

## Antenna test report

|                        |                                                                                                                                       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Laboratory</b> | Shenzhen Morlab Communications Technology Co., Ltd.                                                                                   |
| <b>Address</b>         | FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District,<br>ShenZhen , GuangDong Province, P. R. China |
| <b>Contact:</b>        | Devyn Deng +86 755 36698555                                                                                                           |
| <b>Model</b>           | External Antenna                                                                                                                      |

|                     |                                                                                                            |
|---------------------|------------------------------------------------------------------------------------------------------------|
| <b>Manufacturer</b> | Dongguan Youbi Electronics Co., LTD                                                                        |
| <b>Address</b>      | Building 79, New Sun Industrial City, Lincun Community, Tangxia Town, Dongguan<br>City, Guangdong Province |

### 1. Test procedures

| Standards           | Description of Test Item                           | Result    |
|---------------------|----------------------------------------------------|-----------|
| ANSI/ IEEE 149-2021 | IEEE Recommended Practice for Antenna Measurements | Compliant |

2. Test Items and Equipment

|                                         | Test items                             | Test equipment                                                            |
|-----------------------------------------|----------------------------------------|---------------------------------------------------------------------------|
| S Parameter                             | 1.Return Loss 2.VSWR                   | Network analyzer (Agilent E5071B)                                         |
| The whole machine of Passive parameters | 1.Frequency 2.Gain 3.Radiation Pattern | 1.3D microwave darkroom (6m*6m*6m)<br>2.Network analyzer (Agilent E5071B) |

3. Test Equipment

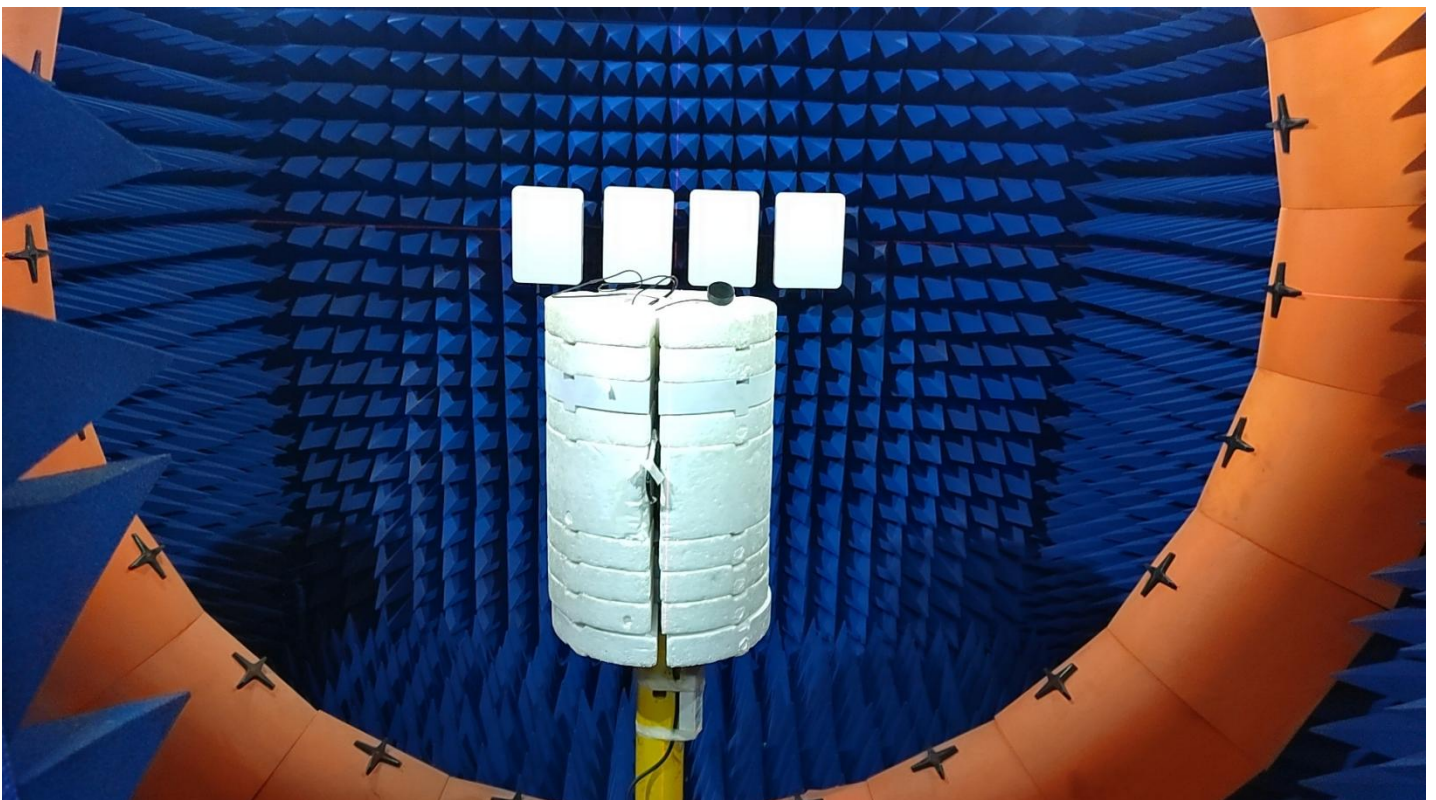
| Equipement Name            | Serial No.   | Type                                       | Manufacture | Cal.Date   | Cal.Due Date |
|----------------------------|--------------|--------------------------------------------|-------------|------------|--------------|
| Network Analyzer           | MY46110140   | E5071C                                     | Agilent     | 2024.05.30 | 2025.05.29   |
| OTA Chamber                | TJ2235-Q1793 | AMS-8923-150                               | ETS         | 2022-11-30 | 2025-11-29   |
| Antenna Measurement System | 1685         | EMQuest<br>EMQ-100<br>V1.13 Build<br>21267 | ETS         | N/A        | N/A          |

4. Name of commercial test software

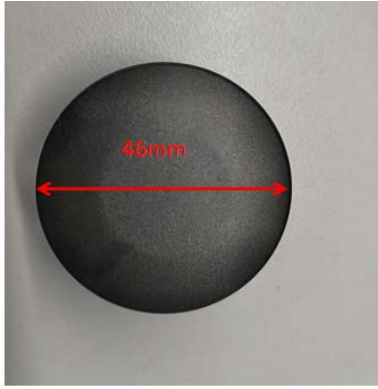
| Software Name              | Serial No. | Version                                 | Manufacturer |
|----------------------------|------------|-----------------------------------------|--------------|
| Antenna Measurement System | 1685       | "EMQuest EMQ-100<br>V 1.13 Build 21267" | ETS          |

5. The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO. When the test result is a critical value, we will use the measurement uncertainty to give the judgment result based on the 95% Confidence intervals.

#### 6. DUT Setup Photo



#### 7. External Antenna Physical Size (unit: mm)



## 8. Antenna Electrical Specification

| External Antenna      |                                         |
|-----------------------|-----------------------------------------|
| Freq                  | 2.4~2.5GHz & 5.15~5.85GHz               |
| Gain                  | 1.92dBi(2.4-2.5) ; -15.05dBi(5.15-5.85) |
| VSWR                  | <2                                      |
| Impedance             | 50 ohm                                  |
| Polarization          | Linear                                  |
| Type of Antenna       | External Antenna                        |
| Outline Dimensions    | Φ46mm*17.6mm                            |
| Manufacture           | EcoFlow                                 |
| Efficiency            | ≥24.54%(2.4-2.5) ; ≥0.91%(5.15-5.85)    |
| Connector Type        | Coaxial lines                           |
| Operating Temperature | -40°C~+85°C                             |
| Storage Temp          | -40°C~+85°C                             |

## 9. Antenna Type & Gain

**Type: External Antenna**

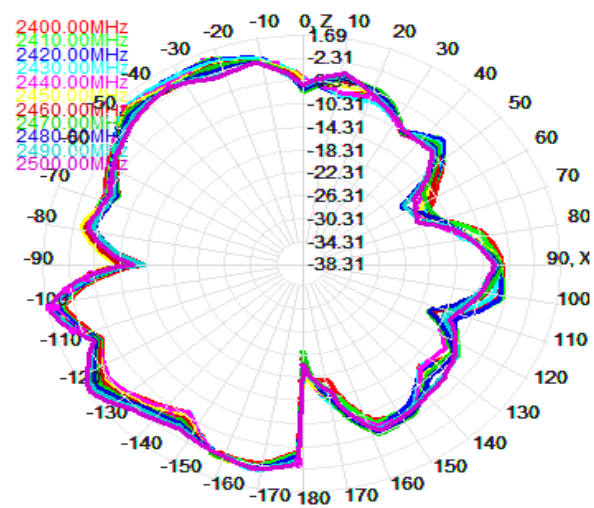
| External Antenna |           |               |
|------------------|-----------|---------------|
| Frequency        | Gain(dBi) | Efficiency(%) |
| 2400MHz          | 1.56      | 27.12         |
| 2410MHz          | 1.16      | 27.39         |
| 2420MHz          | 1.12      | 27.35         |
| 2430MHz          | 1.06      | 26.55         |
| 2440MHz          | 1.20      | 25.40         |
| 2450MHz          | 1.39      | 26.68         |
| 2460MHz          | 1.38      | 25.97         |
| 2470MHz          | 1.41      | 25.83         |
| 2480MHz          | 1.34      | 24.54         |
| 2490MHz          | 1.64      | 24.90         |
| 2500MHz          | 1.92      | 25.87         |

| External Antenna |           |                |
|------------------|-----------|----------------|
| Frequency        | Gain(dBi) | Efficiency (%) |
| 5150MHz          | -18.88    | 1.30           |
| 5200MHz          | -17.43    | 1.81           |
| 5250MHz          | -15.74    | 2.67           |
| 5300MHz          | -15.84    | 2.61           |
| 5350MHz          | -15.05    | 3.13           |
| 5400MHz          | -16.05    | 2.49           |
| 5450MHz          | -16.23    | 2.38           |
| 5500MHz          | -17.35    | 1.84           |
| 5550MHz          | -18.24    | 1.50           |
| 5600MHz          | -18.36    | 1.46           |
| 5650MHz          | -18.79    | 1.32           |
| 5700MHz          | -19.49    | 1.12           |
| 5750MHz          | -18.80    | 1.32           |
| 5800MHz          | -20.41    | 0.91           |
| 5850MHz          | -18.74    | 1.34           |

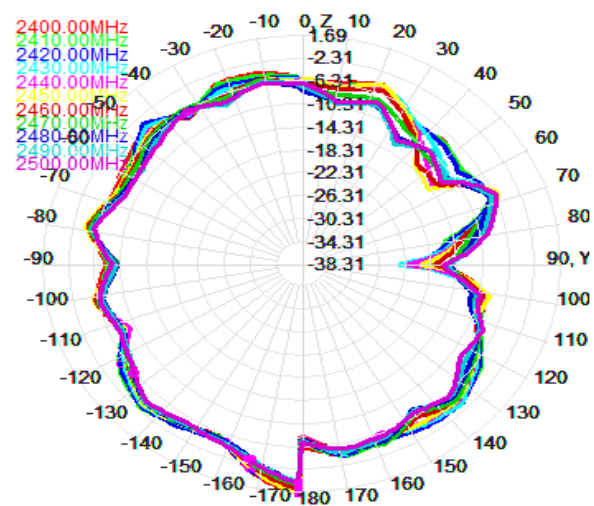
## 10. Pattern and Gain

**External Antenna (2.4–2.5GHz)**

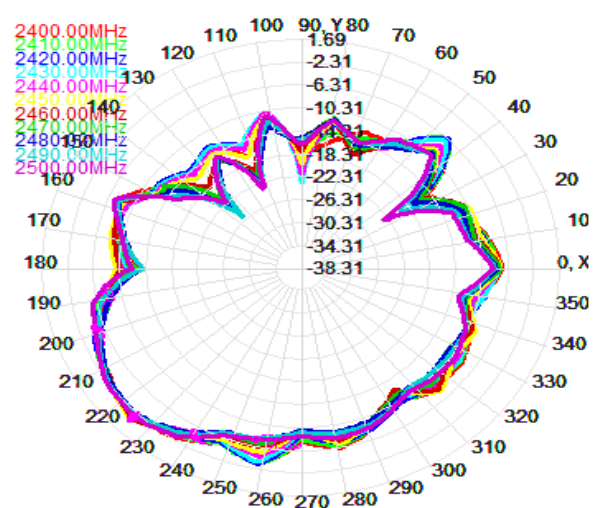
PHI=0DEG



PHI=90DEG

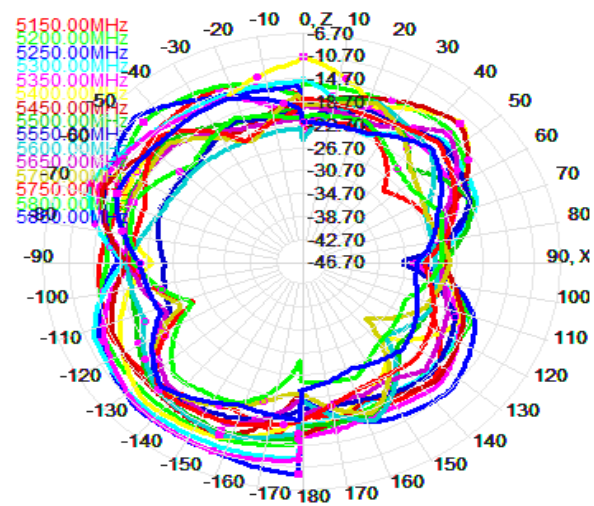


Theta=90DEG

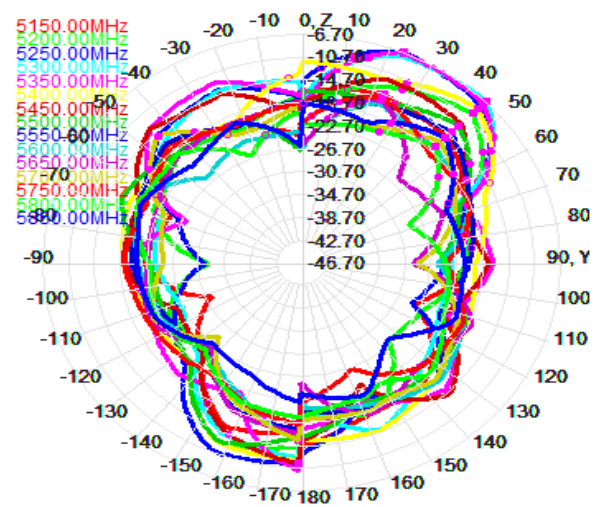


External Antenna (5.15–5.85GHz)

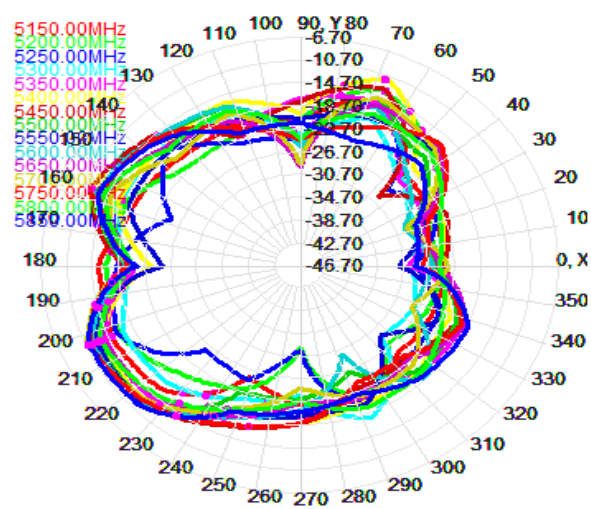
PHI=0DEG



$\Phi = 90^\circ$



$\Theta = 90^\circ$



Tester by: Devyn Deng