



# Antenna Test Report

|            |              |             |            |
|------------|--------------|-------------|------------|
| Project No | LD017F6_V0.2 | PCB Version | LD017F6    |
| Tester     | MoQi         | Date        | 2024.10.17 |
| Auditing   | XuNing       | Date        | 2024.10.18 |
| Approval   |              | Date        |            |

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一、Project Information

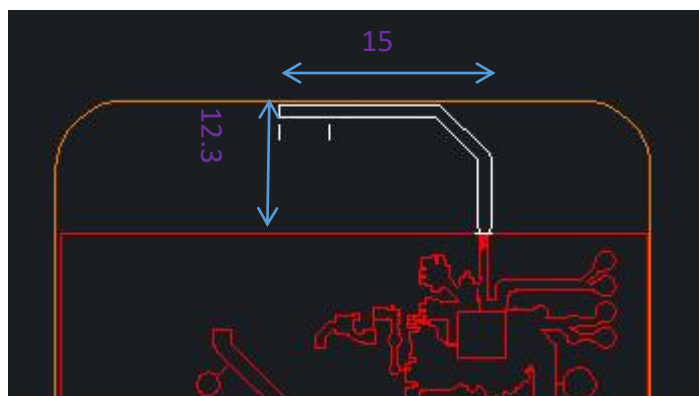
- 1. Antenna Coding: [ANT-BBNCNC24012](#)
- 2. Antenna Type: [Onboard Antenna](#)
- 3. Model of the DUT: [KHWPO300F002](#)
- 4. Test Data : [2024.10.17](#)
- 5. Product picture:

|                       |                                                                                      |
|-----------------------|--------------------------------------------------------------------------------------|
| Product appearance    |   |
| PCB board and antenna |  |

## 二、Technical Specification

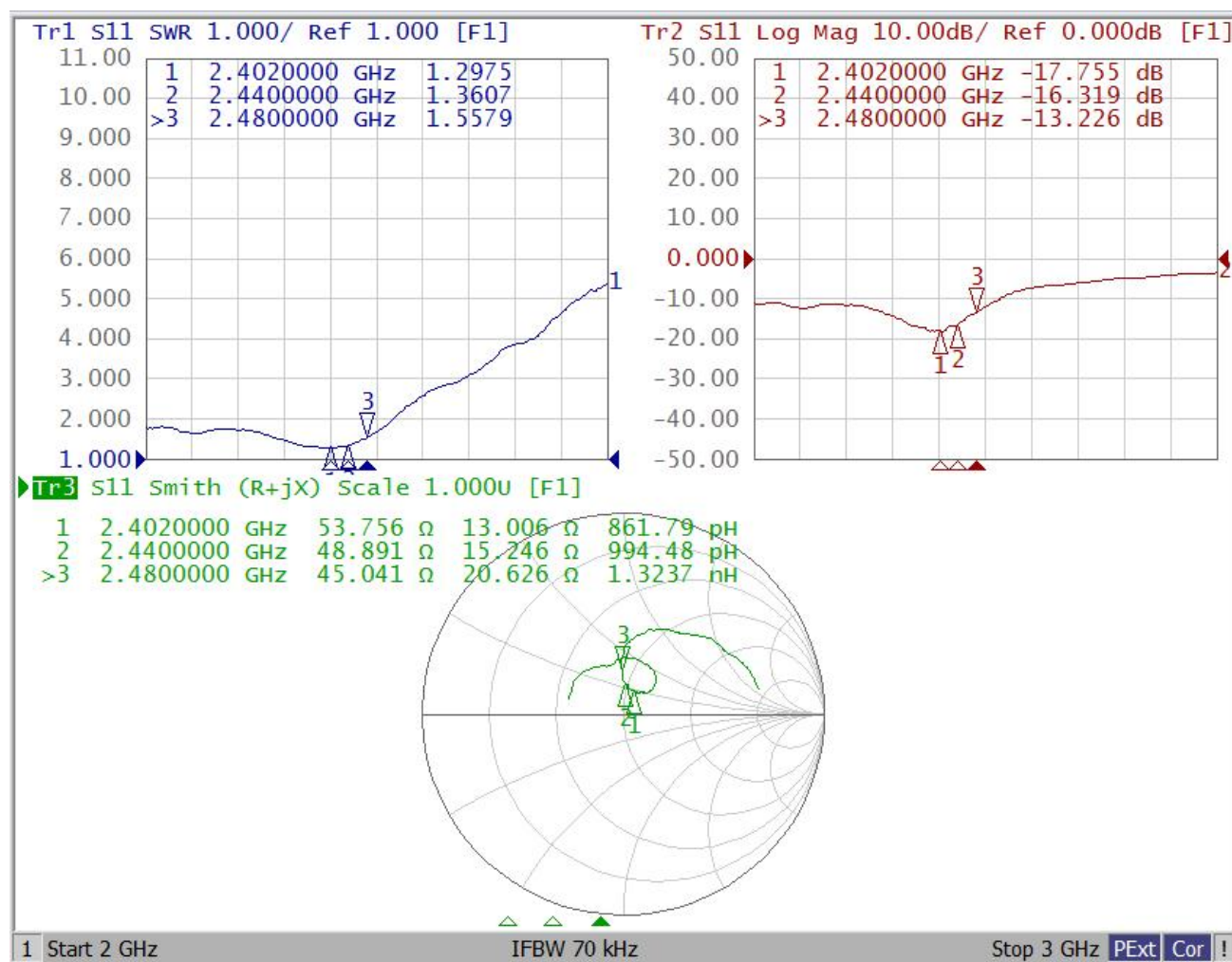
| Electrical Specifications |                  |
|---------------------------|------------------|
| Frequency Range           | 2400-2480 MHz    |
| Peak Gain                 | 3.90 dBi         |
| Efficiency                | 62.29%           |
| Return Loss               | ≤-15.02 dB (MAX) |
| VSWR                      | ≤1.4 (MAX)       |
| Bandwidth (S11≤-10dB)     | 530MHz           |
| Input Impedance           | 50 Ω             |
| Radiation direction       | Directional ANT  |
| Polarization Type         | Linear           |
| Lightning Protection      | DC grounding     |
| Power Capacity            | 1000mW (30dBm)   |
| Mechanical Specifications |                  |
| Antenna Size              | 15*12.3mm        |
| Core Radiator             | Copper           |
| Coaxial wire              | 无                |
| Connect Type              | IPEX-4           |
| Operating Temperature     | -40 to +85° C    |
| Storage Temperature       | -40 to +85° C    |

### 三、The shape and size of the antenna



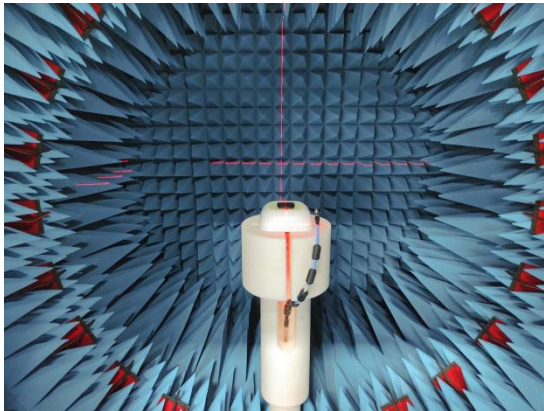
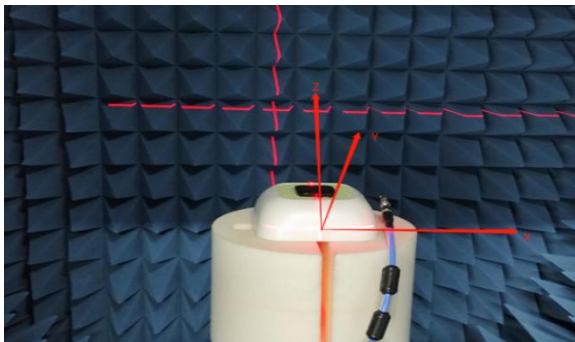
### 四、The result of the test

#### 1. VSWR & Return loss & Smith



| Frequency (MHz)                          | Return Loss (dB) | VSWR |
|------------------------------------------|------------------|------|
| 2402                                     | -17.7            | 1.29 |
| 2440                                     | -16.3            | 1.36 |
| 2480                                     | -13.2            | 1.55 |
| Bandwidth ( $S_{11} \leq -10\text{dB}$ ) | 530              |      |

## 2. Antenna Testing Environment

| Inside the microwave anechoic chamber                                              | Product coordinate axis position                                                    |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |

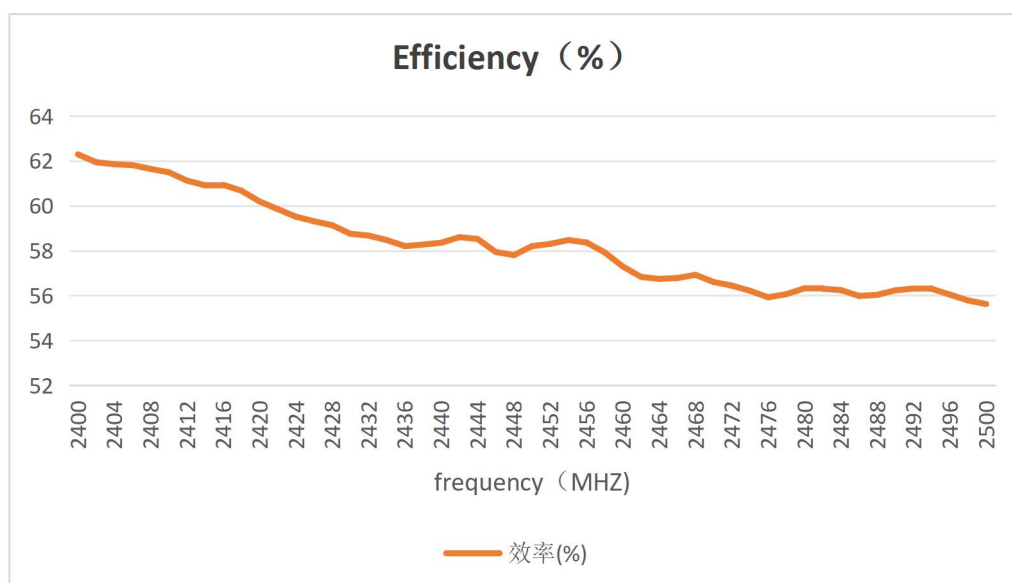
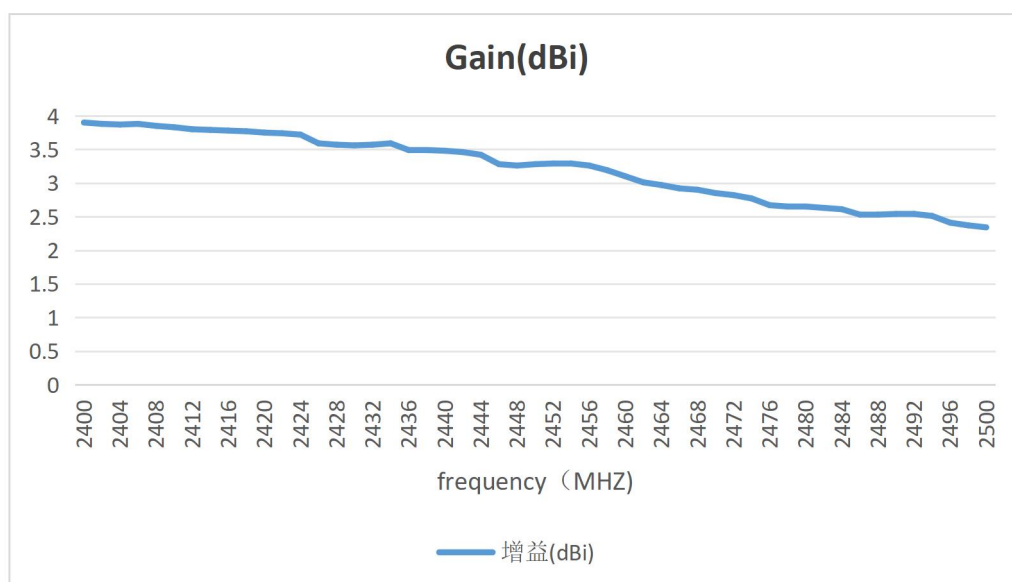
注：天线在+Y 方向。

### 3. Gain and Efficiency

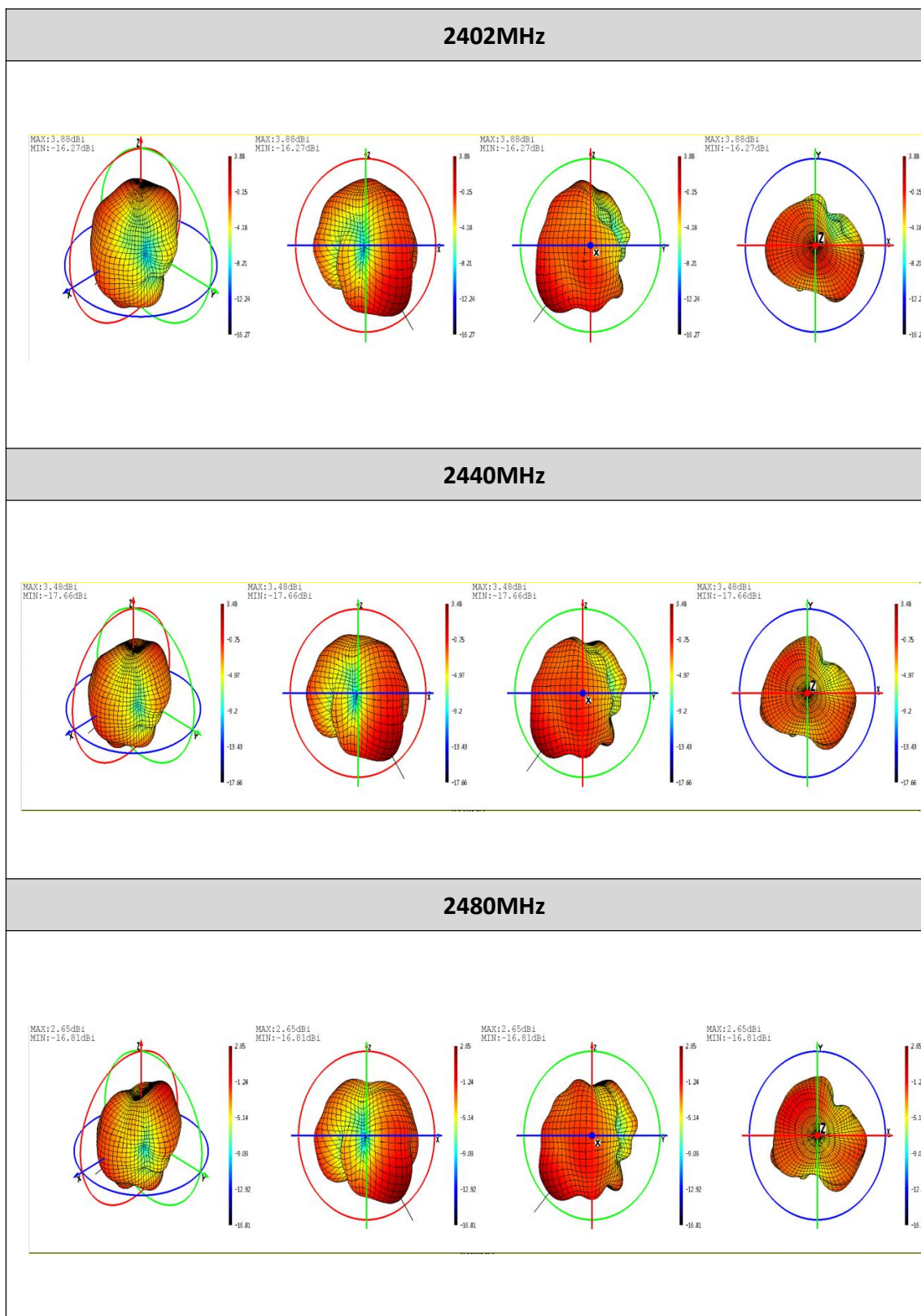
| 频率 (MHz) | 增益 (dBi) | 效率 (dB) | 效率 (%) |
|----------|----------|---------|--------|
| 2400     | 3.90     | -2.06   | 62.29  |
| 2402     | 3.88     | -2.08   | 61.94  |
| 2404     | 3.87     | -2.09   | 61.85  |
| 2406     | 3.88     | -2.09   | 61.81  |
| 2408     | 3.85     | -2.10   | 61.64  |
| 2410     | 3.83     | -2.11   | 61.49  |
| 2412     | 3.80     | -2.14   | 61.12  |
| 2414     | 3.79     | -2.15   | 60.91  |
| 2416     | 3.78     | -2.15   | 60.93  |
| 2418     | 3.77     | -2.17   | 60.67  |
| 2420     | 3.75     | -2.20   | 60.19  |
| 2422     | 3.74     | -2.23   | 59.85  |
| 2424     | 3.72     | -2.25   | 59.51  |
| 2426     | 3.59     | -2.27   | 59.31  |
| 2428     | 3.57     | -2.28   | 59.13  |
| 2430     | 3.56     | -2.31   | 58.75  |
| 2432     | 3.57     | -2.32   | 58.67  |
| 2434     | 3.59     | -2.33   | 58.47  |
| 2436     | 3.49     | -2.35   | 58.20  |
| 2438     | 3.49     | -2.35   | 58.27  |
| 2440     | 3.48     | -2.34   | 58.35  |
| 2442     | 3.46     | -2.32   | 58.60  |
| 2444     | 3.42     | -2.33   | 58.52  |
| 2446     | 3.28     | -2.37   | 57.94  |
| 2448     | 3.26     | -2.38   | 57.80  |
| 2450     | 3.28     | -2.35   | 58.20  |
| 2452     | 3.29     | -2.34   | 58.30  |
| 2454     | 3.29     | -2.33   | 58.47  |
| 2456     | 3.26     | -2.34   | 58.36  |
| 2458     | 3.19     | -2.37   | 57.92  |
| 2460     | 3.10     | -2.42   | 57.29  |
| 2462     | 3.01     | -2.45   | 56.83  |
| 2464     | 2.97     | -2.46   | 56.74  |
| 2466     | 2.92     | -2.46   | 56.78  |
| 2468     | 2.90     | -2.45   | 56.92  |
| 2470     | 2.85     | -2.47   | 56.60  |
| 2472     | 2.82     | -2.48   | 56.44  |
| 2474     | 2.77     | -2.50   | 56.21  |
| 2476     | 2.67     | -2.52   | 55.92  |
| 2478     | 2.65     | -2.51   | 56.06  |
| 2480     | 2.65     | -2.49   | 56.32  |

|      |      |       |       |
|------|------|-------|-------|
| 2482 | 2.63 | -2.50 | 56.30 |
| 2484 | 2.61 | -2.50 | 56.24 |
| 2486 | 2.53 | -2.52 | 55.98 |
| 2488 | 2.53 | -2.52 | 56.03 |
| 2490 | 2.54 | -2.50 | 56.23 |
| 2492 | 2.54 | -2.49 | 56.31 |
| 2494 | 2.51 | -2.50 | 56.30 |
| 2496 | 2.41 | -2.51 | 56.04 |
| 2498 | 2.37 | -2.54 | 55.78 |
| 2500 | 2.34 | -2.55 | 55.62 |

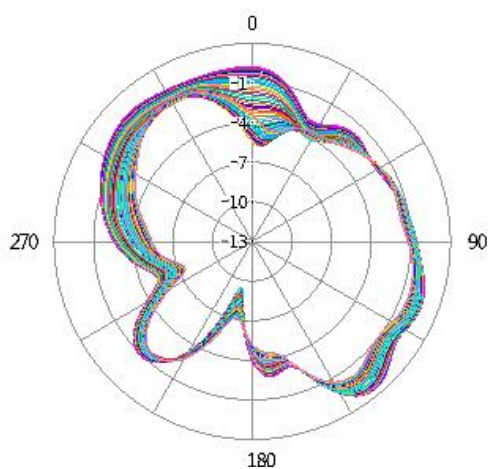
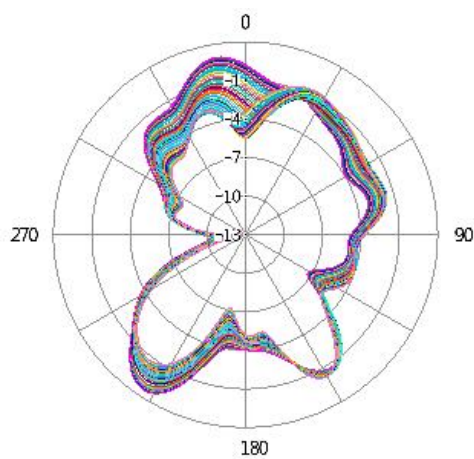
### (1).Antenna Efficiency and Antenna Gain



#### 4. 3D Radiation Pattern



## 5. 2D Radiation Pattern

E1, XZ-Face,  $\phi=0^\circ$  ; ( E1,  $\theta=0^\circ\sim 360^\circ$  ,  $\phi=0^\circ$  )E2, YZ-Face,  $\phi=90^\circ$  ; ( E2,  $\theta=0^\circ\sim 360^\circ$  ,  $\phi=90^\circ$  )H, XY-Face,  $\theta=90^\circ$  ; ( H,  $\phi=0^\circ\sim 360^\circ$  ,  $\theta=90^\circ$  )