# Antenna Performance Description

Applicant: Xiaomi Communications Co., Ltd

Product description: Mobile Phone

Model Name: 23088PND5R

FCC ID: 2AFZZND5R

Test date: 2023/05/18

| | |
|---|---|
| Test Engineer | Hu Xiongmin |
| Signature |  |

# 1. Antenna information

| Antenna | Pattern | Antenna Type | Manufacturer | Manufacturer Address | Test party of Antenna gain |
|---|---|---|---|---|---|
| ANT0 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT1 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT2 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT3 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT4 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT5 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |

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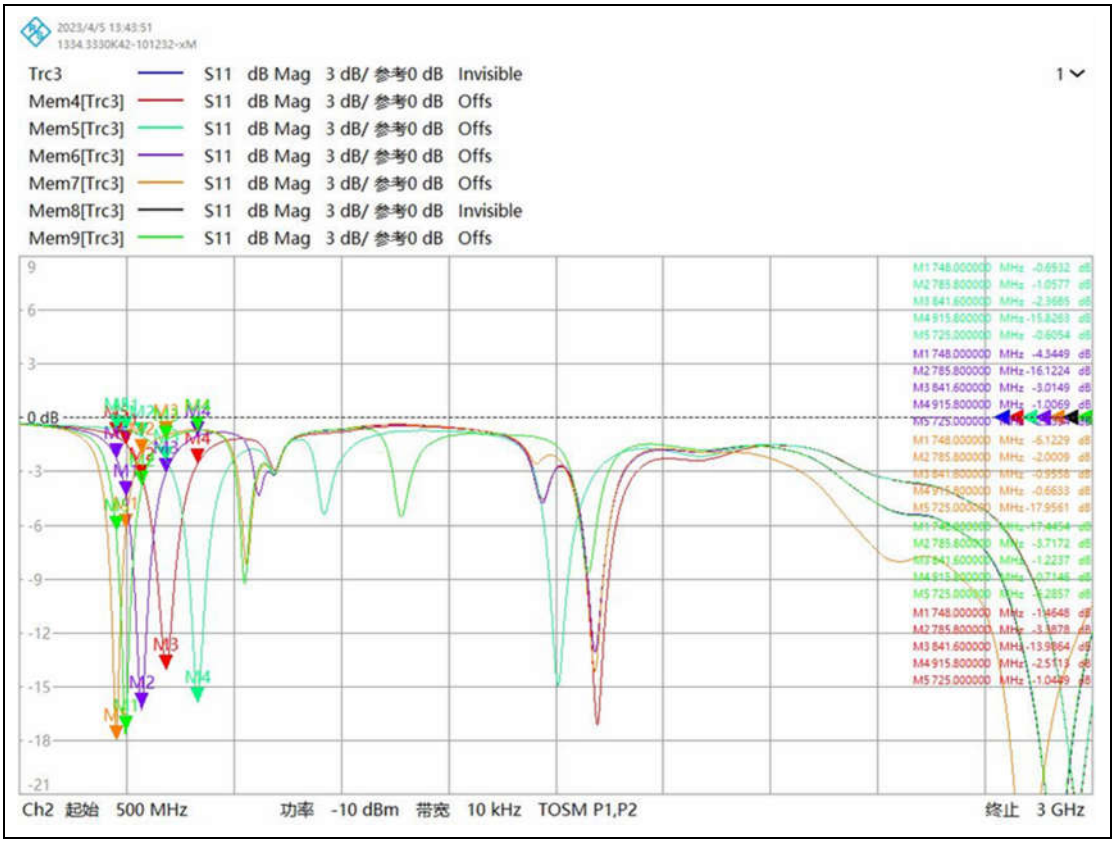
|---|---|---|---|---|---|
| ANT6 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT7 | FPC | Fixed Internal Antenna | AAC Kai Tai (Shenzhen) Technology Development Co., Ltd. | Block A Nanjing University Research Center Shenzhen Branch,No 6 YueXing 3rd Road. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT17 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| ANT18 | Metal Frame | Fixed Internal Antenna | XIAOMI | Floor 9th, Tower 1, Novel Park, No.4078 Dongbin Road, Nanshan District, Shenzhen. | Shenzhen Xiaomi Communications Co., Ltd. |
| NFC | FPC | Fixed Internal Antenna | Kunshan Innowave Communication Technology Co., Ltd. | Building 4, Zone A, Hong Xin Tai Industrial Park, No.28 Yinying Road, Gaoying Village, Dongguan City | |

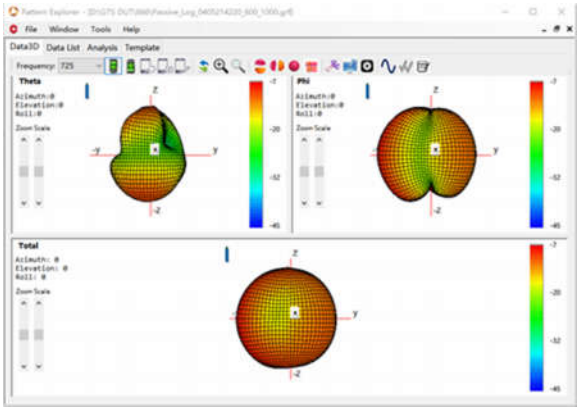
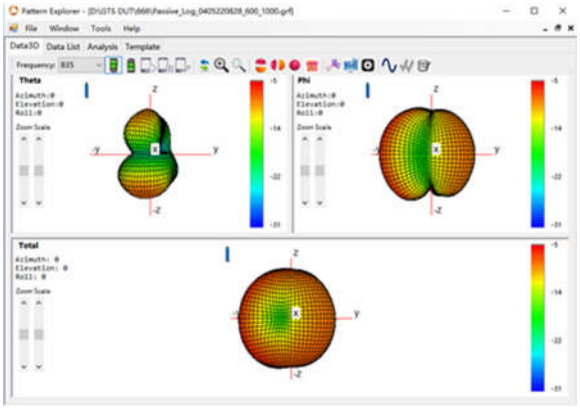
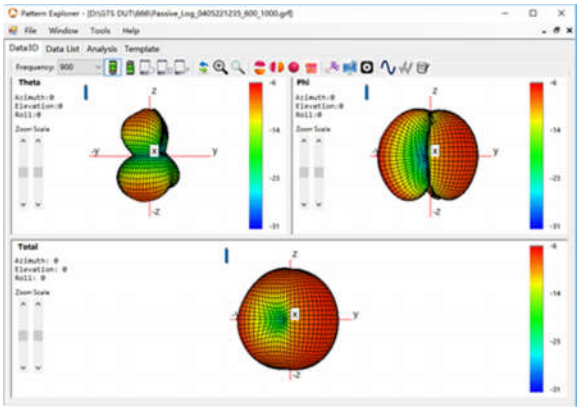
## 2. Test data

| Bands for Antenna 0 | LB ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B28/B12/B13/B17/N28 | -10.5 | -6.39 |
| B20 | -9.4 | -5.48 |
| B5/B18/B19/B26/WB5/WB6/WB19/G5 | -9.98 | -5.48 |
| B8/WB8/G8 | -8.56 | -5.38 |

S 参数

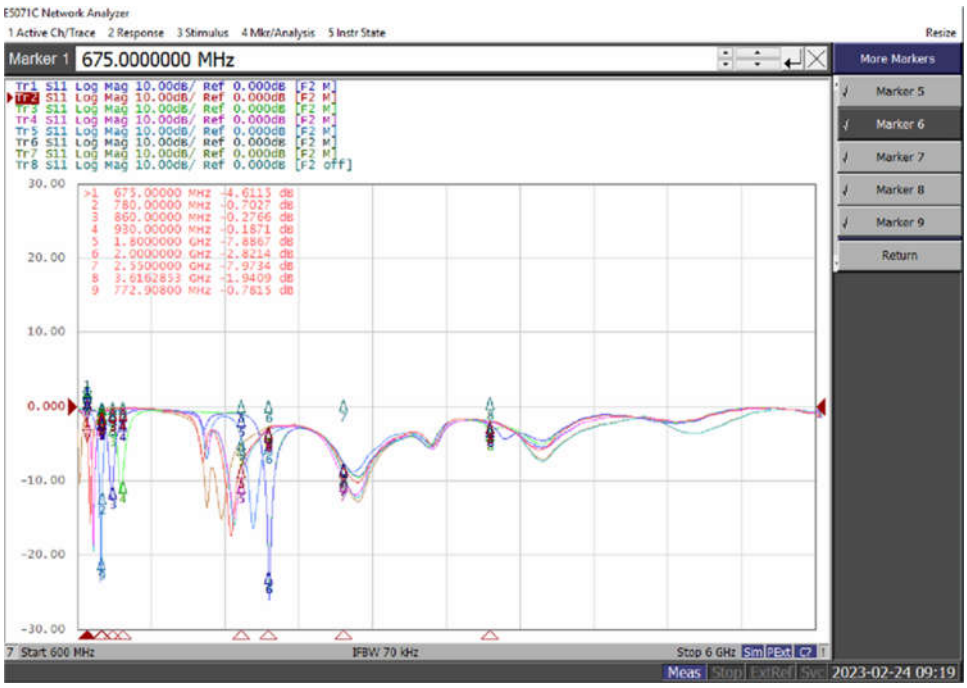


## 方向图

| | |
|---|---|
| Frequency | 723MHz |
|  | |
| Frequency | 835MHz |
|  | |
| Frequency | 900MHz |
|  | |

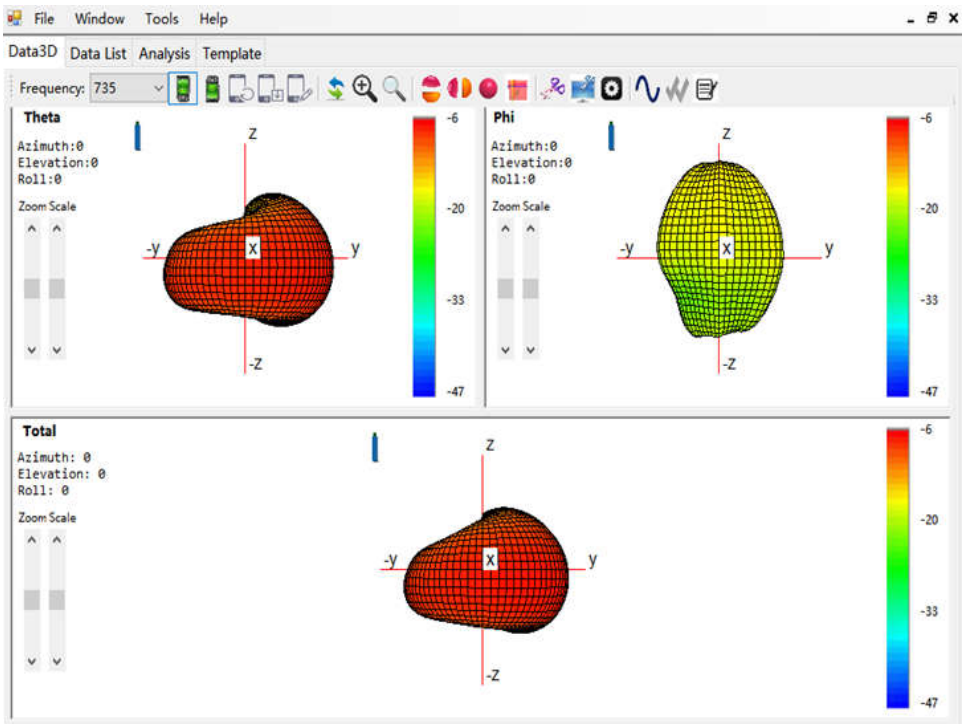
| Bands for Antenna 1 | LMHB+NR ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B5/B19/B26/WB5/WB6/WB19/G5 | -8.62 | -8 |
| B8/WB8/G8 | -8 | -8.4 |
| B20 | -9 | -8.6 |
| B28/N28/B12/B13/B17/B18 | -8.4 | -7.8 |
| B3/N3/G3/WB4 | -8.8 | -5.3 |
| WB1 | -8.6 | -5 |
| B41/N41 | -7.8 | -4.5 |
| G2/WB2 | -5.8 | -6 |
| B42 | -5 | -7.5 |
| NR77: (3450~3550MHz) (3700~3980MHz) | -6.2 | -7 |
| NR78: (3450~3550MHz) (3700~3800MHz) | -6.2 | -7 |

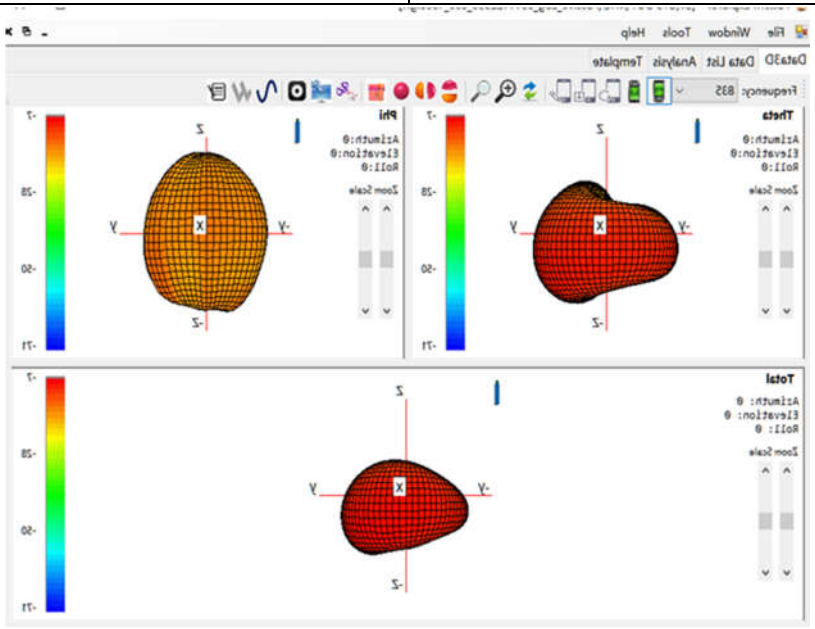
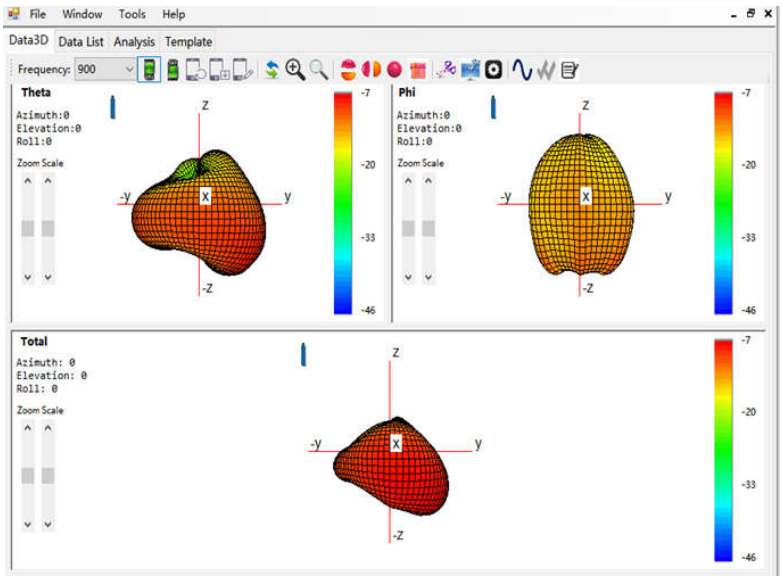
## S 参数

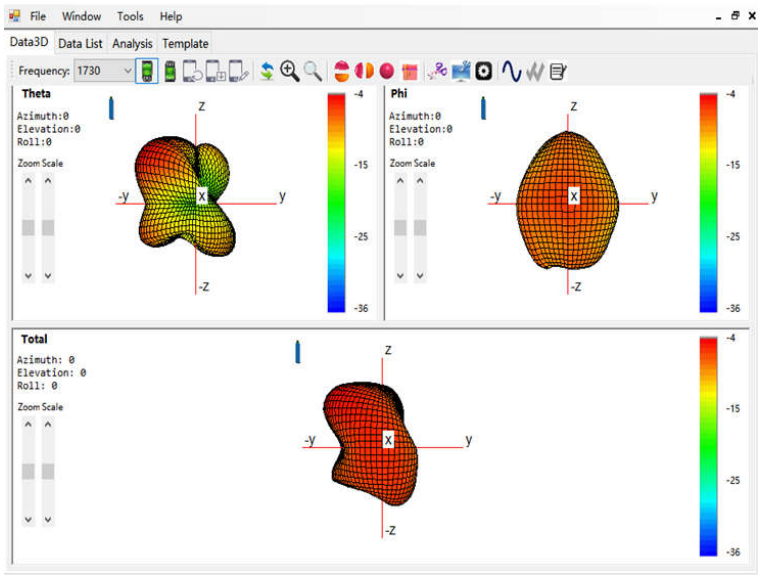



## 方向图

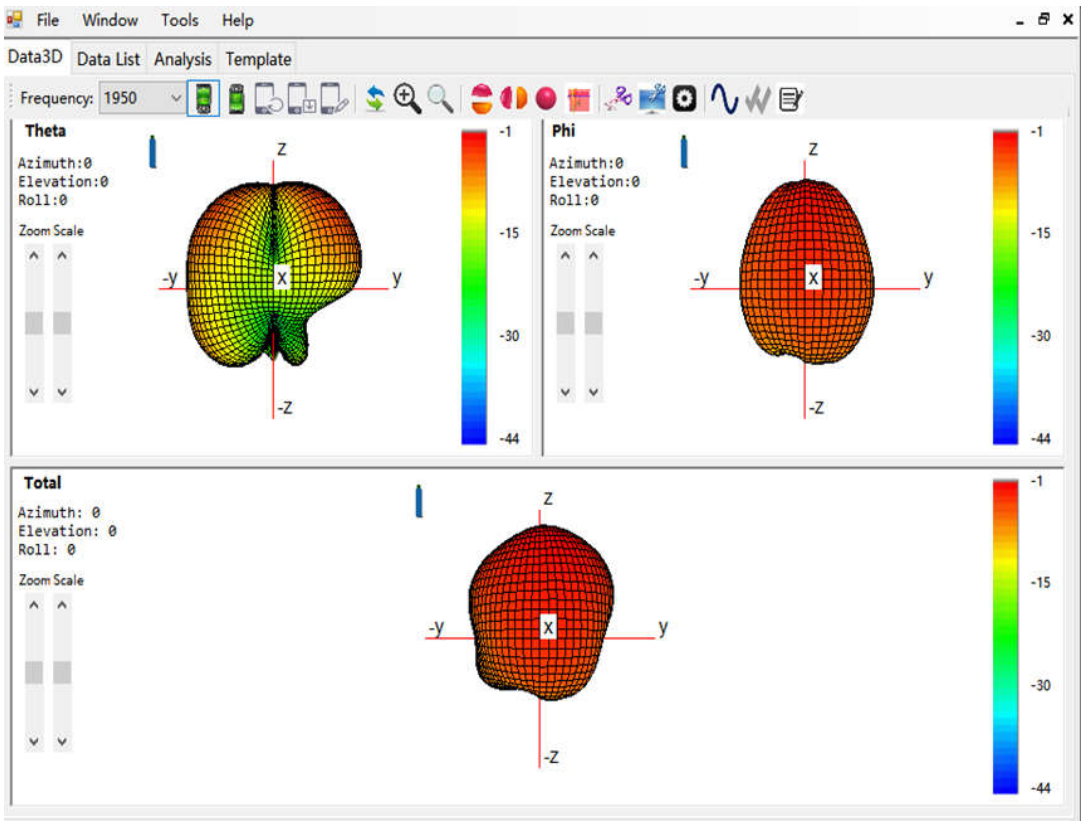
| Frequency | 723MHz |
|---|---|



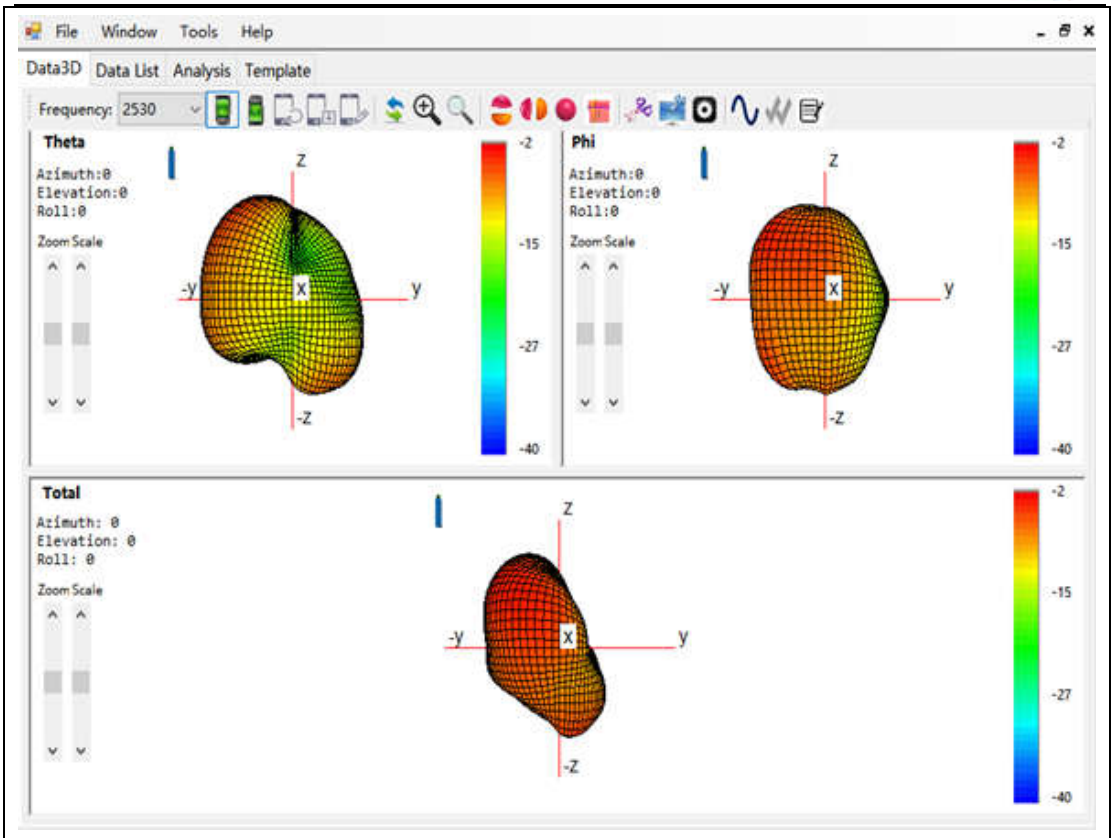
| | |
|---|---|
| Frequency | 835MHz |
|  | |
| Frequency | 900MHz |
|  | |
| Frequency | 1735MHz |



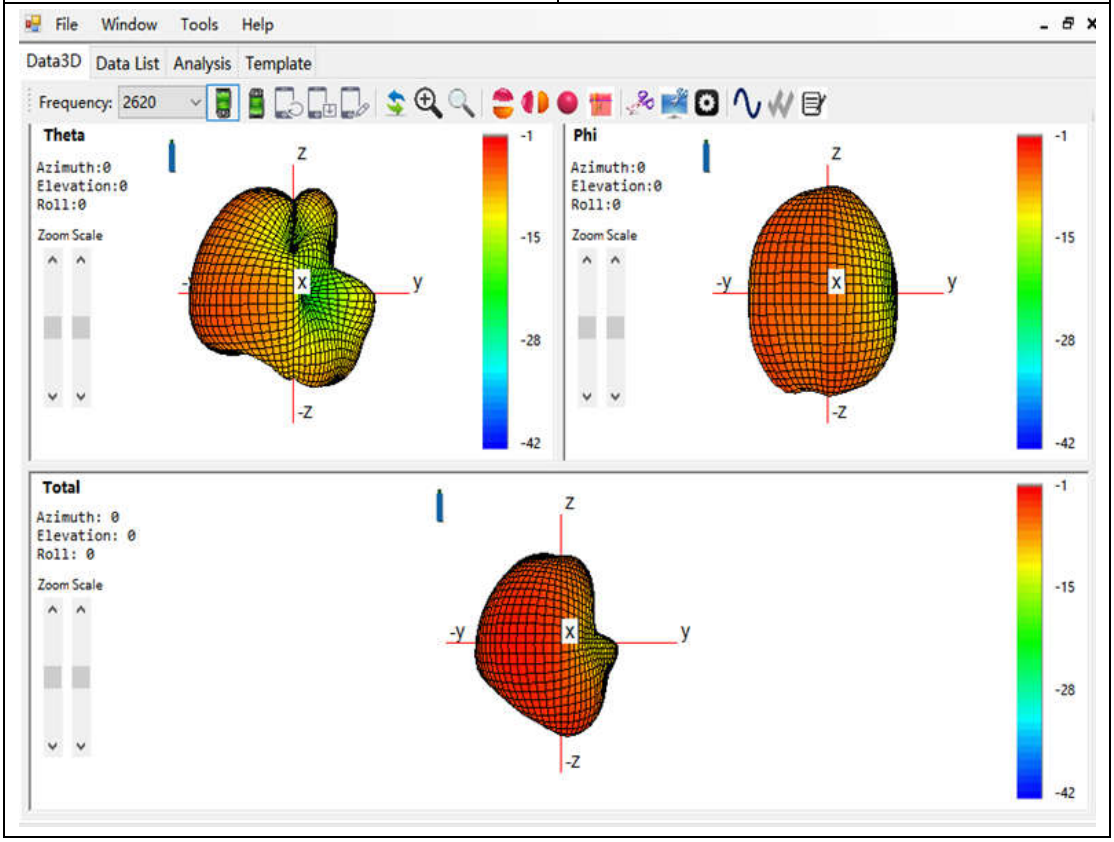

| | |
|---|---|
| Frequency | 1950MHz |



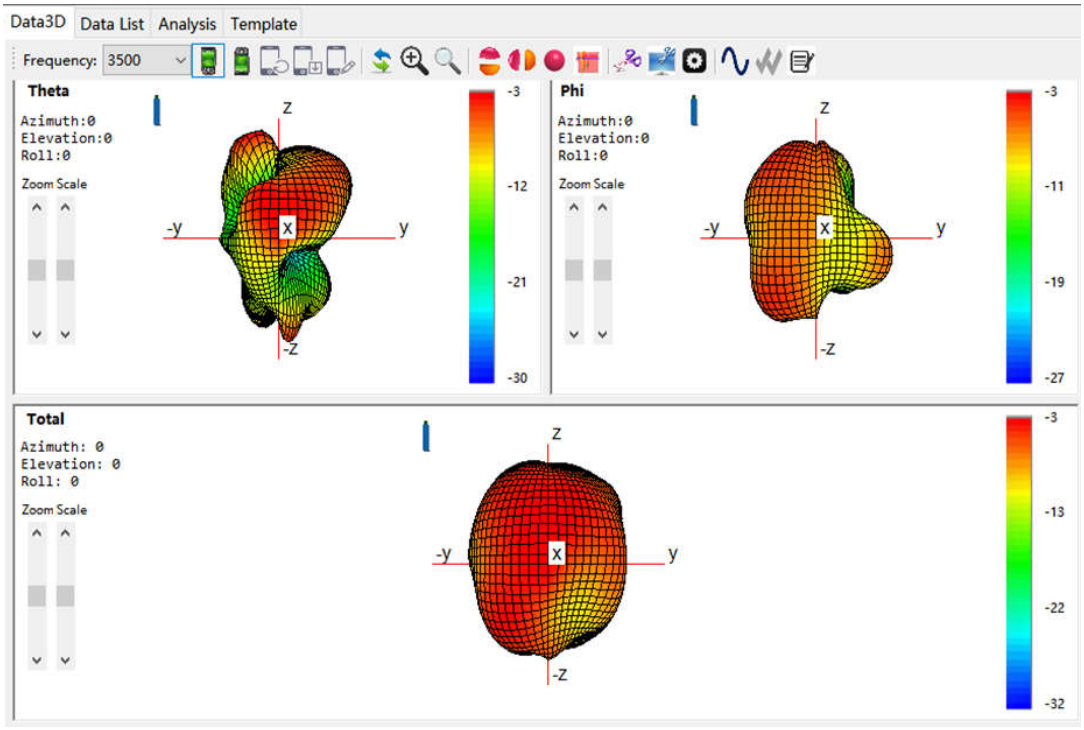

| | |
|---|---|
| Frequency | 2535MHz |



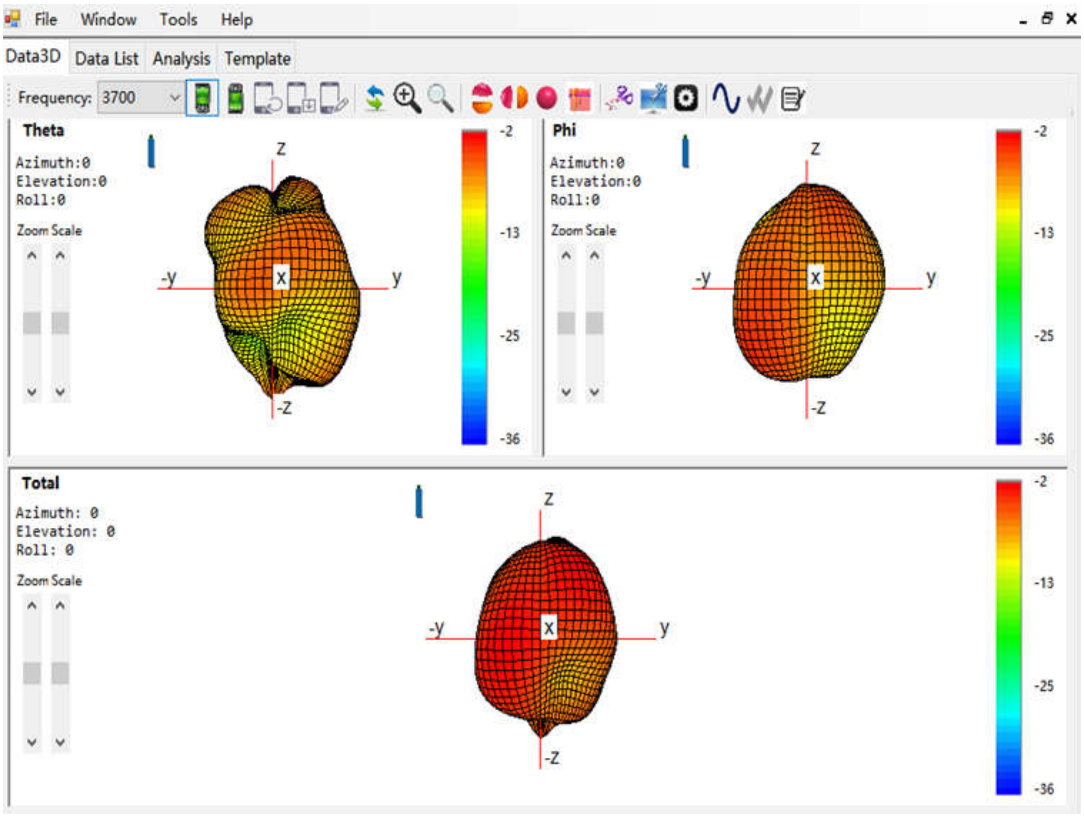

| | |
|---|---|
| Frequency | 2620MHz |

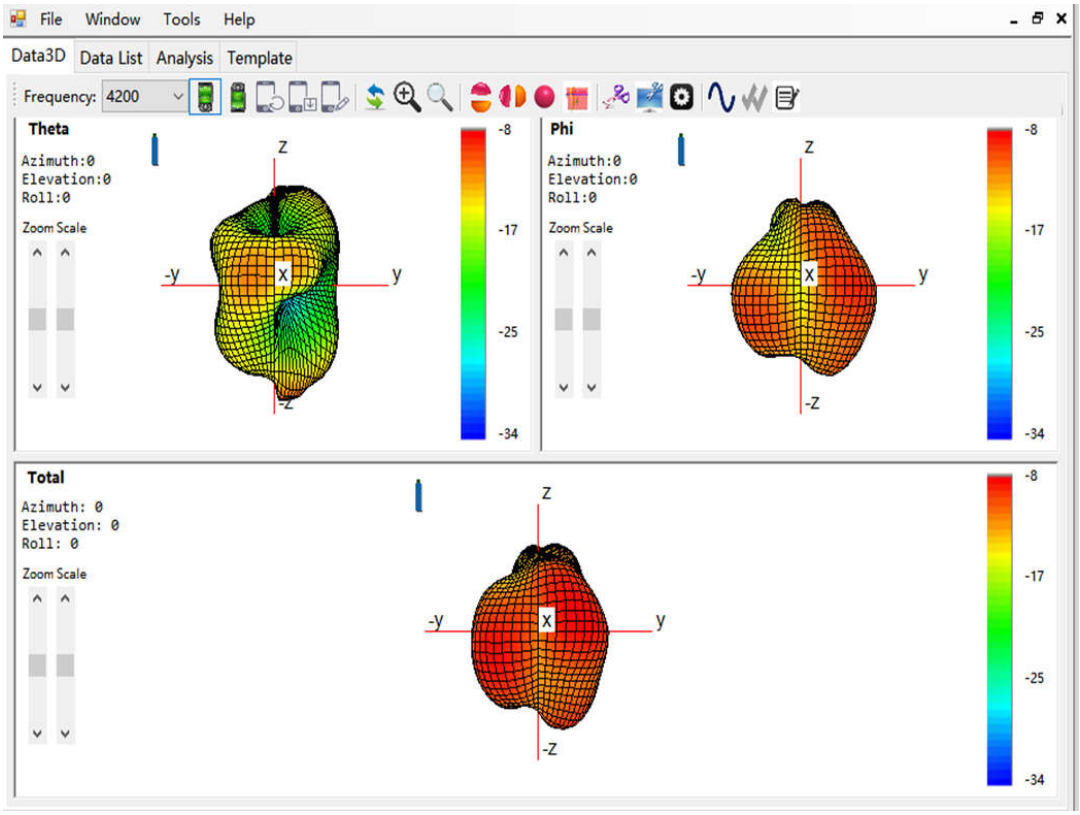


| Frequency | 3450MHz |
|---|---|



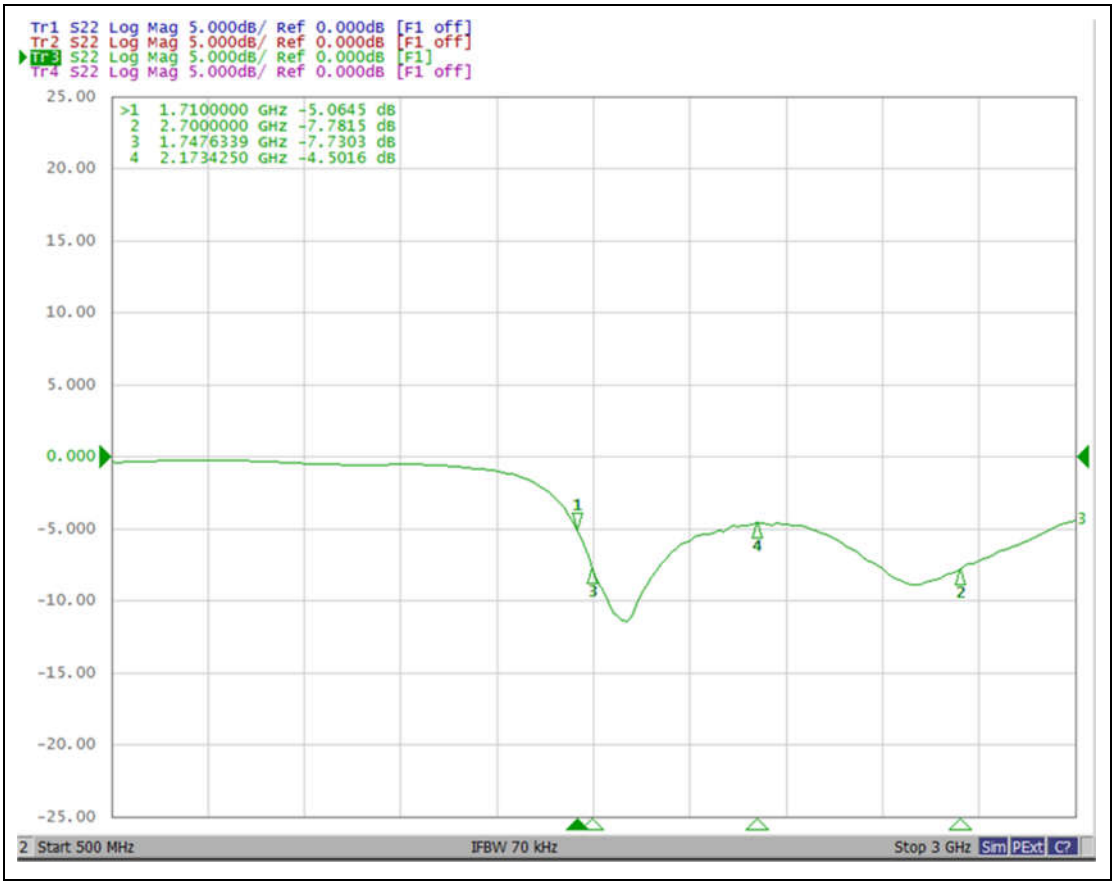

| Frequency | 3700MHz |
|---|---|



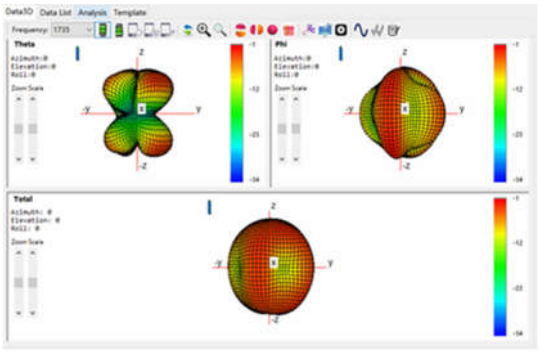
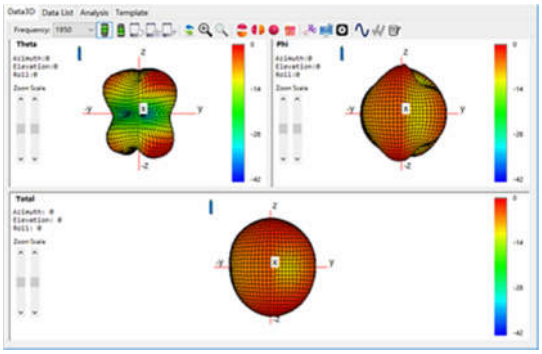
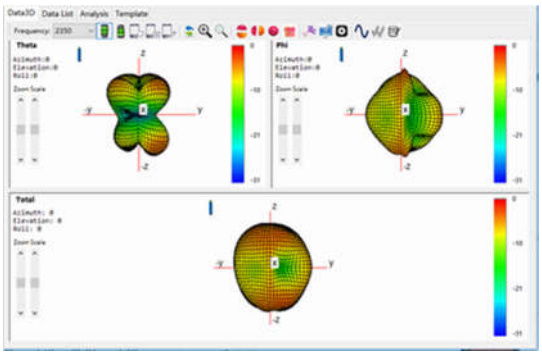
| Frequency | 4200MHz |
| --- | --- |
|  | |

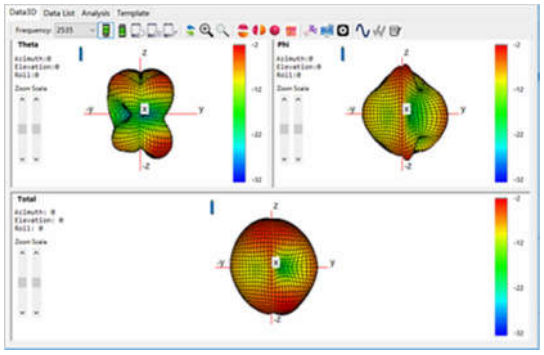
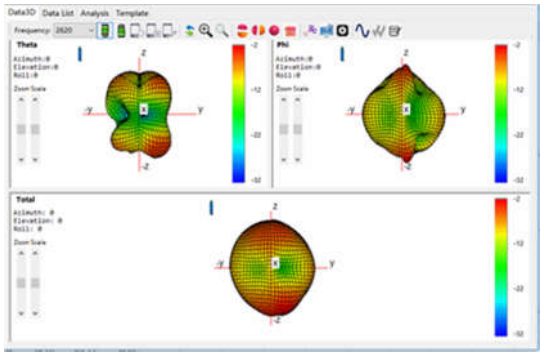
| Bands for Antenna 2 | MHB ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B1/WB1 | -4.0 | -3.4 |
| B2/G2/WB2/B39 | -3.5 | -3.4 |
| B3/N3/B4/G3/WB4 | -4.2 | -3.5 |
| B7/B38/B41/N41 | -5.0 | -4.7 |
| B40 | -5.1 | -5.0 |

S 参数



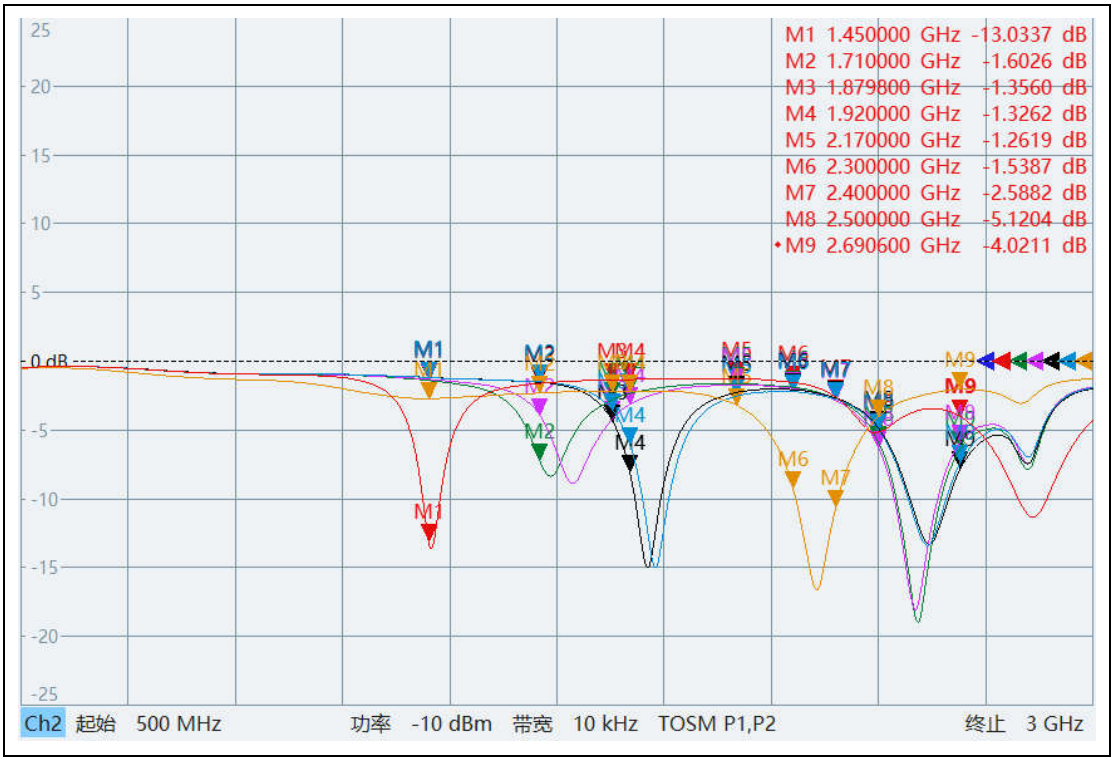
## 方向图

| Frequency | 1735MHz |
| --- | --- |
|  | |
| Frequency | 1950MHz |
|  | |
| Frequency | 2350MHz |
|  | |
| Frequency | 2535MHz |

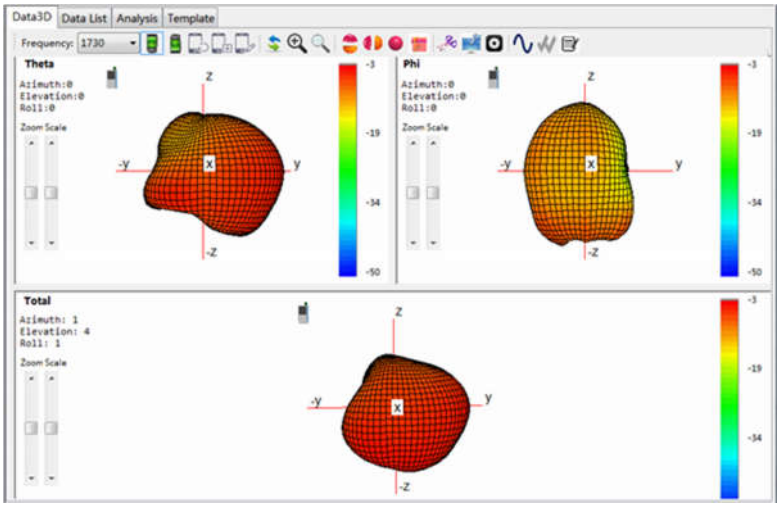
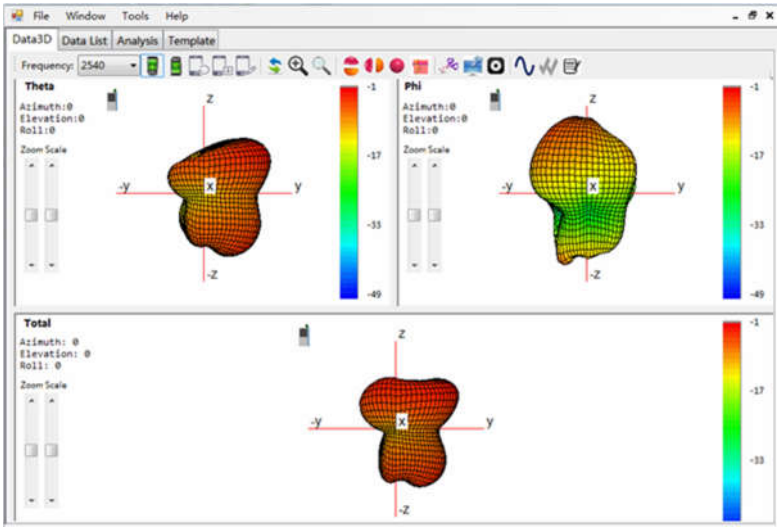
| | |
|---|---|
|  | |
| Frequency | 2620MHz |
|  | |

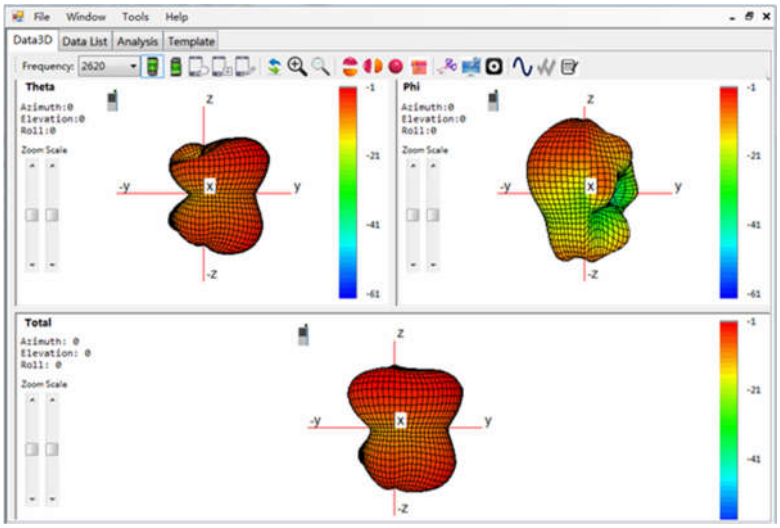
| Band for Antenna 3 | MHB ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B3/N3 | -7.1 | -6.3 |
| B41/N41 | -7 | -6.2 |

S 参数



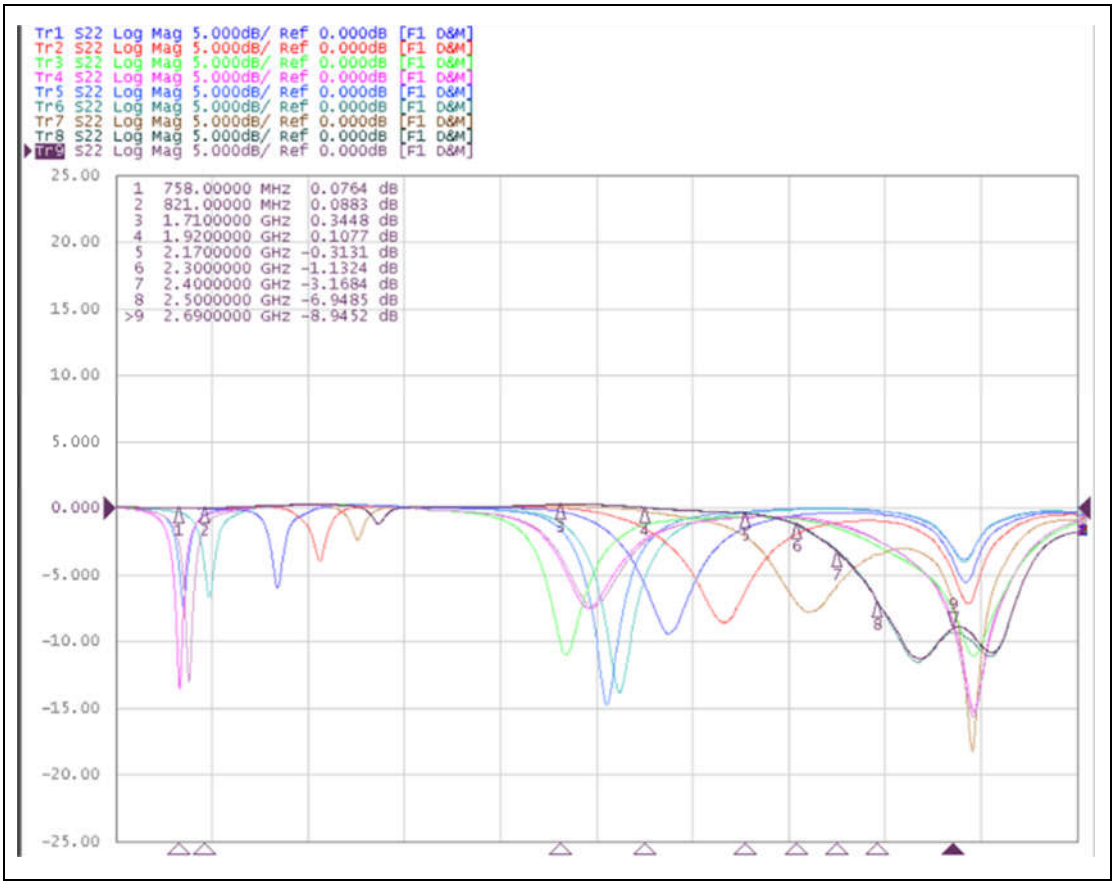
## 方向图

| Frequency | 1735MHz |
| --- | --- |
|  | |
| Frequency | 2535MHz |
|  | |
| Frequency | 2620MHz |

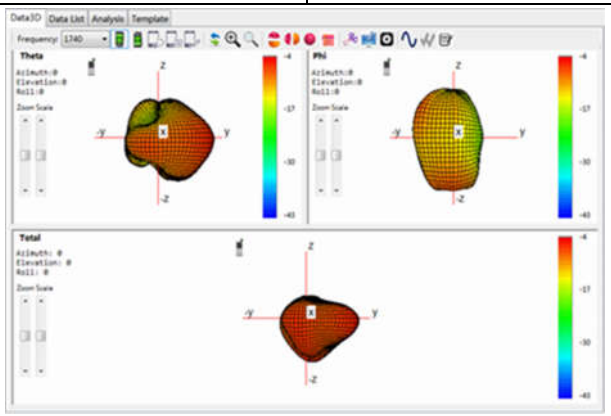
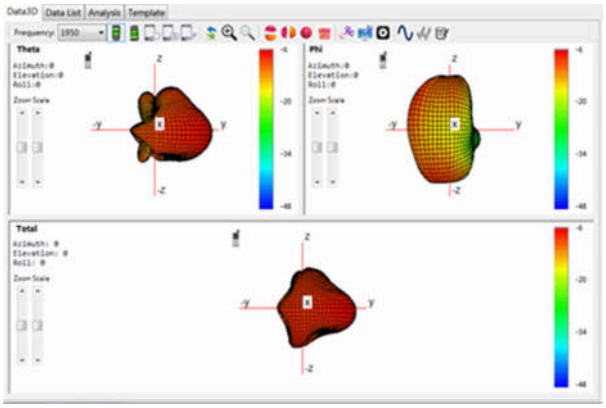
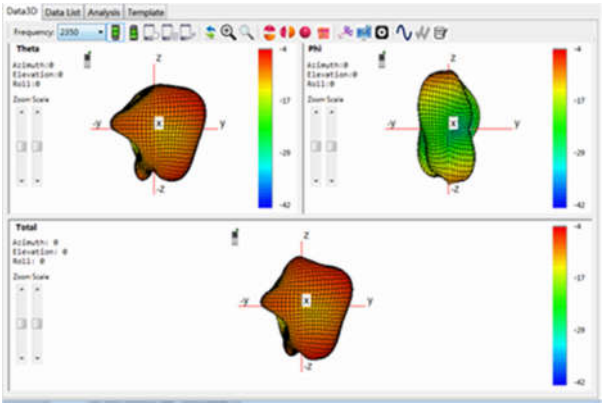

File
Window
Tools
Help
Data3D
Data List
Analysis
Template
Frequency: 2620
Theta
Azimuth:0
Elevation:0
Roll:0
Zoom Scale
Phi
Azimuth:0
Elevation:0
Roll:0
Zoom Scale
Total
Azimuth: 0
Elevation: 0
Roll: 0
Zoom Scale
-1
-21
-41
-61

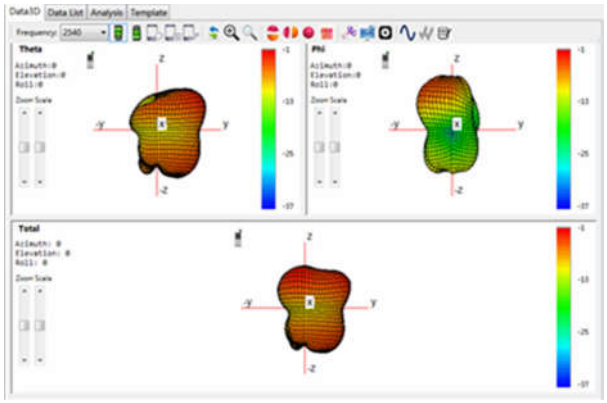
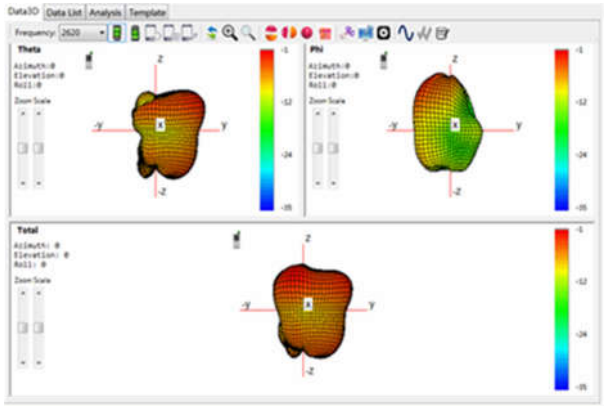
| Band for Antenna 4 | MHB ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B1 | -8.9 | -6 |
| B2/B39 | -6 | -6.1 |
| B3/N3/B4 | -9 | -5 |
| B7/B38/B41/N41 | -6.1 | -1.5 |
| B40 | -8.5 | -4.2 |

S 参数



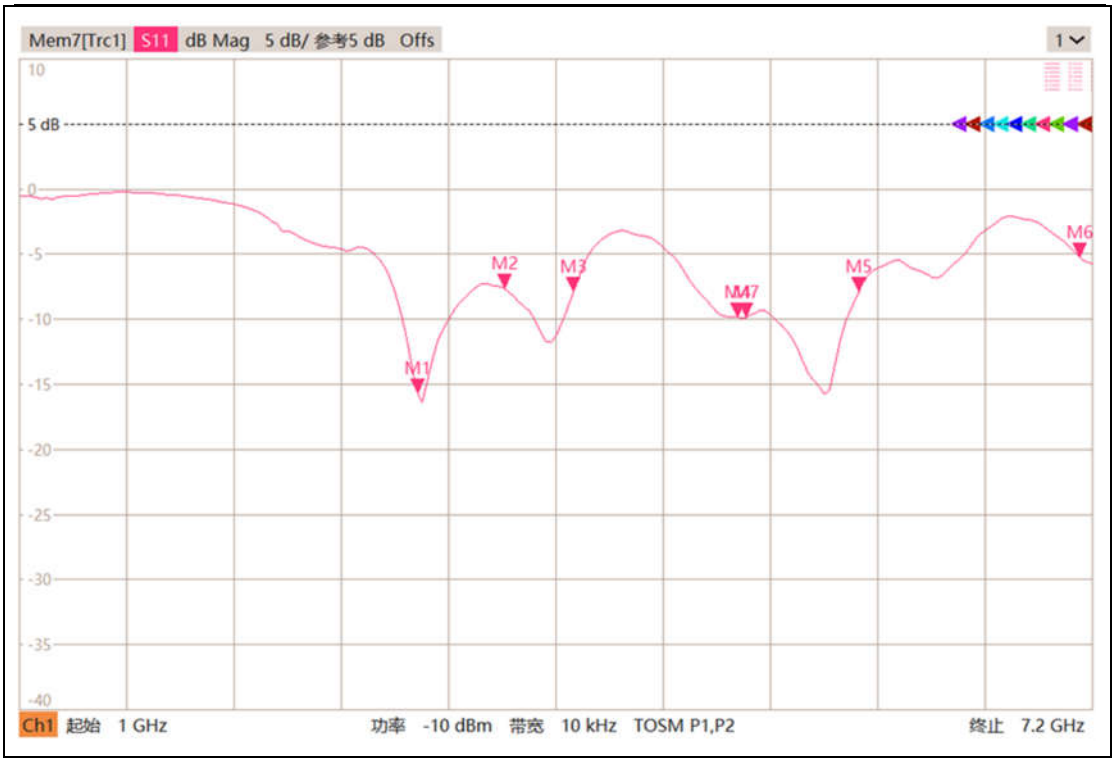
## 方向图

| | |
|---|---|
| Frequency | 1735MHz |
|  | |
| Frequency | 1950MHz |
|  | |
| Frequency | 2350MHz |
|  | |
| Frequency | 2535MHz |

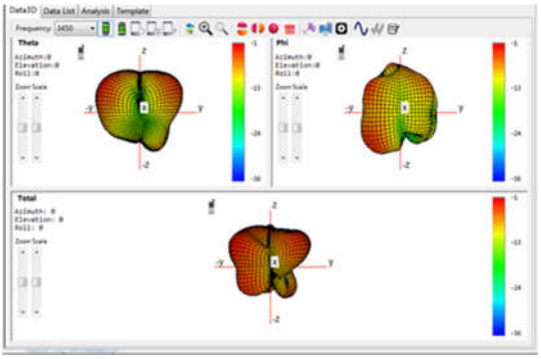
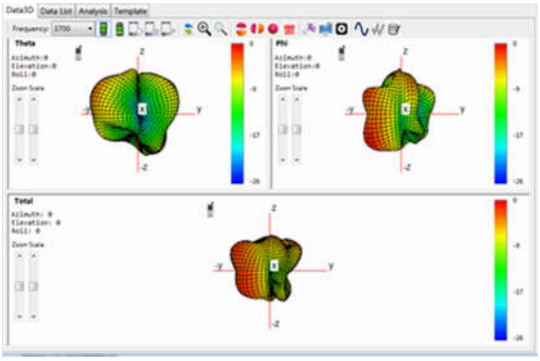
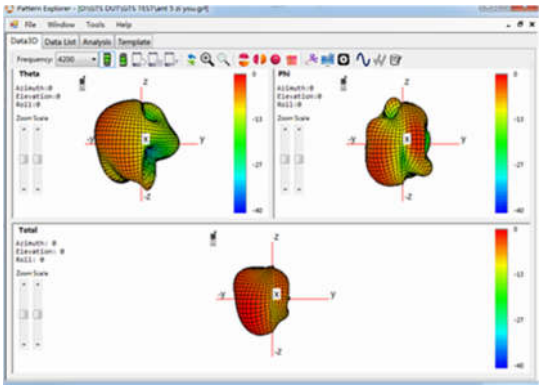
| | |
|---|---|
|  | |
| Frequency | 2620MHz |
|  | |

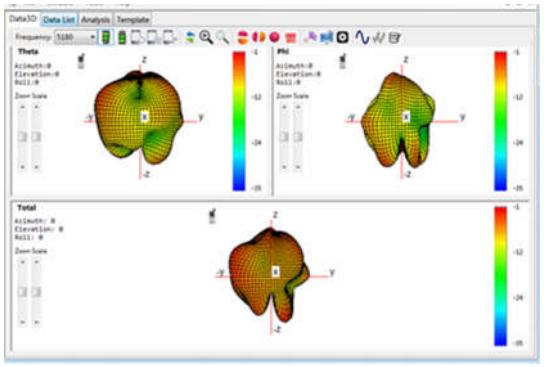
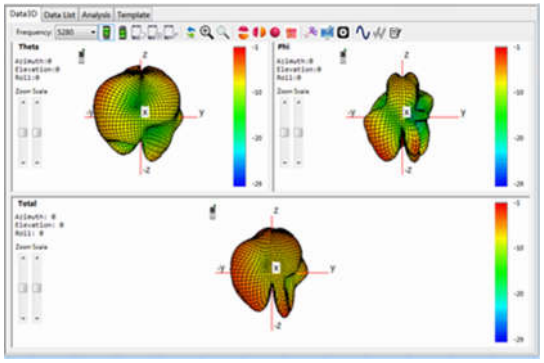
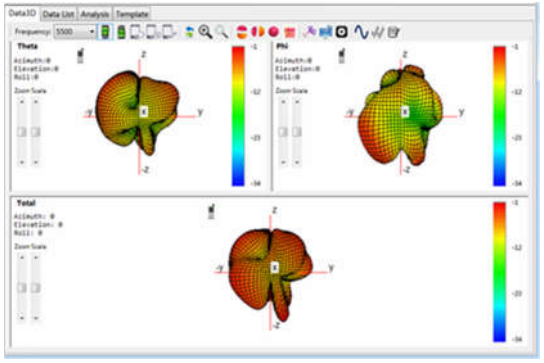
| Band for Antenna 5 | NR+WIFI_5G ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B42 | -4.9 | -0.9 |
| NR77: (3450~3550MHz) (3700~3980MHz) | -5.7 | -0.26 |
| NR78: (3450~3550MHz) (3700~3800MHz) | -6.03 | -0.67 |
| 5G (5150~5250MHz) | -5.1 | -1.29 |
| 5G (5250~5350MHz) | -5.1 | -1.36 |
| 5G (5470~5725MHz) | -4.6 | 0 |
| 5G (5725~5850MHz) | -4.8 | 0 |
| 6G (5925-6425GHz) | -5.8 | -0.43 |
| 6G (6425-6525GHz) | -7.2 | -2.05 |
| 6G (6525-6875GHz) | -7.8 | -3.01 |
| 6G (6875-7125GHz) | -7.7 | -2.04 |

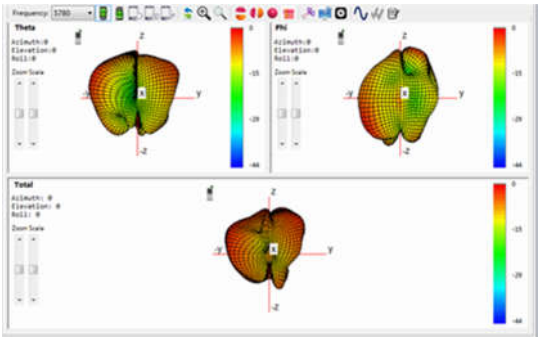
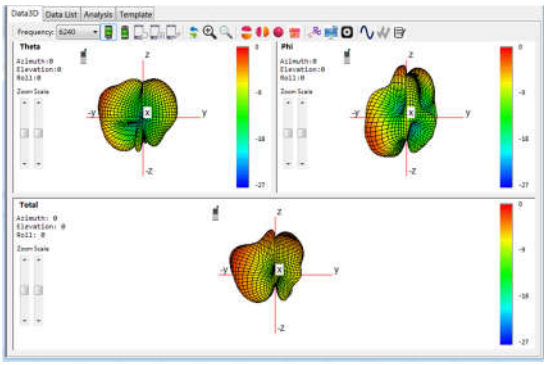
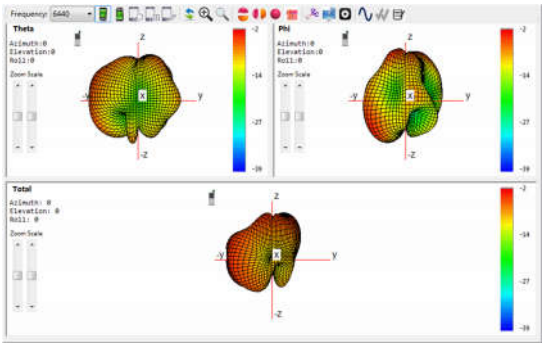
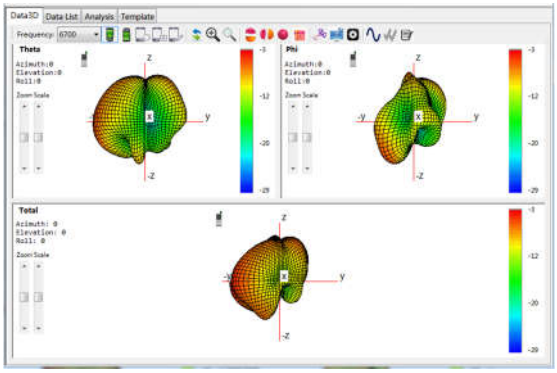
S 参数

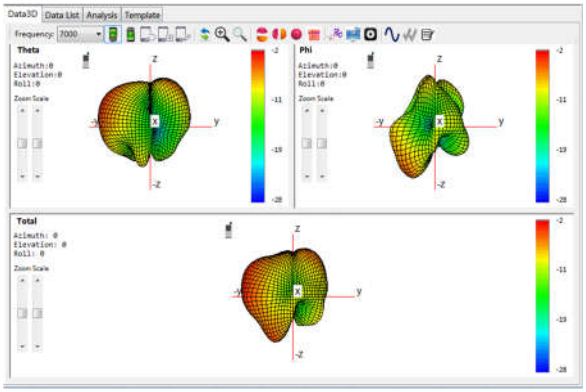

Mem7[Trc1] S11 dB Mag 5 dB/ 参考5 dB Offs
1
10
5 dB
0
-5
-10
-15
-20
-25
-30
-35
-40
M1
M2
M3
MM7
M5
M6
Ch1 起始 1 GHz
功率 -10 dBm 带宽 10 kHz TOSM P1,P2
终止 7.2 GHz

## 方向图

| | |
|---|---|
| Frequency | 3450MHz |
|  | |
| Frequency | 3700MHz |
|  | |
| Frequency | 4200MHz |
|  | |
| Frequency | 5180MHz |

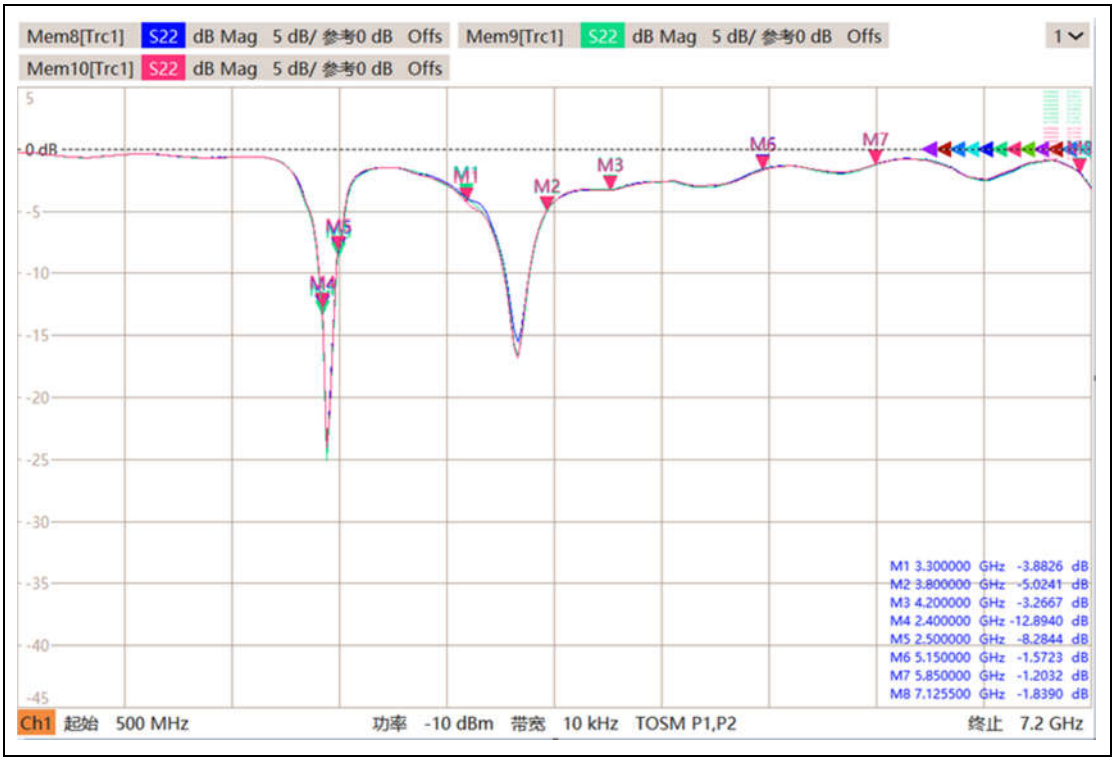
| | |
|---|---|
|  | |
| Frequency | 5280MHz |
|  | |
| Frequency | 5500MHz |
|  | |
| Frequency | 5785MHz |

| | |
|---|---|
|  | |
| Frequency | 6250MHz |
|  | |
| Frequency | 6450MHz |
|  | |
| Frequency | 6700MHz |
|  | |

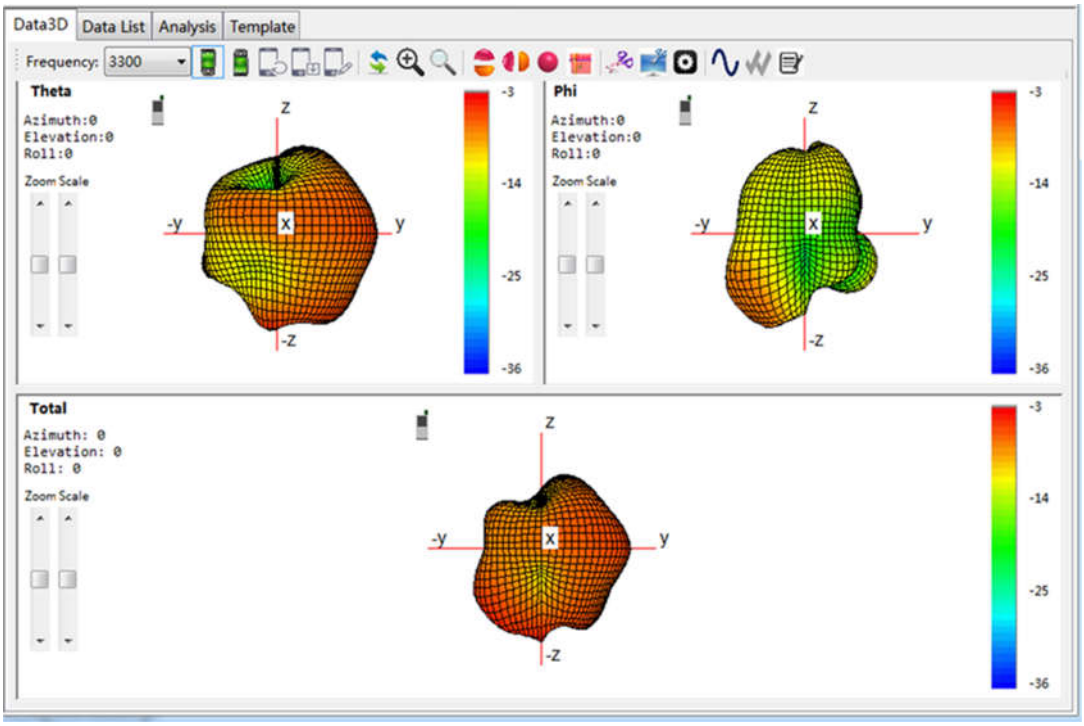
| Frequency | 7000MHz |
| --- | --- |
|  | |

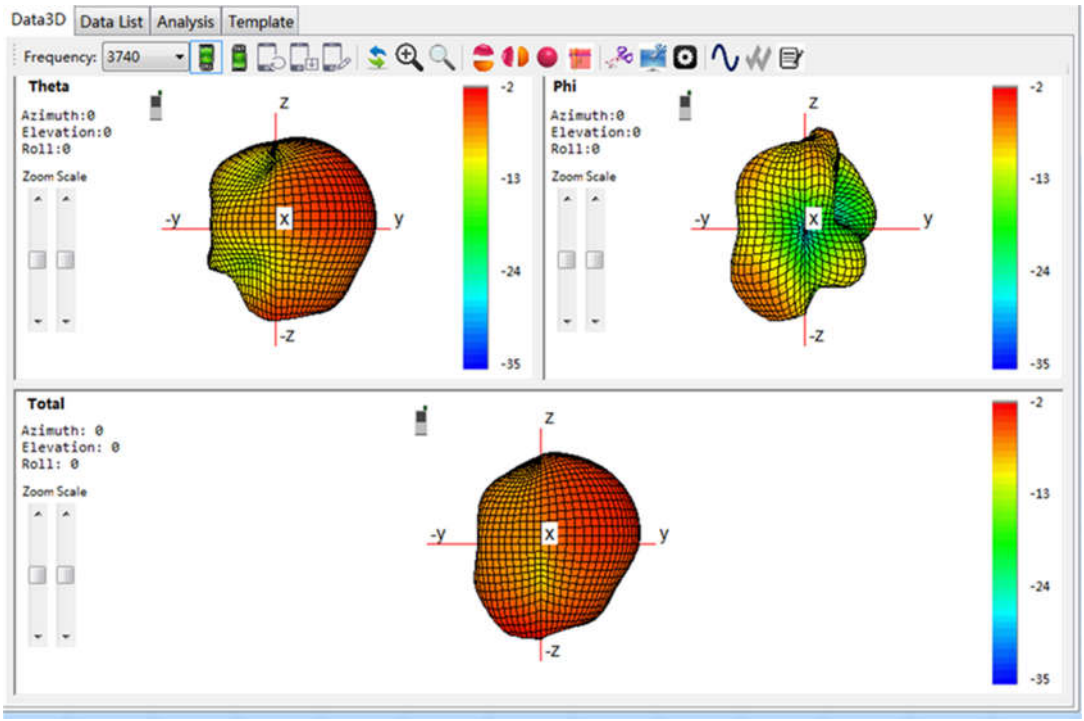
| Band for Antenna 6 | NR+WIFI_2.4G ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B42 | -5.76 | - 1.21 |
| NR77: (3450~3550MHz)<br>(3700~3980MHz) | -5.1 | - 1 |
| NR78: (3450~3550MHz)<br>(3700~3800MHz) | -5.1 | - 1 |
| 2.4G(2400~2485MHz) | -6.6 | -1.72 |
| Bluetooth | -6.6 | -1.72 |

S 参数

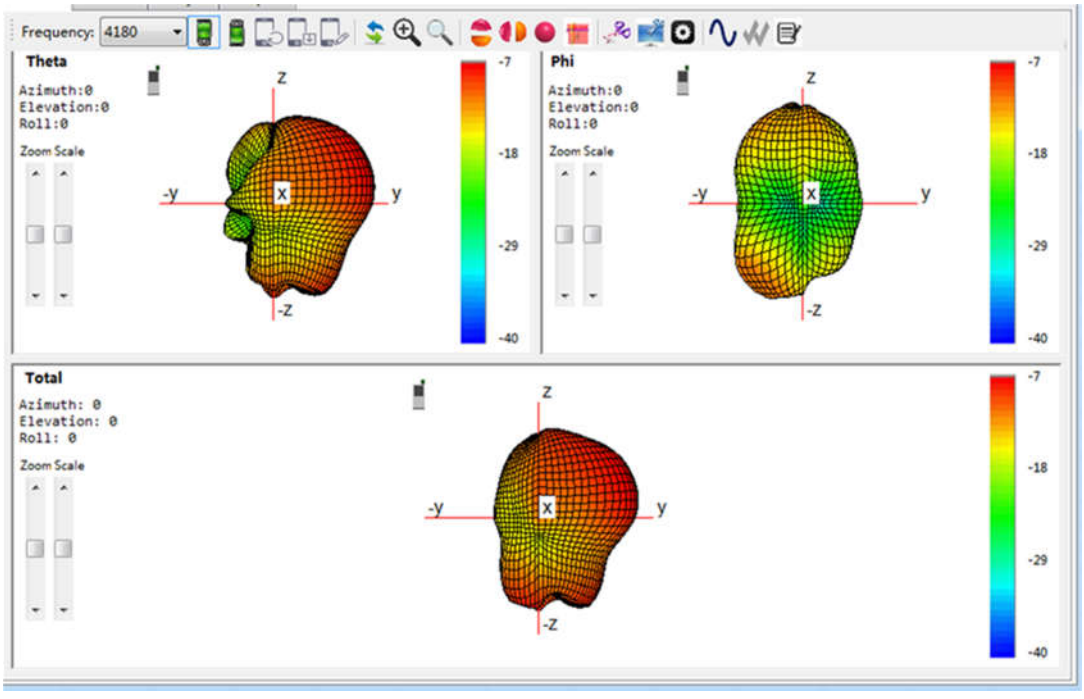


## 方向图

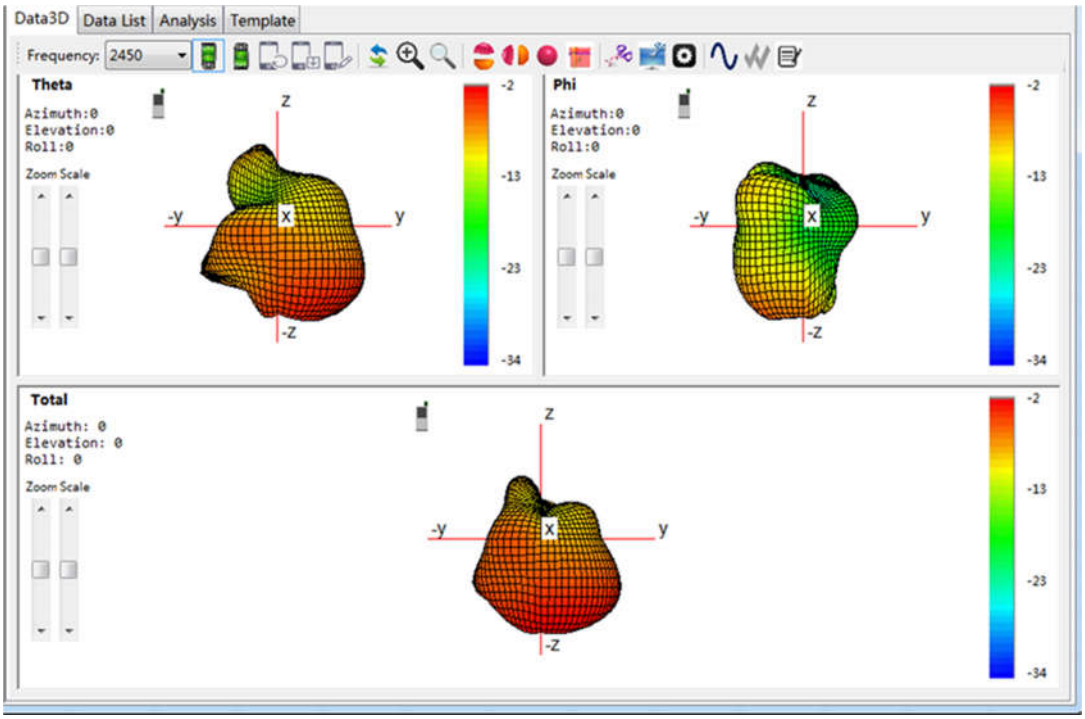
| Frequency | 3310MHz |
| --- | --- |
|  | |
| Frequency | 3750MHz |




| | |
|---|---|
| Frequency | 4190MHz |

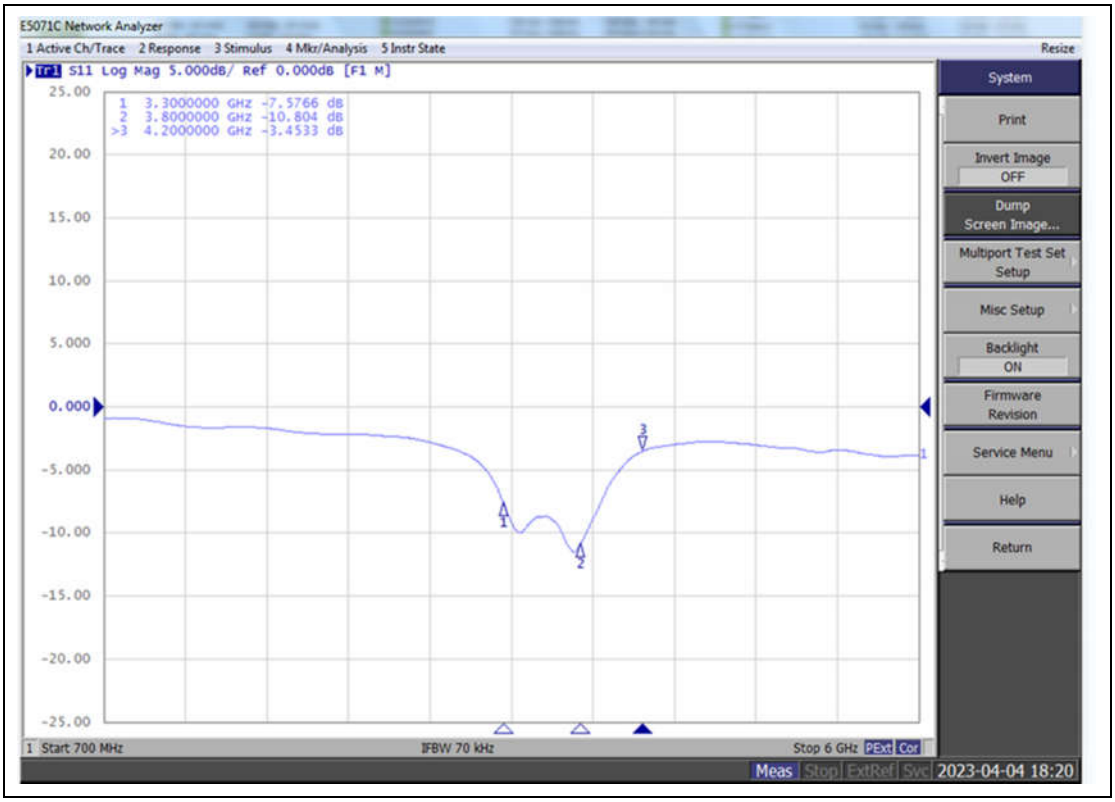



| | |
|---|---|
| Frequency | 2450MHz |

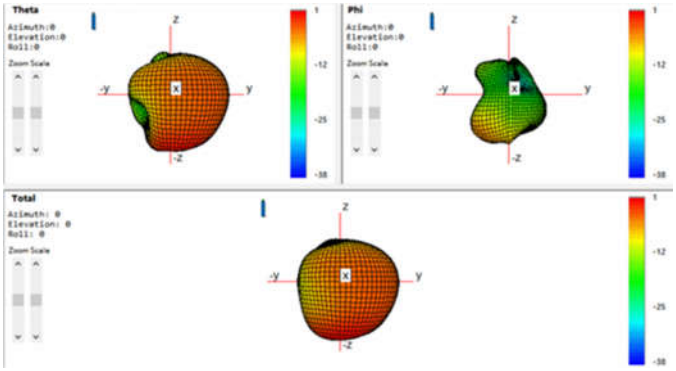
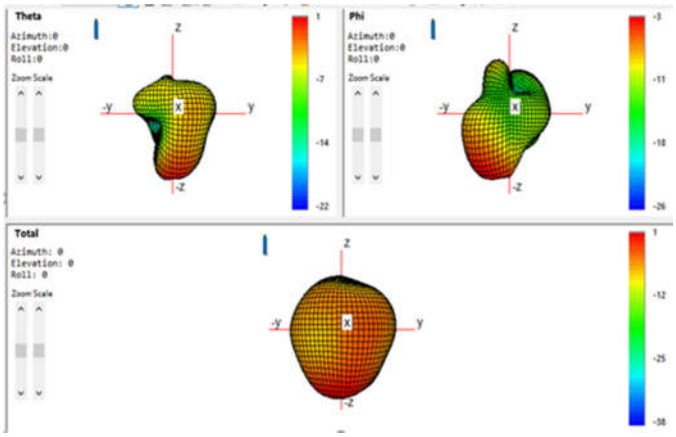
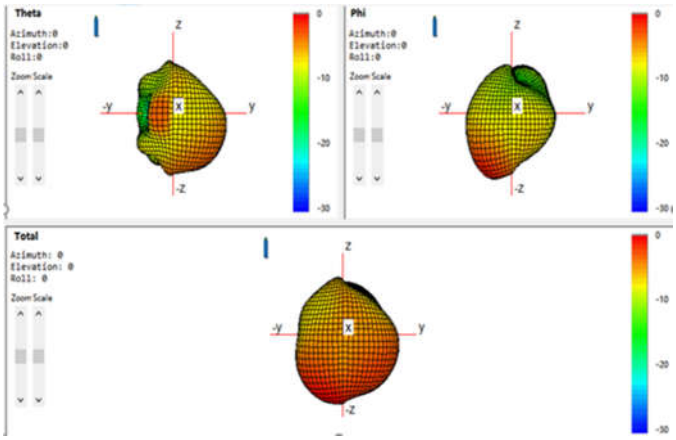

Data3D
Data List
Analysis
Template
Frequency: 2450
Theta
Azimuth:0
Elevation:0
Roll:0
Zoom Scale
Phi
Azimuth:0
Elevation:0
Roll:0
Zoom Scale
Total
Azimuth: 0
Elevation: 0
Roll: 0
Zoom Scale
-2
-13
-23
-34
z
-z
-y
y
x

| Band for Antenna 7 | NR ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| B42 | -6.3 | -6.1 |
| NR77(3450~3550MHz) (3700~3980MHz) | -6.9 | -6.1 |
| NR78 (3450~3550MHz) (3700~3800MHz) | -6.9 | -6.1 |

S 参数

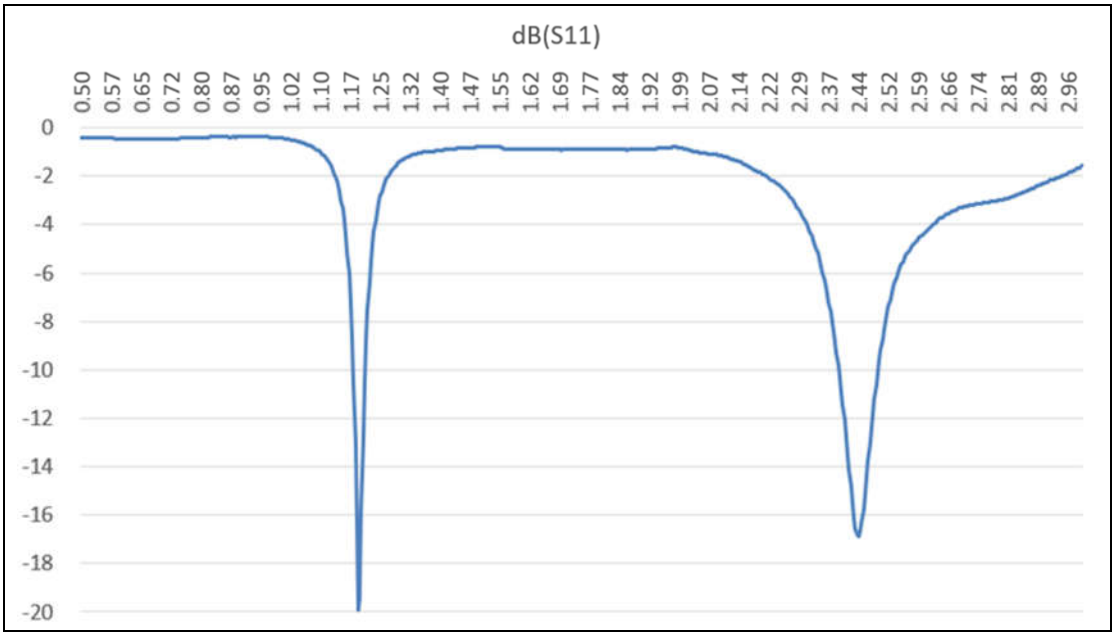


## 方向图

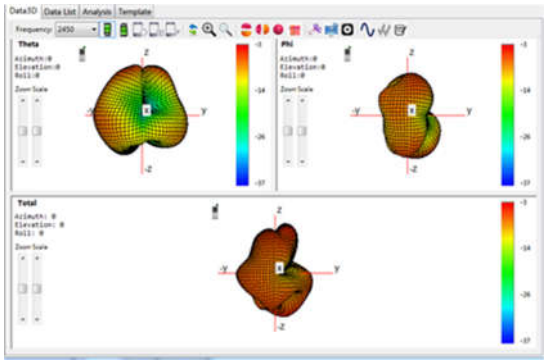
| Frequency | 3310MHz |
| --- | --- |
|  | |
| Frequency | 3750MHz |
|  | |
| Frequency | 4190MHz |
|  | |

| Band for Antenna 17 | WIFI_2.4G ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| 2.4G(2400~2485MHz) | -6.6 | -2.62 |
| Bluetooth | -6.6 | -2.62 |

S 参数

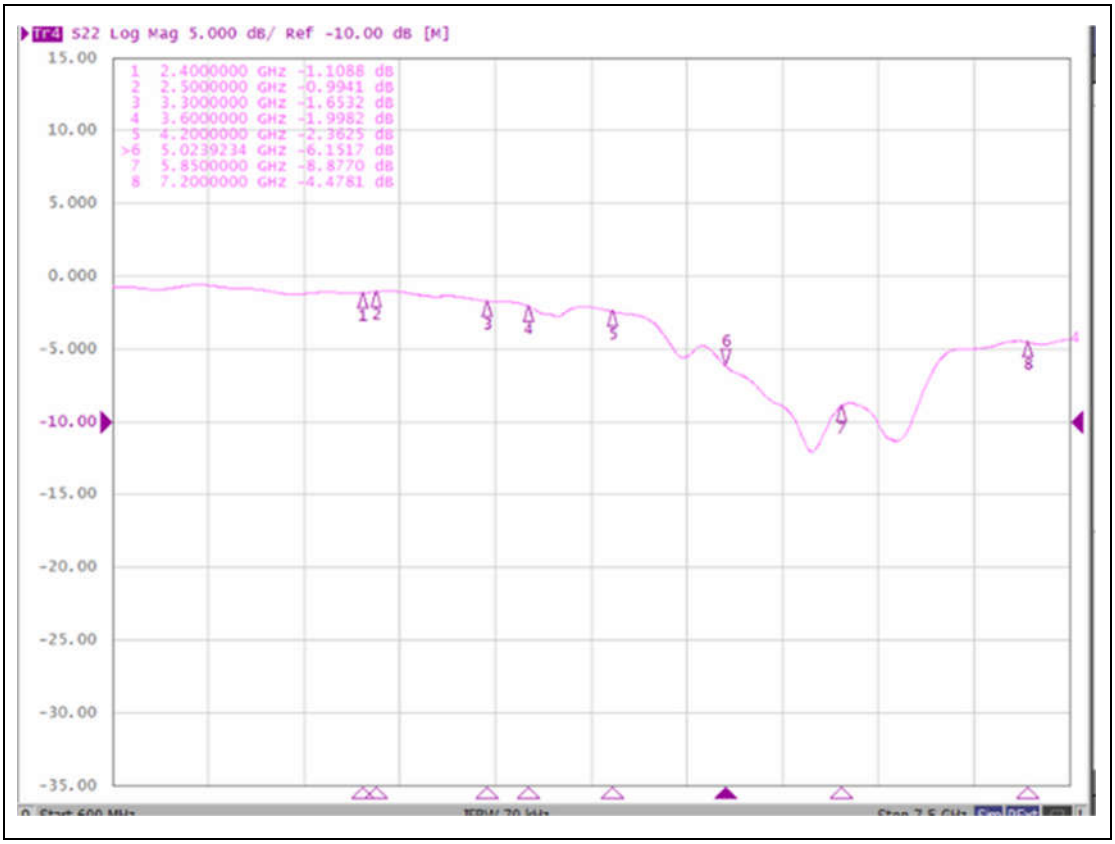



方向图

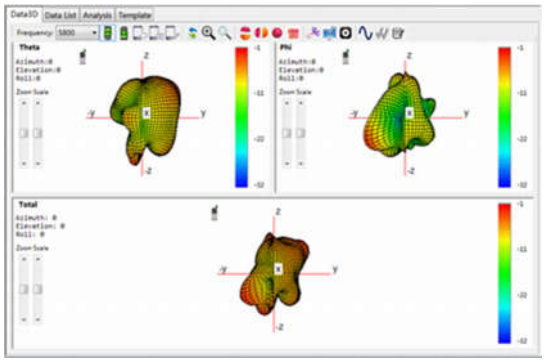
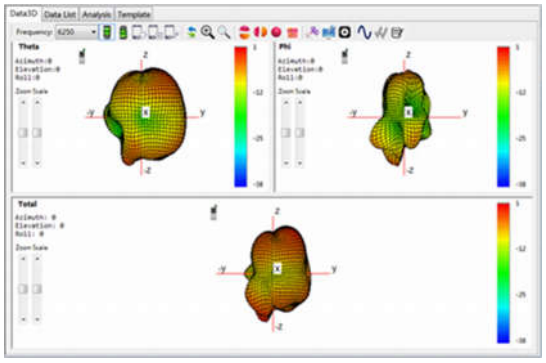
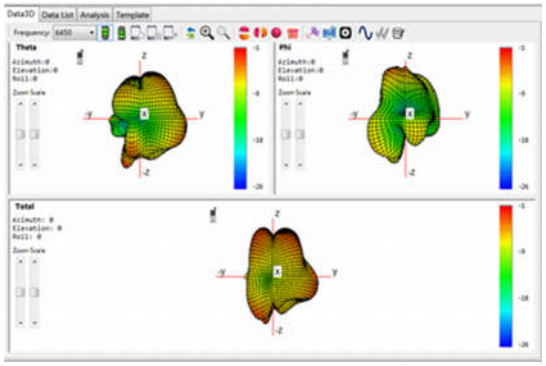
| Frequency | 2450MHz |
|---|---|
|  | |

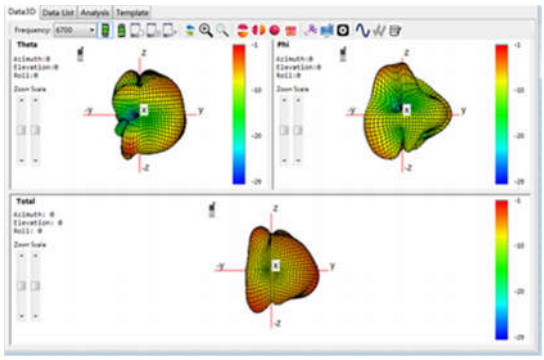
| Band for Antenna 18 | WIFI_5G ANT | |
|---|---|---|
| | Avg.Effi.(dB) | Peak gain(dBi) |
| 5G (5150~5250MHz) | -6.3 | -1.6 |
| 5G (5250~5350MHz) | -6.4 | -1.58 |
| 5G (5470~5725MHz) | -6.5 | -1.49 |
| 5G (5725~5850MHz) | -6.5 | -1.29 |
| 6G (5925-6425GHz) | -5.2 | 0 |
| 6G (6425-6525GHz) | -6.3 | -1.54 |
| 6G (6525-6875GHz) | -6.1 | -1.33 |
| 6G (6875-7125GHz) | -7.8 | -1.67 |

S 参数

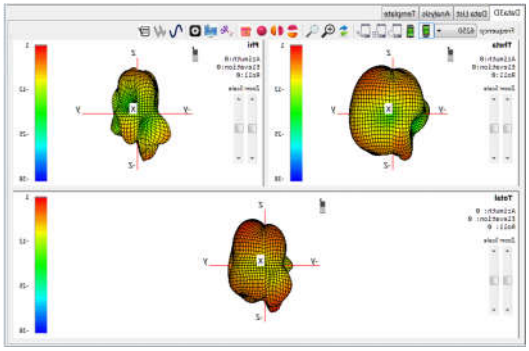


## 方向图

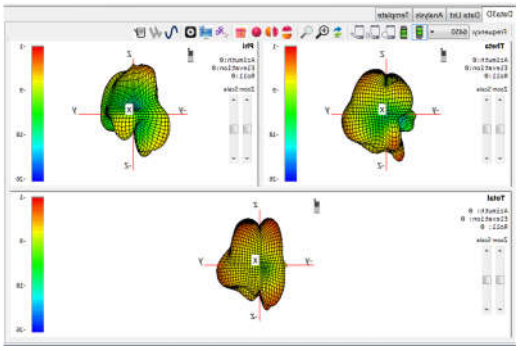
| | |
|---|---|
| Frequency | 5180MHz |
|  | |
| Frequency | 5280MHz |
|  | |
| Frequency | 5500MHz |
|  | |
| Frequency | 5785MHz |



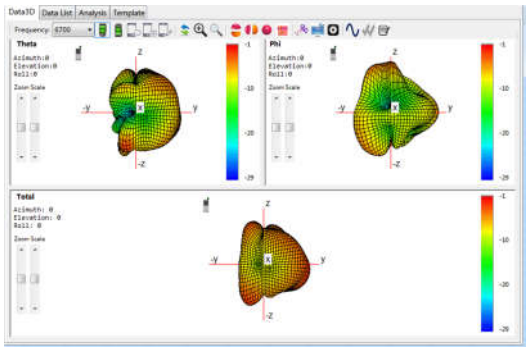
| | |
|---|---|
| Frequency | 6250MHz |

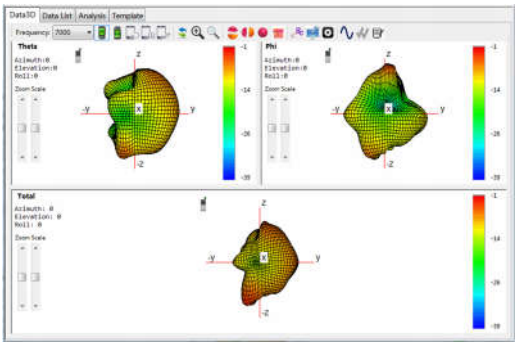


| | |
|---|---|
| Frequency | 6450MHz |



| | |
|---|---|
| Frequency | 6700MHz |



| Frequency | 7000MHz |
| --- | --- |
|  | |

## 3. Main Test Instruments

| Name | Manufacturer | Model name | Serial Number | Antenna Type | Cal., Date | Exp., Date |
|---|---|---|---|---|---|---|
| E5071C | KEYSIGHT | E5071C | EQ80224 | / | 2023-4-6 | 2024-4-6 |
| Testing software | KEYSIGHT | Maxsign100 | / | / | / | / |

## 4. Antenna Model name：Rayzone2800

End of Test Report