



WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)

DONGGUAN AEON TECH CO.,LTD.(CHINA)

## SPECIFICATION FOR APPROVAL

**CUSTOMER:** 訊動科技股份有限公司

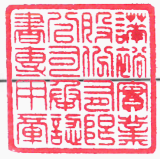
**PART NAME:** RF Antenna Assembly

**PART NO.:**

**REVISION:**

**W. Y. P/NO.:** C787-510178-A(SRF20251624)

**REV.:** XI

|                  | MANUFACTURER                                                                                | CUSTOMER                                                                             |
|------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                  | SIGNATURE                                                                                   | SIGNATURE                                                                            |
| APPROVED<br>BY : | <br>Stone |  |
| DATE :           |          |                                                                                      |

### WHA YU GROUP

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# RF Antenna Assembly

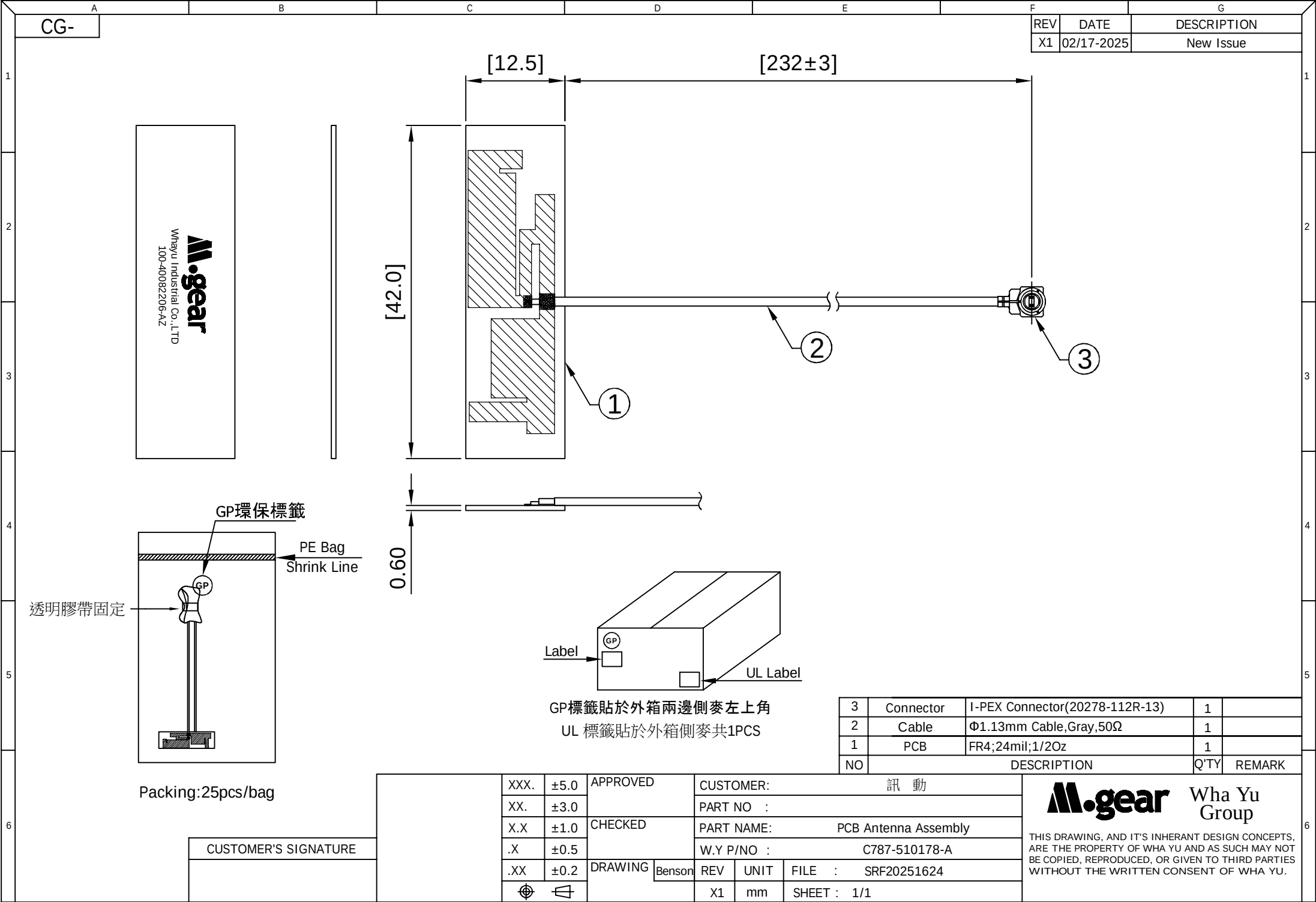
## Specification

### 1. Electrical Properties : With housing/With Cable loss(Ant-2/Ant-3)

|                          |                                                         |
|--------------------------|---------------------------------------------------------|
| 1.1 Frequency Range..... | 2.4 ~ 2.5 , 5.15~5.825 GHz                              |
| 1.2 Impedance .....      | 50Ω Nominal                                             |
| 1.3 VSWR .....           | 1.92 : 1 Max.                                           |
| 1.4 Return Loss.....     | 10 dB Min.                                              |
| 1.5 Radiation .....      | Omni-directional                                        |
| 1.6 Peak Gain.....       | 2.4 ~ 2.5GHz < 3.52dBi<br>5.15~5.825GHz < 4.66dBi       |
| 1.7 Cable Loss.....      | 0.88dB Max. @2.4 ~ 2.5GHz<br>1.25dB Max. @5.15~5.825GHz |
| 1.8 Polarization.....    | Linear                                                  |
| 1.9 Cable.....           | 1.13 Coaxial Cable                                      |
| 1.10 Connector.....      | I-PEX MHF Connector                                     |

### 2. Physical Properties :

|                          |             |
|--------------------------|-------------|
| 2.1 Operating Temp. .... | -10℃ ~ +60℃ |
| 2.2 Storage Temp. ....   | -10℃ ~ +70℃ |





We connect the wireless world.

# ***Antenna Test Report (SBWD2200L-C787-510178-A)***

*Version: V 1.02*

*Released Date: 2025/01/20*

*Prepared By : Tim Cheng*

*Reviewed By :*

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(Device Orientation in the chamber)
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# Revised History



| Released Date | Version | Record                                           |
|---------------|---------|--------------------------------------------------|
| 2025/01/08    | V1.00   | 1st released                                     |
| 2025/01/09    | V1.01   | Use part number 100-40082206-AZ PCB for testing. |
| 2025/01/20    | V1.02   | Modify antenna length                            |
|               |         |                                                  |
|               |         |                                                  |
|               |         |                                                  |
|               |         |                                                  |
|               |         |                                                  |
|               |         |                                                  |

# Specification



## Requirements of Antenna Design

| RF Function | Number of ANT | Frequency Band                  | Remark |
|-------------|---------------|---------------------------------|--------|
| WiFi 2/5G   | 2             | 2400-2500(MHz) / 5150-5825(MHz) |        |
|             |               |                                 |        |

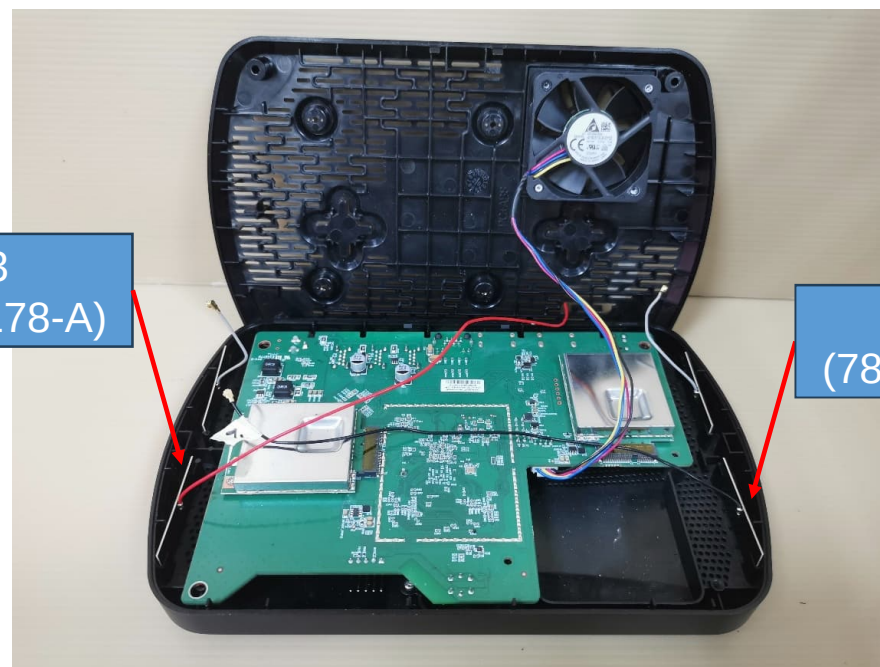
## Requirements of Measurement

| Test Item         | Specification                                  | Remark |
|-------------------|------------------------------------------------|--------|
| Return loss       | > 10dB                                         |        |
| Isolation         | 2G>20dB ; 5G>30dB                              |        |
| Peak gain         | NA                                             |        |
| Efficiency        | > 60 %                                         |        |
| Radiation pattern | Scale: +10 ~ -40dBi, Angle step size: 5 degree |        |

# Antenna Dimension and Placement



Ant-3  
(787-510178-A)



Ant-2  
(787-510178-A)

| Antenna | ANT Type | Size (L * W * H* T)        | Cable Length (mm) | Cable Type       |
|---------|----------|----------------------------|-------------------|------------------|
| Ant.2   | PCB PIFA | (L)42mm*(W)12.5mm*(T)0.6mm | 232mm             | IPEX (1.13 Gray) |
| Ant.3   | PCB PIFA | (L)42mm*(W)12.5mm*(T)0.6mm | 232mm             | IPEX(1.13 Gray)  |

# Test Setup for S-parameter Measurement



| Equipment        | Brand    | Model  | S/N        |
|------------------|----------|--------|------------|
| Network Analyzer | Keysight | E5063A | MY54706080 |



Antenna

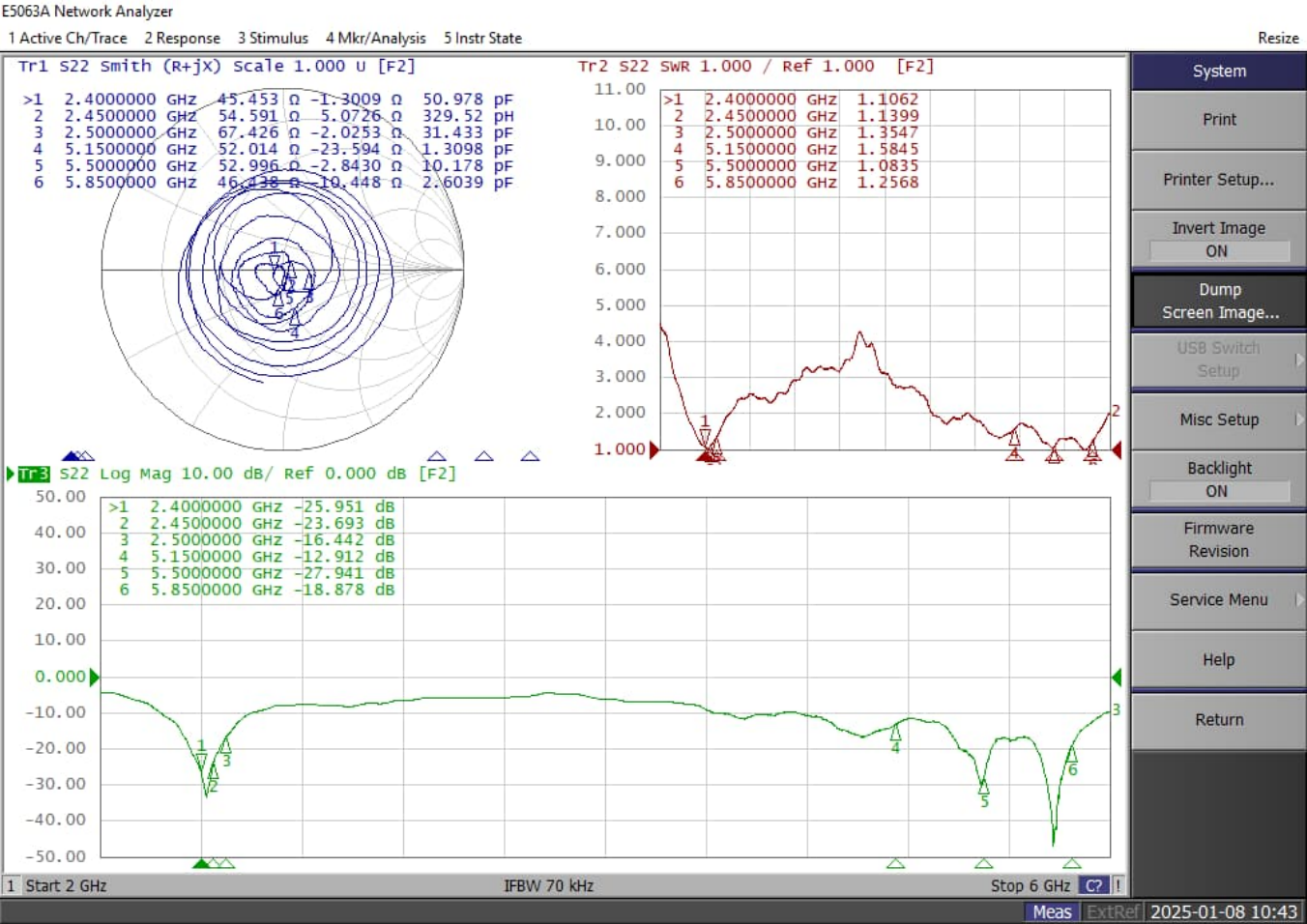
RF Cable with I-PEX  
conn.

Network Analyzer

# Return Loss



## Ant-2



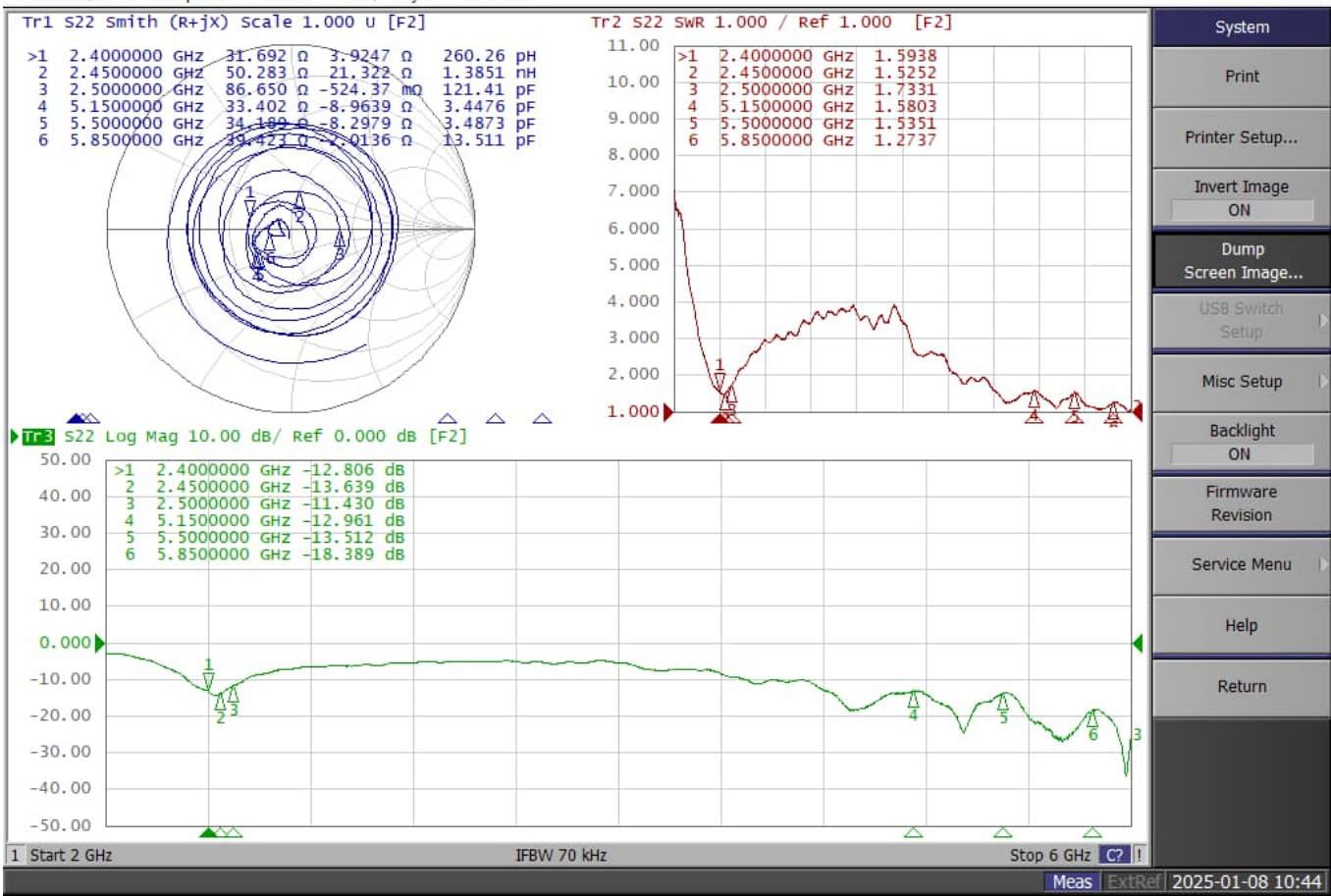
# Return Loss



## Ant-3

E5063A Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

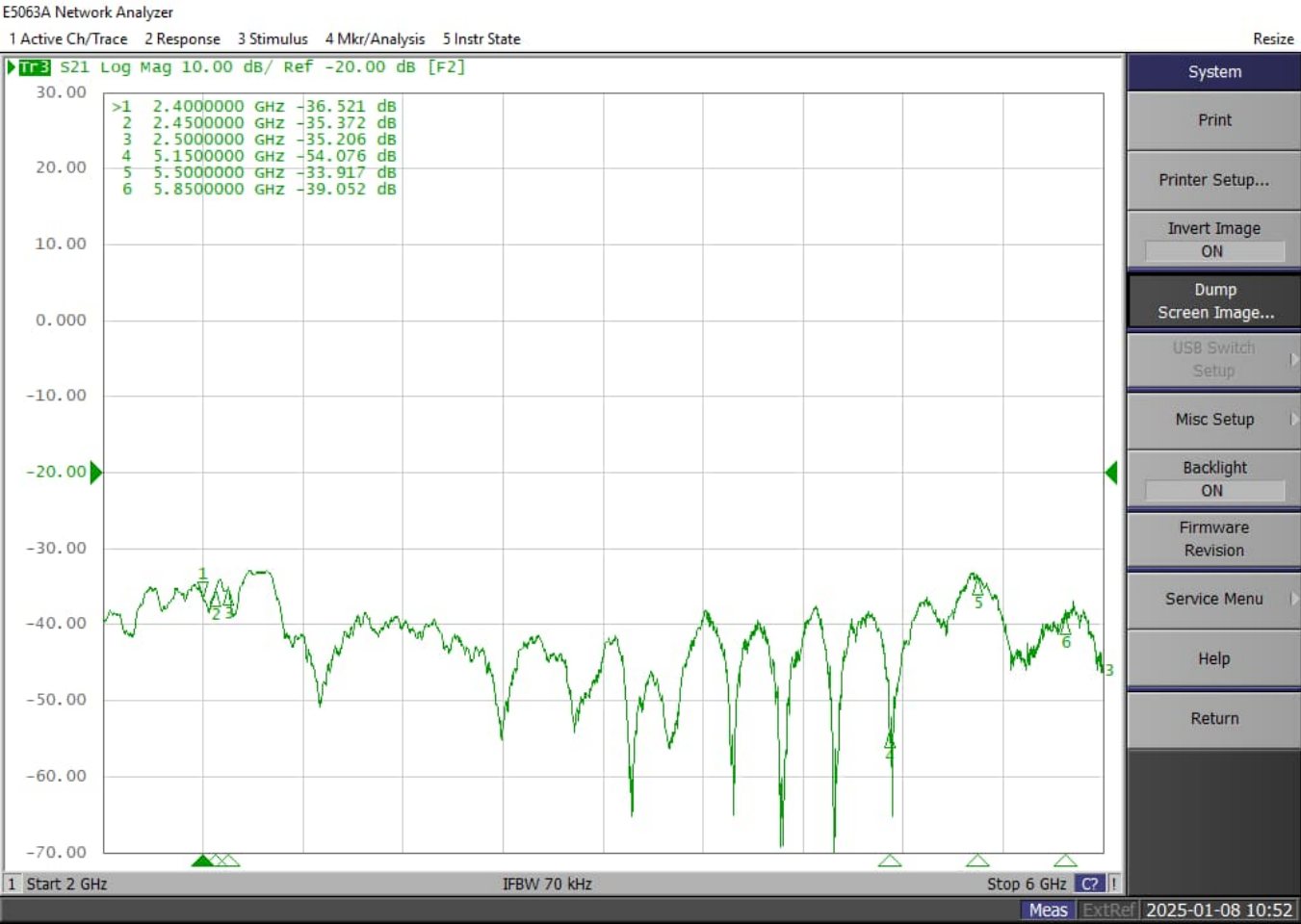


- System
- Print
- Printer Setup...
- Invert Image ON
- Dump Screen Image...
- USB Switch Setup
- Misc Setup
- Backlight ON
- Firmware Revision
- Service Menu
- Help
- Return

# Isolation



## Ant-2 to Ant-3



# Test Setup for Radiation Pattern Measurement



- SATIMO SG-24L Multi-Probe Antenna Measurement System**

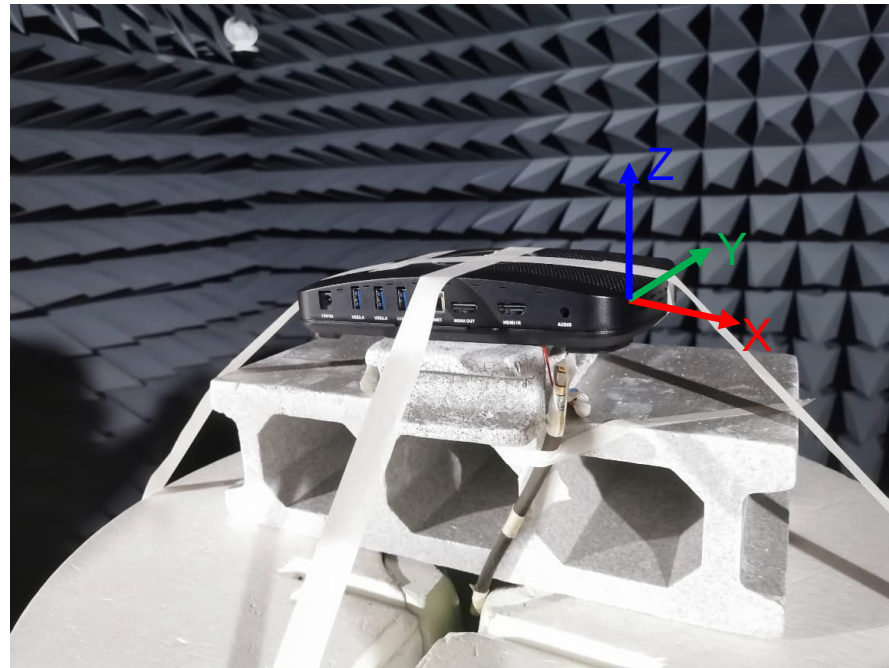
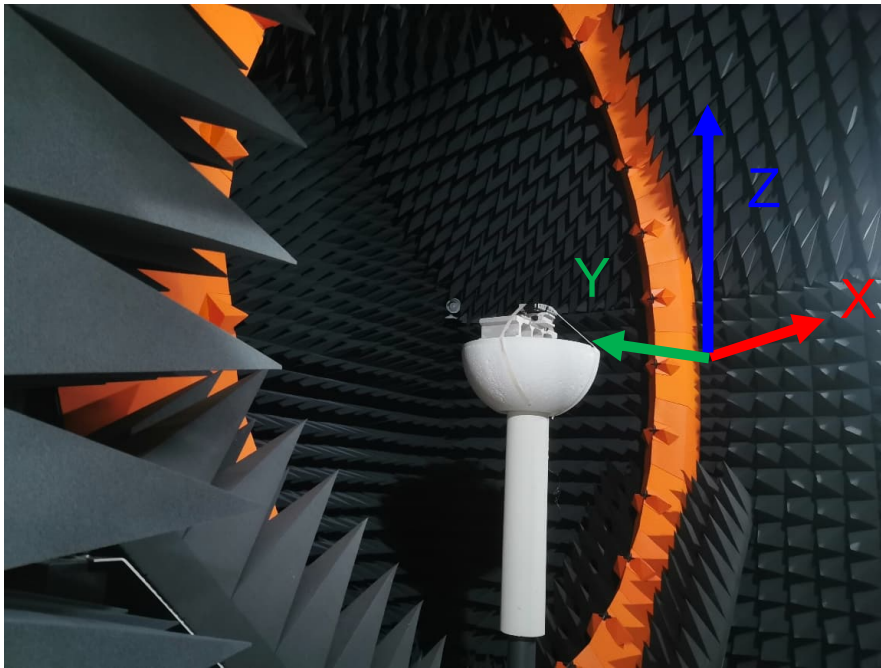
- Angle between probes: 15°**
- Frequency range: 400 MHz – 8.5 GHz**
- Chamber Room Size: 5m L x 5m W x 5m H**
- Software: Wave Studio**

| Chamber | Brand  | Model | Location          |
|---------|--------|-------|-------------------|
| SATIMO  | SATIMO | SG-24 | Taiwan<br>HsinChu |

# Test Setup for Radiation Pattern Measurement

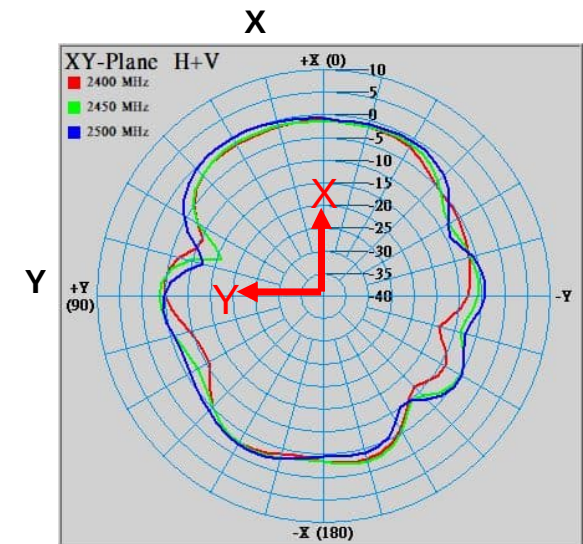
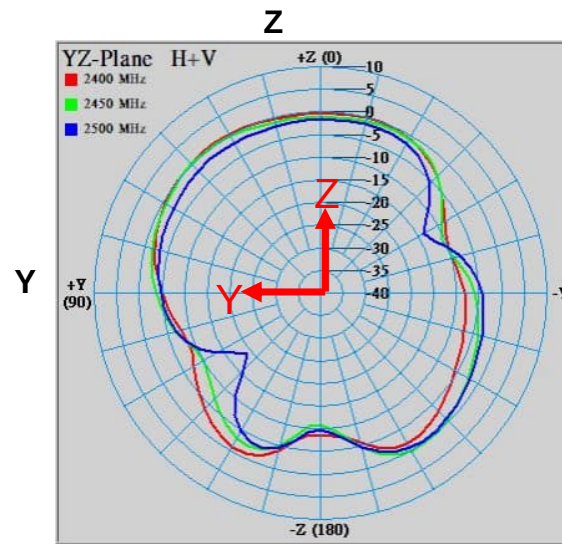
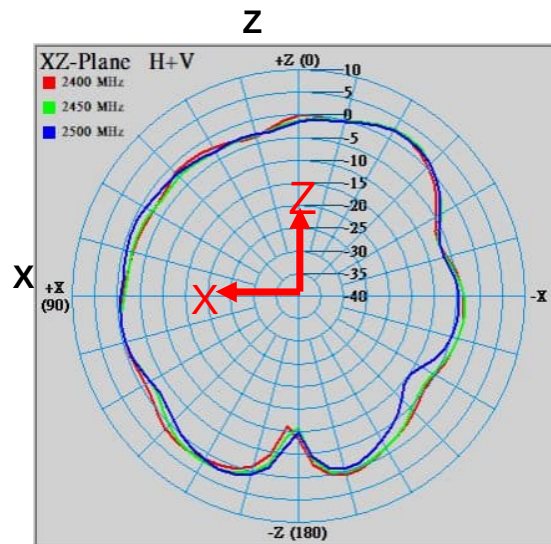
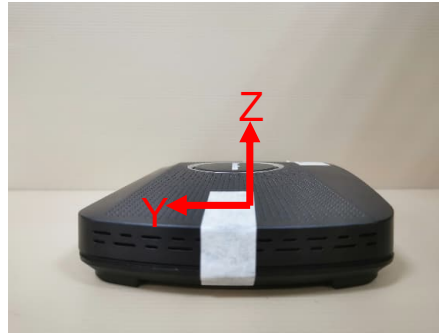


## Device orientation & measurement setup in the chamber



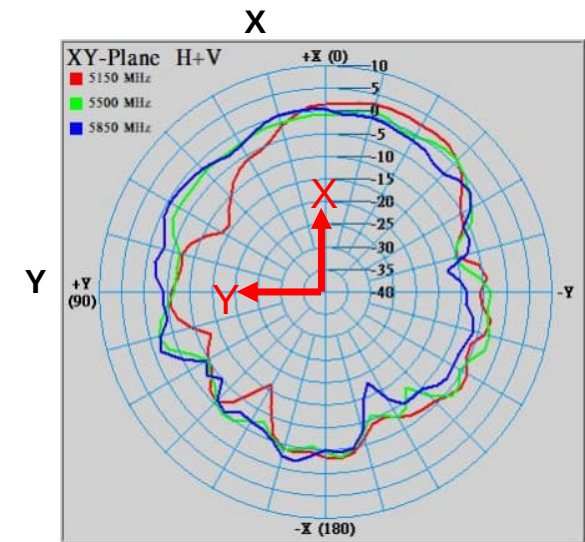
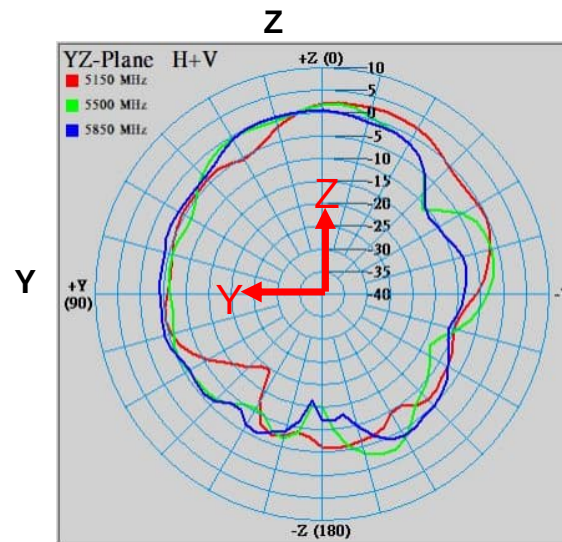
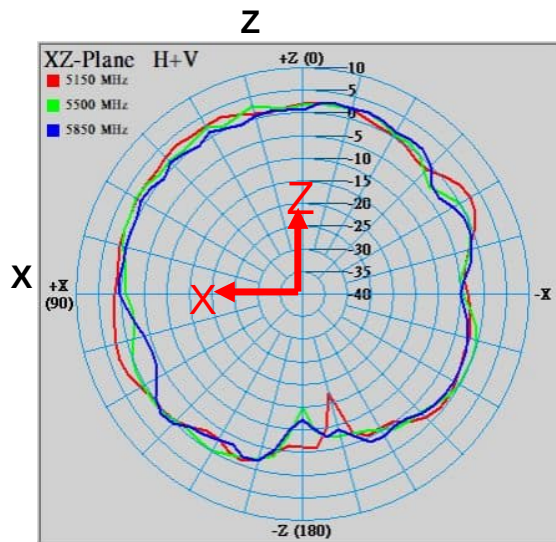
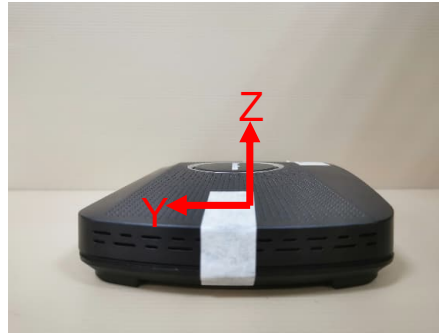
# 2D Radiation Pattern Results

Ant-2 (2G)



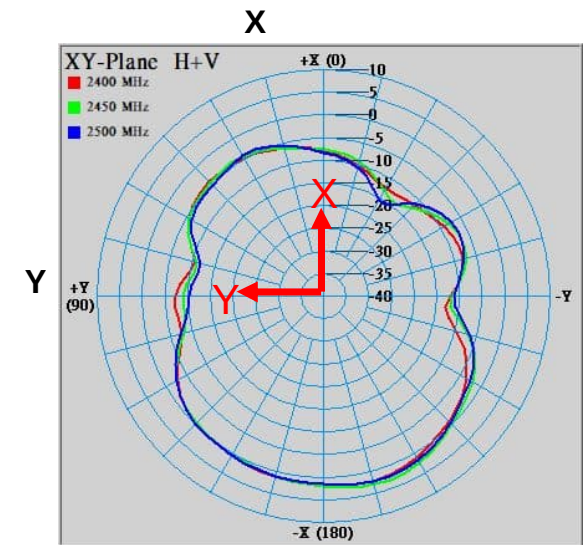
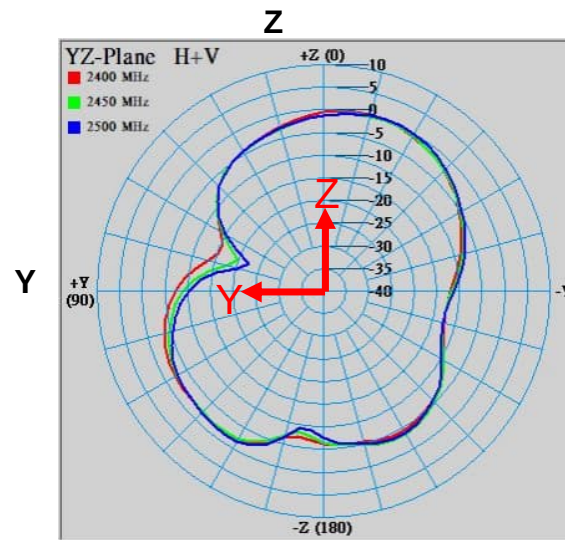
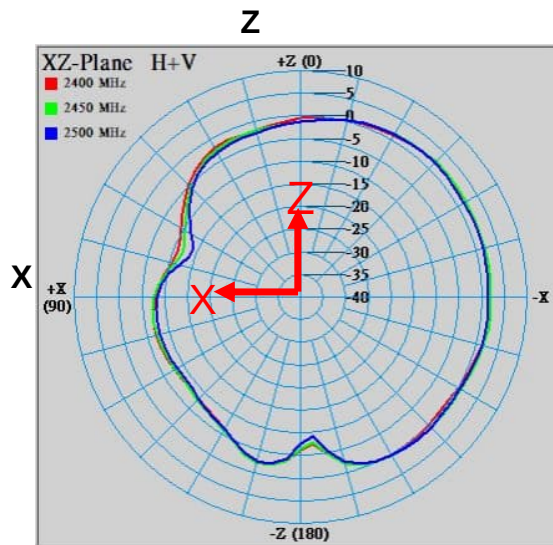
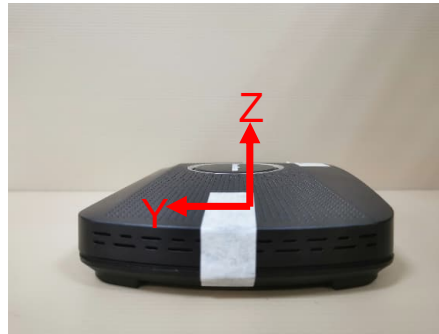
# 2D Radiation Pattern Results

Ant-2 (5G)



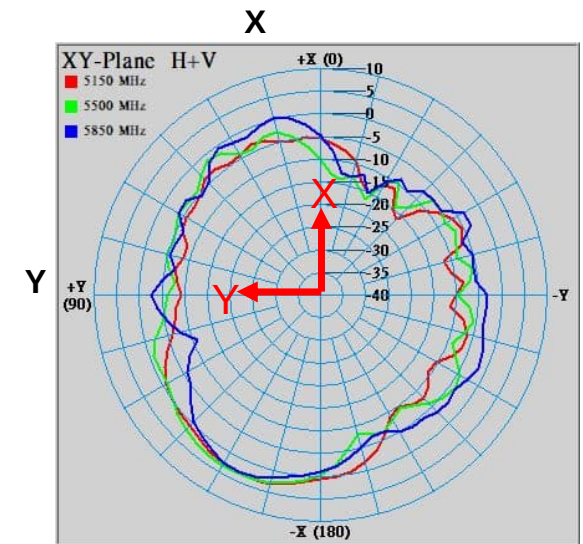
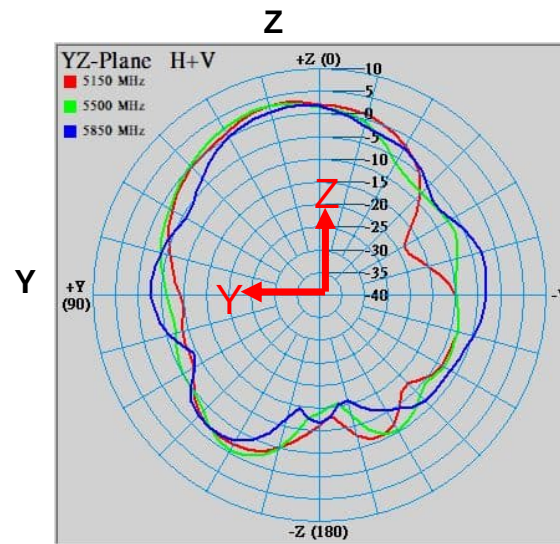
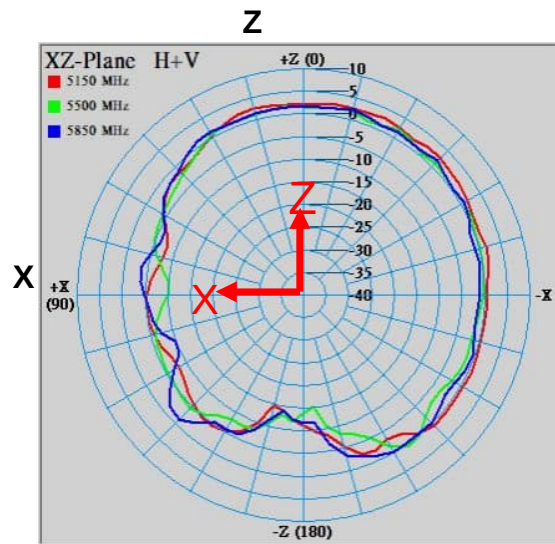
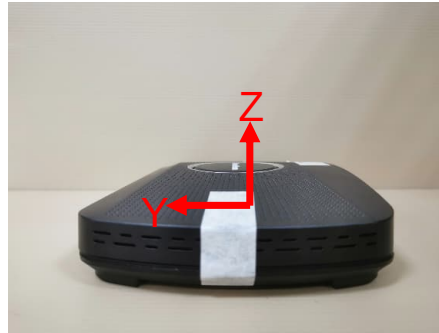
# 2D Radiation Pattern Results

Ant-3 (2G)



# 2D Radiation Pattern Results

Ant-3 (5G)



# Results Summary



## Return Loss

| Frequency(MHz) | Ant.2 (dB) | Ant.3 (dB) |
|----------------|------------|------------|
| 2400           | 25         | 12         |
| 2450           | 23         | 13         |
| 2500           | 16         | 11         |
| 5150           | 12         | 12         |
| 5500           | 27         | 13         |
| 5850           | 18         | 18         |

# Results Summary



## Isolation

| Frequency(MHz) | Ant.2<br>To Ant.3 |
|----------------|-------------------|
| 2400           | 37                |
| 2450           | 35                |
| 2500           | 35                |
| 5150           | 54                |
| 5500           | 34                |
| 5850           | 39                |

Unit: dB

# Results Summary



## 3D Peak gain & Efficiency

| Frequency<br>(MHz) | Ant. 2             |                   | Ant. 3             |                   |
|--------------------|--------------------|-------------------|--------------------|-------------------|
|                    | Peak Gain<br>(dBi) | Efficiency<br>(%) | Peak Gain<br>(dBi) | Efficiency<br>(%) |
| 2400               | 2.55               | 65                | 2.60               | 61                |
| 2450               | 2.75               | 65                | 3.52               | 65                |
| 2500               | 2.40               | 62                | 2.85               | 62                |
| 5150               | 3.91               | 65                | 3.88               | 65                |
| 5500               | 4.66               | 67                | 4.00               | 66                |
| 5850               | 3.46               | 62                | 3.72               | 62                |



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# Thank You

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