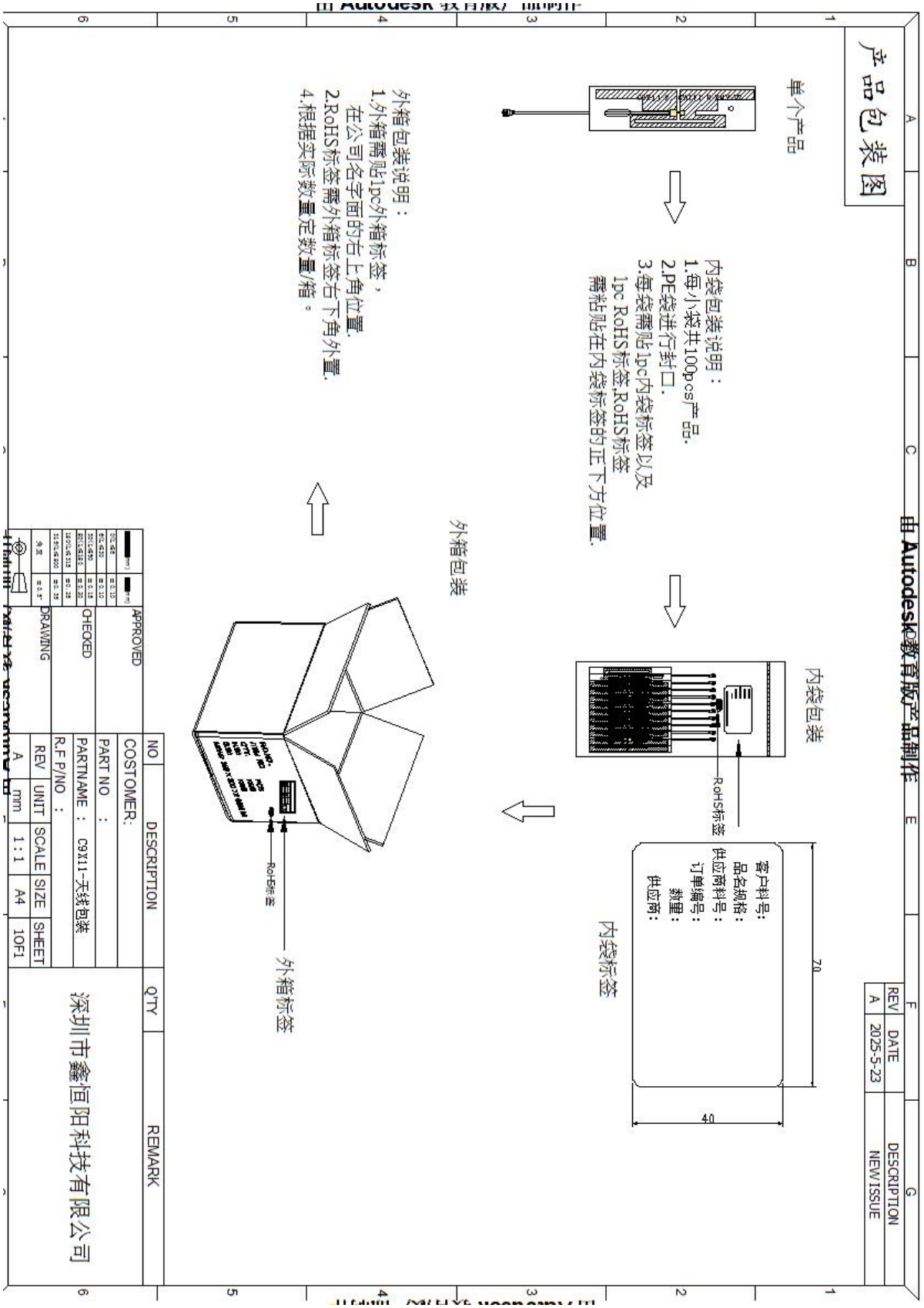
11N-MCS7-TRP



七、 工程图纸（Product Drawing）



八、成品包装图（Finished product packaging drawing）



九、环保标准/RoHS

天线 CP.21.0000252 符合RoHS环保要求，详情请参阅电子文件。

Antenna CP.21.0000252 meets RoHS requirements See electronic file for details.

十、产品包装说明/Product packaging instructions

A.包装应符合防潮、防震、耐压、防霉等要求。

A. packing should meet the moistureproof, vibration, pressure and mildew proof, etc.

B.最小包装单位标志必须有制造商商标、产品型号、名称、代码和数量。

B. the smallest packing unit logo must have the manufacturer trademarks, product model, name, code and quantity.

C.在随附的装箱单、批准证书和工厂检验报告中。

C. in the attached packing list, certificate of approval, and the factory inspection report.

**********END**********