



# 深圳市顺达成科技有限公司

ShenZhen ShunDaCheng Technology Co., Ltd.

## 承 认 书

### SPECIFICATION FOR APPROVAL

|                             |                                  |                         |                                                   |
|-----------------------------|----------------------------------|-------------------------|---------------------------------------------------|
| 客户项目名 Customer Project Name | F215Q                            | 顺达成项目名 SDC Project Name | F215Q                                             |
| 客户编码 Customer P/N           | CZ. 0215. A012<br>CZ. 0215. A013 | 顺达成料号 SDC P/N           | PCB2202-1131R-305(DIV)<br>PCB2202-1131R-190(MAIN) |
| 频段 Band                     | WIFI2. 4G/5. 8G                  |                         |                                                   |
| 版本号 Version                 | A0                               |                         |                                                   |
|                             | 设计人信息/Designer Information       |                         |                                                   |
| 射频工程师 RF Engineer           | 杨永辉                              | 研发主管 R&D Diretor        | 符学荣                                               |
| 结构工程师 ME Engineer           | 李瑶娜                              |                         |                                                   |

| 审批/ Approval |                |               |                | 客户批准/Customer Approval |                |
|--------------|----------------|---------------|----------------|------------------------|----------------|
|              | 制作 Prepared By | 审核 Checked By | 批准 Approval By | 审核 Checked By          | 批准 Approval By |
| 签章 Signature | 李瑶娜            | 杨永辉           | 符学荣            |                        |                |
| 日期 Date      | 2024. 02. 23   | 2024. 02. 23  | 2024. 02. 23   |                        |                |

| 修订履历/Change Log |                         |                      |                |         |
|-----------------|-------------------------|----------------------|----------------|---------|
| 版本 Version      | 修订内容 Change Description | 责任人 Person in Charge | 核准 Approval By | 日期 Date |
|                 |                         |                      |                |         |
|                 |                         |                      |                |         |
|                 |                         |                      |                |         |

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# 深圳市顺达成科技有限公司

ShenZhen ShunDaCheng Technology Co., Ltd.

## 样品尺寸测量报告

### Sample Dimensions Test Report

|                            |                  |                     |                          |                  |         |
|----------------------------|------------------|---------------------|--------------------------|------------------|---------|
| 测试日期<br>Test Date          | 2024. 02. 23     | 样品数量<br>Sample Qty. | 3                        | 测试人<br>Inspector | 许燕芳     |
| 尺寸编号<br>Dimension No.      | 标准<br>Standard   | 样品 1<br>Sample 1    | 样品 2<br>Sample 2         | 样品 3<br>Sample 3 | Pass/NG |
| ①长度<br>length              | 47±0. 2mm        | 47                  | 47. 1                    | 47               | Pass    |
| ②宽度<br>width               | 8. 3±0. 2mm      | 8. 3                | 8. 3                     | 8. 4             | Pass    |
| ③厚度<br>thickness           | 0. 6±0. 05mm     | 0. 6                | 0. 6                     | 0. 6             | Pass    |
| ④线长<br>Line length         | 305±2mm          | 305                 | 306                      | 306              | Pass    |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
| 最终结论<br>Conclusion         |                  |                     |                          |                  | PASS    |
| 测试人&日期<br>Inspector & Date | 许燕芳 2024. 02. 23 |                     | 批准&日期<br>Approval & Date |                  |         |



### Drawing or Product Image





样品尺寸测量报告

Sample Dimensions Test Report

|                            |                  |                     |                          |                  |         |
|----------------------------|------------------|---------------------|--------------------------|------------------|---------|
| 测试日期<br>Test Date          | 2024. 02. 23     | 样品数量<br>Sample Qty. | 3                        | 测试人<br>Inspector | 许燕芳     |
| 尺寸编号<br>Dimension No.      | 标准<br>Standard   | 样品 1<br>Sample 1    | 样品 2<br>Sample 2         | 样品 3<br>Sample 3 | Pass/NG |
| ①长度<br>length              | 47±0. 2mm        | 47                  | 47. 1                    | 47               | Pass    |
| ②宽度<br>width               | 8. 3±0. 2mm      | 8. 3                | 8. 3                     | 8. 4             | Pass    |
| ③厚度<br>thickness           | 0. 6±0. 05mm     | 0. 6                | 0. 6                     | 0. 6             | Pass    |
| ④线长<br>Line length         | 190±2mm          | 190                 | 191                      | 190              | Pass    |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
|                            |                  |                     |                          |                  |         |
| 最终结论<br>Conclusion         |                  |                     |                          |                  | PASS    |
| 测试人&日期<br>Inspector & Date | 许燕芳 2024. 02. 23 |                     | 批准&日期<br>Approval & Date |                  |         |



## 射频性能测量报告

### RF Performance Test Report

#### 天线测试设备简介

##### Antenna Test Equipment Introduction

测试天线输入特性使用 **Agilent E5071C** and **Agilent 5062A** 矢量网络分析仪；辐射特性利用广屏三维近场暗室进行测试，并分别使用 8960 E5515 和 Agilent E4438C 进行了分析。暗房的测试坐标如下：

Test of antenna input characteristics using **Agilent E5071C** and **Agilent 5062A** vector network analyzer; The radiation pattern of the antenna are tested using the guangping 3D near field Anechoic Chamber, and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows:

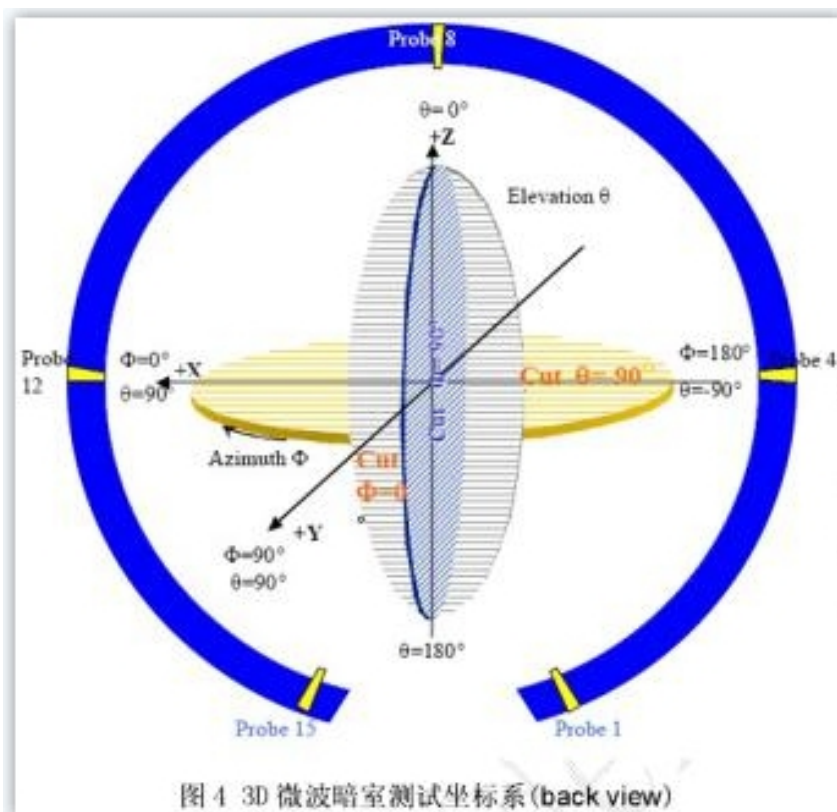


图 4 3D 微波暗室测试坐标系 (back view)

#### 1. S11 参数测量 / **S11 Parameter-VSWR**

使用一根 50 Ω 同轴电缆连接到天线，然后该电缆连接到网络分析仪测量 S11 参数，被测量产品远离金属至少 20 厘米。

Measuring Method is a 50 Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

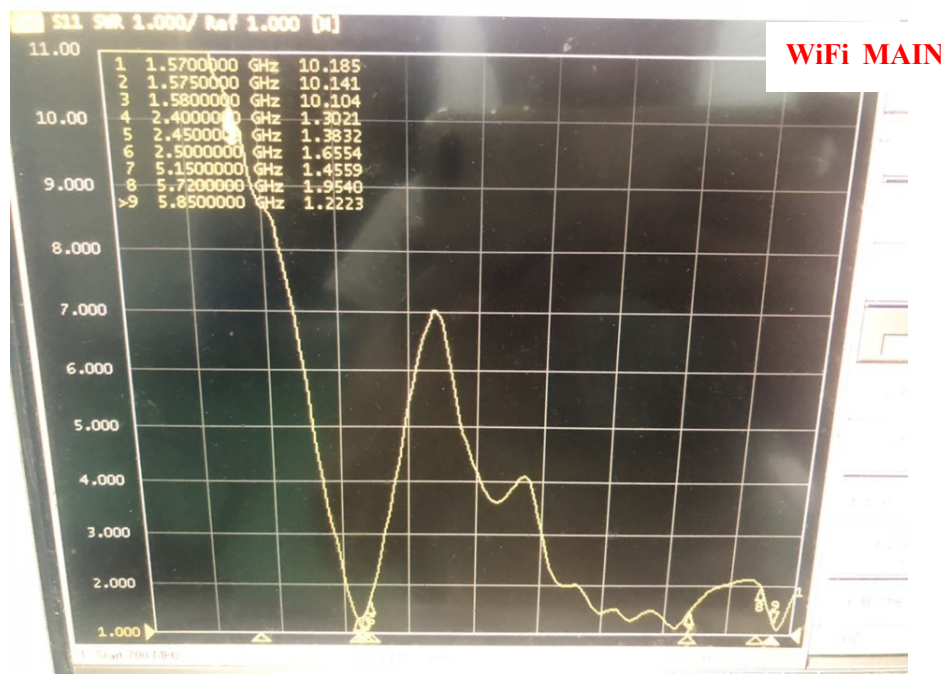


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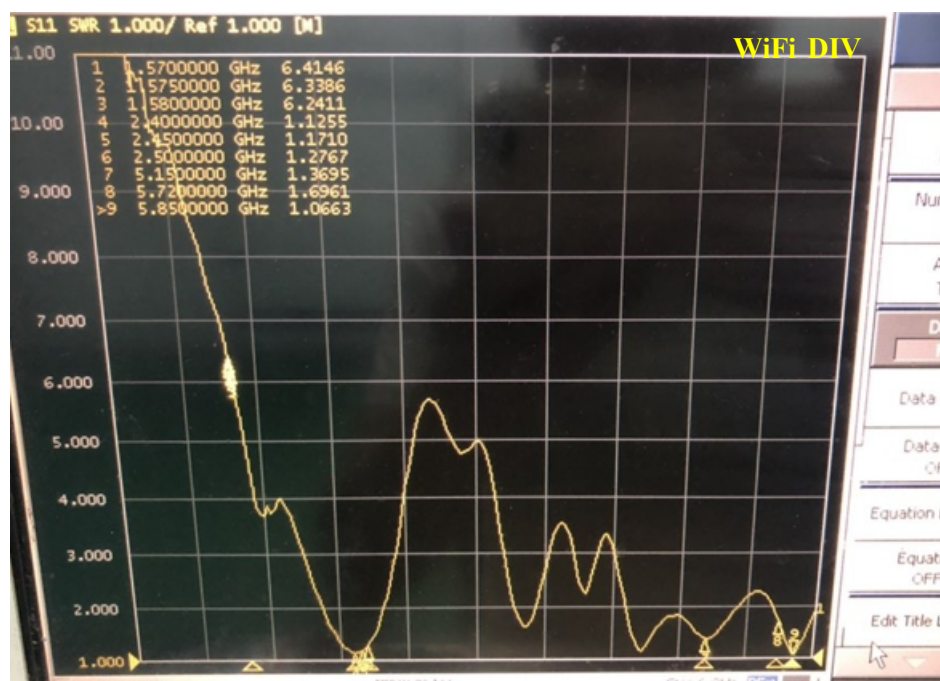
ShenZhen ShunDaCheng Technology Co., Ltd.

## S11 Parameter-VSWR

| Frequency (MHZ)     | 2400 | 2450 | 2500 | 5150 | 5720 | 5850 |
|---------------------|------|------|------|------|------|------|
| Standing wave ratio | 1.30 | 1.38 | 1.65 | 1.45 | 1.95 | 1.22 |



| Frequency (MHZ)     | 2400 | 2450 | 2500 | 5150 | 5720 | 5850 |
|---------------------|------|------|------|------|------|------|
| Standing wave ratio | 1.12 | 1.17 | 1.27 | 1.36 | 1.69 | 1.06 |





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## 2. 天线匹配网络/Antenna Matching Network

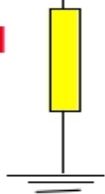
Antenna



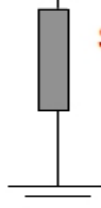
Series  
N/A

PA

Shunt 01  
N/A



Shunt 02  
N/A

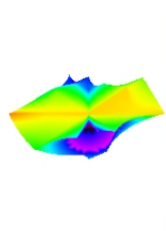


## 3. Gain & Efficiency

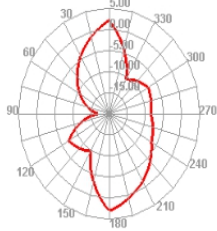
WiFi MAIN

| Passive Test For 2.4G |             |              |               |               |            |             |             |             |                     |                    |              |              |
|-----------------------|-------------|--------------|---------------|---------------|------------|-------------|-------------|-------------|---------------------|--------------------|--------------|--------------|
| Freq<br>(MHz)         | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHIS<br>(%) | Max<br>(dB) | Min<br>(dB) | irectivity<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
| 2400                  | 56.75       | -2.46        | 3.93          | 1.78          | 27.66      | 29.089      | 3.93        | -16.94      | 6.39                | 300                | 47.77        | 47.82        |
| 2425                  | 56.87       | -2.45        | 3.98          | 1.83          | 26.748     | 30.126      | 3.98        | -20.91      | 6.43                | 300                | 48.06        | 48.12        |
| 2450                  | 63.57       | -1.97        | 4.47          | 2.32          | 29.431     | 34.137      | 4.47        | -22.58      | 6.43                | 300                | 48.56        | 48.53        |
| 2475                  | 61.68       | -2.1         | 4.24          | 2.09          | 27.875     | 33.808      | 4.24        | -19.02      | 6.33                | 300                | 48.46        | 48.26        |
| 2500                  | 60.38       | -2.19        | 4.13          | 1.98          | 26.834     | 33.547      | 4.13        | -22.67      | 6.32                | 300                | 48.42        | 48.12        |

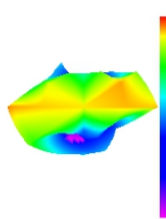
2400.000MHz



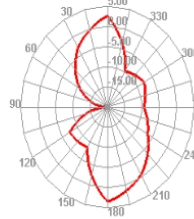
2400.000MHz H



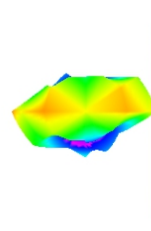
2450.000MHz



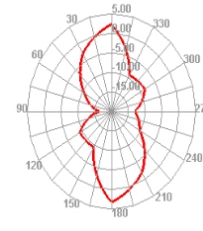
2450.000MHz H



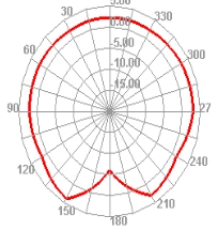
2500.000MHz



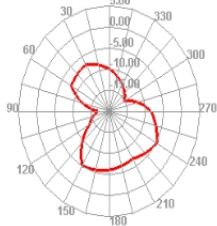
2500.000MHz H



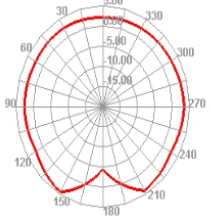
2400.000MHz E1



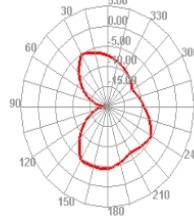
2400.000MHz E2



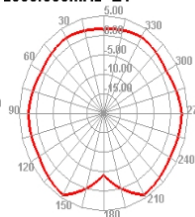
2450.000MHz E1



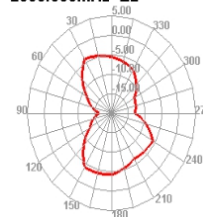
2450.000MHz E2



2500.000MHz E1



2500.000MHz E2



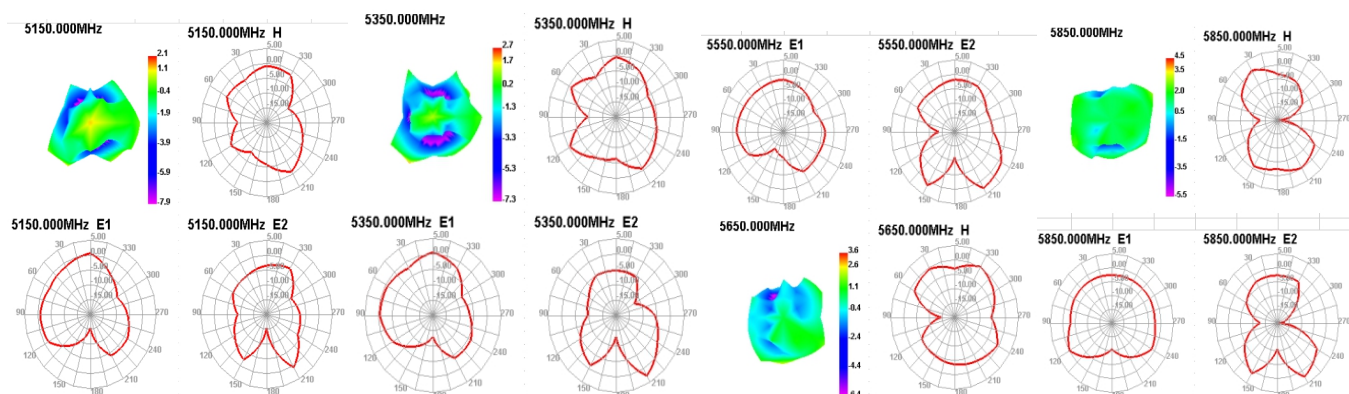


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Passive Test For 5.8G

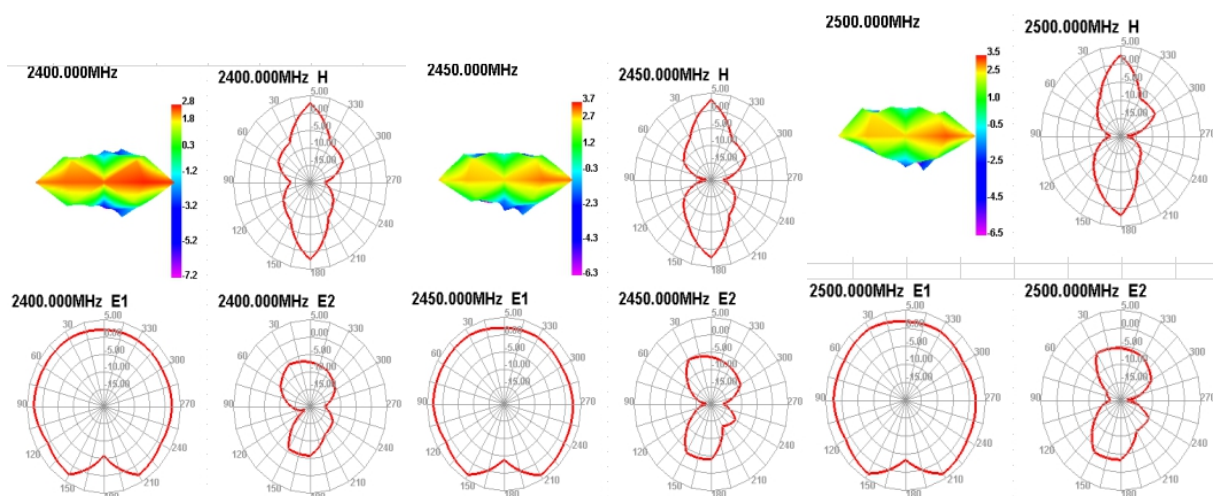
| Freq<br>(MHz) | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHS<br>(%) | Max<br>(dB) | Min<br>(dB) | irectivit<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
|---------------|-------------|--------------|---------------|---------------|------------|------------|-------------|-------------|--------------------|--------------------|--------------|--------------|
| 5150          | 48.73       | -3.12        | 2.06          | -0.09         | 17.654     | 31.071     | 2.06        | -15.51      | 5.19               | 120                | 58.6         | 58.01        |
| 5250          | 52.58       | -2.79        | 2.35          | 0.2           | 18.631     | 33.954     | 2.35        | -20.01      | 5.14               | 90                 | 58.53        | 57.74        |
| 5350          | 56.46       | -2.48        | 2.75          | 0.6           | 18.866     | 37.59      | 2.75        | -13.25      | 5.23               | 120                | 57.99        | 57.08        |
| 5450          | 57.88       | -2.37        | 2.75          | 0.6           | 19.958     | 37.922     | 2.75        | -12.65      | 5.12               | 60                 | 59.19        | 57.9         |
| 5550          | 63.85       | -1.95        | 3.46          | 1.31          | 23.056     | 40.793     | 3.46        | -13.81      | 5.41               | 150                | 60.21        | 58.81        |
| 5650          | 64.94       | -1.87        | 3.61          | 1.46          | 23.327     | 41.613     | 3.61        | -14.69      | 5.48               | 150                | 60.31        | 59.42        |
| 5750          | 66.42       | -1.78        | 3.65          | 1.5           | 24.434     | 41.984     | 3.65        | -14.53      | 5.42               | 0                  | 60.88        | 60.28        |
| 5850          | 64.33       | -1.92        | 4.48          | 2.33          | 23.293     | 41.037     | 4.48        | -19.41      | 6.4                | 0                  | 61.09        | 60.41        |



## WiFi DIV

Passive Test For 2.4G

| Freq<br>(MHz) | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHS<br>(%) | Max<br>(dB) | Min<br>(dB) | irectivit<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
|---------------|-------------|--------------|---------------|---------------|------------|------------|-------------|-------------|--------------------|--------------------|--------------|--------------|
| 2400          | 49.68       | -3.04        | 2.78          | 0.63          | 26.259     | 23.425     | 2.78        | -18.53      | 5.82               | 300                | 47.77        | 47.82        |
| 2425          | 49.02       | -3.1         | 2.87          | 0.72          | 24.622     | 24.393     | 2.87        | -15.99      | 5.97               | 300                | 48.06        | 48.12        |
| 2450          | 55.14       | -2.59        | 3.68          | 1.53          | 26.716     | 28.428     | 3.68        | -18.64      | 6.26               | 300                | 48.56        | 48.53        |
| 2475          | 53.99       | -2.68        | 3.55          | 1.4           | 25.706     | 28.279     | 3.55        | -19.58      | 6.22               | 300                | 48.46        | 48.26        |
| 2500          | 52.46       | -2.8         | 3.45          | 1.3           | 24.871     | 27.586     | 3.45        | -18.06      | 6.25               | 300                | 48.42        | 48.12        |





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| Passive Test For 5.8G |             |              |               |               |            |             |             |             |                     |                    |              |              |
|-----------------------|-------------|--------------|---------------|---------------|------------|-------------|-------------|-------------|---------------------|--------------------|--------------|--------------|
| Freq<br>(MHz)         | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | UHS<br>(%) | DHIS<br>(%) | Max<br>(dB) | Min<br>(dB) | irectivity<br>(dBi) | Beamwidth<br>(3dB) | AttH<br>(dB) | AttV<br>(dB) |
| 5150                  | 43.38       | -3.63        | 1.02          | -1.15         | 17.353     | 22.406      | 1           | -19.66      | 5.01                | 270                | 58.6         | 58.01        |
| 5250                  | 45.06       | -3.46        | 1.67          | -1.48         | 15.503     | 22.498      | 0.67        | -17.18      | 4.88                | 120                | 58.53        | 57.74        |
| 5350                  | 43.07       | -3.66        | 1.04          | -1.19         | 17.783     | 25.289      | 0.96        | -14.31      | 4.62                | 90                 | 57.99        | 57.08        |
| 5450                  | 48.39       | -3.15        | 1.36          | -1.29         | 21.699     | 26.693      | 0.86        | -12.83      | 4.02                | 90                 | 59.19        | 57.9         |
| 5550                  | 55.7        | -2.54        | 1.57          | -0.58         | 26.292     | 29.411      | 1.57        | -15.27      | 4.11                | 90                 | 60.21        | 58.81        |
| 5650                  | 59.99       | -2.22        | 2.18          | 0.03          | 30.382     | 29.604      | 2.18        | -15.05      | 4.4                 | 240                | 60.31        | 59.42        |
| 5750                  | 59.83       | -2.23        | 2.49          | 0.34          | 31.628     | 28.207      | 2.49        | -12.25      | 4.72                | 240                | 60.88        | 60.28        |
| 5850                  | 52.92       | -2.76        | 2.06          | -0.09         | 27.876     | 25.045      | 2.06        | -12.86      | 4.82                | 240                | 61.09        | 60.41        |

