



深圳市星源创科技有限公司

SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

# 天线测试报告

Antenna Test Report

*TC: 忆博通*

*MN: S1000B1*

*RF: 关巍*

*MD: 黄清清*

*MP: 15112592483*

*Date: 2023. 08. 17*

*REV :V1. 0*



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## 测试信息

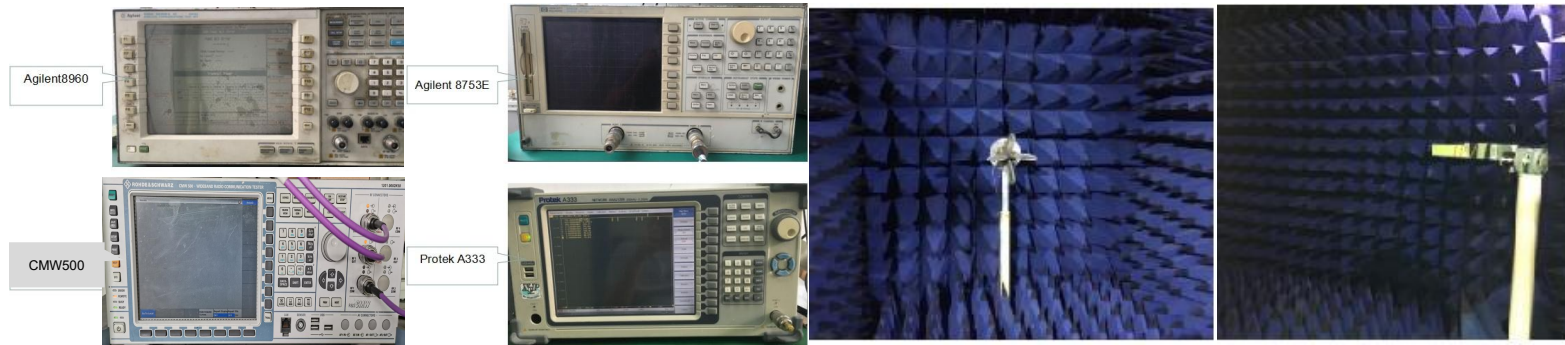
Test information

| Antenna band |         | Antenna state              | Antenna form | Match changes | Note |
|--------------|---------|----------------------------|--------------|---------------|------|
| Main ANT     | 2G      | 850/900/1800/1900          |              |               |      |
|              | 3G      | 2/4/5                      | FPC          | PIFA          | NO   |
|              | 4G      | 2/4/5/12/13/25/26/66/71/41 |              |               |      |
| AUX ANT      | BT/WIFI | 2.4/5.8G                   | FPC          | PIFA          | NO   |
|              | GPS     | 1.575G                     | FPC          | PIFA          | NO   |
|              | DIV     |                            | FPC          | PIFA          | NO   |

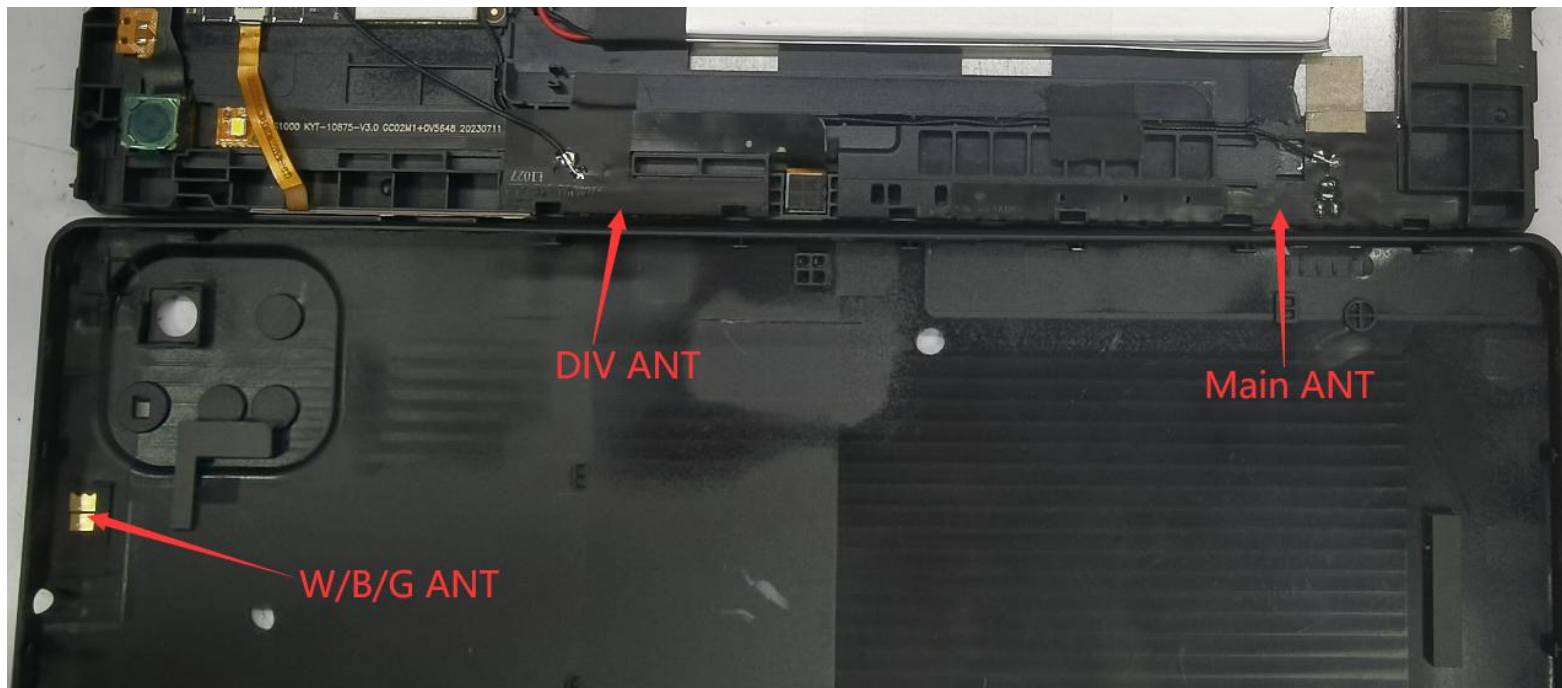
## 测试环境

### Test environment

|                      | 测试项目                                        | 测试设备                                                     |
|----------------------|---------------------------------------------|----------------------------------------------------------|
| S参数<br>(S-parameter) | 1. 电压驻波比 (VSWR)<br>2. 回波损耗 (Rrtun Loss)     | 网络分析仪: Agilent8753ES                                     |
| 2. 有源测试<br>(Active)  | 1. 发射功率 (TRP)<br>2. 接收灵敏度 (TIS)<br>3. 屏灭/屏亮 | 1. 暗室: 5*3*3m (3D) Chamber<br>2. 综测仪: Agilent8960 CMW500 |
| 3. 无源测试<br>(Passive) | 1. 天线增益 (Gain)<br>2. 天线效率 (Efficiency)      | 1. 暗室: 5*3*3m (3D) Chamber<br>2. 网络分析仪: Agilent 8753ES   |



## 天线位置 Antenna position



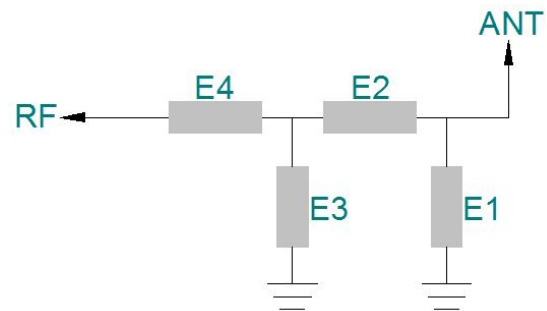


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匹配电路  
Matching circuit



匹配电路原理图&位号图

|          | 电容 (PF) | 电感 (NH) |
|----------|---------|---------|
| E1(0402) |         |         |
| E2(0402) |         |         |
| E3(0402) |         |         |
| E4(0402) |         |         |

主板传导数据  
Conduction data

| 2G/3G      |        |        |         |         |        |        |        |        |        |
|------------|--------|--------|---------|---------|--------|--------|--------|--------|--------|
| Band       | GSM850 | GSM900 | DCS1800 | PCS1900 | WCDMA1 | WCDMA2 | WCDMA4 | WCDMA5 | WCDMA8 |
| TX(dBm)    | 31.6   | 31.8   | 28.8    | 27.5    |        | 20.3   | 21.2   | 21.5   |        |
| RX(dBm)    | -108   | -108   | -108    | -108    |        | -108   | -108   | -108   |        |
| 4G FDD/TDD |        |        |         |         |        |        |        |        |        |
| Band       | B1     | B2     | B3      | B4      | B5     | B7     | B8     | B12    | B13    |
| TX(dBm)    |        | 21.6   |         | 21.8    | 22.7   |        |        | 22.3   | 22.3   |
| RX(dBm)    |        | -98    |         | -96     | -98    |        |        | -96    | -95    |
| Band       | B25    | B26    | B66     | B71     | B34    | B38    | B39    | B40    | B41    |
| TX(dBm)    | 21.6   | 22.6   | 21.8    | 22.2    |        |        |        |        | 24.3   |
| RX(dBm)    | -98    | -97    | -97     | -97     |        |        |        |        | -93    |



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有源测试数据  
Active test data

| 2G           |             |         |         |             |         |         |               |         |         |               |         |         |
|--------------|-------------|---------|---------|-------------|---------|---------|---------------|---------|---------|---------------|---------|---------|
| Band         | GSM850      |         |         | GSM900      |         |         | GSM-1800(DCS) |         |         | GSM-1900(PCS) |         |         |
| Channel      | 128         | 192     | 251     | 1           | 62      | 124     | 512           | 698     | 885     | 512           | 660     | 810     |
| TRP(dBm)     | 27.25       | 26.14   | 26.35   | 25.52       | 25.36   | 24.61   | 24.12         | 24.24   | 25.56   | 25.33         | 25.26   | 24.72   |
| TIS(LCD OFF) | -103.22     | -103.26 | -103.34 | -102.34     | -102.51 | -103.21 | -104.33       | -104.57 | -105.37 | -104.46       | -105.27 | -105.35 |
| TIS(LCD ON)  |             |         |         |             |         |         |               |         |         |               |         |         |
| 3G           |             |         |         |             |         |         |               |         |         |               |         |         |
| Band         | WCDMA-1     |         |         | WCDMA-4     |         |         | WCDMA-2       |         |         | WCDMA-5       |         |         |
| Channel      | 10562       | 10700   | 10838   | 1537        | 1675    | 1738    | 9662          | 9800    | 9938    | 4357          | 4400    | 4458    |
| TRP(dBm)     |             |         |         | 16.54       | 17.15   | 17.36   | 18.24         | 18.46   | 18.21   | 17.35         | 16.56   | 16.24   |
| TIS(LCD OFF) |             |         |         | -103.42     | -102.64 | -102.11 | -104.41       | -104.62 | -105.21 | -103.26       | -103.38 | -103.43 |
| TIS(LCD ON)  |             |         |         |             |         |         |               |         |         |               |         |         |
| 4G(FDD 10M)  |             |         |         |             |         |         |               |         |         |               |         |         |
| Band         | FDD-Band 2  |         |         | FDD-Band 4  |         |         | FDD-Band 5    |         |         | FDD-Band 12   |         |         |
| Channel      | 18650       | 18900   | 19150   | 20000       | 20175   | 23050   | 20450         | 20525   | 20600   | 23060         | 23095   | 23130   |
| TRP(dBm)     | 18.12       | 18.16   | 18.26   | 17.54       | 17.66   | 18.28   | 17.49         | 17.34   | 17.28   | 17.45         | 17.57   | 17.73   |
| TIS(LCD OFF) | -93.29      | -93.44  | -93.26  | -93.4       | -93.26  | -93.44  | -92.5         | -92.42  | -92.3   | -92.24        | -92.38  | -92.55  |
| TIS(LCD ON)  |             |         |         |             |         |         |               |         |         |               |         |         |
| Band         | FDD-Band 13 |         |         | FDD-Band25  |         |         | FDD-Band 26   |         |         | FDD-Band66    |         |         |
| Channel      |             | 23230   |         | 26090       | 26365   | 26640   | 26740         | 26865   | 26990   | 132022        | 132322  | 132622  |
| TRP(dBm)     |             | 17.6    |         | 18.4        | 18.46   | 18.37   | 17.64         | 17.43   | 17.29   | 17.62         | 17.73   | 17.58   |
| TIS(LCD OFF) |             | -92.22  |         | -93.53      | -93.48  | -93.43  | -92.28        | -92.21  | -92.22  | -93.07        | -93.26  | -93.46  |
| TIS(LCD ON)  |             |         |         |             |         |         |               |         |         |               |         |         |
| 4G(FDD 10M)  |             |         |         | 4G(TDD 20M) |         |         |               |         |         |               |         |         |
| Band         | FDD-Band 71 |         |         | FDD-Band 39 |         |         | FDD-Band 40   |         |         | FDD-Band 41   |         |         |
| Channel      | 133172      | 133297  | 133422  | 38350       | 38450   | 38550   | 38750         | 39150   | 39550   | 39750         | 40620   | 41490   |
| TRP(dBm)     | 17.53       | 17.46   | 17.22   |             |         |         |               |         |         | 20.35         | 21.74   | 20.54   |
| TIS(LCD OFF) | -91.2       | -91.39  | -91.54  |             |         |         |               |         |         | -92.16        | -92.43  | -92.59  |
| TIS(LCD ON)  |             |         |         |             |         |         |               |         |         |               |         |         |



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## GPS搜星测试 GPS star search test

GPS冷启动实测效果以下：  
CN值40以上5颗  
CN值35以上8颗  
实际定位18颗

备注：  
GPS搜星测试。会因时间段  
及地域而存在差异。以上数  
据为我司测试（空旷地带）  
最佳数据







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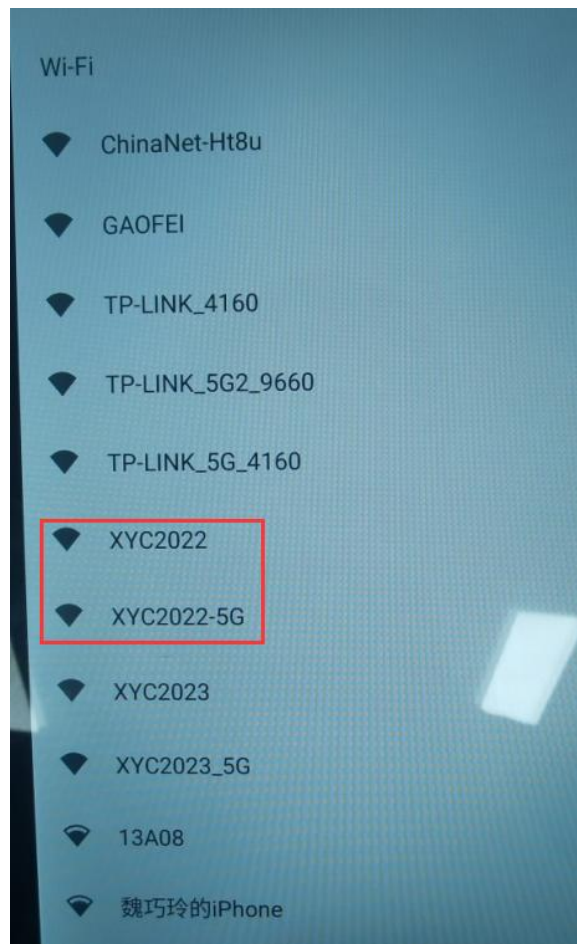
Wifi天线实测

Wifi Antenna test

测试环境：开放空间

测试距离：10m

测试结果如右图





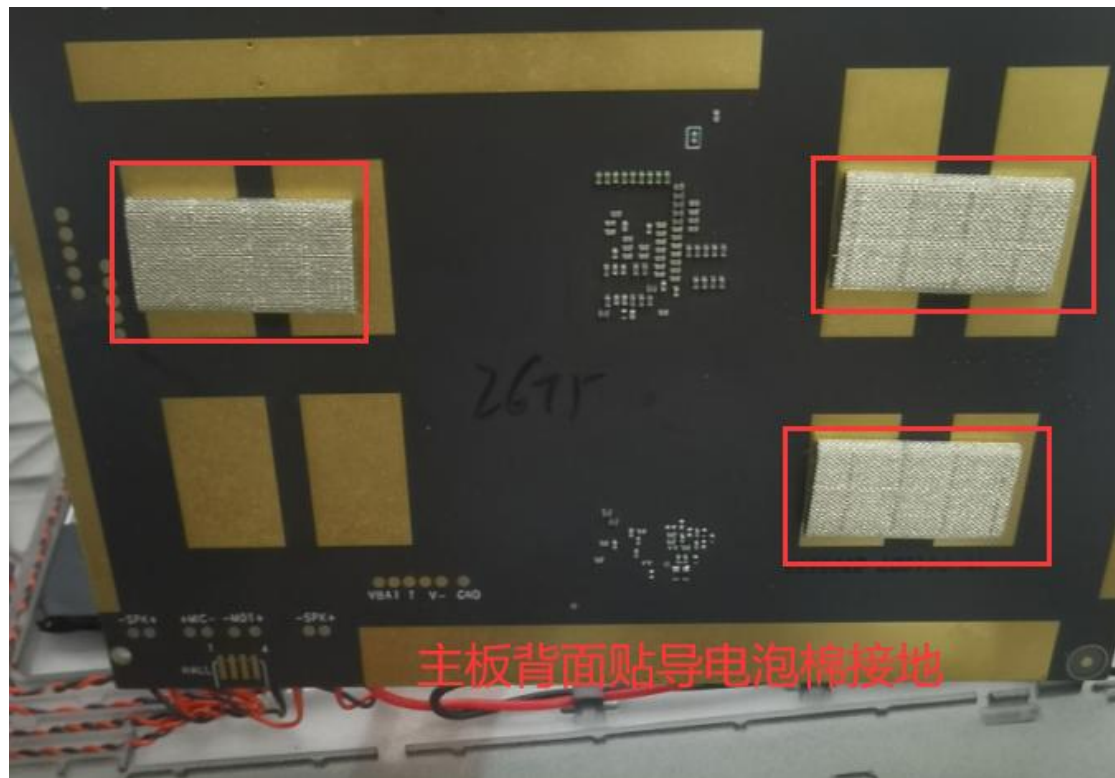
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环境处理

Environmental treatment





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环境处理

Environmental treatment

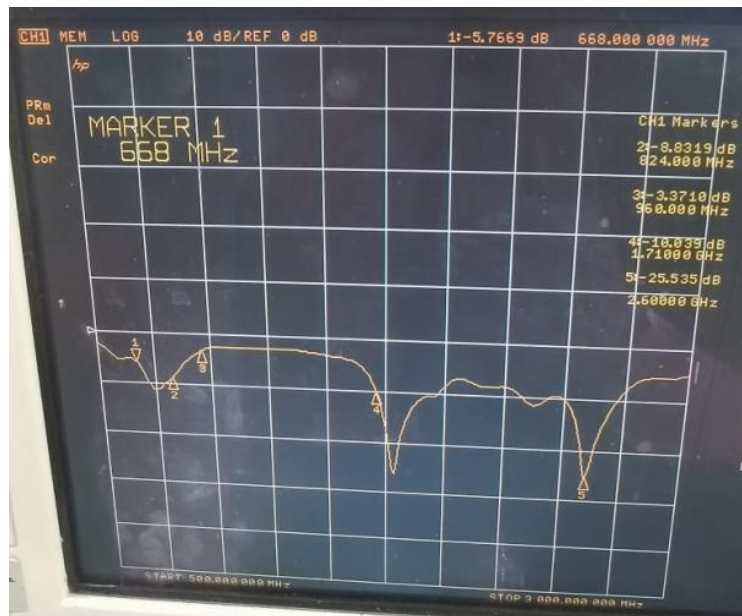
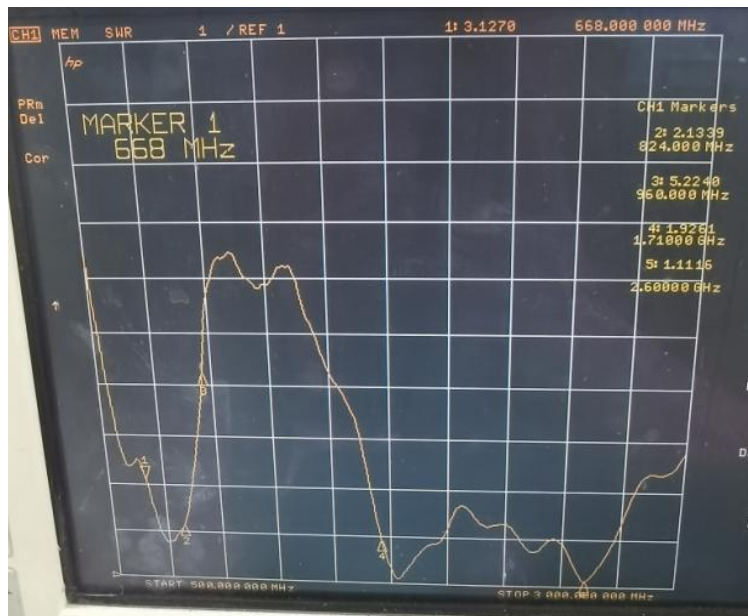




## Main ANT 无源测试数据

## Main ANT Passive test data

## ANT S11-VSWR&Return Loss



| Frequency(MHZ)  | 668   | 824   | 960   | 1710   | 2600   |
|-----------------|-------|-------|-------|--------|--------|
| VSWR            | 3.12  | 2.13  | 5.22  | 1.92   | 1.11   |
| Return Loss(DB) | -5.76 | -8.83 | -3.37 | -10.03 | -25.53 |





### 无源测试数据 Passive test data

### ANT Direction of figure 690-2690MHz

| Passive Test For L |          |           |            |            |         |         |          |          |                  |                 |           |           |
|--------------------|----------|-----------|------------|------------|---------|---------|----------|----------|------------------|-----------------|-----------|-----------|
| Freq (MHz)         | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | UHS (%) | DHS (%) | Max (dB) | Min (dB) | irectivity (dBi) | Beamwidth (3dB) | AttH (dB) | AttV (dB) |
| 650                | 22.05    | -6.57     | -3.36      | -5.51      | 12.358  | 9.693   | -3.36    | -14.98   | 3.2              | 60              | 39.51     | 39.08     |
| 660                | 23.45    | -6.3      | -3.09      | -5.24      | 12.973  | 10.476  | -3.09    | -15.17   | 3.21             | 30              | 39.76     | 39.23     |
| 670                | 22.16    | -6.54     | -3.07      | -5.22      | 11.992  | 10.172  | -3.07    | -13.68   | 3.47             | 0               | 39.56     | 38.99     |
| 680                | 21.87    | -6.5      | -3.23      | -5.38      | 11.726  | 10.144  | -3.23    | -16.24   | 3.37             | 0               | 38.97     | 38.55     |
| 690                | 23.72    | -6.25     | -3.28      | -5.43      | 12.554  | 11.164  | -3.28    | -15.8    | 2.97             | 0               | 38.99     | 38.05     |
| 700                | 25.32    | -5.97     | -3.13      | -5.28      | 13.205  | 12.113  | -3.13    | -13.01   | 2.84             | 60              | 37.95     | 37.71     |
| 710                | 32.81    | -4.84     | -2.13      | -4.28      | 17.247  | 15.56   | -2.13    | -10.55   | 2.71             | 60              | 38.33     | 38.1      |
| 720                | 35.63    | -4.48     | -1.96      | -4.11      | 19.114  | 16.52   | -1.96    | -11.52   | 2.52             | 60              | 38.12     | 37.78     |
| 730                | 37.01    | -4.32     | -1.31      | -3.46      | 19.824  | 17.189  | -1.31    | -14.02   | 3.01             | 30              | 37.65     | 37.31     |
| 740                | 36.44    | -4.38     | -1.03      | -3.18      | 19.033  | 17.409  | -1.03    | -15.96   | 3.35             | 30              | 37.21     | 36.99     |
| 750                | 34.51    | -4.62     | -1.33      | -3.48      | 17.752  | 16.761  | -1.33    | -15.91   | 3.29             | 60              | 37.03     | 36.95     |
| 760                | 31.16    | -5.06     | -2.01      | -4.16      | 15.878  | 15.286  | -2.01    | -16.06   | 3.06             | 60              | 36.73     | 36.72     |
| 770                | 24.89    | -6.04     | -2.8       | -4.95      | 12.5    | 12.389  | -2.8     | -21.82   | 3.24             | 60              | 35.81     | 35.92     |
| 780                | 23.26    | -6.33     | -2.95      | -5.1       | 11.483  | 11.774  | -2.95    | -23.15   | 3.38             | 60              | 35.67     | 35.88     |
| 790                | 23.57    | -6.28     | -2.55      | -4.7       | 11.607  | 11.967  | -2.55    | -17.32   | 3.72             | 60              | 35.94     | 36.19     |
| 800                | 29.09    | -5.36     | -1.58      | -3.73      | 14.696  | 14.396  | -1.58    | -16.69   | 3.78             | 60              | 36.77     | 36.98     |
| 810                | 31.47    | -5.02     | -1.4       | -3.55      | 16.109  | 15.365  | -1.4     | -18.16   | 3.62             | 60              | 36.63     | 36.88     |
| 820                | 31.97    | -4.95     | -1.54      | -3.69      | 16.461  | 15.514  | -1.54    | -18.29   | 3.41             | 60              | 36.69     | 36.92     |
| 830                | 31.6     | -5        | -1.77      | -3.92      | 16.34   | 15.262  | -1.77    | -18.76   | 3.24             | 90              | 36.46     | 36.76     |
| 840                | 29.78    | -5.26     | -2.07      | -4.22      | 15.543  | 14.233  | -2.07    | -19.24   | 3.19             | 120             | 36.63     | 37.05     |
| 850                | 31.65    | -5        | -1.56      | -3.71      | 16.504  | 15.144  | -1.56    | -19.88   | 3.43             | 120             | 36.69     | 37.16     |
| 860                | 32.35    | -4.9      | -1.49      | -3.63      | 16.645  | 15.701  | -1.49    | -19.19   | 3.82             | 120             | 36.82     | 37.25     |
| 870                | 29.33    | -5.33     | -1.75      | -3.9       | 14.664  | 14.664  | -1.75    | -19.14   | 3.57             | 120             | 36.68     | 37.07     |
| 880                | 28.34    | -5.48     | -1.87      | -4.02      | 14.125  | 14.217  | -1.87    | -18.87   | 3.6              | 120             | 36.82     | 37.19     |
| 890                | 27.42    | -5.62     | -2.31      | -4.46      | 13.793  | 13.627  | -2.31    | -19.01   | 3.31             | 120             | 37        | 37.41     |
| 900                | 27.46    | -5.61     | -2.62      | -4.77      | 13.984  | 13.479  | -2.62    | -19.43   | 2.99             | 120             | 37.06     | 37.58     |
| 910                | 24.96    | -6.03     | -3.17      | -5.32      | 12.734  | 12.227  | -3.17    | -21.22   | 2.86             | 120             | 37.17     | 37.66     |
| 920                | 20.37    | -6.91     | -4.04      | -6.19      | 10.445  | 9.921   | -4.04    | -23.67   | 2.87             | 120             | 37.7      | 38.16     |
| 930                | 18.78    | -7.26     | -4.25      | -6.4       | 9.849   | 9.827   | -4.25    | -25.08   | 3.02             | 30              | 37.46     | 37.87     |
| 940                | 16.64    | -7.79     | -3.93      | -6.08      | 8.969   | 7.672   | -3.93    | -24.06   | 3.86             | 30              | 37.44     | 37.81     |
| 950                | 13.96    | -8.55     | -4.34      | -6.49      | 7.59    | 6.393   | -4.34    | -25.85   | 4.21             | 60              | 37.77     | 38.07     |
| 960                | 12.13    | -9.16     | -5.02      | -7.17      | 6.599   | 5.536   | -5.02    | -23.44   | 4.14             | 60              | 37.78     | 37.92     |

| Passive Test For 高频 |          |           |            |            |         |         |          |          |                  |                 |           |           |
|---------------------|----------|-----------|------------|------------|---------|---------|----------|----------|------------------|-----------------|-----------|-----------|
| Freq (MHz)          | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | UHS (%) | DHS (%) | Max (dB) | Min (dB) | irectivity (dBi) | Beamwidth (3dB) | AttH (dB) | AttV (dB) |
| 1710                | 29.96    | -5.23     | -0.44      | -2.59      | 12.866  | 17.093  | -0.44    | -18.23   | 4.8              | 30              | 42.52     | 42.01     |
| 1720                | 31.11    | -5.07     | -0.18      | -2.33      | 13.009  | 18.098  | -0.18    | -16.95   | 4.89             | 30              | 42.4      | 41.88     |
| 1730                | 35.18    | -4.54     | 0.67       | -1.48      | 14.319  | 20.856  | 0.67     | -15.95   | 5.21             | 30              | 42.83     | 42.29     |
| 1740                | 34.44    | -4.63     | 1.03       | -1.12      | 13.565  | 20.878  | 1.03     | -16.24   | 5.56             | 30              | 42.89     | 42.17     |
| 1750                | 34.74    | -4.59     | 1.4        | -0.7       | 13.392  | 21.344  | 1.4      | -16.13   | 6.04             | 30              | 42.92     | 42.23     |
| 1760                | 36.23    | -4.41     | 1.83       | -0.32      | 13.807  | 22.42   | 1.83     | -16.07   | 6.24             | 30              | 43.13     | 42.41     |
| 1770                | 40.11    | -3.97     | 2.35       | 0.2        | 15.177  | 24.935  | 2.35     | -15.07   | 6.32             | 30              | 43.26     | 42.64     |
| 1780                | 41.6     | -3.86     | 2.37       | 0.22       | 15.634  | 25.526  | 2.37     | -13.64   | 6.22             | 30              | 43.6      | 43.04     |
| 1790                | 36.7     | -4.35     | 1.8        | -0.38      | 14.048  | 22.648  | 1.8      | -12.13   | 6.15             | 30              | 43.12     | 42.67     |
| 1850                | 36.46    | -4.38     | 2.66       | -0.49      | 15.838  | 20.025  | 1.66     | -12.91   | 6.04             | 30              | 43.4      | 43.05     |
| 1860                | 35.7     | -4.47     | 1.24       | -0.91      | 15.71   | 19.995  | 1.24     | -13.5    | 5.71             | 30              | 43.4      | 43.07     |
| 1870                | 32.95    | -4.82     | 0.48       | -1.67      | 14.404  | 18.549  | 0.48     | -15.45   | 5.3              | 30              | 43.15     | 42.96     |
| 1880                | 33.84    | -4.71     | 0.14       | -2.01      | 14.538  | 19.298  | 0.14     | -16.89   | 4.84             | 30              | 43.26     | 43.08     |
| 1890                | 31.05    | -5.08     | -0.53      | -2.68      | 12.961  | 18.084  | -0.53    | -18      | 4.55             | 30              | 42.84     | 42.68     |
| 1900                | 28.26    | -5.49     | -1.01      | -3.16      | 11.736  | 16.527  | -1.01    | -17.26   | 4.46             | 30              | 42.94     | 42.77     |
| 1910                | 27.87    | -5.55     | -1.31      | -3.46      | 11.427  | 16.441  | -1.31    | -17.08   | 4.24             | 30              | 42.87     | 42.69     |
| 1920                | 27.81    | -5.56     | -1.61      | -3.76      | 11.458  | 16.348  | -1.61    | -15.05   | 3.95             | 30              | 42.9      | 42.78     |
| 1930                | 26.75    | -5.73     | -1.84      | -3.99      | 11.112  | 15.639  | -1.84    | -14.25   | 3.89             | 30              | 43.03     | 42.87     |
| 1940                | 23.94    | -6.21     | -2.44      | -4.59      | 10.05   | 13.891  | -2.44    | -15.11   | 3.77             | 30              | 42.93     | 42.71     |
| 1950                | 21.32    | -6.59     | -2.78      | -4.93      | 9.355   | 12.565  | -2.78    | -16.35   | 3.81             | 30              | 42.85     | 42.64     |
| 1960                | 21.07    | -6.76     | -2.62      | -4.77      | 8.914   | 12.155  | -2.62    | -19.32   | 4.14             | 30              | 42.95     | 42.68     |
| 1970                | 19.16    | -7.18     | -2.82      | -4.97      | 7.994   | 11.165  | -2.82    | -20.56   | 4.36             | 30              | 42.9      | 42.76     |
| 1980                | 21.24    | -6.73     | -2.33      | -4.48      | 8.721   | 12.522  | -2.33    | -17.55   | 4.4              | 30              | 43.15     | 43.1      |
| 1990                | 18.71    | -7.28     | -3.14      | -5.29      | 7.617   | 11.095  | -3.14    | -15.53   | 4.14             | 30              | 43.17     | 43.1      |
| 2100                | 22.87    | -6.38     | -2.42      | -4.22      | 10.727  | 12.727  | -2.07    | -19.02   | 4.31             | 30              | 44.77     | 44.61     |
| 2110                | 24.35    | -6.13     | -1.98      | -4.13      | 11.093  | 13.261  | -1.98    | -16.96   | 4.16             | 60              | 44.45     | 44.27     |
| 2120                | 24.52    | -6.11     | -2.23      | -4.38      | 11.52   | 12.996  | -2.23    | -17.84   | 3.88             | 60              | 44.21     | 44.07     |
| 2130                | 20.3     | -6.93     | -2.83      | -4.98      | 9.956   | 10.344  | -2.83    | -20.47   | 4.1              | 60              | 43.73     | 43.61     |
| 2140                | 21.93    | -6.59     | -2.3       | -4.45      | 11.093  | 10.837  | -2.3     | -20.31   | 4.29             | 30              | 43.96     | 43.93     |
| 2150                | 21.52    | -6.76     | -2.25      | -4.22      | 10.837  | 10.272  | -2.25    | -19.99   | 4.51             | 30              | 43.93     | 43.95     |
| 2160                | 24.3     | -6.14     | -1.57      | -3.72      | 12.539  | 11.762  | -1.57    | -17.83   | 4.57             | 30              | 44.05     | 44.08     |
| 2170                | 24.29    | -6.15     | -1.37      | -3.52      | 12.715  | 11.571  | -1.37    | -17.81   | 4.77             | 30              | 44.22     | 44.25     |
| 2180                | 24.02    | -6.19     | -1.17      | -3.32      | 12.733  | 11.284  | -1.17    | -18.89   | 5.02             | 30              | 44        | 44.04     |
| 2190                | 22.94    | -6.39     | -1.3       | -3.45      | 12.293  | 10.644  | -1.3     | -19.31   | 5.09             | 30              | 44.05     | 44.05     |
| 2200                | 21.36    | -6.55     | -1.34      | -3.29      | 12.893  | 10.913  | -1.34    | -18.71   | 5.08             | 30              | 44.27     | 44.22     |
| 2500                | 34.13    | -4.67     | 1.29       | -0.86      | 24.995  | 9.133   | 1.29     | -20.79   | 5.96             | 0               | 46.47     | 46.86     |

| Passive Test For 高频 |          |           |            |            |         |         |          |          |                  |                 |           |           |
|---------------------|----------|-----------|------------|------------|---------|---------|----------|----------|------------------|-----------------|-----------|-----------|
| Freq (MHz)          | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | UHS (%) | DHS (%) | Max (dB) | Min (dB) | irectivity (dBi) | Beamwidth (3dB) | AttH (dB) | AttV (dB) |
| 2510                | 35.2     | -4.54     | 1.44       | -0.71      | 26.163  | 9.033   | 1.44     | -22.88   | 5.97             | 0               | 46.13     | 46.49     |
| 2520                | 32.12    | -4.93     | 1.11       | -1.04      | 24.056  | 8.064   | 1.11     | -25.6    | 6.05             | 30              | 46.06     | 46.36     |
| 2530                | 31.52    | -5.01     | 1.13       | -1.02      | 23.718  | 7.798   | 1.13     | -26.76   | 6.15             | 30              | 45.99     | 46.31     |
| 2540                | 32.63    | -4.86     | 1.31       | -0.84      | 24.688  | 7.943   | 1.31     | -23.37   | 6.17             | 30              | 45.89     | 46.15     |
| 2550                | 32.3     | -4.91     | 1.15       | -1         | 24.53   | 7.767   | 1.15     | -20.64   | 6.06             | 30              | 46.08     | 46.33     |
| 2560                | 30.11    | -5.21     | 0.46       | -1.69      | 22.63   | 7.476   | 0.46     | -18.83   | 5.67             | 30              | 46.01     | 46.24     |
| 2570                | 31.71    | -4.99     | 0.28       | -1.87      | 23.556  | 8.151   | 0.28     | -17.21   | 5.26             | 30              | 46.03     | 46.19     |
| 2580                | 30.69    | -5.13     | -0.24      | -2.39      | 22.547  | 8.148   | -0.24    | -16.37   | 4.89             | 30              | 46.01     | 46.21     |
| 2590                | 29.3     | -5.33     | -0.62      | -2.77      | 21.211  | 8.086   | -0.62    | -15.27   | 4.71             | 120             | 45.73     | 45.95     |
| 2600                | 29.19    | -5.35     | -0.52      | -2.67      | 20.868  | 8.321   | -0.52    | -14.42   | 4.83             | 120             | 46.04     | 46.24     |
| 2610                | 28.99    | -5.38     | -0.34      | -2.49      | 20.61   | 8.384   | -0.34    | -13.81   | 5.04             | 120             | 45.99     | 46.22     |
| 2620                | 27       | -5.69     | -0.37      | -2.52      | 19.081  | 7.917   | -0.37    | -13.56   | 5.32             | 60              | 45.99     | 46.17     |
| 2630                | 26.56    | -5.76     | -0.08      | -2.23      | 18.717  | 7.84    | -0.08    | -12.83   | 5.68             | 60              | 45.98     | 46.18     |
| 2640                | 27.15    | -5.66     | 0.42       | -1.73      | 19.011  | 8.135   | 0.42     | -12.43   | 6.09             | 60              | 46.5      | 46.72     |
| 2650                | 26.09    | -5.84     | 0.56       | -1.59      | 18.039  | 8.047   | 0.56     | -13.9    | 6.39             | 60              | 46.45     | 46.68     |
| 2660                | 24.6     | -6.09     | 0.44       | -1.71      | 16.555  | 8.044   | 0.44     | -15.04   | 6.53             | 60              | 46.66     | 46.86     |
| 2670                | 25       | -6.02     | 0.48       | -1.67      | 16.404  | 8.595   | 0.48     | -14.86   | 6.5              | 60              | 46.65     | 46.9      |
| 2680                | 24.14    | -6.17     | 0.26       | -1.89      | 15.582  | 8.557   | 0.26     | -17.6    | 6.43             | 60              | 46.69     | 46.87     |
| 2690                | 21.09    | -6.76     | -0.38      | -2.53      | 13.441  | 7.651   | -0.38    | -18.92   | 6.38             | 60              | 46.47     | 46.69     |



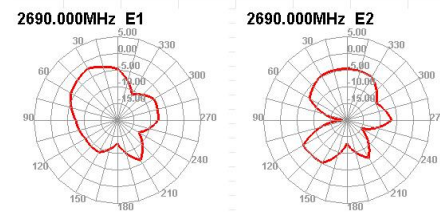
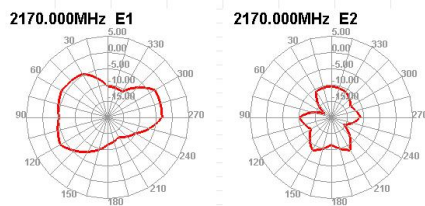
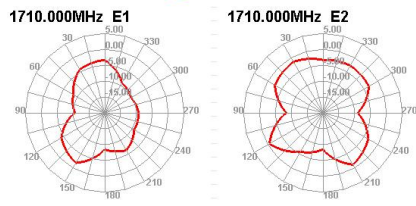
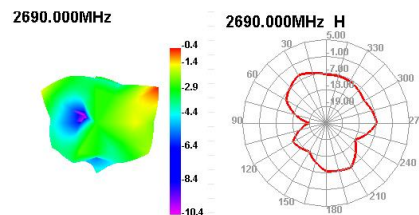
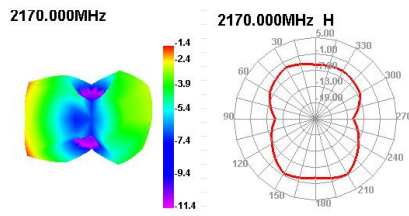
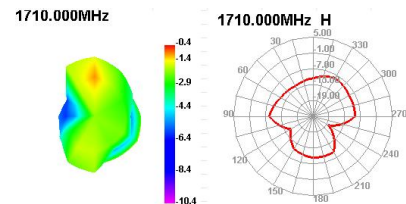
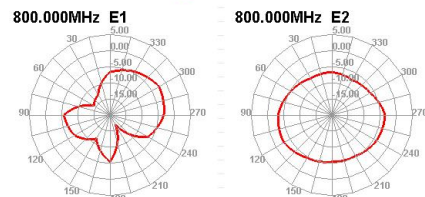
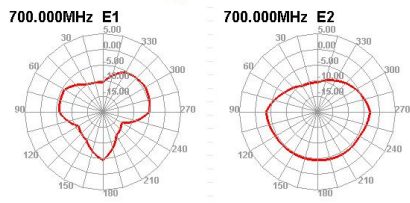
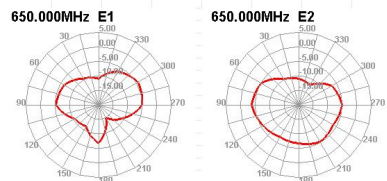
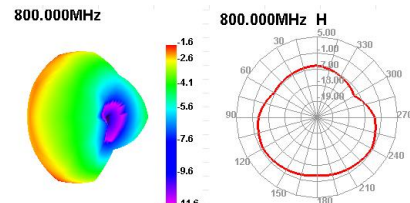
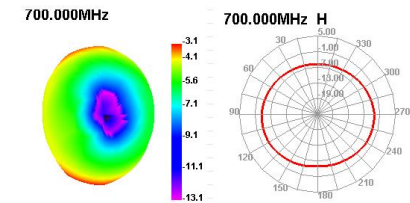
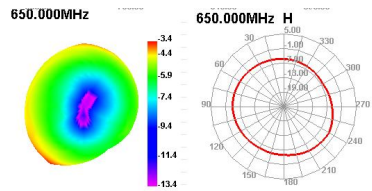
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Passive test data

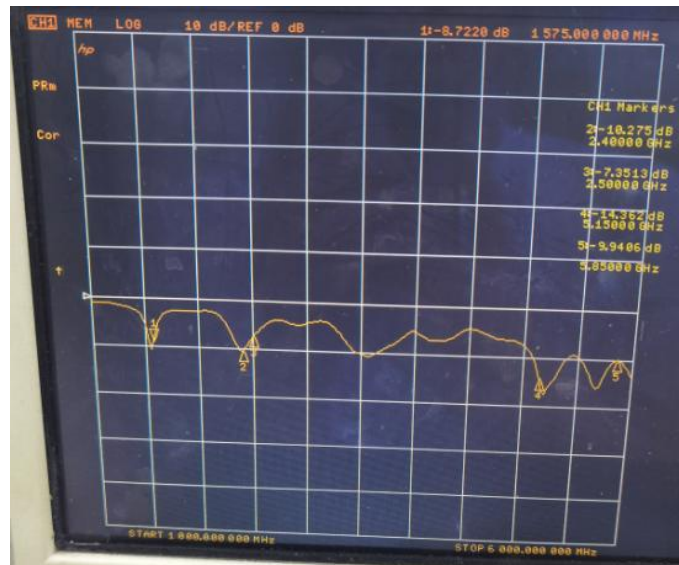
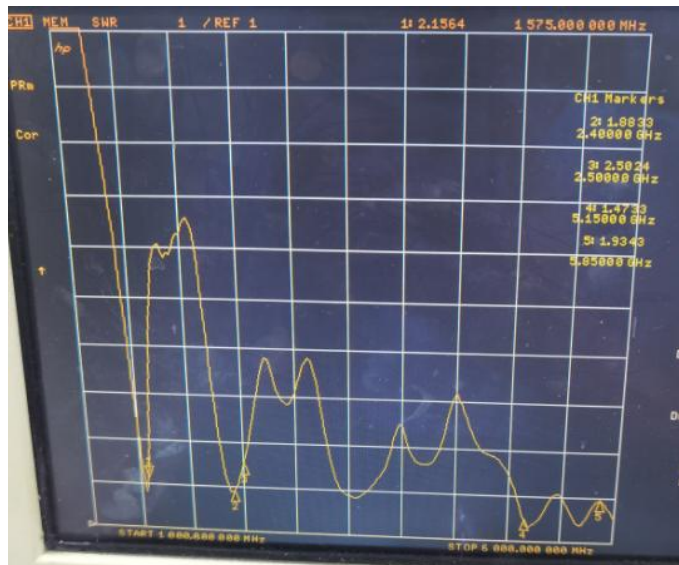
ANT Direction of figure 690-2690MHz





## 无源测试数据 Passive test data

### ANT S11-VSWR&Return Loss



| Frequency (MHZ)  | 1575  | 2400   | 2500  | 5150   | 5850  |
|------------------|-------|--------|-------|--------|-------|
| VSWR             | 2.15  | 1.88   | 2.50  | 1.47   | 1.93  |
| Return Loss (DB) | -8.77 | -10.27 | -7.35 | -14.36 | -9.94 |



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Passive test data

ANT GAIN&Efficiency-GPS

|      |       |       |       |       |       |        |       |        |      |    |       |       |
|------|-------|-------|-------|-------|-------|--------|-------|--------|------|----|-------|-------|
| 1570 | 19.75 | -7.04 | -1.57 | -3.72 | 8.484 | 11.263 | -1.57 | -16.03 | 5.47 | 30 | 41.12 | 40.65 |
| 1575 | 20.4  | -6.9  | -1.5  | -3.65 | 8.893 | 11.508 | -1.5  | -15.59 | 5.4  | 30 | 41.25 | 40.8  |
| 1580 | 20.57 | -6.87 | -1.53 | -3.68 | 9.038 | 11.532 | -1.53 | -15.47 | 5.34 | 30 | 41.33 | 40.9  |





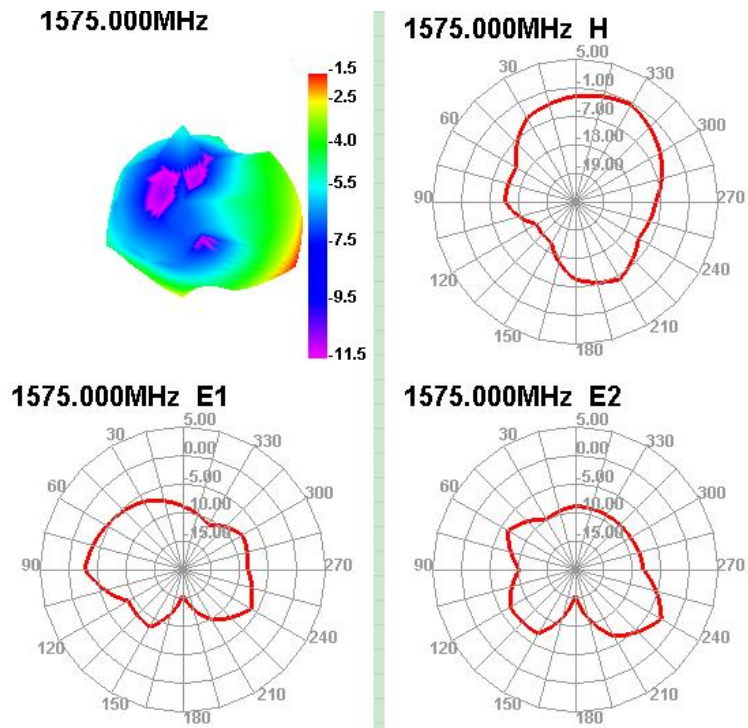
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Passive test data

ANT Direction of figure(GPS)



无源测试数据

Passive test data

ANT GAIN&Efficiency-WIFI2.4G/BT

Passive Test For WIFI2.4

| Freq<br>(MHz) | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHS<br>(%) | Max<br>(dB) | Min<br>(dB) | Directivity<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
|---------------|-------------|--------------|---------------|---------------|------------|------------|-------------|-------------|----------------------|--------------------|--------------|--------------|
| 2400          | 25.25       | -5.98        | -0.69         | -2.84         | 8.093      | 17.16      | -0.69       | -17.1       | 5.29                 | 0                  | 45.79        | 46.02        |
| 2410          | 25.23       | -5.98        | -0.53         | -2.68         | 8.068      | 17.16      | -0.53       | -16.74      | 5.45                 | 0                  | 46           | 46.28        |
| 2420          | 24.39       | -6.13        | -0.49         | -2.64         | 7.743      | 16.648     | -0.49       | -17.71      | 5.64                 | 0                  | 45.66        | 45.93        |
| 2430          | 24.12       | -6.18        | -0.42         | -2.57         | 7.633      | 16.487     | -0.42       | -18.29      | 5.76                 | 0                  | 45.82        | 46.17        |
| 2440          | 24.72       | -6.07        | -0.19         | -2.34         | 7.84       | 16.876     | -0.19       | -17.23      | 5.88                 | 0                  | 45.92        | 46.28        |
| 2450          | 25.46       | -5.94        | -0.04         | -2.19         | 8.136      | 17.328     | -0.04       | -15.99      | 5.9                  | 0                  | 45.95        | 46.38        |
| 2460          | 25.83       | -5.88        | 0.03          | -2.12         | 8.335      | 17.49      | 0.03        | -15.44      | 5.91                 | 0                  | 45.93        | 46.31        |
| 2470          | 25.6        | -5.92        | -0.01         | -2.16         | 8.347      | 17.257     | -0.01       | -15         | 5.91                 | 0                  | 46.24        | 46.64        |
| 2480          | 25.78       | -5.89        | 0.07          | -2.08         | 8.469      | 17.309     | 0.07        | -14.76      | 5.96                 | 0                  | 46.17        | 46.56        |
| 2490          | 26.3        | -5.8         | 0.23          | -1.92         | 8.726      | 17.573     | 0.23        | -15.17      | 6.04                 | 0                  | 46.38        | 46.78        |
| 2500          | 24.91       | -6.04        | 0.12          | -2.03         | 8.32       | 16.591     | 0.12        | -15.36      | 6.15                 | 0                  | 46.26        | 46.65        |



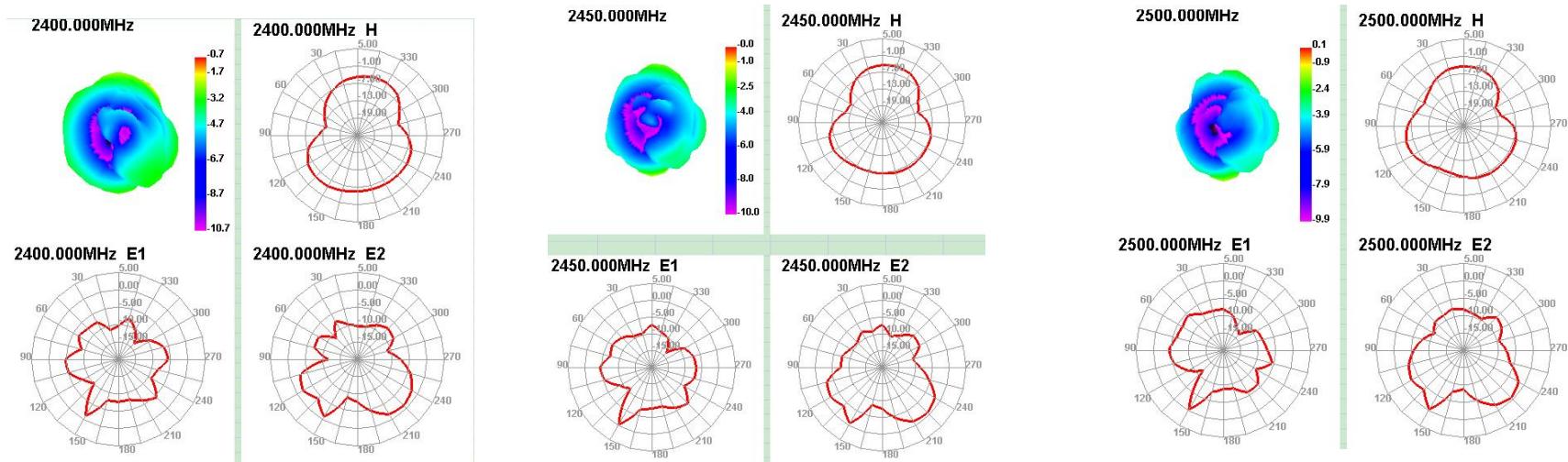
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SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

无源测试数据  
Passive test data

ANT Direction of figure(2.4/BT)





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SHENZHEN Xingyuanchuang TECHNOLOGY CO.,LTD

无源测试数据

Passive test data

ANT GAIN&amp;Efficiency-WIFI 5G

| Passive Test For WIFI5G |             |              |               |               |            |            |             |             |
|-------------------------|-------------|--------------|---------------|---------------|------------|------------|-------------|-------------|
| Freq<br>(MHz)           | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHS<br>(%) | Max<br>(dB) | Min<br>(dB) |
| 5150                    | 14.21       | -8.48        | -2.92         | -5.07         | 7.417      | 6.788      | -2.92       | -21.94      |
| 5170                    | 14.03       | -8.53        | -2.45         | -4.6          | 7.51       | 6.521      | -2.45       | -20.13      |
| 5190                    | 17.7        | -7.52        | -1.44         | -3.59         | 9.259      | 8.441      | -1.44       | -19.27      |
| 5210                    | 16.77       | -7.76        | -1.99         | -4.14         | 8.492      | 8.275      | -1.99       | -21.42      |
| 5230                    | 18.97       | -7.22        | -1.84         | -3.99         | 9.681      | 9.292      | -1.84       | -23.64      |
| 5250                    | 17.31       | -7.62        | -2.99         | -5.14         | 9.189      | 8.118      | -2.99       | -23.39      |
| 5270                    | 21.19       | -6.74        | -2.27         | -4.42         | 11.595     | 9.599      | -2.27       | -20.68      |
| 5290                    | 18.76       | -7.27        | -2.53         | -4.68         | 10.506     | 8.259      | -2.53       | -18.4       |
| 5310                    | 19.57       | -7.08        | -2.32         | -4.47         | 11.219     | 8.353      | -2.32       | -18.86      |
| 5330                    | 20.35       | -6.91        | -2.38         | -4.53         | 11.96      | 8.387      | -2.38       | -19.52      |
| 5350                    | 23.62       | -6.27        | -1.83         | -3.98         | 13.93      | 9.687      | -1.83       | -18.58      |
| 5370                    | 23.87       | -6.22        | -1.57         | -3.72         | 14.02      | 9.848      | -1.57       | -19.55      |
| 5390                    | 22.86       | -6.41        | -1.62         | -3.77         | 13.443     | 9.413      | -1.62       | -19.09      |
| 5410                    | 29.22       | -5.34        | -0.01         | -2.16         | 16.9       | 12.32      | -0.01       | -16.25      |
| 5430                    | 27.03       | -5.68        | 0.46          | -1.69         | 15.208     | 11.82      | 0.46        | -19.37      |
| 5450                    | 29.96       | -5.23        | 1.3           | -0.85         | 16.709     | 13.255     | 1.3         | -20.7       |
| 5470                    | 27.01       | -5.68        | 0.57          | -1.58         | 14.866     | 12.145     | 0.57        | -21.45      |
| 5490                    | 27.76       | -5.57        | 0.07          | -2.08         | 14.668     | 13.087     | 0.07        | -19.69      |
| 5510                    | 27.41       | -5.62        | -0.34         | -2.49         | 13.684     | 13.726     | -0.34       | -17.92      |
| 5530                    | 26.82       | -5.72        | -0.28         | -2.43         | 12.916     | 13.9       | -0.28       | -18.17      |
| 5550                    | 25.89       | -5.87        | -0.65         | -2.8          | 12.421     | 13.467     | -0.65       | -17.89      |
| 5570                    | 22.83       | -6.41        | -1.78         | -3.93         | 10.777     | 12.055     | -1.78       | -17.84      |
| 5590                    | 20.29       | -6.93        | -2.72         | -4.87         | 9.198      | 11.091     | -2.72       | -19         |
| 5610                    | 18.7        | -7.28        | -2.41         | -4.56         | 8.366      | 10.336     | -2.41       | -22.37      |
| 5630                    | 17.34       | -7.61        | -2.39         | -4.54         | 8.002      | 9.341      | -2.39       | -29.38      |
| 5650                    | 18.55       | -7.32        | -1.97         | -4.12         | 8.787      | 9.764      | -1.97       | -24.36      |
| 5670                    | 15.58       | -8.07        | -2.71         | -4.86         | 7.387      | 8.192      | -2.71       | -19.01      |
| 5690                    | 16.93       | -7.71        | -1.89         | -4.04         | 8.228      | 8.706      | -1.89       | -17.98      |
| 5710                    | 11.37       | -9.44        | -3.43         | -5.58         | 5.699      | 5.674      | -3.43       | -21.8       |
| 5730                    | 13.49       | -8.7         | -2.45         | -4.6          | 6.746      | 6.742      | -2.45       | -23.05      |
| 5750                    | 11.07       | -9.56        | -3.44         | -5.59         | 5.442      | 5.625      | -3.44       | -24.25      |
| 5770                    | 15.63       | -8.06        | -2.15         | -4.3          | 7.542      | 8.086      | -2.15       | -19.98      |
| 5790                    | 16.06       | -7.94        | -2.18         | -4.33         | 7.737      | 8.324      | -2.18       | -17.1       |
| 5810                    | 20.28       | -6.93        | -1.37         | -3.52         | 9.937      | 10.341     | -1.37       | -16.19      |
| 5830                    | 20.53       | -6.88        | -1.32         | -3.47         | 10.299     | 10.226     | -1.32       | -14.63      |
| 5850                    | 23.63       | -6.27        | -0.43         | -2.58         | 12.298     | 11.328     | -0.43       | -14.48      |





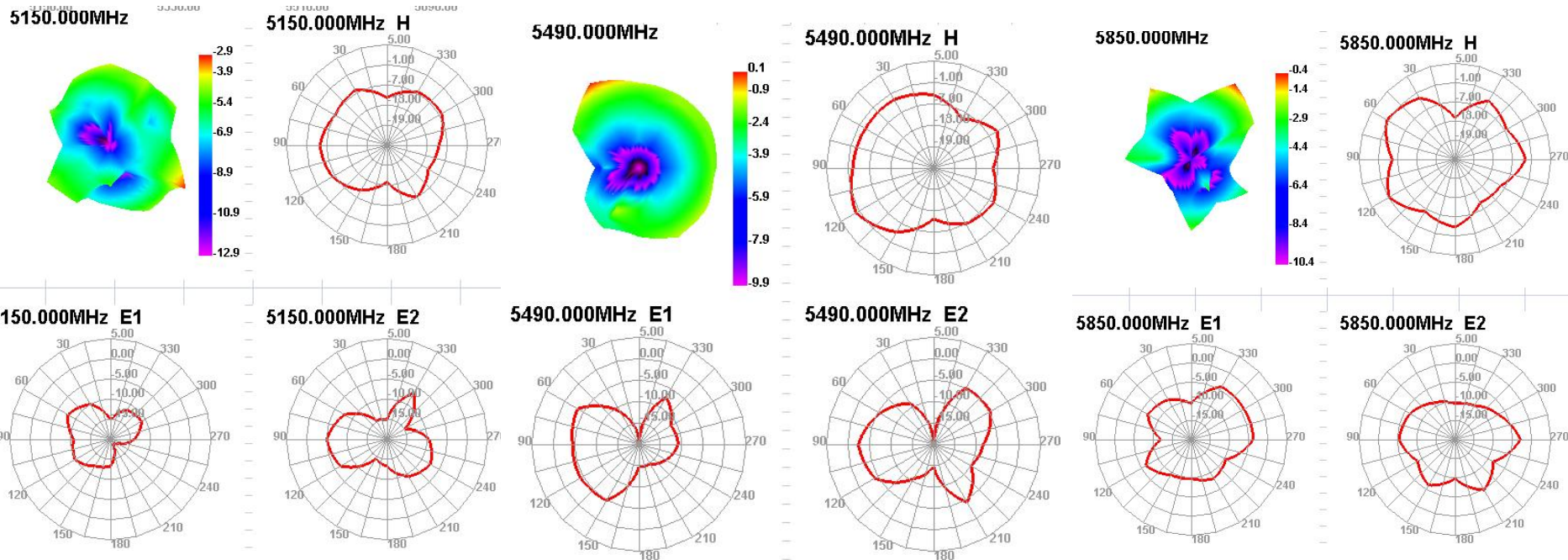
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Passive test data

ANT Direction of figure(5G)





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附加说明

Additional instructions

01

报告中天线匹配电路是否改动，天线有关的环境处理是否增加，将直接影响天线性能，请仔细确认查看。

02

贵司如有最新试产或更新产品（如软件，**ESD**，物料等）请尽快提供我司进行验证，以确认天线性能是否有变化影响。

03

倘若贵司需要送第三方检测机构复测或客户测试，请务必先与我司进行天线相关测试确认，因主板•装配的一致性，以及天线组装的差异等因素，均可能导致天线参数的偏差。



合作共赢

