



ShenZhen VLG Wireless TECHNOLOGY CO.,LTD

## SPECIFICATION

|                                                                                                                                                                                |                                                                   |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-------|-----------------------------------------------|----------------|----------------------------------------|-------|---------------|--|--|--|--|--|--|--|--|--|
| Project                                                                                                                                                                        | S90 Intelligent Horseshoe Lock LDS Antenna                        |       |                                               | Frequency Band | 708-960,1710-2690 MHz & 2400-2500 MHz  |       |               |  |  |  |  |  |  |  |  |  |
| VLG SCT P/N                                                                                                                                                                    | V2055-002-A-01                                                    |       |                                               | Version        | A                                      |       |               |  |  |  |  |  |  |  |  |  |
| RF                                                                                                                                                                             | yahu.huang                                                        | Check | yahu. huang                                   | QC             | hong. yu                               | Check | hong. yu      |  |  |  |  |  |  |  |  |  |
| ME                                                                                                                                                                             | xiaorui.chai                                                      |       | xiaorui. chai                                 | PM             | chunxin. wang                          |       | chunxin. wang |  |  |  |  |  |  |  |  |  |
| Date                                                                                                                                                                           | December 28, 2022                                                 |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
| Customer item P/N                                                                                                                                                              | Customer Project Name: S90 Intelligent Horseshoe Lock LDS Antenna |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                | Customer Item No. :                                               |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
| Customer Remark                                                                                                                                                                |                                                                   |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
| VLG Wireless Technology                                                                                                                                                        |                                                                   |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
| R&d project customer satisfaction survey (Customer please according to our research and development, a comment or PM management staff, supervise and urge us serve you better) |                                                                   |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
| RF                                                                                                                                                                             | <input type="checkbox"/> satisfaction                             |       | <input type="checkbox"/> largely satisfactory |                | <input type="checkbox"/> Not satisfied |       |               |  |  |  |  |  |  |  |  |  |
| ME                                                                                                                                                                             | <input type="checkbox"/> satisfaction                             |       | <input type="checkbox"/> largely satisfactory |                | <input type="checkbox"/> Not satisfied |       |               |  |  |  |  |  |  |  |  |  |
| PM                                                                                                                                                                             | <input type="checkbox"/> satisfaction                             |       | <input type="checkbox"/> largely satisfactory |                | <input type="checkbox"/> Not satisfied |       |               |  |  |  |  |  |  |  |  |  |
| Customer Suggestions:                                                                                                                                                          |                                                                   |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |
| The antenna images :                                                                       |                                                                   |       |                                               |                |                                        |       |               |  |  |  |  |  |  |  |  |  |

The form number: VLG/QRF7.3-24/A4

Save the fixed number of year: 2 years

Shenzhen Baoan District Xixiang street Tiegang Road Oyster Industrial Park a plant 3 floors 4 floors

| Design Specifications | Typical                                                                                  | Units |
|-----------------------|------------------------------------------------------------------------------------------|-------|
| Antenna type          | LDS support+Leadwire                                                                     |       |
| working Frequency     | 708-960,1710-2690 &2400-2500                                                             | MHz   |
| Gain                  | 4G: -1.17 ~4.67<br>BT: 0.10~0.80                                                         | dBi   |
| Antenna efficiency    | 4G: 25.93~55.00<br>BT: 38.02 ~ 41.91                                                     | %     |
| VSWR                  | <7                                                                                       |       |
| Ploriaztion           | Linear polarization                                                                      |       |
| Axial Ratio           | When the antenna is circular polarization, note the axial ratio in the working bandwidth | N/A   |
| Radiation pattern     | omnidirectional                                                                          |       |
| impedance             | 50 ohm                                                                                   |       |
| Power handling        | 33                                                                                       | dBm   |
| Interface             | IPEX                                                                                     |       |
| Overall dimensions    | See drawing section                                                                      |       |
| Weight                | no requirement                                                                           |       |
| Operatin Temp         | -30 ----- 70                                                                             | °     |
| Storing Temp          | -30 ----- 70                                                                             | °     |

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# S90 Intelligent Horseshoe Lock LDS Antenna Specification

## 1、Indication

The report mainly provides the test status of various electrical performance parameters of the S90 Intelligent Horseshoe Lock LDS Antenna. (As shown in Figure 1 below)



Figure 1 S90 Intelligent Horseshoe Lock LDS Antenna

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## 2、 Electrical Performance

### 2.1 Specification standard

S90 Intelligent Horseshoe Lock LDS Antenna working band is at 708-960, 1710-2690MHz&2400-2500MHz.

### 2.2 Antenna matching circuit

S90 Intelligent Horseshoe Lock LDS Antenna matches the original matching circuit.

### 2.3 VSWR Test

#### A. Test setup

VSWR measurements (S11) were performed using Agilent E5071B Network Analyzer and the previously described test fixture. A ferrite-loaded coaxial cable was used to mitigate surface currents on the outside of the cabling. The testing was performed in free space ETS AMP8500S chamber.

#### B. VSWR

The table below shows the standing wave ratio value of the edge frequency of the working band of S90 Intelligent Horseshoe Lock LDS Antenna matches the original matching circuit.

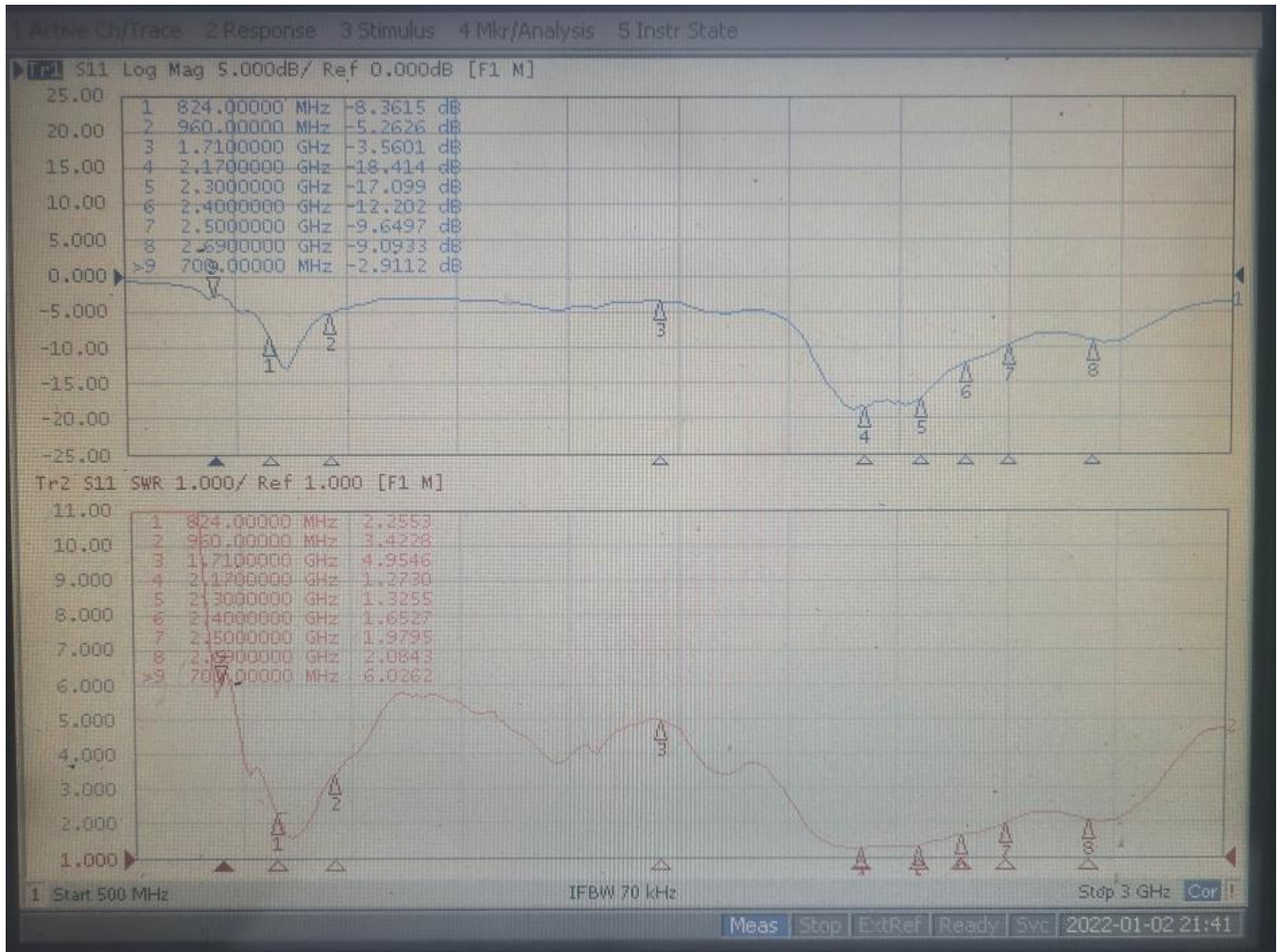
| Frequency band | frequency (MHz) | VSWR |
|----------------|-----------------|------|
| <b>4G</b>      | 700             | 6.02 |
|                | 960             | 3.42 |
|                | 1710            | 4.95 |
|                | 2690            | 2.08 |
| <b>BT</b>      | 2400            | 2.74 |
|                | 2500            | 2.28 |

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## 2.3.1 S11 parameter

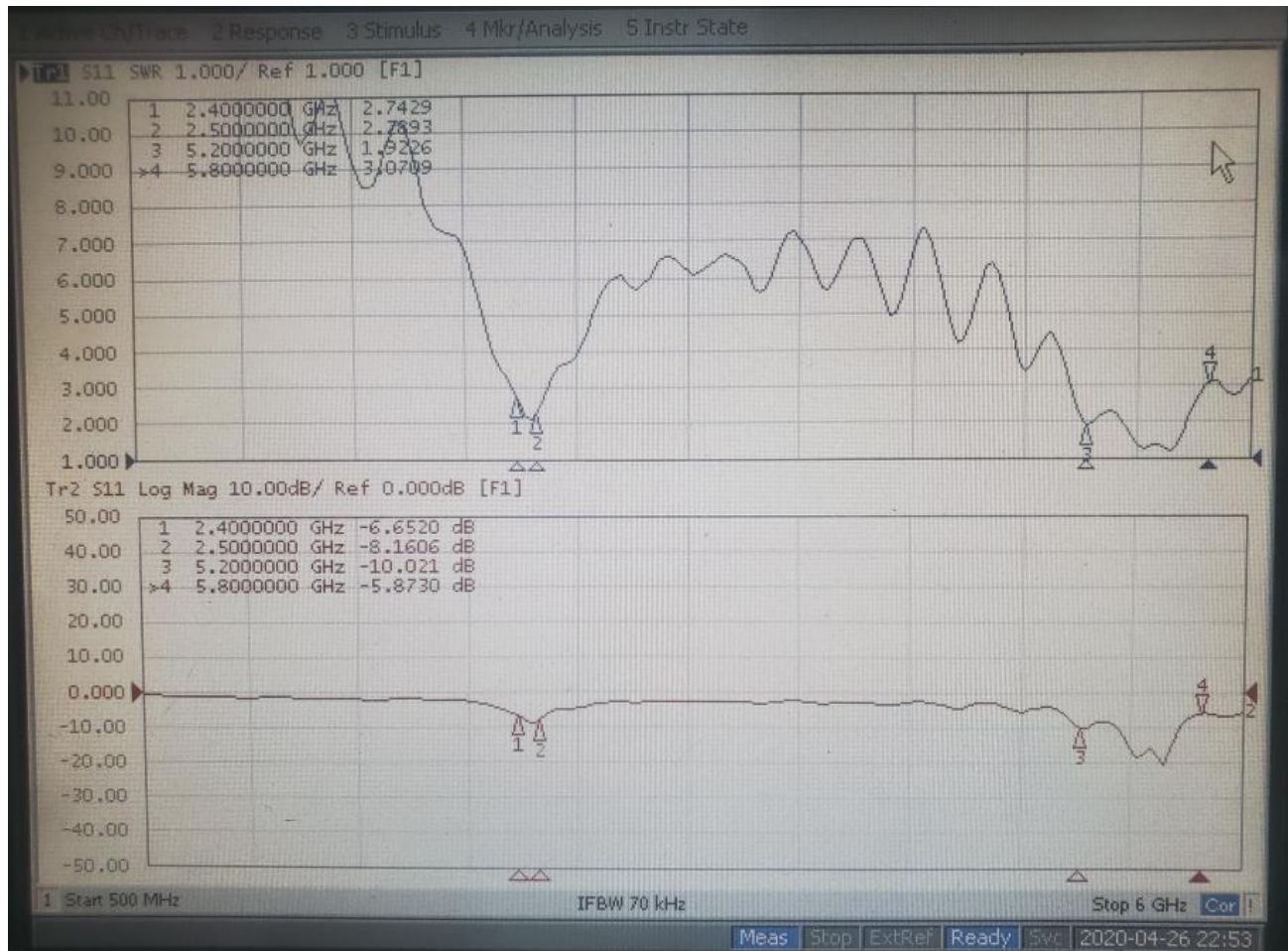
4G Antenna:



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BT Antenna:

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## 2.3.2 Antenna Passive Efficiency

4G Antenna:

| Freq(MHz) | Gain(dBi) | Efficiency(dB) | Efficiency(%) |
|-----------|-----------|----------------|---------------|
| 708       | -1.17     | -5.05          | 31.23         |
| 718       | -1.15     | -4.91          | 32.30         |
| 728       | -0.86     | -4.67          | 34.14         |
| 738       | -0.38     | -4.17          | 38.30         |
| 748       | -0.16     | -3.76          | 42.04         |
| 758       | -0.03     | -3.46          | 45.03         |
| 768       | 0.03      | -3.15          | 48.44         |
| 778       | 0.07      | -2.88          | 51.49         |
| 788       | 0.15      | -2.79          | 52.54         |
| 798       | 0.14      | -2.81          | 52.39         |
| 808       | 0.32      | -2.75          | 53.11         |
| 818       | 0.46      | -2.76          | 52.94         |
| 828       | 0.35      | -2.79          | 52.57         |
| 838       | 0.31      | -2.77          | 52.83         |
| 848       | 0.01      | -2.93          | 50.95         |
| 858       | -0.08     | -2.99          | 50.28         |
| 868       | -0.15     | -3.02          | 49.86         |
| 878       | -0.30     | -3.19          | 47.98         |
| 888       | -0.47     | -3.31          | 46.65         |
| 898       | -0.40     | -3.49          | 44.80         |
| 908       | -0.44     | -3.70          | 42.63         |
| 918       | 0.05      | -3.81          | 41.55         |
| 928       | 0.23      | -4.03          | 39.58         |
| 938       | 0.11      | -4.20          | 38.03         |
| 948       | -0.22     | -4.49          | 35.54         |
| 958       | -0.52     | -4.73          | 33.66         |
| 960       | -0.59     | -4.79          | 33.20         |

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| Freq (MHz) | Gain (dBi) | Efficiency (dB) | Efficiency (%) |
|------------|------------|-----------------|----------------|
| 1710       | 0.39       | -5.41           | 28.76          |
| 1745       | -0.20      | -5.86           | 25.93          |
| 1780       | 0.85       | -5.38           | 28.96          |
| 1815       | 0.92       | -5.15           | 30.56          |
| 1850       | 0.88       | -5.03           | 31.37          |
| 1885       | 1.29       | -4.70           | 33.90          |
| 1920       | 1.54       | -4.54           | 35.13          |
| 1955       | 1.86       | -4.41           | 36.19          |
| 1990       | 1.96       | -4.40           | 36.34          |
| 2025       | 3.01       | -3.72           | 42.46          |
| 2060       | 3.32       | -3.40           | 45.70          |
| 2095       | 3.18       | -3.06           | 49.45          |
| 2130       | 2.57       | -3.07           | 49.29          |
| 2165       | 2.21       | -3.17           | 48.23          |
| 2200       | 2.43       | -3.12           | 48.77          |
| 2235       | 2.64       | -3.18           | 48.11          |
| 2270       | 2.93       | -3.45           | 45.22          |
| 2305       | 2.94       | -3.82           | 41.51          |
| 2340       | 3.41       | -3.71           | 42.59          |
| 2375       | 3.67       | -3.63           | 43.31          |
| 2410       | 3.60       | -3.43           | 45.37          |
| 2445       | 3.63       | -3.15           | 48.41          |
| 2480       | 4.35       | -2.74           | 53.22          |
| 2515       | 4.67       | -2.60           | 55.00          |
| 2550       | 4.20       | -2.84           | 51.98          |
| 2585       | 4.05       | -2.91           | 51.13          |
| 2620       | 3.92       | -3.09           | 49.13          |
| 2655       | 3.82       | -3.23           | 47.54          |
| 2690       | 1.68       | -5.22           | 30.09          |

BT Antenna:

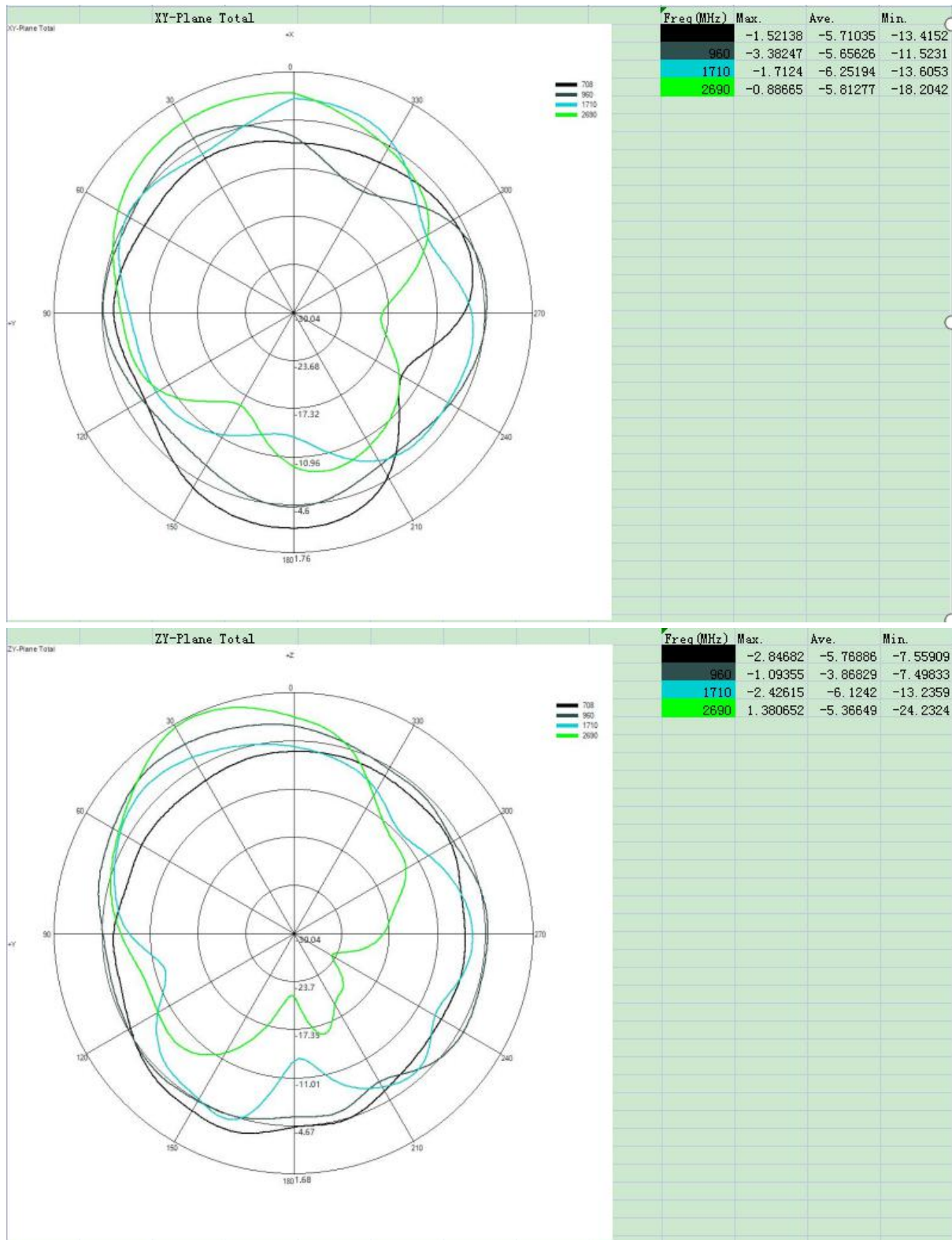
| Freq (MHz) | Gain (dBi) | Efficiency (dB) | Efficiency (%) |
|------------|------------|-----------------|----------------|
| 2400       | 0.60       | -4.11           | 38.82          |
| 2410       | 0.62       | -4.05           | 39.35          |
| 2420       | 0.80       | -3.94           | 40.35          |
| 2430       | 0.78       | -3.90           | 40.78          |
| 2440       | 0.71       | -3.90           | 40.73          |
| 2450       | 0.79       | -3.78           | 41.90          |
| 2460       | 0.75       | -3.78           | 41.91          |
| 2470       | 0.69       | -3.82           | 41.49          |
| 2480       | 0.52       | -3.89           | 40.85          |
| 2490       | 0.47       | -3.96           | 40.17          |
| 2500       | 0.10       | -4.20           | 38.02          |

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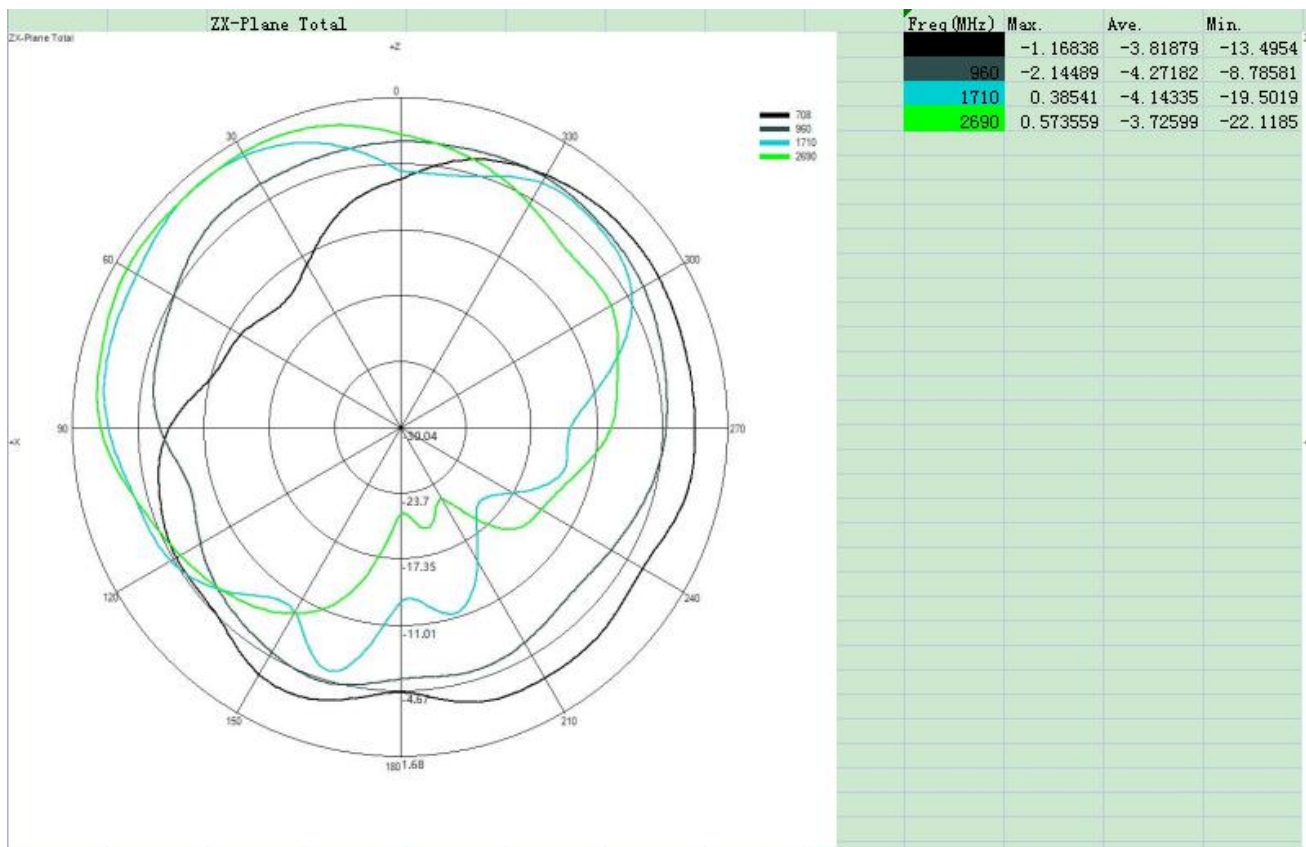
### 2.3.3 Pattern

4G Antenna:



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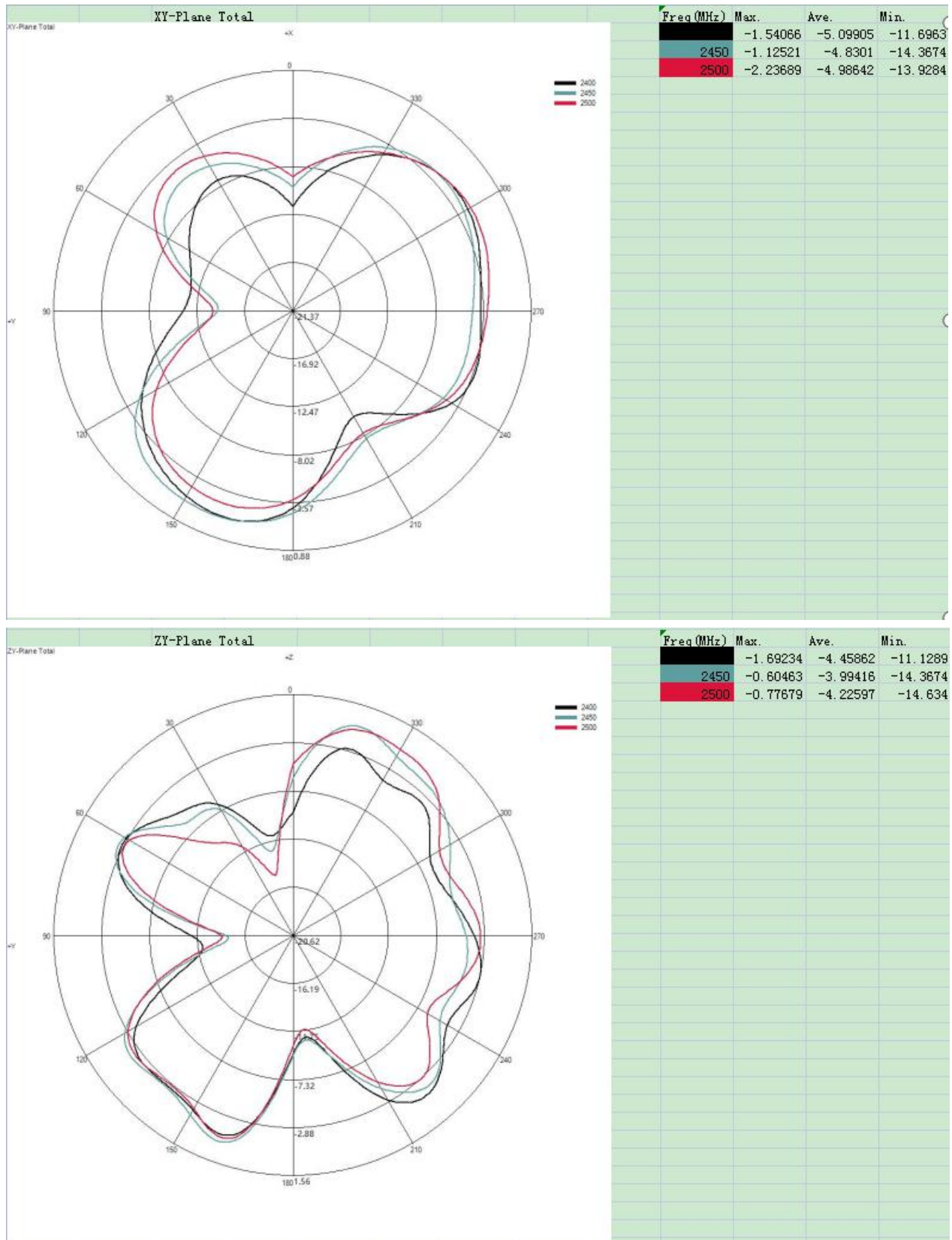
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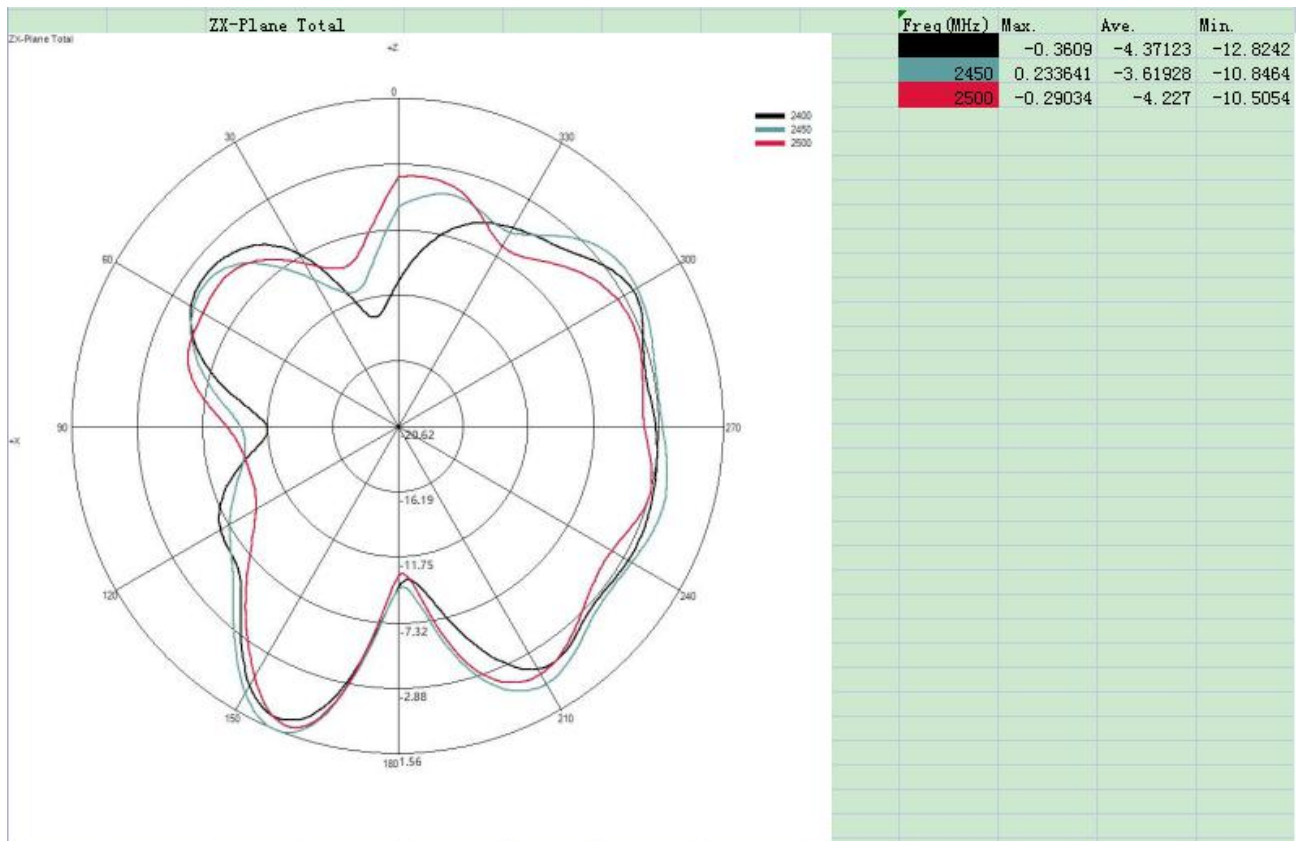
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## BT Antenna:



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### 3、Suggestion And Solution

This report is according to the customer provide S90 Intelligent Horseshoe Lock LDS Antenna the final version of the electrical performance of antenna.

As can be seen from the above test data, this antenna provides better electrical performance.

We are looking forward to your confirmation. Thank you for your cooperation!

### 4、Appearance Drawing

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Painting requirements:

- 1, 2 spray and 2 bake/Black/Cover Ant
- 2, Paint brand: KX5567-series