



SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

Antenna Test Report

TC: Mei Difei

MN: AP32

RF: Guan Wei

MD: Huang Qingqing

MP: 15112592483

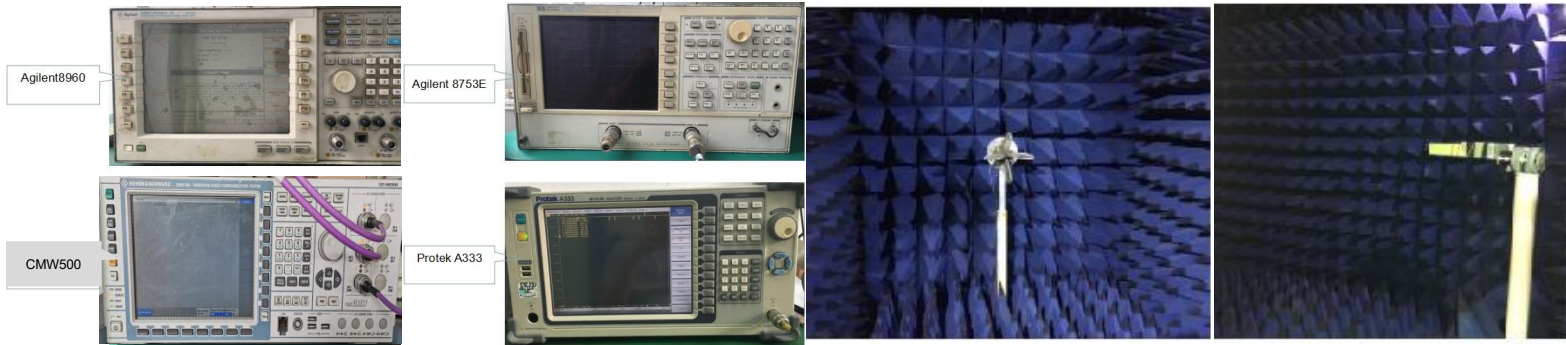
*Date: 2023. 06. 05.
REV :V1. 0*

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

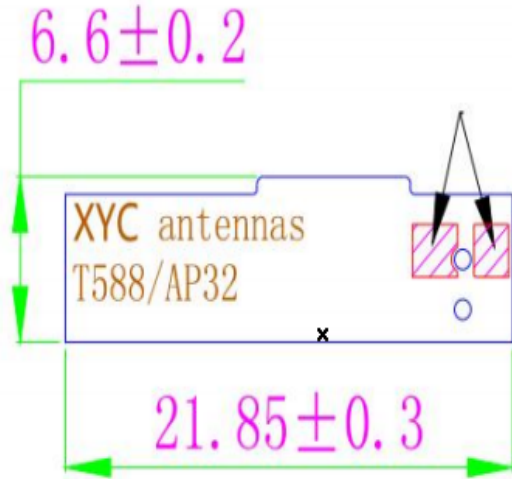
| | Test Item | Test Equipment |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 1. S-parameter | <ol style="list-style-type: none"> 1. Voltage standing wave ratio 2. Return Loss | Network analyzer: Agilent8753ES |
| 2. Active Test | <ol style="list-style-type: none"> 1. Transmitted power (TRP) 2. Receiving sensitivity (TIS) 3. screen is off or on | <ol style="list-style-type: none"> 1. Dark room: 5*3*3m (3D) Chamber 2. synthesizer: Agilent8960 CMW500 |
| 3. Passive Test | <ol style="list-style-type: none"> 1. Antenna gain 2. Antenna efficiency | <ol style="list-style-type: none"> 1. Dark room: 5*3*3m (3D) Chamber 2. Network analyzer: Agilent 8753ES |



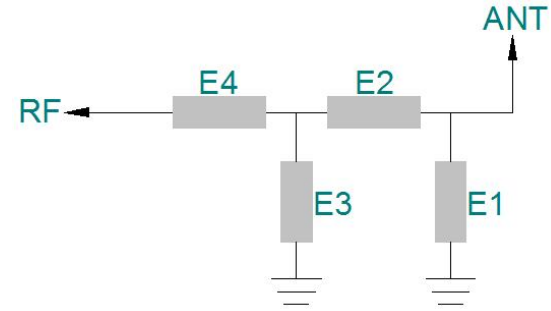
Antenna position



Matching circuit



Matching circuit schematic & bit number diagram



| | Capacitance (PF) | Inductance (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

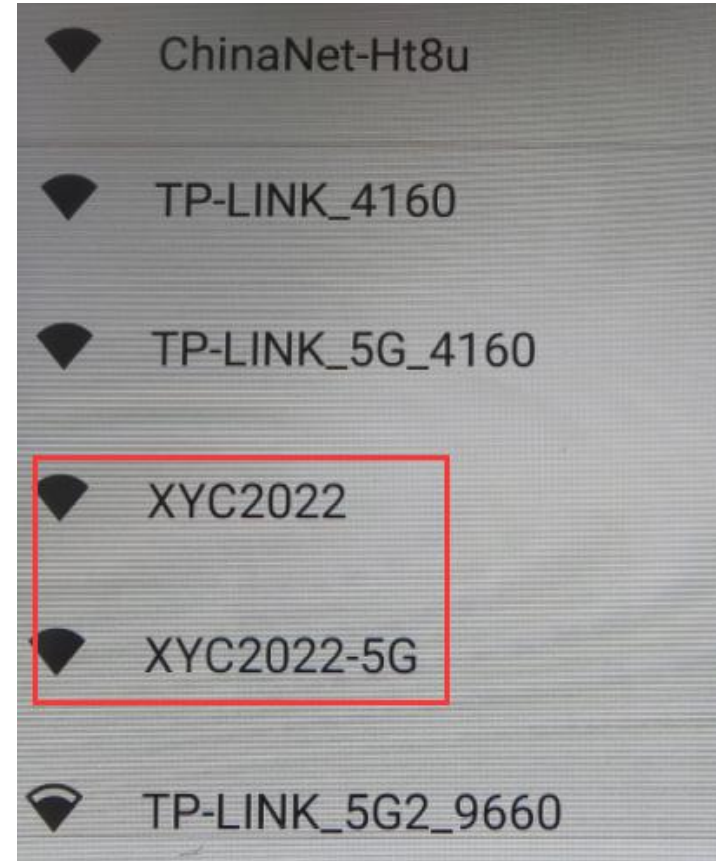
BT

Test environment: Open space (channel)

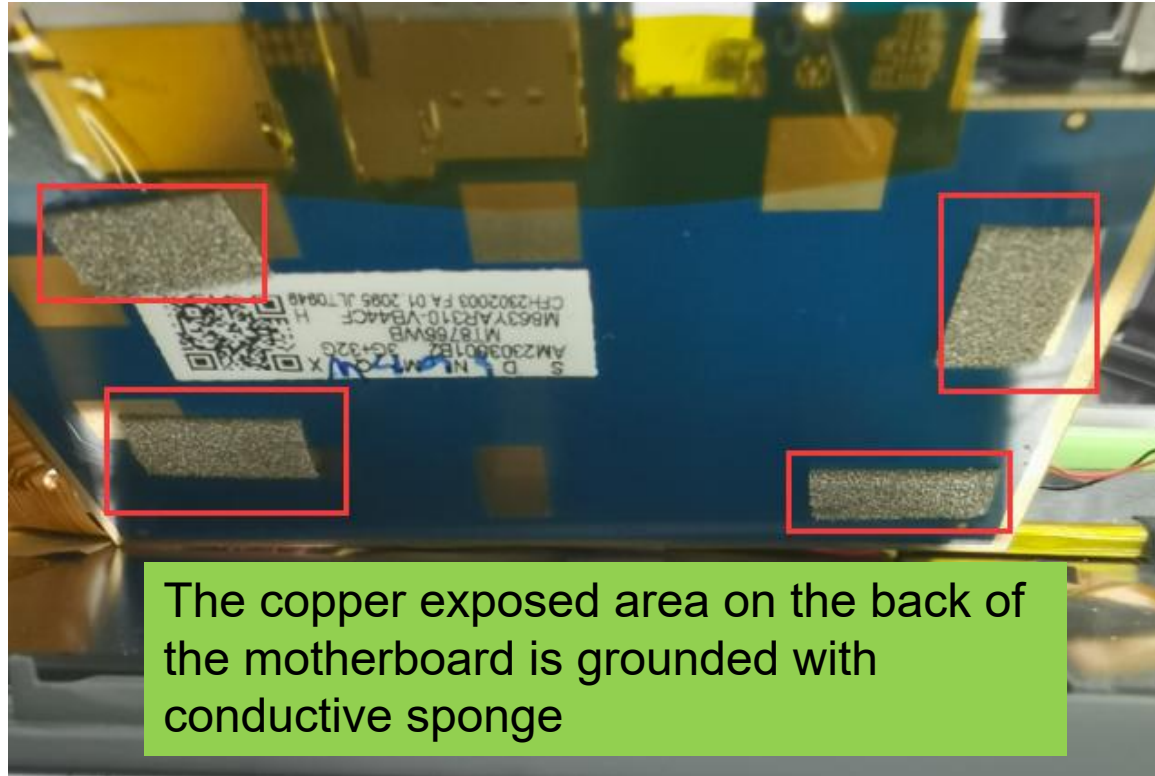
Test tool: Bluetooth speaker

Test distance: 10m

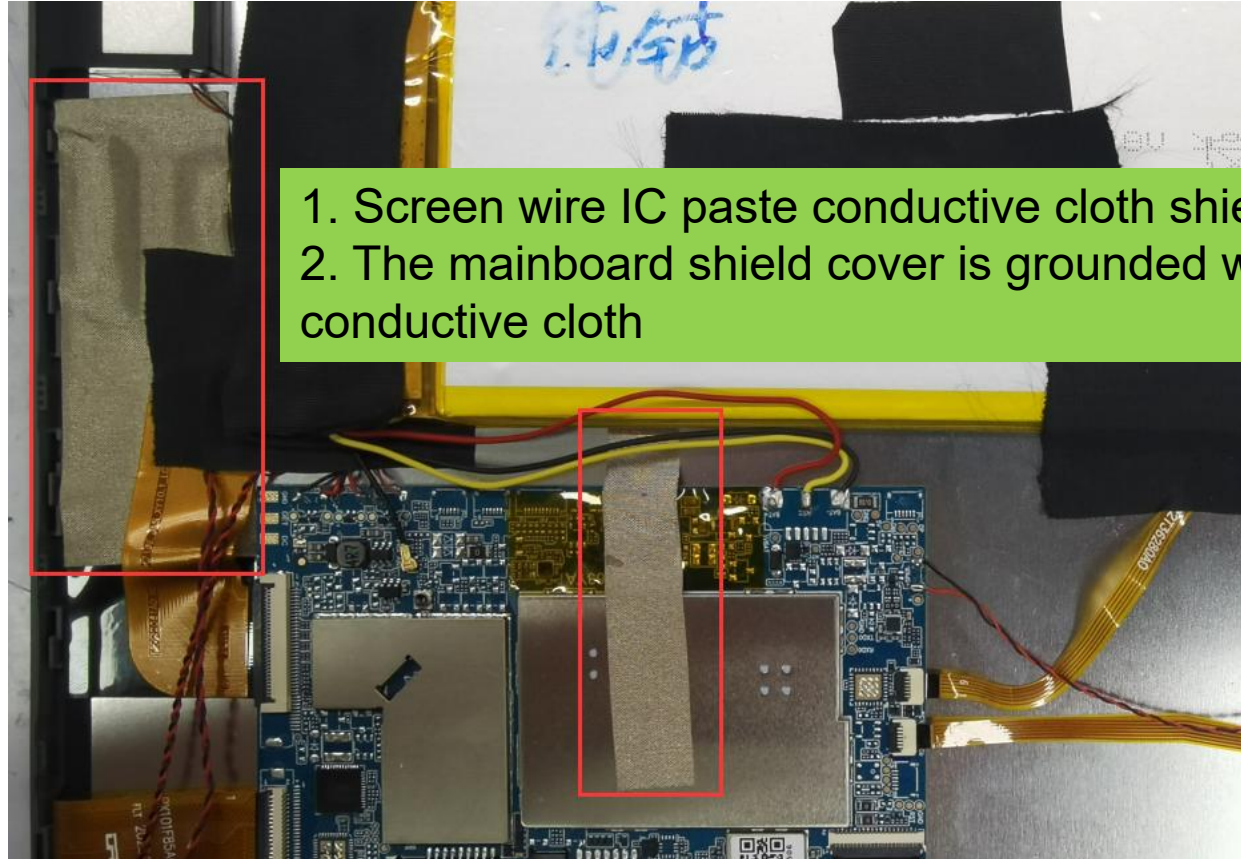
Results: Play music smoothly, no noise.



Environmental treatment

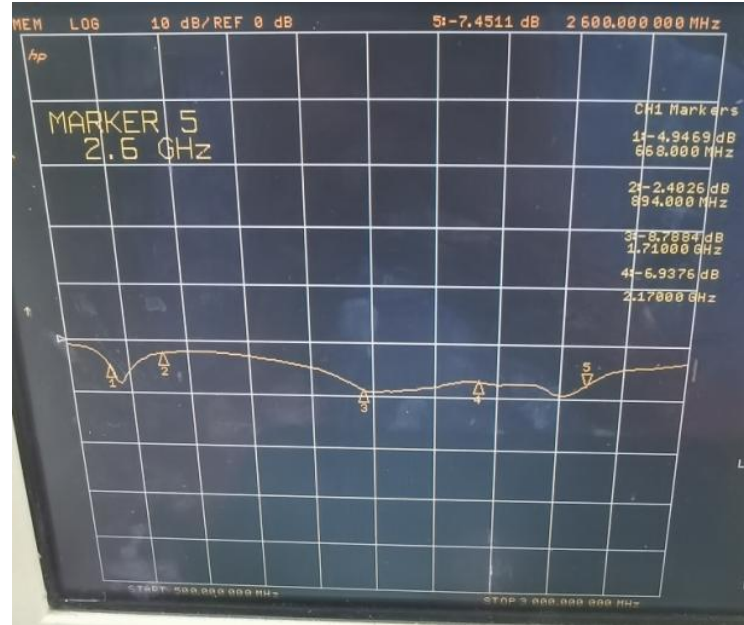
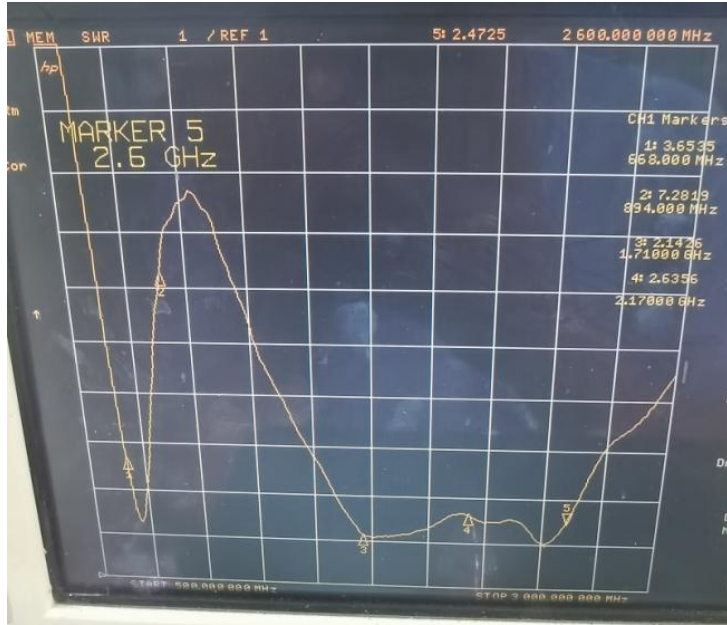


Additional instructions



Main ANT Passive test data

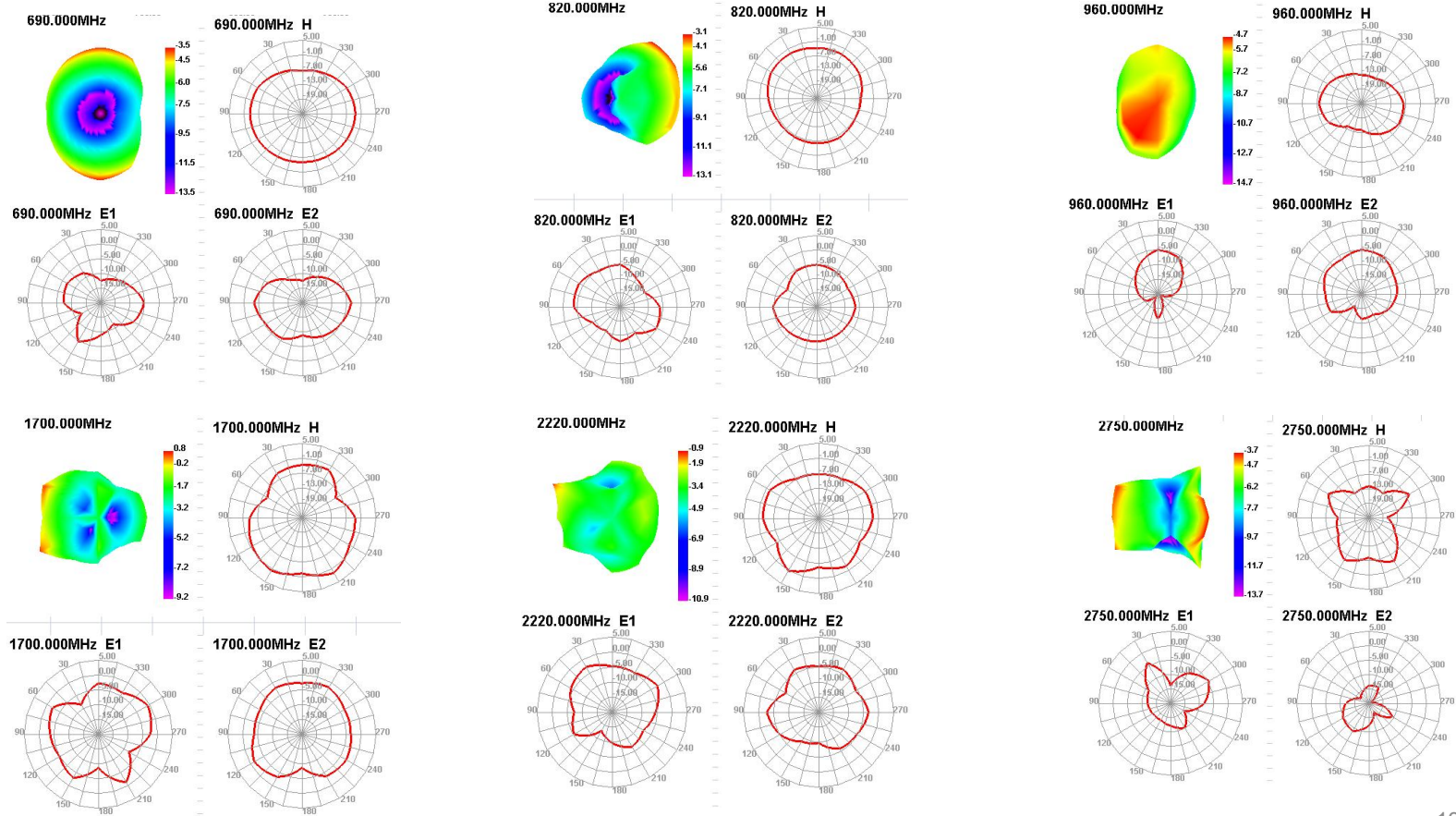
ANT S11-VSWR&Return Loss



| 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 |

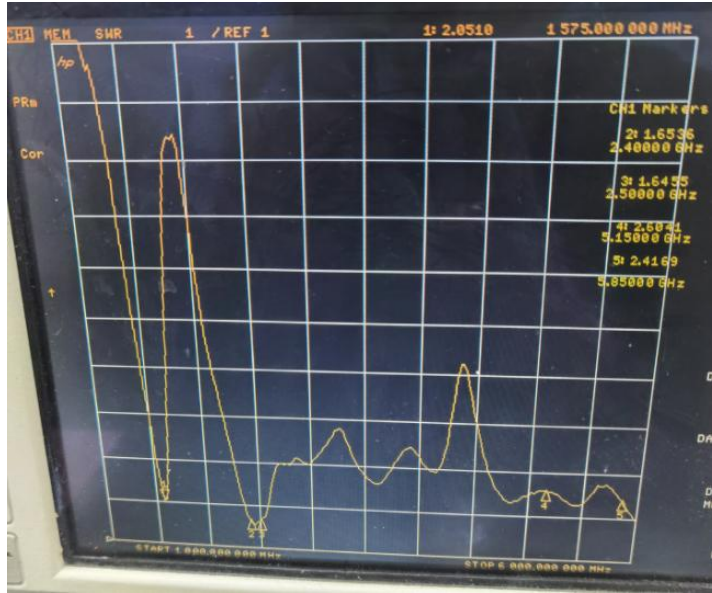
Passive test data

ANT Direction of figure 690-2690MHz



Passive test 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

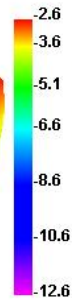
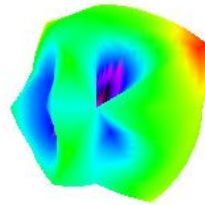
ANTI GAIN&Efficiency-GPS

| | | | | | | | | | | | | |
|------|-------|-------|-------|-------|--------|--------|-------|--------|------|----|-------|-------|
| 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 |

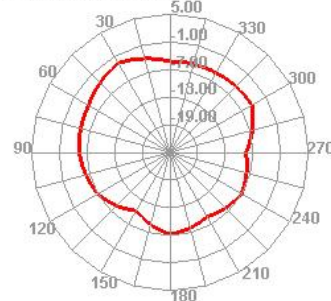
Passive test data

ANT1 Direction of figure (GPS)

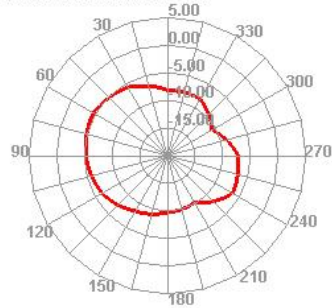
1575.000MHz



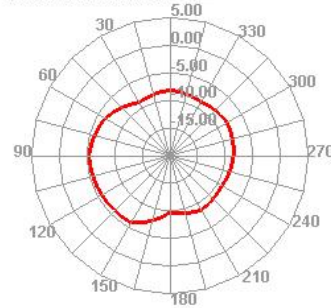
1575.000MHz H



1575.000MHz E1



1575.000MHz E2



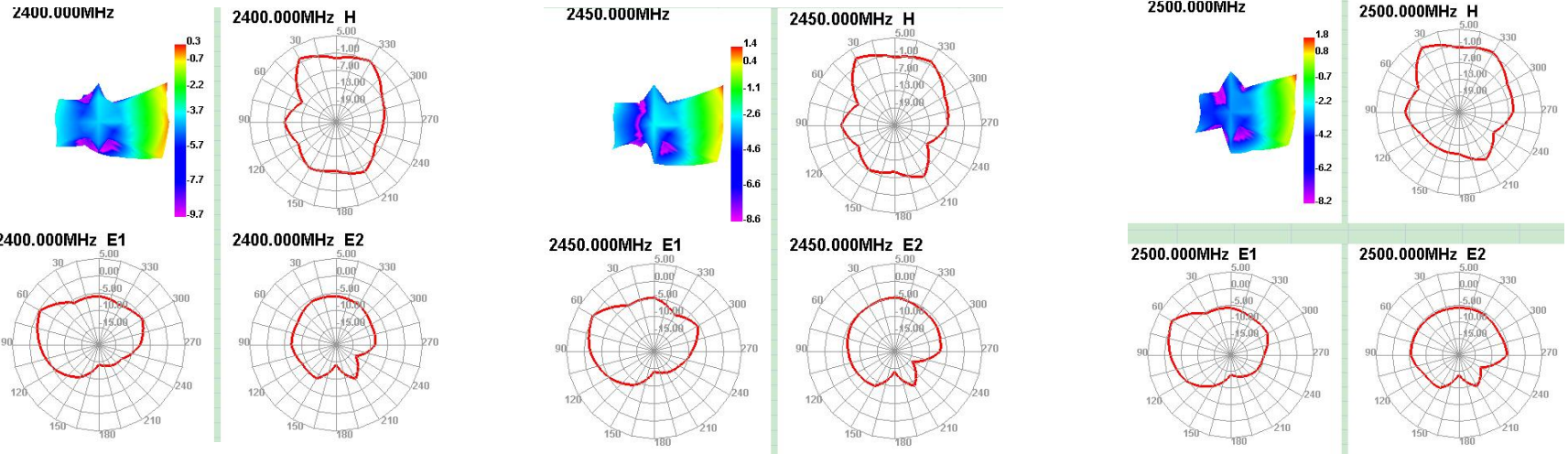
Passive test data

ANTI GAIN&Efficiency-WIFI2.4G/BT

| Passive Test For WIFI2.4 | | | | | | | | | | | | |
|--------------------------|----------|-----------|------------|------------|---------|---------|----------|----------|-------------------|-----------------|-----------|-----------|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | UHS (%) | DHS (%) | Max (dB) | Min (dB) | Directivity (dBi) | Beamwidth (3dB) | AttH (dB) | AttV (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 |
| 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)



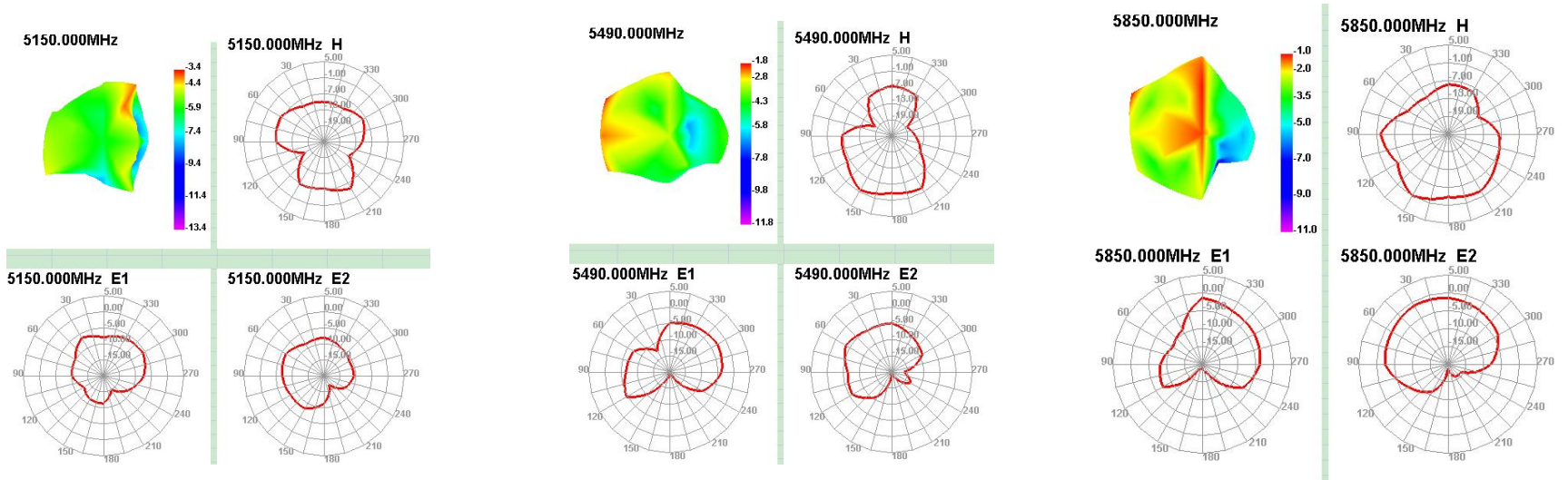
Passive test data

ANTI GAIN&Efficiency-WIFI 5G

| Passive Test For WIFI5G | | | | | | | | | | | | |
|-------------------------|----------|-----------|------------|------------|---------|---------|----------|----------|------------------|-----------------|-----------|-----------|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dEd) | UHS (%) | DHS (%) | Max (dB) | Min (dB) | irectivity (dBi) | Beamwidth (3dB) | AttH (dB) | AttV (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

