

深圳市连兴创电子科技有限公司

APPROVAL SHEET

承认书

客户 (Customer) : 希哈

产品 (Product) : 4G 天线 (L=150MM)

型号 (Model) : LXC-202404250009

料号 (Part Number) : AC220V 150A

制作人 (Written By) : 唐红交

签发时间 (Issued Date) : 2024-07-11

客户 CUSTOMER

|                               |                                          |
|-------------------------------|------------------------------------------|
| 频率范围(Frequency range)         | 824-960 1710-2690 (MHz)                  |
| 驻波比系数(VSWR)                   | <2.0                                     |
| 输入阻抗(Input Impedance)         | 50 (Ω)                                   |
| 极化方式(Polarization)            | 垂直极化 Vertical Polarization               |
| 半功率波束 (3dB) HPW               | 180° H-plane 120° E-plane                |
| 天线类型(Antenna type)            | FPC 天线 (Built-inFPC 天线 antenna)          |
| 天线增益峰值(Antenna gain MAX (dBi) | 5dBi+/-1                                 |
| 天线供应商 (Antenna supplier)      | Shenzhen Electronics Technology Co., Ltd |
| 天线型号 (Antenna Model)          | AC220V 63A                               |

|                  |  |            |  |
|------------------|--|------------|--|
| RF by            |  | Checked by |  |
| ME by            |  | Date       |  |
| Customer Confirm |  |            |  |

|                                                                                                                             |           |              |                                     |
|-----------------------------------------------------------------------------------------------------------------------------|-----------|--------------|-------------------------------------|
| 8Project:                                                                                                                   |           | Author:Wang  | File Name:<br><br><b>AC220V 63A</b> |
| Date: 2024-07-11                                                                                                            |           |              |                                     |
| TEST:                                                                                                                       | Language: | Check: Zhong |                                     |
| A                                                                                                                           | English   |              |                                     |
|                                                                                                                             |           |              |                                     |
| 地址： 深圳市龙华区大浪街道华芳路 12 号金瑞华工业园 C 栋 4 楼<br>电话： 0755-29195258    传真： 0755-29590286<br>Shenzhen Electronics Technology Co ., Ltd |           |              |                                     |

Revision History

| Date       | Revision | Description of Changes       |
|------------|----------|------------------------------|
| 2024-07-11 | RA       | Measured with SUS301 sample. |

深圳市连兴创电子科技有限公司 ..... 1

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# 1 Technical Summary

This report summarizes the electrical results of the proposed antenna to support the program. We test the antenna with the latest version handset. And it seems to be acceptable.

## 2 General Description

### 2.1 Components/Part revisions

VSWR: Voltage Standing Wave Rate.

## 3 Mechanical Description

## 4 Electrical Performance

### 4.1 Set-up

#### 4.1.1 VSWR

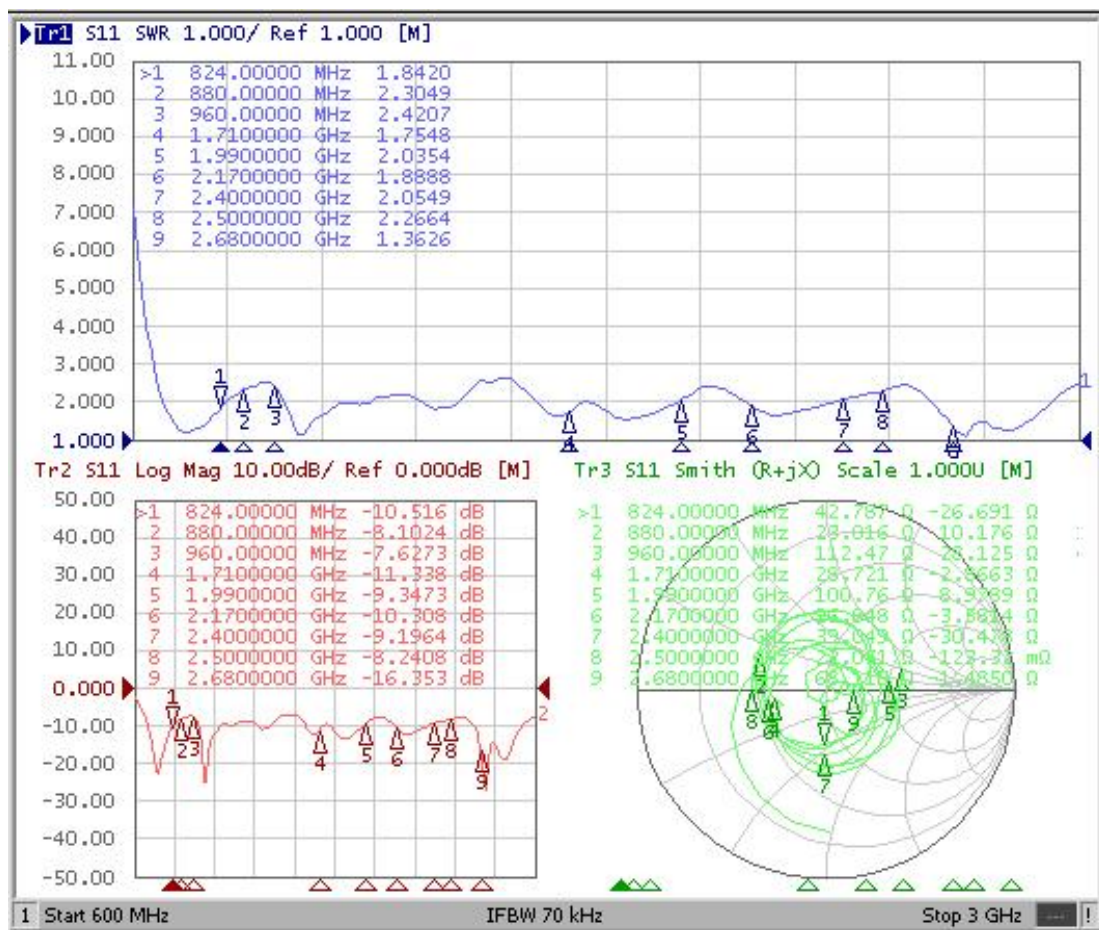
VSWR measurements (S11) were performed using an Agilent 8753D Network Analyzer and the previously described test fixture. Coaxial chokes were used to mitigate surface currents on the outside of the cabling. The testing was performed in free space.

#### 4.1.2 Gain & Radiation Patterns

The gain of the antenna was measured in the Lxc's anechoic chamber. Coaxial chokes on the feed cable were used to mitigate surface currents. The chamber provides less than -30 dB reflectivity from 800 MHz through 3 GHz and an 18" diameter spherical quiet zone. The measurement results are calibrated using both dipole and leaky wave horn standards.

#### 4.1.3 Matching Circuit Description

|                                                                                                                           |           |              |                                     |
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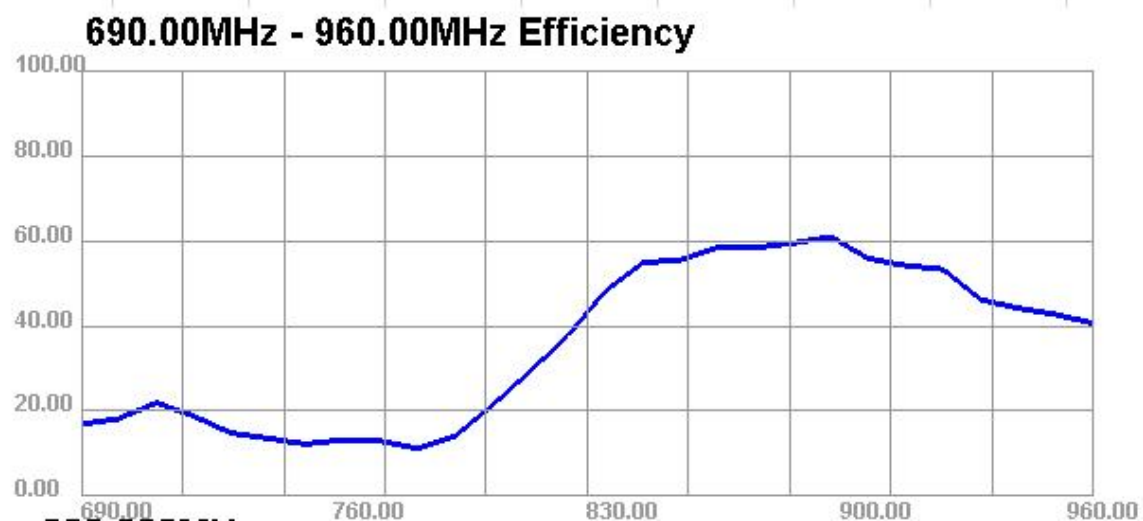
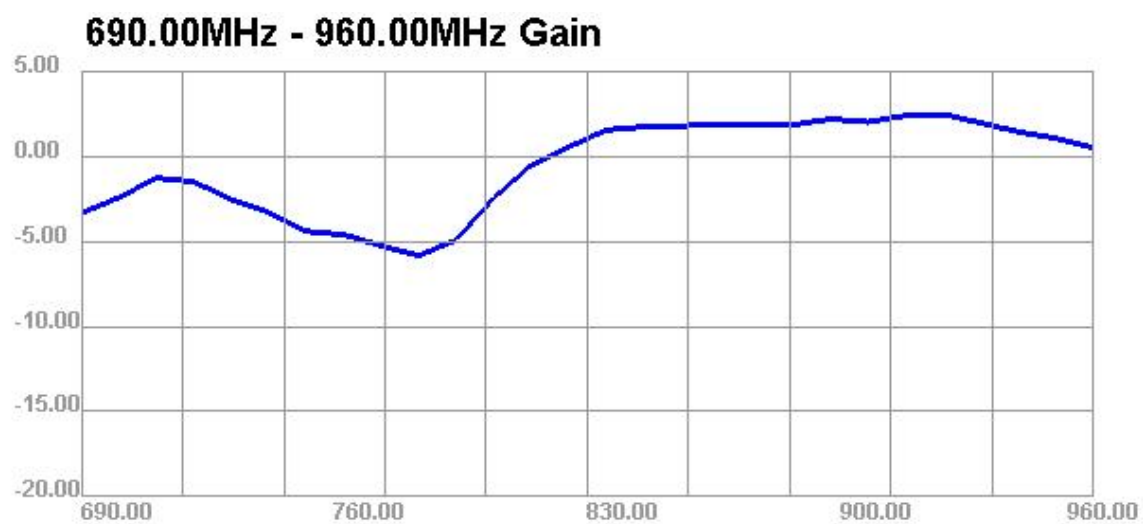


## 4.2 Measurement Data

### 4.2.1 Active result (4G)

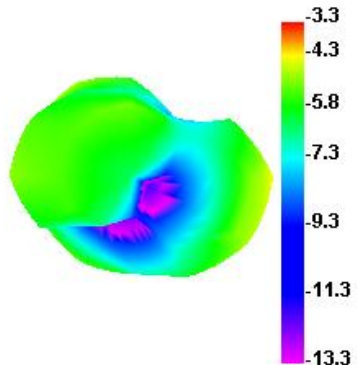
|     |       |       |      |
|-----|-------|-------|------|
| 830 | 52.39 | -3.15 | 1.95 |
| 840 | 52.92 | -2.6  | 2.13 |
| 850 | 55.58 | -2.55 | 2.19 |
| 860 | 58.55 | -2.32 | 1.89 |
| 870 | 59.43 | -2.33 | 1.97 |
| 880 | 59.49 | -2.26 | 2.26 |
| 890 | 60.97 | -2.15 | 2.39 |
| 900 | 61.85 | -2.53 | 2.42 |
| 910 | 62.2  | -2.66 | 2.49 |
| 920 | 63.31 | -2.73 | 2.47 |
| 930 | 63.49 | -3.35 | 2.56 |
| 940 | 64.16 | -3.55 | 2.58 |
| 950 | 64.52 | -3.69 | 2.62 |
| 960 | 64.63 | -3.91 | 2.52 |

|                                                                                                                              |           |              |                                     |
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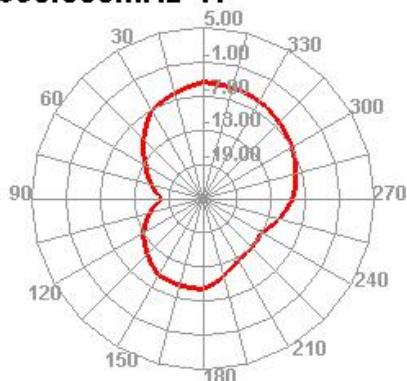


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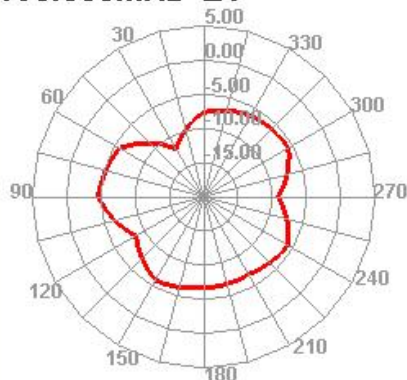
690.000MHz



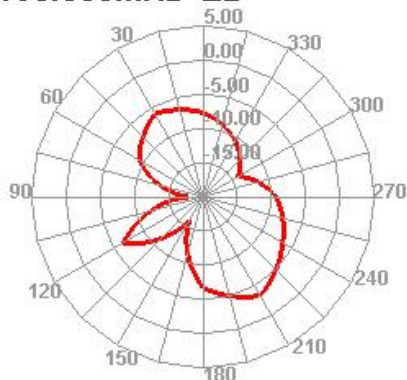
690.000MHz H



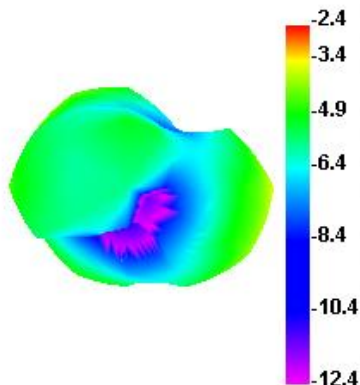
690.000MHz E1



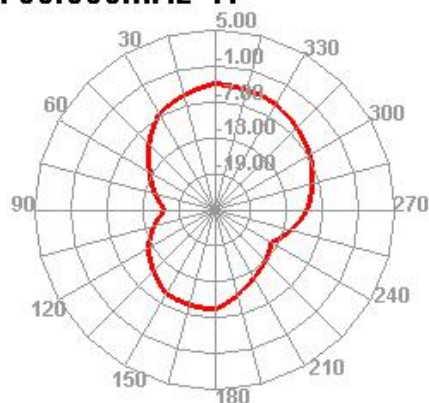
690.000MHz E2



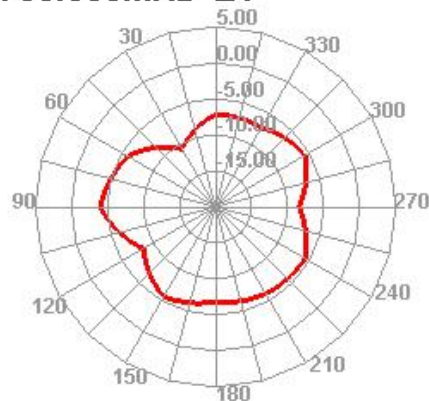
700.000MHz



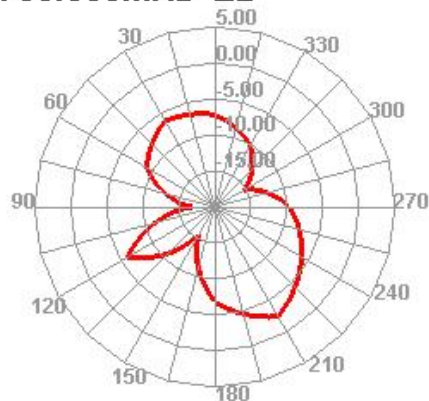
700.000MHz H



700.000MHz E1



700.000MHz E2



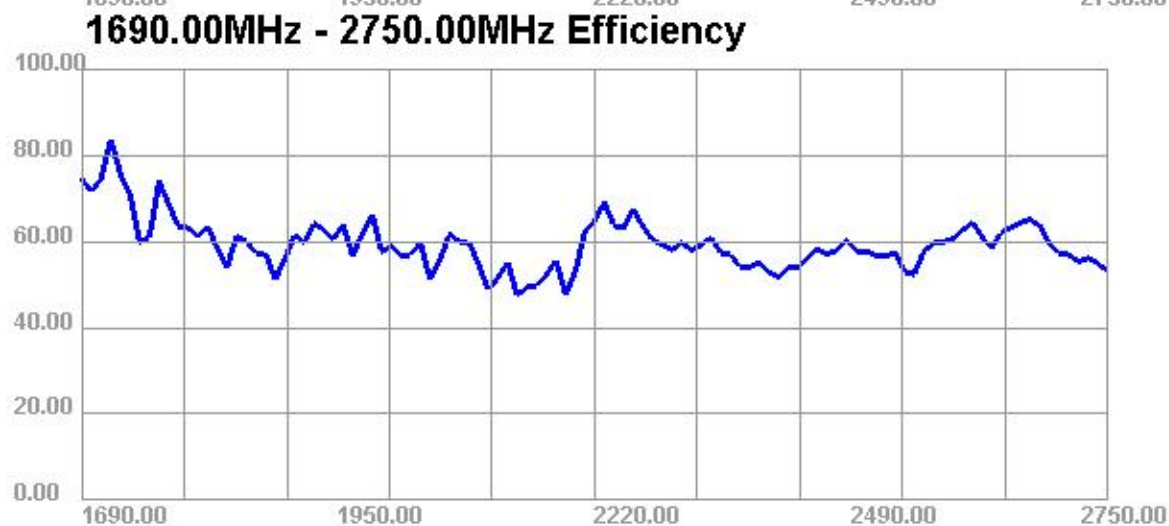
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|      |       |       |      |
|------|-------|-------|------|
| 1690 | 64.63 | -1.27 | 2.49 |
| 1700 | 65.49 | -1.46 | 2.53 |
| 1710 | 69.64 | -1.27 | 2.46 |
| 1720 | 69.78 | -0.77 | 2.54 |
| 1730 | 70.66 | -1.21 | 2.65 |
| 1740 | 70.82 | -1.5  | 2.71 |
| 1750 | 59.81 | -2.23 | 2.38 |
| 1760 | 61.04 | -2.14 | 2.44 |
| 1770 | 64.04 | -1.31 | 2.2  |
| 1780 | 68.46 | -1.65 | 2.91 |
| 1790 | 63.59 | -1.97 | 2.77 |
| 1800 | 63.18 | -1.99 | 2.86 |
| 1810 | 61.33 | -2.12 | 2.8  |
| 1820 | 63.6  | -1.97 | 2.98 |
| 1830 | 58.48 | -2.33 | 2.61 |
| 1840 | 53.94 | -2.68 | 2.3  |
| 1850 | 61.34 | -2.12 | 2.91 |
| 1860 | 60.03 | -2.22 | 2.97 |
| 1870 | 57.4  | -2.41 | 2.85 |
| 1880 | 57.21 | -2.43 | 2.92 |
| 1890 | 58.29 | -2.9  | 2.38 |
| 1900 | 59.95 | -2.52 | 2.74 |
| 1910 | 61.52 | -2.11 | 2.78 |
| 1920 | 59.75 | -2.24 | 2.95 |
| 1930 | 64.27 | -1.92 | 2.36 |
| 1940 | 62.68 | -2.03 | 2.42 |
| 1950 | 60.49 | -2.18 | 2.28 |
| 1960 | 64.01 | -1.94 | 2.46 |
| 1970 | 62.73 | -2.46 | 2.18 |
| 1980 | 61.73 | -2.1  | 2.39 |
| 1990 | 66.23 | -1.79 | 2.33 |
| 2000 | 57.79 | -2.38 | 2.69 |
| 2010 | 58.96 | -2.29 | 2.74 |
| 2020 | 59.78 | -2.46 | 2.44 |
| 2030 | 59.98 | -2.44 | 2.13 |
| 2040 | 60.84 | -2.23 | 2.01 |
| 2050 | 61.18 | -2.91 | 2.07 |
| 2060 | 61.63 | -2.55 | 2.31 |
| 2070 | 61.74 | -2.09 | 2.43 |
| 2080 | 62.53 | -2.22 | 2.54 |
| 2090 | 59.77 | -2.23 | 2.06 |
| 2100 | 59.85 | -2.61 | 2.19 |

|                                                                                                                           |           |              |                                     |
|---------------------------------------------------------------------------------------------------------------------------|-----------|--------------|-------------------------------------|
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| Date: 2024-07-11                                                                                                          |           |              |                                     |
| TEST:                                                                                                                     | Language: | Check: Zhong |                                     |
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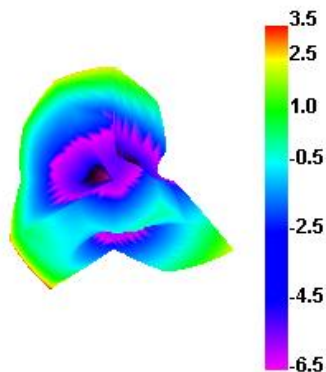
|      |       |       |      |      |       |       |      |
|------|-------|-------|------|------|-------|-------|------|
| 2110 | 58.77 | -3.12 | 1.89 |      |       |       |      |
| 2120 | 59.52 | -2.88 | 2.52 |      |       |       |      |
| 2130 | 59.64 | -2.59 | 1.93 |      |       |       |      |
| 2140 | 60.58 | -3.23 | 2.33 |      |       |       |      |
| 2150 | 59.34 | -3.07 | 2.34 |      |       |       |      |
| 2160 | 59.89 | -3.02 | 2.44 |      |       |       |      |
| 2170 | 60.27 | -2.82 | 2.74 |      |       |       |      |
| 2180 | 65.65 | -2.55 | 2.19 |      |       |       |      |
| 2190 | 66.69 | -3.22 | 2.59 |      |       |       |      |
| 2200 | 59.05 | -2.75 | 2.08 |      |       |       |      |
| 2210 | 62.49 | -2.04 | 2.69 |      |       |       |      |
| 2220 | 64.91 | -1.88 | 2.72 |      |       |       |      |
| 2230 | 69.03 | -1.61 | 2.98 |      |       |       |      |
| 2240 | 63.76 | -1.95 | 2.71 |      |       |       |      |
| 2250 | 63.05 | -2    | 2.35 |      |       |       |      |
| 2260 | 67.56 | -1.7  | 2.29 |      |       |       |      |
| 2270 | 63.4  | -1.98 | 2.94 |      |       |       |      |
| 2280 | 60.28 | -2.2  | 2.74 |      |       |       |      |
| 2290 | 59.38 | -2.26 | 2.84 |      |       |       |      |
| 2300 | 58.12 | -2.36 | 2.89 |      |       |       |      |
| 2310 | 59.79 | -2.23 | 3.18 |      |       |       |      |
| 2320 | 59.86 | -2.38 | 2.98 | 2510 | 56.85 | -2.45 | 1.89 |
| 2330 | 59.23 | -2.27 | 2.96 | 2520 | 56.51 | -2.48 | 1.87 |
| 2340 | 60.95 | -2.15 | 2.85 | 2530 | 58.55 | -2.4  | 2.19 |
| 2350 | 61.43 | -2.41 | 2.86 | 2540 | 59.01 | -2.76 | 1.93 |
| 2360 | 61.92 | -2.45 | 2.82 | 2550 | 58.34 | -2.81 | 1.96 |
| 2370 | 62.3  | -2.65 | 2.69 | 2560 | 58.61 | -2.39 | 2.39 |
| 2380 | 63.98 | -2.68 | 2.54 | 2570 | 59.73 | -2.24 | 2.43 |
| 2390 | 65.13 | -2.59 | 2.52 | 2580 | 59.95 | -2.22 | 2.17 |
| 2400 | 65.97 | -2.76 | 2.13 | 2590 | 60.62 | -2.17 | 2.18 |
| 2410 | 66.88 | -2.85 | 1.98 | 2600 | 62.56 | -2.04 | 2.05 |
| 2420 | 67.99 | -2.68 | 2.1  | 2610 | 64.64 | -1.9  | 2.35 |
| 2430 | 63.04 | -2.67 | 2.07 | 2620 | 61.17 | -2.13 | 2.12 |
| 2440 | 65.13 | -2.52 | 2.18 | 2630 | 61.52 | -2.33 | 2.17 |
| 2450 | 58.23 | -2.35 | 2.28 | 2640 | 62.01 | -2.08 | 2.15 |
| 2460 | 57.2  | -2.43 | 2.16 | 2650 | 63.16 | -2    | 2.19 |
| 2470 | 57.88 | -2.37 | 2.14 | 2660 | 64.45 | -1.91 | 2.25 |
| 2480 | 60.08 | -2.21 | 2.27 | 2670 | 65.07 | -1.87 | 2.28 |
| 2490 | 57.84 | -2.38 | 1.99 | 2680 | 67.79 | -1.95 | 2.25 |
| 2500 | 57.77 | -2.38 | 1.96 | 2690 | 69.38 | -2.26 | 2.68 |

|                                                                                                                         |           |              |                                     |
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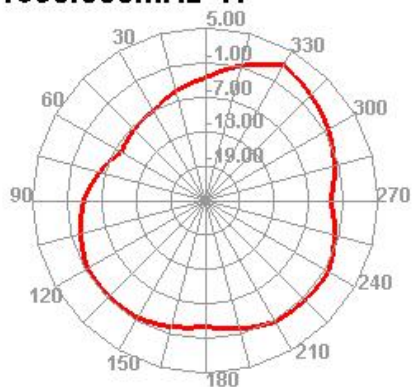


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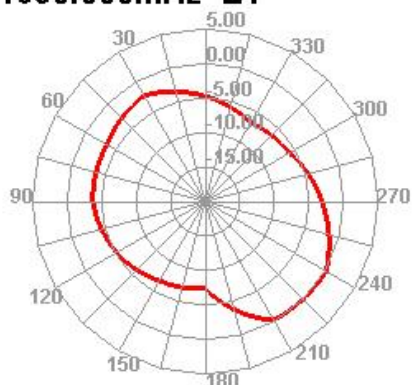
1690.000MHz



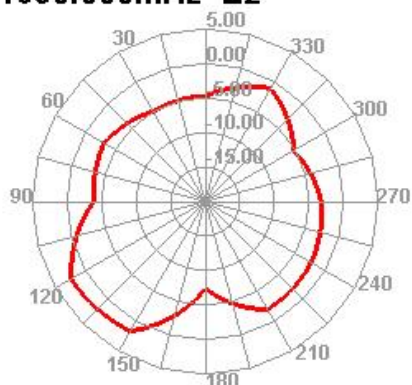
1690.000MHz H



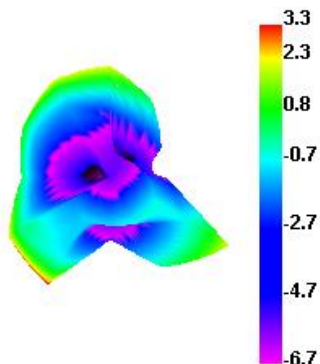
1690.000MHz E1



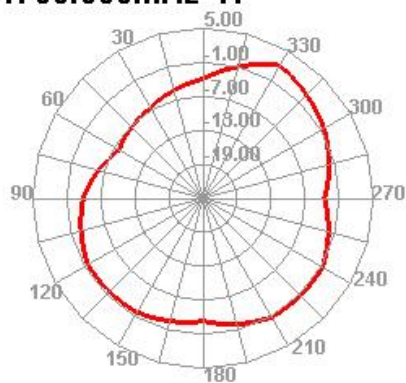
1690.000MHz E2



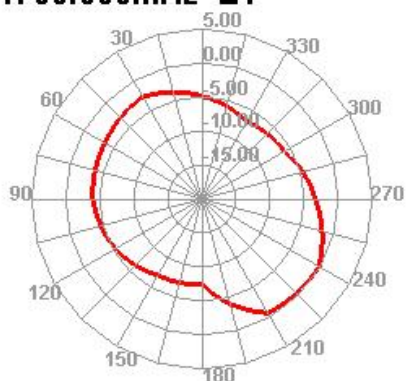
1700.000MHz



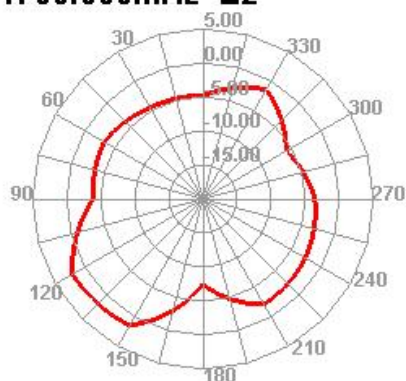
1700.000MHz H



1700.000MHz E1

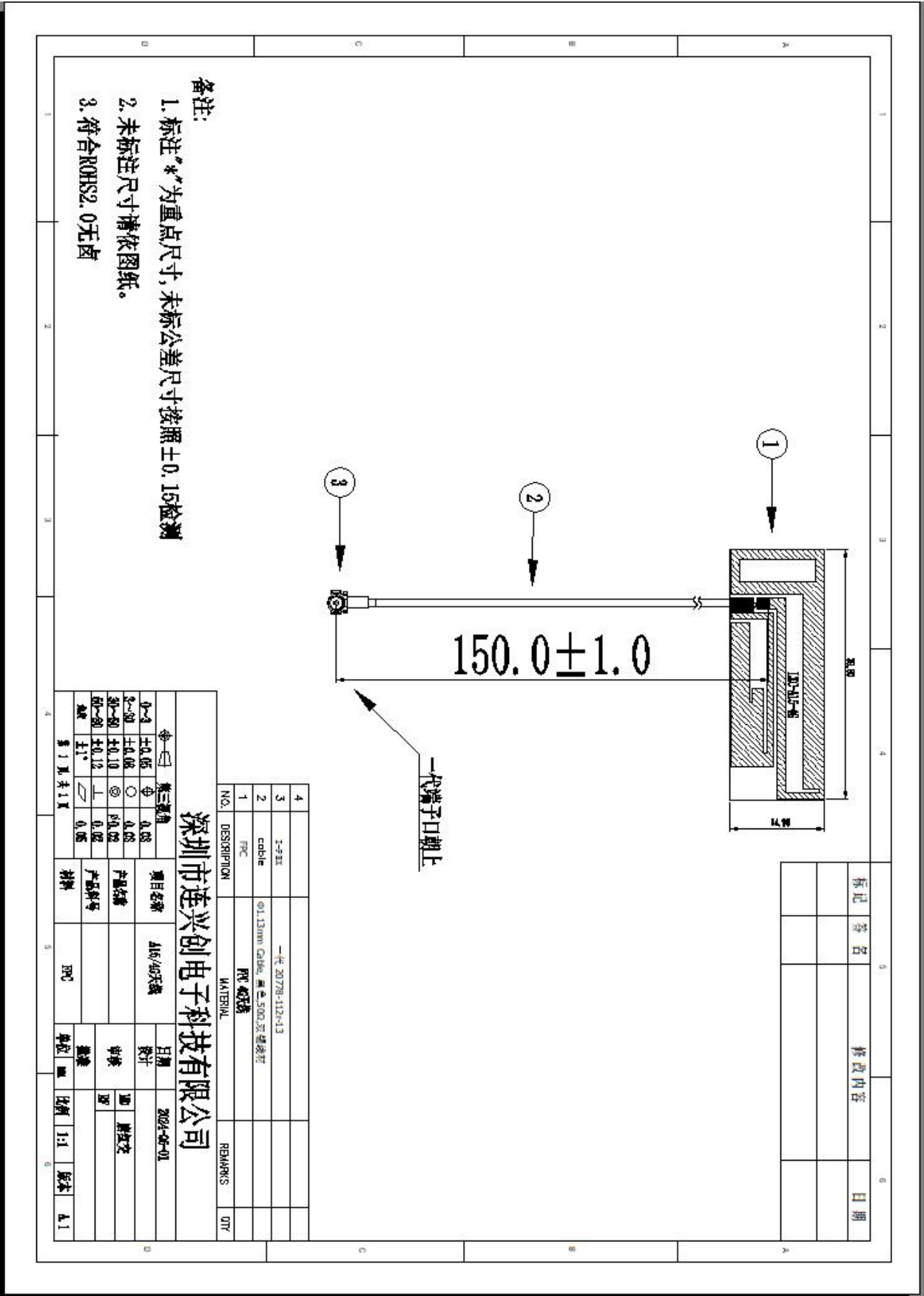


1700.000MHz E2



|                                                                                                                           |           |              |                                     |
|---------------------------------------------------------------------------------------------------------------------------|-----------|--------------|-------------------------------------|
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6 Mechanical drawing



## 7 Reliability tests

### 7.1 Test content

| No | 试验项目   | 试验方法              | 判定基准                          |
|----|--------|-------------------|-------------------------------|
| 1  | 盐水喷雾试验 | 把盐浓度 5%的溶液喷雾 48HR | 不能有变色, 歪 (变形) 脱落等的缺点 腐蚀面积不能过大 |
|    |        |                   |                               |

### 7.2 Test results

| NO | 样品数 | 试验期间  | 实验结果 | 备注                    |
|----|-----|-------|------|-----------------------|
| 1  | 50  | 24 小时 | OK   | 技术等级为 9 级<br>腐蚀<0.4mm |
| 2  | 50  | 48 小时 | OK   | 技术等级为 9 级<br>腐蚀<0.4mm |

## 8 Conclusion

From the above test results, we can know the electrical performance of the antenna is seems good.

Shenzhen Lxc Electronics Technology Co ., Ltd ,look forward to your confirmation, thank you for your cooperation !

|                                                                                                                             |           |              |                                     |
|-----------------------------------------------------------------------------------------------------------------------------|-----------|--------------|-------------------------------------|
| 8Project:                                                                                                                   |           | Author:Wang  | File Name:<br><br><b>AC220V 63A</b> |
| Date: 2024-07-11                                                                                                            |           |              |                                     |
| TEST:                                                                                                                       | Language: | Check: Zhong |                                     |
| A                                                                                                                           | English   |              |                                     |
|                                                                                                                             |           |              |                                     |
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