

# Testing Report

Customer Name: ShenZhen APP-life Technology Co.,Ltd

Product Name: Bluetooth Keyboard

Sample Model: 110MB01GW/129MB01GW

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

Issue Date: 2023.10.20



## Version

Version No.	Date	Description	Formulate	Approval
A0	2023.10.20	For the first time, formulate	Jackson	Eason

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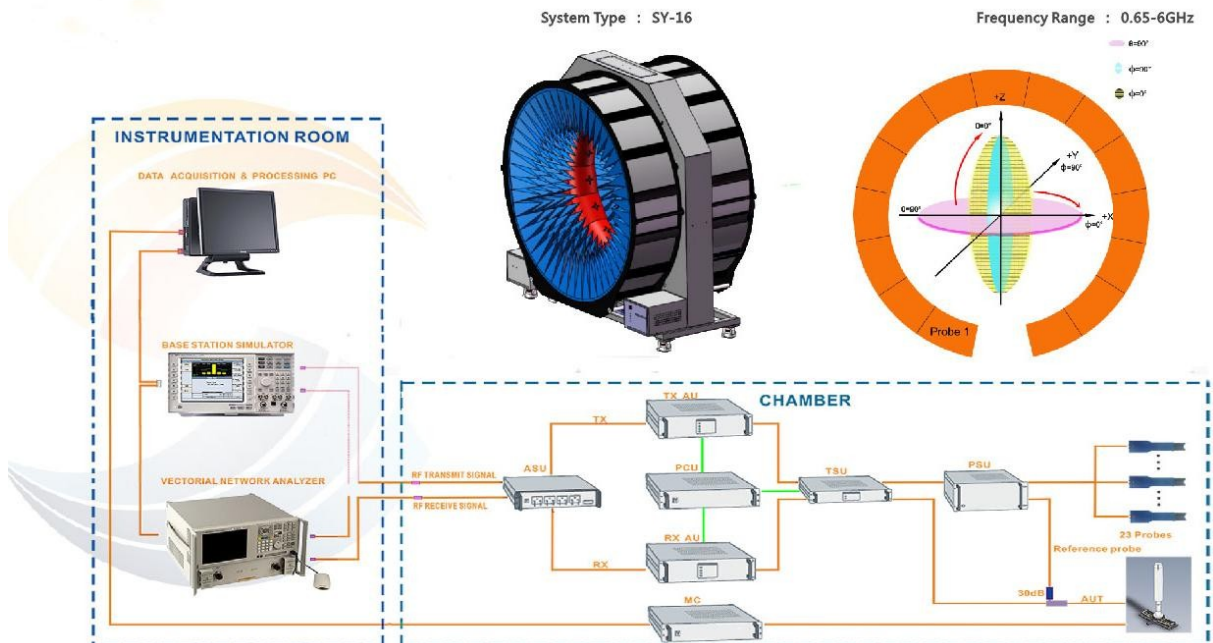
# 1. General Information

## 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>	13631623357
<b>E-mail</b>	liss@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	2023.3.15	2025.3.14
Network Analyzer	E5071C	RFI-LAB-RF-A02	Agilent	2023.5.13	2024.5.12
Network Analyzer	E5071C	RFI-LAB-RF-C02	KEYSIGHT	2023.5.13	2024.5.12

### 1.4 Test environment

Temperature	24.5°C
Humidity	59%RH
Pressure	100.08kPa

### 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

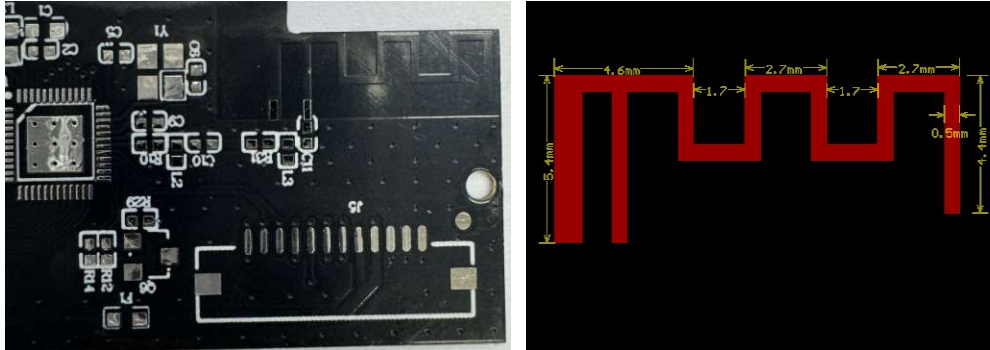
### 2.1 Client information

<b>Name</b>	ShenZhen APP-life Technology Co.,Ltd
<b>Address</b>	ShenZhen APP-life Technology Co., Ltd, Room 1005, Huamei Building, Songgang Street, Baoan District, Shenzhen, Guangdong.
<b>Contacts</b>	Tommy
<b>Tel</b>	15986801728
<b>E-mail</b>	44340242@qq.com
<b>Manufacturer</b>	ShenZhen APP-life Technology Co.,Ltd

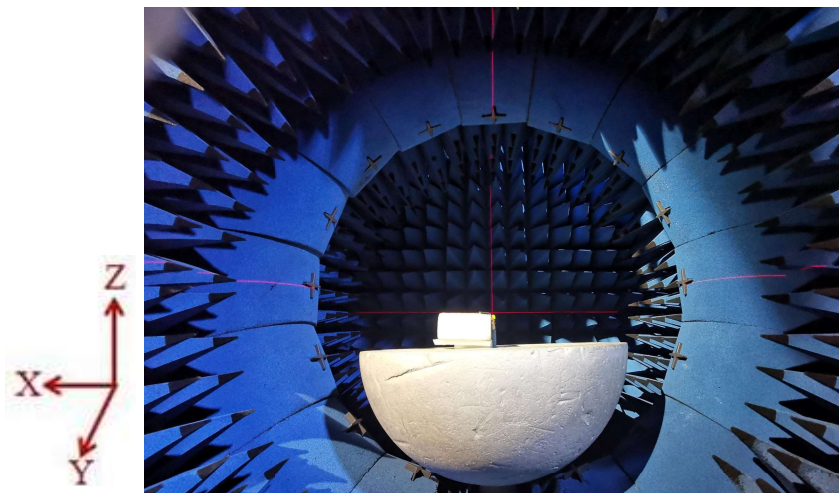
### 2.2 Description of EUT(S)

<b>Product Name</b>	Bluetooth Keyboard
<b>Sample Model</b>	110MB01GW/129MB01GW
<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>	2023.10.20
<b>Test Date</b>	2022.10.20
<b>Remark</b>	The length of the RF cable is 30mm

### 2.3 EUT appearance



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



## 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		

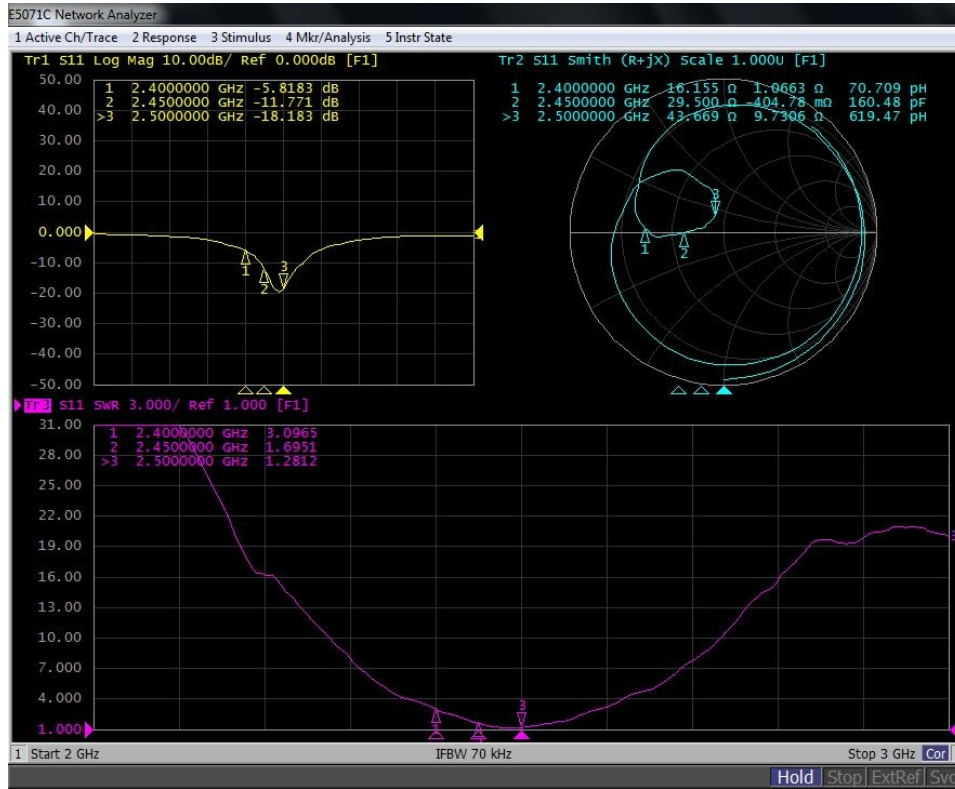
### 3.2 Test uncertainty

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	3.0965	1.6951	1.2812

#### 3.3.3 Typical free space efficiency and gain

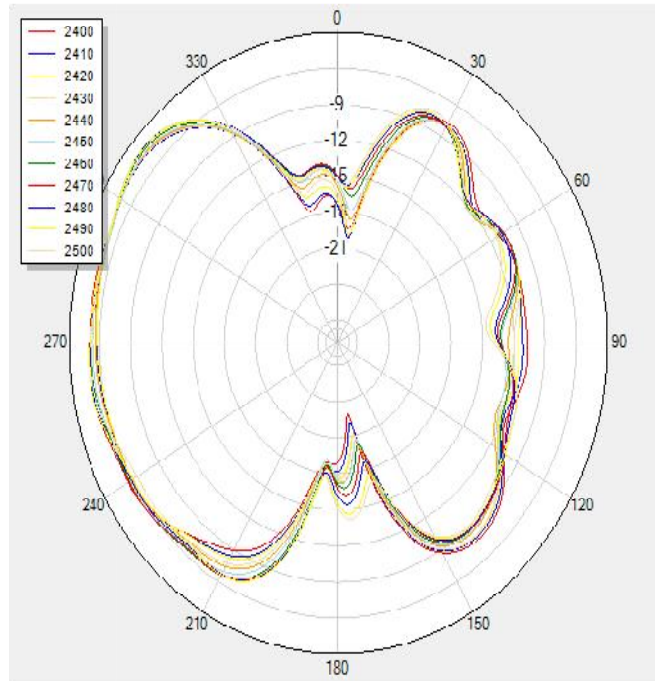
Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain/dBi	1.4	1.43	1.55	1.8	1.67	1.91	2.04	2.26	2.45	2.63	2.78
Efficiency/%	38.96	39.56	40.38	41.59	41.77	43.56	45.69	47.94	48.99	50.26	50.86



### 3.3.4 Typical free space radiation pattern

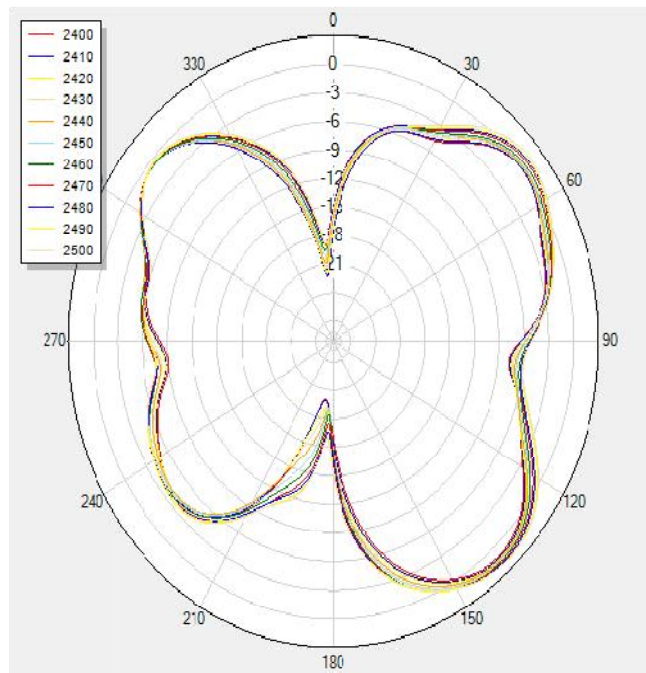
(1) X-Z Plane:

**V Phi=0**



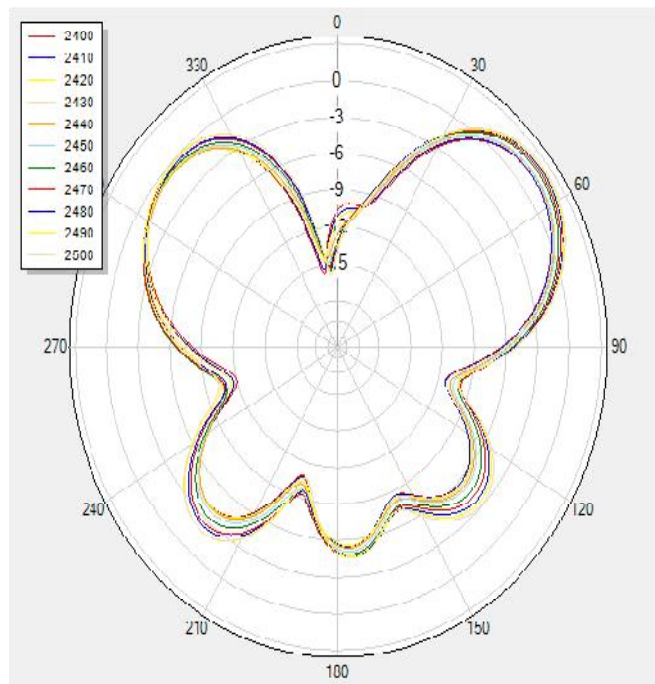
(2) Y-Z Plane:

**V Phi=90**

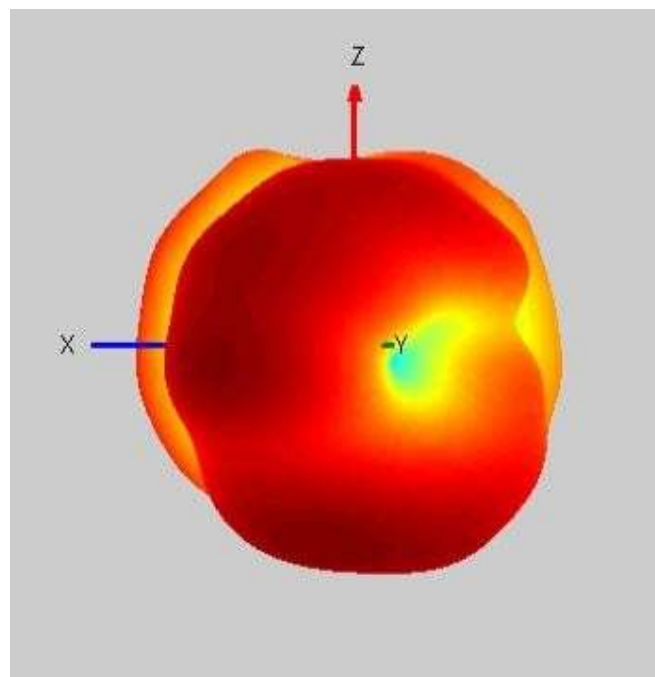


(3) X-Y Plane:

**H Theta=90**



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



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**End**

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