



*SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD*

# Antenna Test Report

*TC: Mei Difei*

*MN: AP32*

*RF: Guan Wei*

*MD: Huang Qingqing*

*MP: 15112592483*

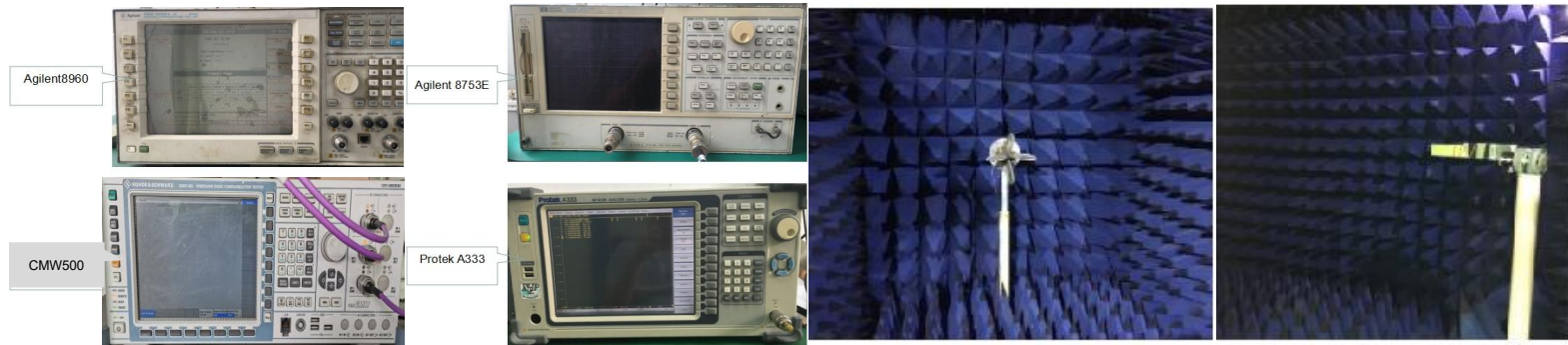
*Date: 2023. 06. 05.*  
*REV :V1. 0*

## 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           | 2/4/5/12/25/26/66/71/41 |               |              |               |      |
| AUX ANT  | BT/WIFI      | 2.4/5G                  | FPC           | PIFA         | NO            |      |
|          | GPS          | 1.575G                  | FPC           | PIFA         | NO            |      |
|          | DIV          |                         | FPC           | PIFA         | NO            |      |

## Test environment

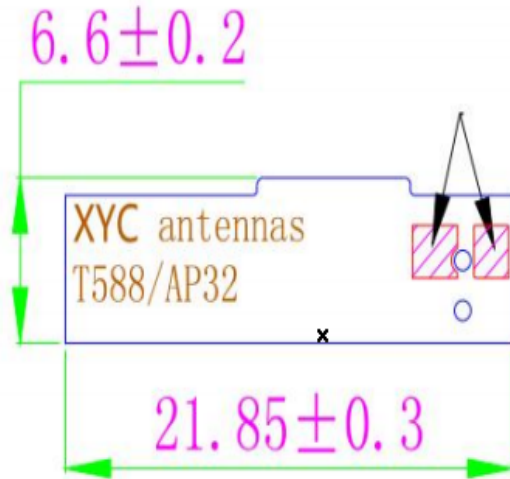
|                 | Test Item                                                                              | Test Equipment                                                           |
|-----------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1. S-parameter  | 1. Voltage standing wave ratio<br>2. Return Loss                                       | Network analyzer: Agilent 8753ES                                         |
| 2. Active Test  | 1. Transmitted power (TRP)<br>2. Receiving sensitivity (TIS)<br>3. screen is off or on | 1. Dark room: 5*3*3m (3D) Chamber<br>2. synthesizer: Agilent 8960 CMW500 |
| 3. Passive Test | 1. Antenna gain<br>2. Antenna efficiency                                               | 1. Dark room: 5*3*3m (3D) Chamber<br>2. Network analyzer: Agilent 8753ES |



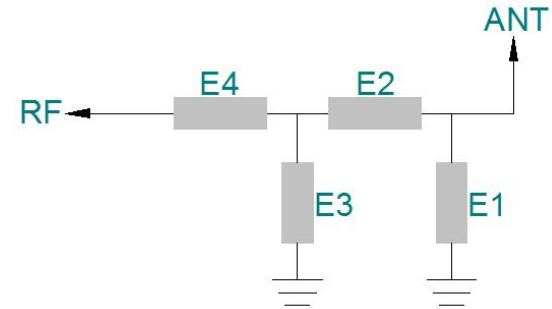
## Antenna position



## Matching circuit



Matching circuit schematic & bit number diagram



|          | Capacitance<br>(PF) | Inductance<br>(NH) |
|----------|---------------------|--------------------|
| E1(0402) |                     |                    |
| E2(0402) |                     |                    |
| E3(0402) |                     |                    |
| E4(0402) |                     |                    |

## OTA 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)     | 22.42       | 22.59 | 23.15  | 24.3        | 24.23 | 24.18   | 25.94         | 25.41  | 25.74   | 25.59         | 25.7   | 25.79   |
| TIS(LCD OFF) |             |       | -102.7 |             |       | -104.31 |               |        | -105.21 |               |        | -105.8  |
| 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)     |             |       |        | 18.59       | 18.44 | 18.58   | 18.66         | 18.57  | 18.24   | 17.17         | 16.55  | 16.14   |
| TIS(LCD OFF) |             |       |        |             |       |         |               |        |         |               |        | -98.75  |
| TIS(LCD ON)  |             |       |        |             |       | -105.49 |               |        | -105.55 |               |        | -102.01 |
| 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)     | 18.32       | 18.27 | 18.13  | 18.58       | 18.1  | 18.12   | 17.36         | 16.67  | 16.43   | 17.43         | 17.47  | 17.29   |
| TIS(LCD OFF) |             |       |        |             |       |         |               |        | -89.83  |               |        |         |
| TIS(LCD ON)  |             |       | -92.48 |             |       | -92.86  |               |        | -85.57  |               |        | -89.11  |
| Band         | FDD-Band25  |       |        | FDD-Band 26 |       |         | FDD-Band66    |        |         | FDD-Band 71   |        |         |
| Channel      | 26090       | 26365 | 26640  | 26740       | 26865 | 26990   | 132022        | 132322 | 132622  | 133172        | 133297 | 133422  |
| TRP(dBm)     | 18.52       | 18.25 | 18.49  | 16.85       | 16.54 | 16.26   | 18.43         | 18.59  | 18.55   | 17.12         | 17.37  | 17.35   |
| TIS(LCD OFF) |             |       |        |             |       | -88.95  |               |        |         |               |        | -86.84  |
| TIS(LCD ON)  |             |       | -92.79 |             |       | -85.56  |               |        | -92.34  |               |        | -77.91  |
| 4G(TDD 20M)  |             |       |        |             |       |         |               |        |         |               |        |         |
| Band         | FDD-Band 38 |       |        | FDD-Band 39 |       |         | FDD-Band 40   |        |         | FDD-Band 41   |        |         |
| Channel      | 37850       | 38000 | 38150  | 38350       | 38450 | 38550   | 38750         | 39150  | 39550   | 39750         | 40620  | 41490   |
| TRP(dBm)     |             |       |        |             |       |         |               |        |         |               | 19.19  |         |
| TIS(LCD OFF) |             |       |        |             |       |         |               |        |         |               | -88.91 |         |
| TIS(LCD ON)  |             |       |        |             |       |         |               |        |         |               |        |         |

## GPS star search test

The measured effect of GPS cold start is as follows:  
 CN value over 40 4 pieces  
 CN value more than 35 8 pieces  
 Actual location of 14

Note;  
 GPS star search test. It varies by time period and region. The above data are the best data in our test (open area)

|    |    |      |
|----|----|------|
| 1  | L1 | 36.6 |
| 3  | L1 | 32.4 |
| 6  | L1 | 32.3 |
| 7  | L1 | 30.6 |
| 8  | L1 | 29.8 |
| 14 | L1 | 31.9 |
| 19 | L1 | 0.0  |
| 21 | L1 | 44.7 |
| 30 | L1 | 38.3 |
| 75 | L1 | 36.9 |
| 76 | L1 | 40.3 |
| 77 | L1 | 0.0  |
| 78 | L1 | 0.0  |
| 86 | L1 | 36.6 |
| 87 | L1 | 18.3 |
| 88 | L1 | 0.0  |
| 1  | L1 | 33.4 |
| 2  | L1 | 32.1 |
| 3  | L1 | 29.5 |
| 4  | L1 | 0.0  |
| 6  | L1 | 0.0  |
| 7  | L1 | 29.1 |

|    |    |      |
|----|----|------|
| 7  | L1 | 21.0 |
| 8  | L1 | 34.4 |
| 9  | L1 | 34.7 |
| 10 | L1 | 0.0  |
| 11 | L1 | 0.0  |
| 13 | L1 | 22.9 |
| 14 | L1 | 0.0  |
| 16 | L1 | 0.0  |
| 23 | L1 | 32.0 |
| 25 | L1 | 42.9 |
| 28 | L1 | 0.0  |
| 33 | L1 | 0.0  |
| 34 | L1 | 0.0  |
| 37 | L1 | 30.5 |
| 39 | L1 | 0.0  |
| 40 | L1 | 0.0  |
| 2  | L1 | 32.0 |
| 3  | L1 | 41.0 |
| 4  | L1 | 0.0  |
| 7  | L1 | 0.0  |
| 41 | L1 | 27.0 |

## Wifi Antenna test

### WIFI

Test environment: Open space

Test distance: 10m

The test results are shown on the right

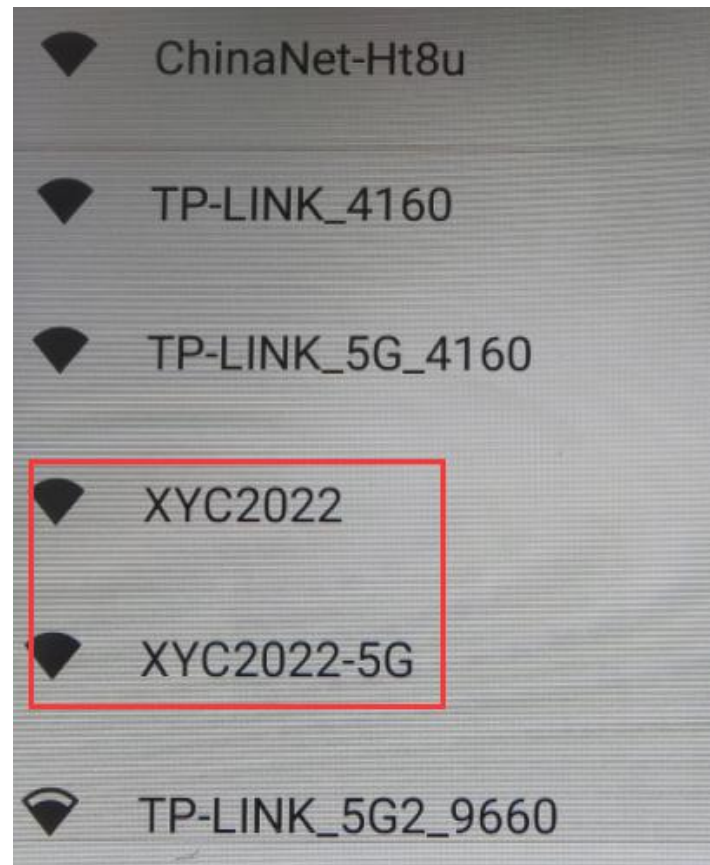
### BT

Test environment: Open space (channel)

Test tool: Bluetooth speaker

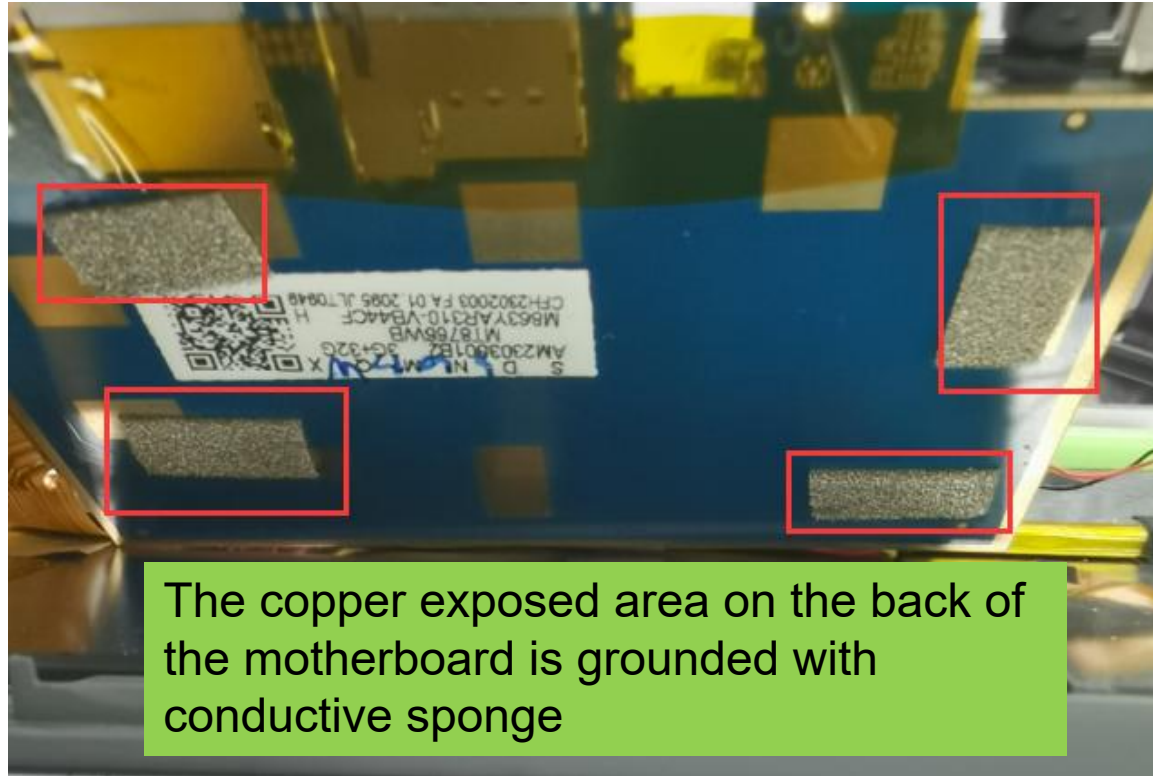
Test distance: 10m

Results: Play music smoothly, no noise.

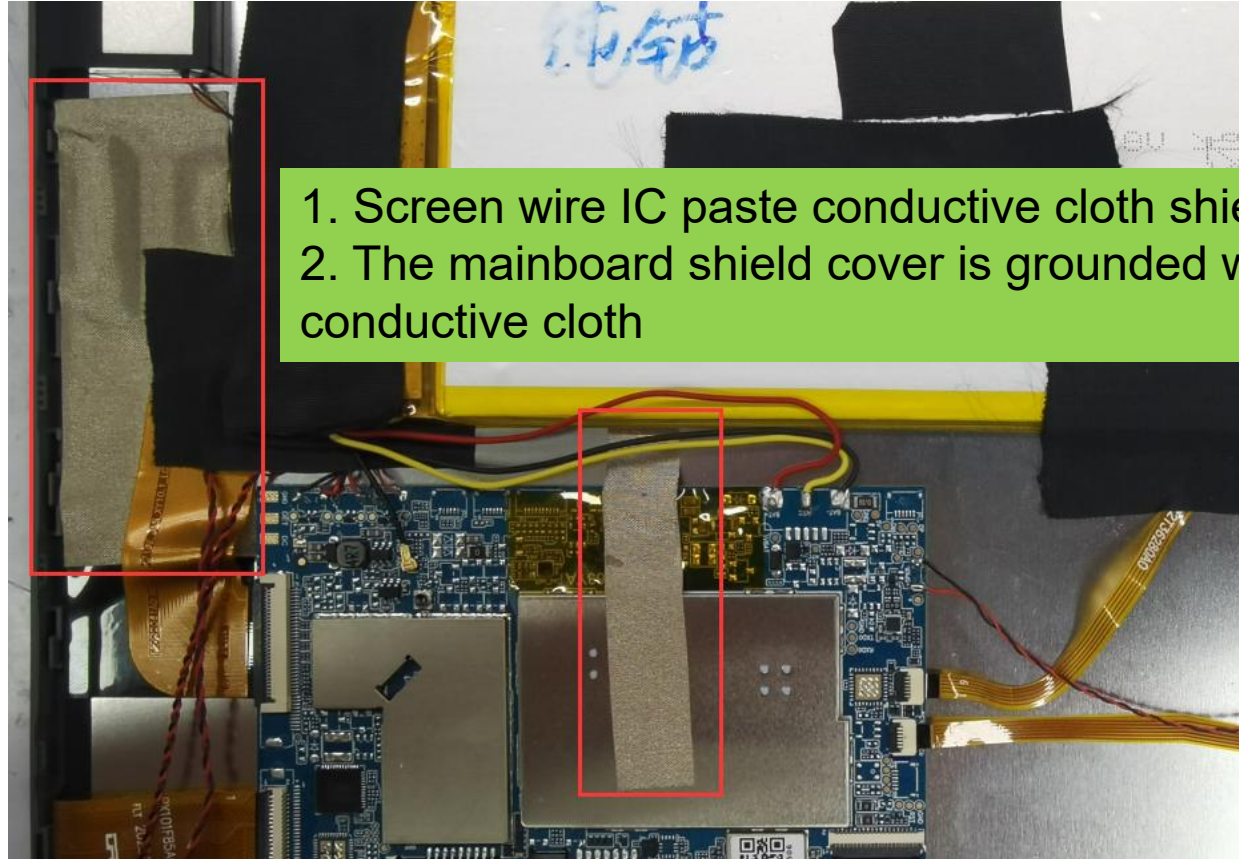




## Environmental treatment

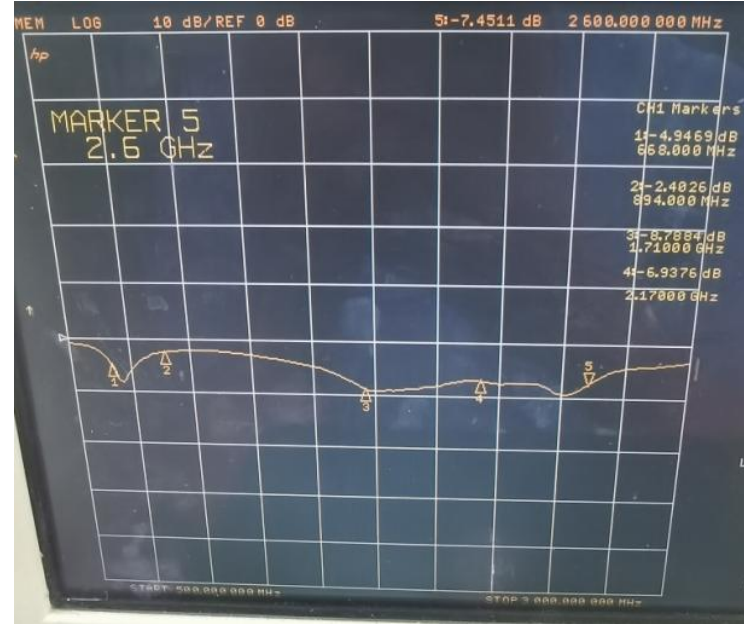
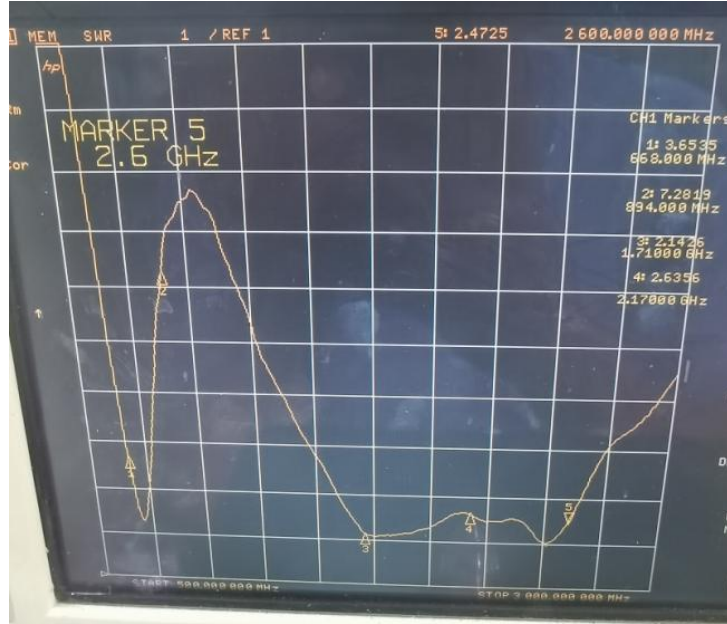


## Additional instructions



# Main ANT Passive test data

## ANT S11-VSWR&Return Loss



| Frequency(MHZ)  | 668   | 894   | 1710  | 2170  | 2600  |
|-----------------|-------|-------|-------|-------|-------|
| VSWR            | 3.65  | 7.28  | 2.14  | 2.63  | 2.47  |
| Return Loss(DB) | -4.94 | -2.40 | -8.78 | -6.93 | -7.45 |



## Passive test data

ANT Direction of figure 690-2690MHz

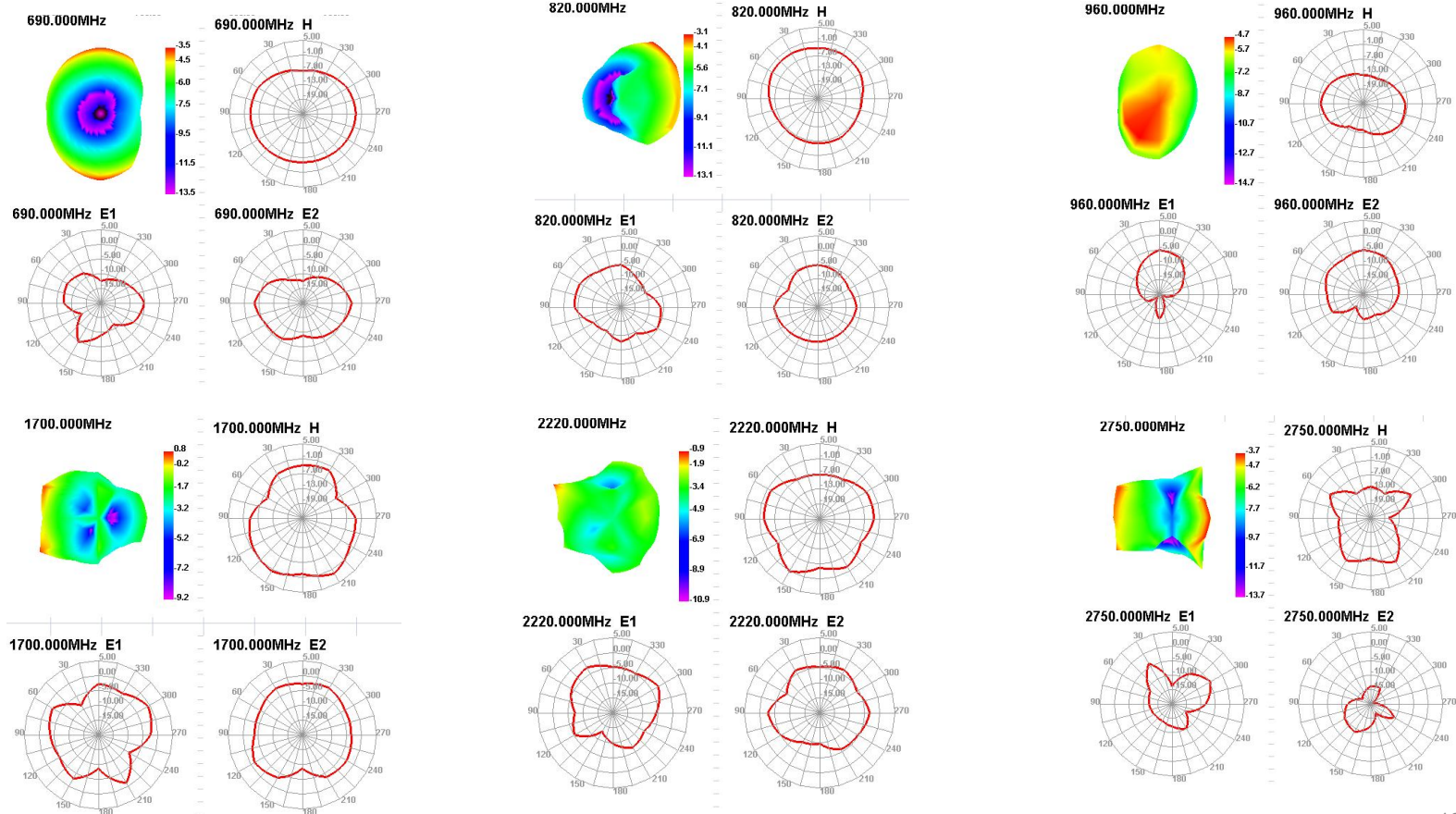
| Passive Test For 低频 |             |              |              |              |            |            |             |             |                       |                    |              |              |
|---------------------|-------------|--------------|--------------|--------------|------------|------------|-------------|-------------|-----------------------|--------------------|--------------|--------------|
| Freq<br>(MHz)       | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dB) | Gain<br>(dB) | UHS<br>(%) | DHS<br>(%) | Max<br>(dB) | Min<br>(dB) | Irradiativity<br>(dB) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
| 690                 | 22.28       | -6.52        | -3.46        | -5.61        | 10.147     | 12.13      | -3.46       | -12.63      | 3.06                  | 0                  | 38.39        | 38.05        |
| 700                 | 23.76       | -6.24        | -3.37        | -5.52        | 10.780     | 12.978     | -3.37       | -13.83      | 2.87                  | 30                 | 37.95        | 37.71        |
| 710                 | 27.76       | -5.57        | -2.64        | -4.79        | 12.951     | 14.813     | -2.64       | -14.15      | 2.92                  | 30                 | 38.33        | 38.1         |
| 720                 | 31.28       | -5.05        | -2.23        | -4.38        | 15.201     | 16.08      | -2.23       | -12.74      | 2.82                  | 60                 | 38.12        | 37.78        |
| 730                 | 31.61       | -5           | -2.01        | -4.16        | 15.542     | 16.067     | -2.01       | -11.29      | 2.99                  | 60                 | 37.65        | 37.31        |
| 740                 | 28.65       | -5.43        | -2.34        | -4.49        | 13.944     | 14.711     | -2.34       | -10.8       | 3.09                  | 60                 | 37.21        | 36.99        |
| 750                 | 29.14       | -5.36        | -2.31        | -4.46        | 14.201     | 14.937     | -2.31       | -10.44      | 3.05                  | 60                 | 37.03        | 36.95        |
| 760                 | 27.99       | -5.53        | -2.64        | -4.79        | 13.639     | 14.35      | -2.64       | -10.92      | 2.89                  | 60                 | 36.73        | 36.72        |
| 770                 | 22.11       | -6.65        | -3.68        | -5.83        | 10.63      | 11.481     | -3.68       | -12.58      | 2.88                  | 30                 | 35.81        | 35.92        |
| 780                 | 20.48       | -6.89        | -4.02        | -6.17        | 9.738      | 10.744     | -4.02       | -13.18      | 2.87                  | 60                 | 35.67        | 35.88        |
| 790                 | 20.48       | -6.89        | -4           | -6.15        | 9.972      | 10.507     | -4          | -12.41      | 2.88                  | 60                 | 35.94        | 36.19        |
| 800                 | 26.36       | -5.79        | -2.85        | -5           | 13.532     | 12.829     | -2.85       | -9.94       | 2.94                  | 90                 | 36.77        | 36.98        |
| 810                 | 26.91       | -5.7         | -2.52        | -4.67        | 14.313     | 12.6       | -2.52       | -9.48       | 3.18                  | 90                 | 36.63        | 36.88        |
| 820                 | 23.24       | -6.34        | -3.08        | -5.23        | 12.603     | 10.639     | -3.08       | -10.4       | 3.26                  | 90                 | 36.69        | 36.92        |
| 830                 | 22.15       | -6.65        | -3.2         | -5.35        | 12.408     | 9.742      | -3.2        | -11.58      | 3.34                  | 90                 | 36.46        | 36.76        |
| 840                 | 22.44       | -6.49        | -3.19        | -5.34        | 13.038     | 9.405      | -3.19       | -12.4       | 3.3                   | 90                 | 36.63        | 37.05        |
| 850                 | 23.42       | -6.31        | -3.1         | -5.25        | 13.846     | 9.569      | -3.1        | -12.91      | 3.2                   | 90                 | 36.69        | 37.16        |
| 860                 | 23.93       | -6.21        | -3.02        | -5.17        | 14.027     | 9.898      | -3.02       | -12.57      | 3.19                  | 90                 | 36.82        | 37.25        |
| 870                 | 20.56       | -6.87        | -3.67        | -5.82        | 11.895     | 8.662      | -3.67       | -13.99      | 3.2                   | 90                 | 36.68        | 37.07        |
| 880                 | 19.14       | -7.18        | -4.03        | -6.18        | 11.252     | 7.892      | -4.03       | -14.74      | 3.15                  | 30                 | 36.82        | 37.19        |
| 890                 | 19.67       | -7.06        | -3.34        | -5.49        | 11.976     | 7.693      | -3.34       | -15.77      | 3.72                  | 60                 | 37           | 37.41        |
| 900                 | 17.11       | -7.67        | -3.59        | -5.74        | 10.853     | 6.249      | -3.59       | -18.22      | 4.07                  | 60                 | 37.06        | 37.58        |

|      |       |       |       |       |        |        |       |        |      |     |       |       |
|------|-------|-------|-------|-------|--------|--------|-------|--------|------|-----|-------|-------|
| 2120 | 34.28 | -4.65 | -0.42 | -2.57 | 17.729 | 16.554 | -0.42 | -13.52 | 4.23 | 120 | 44.21 | 44.07 |
| 2130 | 33.34 | -4.77 | -0.55 | -2.7  | 16.954 | 16.382 | -0.55 | -13.45 | 4.22 | 120 | 43.73 | 43.61 |
| 2140 | 31.99 | -4.95 | -0.79 | -2.94 | 16.392 | 15.594 | -0.79 | -13.99 | 4.16 | 120 | 43.96 | 43.93 |
| 2150 | 31.51 | -5.01 | -0.92 | -3.07 | 16.609 | 14.905 | -0.92 | -14.87 | 4.09 | 120 | 43.93 | 43.95 |
| 2160 | 31.01 | -5.09 | -1.12 | -3.27 | 16.501 | 14.507 | -1.12 | -14.58 | 3.96 | 120 | 44.05 | 44.08 |
| 2170 | 32.97 | -4.82 | -0.92 | -3.07 | 17.536 | 15.43  | -0.92 | -13.2  | 3.9  | 0   | 44.22 | 44.25 |
| 2570 | 34.18 | -4.66 | -0.45 | -2.6  | 20.552 | 13.63  | -0.45 | -14.34 | 4.21 | 30  | 46.03 | 46.19 |
| 2580 | 29.38 | -5.32 | -1.07 | -3.22 | 17.706 | 11.674 | -1.07 | -15.23 | 4.25 | 30  | 46.01 | 46.21 |
| 2590 | 26.17 | -5.82 | -1.53 | -3.68 | 15.626 | 10.543 | -1.53 | -16.29 | 4.29 | 30  | 45.73 | 45.95 |
| 2600 | 28.53 | -5.45 | -1.1  | -3.25 | 16.914 | 11.615 | -1.1  | -15.8  | 4.35 | 30  | 46.04 | 46.24 |
| 2610 | 27.15 | -5.66 | -1.34 | -3.49 | 16.07  | 11.076 | -1.34 | -15.61 | 4.33 | 30  | 45.99 | 46.22 |
| 2620 | 23.68 | -6.26 | -1.96 | -4.11 | 14.13  | 9.551  | -1.96 | -15.93 | 4.3  | 30  | 45.99 | 46.17 |
| 2630 | 23.65 | -6.26 | -1.9  | -4.05 | 14.05  | 9.6    | -1.9  | -15.66 | 4.36 | 30  | 45.98 | 46.18 |
| 2640 | 22.61 | -6.46 | -2.01 | -4.16 | 13.345 | 9.261  | -2.01 | -16.21 | 4.45 | 30  | 46.5  | 46.72 |
| 2650 | 23.32 | -6.32 | -1.91 | -4.06 | 13.745 | 9.57   | -1.91 | -17.14 | 4.42 | 30  | 46.45 | 46.68 |
| 2660 | 22.97 | -6.39 | -1.94 | -4.09 | 13.66  | 9.312  | -1.94 | -18.14 | 4.45 | 0   | 46.66 | 46.86 |
| 2670 | 20.17 | -6.95 | -2.42 | -4.57 | 12.018 | 8.153  | -2.42 | -18.96 | 4.53 | 0   | 46.65 | 46.9  |
| 2680 | 17.71 | -7.52 | -2.8  | -4.95 | 10.547 | 7.162  | -2.8  | -19.23 | 4.71 | 0   | 46.69 | 46.87 |
| 2690 | 17.57 | -7.55 | -2.75 | -4.9  | 10.403 | 7.165  | -2.75 | -19.01 | 4.8  | 0   | 46.47 | 46.69 |

| Passive Test For 高频 |             |              |               |               |            |             |             |             |                     |                    |              |              |
|---------------------|-------------|--------------|---------------|---------------|------------|-------------|-------------|-------------|---------------------|--------------------|--------------|--------------|
| Freq<br>(MHz)       | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHIS<br>(%) | Max<br>(dB) | Min<br>(dB) | irectivity<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
| 1710                | 42.65       | -3.7         | 0.18          | -1.97         | 21.593     | 21.059      | 0.18        | -12.59      | 3.88                | 30                 | 42.52        | 42.01        |
| 1720                | 40.99       | -3.87        | 0.17          | -1.98         | 21.089     | 19.906      | 0.17        | -12.39      | 4.04                | 30                 | 42.4         | 41.88        |
| 1730                | 44.78       | -3.49        | 0.63          | -1.52         | 23.299     | 21.48       | 0.63        | -11.85      | 4.12                | 30                 | 42.83        | 42.29        |
| 1740                | 50.15       | -3           | 0.99          | -1.16         | 26.187     | 23.963      | 0.99        | -11.07      | 3.99                | 30                 | 42.89        | 42.17        |
| 1750                | 49.26       | -3.08        | 0.59          | -1.56         | 25.393     | 23.865      | 0.59        | -10.65      | 3.66                | 0                  | 42.92        | 42.22        |
| 1760                | 43.8        | -3.58        | 0.04          | -2.11         | 22.492     | 21.312      | 0.04        | -11.09      | 3.63                | 30                 | 43.13        | 42.41        |
| 1770                | 51.01       | -2.92        | 0.68          | -1.47         | 26.151     | 24.861      | 0.68        | -10.58      | 3.61                | 30                 | 43.26        | 42.64        |
| 1780                | 57.75       | -2.38        | 1.24          | -0.91         | 29.819     | 27.93       | 1.24        | -10.32      | 3.63                | 30                 | 43.6         | 43.04        |
| 1790                | 52.44       | -2.8         | 0.86          | -1.29         | 27.037     | 25.402      | 0.86        | -10.34      | 3.66                | 30                 | 43.12        | 42.67        |
| 1800                | 49.06       | -3.09        | 0.56          | -1.59         | 25.318     | 23.742      | 0.56        | -10.45      | 3.66                | 30                 | 42.97        | 42.55        |
| 1810                | 47.84       | -3.2         | 0.47          | -1.68         | 24.842     | 22.994      | 0.47        | -10.8       | 3.67                | 0                  | 42.94        | 42.49        |
| 1820                | 54.6        | -2.63        | 1.11          | -1.04         | 28.644     | 25.961      | 1.11        | -9.8        | 3.73                | 0                  | 43.24        | 42.77        |
| 1830                | 50.94       | -2.93        | 0.84          | -1.31         | 26.855     | 24.08       | 0.84        | -10.35      | 3.77                | 0                  | 43.09        | 42.62        |
| 1840                | 50.96       | -2.93        | 0.95          | -1.2          | 26.605     | 24.359      | 0.95        | -9.88       | 3.88                | 0                  | 43.08        | 42.67        |
| 1850                | 58.85       | -2.3         | 1.46          | -0.69         | 30.485     | 28.364      | 1.46        | -9.32       | 3.76                | 0                  | 43.4         | 43.05        |
| 1860                | 55.61       | -2.55        | 1.05          | -1.1          | 29.139     | 26.473      | 1.05        | -10.04      | 3.59                | 0                  | 43.4         | 43.07        |
| 1870                | 49.76       | -3.03        | 0.57          | -1.58         | 26.211     | 23.548      | 0.57        | -10.56      | 3.61                | 0                  | 43.15        | 42.96        |
| 1880                | 53.48       | -2.72        | 0.85          | -1.3          | 28.231     | 25.248      | 0.85        | -10.05      | 3.57                | 0                  | 43.26        | 43.08        |
| 1890                | 50.86       | -2.94        | 0.55          | -1.6          | 26.589     | 24.273      | 0.55        | -10.09      | 3.49                | 0                  | 42.84        | 42.68        |
| 1900                | 46.54       | -3.32        | 0.19          | -1.96         | 24.469     | 22.071      | 0.19        | -10.96      | 3.51                | 0                  | 42.94        | 42.77        |
| 1910                | 44.47       | -3.52        | 0.07          | -2.08         | 23.346     | 21.12       | 0.07        | -11.34      | 3.59                | 0                  | 42.87        | 42.69        |
| 1920                | 48.37       | -3.15        | 0.56          | -1.59         | 25.447     | 22.924      | 0.56        | -10.82      | 3.71                | 0                  | 42.9         | 42.78        |
| 1930                | 49.57       | -3.05        | 0.65          | -1.5          | 25.832     | 23.737      | 0.65        | -10.21      | 3.7                 | 0                  | 43.03        | 42.87        |
| 1940                | 44.62       | -3.5         | 0.29          | -1.86         | 23.084     | 21.533      | 0.29        | -10.53      | 3.79                | 0                  | 42.93        | 42.71        |
| 1950                | 43.36       | -3.63        | 0.29          | -1.86         | 22.554     | 20.807      | 0.29        | -11.11      | 3.92                | 0                  | 42.85        | 42.64        |
| 1960                | 40.23       | -3.95        | 0.11          | -2.04         | 21.069     | 19.164      | 0.11        | -12.02      | 4.07                | 0                  | 42.95        | 42.68        |
| 1970                | 38.64       | -4.13        | 0.07          | -2.08         | 20.2       | 18.441      | 0.07        | -12.04      | 4.2                 | 0                  | 42.9         | 42.76        |
| 1980                | 42.47       | -3.72        | 0.64          | -1.51         | 21.835     | 20.633      | 0.64        | -11.15      | 4.36                | 0                  | 43.15        | 43.1         |
| 1990                | 38.05       | -4.2         | 0.39          | -1.76         | 19.133     | 18.918      | 0.39        | -11.81      | 4.59                | 0                  | 43.17        | 43.1         |
| 2000                | 37.38       | -4.27        | 0.38          | -1.77         | 18.687     | 18.692      | 0.38        | -12.27      | 4.66                | 0                  | 43.48        | 43.38        |
| 2010                | 38.81       | -4.11        | 0.53          | -1.62         | 19.465     | 19.348      | 0.53        | -12.34      | 4.64                | 0                  | 43.5         | 43.33        |
| 2020                | 38.04       | -4.2         | 0.26          | -1.89         | 19.271     | 18.772      | 0.26        | -12.4       | 4.45                | 0                  | 43.39        | 43.21        |
| 2030                | 35.8        | -4.46        | -0.05         | -2.2          | 17.951     | 17.85       | -0.05       | -12.31      | 4.41                | 0                  | 43.28        | 43.09        |
| 2040                | 33.09       | -4.8         | -0.36         | -2.51         | 16.406     | 16.686      | -0.36       | -12.36      | 4.44                | 0                  | 43.43        | 43.26        |
| 2050                | 38.95       | -4.1         | 0.18          | -1.97         | 19.814     | 19.131      | 0.18        | -11.52      | 4.27                | 0                  | 43.79        | 43.65        |
| 2060                | 37.87       | -4.22        | -0.22         | -2.37         | 19.836     | 18.036      | -0.22       | -11.62      | 3.99                | 0                  | 43.67        | 43.53        |
| 2070                | 34.63       | -4.61        | -0.72         | -2.87         | 18.309     | 16.324      | -0.72       | -11.89      | 3.89                | 0                  | 43.99        | 43.83        |
| 2080                | 38.82       | -4.11        | -0.15         | -2.3          | 20.207     | 18.611      | -0.15       | -11.16      | 3.96                | 0                  | 44.24        | 44.1         |
| 2090                | 45.19       | -3.45        | 0.55          | -1.6          | 23.362     | 21.831      | 0.55        | -11.15      | 4                   | 0                  | 44.64        | 44.47        |
| 2100                | 43.96       | -3.57        | 0.4           | -1.75         | 23.119     | 20.84       | 0.4         | -12.51      | 3.97                | 120                | 44.77        | 44.61        |
| 2110                | 37.81       | -4.22        | -0.07         | -2.22         | 19.754     | 18.056      | -0.07       | -13.38      | 4.15                | 120                | 44.45        | 44.27        |

# Passive test data

ANT Direction of figure 690-2690MHz



## Passive test data

### ANT1 S11-VSWR&Return Loss



| Frequency(MHZ)  | 1575  | 2400   | 2500   | 5150  | 5850  |
|-----------------|-------|--------|--------|-------|-------|
| VSWR            | 2.05  | 1.65   | 1.64   | 2.60  | 2.41  |
| Return Loss(DB) | -9.25 | -12.17 | -12.25 | -7.83 | -7.64 |



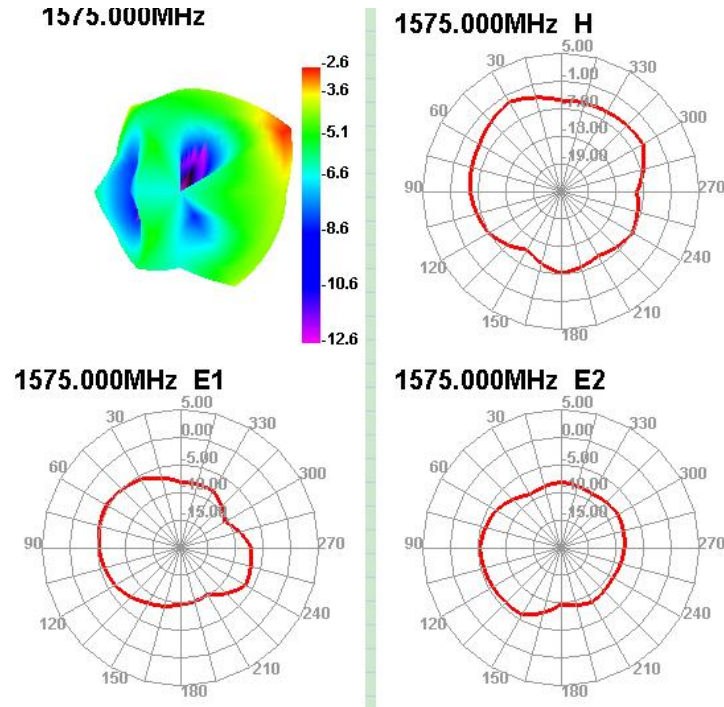
## Passive test data

ANT1 GAIN&amp;Efficiency-GPS

|      |       |       |       |       |        |        |       |        |      |    |       |       |
|------|-------|-------|-------|-------|--------|--------|-------|--------|------|----|-------|-------|
| 1570 | 24.58 | -6.09 | -2.59 | -4.74 | 10.92  | 13.663 | -2.59 | -16.86 | 3.51 | 90 | 41.5  | 41.03 |
| 1575 | 24.18 | -6.17 | -2.61 | -4.76 | 10.74  | 13.44  | -2.61 | -17.19 | 3.55 | 90 | 41.68 | 41.23 |
| 1580 | 24.91 | -6.04 | -2.44 | -4.59 | 11.084 | 13.829 | -2.44 | -18.49 | 3.59 | 90 | 41.78 | 41.35 |

## Passive test data

ANT1 Direction of figure (GPS)





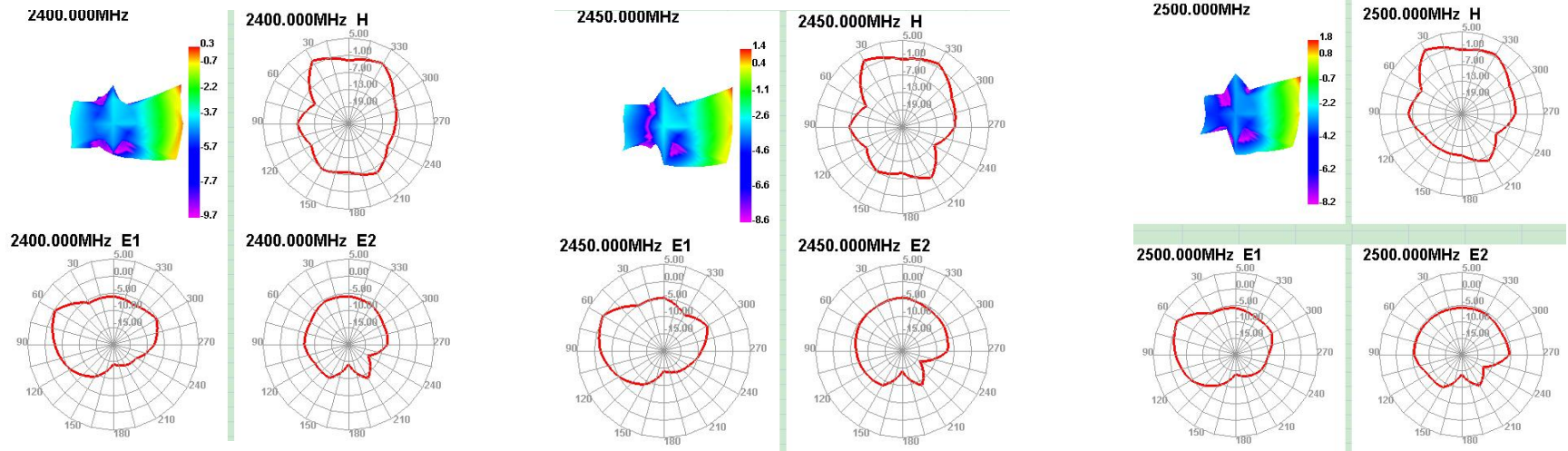
## Passive test data

ANT1 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                     | 24.44       | -6.12        | 0.3           | -1.85         | 14.262     | 10.176     | 0.3         | -14.34      | 6.42                 | 30                 | 45.78        | 46.01        |
| 2410                     | 24.89       | -6.04        | 0.44          | -1.71         | 14.686     | 10.202     | 0.44        | -14.75      | 6.48                 | 30                 | 46.01        | 46.29        |
| 2420                     | 25.66       | -5.91        | 0.65          | -1.5          | 15.278     | 10.384     | 0.65        | -14.76      | 6.56                 | 30                 | 45.73        | 46.0         |
| 2430                     | 25.08       | -6.01        | 0.64          | -1.51         | 14.926     | 10.149     | 0.64        | -15.32      | 6.65                 | 30                 | 46.01        | 46.36        |
| 2440                     | 26.1        | -5.83        | 0.9           | -1.25         | 15.237     | 10.86      | 0.9         | -14.97      | 6.73                 | 30                 | 46.12        | 46.48        |
| 2450                     | 28.43       | -5.46        | 1.42          | -0.73         | 16.36      | 12.071     | 1.42        | -14.3       | 6.88                 | 30                 | 46.12        | 46.54        |
| 2460                     | 28.76       | -5.41        | 1.55          | -0.6          | 16.397     | 12.359     | 1.55        | -14.23      | 6.96                 | 30                 | 46.14        | 46.52        |
| 2470                     | 27.54       | -5.6         | 1.49          | -0.66         | 15.652     | 11.889     | 1.49        | -14.23      | 7.09                 | 30                 | 46.4         | 46.8         |
| 2480                     | 29.45       | -5.31        | 1.8           | -0.35         | 16.601     | 12.85      | 1.8         | -13.68      | 7.11                 | 30                 | 46.26        | 46.64        |
| 2490                     | 32.01       | -4.95        | 2.16          | 0.01          | 17.887     | 14.121     | 2.16        | -13.54      | 7.1                  | 30                 | 46.51        | 46.91        |
| 2500                     | 29.12       | -5.36        | 1.8           | -0.35         | 16.327     | 12.793     | 1.8         | -14.12      | 7.16                 | 30                 | 46.47        | 46.86        |

# Passive test data

ANT1 Direction of figure (2.4/BT)



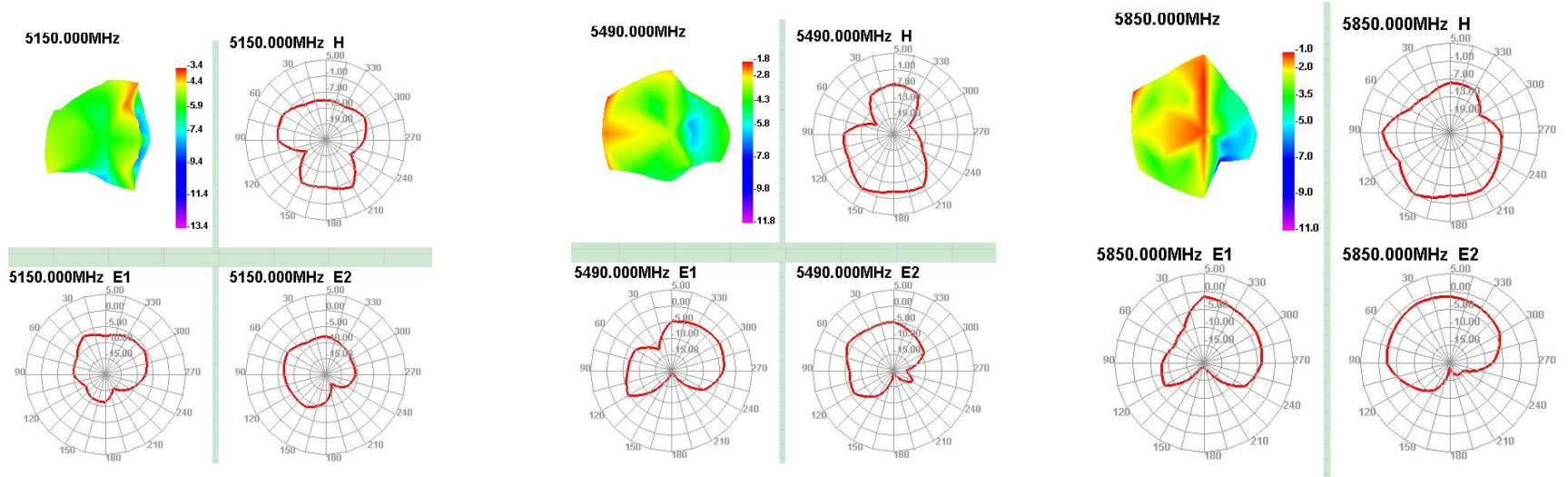
## Passive test data

## ANT1 GAIN&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) | Directivity<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
| 5150                    | 15.04       | -8.23        | -3.38         | -5.53         | 8.949      | 6.091      | -3.38       | -20.62      | 4.84                 | 120                | 49.82        | 49.4         |
| 5170                    | 13.29       | -8.76        | -4.03         | -6.18         | 7.793      | 5.498      | -4.03       | -22.49      | 4.73                 | 120                | 50.13        | 49.77        |
| 5190                    | 15.52       | -8.09        | -3.65         | -5.8          | 9.014      | 6.504      | -3.65       | -22.05      | 4.44                 | 60                 | 50.42        | 49.95        |
| 5210                    | 15.16       | -8.19        | -3.7          | -5.85         | 8.55       | 6.614      | -3.7        | -21.88      | 4.49                 | 60                 | 50.88        | 50.49        |
| 5230                    | 15.61       | -8.06        | -3.24         | -5.39         | 8.538      | 7.077      | -3.24       | -20         | 4.82                 | 60                 | 50.42        | 50.08        |
| 5250                    | 17.45       | -7.58        | -2.78         | -4.93         | 9.466      | 7.98       | -2.78       | -21.1       | 4.8                  | 60                 | 51.02        | 50.72        |
| 5270                    | 17.86       | -7.48        | -2.28         | -4.43         | 9.684      | 8.178      | -2.28       | -20.69      | 5.2                  | 60                 | 50.85        | 50.6         |
| 5290                    | 19.38       | -7.13        | -2.12         | -4.27         | 10.42      | 8.96       | -2.12       | -21.16      | 5                    | 60                 | 51.34        | 51.12        |
| 5310                    | 16.33       | -7.87        | -2.71         | -4.86         | 8.73       | 7.603      | -2.71       | -21.11      | 5.16                 | 60                 | 50.44        | 50.36        |
| 5330                    | 17.89       | -7.47        | -1.95         | -4.1          | 9.59       | 8.301      | -1.95       | -20.34      | 5.52                 | 90                 | 51.08        | 51.01        |
| 5350                    | 16.96       | -7.71        | -2.06         | -4.21         | 9.143      | 7.814      | -2.06       | -21.12      | 5.65                 | 90                 | 51.02        | 51.01        |
| 5370                    | 18.14       | -7.41        | -2.04         | -4.19         | 9.794      | 8.35       | -2.04       | -20.56      | 5.37                 | 90                 | 50.91        | 50.95        |
| 5390                    | 14.58       | -8.36        | -3.32         | -5.47         | 7.912      | 6.663      | -3.32       | -24.06      | 5.04                 | 90                 | 50.46        | 50.43        |
| 5410                    | 19.63       | -7.07        | -1.88         | -4.03         | 10.75      | 8.876      | -1.88       | -22.71      | 5.19                 | 90                 | 51.18        | 51.09        |
| 5430                    | 14.95       | -8.25        | -2.94         | -5.09         | 8.259      | 6.688      | -2.94       | -22.81      | 5.32                 | 90                 | 50.69        | 50.7         |
| 5450                    | 18.8        | -7.26        | -2.17         | -4.32         | 10.481     | 8.314      | -2.17       | -24.31      | 5.09                 | 90                 | 50.71        | 50.85        |
| 5470                    | 16.19       | -7.91        | -2.57         | -4.72         | 9.086      | 7.099      | -2.57       | -26.5       | 5.34                 | 90                 | 50.93        | 50.83        |
| 5490                    | 18.86       | -7.24        | -1.78         | -3.93         | 10.699     | 8.163      | -1.78       | -25.89      | 5.46                 | 90                 | 50.92        | 50.79        |
| 5510                    | 18.26       | -7.39        | -2.12         | -4.27         | 10.535     | 7.722      | -2.12       | -23.53      | 5.27                 | 90                 | 51.18        | 51.16        |
| 5530                    | 20.22       | -6.94        | -1.83         | -3.98         | 11.938     | 8.286      | -1.83       | -24.28      | 5.11                 | 90                 | 51.44        | 51.3         |
| 5550                    | 20.64       | -6.85        | -1.62         | -3.77         | 12.171     | 8.465      | -1.62       | -24.93      | 5.23                 | 90                 | 51.89        | 51.76        |
| 5570                    | 21.24       | -6.73        | -1.5          | -3.65         | 12.546     | 8.693      | -1.5        | -22.96      | 5.23                 | 90                 | 51.42        | 51.33        |
| 5590                    | 23.43       | -6.3         | -0.96         | -3.11         | 14.087     | 9.339      | -0.96       | -22.77      | 5.34                 | 90                 | 51.71        | 51.76        |
| 5610                    | 22.68       | -6.44        | -0.86         | -3.01         | 13.868     | 8.816      | -0.86       | -23.02      | 5.58                 | 90                 | 51.17        | 51.22        |
| 5630                    | 25.26       | -5.98        | -0.31         | -2.46         | 15.538     | 9.717      | -0.31       | -21.81      | 5.67                 | 90                 | 51.78        | 51.77        |
| 5650                    | 21.83       | -6.61        | -1.09         | -3.24         | 13.482     | 8.348      | -1.09       | -22.58      | 5.52                 | 90                 | 51.47        | 51.55        |
| 5670                    | 26.58       | -5.75        | -0.24         | -2.39         | 16.613     | 9.965      | -0.24       | -20.75      | 5.52                 | 90                 | 52.12        | 52.28        |
| 5690                    | 23.3        | -6.33        | -0.7          | -2.85         | 14.787     | 8.511      | -0.7        | -21.15      | 5.63                 | 90                 | 52.12        | 52.25        |
| 5710                    | 27.02       | -5.68        | -0.1          | -2.25         | 17.169     | 9.85       | -0.1        | -20.38      | 5.58                 | 90                 | 51.95        | 52.05        |
| 5730                    | 24.81       | -6.05        | -0.39         | -2.54         | 15.765     | 9.046      | -0.39       | -23.87      | 5.66                 | 90                 | 51.59        | 51.69        |
| 5750                    | 25.31       | -5.97        | -0.21         | -2.36         | 16.17      | 9.135      | -0.21       | -25.2       | 5.76                 | 90                 | 51.12        | 51.15        |
| 5770                    | 24.3        | -6.14        | -0.52         | -2.67         | 15.72      | 8.583      | -0.52       | -22.29      | 5.62                 | 90                 | 51.02        | 51.06        |
| 5790                    | 23.77       | -6.24        | -0.67         | -2.82         | 15.468     | 8.3        | -0.67       | -21.99      | 5.57                 | 90                 | 51.08        | 51.16        |
| 5810                    | 23.03       | -6.38        | -0.82         | -2.97         | 14.942     | 8.087      | -0.82       | -26.4       | 5.56                 | 90                 | 51.36        | 51.43        |
| 5830                    | 23.66       | -6.26        | -0.75         | -2.9          | 15.381     | 8.284      | -0.75       | -28.13      | 5.51                 | 90                 | 51.65        | 51.66        |
| 5850                    | 22.69       | -6.44        | -1.04         | -3.19         | 14.787     | 7.904      | -1.04       | -22.01      | 5.4                  | 90                 | 51.88        | 52.05        |

## Passive test data

ANT1 Direction of figure (5G)





Win-win cooperation

