

# Testing Report

Customer Name: Xiaomi Communication Technology Co. LTD

Product Name: 2.4GHz WIFI/BT Module

Sample Model: MHCWB9B-B

Reference Standard: GB/T 9410-2008;ANSI/IEEE Std 149-1979

Test Date: 2024.12.27

| Role     | Name | Date       |
|----------|------|------------|
| Engineer | 林何哲  | 2024.12.27 |
| Auditor  | 于永亮  | 2024.12.27 |
| Approver | 张赞   | 2024.12.27 |

## Version

| Version No. | Date       | Description                   | Formulate | Approval |
|-------------|------------|-------------------------------|-----------|----------|
| A0          | 2024.12.27 | For the first time, formulate | Lin Yuzhe | Zhang He |

## Contents

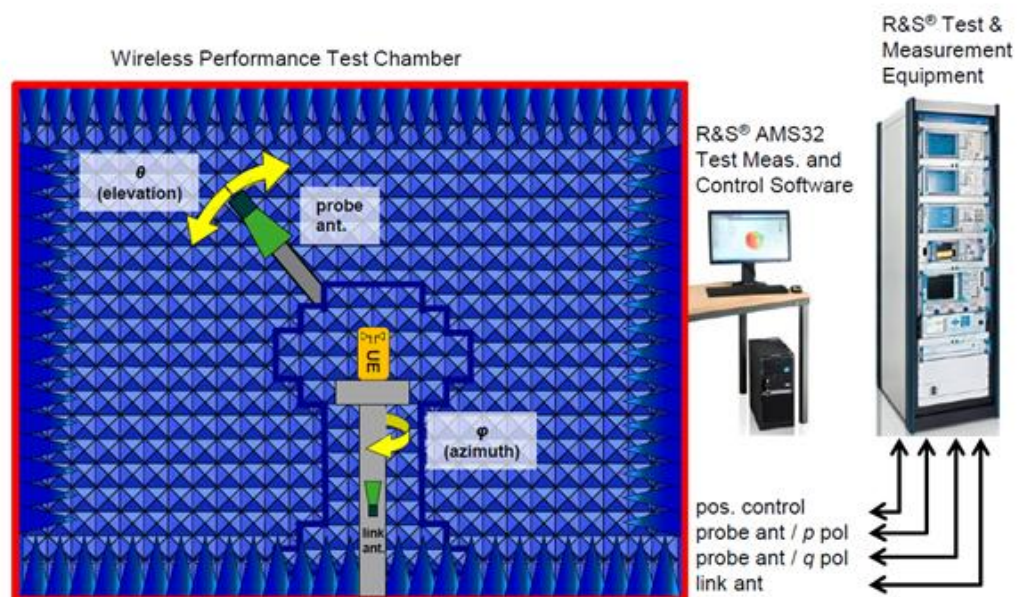
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# 1.General Information

## 1.1 General information of testing institutions

|         |                                                                                       |
|---------|---------------------------------------------------------------------------------------|
| Name    | Xiaomi Communication Technology Co. LTD                                               |
| Address | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China |
| Tel     | 010-6060666                                                                           |

## 1.2 Testing principle



**Multi-Probe OTA Measurement System**

### 1.3 Test equipment

| Equipment        | Model No.     | Serial No. | Manufacturer | Calibration date | Next calibration date |
|------------------|---------------|------------|--------------|------------------|-----------------------|
| Network Analyzer | Rohde&Schwarz | 102231     | ZND          | 20241018         | 20251018              |

### 1.4 Test environment

|             |           |
|-------------|-----------|
| Temperature | 23.9℃     |
| Humidity    | 24%RH     |
| Pressure    | 100.32kPa |

### 1.5 Statement

- (1) The test results in the report are only applicable to the tested samples and the tested samples work under the environment described in the report.
- (2) Only Xiaomi Communication Technology Co. LTD. have the right to modify the report, and the modification information shall be annotated in the revision form.
- (3) Any objection to this report shall be raised within 30 days after formal confirmation of the report.
- (4) This report is invalid if there is any evidence that the sample information provided is falsified.
- (5) The report is invalid without the signature of the auditor and approver.

## 2.Sample Information

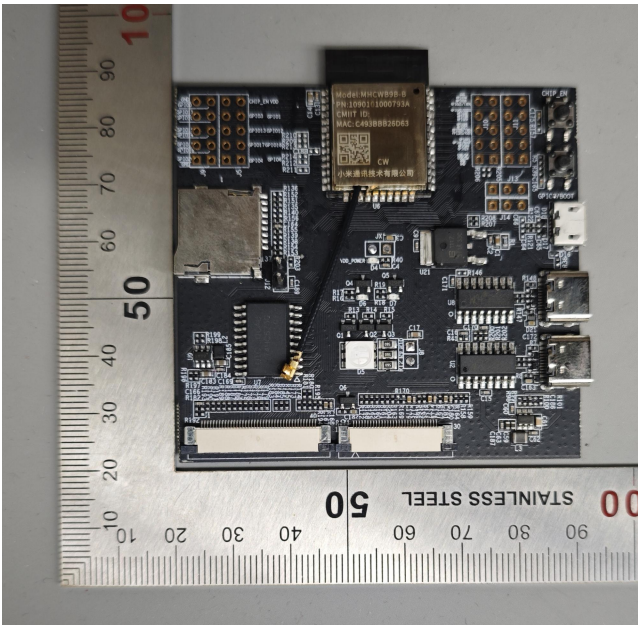
### 2.1 Client information

|                |                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------|
| <b>Name</b>    | Xiaomi Communication Technology Co. LTD                                                       |
| <b>Address</b> | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085 |

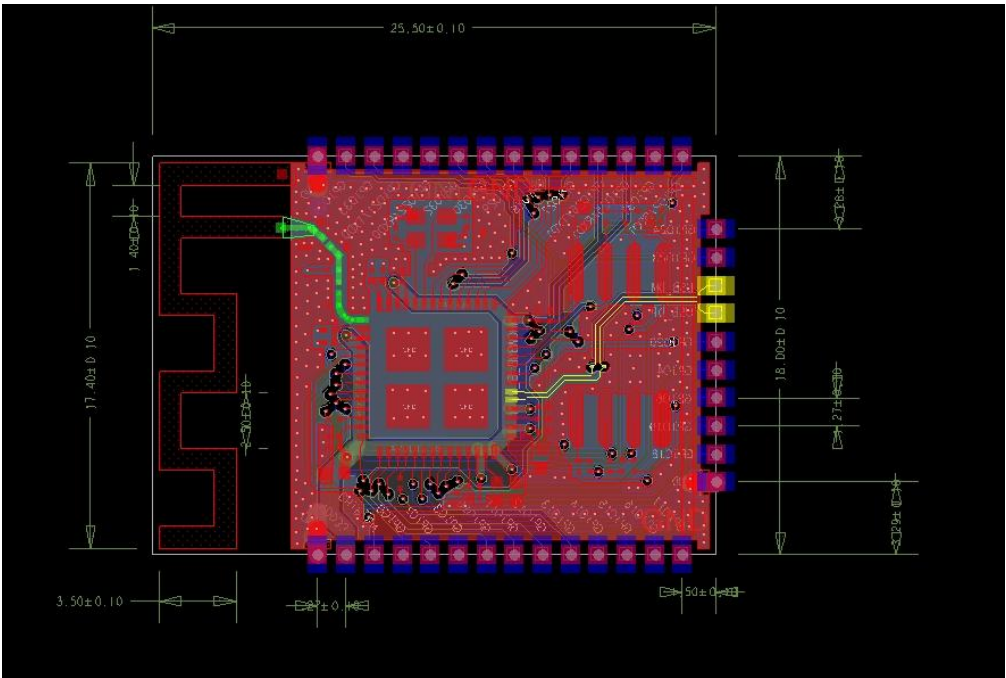
### 2.2 Description of Sample

|                        |                                                          |
|------------------------|----------------------------------------------------------|
| <b>Product Name</b>    | 2.4GHz WIFI/BT Module                                    |
| <b>Sample Modle</b>    | MHCWB9B-B                                                |
| <b>Test Item</b>       | VSWR, Peak Gian, Radiation Efficiency, Radiation pattern |
| <b>Frequency Range</b> | 2400-2480MHz                                             |
| <b>Received Date</b>   | 2024.12.27                                               |
| <b>Test Date</b>       | 2024.12.27                                               |
| <b>Remark</b>          | RF Cable: cable length=50mm, IPEX                        |

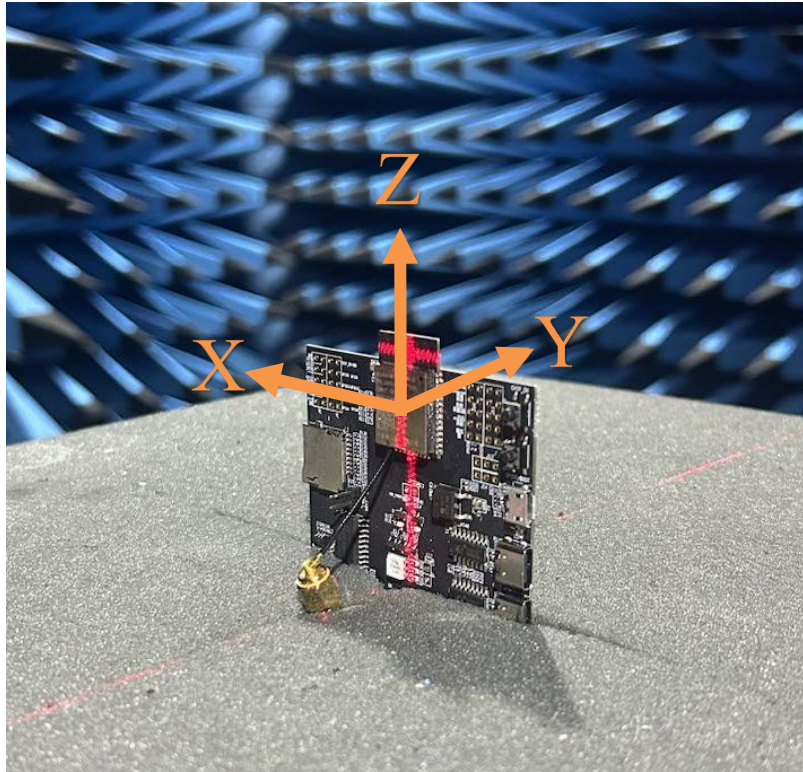
## 2.3 Sample appearance



## 2.4 Antenna size



## 2.5 DUT setup photo of free space OTA testing



## 3. Test Results

### 3.1 Test standard

| Name                         | Parameter         | Method                                                               | Standard no.   |
|------------------------------|-------------------|----------------------------------------------------------------------|----------------|
| Mobile communication antenna | VSWR              | Generic specification for antennas used in the mobile communications | GB/T 9410-2008 |
|                              | Antenna gain      |                                                                      |                |
|                              | Radiation pattern |                                                                      |                |

|         |                      |                                                  |                           |
|---------|----------------------|--------------------------------------------------|---------------------------|
| Antenna | Radiation efficiency | IEEE Standard<br>Test Procedures<br>for Antennas | ANSI/IEEE Std<br>149-1979 |
|         | Gain and directivity |                                                  |                           |

### 3.2 Test uncertainty

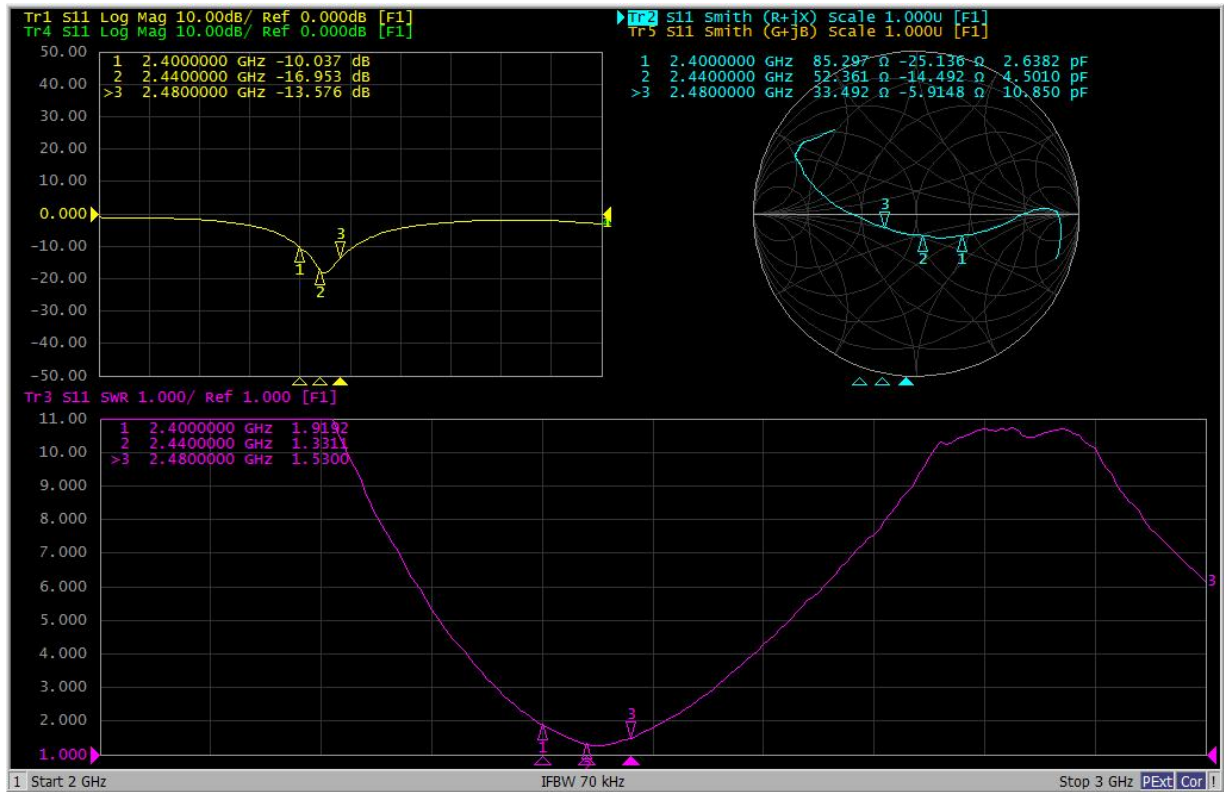
The uncertainty was calculated on the basis of the GUM published by ISO, using the inclusion factor of K=2 and the 95% confidence level to express the extended uncertainty.

| Item                 | Uncertainty           |
|----------------------|-----------------------|
| VSWR                 | $\pm 0.3$             |
| Antenna gain         | $\pm 1.0 \text{ dBi}$ |
| Radiation efficiency | $\pm 10\%$            |



### 3.3 Test data

#### 3.3.1 Network analyzer S parameter



#### 3.3.2 S11 Data

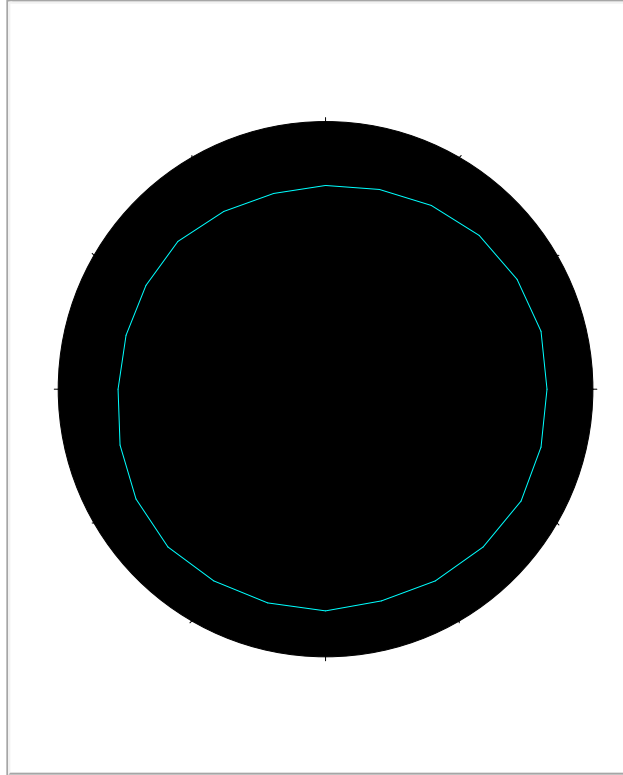
| Frequency/MHz | 2400 | 2440 | 2480 |
|---------------|------|------|------|
| VSWR          | 1.9  | 1.3  | 1.5  |

#### 3.3.3 Typical free space efficiency and gain

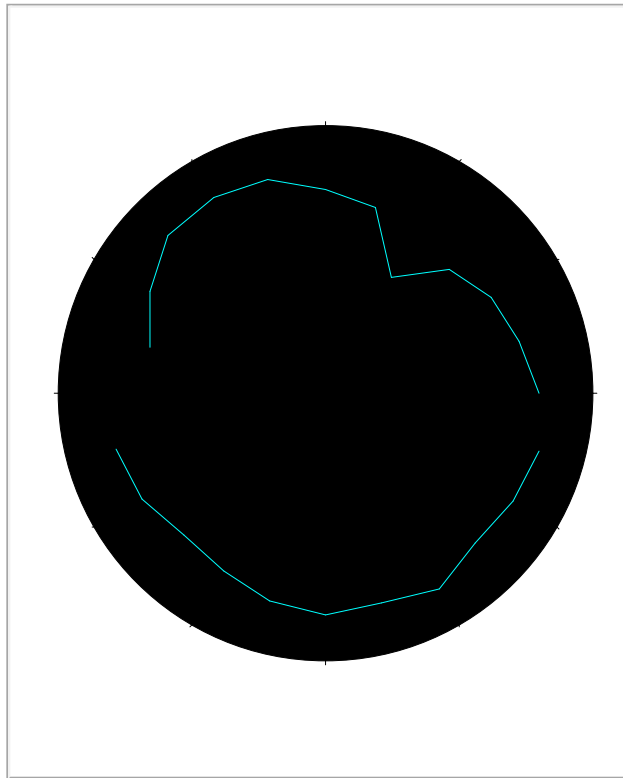
| Frequency/MHz | 2400 | 2410 | 2420 | 2430 | 2440 | 2450 | 2460 | 2470 | 2480 |
|---------------|------|------|------|------|------|------|------|------|------|
| Peak Gain/dBi | -0.3 | -0.1 | -0.1 | -0.1 | 0.1  | 0.0  | 0.3  | 0.4  | 0.4  |
| Efficiency/%  | 45.0 | 46.1 | 48.0 | 48.9 | 51.3 | 50.4 | 52.2 | 53.6 | 53.3 |

### 3.3.4 Typical free space radiation pattern

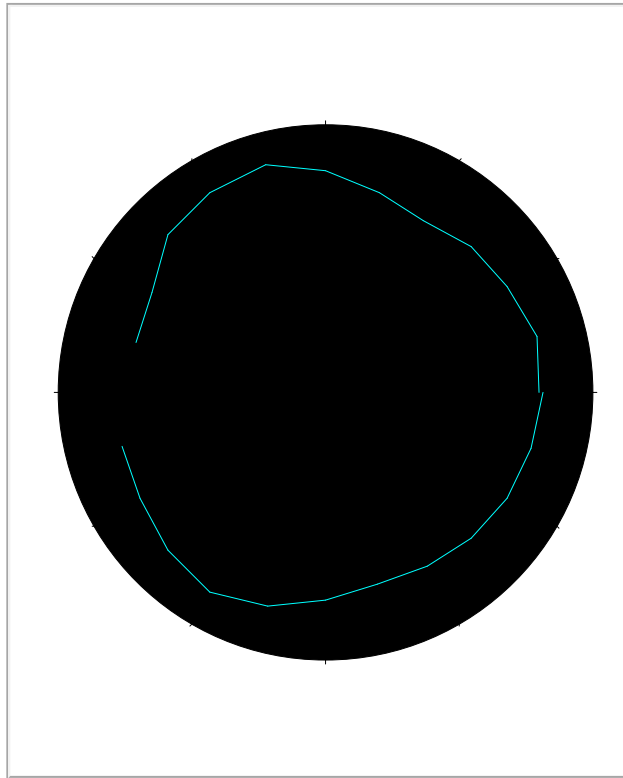
(1) X-Y Plane:



(2) Y-Z Plane:

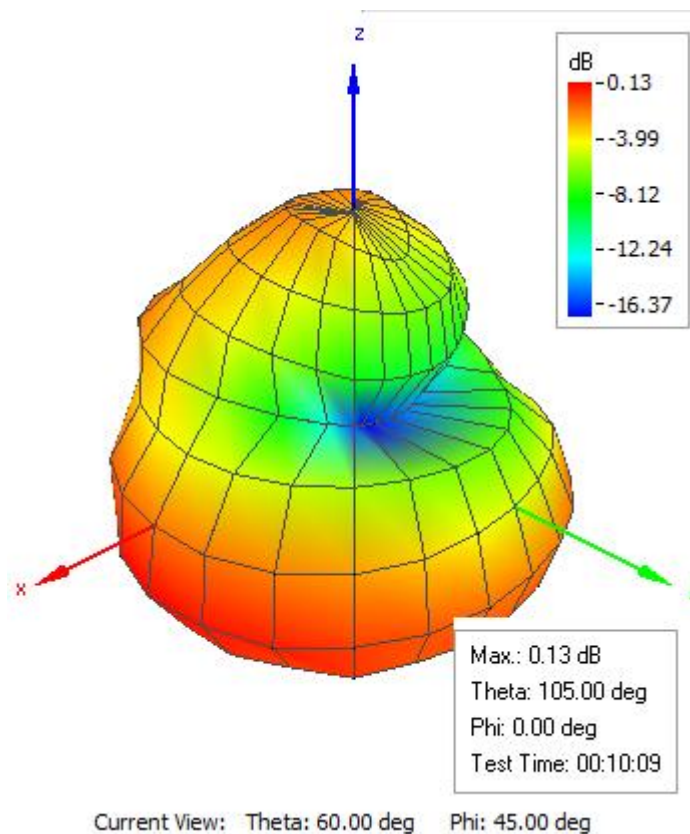


(3) X-Z Plane:



—

(4) Typical Free Space 3D Radiation Pattern at 2440MHz:



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