

# Shenzhen Lxc Electronics Technology Co., Ltd

深圳市连兴创电子科技有限公司

## APPROVAL SHEET

### 承认书

客户 (Customer) : 威视达康

产品 (Product) : WIFI 内置天线 (L=80MM)

型号 (Model) : C993-WIFI 天线

料号 (Part Number) : LXC1BL80202407300002

制作人 (Written By) : 唐红交

签发时间 (Issued Date) : 2024-07-30

客户 CUSTOMER

|                                |                                              |
|--------------------------------|----------------------------------------------|
| 频率范围(Frequency range)          | WIFI:2400-2500 5150-5850 (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)             | 内置天线 (Built-in 内置天线 antenna)                 |
| 天线增益峰值(Antenna gain MAX (dBi)) | 5dBi+/-1                                     |
| 天线供应商 (Antenna supplier)       | Shenzhen Lxc Electronics Technology Co., Ltd |
| 天线型号 (Antenna Model)           | C993-WIFI天线                                  |

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

|                                                                                                                                 |           |              |                                        |
|---------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                       |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                                |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

Revision History

| Date       | Revision | Description of Changes       |
|------------|----------|------------------------------|
| 2024-07-30 | RA       | Measured with SUS301 sample. |

深圳市连兴创电子科技有限公司 .....1

PROJECT .....2

ANTENNA COMPONENTST ..... 3

1 TECHNICAL SUMMARY .....3

2 GENERAL DESCRIPTION .....3

2.1 Components/Part revisions ..... 3

3 MECHANICAL DESCRIPTION .....3

4 ELECTRICAL PERFORMANCE.....3

4.1 Set-up .....3

4.1.1 VSWR ..... 3

4.1.2 Gain & Radiation Patterns ..... 3

4.1.3 Matching Circuit Description ..... 3

4.2 Measurement Data .....5

4.2.1 Active result（GSM） ..... 5

6 Mechanical drawing ..... 5

7 RELIABILITY TESTS.....12

7.1 Test content ..... 12

7.2 Test results ..... 12

8 CONCLUSION .....9

|                                                                                                                                 |           |              |                                        |
|---------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                       |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                                |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

# 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.

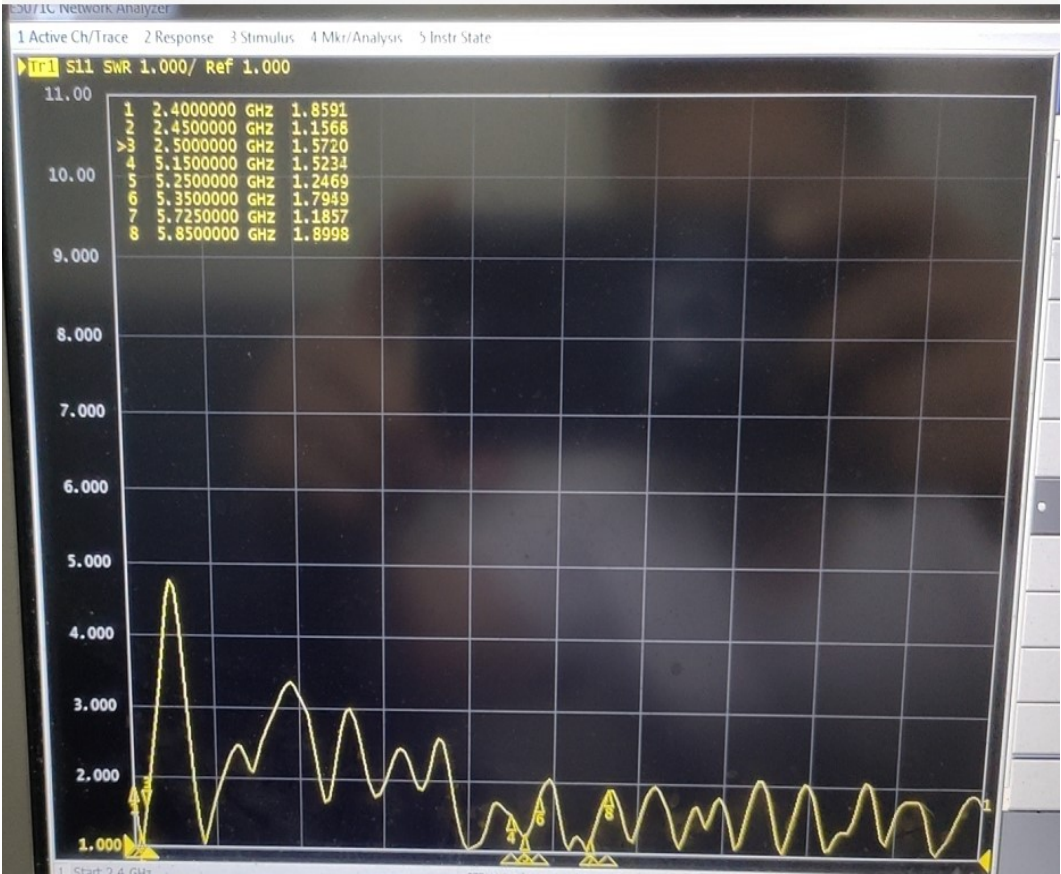
#### 4.1.3 Matching Circuit Description

|                                                                                                                              |           |              |                                        |
|------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                    |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                             |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

有源测试数据

| 天线测试报告           | 802.11B Antenna Performance Table |       |       | 802.11G Antenna Performance Table |       |       |
|------------------|-----------------------------------|-------|-------|-----------------------------------|-------|-------|
| Channel          | CH 1                              | CH 6  | CH11  | CH 1                              | CH 6  | CH 11 |
| Max Power (dBm)  | 20.4                              | 20.6  | 20.4  | 20.2                              | 19.6  | 19.3  |
| TRP(dBm)         | 17.1                              | 17.9  | 17.5  | 17.1                              | 16.2  | 16.7  |
| Sensitivity(dBm) | -89.6                             | -89.8 | -90.2 | -78.3                             | -78.8 | -79.6 |
| TIS(dBm)         | -87.7                             | -87.8 | -88.8 | -76.6                             | -76.4 | -77.2 |

| 天线测试报告           | 802.11N Antenna Performance Table |       |       | 802.11A Antenna Performance Table |        |        |
|------------------|-----------------------------------|-------|-------|-----------------------------------|--------|--------|
| Channel          | CH1                               | CH6   | CH11  | CH 36                             | CH 149 | CH 161 |
| Max Power (dBm)  | 18.3                              | 18.2  | 19.2  | 19.2                              | 19.4   | 19.7   |
| TRP(dBm)         | 16.6                              | 16.7  | 17.9  | 17.3                              | 16.5   | 16.8   |
| Sensitivity(dBm) | -72.5                             | -72.2 | -72.4 | -73.4                             | -72.7  | -72.8  |
| TIS(dBm)         | -69.2                             | -69.7 | -69.9 | -69.2                             | -69.3  | -69.5  |



|                                                                                                                                 |           |              |                                        |
|---------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                       |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                                |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

## 4.2 Measurement Data

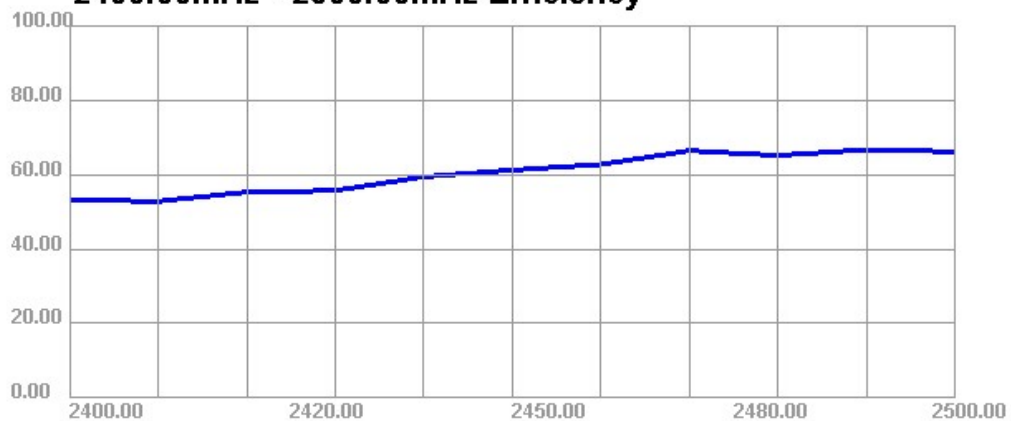
### 4.2.1 Active result (2.4G)

| Freq<br>(MHz) | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) |
|---------------|-------------|--------------|---------------|
| 2400          | 59.21       | -2.28        | 2.74          |
| 2410          | 58.24       | -2.35        | 2.62          |
| 2420          | 56.85       | -2.45        | 2.44          |
| 2430          | 56.6        | -2.47        | 2.32          |
| 2440          | 57.88       | -2.37        | 2.49          |
| 2450          | 63.35       | -1.98        | 2.88          |
| 2460          | 63.1        | -2           | 2.9           |
| 2470          | 58.23       | -2.35        | 2.51          |
| 2480          | 60.98       | -2.15        | 2.74          |
| 2490          | 59.85       | -2.23        | 2.62          |
| 2500          | 56.6        | -2.47        | 2.33          |

2400.00MHz - 2500.00MHz Gain

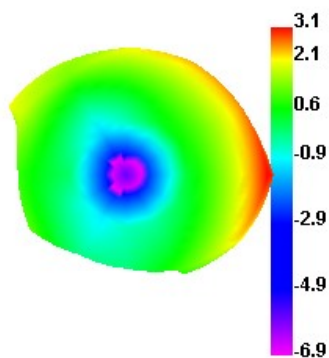


2400.00MHz - 2500.00MHz Efficiency

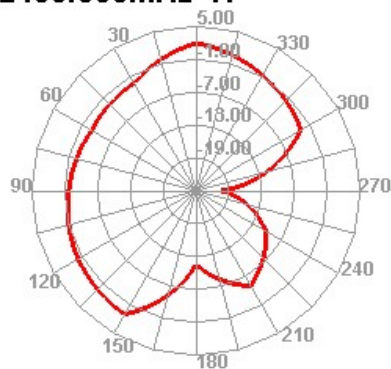


|                                                                                                                                |           |              |                                        |
|--------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                      |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                               |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

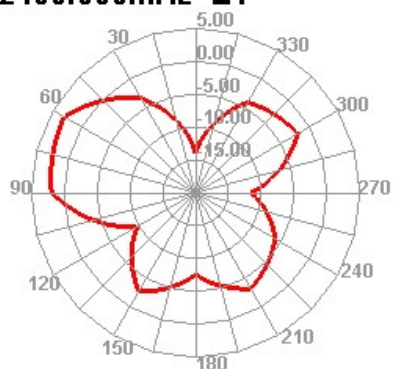
2400.000MHz



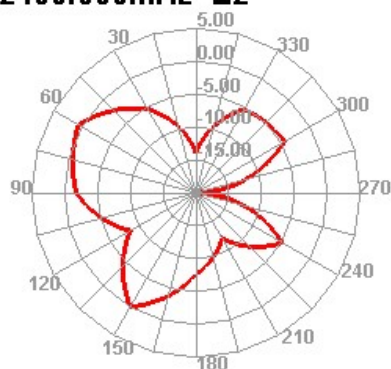
2400.000MHz H



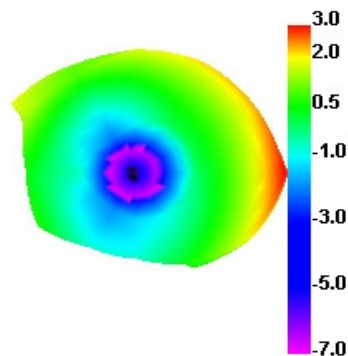
2400.000MHz E1



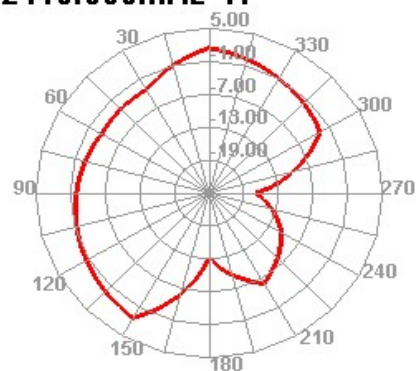
2400.000MHz E2



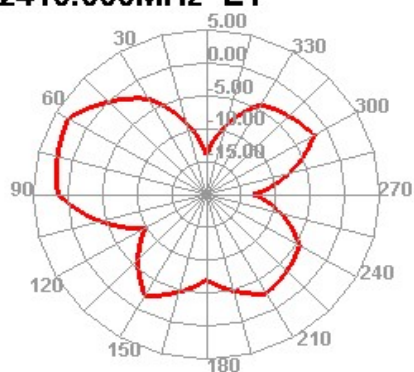
2410.000MHz



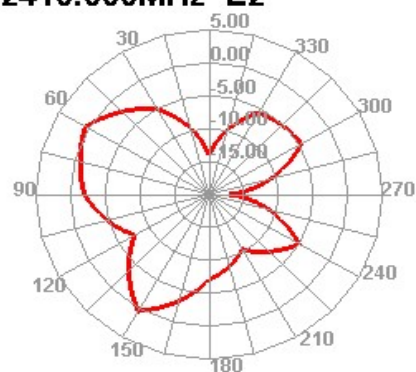
2410.000MHz H



2410.000MHz E1



2410.000MHz E2



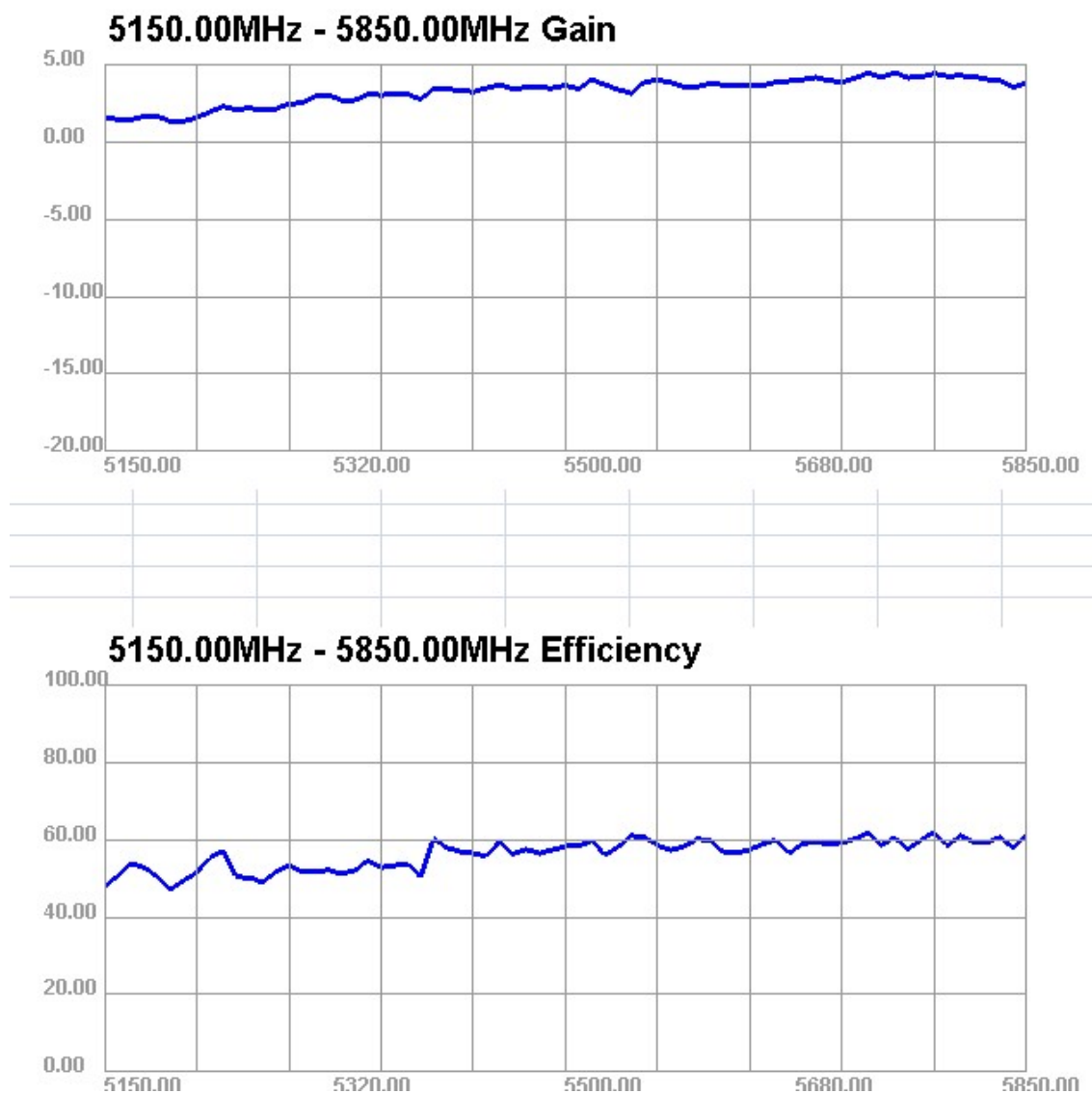
|                                                                                                                                 |           |              |                                        |
|---------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                       |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                                |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

| Freq<br>(MHz) | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) |
|---------------|-------------|--------------|---------------|
| 5150          | 50.43       | -2.41        | 2.49          |
| 5160          | 50.69       | -2.24        | 2.52          |
| 5170          | 51.03       | -2.29        | 2.53          |
| 5180          | 51.77       | -2.31        | 2.54          |
| 5190          | 52.24       | -2.46        | 2.59          |
| 5200          | 55.15       | -2.58        | 2.91          |
| 5210          | 56.24       | -2.5         | 3.14          |
| 5220          | 56.27       | -2.74        | 3.29          |
| 5230          | 58.66       | -2.32        | 3.31          |
| 5240          | 59.23       | -2.27        | 3.39          |
| 5250          | 56.29       | -2.5         | 3.41          |
| 5260          | 54.9        | -2.6         | 3.48          |
| 5270          | 55.01       | -2.84        | 3.71          |
| 5280          | 55.93       | -2.68        | 3.8           |
| 5290          | 55.55       | -2.55        | 3.11          |
| 5300          | 55.65       | -2.55        | 3.08          |
| 5310          | 57.83       | -2.38        | 3.46          |
| 5320          | 56.42       | -2.49        | 3.55          |
| 5330          | 56.87       | -2.77        | 3.57          |
| 5340          | 54.92       | -2.6         | 3.71          |
| 5350          | 59.77       | -2.23        | 3.79          |
| 5360          | 59.54       | -2.18        | 3.13          |
| 5370          | 59.41       | -2.26        | 3.5           |
| 5380          | 59.93       | -2.15        | 3.14          |
| 5390          | 56.24       | -2.5         | 2.97          |
| 5400          | 56.63       | -1.76        | 3.83          |
| 5410          | 57.01       | -1.8         | 3.76          |
| 5420          | 61.87       | -1.75        | 3.91          |
| 5430          | 62.56       | -1.7         | 3.95          |
| 5440          | 62.76       | -1.82        | 3.12          |
| 5450          | 63.69       | -1.69        | 3.34          |
| 5460          | 63.84       | -1.75        | 3.27          |
| 5470          | 63.92       | -1.68        | 3.59          |
| 5480          | 64.55       | -1.64        | 3.78          |
| 5490          | 65.33       | -1.65        | 3.82          |
| 5500          | 65.38       | -1.53        | 3.35          |
| 5510          | 65.86       | -1.5         | 3.54          |
| 5520          | 66.74       | -1.57        | 3.38          |
| 5530          | 64.12       | -1.93        | 3.64          |
| 5540          | 64.83       | -1.88        | 3.44          |
| 5550          | 63.76       | -1.32        | 3.25          |

|                                                                                                                                |           |              |                                        |
|--------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                      |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                               |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

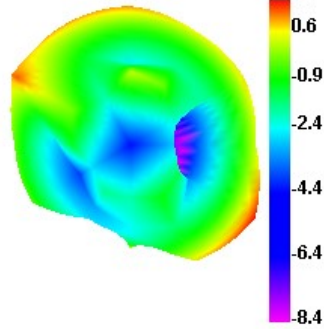
|      |       |       |      |
|------|-------|-------|------|
| 5560 | 64.17 | -1.48 | 3.89 |
| 5570 | 64.64 | -1.7  | 3.37 |
| 5580 | 62.61 | -2.03 | 3.59 |
| 5590 | 60.72 | -2.17 | 3.82 |
| 5600 | 65.5  | -1.71 | 3.54 |
| 5610 | 66.69 | -1.76 | 3.31 |
| 5620 | 64.18 | -1.93 | 3.96 |
| 5630 | 61.2  | -2.13 | 3.11 |
| 5640 | 59.42 | -2.26 | 3.18 |
| 5650 | 61.89 | -1.68 | 3.83 |
| 5660 | 66.93 | -1.66 | 3.87 |
| 5670 | 66.66 | -1.76 | 3.84 |
| 5680 | 68.38 | -1.65 | 3.14 |
| 5690 | 65.14 | -1.86 | 3.29 |
| 5700 | 66.02 | -1.8  | 3.35 |
| 5710 | 65.69 | -1.82 | 3.46 |
| 5720 | 64.13 | -1.93 | 3.36 |
| 5730 | 61.91 | -1.43 | 3.89 |
| 5740 | 68.11 | -1.67 | 3.9  |
| 5750 | 68.29 | -1.66 | 3.56 |
| 5760 | 67.69 | -1.51 | 3.95 |
| 5770 | 67.82 | -1.62 | 3.26 |
| 5780 | 66.48 | -1.58 | 3.41 |
| 5790 | 67.39 | -1.85 | 3.47 |
| 5800 | 65.66 | -1.83 | 3.51 |
| 5810 | 65.84 | -1.44 | 3.91 |
| 5820 | 66.12 | -1.54 | 3.28 |
| 5830 | 66.49 | -1.58 | 3.34 |
| 5840 | 66.89 | -1.88 | 3.66 |
| 5850 | 66.93 | -1.75 | 3.84 |

|                                                                                                                                |           |              |                                        |
|--------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                      |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                               |           | Check: Zhong |                                        |
| TEST:                                                                                                                          | Language: |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

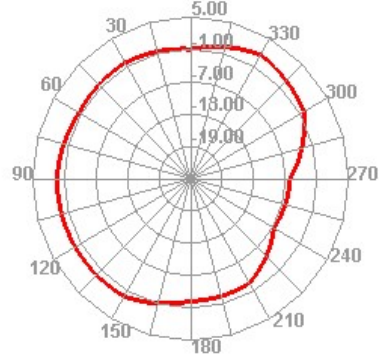


|                                                                                                                                |           |              |                                        |
|--------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                      |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                               |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

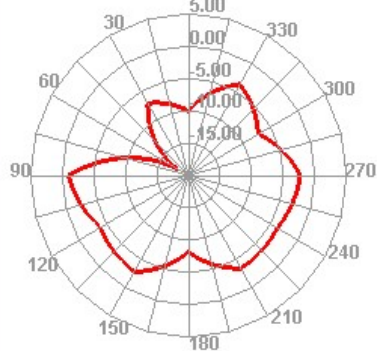
5150.000MHz



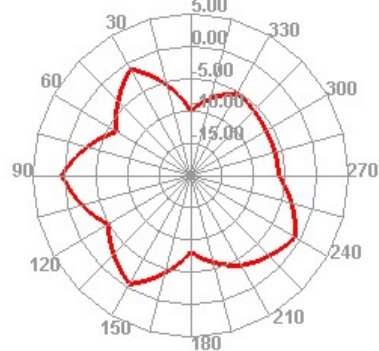
5150.000MHz H



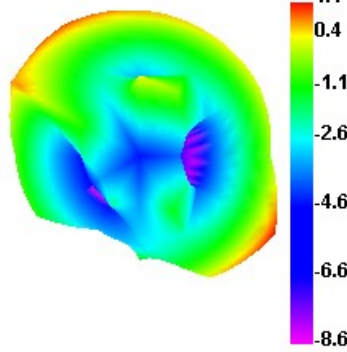
5150.000MHz E1



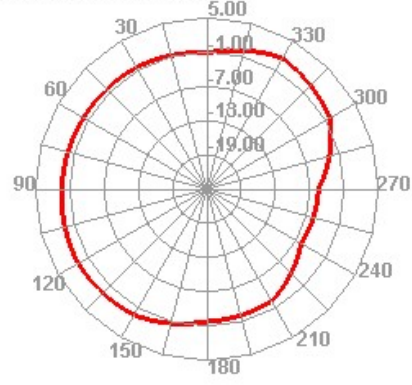
5150.000MHz E2



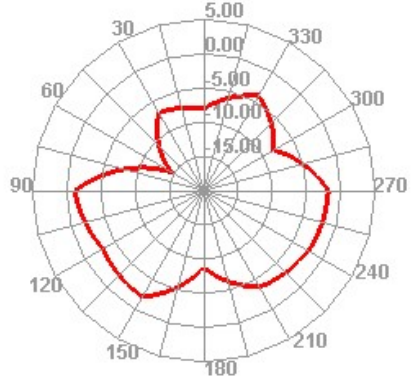
5160.000MHz



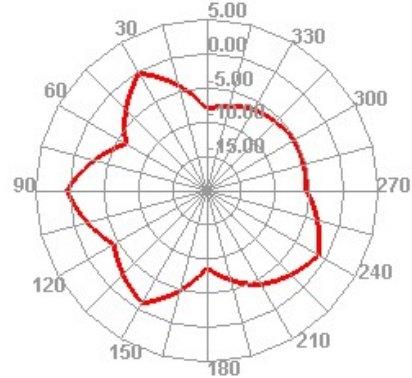
5160.000MHz H



5160.000MHz E1

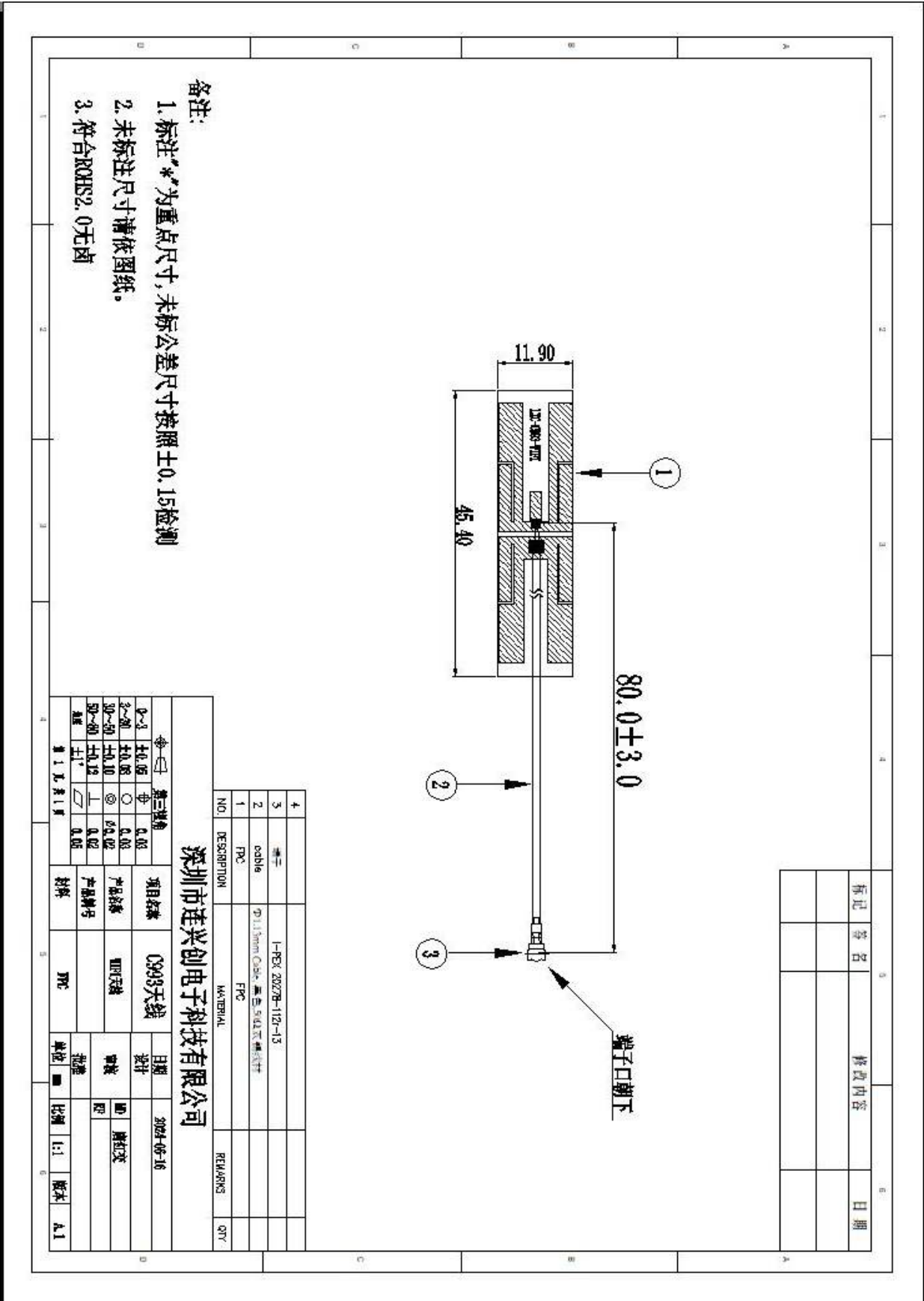


5160.000MHz E2



|                                                                                                                                  |           |              |                                        |
|----------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|----------------------------------------|
| 8Project:                                                                                                                        |           | Author:Wang  | File Name:<br><br><b>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                                 |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |

6 Mechanical drawing



|                                               |           |              |            |               |
|-----------------------------------------------|-----------|--------------|------------|---------------|
| 8Project:                                     |           | Author:Wang  | File Name: | C993- WIFI 天线 |
| Date: 2024-07-30                              |           |              |            |               |
| 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          |           |              |            |               |
| 电话： 0755-29195258    传真： 0755-29590286        |           |              |            |               |
| Shenzhen Lxc Electronics Technology Co ., Ltd |           |              |            |               |

# 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 |

# 8Conclusion

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>C993- WIFI 天线</b> |
| Date: 2024-07-30                                                                                                                |           |              |                                        |
| 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 Lxc Electronics Technology Co ., Ltd |           |              |                                        |