

# Testing Report

Customer Name: ShenZhen Rfstar Technology Co.,Ltd

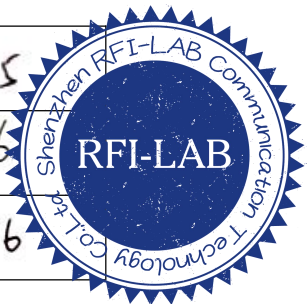
Product Name: Bluetooth Module

Sample Model: RSBR02ABR

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

Issue Date: 2021.11.16

Engineer: Jackson	Date: 2021.11.15
Auditor: Eason	Date: 2021.11.16
Approver: Janson	Date: 2021.11.16



## Version

Version No.	Date	Description	Formulate	Approval
A0	2021.11.16	For the first time, formulate	Jackson	Eason

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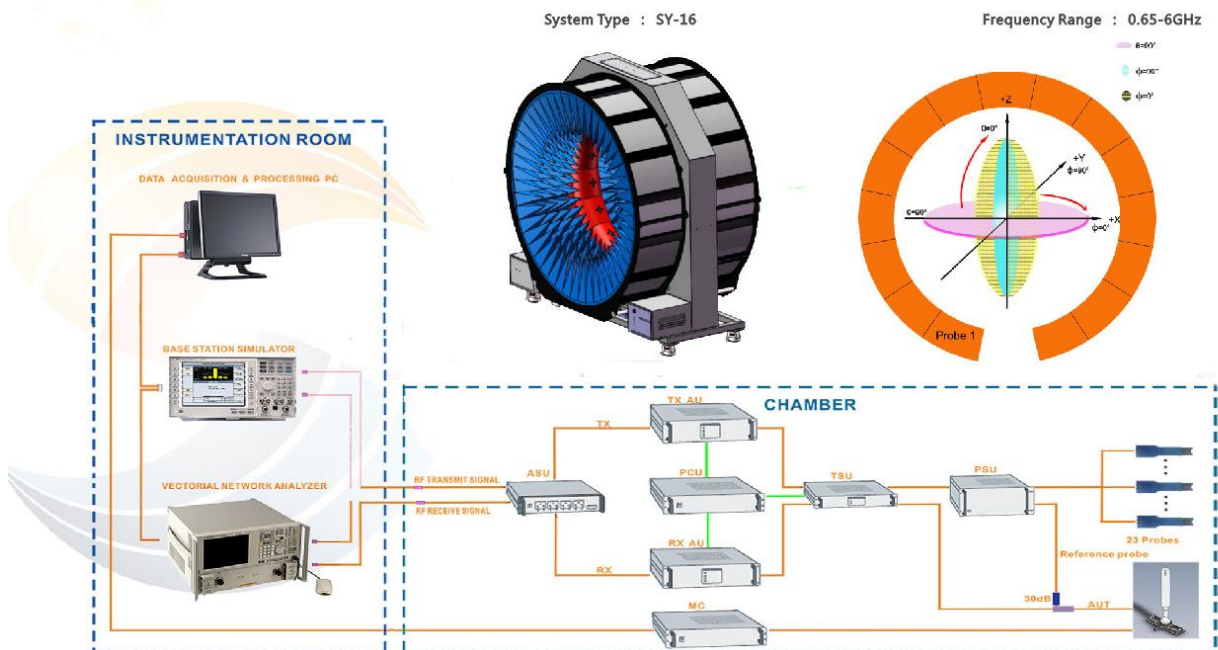
# 1.General Information

## 1.1 General information of testing institutions

<b>Name</b>	Shenzhen RFI-LAB Communication Technology Co., Ltd.
<b>Address</b>	10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ
<b>Tel</b>	13682621346
<b>E-mail</b>	rfi-lab@tech-now.com
<b>Equipment</b>	All the equipment used in the report is fixed in 10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ

## 1.2 Testing principle

### Multi-Probe OTA Measurement System



### 1.3 Test equipment

Equipment	Model No.	Serial No.	Manufacturer	Calibration date	Next calibration date
16 probe microwave chamber	3*3*2.5	RFI-LAB-RF-A00	SUNYIELD	2021.3.15	2023.3.14
Network Analyzer	E5071C	RFI-LAB-RF-A02	Agilent	2021.5.14	2022.5.13
Network Analyzer	E5071C	RFI-LAB-RF-C02	KEYSIGHT	2021.5.14	2022.5.13

### 1.4 Test environment

Temperature	24.0°C
Humidity	55%RH
Pressure	100.04kPa

### 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 Shenzhen RFI-LAB 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

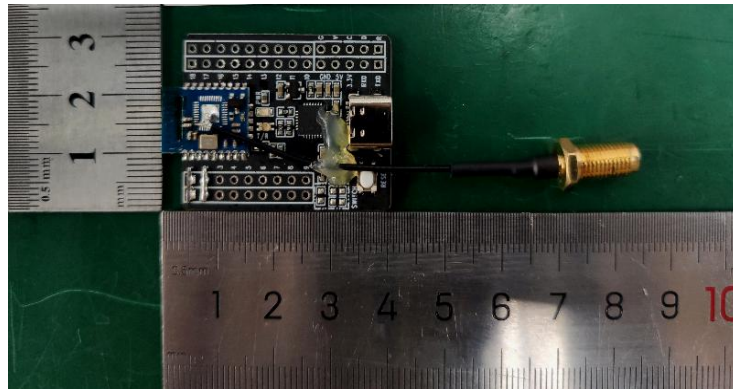
### 2.1 Client information

<b>Name</b>	ShenZhen Rfstar Technology Co.,Ltd
<b>Address</b>	Room601, Block C, Skyworth Building, High-tech Park, NanShan District, ShenZhen, China
<b>Contacts</b>	Mr. Xie
<b>Tel</b>	13580115040
<b>E-mail</b>	aiden@szrfstar.com

### 2.2 Description of EUT(S)

<b>Product Name</b>	Bluetooth Module
<b>Sample Model</b>	RSBRS02ABR
<b>Size</b>	/
<b>Serial No.</b>	/
<b>Test Item</b>	VSWR; Antenna gain; Efficiency; Radiation pattern
<b>Frequency Range</b>	2400-2500MHz
<b>Received Date</b>	2021.11.15
<b>Test Date</b>	2021.11.15
<b>Remark</b>	The length of the RF cable is 65mm

### 2.3 EUT appearance

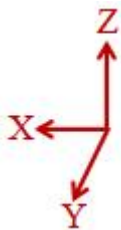
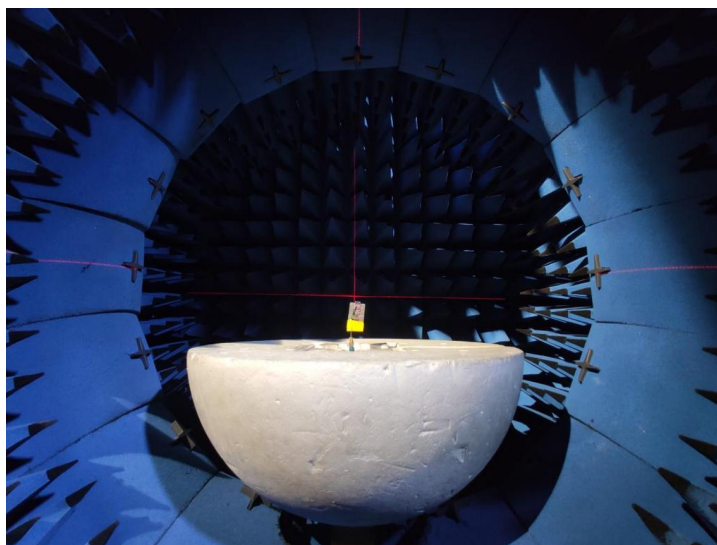


### 2.4 DUT setup photo of free space OTA testing

Planform



Front view



## 3. Test Results

### 3.1 Test standard

Name	Parameter	Method	Standard no.
Mobile communication antenna	Antenna gain	Generic specification for antennas used in the mobile communications	GB/T 9410-2008
	Radiation pattern		
	VSWR		
Antenna	Radiation efficiency	IEEE Standard Test Procedures for Antennas	ANSI/IEEE Std 149-1979
	Gain and directivity		

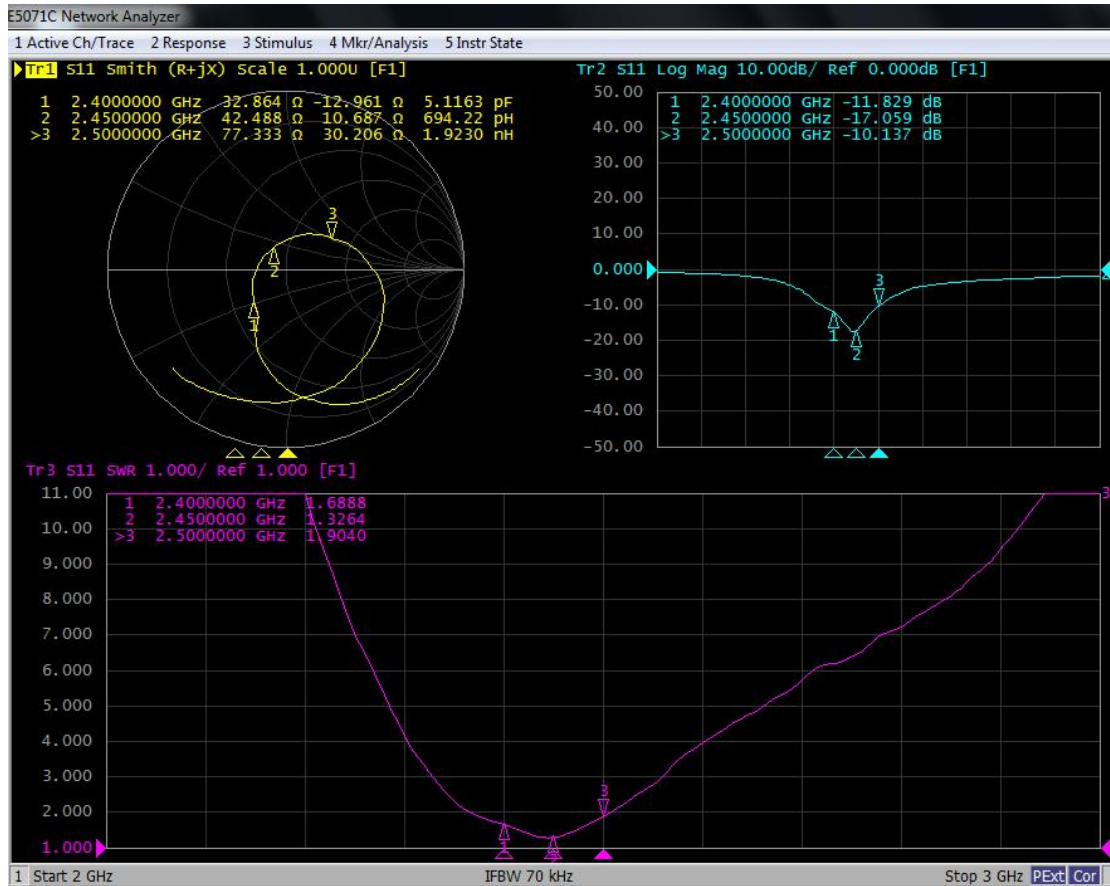
### 3.2 Test uncertainty

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	$\pm 1\text{dB}$
Radiation efficiency	$\pm 10\%$

### 3.3 Test data

#### 3.3.1 S11 parameters



#### 3.3.2 VSWR data

Frequency/MHz	2400	2450	2500
VSWR	1.6888	1.3264	1.9040

#### 3.3.3 Typical free space efficiency and gain

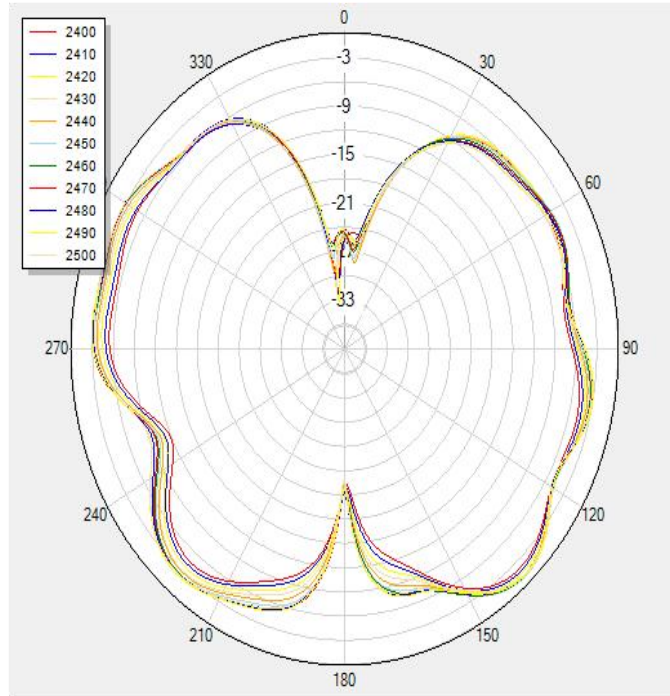
Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain/dBi	-2.16	-1.83	-1.52	-1.13	-1.19	-0.89	-1.01	-1.01	-1.07	-0.94	-1.17
Efficiency/%	25.34	27.70	30.18	32.53	33.69	35.84	36.24	36.48	36.48	36.92	35.53



### 3.3.4 Typical free space radiation pattern

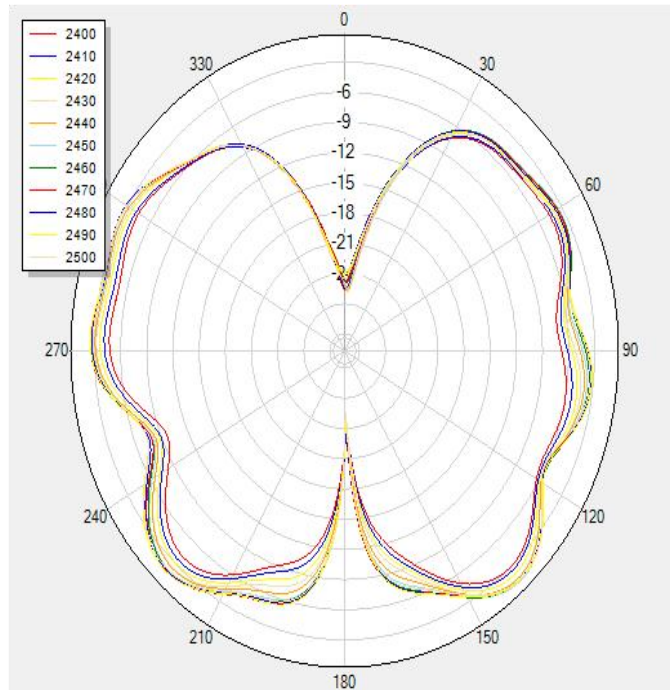
(1) X-Z Plane:

**V Phi=0**



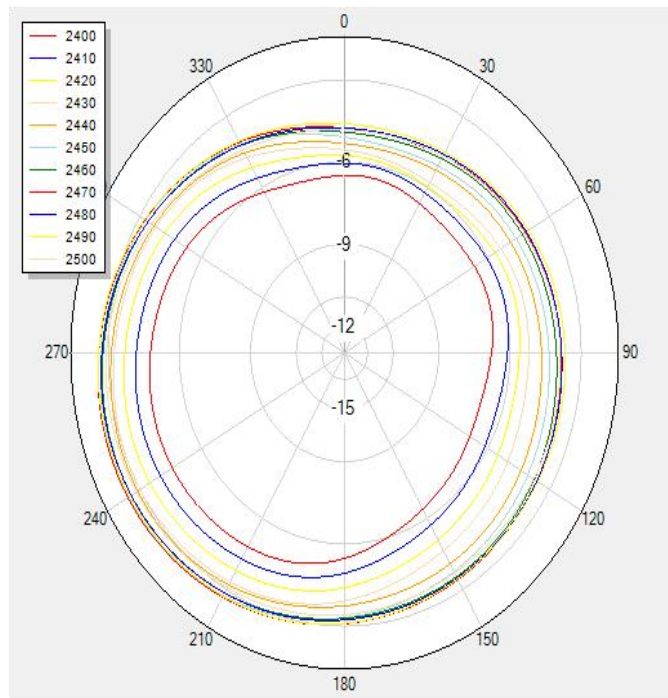
(2) Y-Z Plane:

**V Phi=90**

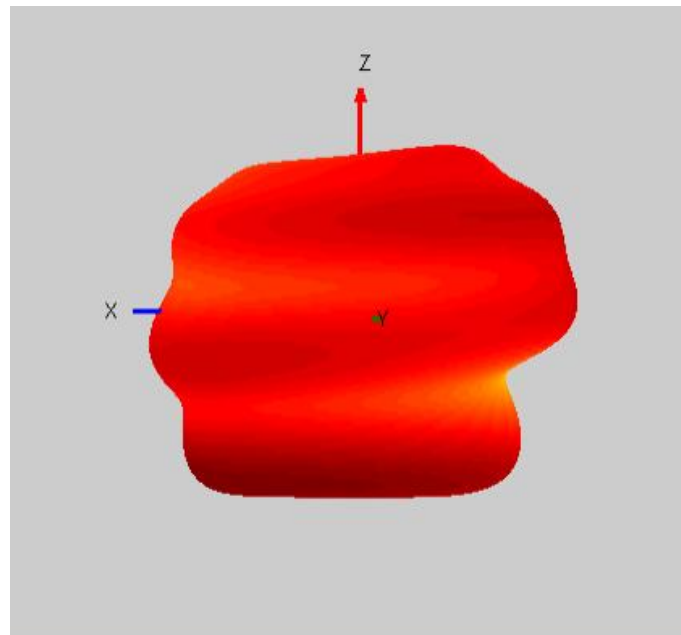


(3) X-Y Plane:

**H Theta=90**



(4) Typical Free Space 3D Radiation Pattern at 2.45GHz:



**End**

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