

# 深圳市天联凌科技有限公司

Shenzhen SKYLink Technology Co.,Ltd

## 天线规格承认书

编号：SLSOA20221115FZF01

客户名称：深圳市乐信兴业科技有限公司  
Customer Name

项目名称：  
Project Name

Single copper pipe welded 1.13mm black coaxial line, wire length is 84mm, strip wire 111,5.0\*28 mm white heat shrink tubing, 2mm reserved at the plate end.

产品描述：单铜管焊接 1.13mm 黑色同轴线，线长 84mm，剥线 111, 5.0\*28 mm 白色热缩套管，板端预留 2mm.  
Product Description

客户料号：  
Customer material number

我司料号：WF95A.C113.84B.123200.111.W  
Our company's material number

板 本：V1.0  
Version

日 期：2022-11-15  
Date

**此承认书严禁修改**

客户

| 工程 | 采购 | 承认 |
|----|----|----|
|    |    |    |

天联凌

| 研发 | 工程 | 审核 |
|----|----|----|
|    |    |    |

| 电特性Electrical characteristics                  |                                       |
|------------------------------------------------|---------------------------------------|
| 频率Frequency                                    | 2400MHz ~2500MHz                      |
| 回波损耗 Loss of return                            | <-10dB                                |
| 效率Efficiency                                   | >50%                                  |
| 增益Gain                                         | 1.45dbi                               |
| 阻抗Impedance                                    | 50 Ω                                  |
| 极化方式<br>Mode of polarization                   | Polarization of line                  |
| 材料和机械特性Material and mechanical properties      |                                       |
| 材料Material                                     | Cu                                    |
| 线材类型Type of wire                               | Wire diameter 1.13mm, black           |
| 端子类型Terminal Type                              | /                                     |
| 图纸尺寸Size of drawing                            | See the drawing for details           |
| 丝印方式<br>Screen printing method                 | /                                     |
| 环境特性Environmental Characteristics              |                                       |
| 储存温度<br>Temperature of storage                 | - 30 °C ~ + 85 °C                     |
| FPC 焊接温度<br>FRC Temperature of welding         | 280±5°C Impregnation time :10 seconds |
| 射频线焊接温度<br>Welding temperature of the RF cable | 320±5°C 2-3s                          |

## ● Test Equipment & Conditions

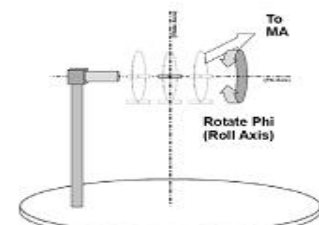
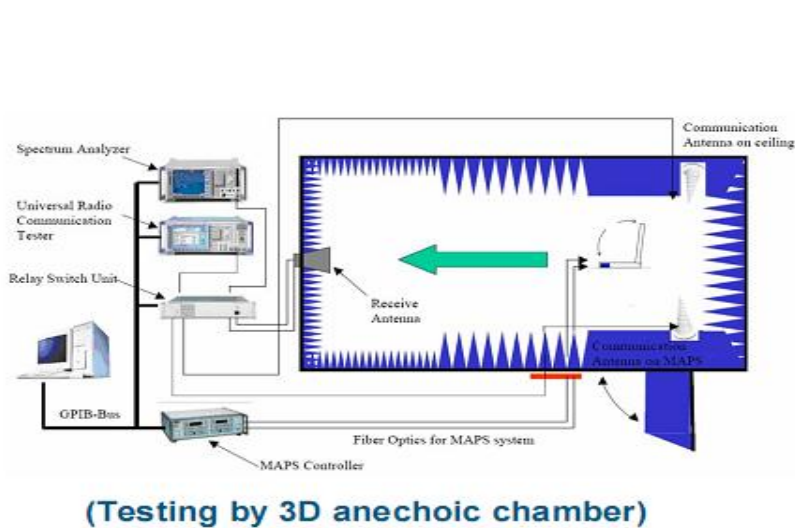
### 1. Network Analyzers :

Agilent 8753D 5071B

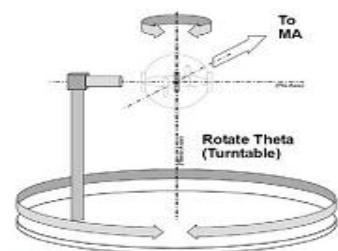
#### Communications Test Set:

Agilent E5515C CMW500

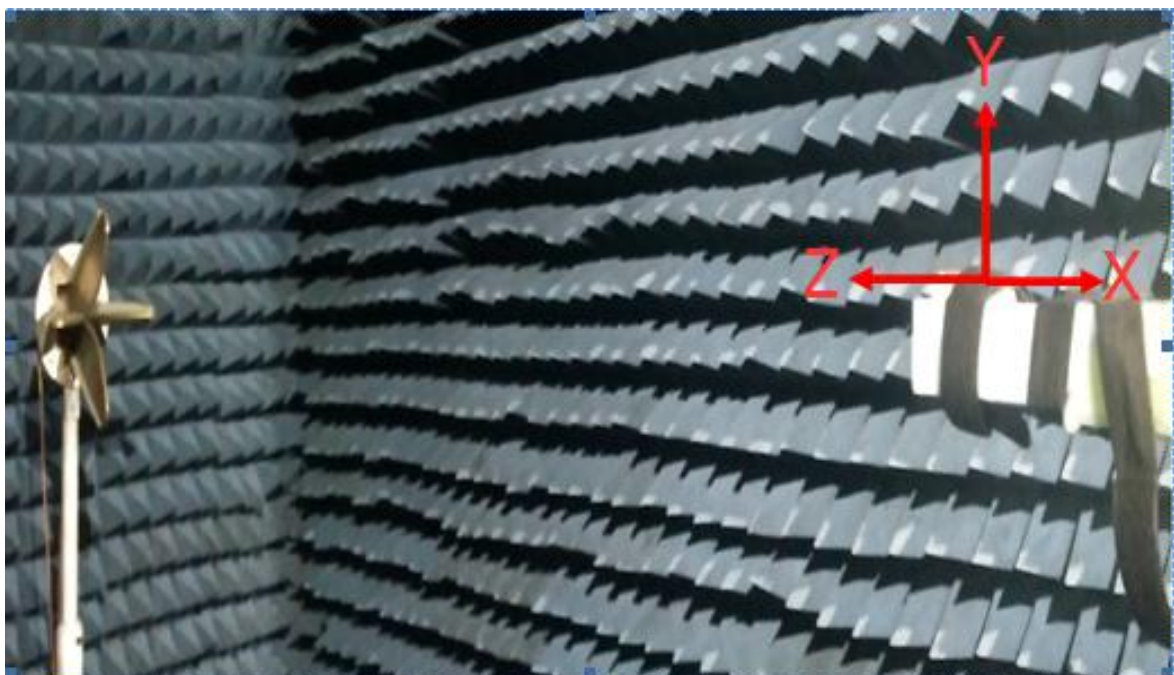
### 2. 3D Chamber Test System

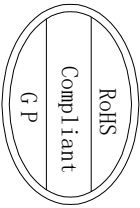


**Phi axis test**

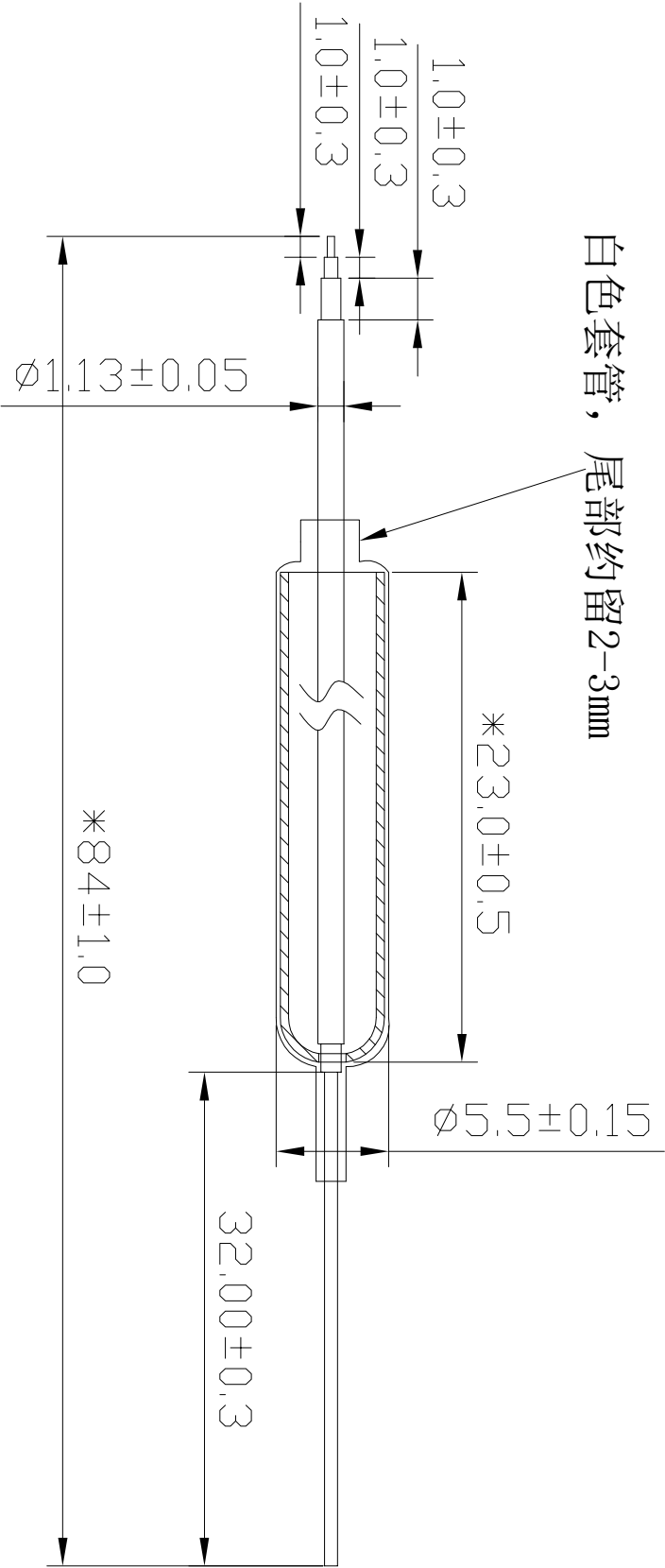


**Theta axis test**



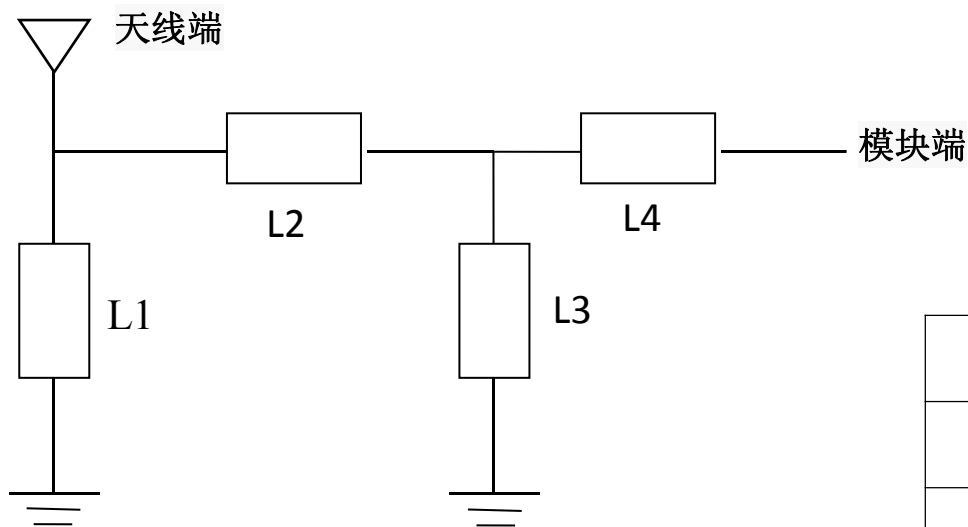


白色套管，尾部约留2-3mm



|     |  |             |  |      |  |        |  |          |  |         |  |      |  |       |   |
|-----|--|-------------|--|------|--|--------|--|----------|--|---------|--|------|--|-------|---|
| 1   |  | 2           |  | 3    |  | 4      |  | 5        |  | 6       |  | 7    |  | 8     |   |
| A   |  |             |  |      |  |        |  |          |  |         |  |      |  |       | A |
| B   |  |             |  |      |  |        |  |          |  |         |  |      |  |       | B |
| C   |  |             |  |      |  |        |  |          |  |         |  |      |  |       | C |
| D   |  |             |  |      |  |        |  |          |  |         |  |      |  |       | D |
| Rev |  | Description |  | Date |  | Remark |  | Location |  | DWG No. |  | Unit |  | Scale |   |
| 1   |  |             |  |      |  |        |  |          |  |         |  |      |  | 1:1   |   |
| A   |  | New drawing |  |      |  |        |  |          |  |         |  |      |  | Rev A |   |

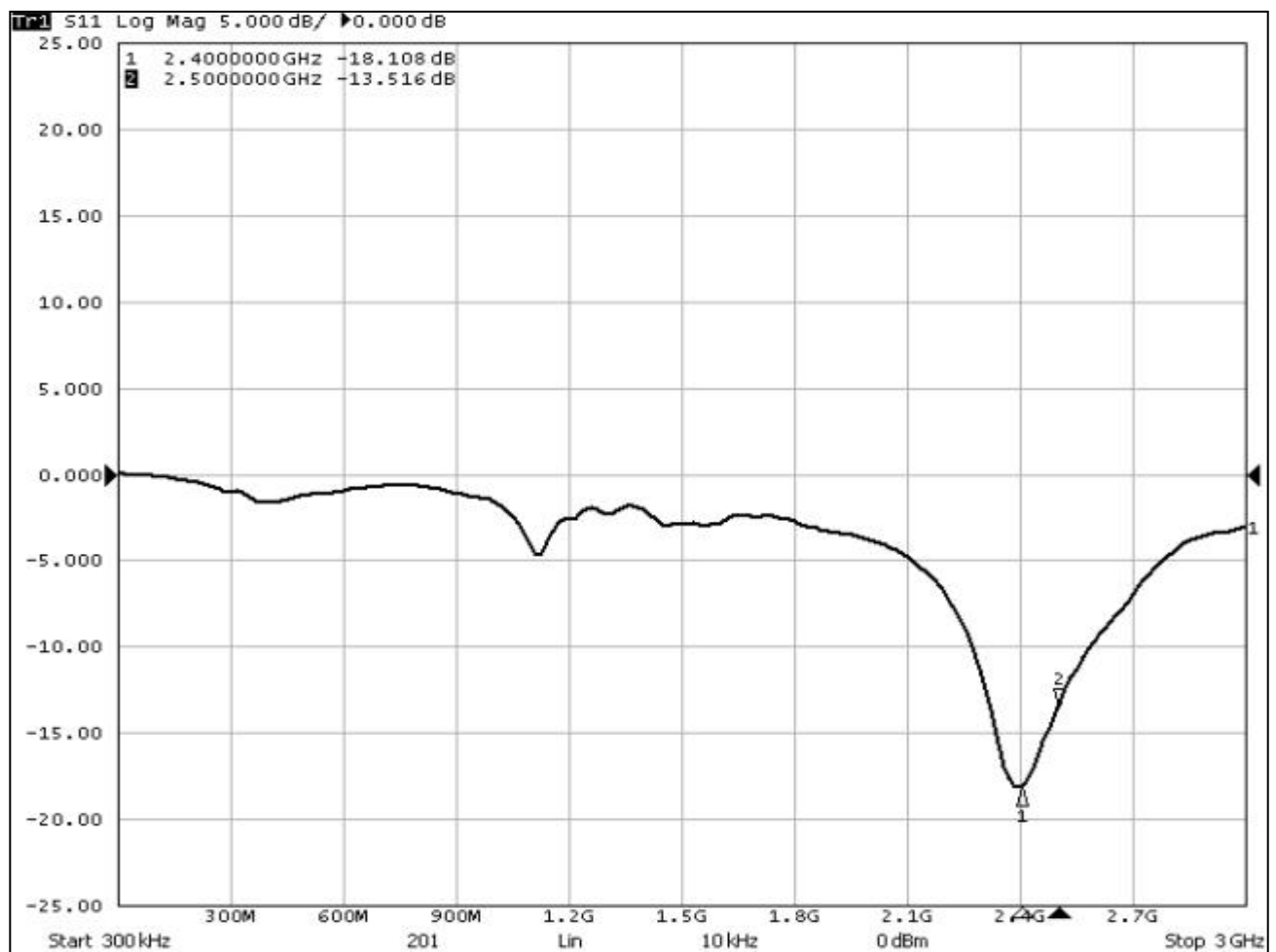
## ● 匹配电路（matching circuit）



|    |   |
|----|---|
| L1 | / |
| L2 | / |
| L3 | / |
| L4 | / |

原主板匹配电路不变

## ◆ Return Loss

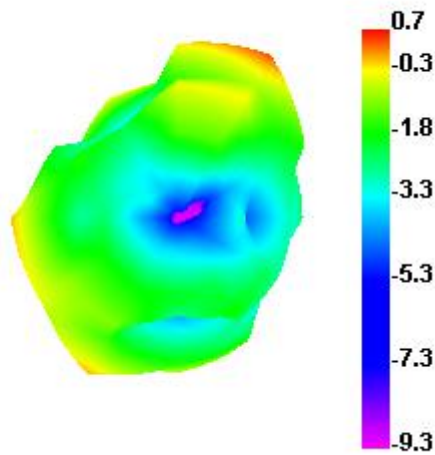


## ◆ Gain & Efficiency

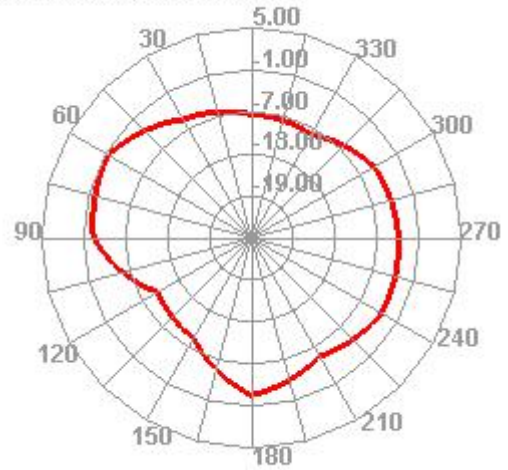
| Freq<br>(MHz) | Effi<br>(%) | Gain<br>(dBi) |
|---------------|-------------|---------------|
| 2400          | 53.66       | 0.7           |
| 2410          | 52.19       | 0.8           |
| 2420          | 53.03       | 1.09          |
| 2430          | 54.41       | 1.32          |
| 2440          | 56.67       | 1.45          |
| 2450          | 55.24       | 1.2           |
| 2460          | 55.61       | 1.21          |
| 2470          | 51.91       | 1.29          |
| 2480          | 54.39       | 1.66          |
| 2490          | 56.96       | 2.03          |
| 2500          | 56.23       | 2.16          |

## ◆ Radiation Pattern

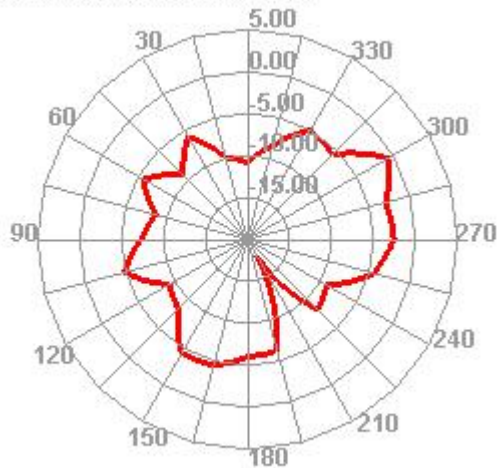
2400.000MHz



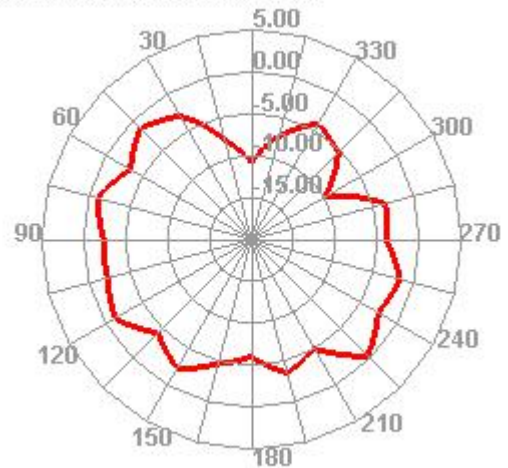
2400.000MHz H



2400.000MHz E1

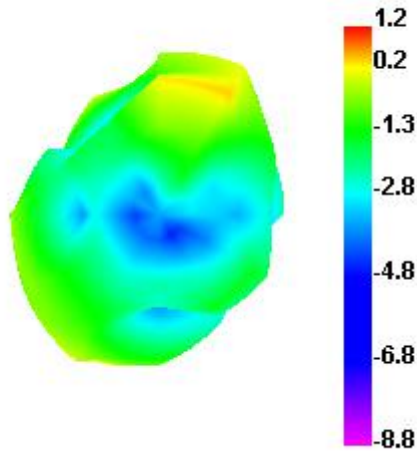


2400.000MHz E2

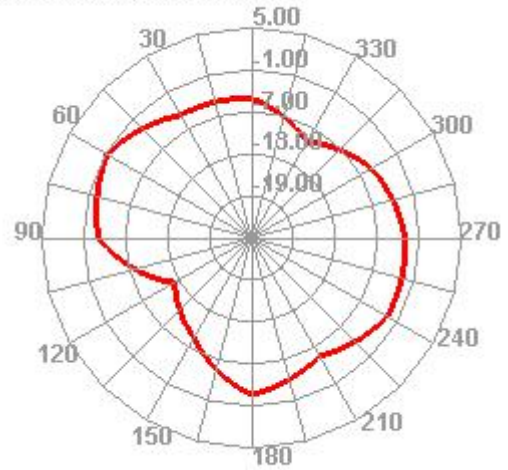


## ◆ Radiation Pattern

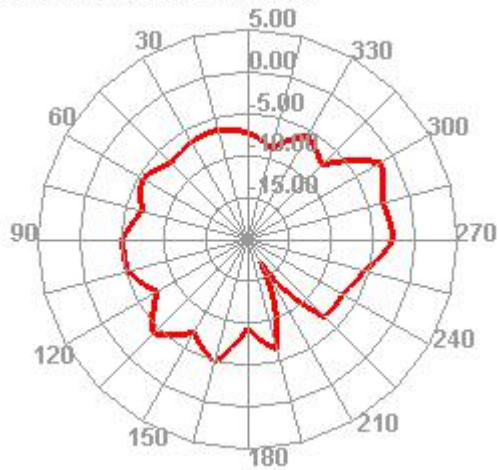
2450.000MHz



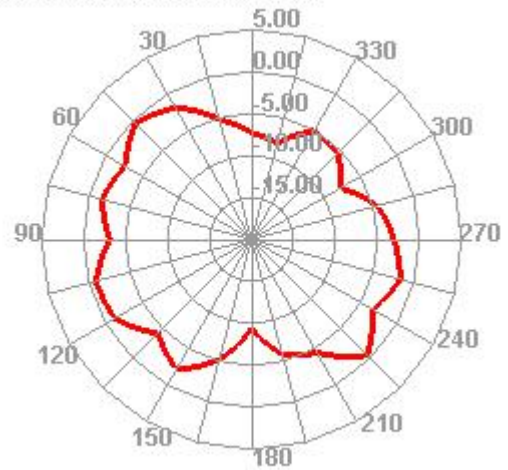
2450.000MHz H



2450.000MHz E1

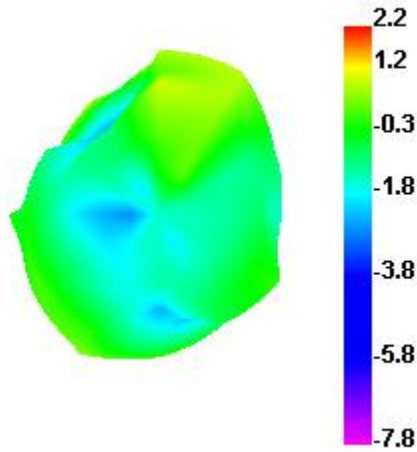


2450.000MHz E2

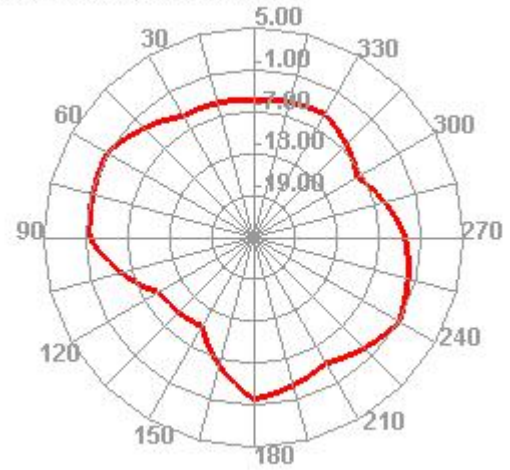


## ◆ Radiation Pattern

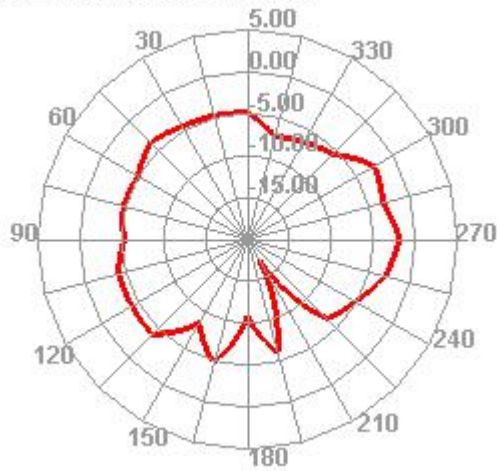
**2500.000MHz**



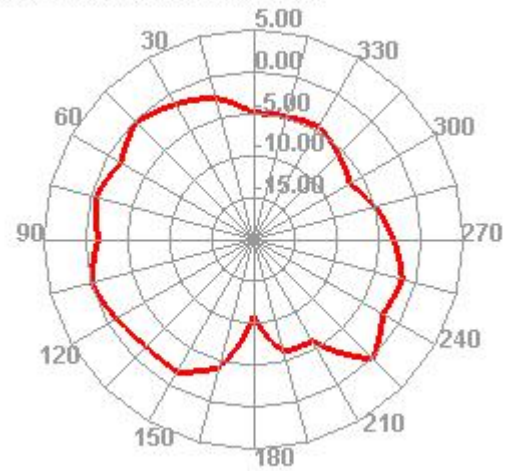
**2500.000MHz H**



**2500.000MHz E1**



**2500.000MHz E2**



## ◆ 可靠性测试

| 测试项目 |      | 测试条件                                                                                                                     | 设备     | 规范                   | 结果 |
|------|------|--------------------------------------------------------------------------------------------------------------------------|--------|----------------------|----|
| 1    | 低温测试 | 温度：-30℃，湿度：65%，时间：48小时<br>测试条件：<br>把天线放置在高低温测试箱里，温度保持在25℃，湿度保持在65%,时间为1小时，然后在1小时内降低温度到-30℃，保持44小时，再升温到25℃，保持2小时          | 高低温测试机 | 不允许材料变形<br><br>电子性能好 | 通过 |
| 2    | 高温测试 | 温度：85℃，湿度：85%，时间：48小时<br>测试条件：<br>把天线放置在高低温测试箱里，温度保持在25℃，湿度保持在65%，时间为1小时，然后在1小时内，把温度升到80℃，湿度为85%,保持44小时，再把温度降到25℃，保持2小时。 | 高低温测试机 | 不允许材料变形<br><br>电子性能好 | 通过 |
| 3    | 盐雾测试 | 盐雾测试：<br>把天线放置在盐雾测试机内<br>设置测试环境：<br>温度 $35 \pm 2^{\circ}\text{C}$<br>湿度85%<br>盐雾喷剂： $5 \pm 1\%$<br>PH值6.5~7.2<br>时间：24小时 | 盐雾测试机  | 没有颜色变化<br><br>没有出现生锈 | 通过 |