

# Testing Report

Report No: MIoT202206001

Customer Name: Xiaomi Communication Technology Co. LTD

Product Name: 2.4GHz WIFI/BT Module

Sample Model: MHCWB5S

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

Test Date: 2022.06.17

Role	Name	Date
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Approver	张贺	20220617

**Version**

Version No.	Date	Description	Formulate	Approval
A0	2022.06.17	For the first time, formulate	Lin Yuzhe	Zhang He

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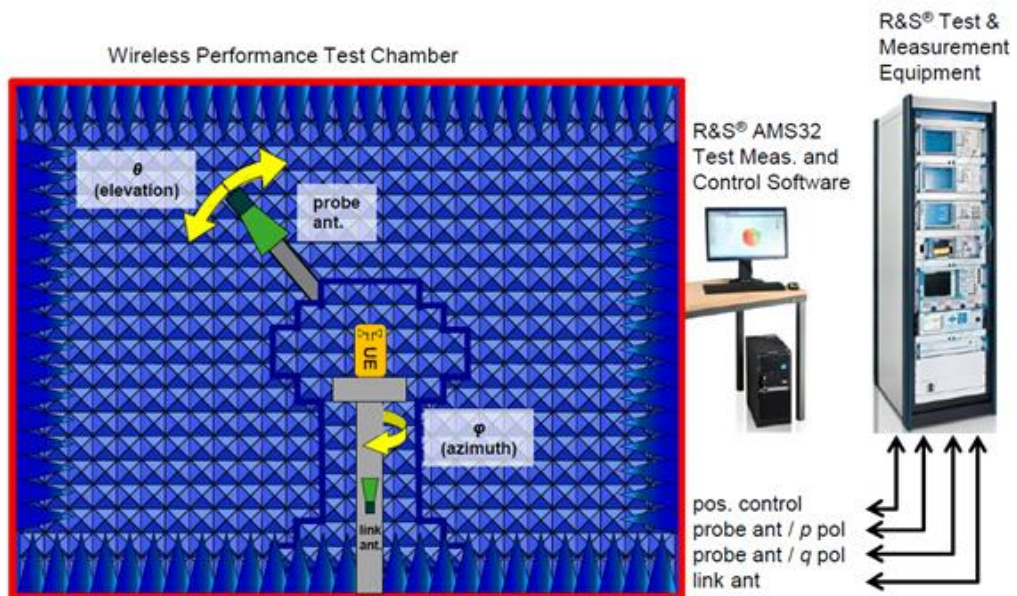
# 1. General Information

## 1.1 General information of testing institutions

<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
<b>Tel</b>	010-6060666

## 1.2 Testing principle

Multi-Probe OTA Measurement System



### 1.3 Test equipment

<b>Equipment</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Calibration date</b>	<b>Next calibration date</b>
Network Analyzer	ROHED&SCH WARZ	102231	ZND	20211018	20221018

### 1.4 Test environment

<b>Temperature</b>	23.9°C
<b>Humidity</b>	24%RH
<b>Pressure</b>	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

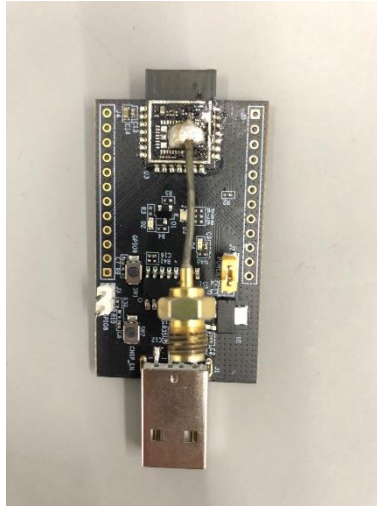
### 2.1 Client information

<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

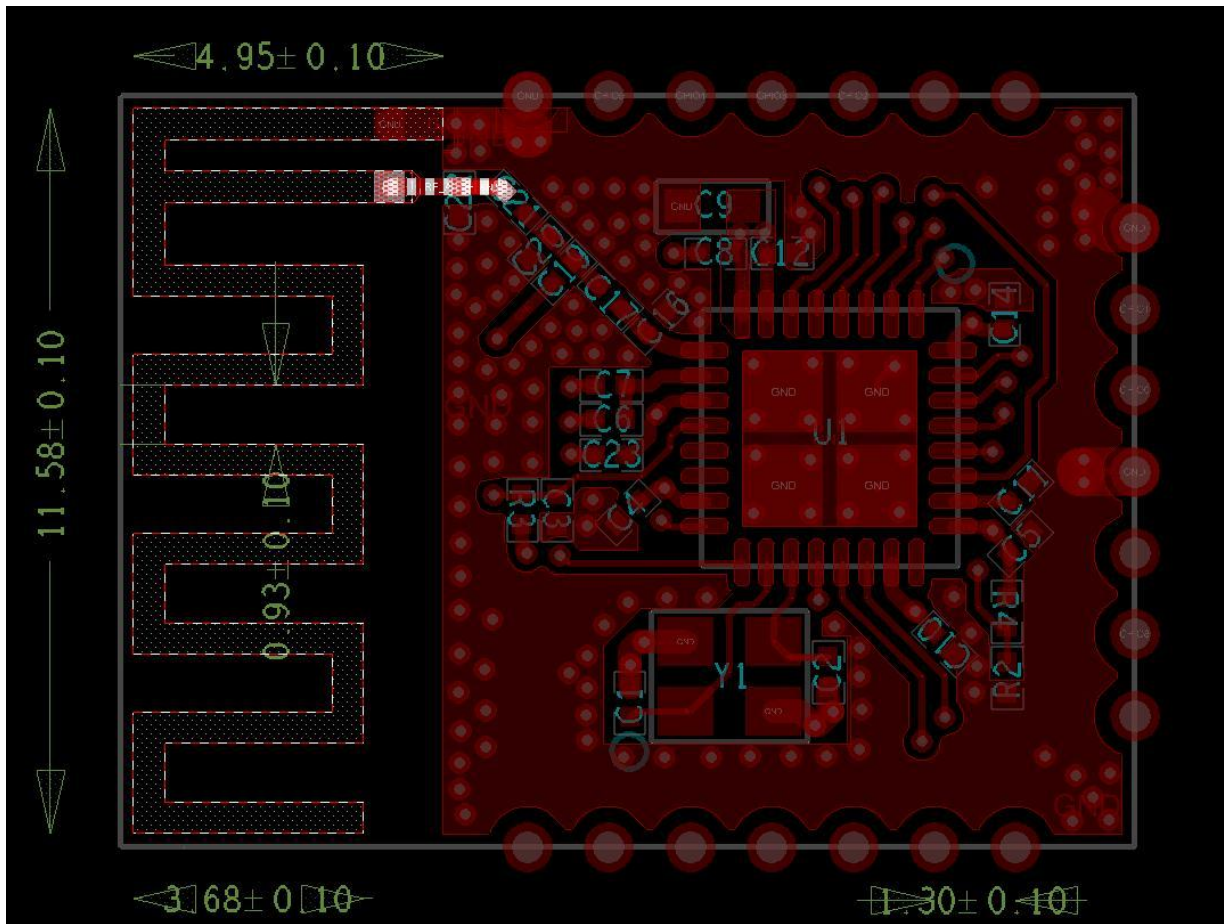
### 2.2 Description of Sample

<b>Product Name</b>	2.4GHz WIFI/BT Module
<b>Sample Modle</b>	MHCWB5S-B
<b>Test Item</b>	VSWR, Peak Gian, Radiation Efficiency, Radiation pattern
<b>Frequency Range</b>	2400-2480MHz
<b>Received Date</b>	2022.06.17
<b>Test Date</b>	2022.06.17
<b>Remark</b>	RF Cable: cable length=50mm, SMA

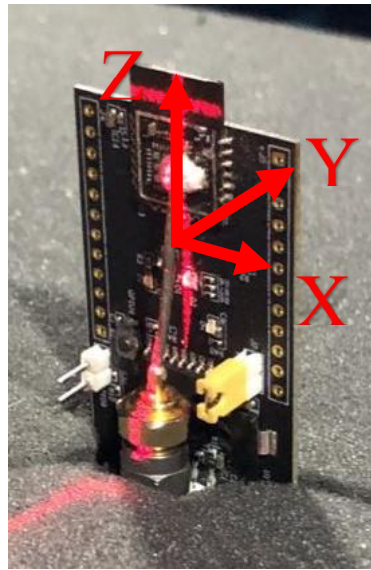
## 2.3 Sample appearance



## 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 Test Procedures for Antennas	ANSI/IEEE Std 149-1979



Gain and directivity
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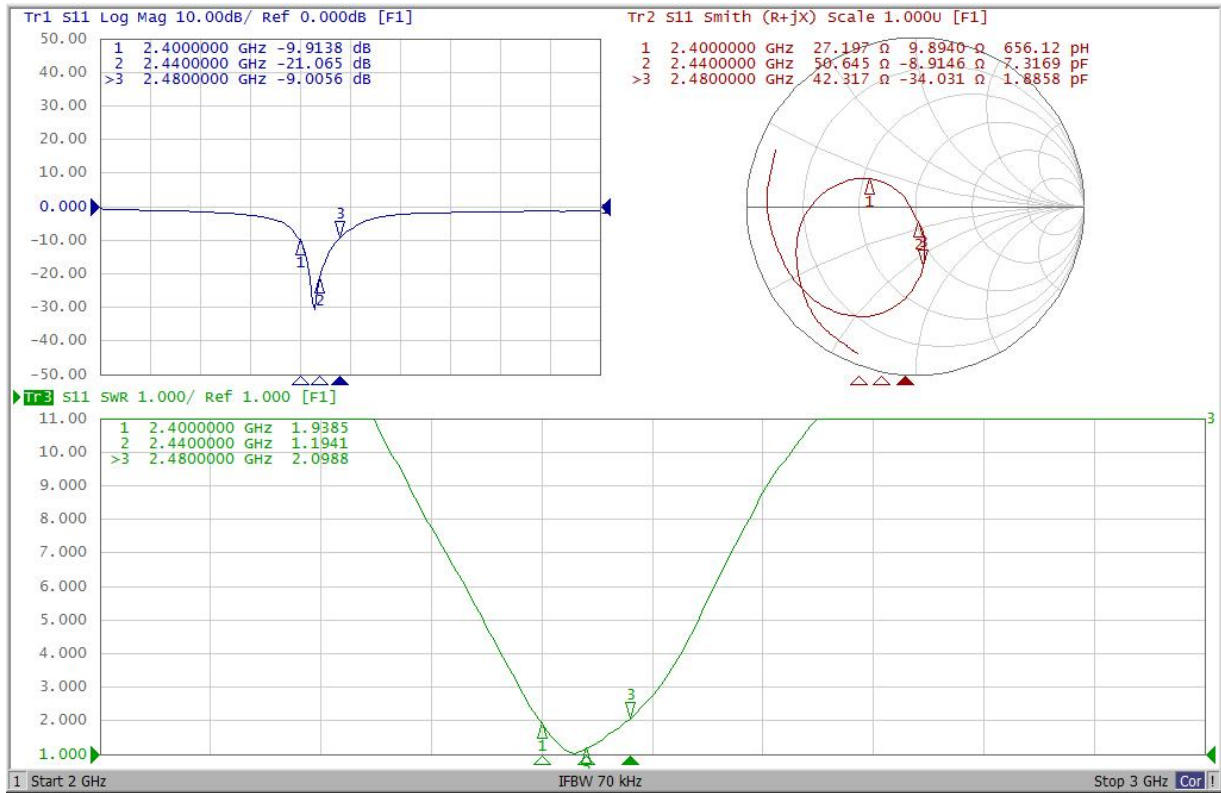
### 3.2 Test uncertainty

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.

<b>Item</b>	<b>Uncertainty</b>
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	1.2	2.1

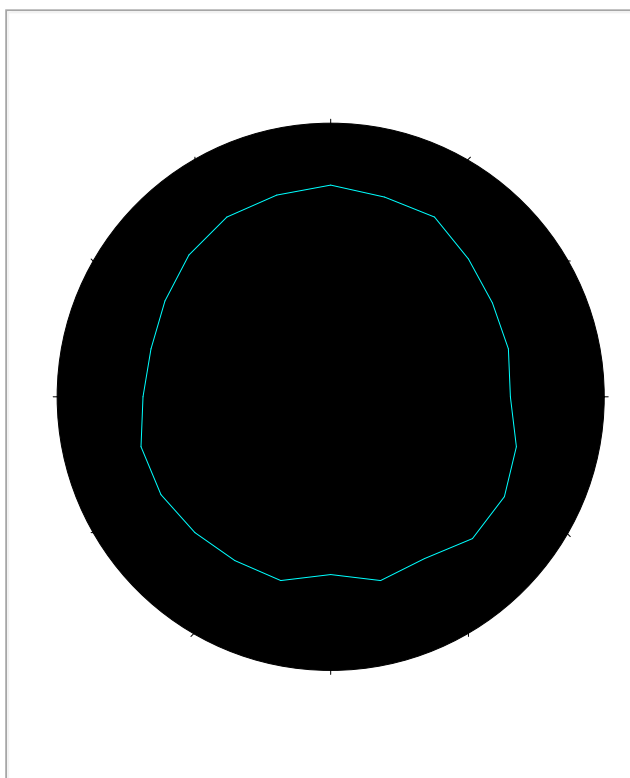
#### 3.3.3 Typical free space efficiency and gain

Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480

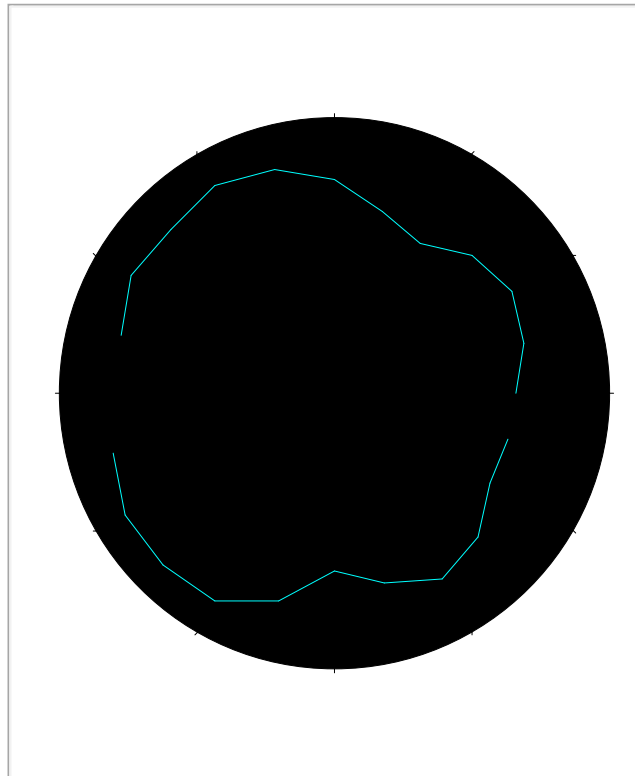
<b>Peak Gain/dBi</b>	-0.1	1.7	2.0	2.3	2.4	1.4	2.6	2.8	2.6
<b>Efficiency/%</b>	30.2	36.4	40.9	44.9	47.8	40.3	50.8	51.3	51.2

### 3.3.4 Typical free space radiation pattern

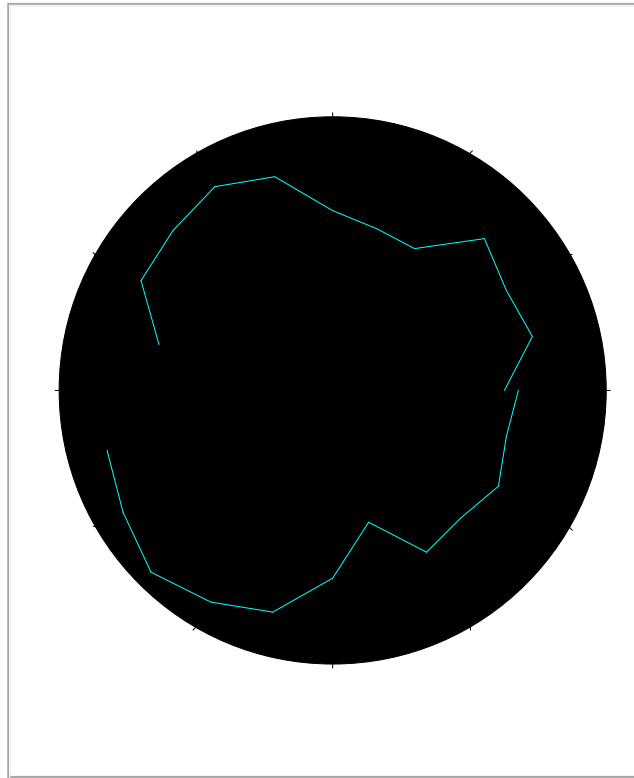
(1) X-Y Plane:



(2) Y-Z Plane:

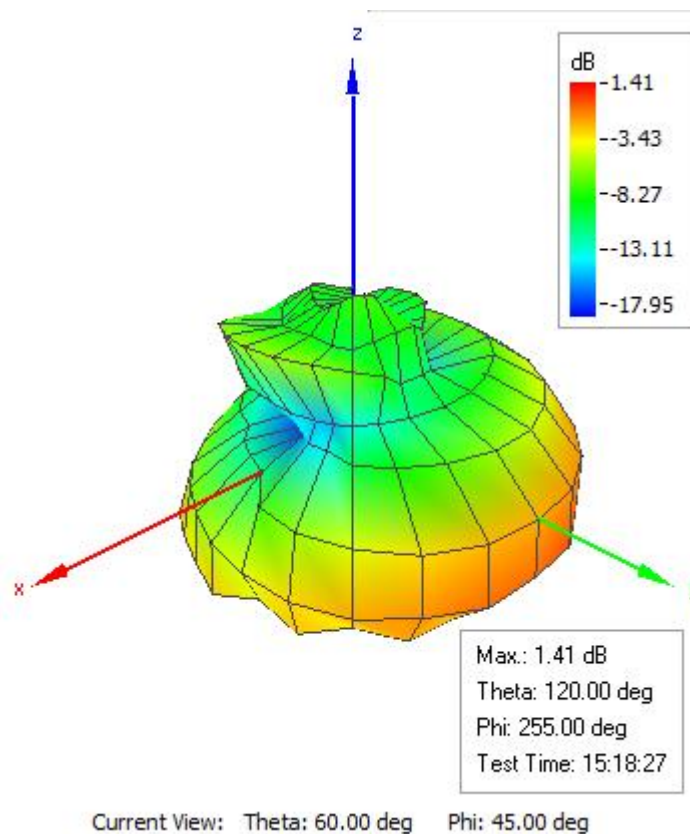


(3) X-Z Plane:



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



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