# Antenna Test Report

# 天线调试报告

**Customer Name(客户名称)：**安克

**Project Name (项目名称)：**D4112

**Date (日 期)：**2024.03.28

**R & D Engineer (研 发)：**莫振文

# Directory(目录)

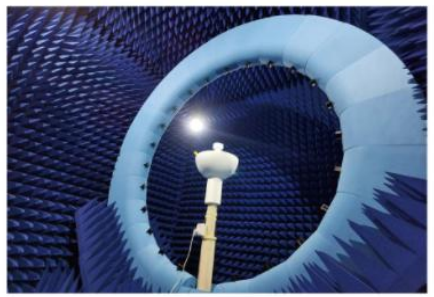

# 公司简介

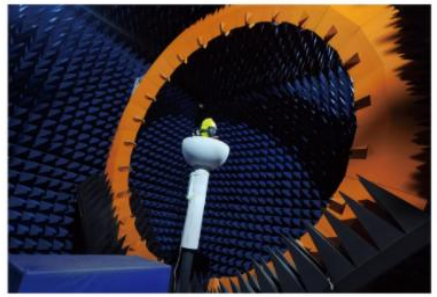
爱特恩科技（深圳）有限公司成立于2016年，公司位于深圳市，是一家专业的通讯电子产品配件的解决方案提供商和制造商。集天线研发、生产、销售于一体的高新科技企业。

公司主要从事与开发安防类、智能家居类的电子产品。 目前拥有3座微波暗室、模拟人头手测试、网络分析仪等 。

我们致力与客户建立长期稳定的商业合作关系，始终坚持“顾客至上，锐意进取”的经营理念，为我们的客户提供最具竞争力的价格，最好的质量和优质的服务。

AT&C 专注品质 | 质量第一 | 共赢未来





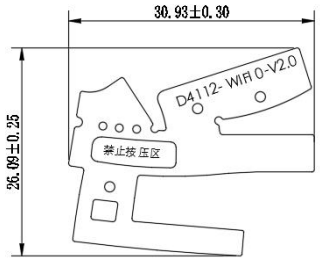
拥有SATIMO原装实验室7M*5M*5M的24探头一座
益麦3.5MX3.5MX3.5M的24探头一座
频率范围均为400MHZ-8.5GHZ
2/3/4/5G、
WIFI A/B/G/N/AC/AX
BT
GPS
NB-10T等有源测试，
拥有模拟人头手测试设备

拥有AGILENT5071系列网络分析仪、AGILENT8960、RS CMW500、4438C等终端测试设备,提供天线性能测试。

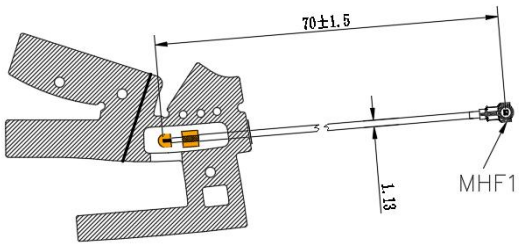
# ● D4112_Project Overview(项目概况)

| | |
|---|---|
| Prototype status (样机状态) | DVT |
| product type (产品类型) | Projector(投影仪) |
| Number of antennas (天线数量) | 3pcs |
| Antenna frequency band (天线频段) | WIFI 0 802.11 a/b/g/n |
| | WIFI 1 802.11 a/b/g/n |
| | BT |
| | |
| | |
| structural style (结构形式) | FPC+CABLE线 |
| environmental treatment (环境处理) | No changes (未做改动) |
| matching circuit (匹配电路) | No changes (未做改动) |

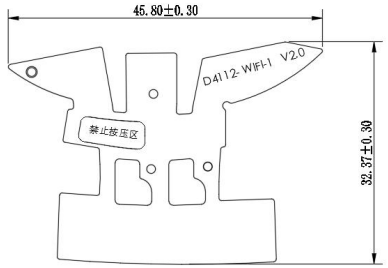
# ● D4112_Antenna Information(天线信息)




TOP




BOTTOM

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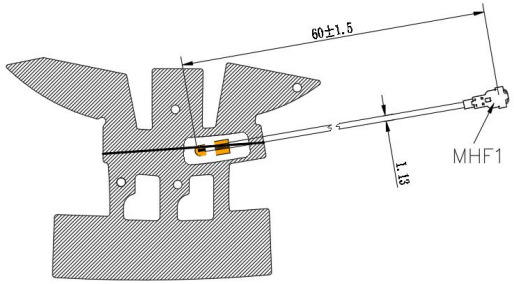
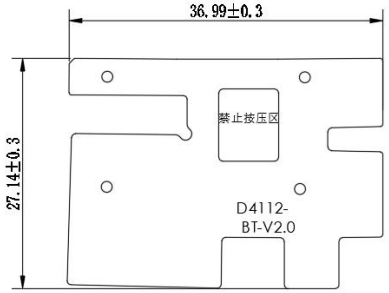



BOTTOM

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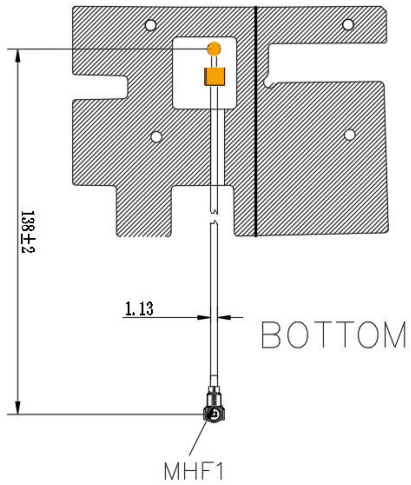
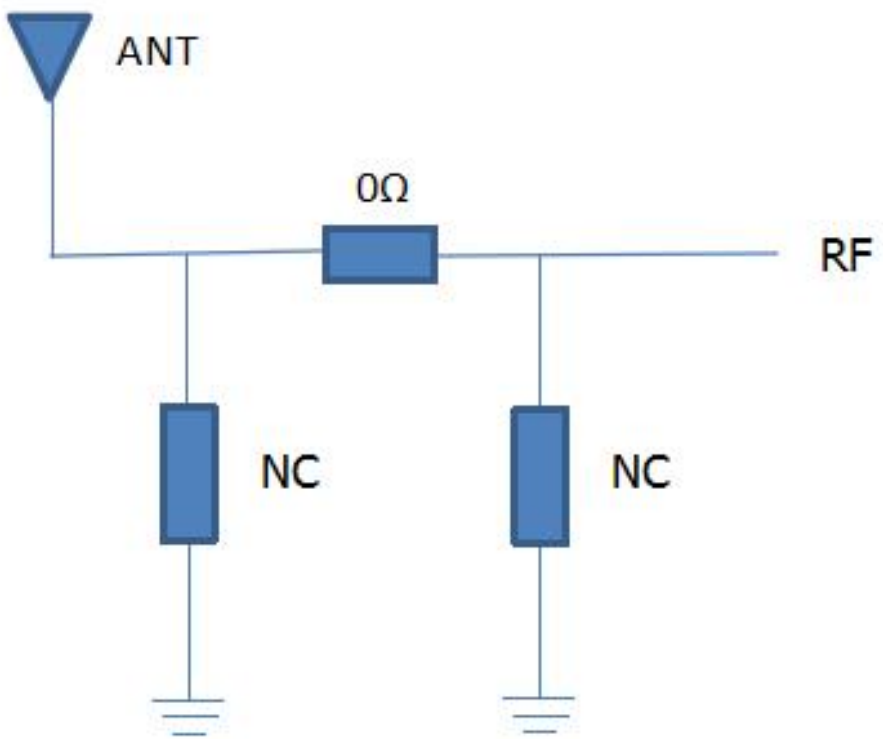
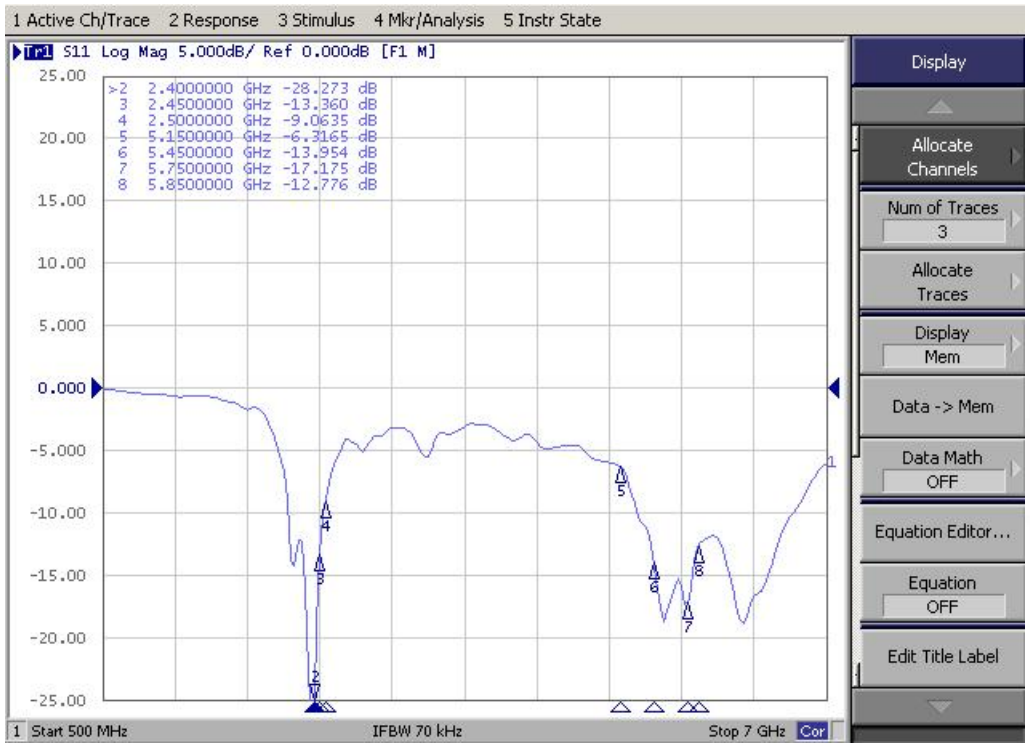



BOTTOM

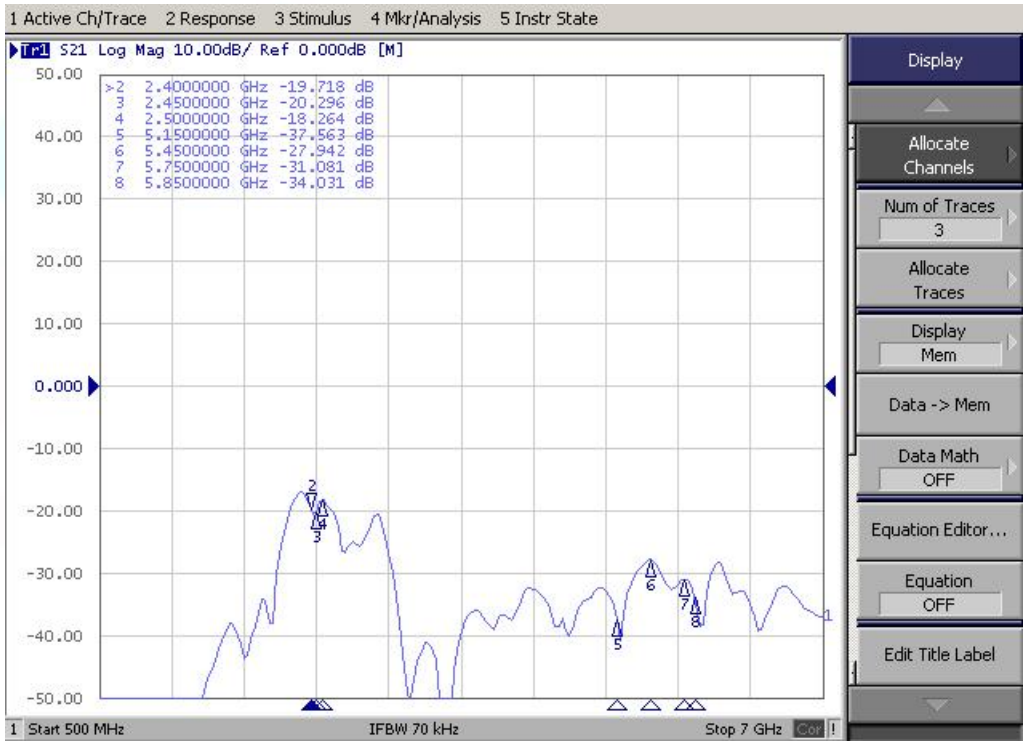
1. No changes were made to the matching of the three antennas(三个天线匹配均无更改)。



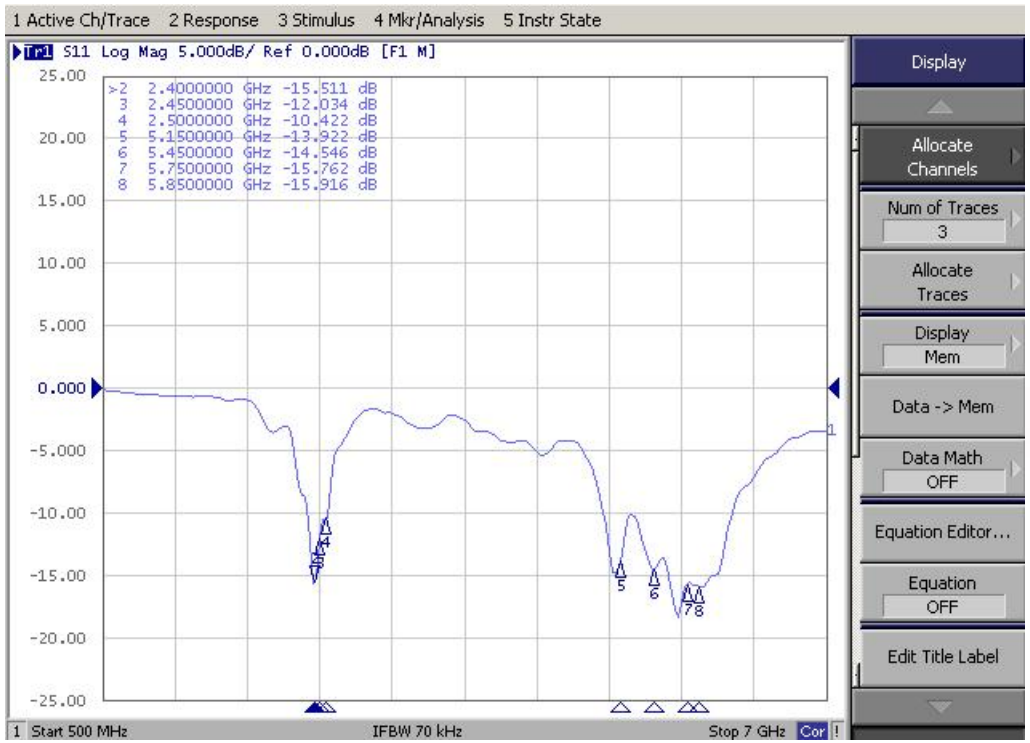
## WIFI 0 antenna_ VSWR (WIFI 0天线_VSWR)



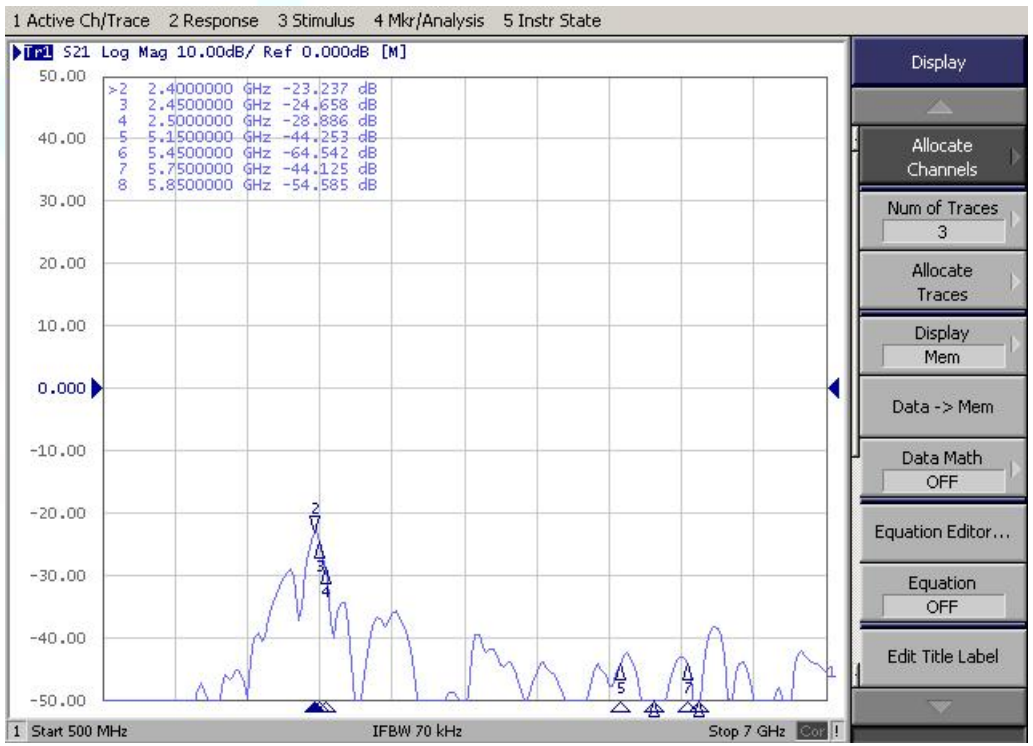

## Isolation between WIFI 0 antenna and WIFI 1 antenna (WIFI 0天线与WIFI 1天线隔离度)



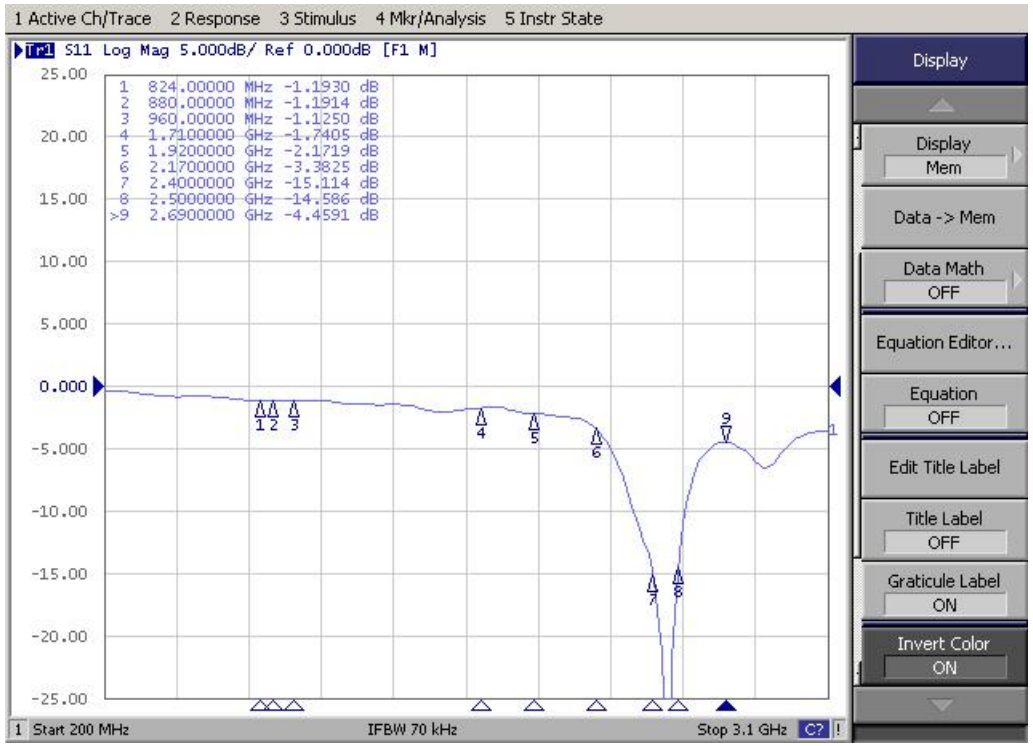
## WIFI 1 antenna_ VSWR (WIFI 1天线_VSWR)



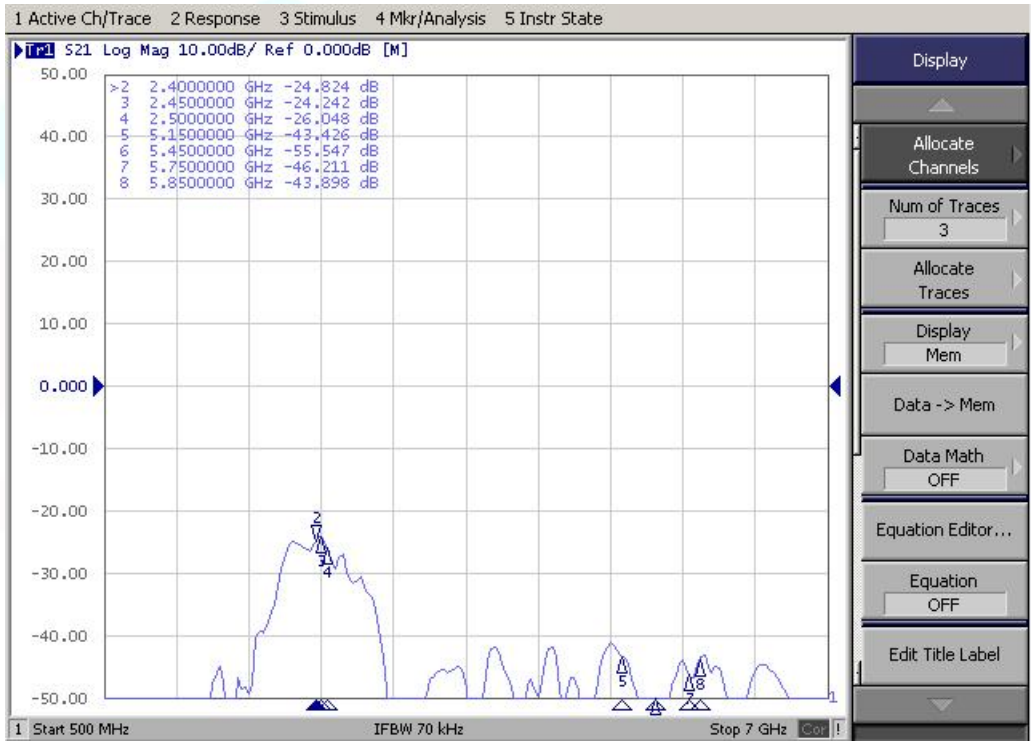

## Isolation between WIFI 1 antenna and BT antenna (WIFI 1天线与BT天线隔离度)



## BT antenna_ VSWR
## (BT天线_VSWR)




## Isolation between WIFI 0 antenna and BT antenna
## (WIFI 0天线与BT天线隔离度)



# ● D4112 _WIFI 0_Efficiency & Gain（无源效率和增益）

**2.4G**

| (2.4G) PassiveTest**Results**(无源测试结果) | | | |
|---|---|---|---|
| Frequency(MHz) | Efficiency(%) | Efficiency(dB) | Max Gain(dBi) |
| 2400 | 61.68% | -2.10 | 2.86 |
| 2420 | 63.27% | -1.99 | 2.88 |
| 2440 | 61.94% | -2.08 | 2.89 |
| 2460 | 64.24% | -1.92 | 3.05 |
| 2480 | 62.91% | -2.01 | 3.08 |
| 2500 | 62.41% | -2.05 | 3.05 |
| AVG: | 62.74% | -2.03 | 2.97 |

**5G**

| (5G) PassiveTest**Results**(无源测试结果) | | | |
|---|---|---|---|
| Frequency(MHz) | Efficiency(%) | Efficiency(dB) | Max Gain(dBi) |
| 5150 | 42.69% | -3.70 | 3.08 |
| 5200 | 43.95% | -3.57 | 2.77 |
| 5250 | 47.69% | -3.22 | 4.13 |
| 5300 | 50.50% | -2.97 | 4.64 |
| 5350 | 49.98% | -3.01 | 4.46 |
| 5400 | 50.63% | -2.96 | 4.56 |
| 5450 | 54.11% | -2.67 | 4.87 |
| 5500 | 56.21% | -2.50 | 5.15 |
| 5550 | 54.22% | -2.66 | 4.67 |
| 5600 | 51.40% | -2.89 | 4.46 |
| 5650 | 54.13% | -2.67 | 4.93 |
| 5700 | 54.89% | -2.61 | 5.24 |
| 5750 | 54.83% | -2.61 | 4.98 |
| 5800 | 53.75% | -2.70 | 3.71 |
| 5850 | 56.16% | -2.51 | 2.63 |
| 5900 | 54.15% | -2.66 | 2.95 |
| AVG: | 51.83% | -2.87 | 4.20 |

2.4G

| (2.4G) PassiveTestResults(无源测试结果) | | | |
|---|---|---|---|
| Frequency(MHz) | Efficiency(%) | Efficiency(dB) | Max Gain(dBi) |
| 2400 | 51.86% | -2.85 | 2.20 |
| 2420 | 49.27% | -3.07 | 2.16 |
| 2440 | 47.29% | -3.25 | 1.66 |
| 2460 | 46.06% | -3.37 | 1.28 |
| 2480 | 45.52% | -3.42 | 0.87 |
| 2500 | 45.75% | -3.40 | 1.10 |
| AVG: | 47.62% | -3.23 | 1.54 |

5G

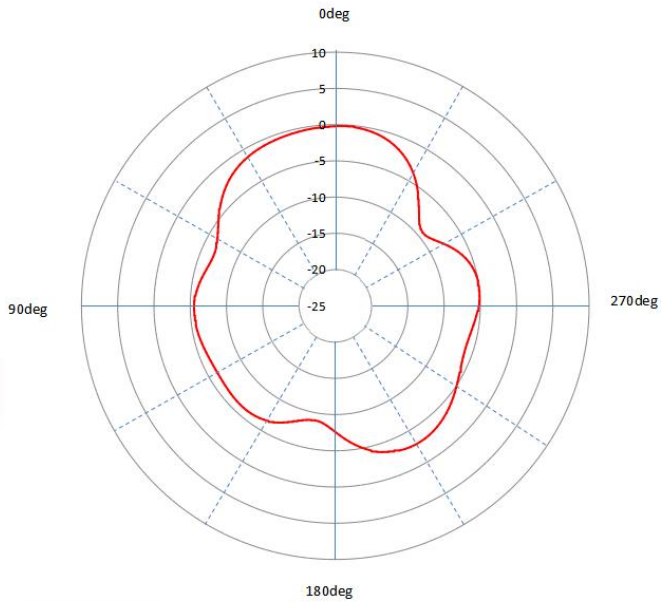
| (5G) PassiveTestResults(无源测试结果) | | | |
|---|---|---|---|
| Frequency(MHz) | Efficiency(%) | Efficiency(dB) | Max Gain(dBi) |
| 5150 | 44.19% | -3.55 | 2.96 |
| 5200 | 41.91% | -3.78 | 2.19 |
| 5250 | 43.18% | -3.65 | 2.85 |
| 5300 | 46.73% | -3.30 | 3.33 |
| 5350 | 48.99% | -3.10 | 3.46 |
| 5400 | 47.51% | -3.23 | 2.92 |
| 5450 | 48.24% | -3.17 | 2.44 |
| 5500 | 50.34% | -2.98 | 2.27 |
| 5550 | 51.87% | -2.85 | 2.53 |
| 5600 | 54.17% | -2.66 | 2.96 |
| 5650 | 56.58% | -2.47 | 2.93 |
| 5700 | 55.25% | -2.58 | 2.29 |
| 5750 | 55.32% | -2.57 | 2.77 |
| 5800 | 56.41% | -2.49 | 3.46 |
| 5850 | 61.17% | -2.13 | 3.75 |
| 5900 | 61.98% | -2.08 | 3.73 |
| AVG: | 51.49% | -2.91 | 2.93 |

| (2.4G) Passive Test **Results(无源测试结果)** | | | |
|---|---|---|---|
| Frequency(MHz) | Efficiency(%) | Efficiency(dB) | Max Gain(dBi) |
| 2400 | 31.21% | -5.06 | -1.41 |
| 2410 | 33.02% | -4.81 | -1.26 |
| 2420 | 34.01% | -4.68 | -1.23 |
| 2430 | 35.02% | -4.56 | -1.06 |
| 2440 | 35.76% | -4.47 | -1.11 |
| 2450 | 36.70% | -4.35 | -1.31 |
| 2460 | 36.79% | -4.34 | -1.39 |
| 2470 | 36.10% | -4.42 | -1.31 |
| 2480 | 35.75% | -4.47 | -1.10 |
| 2490 | 36.54% | -4.37 | -0.81 |
| 2500 | 36.78% | -4.34 | -0.64 |
| AVG: | 35.24% | -4.53 | -1.15 |

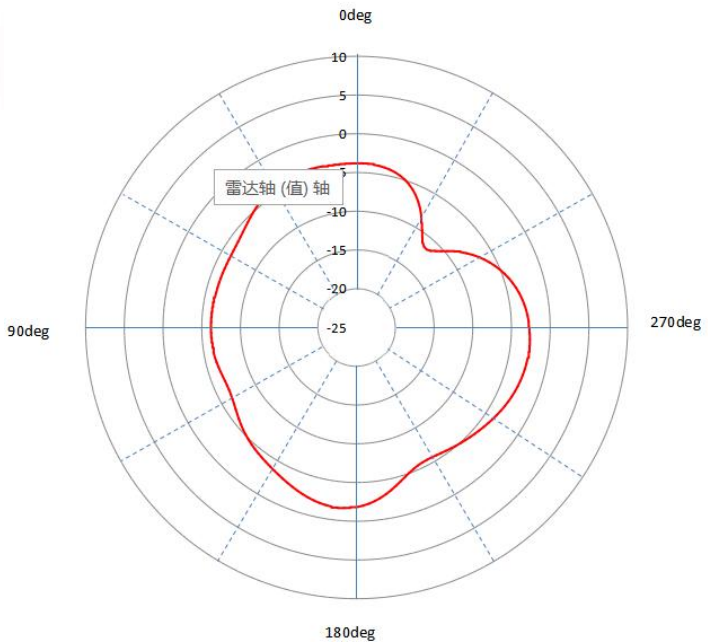
# ● D4112_2.4G_2D Antenna Radiation Pattern(2D 天线辐射方向图)

1. The horizontal direction is the X-Y plane of the legend
(水平方向为图例X-Y面)。

**WIFI 0**

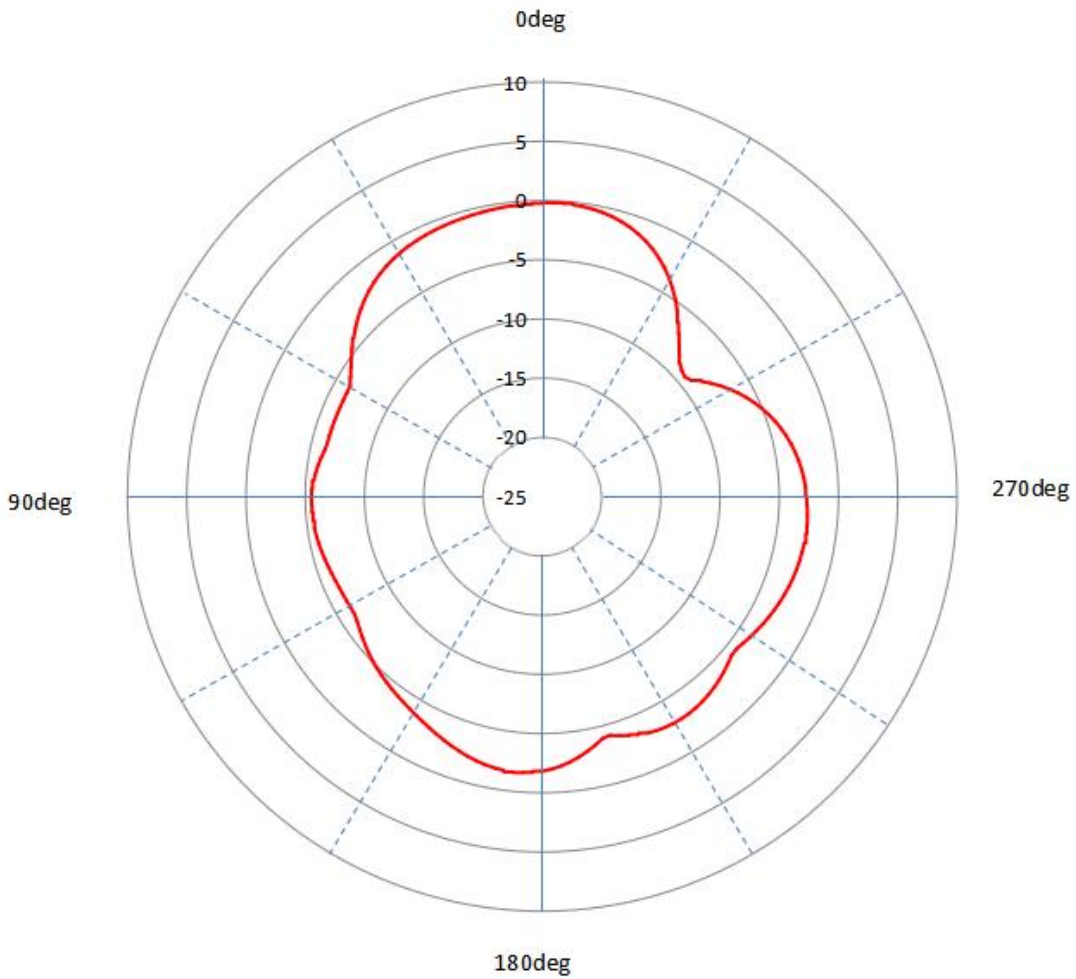



**WIFI 1**



# ● D4112_2.4G_2D Synthetic Direction Map(2D 合成方向图)

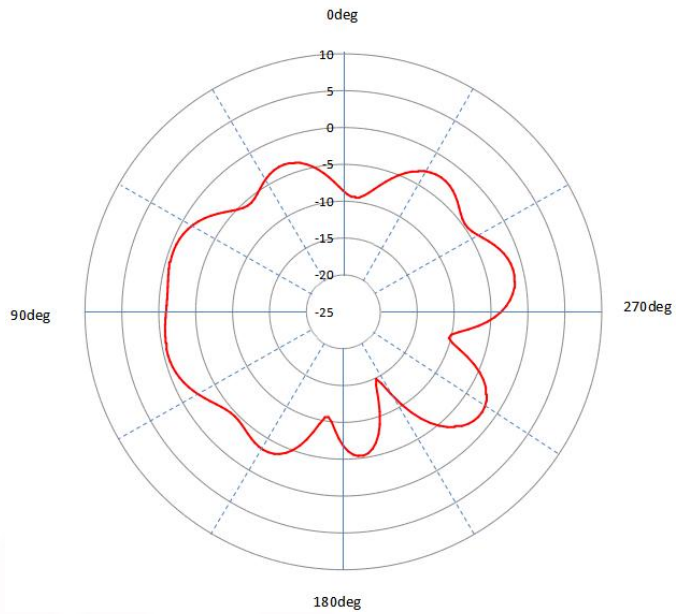
1. The horizontal direction is the X-Y plane of the legend(水平方向为图例X-Y面)。
2. The minimum value is -9.27(最小值为-9.27)。



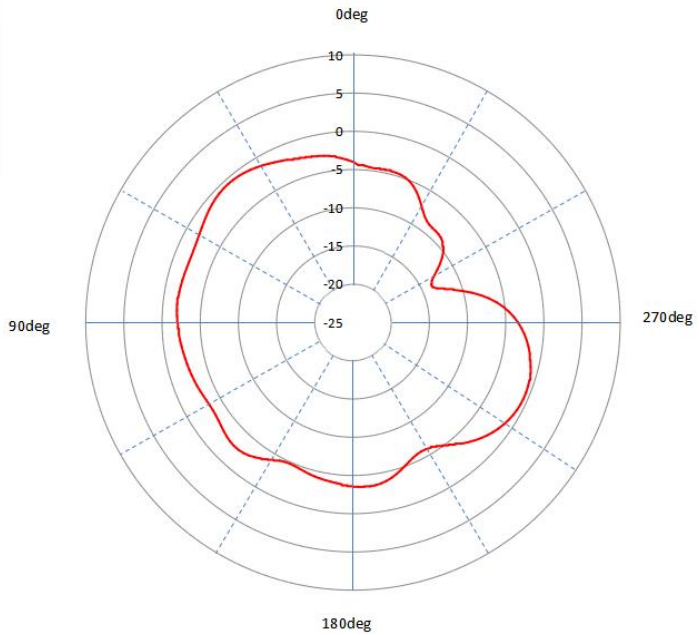
# ● D4112_5G_2D Antenna Radiation Pattern(2D 天线辐射方向图)

1. The horizontal direction is the X-Y plane of the legend
(水平方向为图例X-Y面)。

WIFI 0

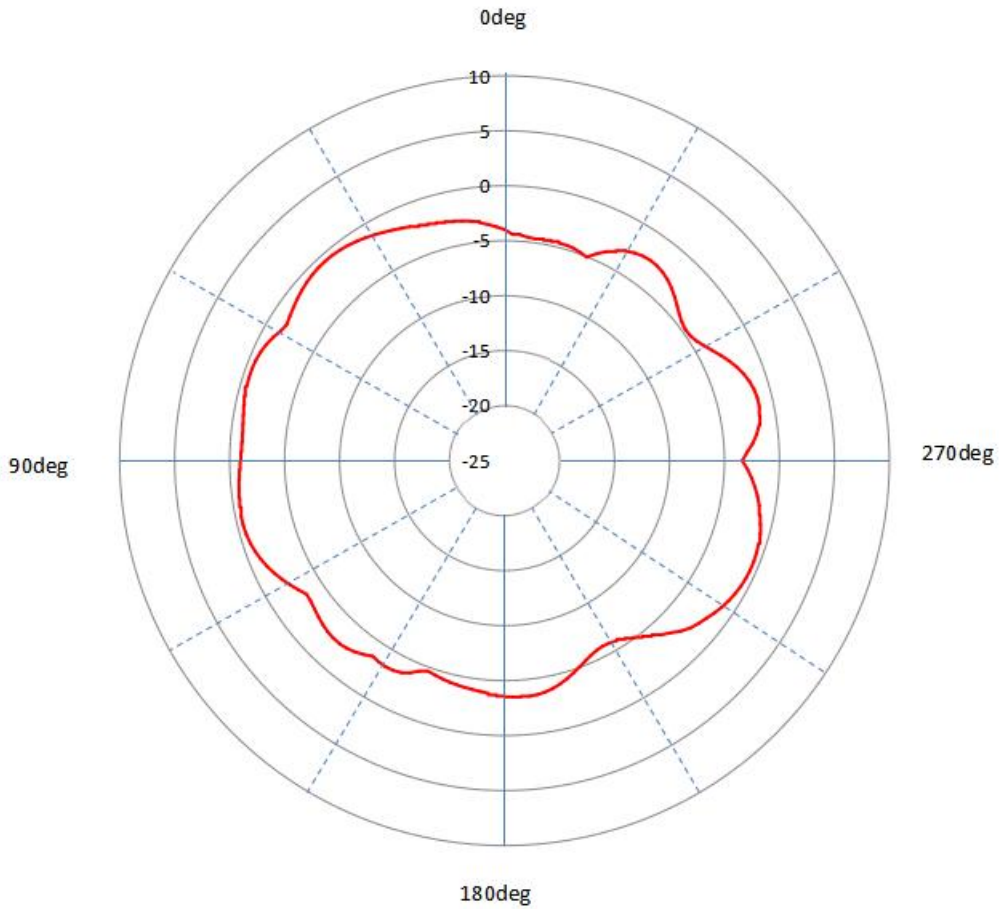



WIFI 1



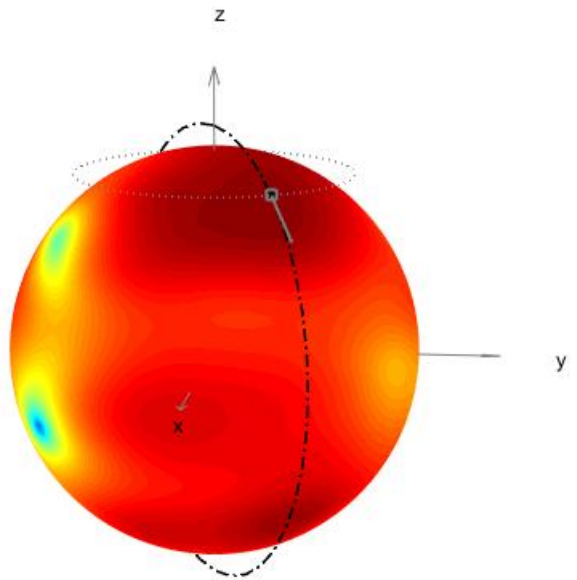
# ● D4112_5G_2D Synthetic Direction Map(2D 合成方向图)

1. The horizontal direction is the X-Y plane of the legend(水平方向为图例X-Y面)。
2. The minimum value is -5.92(最小值为-5.92)。

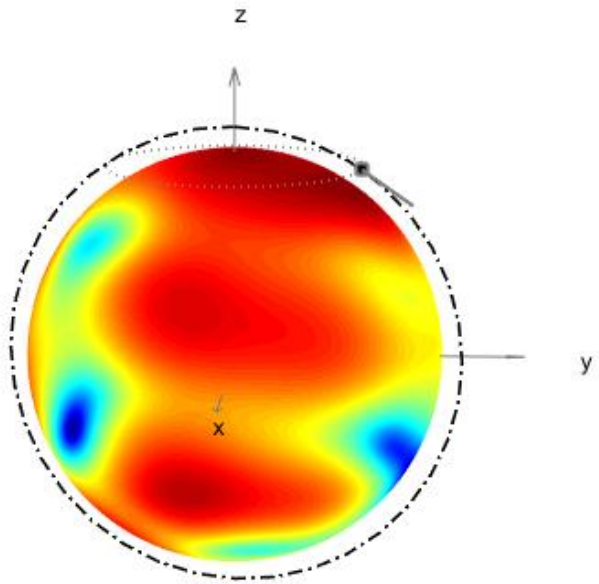


# ● D4112 _2.4G_ 3D Antenna Radiation Pattern(3D 天线辐射方向图)

WIFI 0 -2460MHz

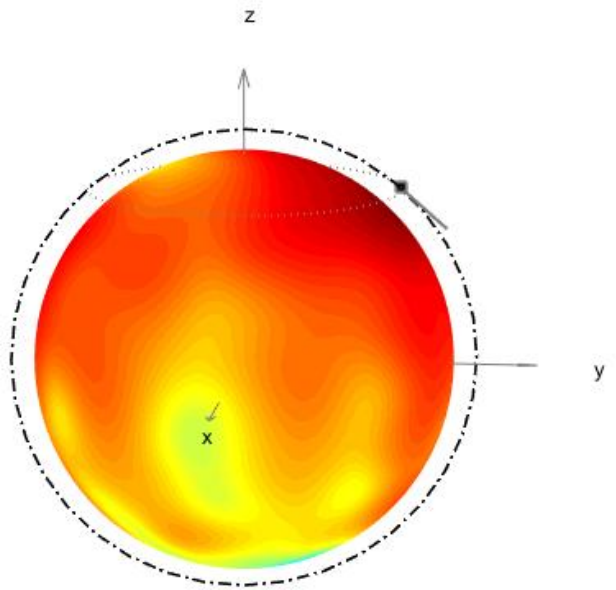



WIFI 1 -2460MHz

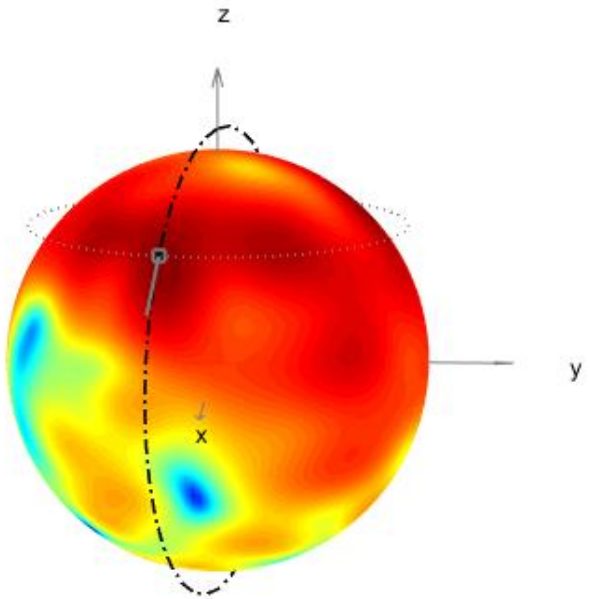


# ● D4112 _5G_ 3D Antenna Radiation Pattern(3D 天线辐射方向图)

WIFI 0 -5500MHz



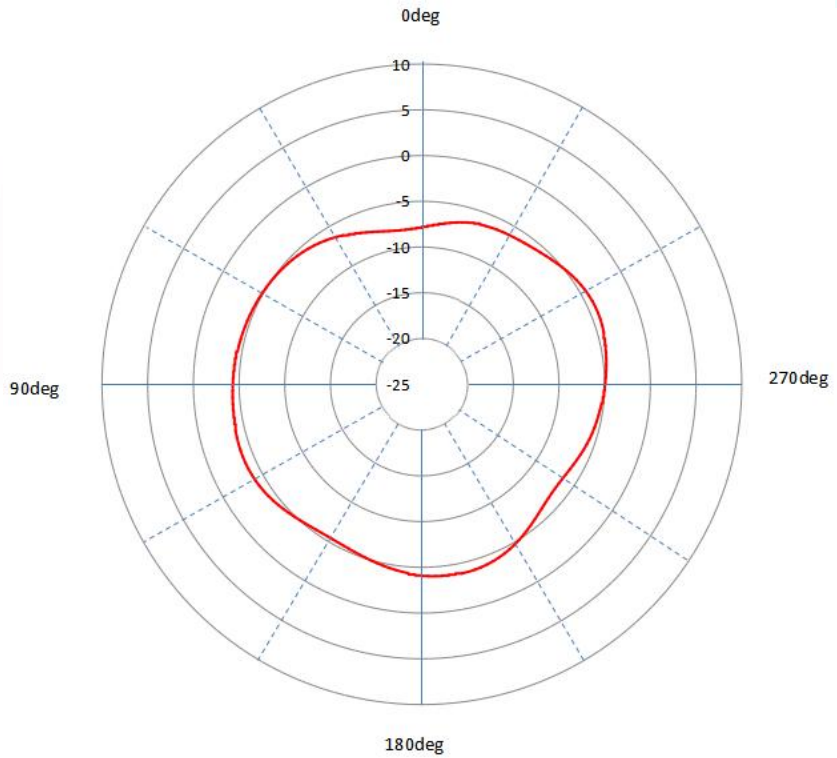

WIFI 1 -5500MHz

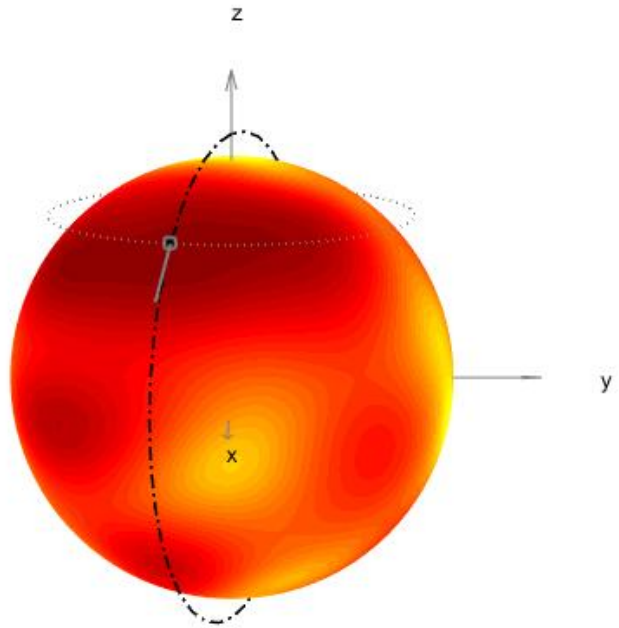


# ● D4112 _BT Antenna Radiation Pattern(天线辐射方向图)

1. The horizontal direction is the X-Y plane of the legend(水平方向为图例X-Y面)。
2. The minimum value is -7.97(最小值为-7.97)。

**BT-2450MHz**



# ● D4112 _Summary(总结)

1.The antenna matching has not changed, and the antenna performance is basically up to standard(天线匹配无更改，天线性能基本达标)。

2. During assembly, pay attention to the position of the FPC sticker and follow the instructions, as well as ensure consistency in the placement of the coaxial line and good grounding(组装时注意FPC贴的位置按标示进行作业，以及注意同轴线摆放一致性和接地的良好)。

***(If there are any changes to the machine, please notify our company; if there are any problems, please communicate promptly)***

***（如果机器有变化，请通知我司；如果有任何问题，请及时沟通）***

**Thank You!!**