



东莞市魔都声学科技有限公司
Dongguan Modu Acoustic Technology Co., Ltd.

零 部 件 承 认 书

供 应 商/Suppliers:	深圳顶设科技有限公司/Shenzhen Dingshe Technology Co., Ltd.	
产品型号/Product Model:	MD039	
物料名称/Material Name:	MD039-L/R 天线	
物料料号/Material Part Number:	D7.TXD03903	
送样日期/Sample submission date:	2025/11/26	
版 本: Version:	V5.0	
变更履历/Change History		
变更内容/Change content	V1.0	
	V1.1	
	V1.2	

客户签核	日期	承认	审核	批准

地址：东莞市凤岗镇黄洞村凤芝美工业园D栋1号电梯5楼
Address: 5th Floor, Elevator 1, Building D,
Fengzhimei Industrial Park, Huangdong Village,
Fenggang Town, Dongguan City
TEL:

供应商信息

供方签核	确认	审核	批准

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Address: Room 711, Building 2, Phase II, Gaoxinqi
Industrial Park, Longchang Road, Xinan Street, Bao'an
District, Shenzhen City
TEL : 18770406282

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四、基本参数 (The basic parameters)

A. 电气参数/Electrical Characteristics	
频率/Frequency	2400MHZ-2500MHZ
驻波比/VSWR	< 3.5
效率/Avg Efficiency	>5%
阻抗/Impedance	50 ± 25 Ohm
极化方向/Polarization	Linear
最大增益/Peak Gain	0.82dBi
B. 材料和机械特性/Material & Mechanical Characteristics	
天线材料/Material of Radiator	FPC black
电缆类型/Cable Type	/
连接器类型/Connector Type	POGOPIN
尺寸/Dimension	19.61MM*6.30MM±0.15MM
C. 环境Environmental	
工作温度Operation Temperature	- 20 °C ~ + 60 °C
储存温度Storage Temperature	- 20 °C ~ + 60 °C

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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.

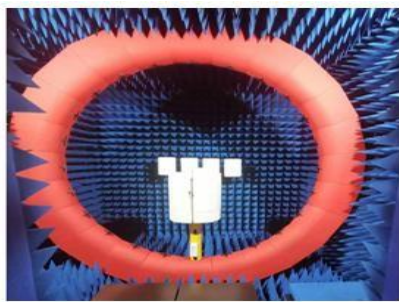
微波暗室的主要工作原理是根据电磁波在介质中从低磁导向高磁导方向传播的规律，利用高磁导率吸波材料引导电磁波，通过共振，大量吸收电磁波的辐射能量，再通过耦合把电磁波的能量转变成热能。

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：400MHz~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).



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六、性能测试报告（Test Report）

这些规格是专门为 MD039 定义的模型。

Those specifications were specially defined for MD039 model.

1. 天线位置Prototype position:



2. 环境处理Environmental treatment:

机台原环境

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3. 电压驻波比VSWR

1. 测量方法Measuring Method

1. 50 Ω 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 50 Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the VSWR.

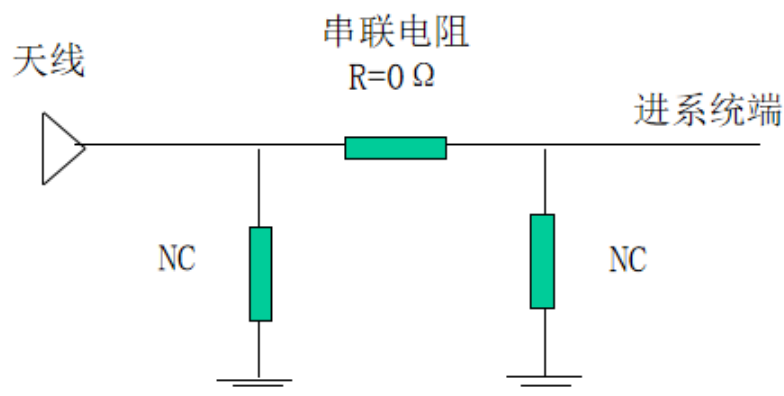
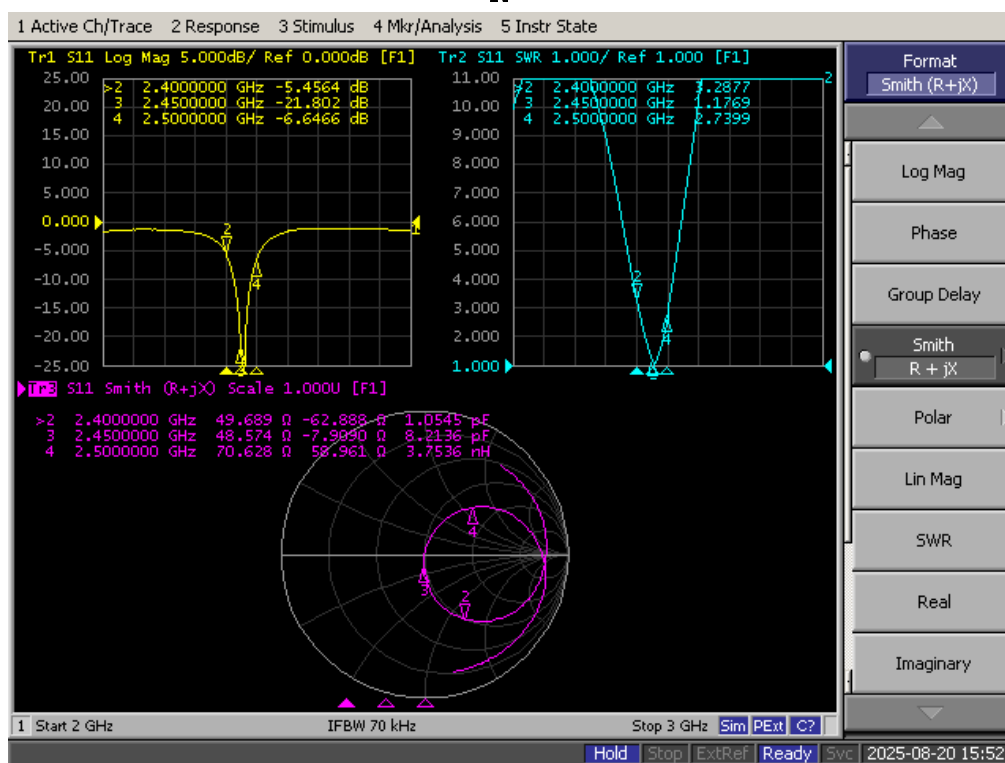
2. 夹具与金属保持至少20cm的距离。

Keeping this jig away from metal at least 20cm

2. 测量频率点和驻波比

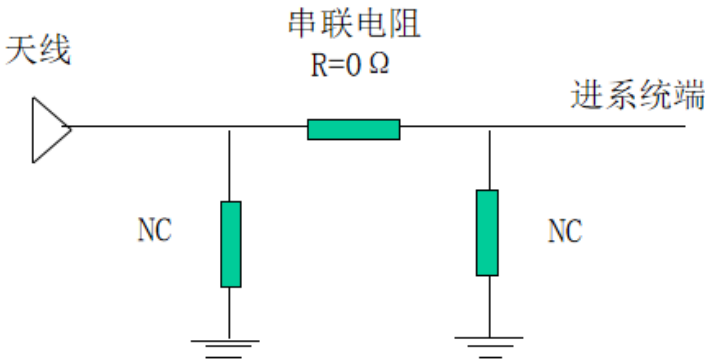
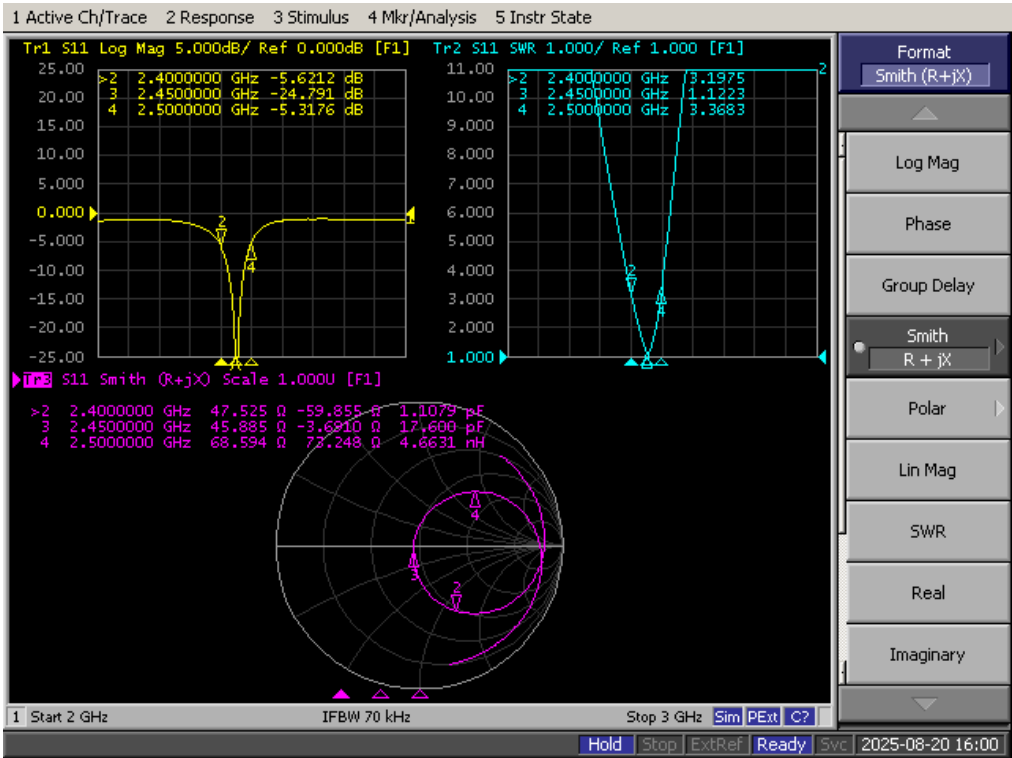
Measurement frequency points and VSWR value

R



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L

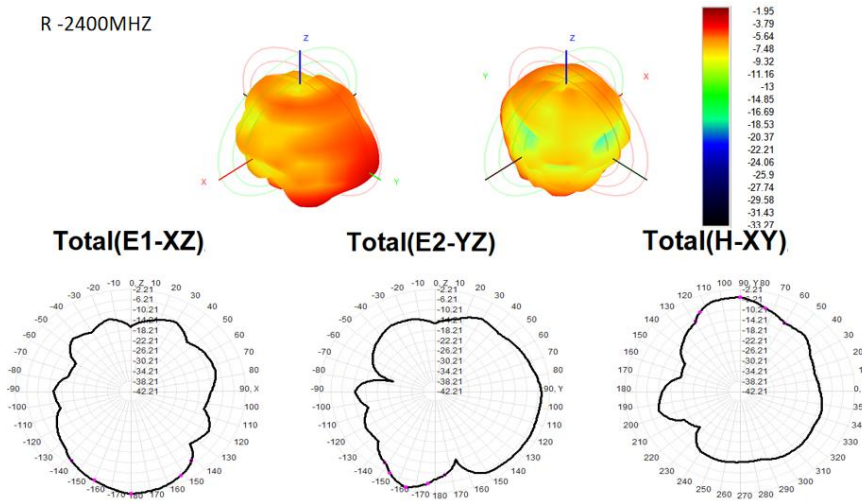


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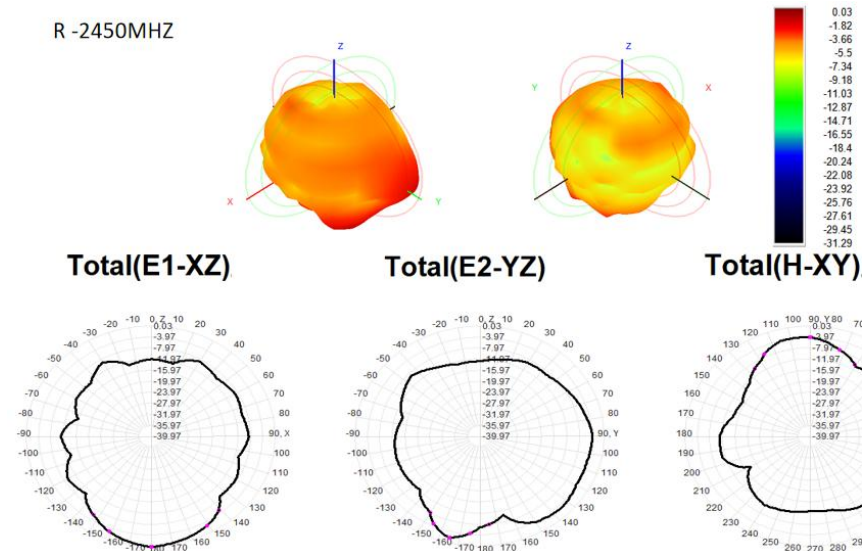
3. 2D/3D场型图-R

2D/3D field pattern diagram

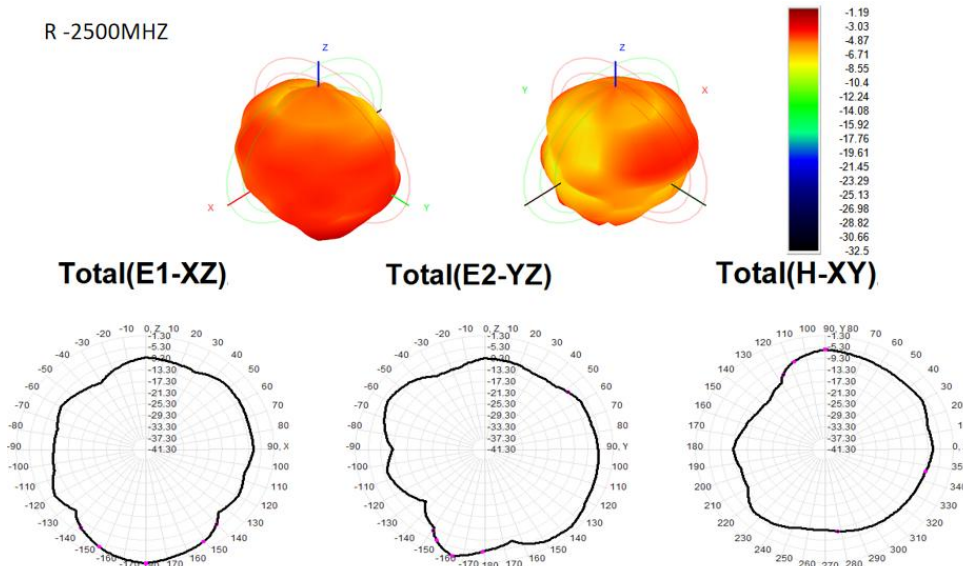
R -2400MHZ



R -2450MHZ



R -2500MHZ

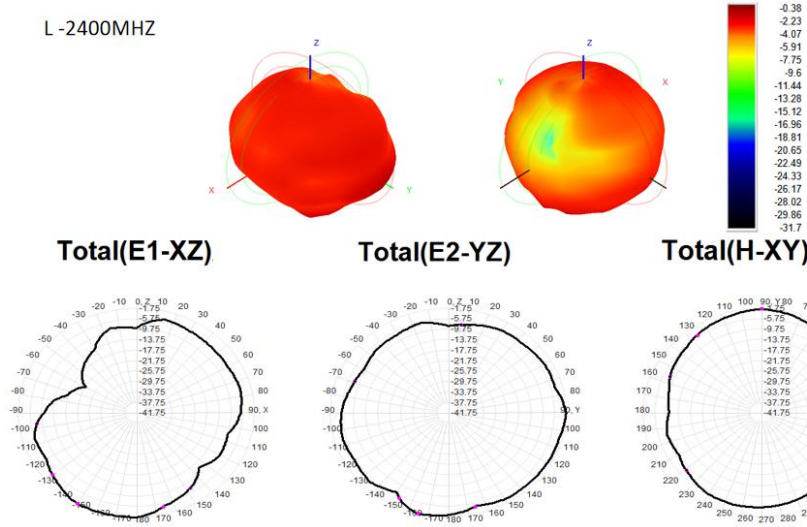


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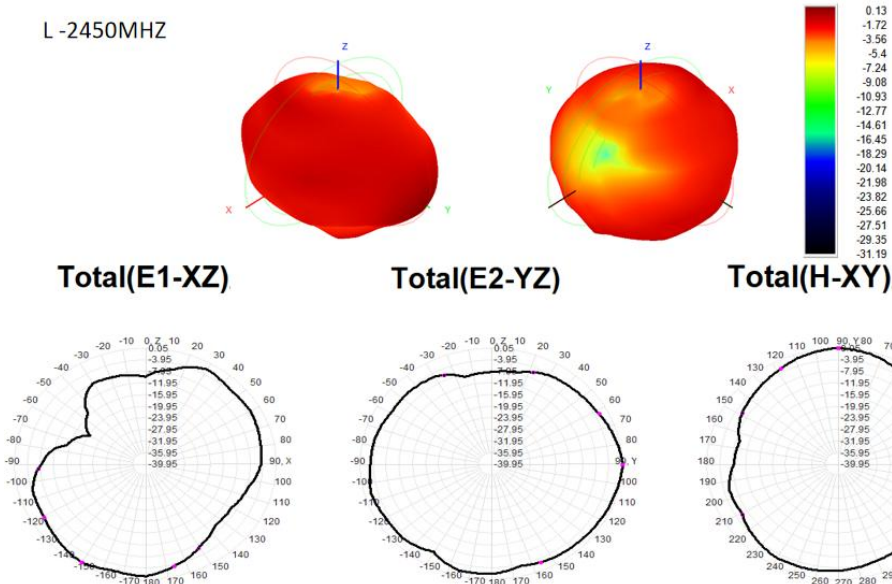
3. 2D/3D场型图-L

2D/3D field pattern diagram

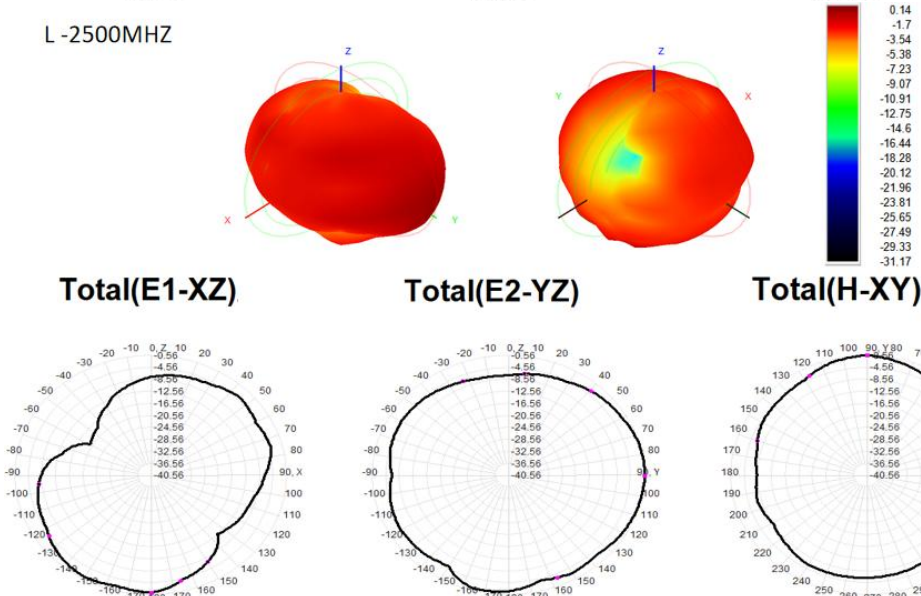
L -2400MHZ



L -2450MHZ



L -2500MHZ



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4. 无源效率&增益

Passive efficiency & Gain

2400MHZ-2500MHZ		
R		
Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	-1.95	9.31
2410	-1.54	10.22
2420	-1.27	11.40
2430	-0.70	13.12
2440	-0.49	13.57
2450	0.03	15.00
2460	0.40	16.08
2470	0.27	16.19
2480	0.16	16.90
2490	-0.30	17.01
2500	-1.19	15.21

2400MHZ-2500MHZ		
L		
Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	-0.38	25.23
2410	0.17	29.47
2420	0.51	33.02
2430	0.82	37.46
2440	0.33	36.71
2450	0.13	38.24
2460	-0.15	37.76
2470	-0.31	35.58
2480	0.00	35.66
2490	0.29	35.48
2500	0.14	32.51

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5. OTA有源

OTA active

OTA有源					
Test Condition		自由空间		头模	
band	Channel	TRP (dBm)	TIS (dBm)	TRP (dBm)	TIS (dBm)
R	0	6.71	-92.13	-1.46	-83.62
	39	7.41	-88.45	-0.90	-79.57
	78	5.15	-88.25	-2.69	-80.87

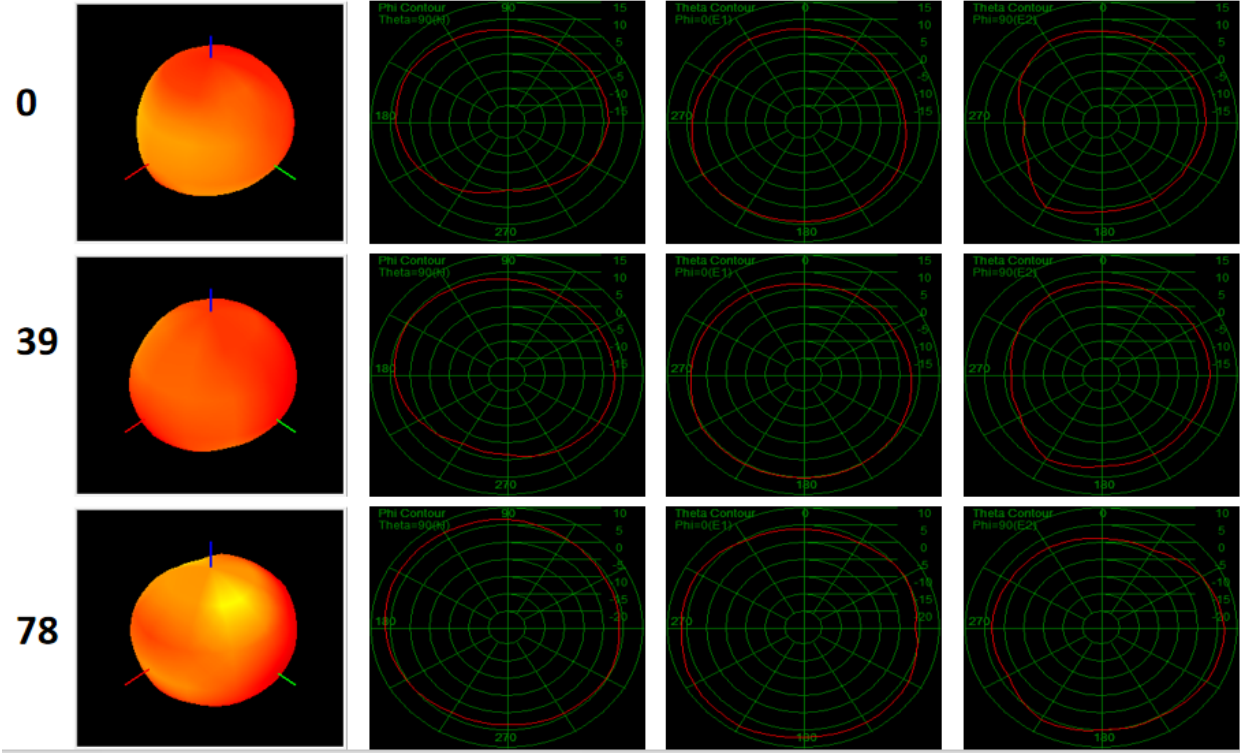
OTA有源					
Test Condition		自由空间		头模	
band	Channel	TRP (dBm)	TIS (dBm)	TRP (dBm)	TIS (dBm)
L	0	8.02	-90.72	0.17	-83.74
	39	7.02	-88.06	-0.12	-81.67
	78	5.81	-88.32	-0.43	-82.35

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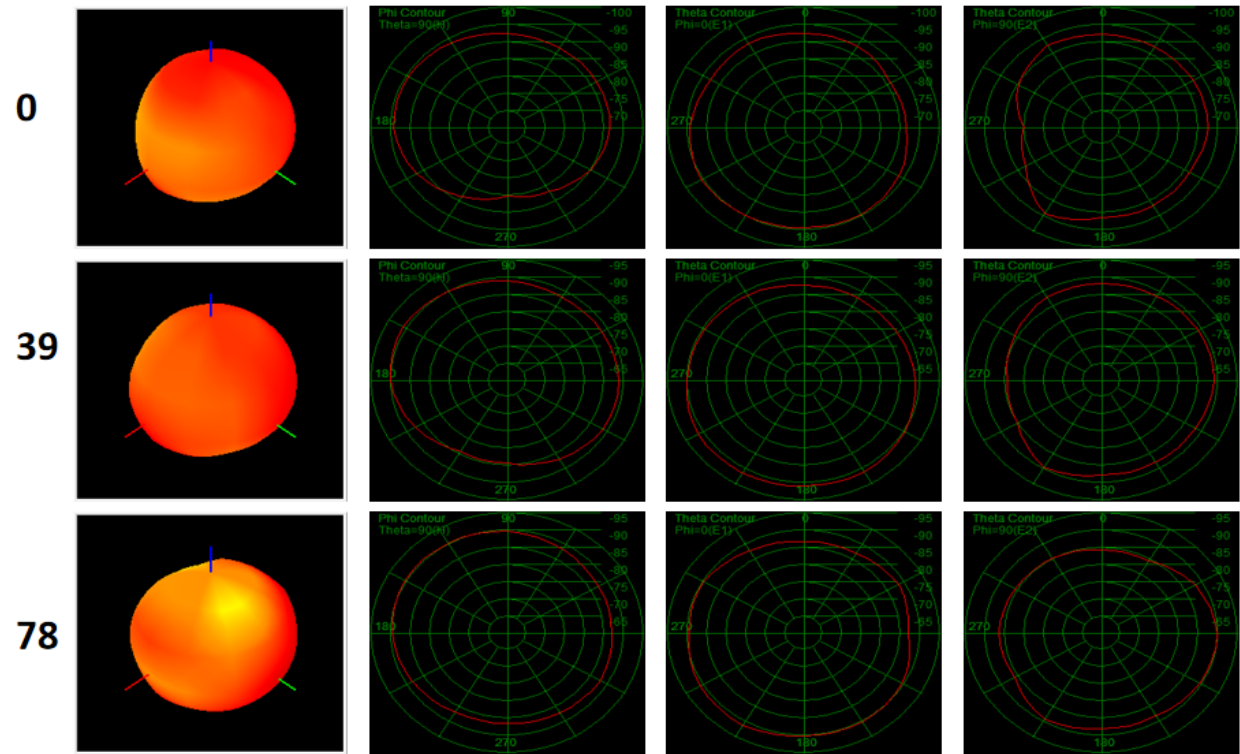
6. 有源3D&2D场型图

Active 3D&2D field pattern diagrams

自由空间-TRP-R

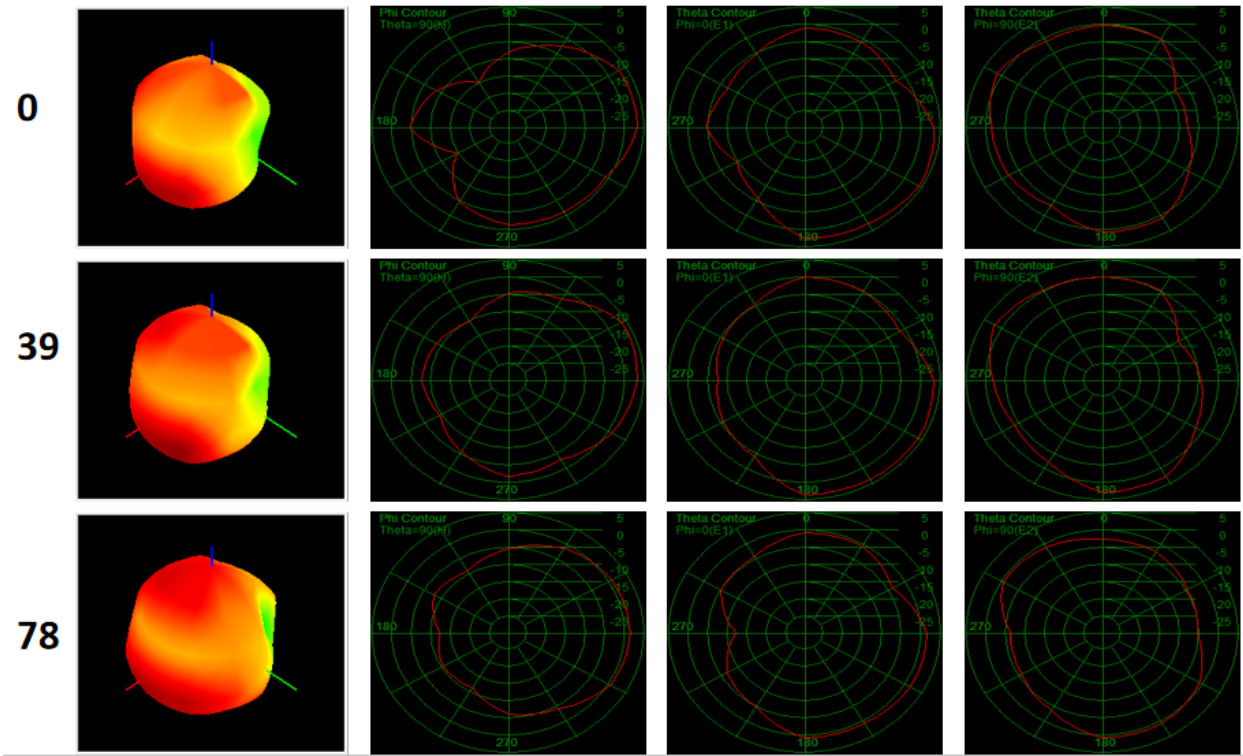


自由空间-TIS-R

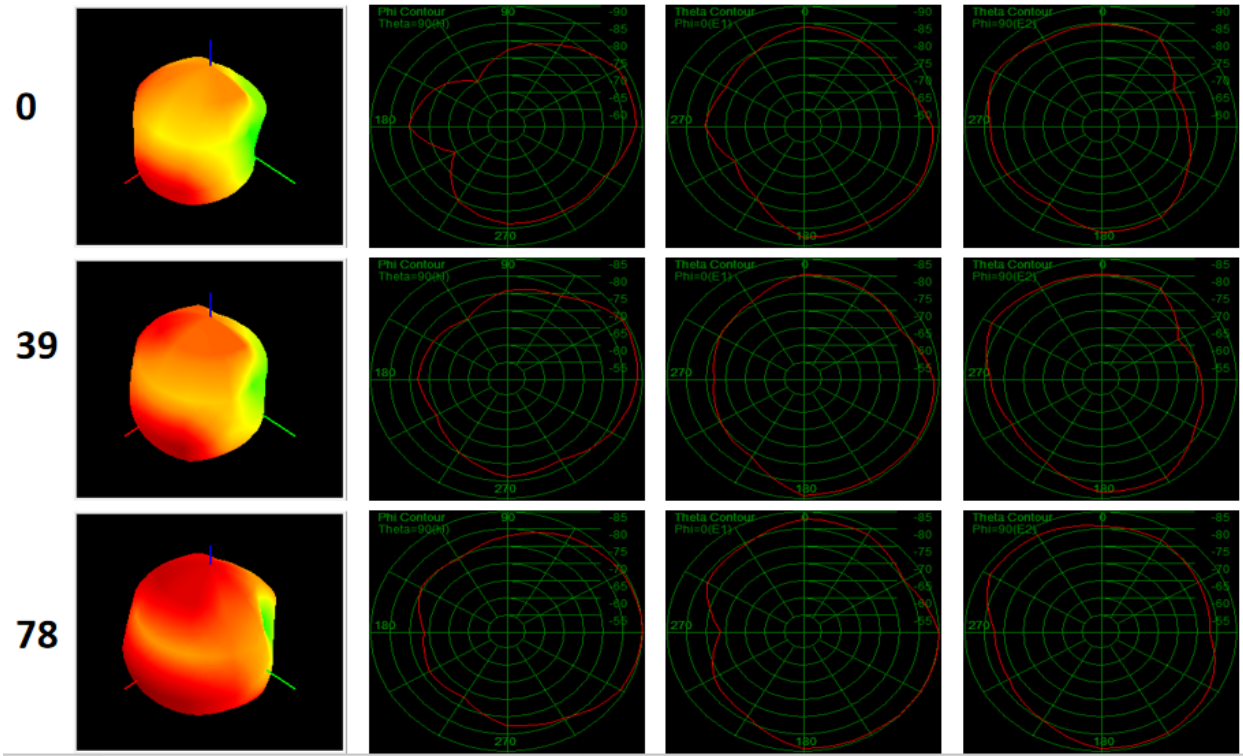


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头模-TRP-R

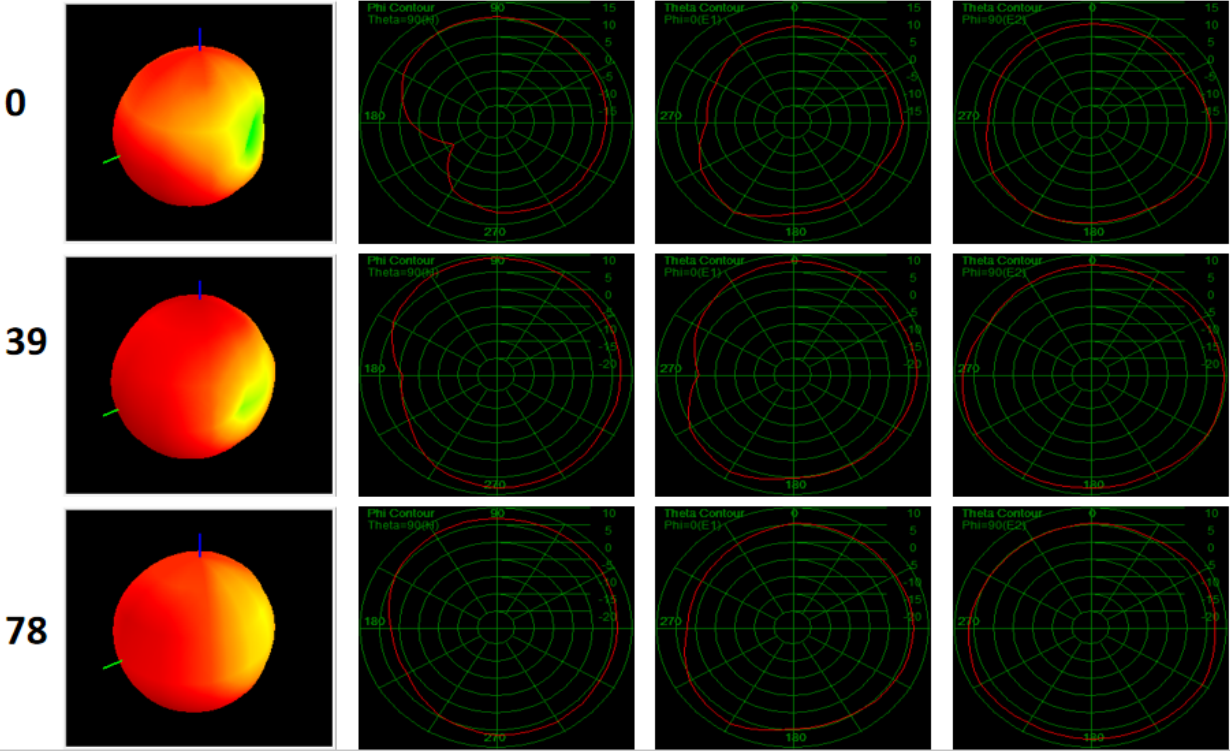


头模-TIS-R

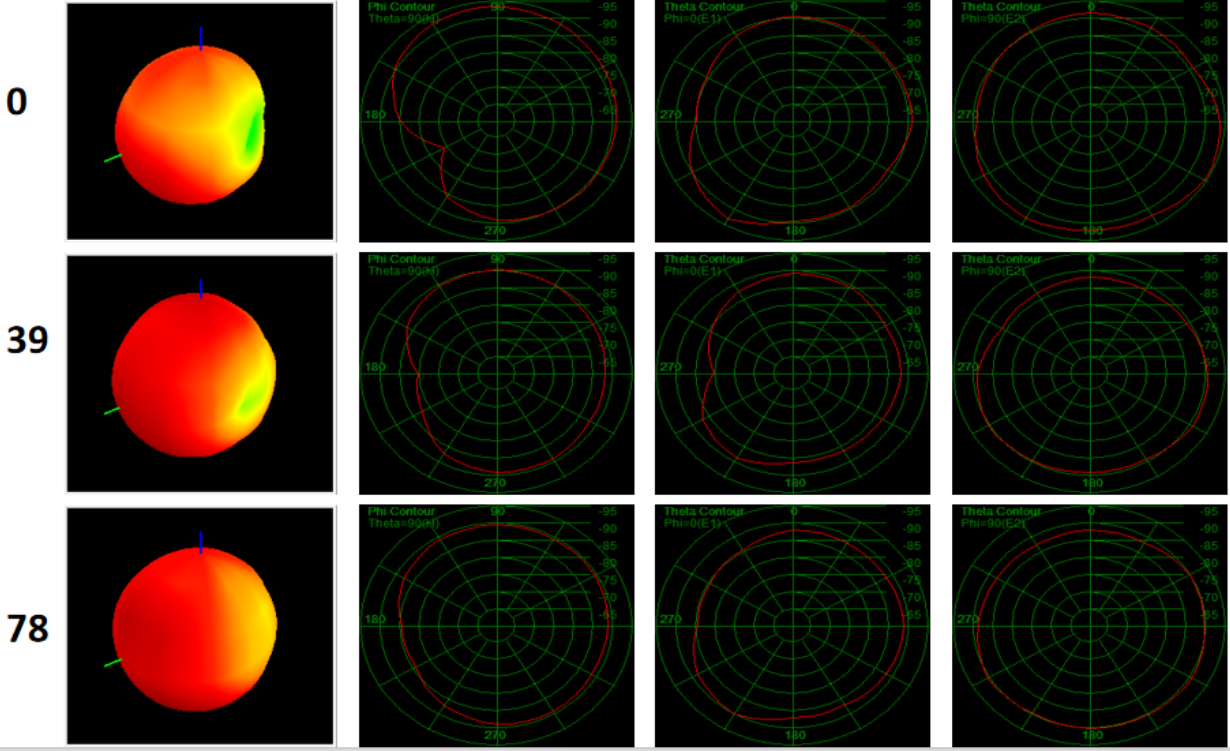


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自由空间-TRP-L

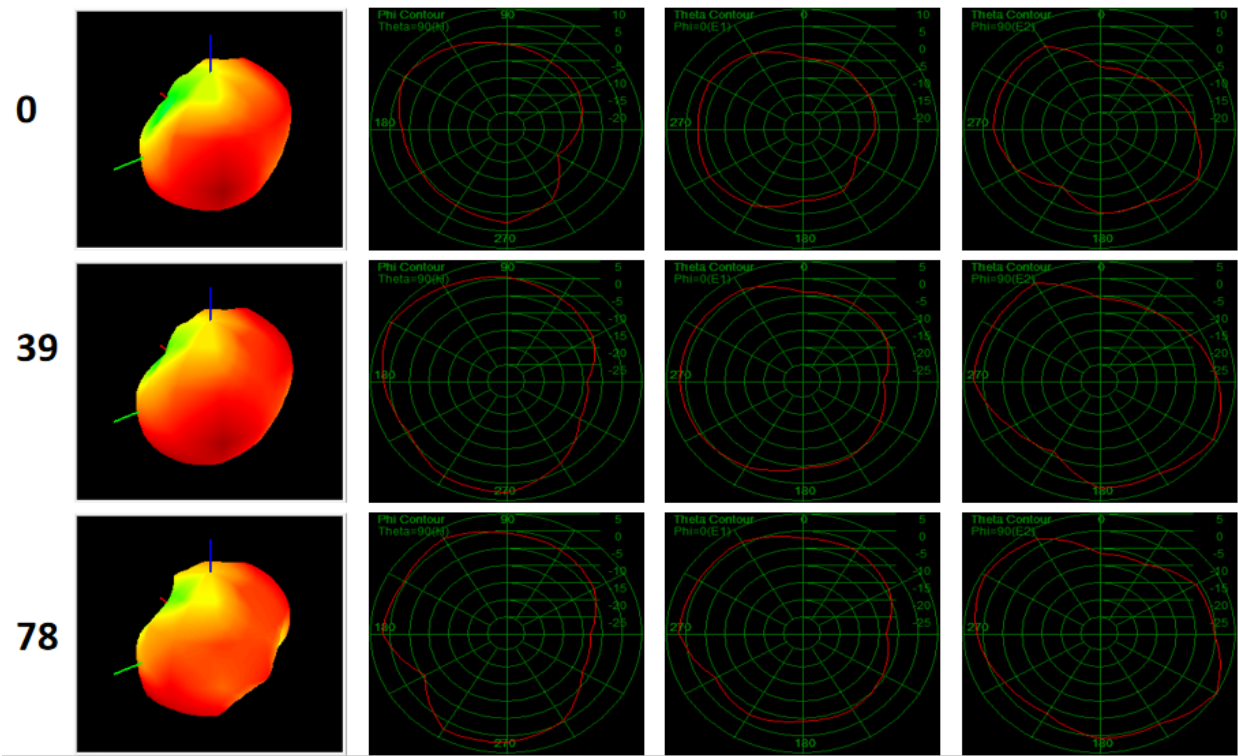


自由空间-TIS-L

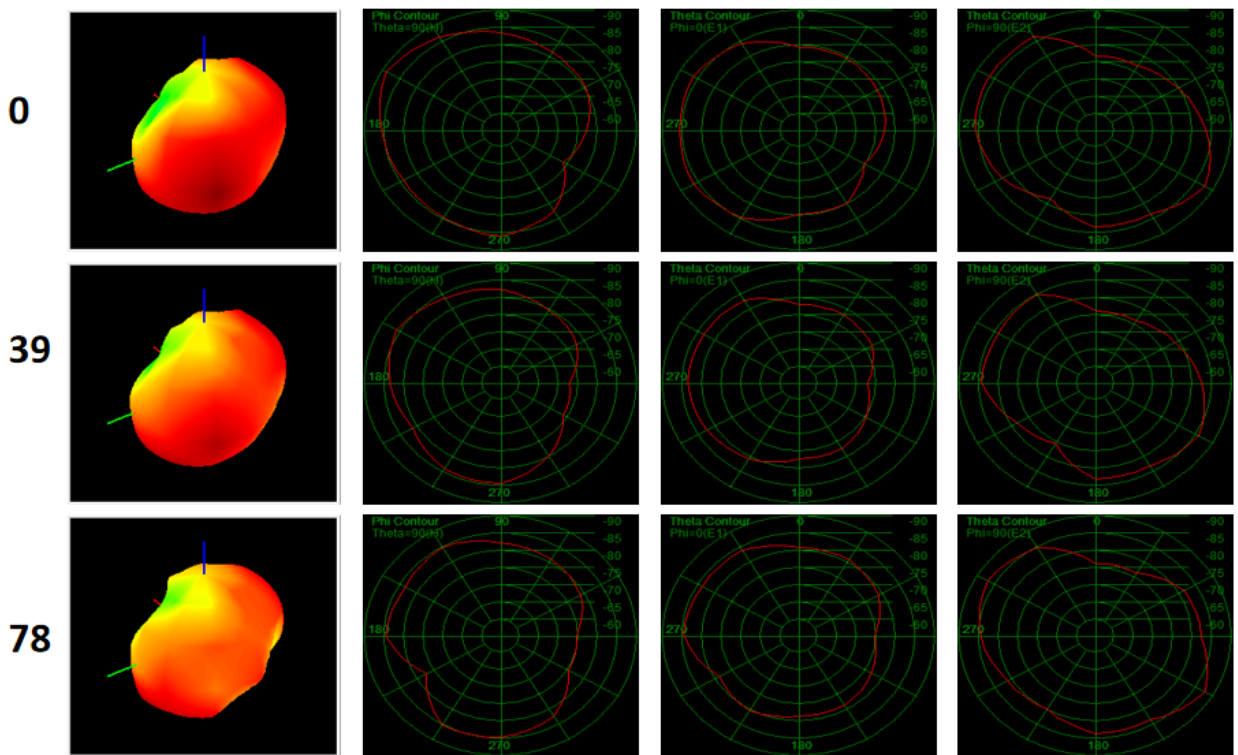


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头模-TRP-L

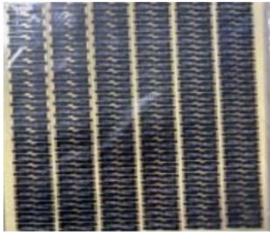


头模-TIS-L



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十、产品包装：

产品规格：	天线（黑色）	包装材料：	封口袋+纸箱
包装数量：	1箱	包装方式：	PFC整版包装
装箱数量：			
图1：整版半切包装出货  图2：装箱包装方式  图3：包装箱视图（正面、侧面、顶部） 			
备注：PFC产品以单体制作，PE袋方式包装出货。			

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*****