

**承 认 书**

**SPECIFICATION APPROVAL SHEET**

客 户 :

CUSTOMER

客 户 料 号 :

CUS PART NO

版次:

REV

X3

品 名 / 规格 :

SPECIFICATION

2.4~2.5/5.15~7.15GHz

WIFI-1 Antenna L=450mm(Ø1.13+MHF)

单重:

weight

供 方 料 号 :

SUP PART NO

SLEingB247530345

日 期 :

DATE

2024.11.20

厂 商 核 准 :

SUP APPROVED

| 核准<br>APPROVED | 结构审核<br>Structure audit | RF审核<br>RF CHECKED | 品保审核<br>QA CHECKED | 承办<br>DESIGNED    |
|----------------|-------------------------|--------------------|--------------------|-------------------|
| <i>Jourym</i>  | <i>H2U</i>              | <i>7DM</i>         | <i>LSX</i>         | <i>2024.11.20</i> |

客 户 核 准 :

CUS APPROVED

| 核准<br>APPROVED | 审核<br>CHECKED | 品保审核<br>QA CHECKED | 承办<br>DESIGNED |
|----------------|---------------|--------------------|----------------|
|                |               |                    |                |

**东莞市森岭智能科技有限公司**

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正本由承办单位保存

[illegible]



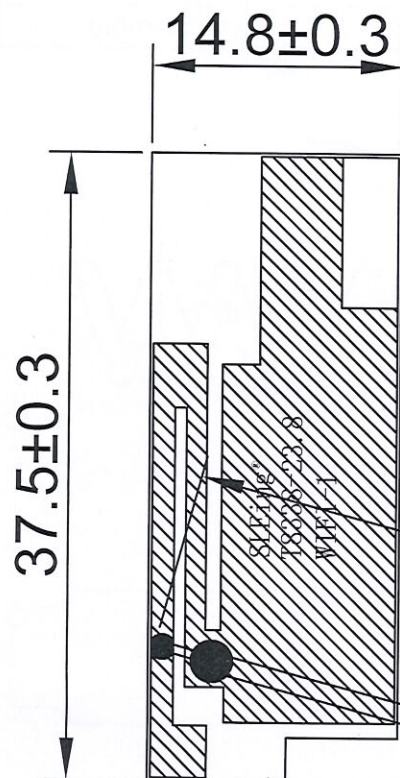
## 承认书项目表 (Spec Item )

| 序号<br>(NO.) | 项目 (Project)                     | 备注 (Remark) | 页码<br>(Page) |
|-------------|----------------------------------|-------------|--------------|
| 1           | 承认书封面 (Spec Cover)               |             | 1            |
| 2           | 变更记录 (MODIFICATION RECORD SHEET) |             | 2            |
| 3           | 承认书项目表 (Spec Item )              |             | 3            |
| 4           | 工程成品图 (Drawing)                  |             | 4            |
| 5           | 电性测试报告 (Test Reports )           |             | 5            |
| 6           | 天线组装图 (Antenna assembly diagram) |             | 6            |
| 7           | S参数测试 (S Parameter Test)         |             | 7~8          |
| 8           | 测试设备 (Test Setup)                |             | 9            |
| 9           | 测试效率 (Test Efficiency)           |             | 10           |
| 10          | OTA                              |             | 11           |
|             |                                  |             |              |
|             |                                  |             |              |
|             |                                  |             |              |
|             |                                  |             |              |

Give clear indication of:

1. The contents of the acknowledgement shall be arranged in order according to the items in the check sheet.
2. The number of copies of the acceptance letter shall be printed according to the customer's requirements, and the SGS report shall be stamped with the engineering seal.
3. All materials shall be confirmed by the customer. Any material/process/changes that may affect product quality and environmental quality must be re-sent to the customer for confirmation before import.
4. SGS report is valid for one year.
5. According to the contents attached to the actual acknowledgement, check the check form: "Yes" is provided, "no" is provided according to customer requirements.

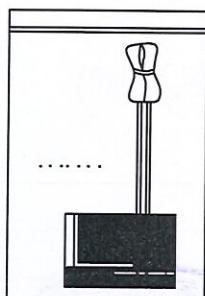
| REV. | CONTENT      | DATE       |
|------|--------------|------------|
| X1   | First Sample | 2024.07.23 |
| X2   | 修改FPC        | 2024.08.02 |
| X3   | 修改线长         | 2024.11.20 |



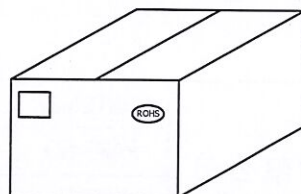
背胶: 3M 300LSE

Specification:  
Frequency Rang:2.4~2.5/5.15~7.15GHz(带机测试)  
Return Loss:-10dB or less  
VSWR:1.92 Max

450±3



50pcs/Bundle  
Packing:100pcs/bag



外箱须贴ROHS标签与物料标签各1PCS

|                                                                                                                            |  |  |              |        |                  |          |
|----------------------------------------------------------------------------------------------------------------------------|--|--|--------------|--------|------------------|----------|
| SLEing® 森岭<br>东莞市森岭智能科技有限公司<br>DONGGUAN SLEing INTEL-TECH CO.,LTD                                                          |  |  | CUSTOMER     |        |                  |          |
|                                                                                                                            |  |  | PART NO      |        |                  |          |
|                                                                                                                            |  |  | TITLE        |        | WiFi-1 ANTENNA   |          |
|                                                                                                                            |  |  | S.L P/NO     |        | SLEingB247530345 |          |
|  TOLERANCE UNLESS OTHERWISE SPECIFIED |  |  | SIZE         | DRAWN  | CHECKED          | APPROVED |
|                                                                                                                            |  |  | A4           | Xicang |                  | H2U      |
| UNIT:mm                                                                                                                    |  |  | ANGLES ±0.5° | X.     | ±0.3             |          |
| SHEET: 1/1                                                                                                                 |  |  | .XX ±0.05    | XX.    | ±0.5             |          |
| SCALE: 1/1                                                                                                                 |  |  |              | XXX.   | ±2.0             |          |

| NO | PART NAME | DESCRIPTION                         | REMARK          | Q'TY |
|----|-----------|-------------------------------------|-----------------|------|
| 3  | Connector | MHF Plug for Φ1.13 Cable            | 第一代端子           | 1    |
| 2  | Cable     | Φ1.13mm Coaxial Cable Dark Grey,50Ω | 低损耗线            | 1    |
| 1  | FPCB      | FPC,L31.7*W14.8*T0.2mm,Color:Black  | 300LSE Adhesive | 1    |



东莞市森岭智能科技有限公司

DONGGUAN SLEing INTEL-TECH CO.,LTD

## 电性测试报告

## Test Reports

| Electrical Properties |                             |
|-----------------------|-----------------------------|
| Frequency             | 2.4~2.5/5.15~7.15GHz( 带机测试) |
| Impedance             | 50 Ohm Nominal              |
| V.S.W.R               | $\leq 1.92$                 |
| Return Loss           | -10 dB Max                  |
| Radiation             | Omni-directional            |
| Gain (Peak)           | 2 $\pm$ 0.5 dBi             |
| Polarization          | Linear, Vertical            |
| Admitted Power        | 2 W                         |
| Connector             | MHF                         |
| Physical Properties   |                             |
| Antenna Material      | FPCB                        |
| Cable Type            | $\Phi$ 1.13mm Dark Grey     |
| Operating Temp.       | -40~+85 °C                  |
| Storage Temp.         | -5~+30 °C                   |
|                       |                             |

## 天线组装图

## Antenna Profile

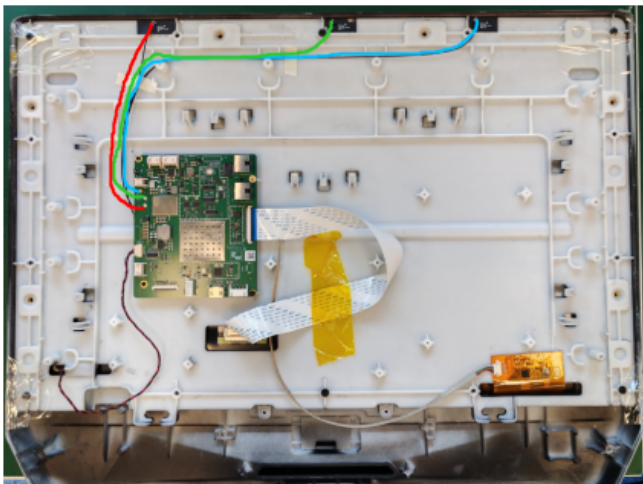
## Device

天线走线具体如图所示。将天线固定好，装上主板，将天线端子扣在端口上（蓝色绿色红色方框）

WiFi\_0 天线如图中蓝色所示，天线线长 600mm，直径 1.13mm，1 代端子（黑色同轴线）。

WiFi\_1 天线如图中绿色所示，天线线长 450mm，直径 1.13mm，1 代端子（灰色同轴线）。

BT 天线如图中红色所示，天线线长 250mm，直径 1.13mm，1 代端子（白色同轴线）。



## Antenna

## 3、粘贴 WiFi\_1 天线

粘贴 WiFi\_1 天线细节如下图所示。将 WiFi\_1 天线顶部及左侧分别与壳体的顶部及左侧定位枝节对齐（红线所示），最后将天线由上往下依次粘贴即可。注意：天线粘贴时，天线不能粘偏、歪斜、起翘。



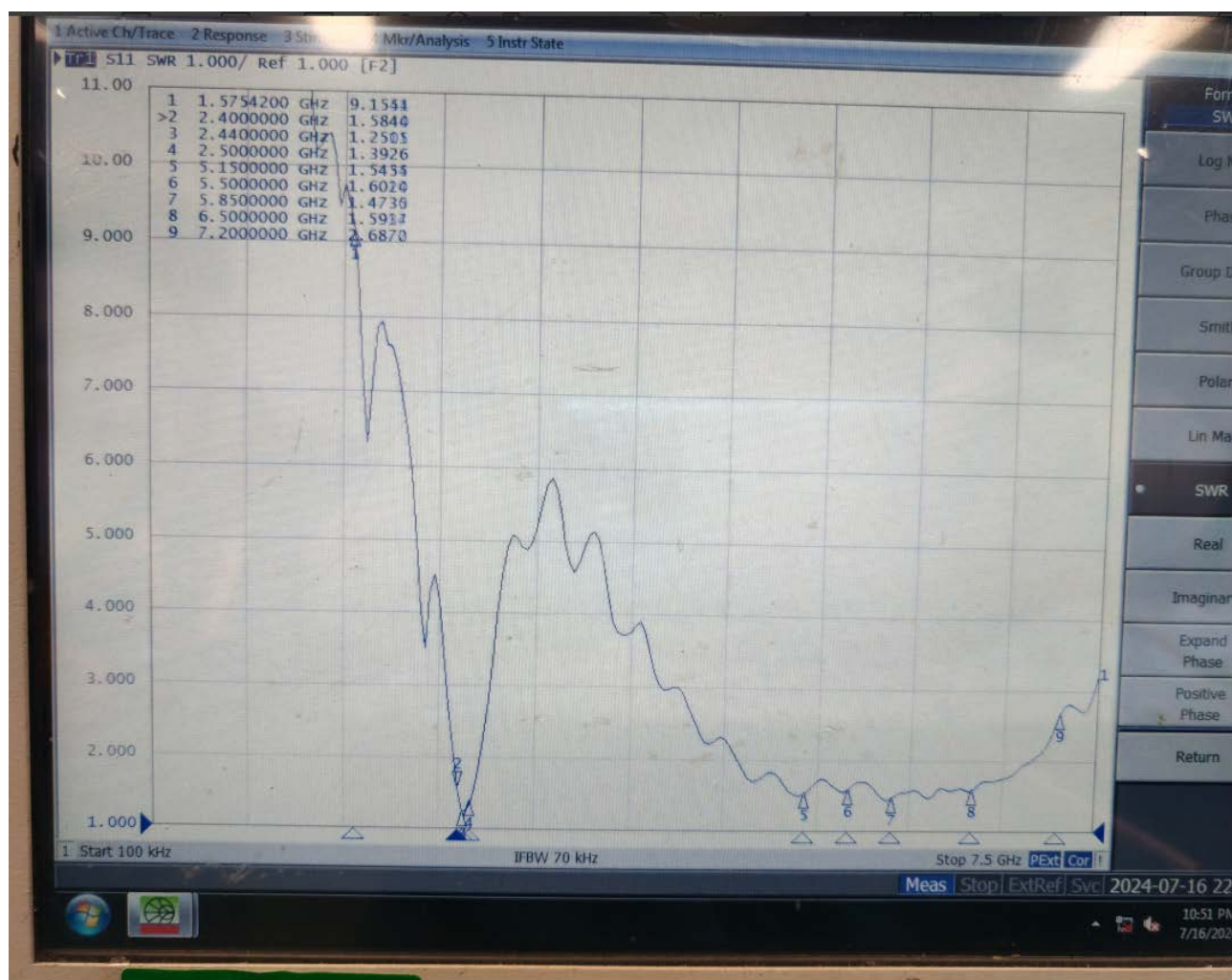
# S 参数测试

## S Parameter Test

Agilent E5071C Network Analyzer



WiFi 驻波 Antenna (NO.1)



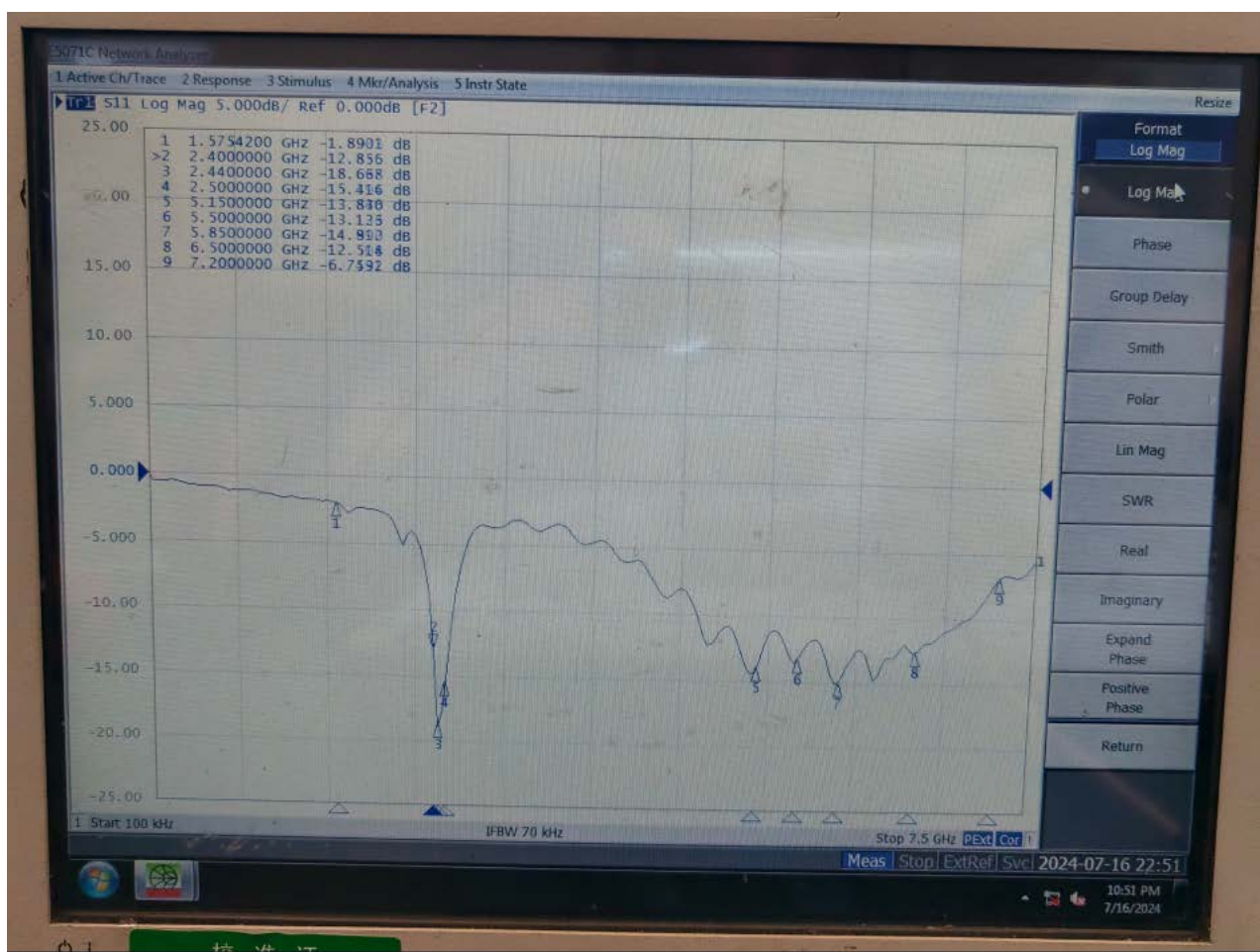
# S 参数测试

## S Parameter Test

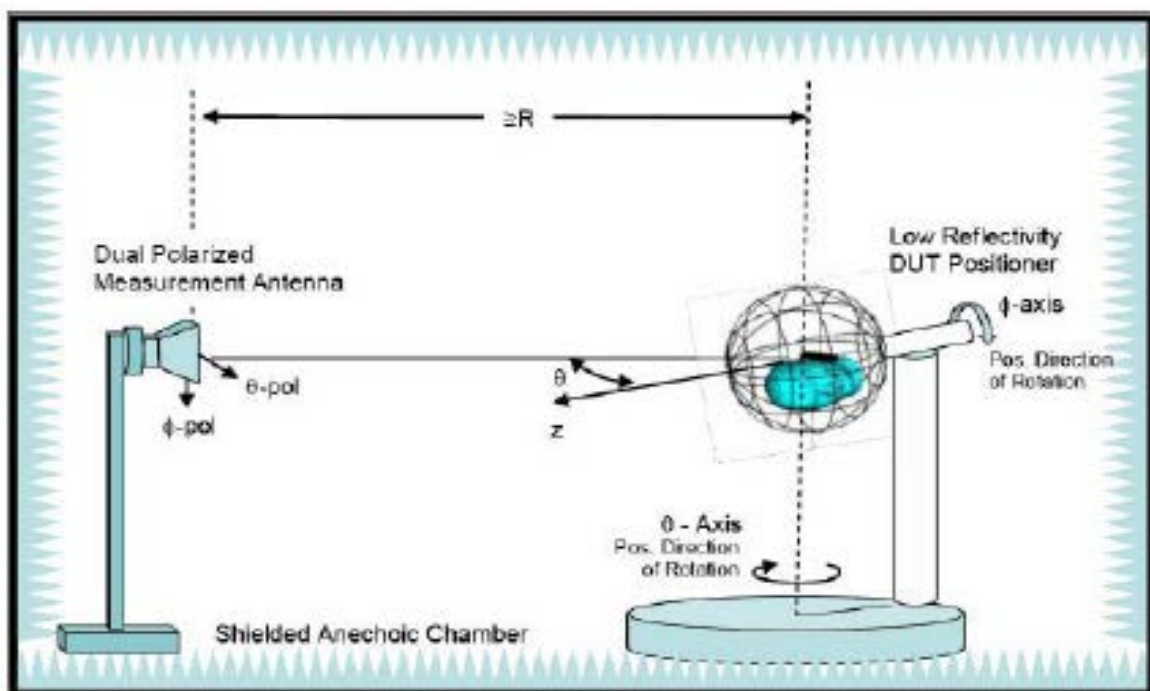
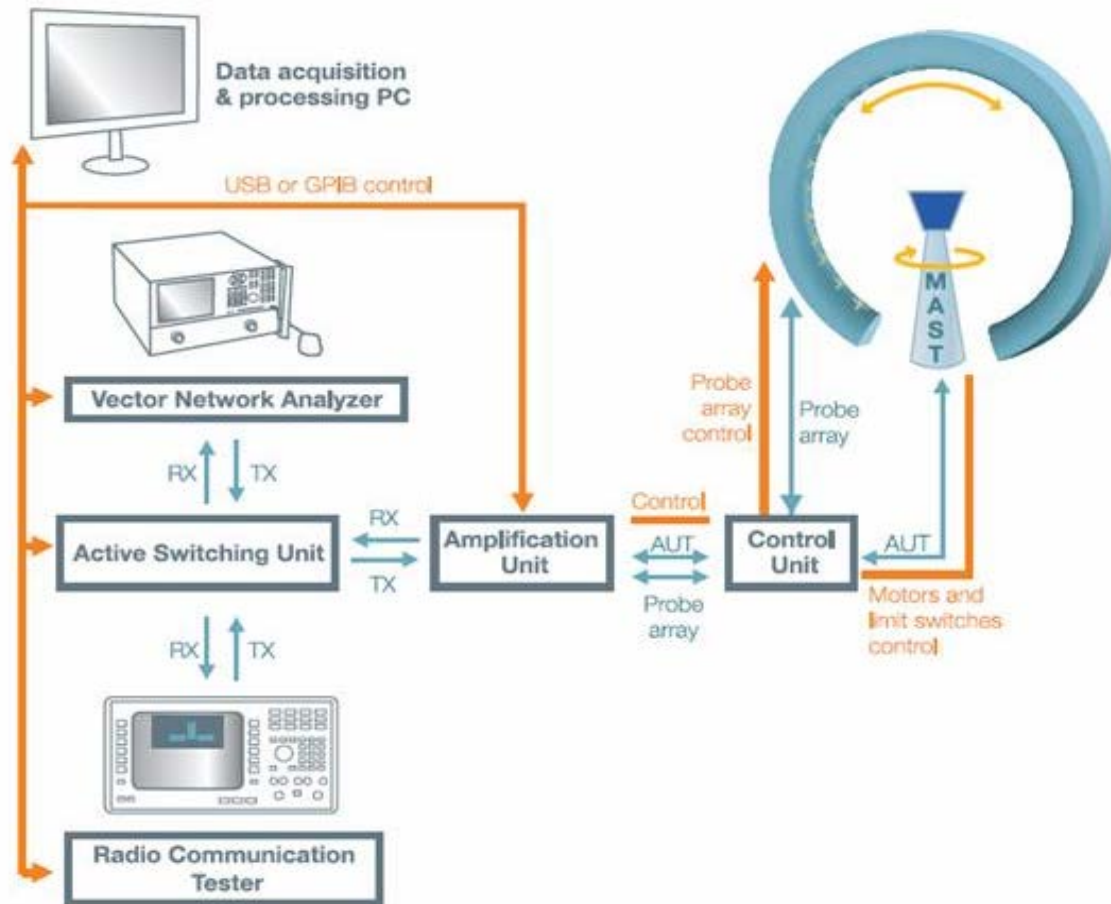
Agilent E5071C Network Analyzer



WiFi 回波损耗 Antenna (NO.1)



## 测试设备 Test Setup

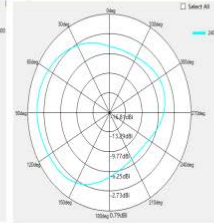
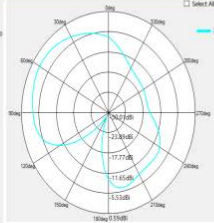
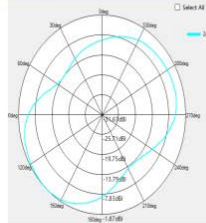
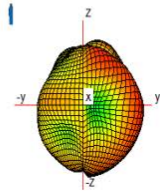


# 测试效率

## Test Efficiency

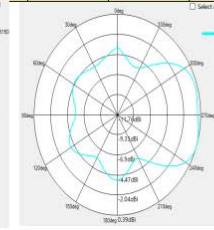
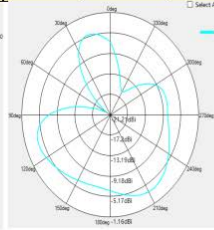
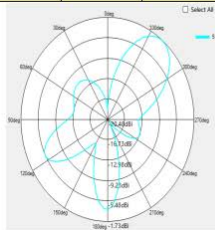
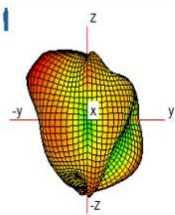
**WIFI-1天线无源效率测试报告**

| 2.4G WiFi | Frequency ID    | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11     |
|-----------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|           | Frequency (MHz) | 2400.0 | 2410.0 | 2420.0 | 2430.0 | 2440.0 | 2450.0 | 2460.0 | 2470.0 | 2480.0 | 2490.0 | 2500.0 |
|           | Gain (dBi)      | 0.55   | 0.70   | 0.78   | 0.95   | 1.07   | 1.22   | 1.46   | 1.57   | 1.80   | 1.83   | 1.89   |
|           | Efficiency (%)  | 44.54  | 44.62  | 43.80  | 43.59  | 44.47  | 43.70  | 43.21  | 41.99  | 41.51  | 41.31  | 41.10  |



| 5G WiFi | Frequency ID    | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11     |
|---------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|         | Frequency (MHz) | 5150.0 | 5200.0 | 5250.0 | 5300.0 | 5350.0 | 5400.0 | 5450.0 | 5500.0 | 5550.0 | 5600.0 | 5650.0 |
|         | Gain (dBi)      | -0.03  | 0.45   | 0.53   | 0.02   | -0.11  | -1.00  | -0.74  | -0.66  | -0.44  | 0.05   | -0.32  |
|         | Efficiency (%)  | 35.14  | 35.58  | 35.10  | 34.74  | 35.10  | 36.43  | 35.59  | 35.99  | 36.27  | 36.27  | 36.27  |

|  | Frequency ID    | 12     | 13     | 14     | 15     | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|--|-----------------|--------|--------|--------|--------|----|----|----|----|----|----|----|
|  | Frequency (MHz) | 5700.0 | 5750.0 | 5800.0 | 5850.0 |    |    |    |    |    |    |    |
|  | Gain (dBi)      | 0.07   | -0.43  | -0.46  | -0.94  |    |    |    |    |    |    |    |
|  | Efficiency (%)  | 36.50  | 37.48  | 35.91  | 35.37  |    |    |    |    |    |    |    |





## OTA

| Operating Band | Bandwidth  | Free Space Requirements |       | Channal | Testing Results |              | Gap |              |
|----------------|------------|-------------------------|-------|---------|-----------------|--------------|-----|--------------|
|                |            | TRP                     | TIS   |         | TRP             | TIS (LCD ON) | TRP | TIS (LCD ON) |
| WIFI2-2.4G     | 11b 11Mbps | 11                      | -80   | 1       | 11.7            | -82.1        | 0.7 | 2.1          |
|                |            | 11                      | -80   | 7       | 11.5            | -81.5        | 0.5 | 1.5          |
|                |            | 11                      | -80   | 13      | 12.3            | -82.3        | 1.3 | 2.3          |
|                |            | 11                      | -80   | Avg     | 11.8            | -82.0        | 0.8 | 2.0          |
| WIFI2-5G       | 11a 6Mbps  | 9                       | -86   | 36      | 9.6             | -86.2        | 0.6 | 0.2          |
|                |            | 9                       | -86   | 100     | 10.5            | -86.8        | 1.5 | 0.8          |
|                |            | 9                       | -86   | 157     | 10.2            | -86.7        | 1.2 | 0.7          |
|                |            | 9.0                     | -86.0 | Avg     | 10.1            | -86.6        | 1.1 | 0.6          |