

# Testing Report

Customer Name: Hayco Enterprises (Shenzhen) Ltd. Luotian Branch

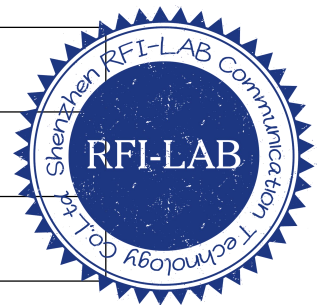
Product Name: Oralucet toothbrush

Sample Model: Model 2

Reference Standard: *GB/T 9410-2008; ANSI/IEEE Std149-2021*

Issue Date: 2024.3.6

Engineer: Zkm's	Date: 2024.2.28
Auditor: Eason	Date: 2024.3.6
Approver: Aason	Date: 2024.3.6



### Version

Version No.	Date	Description	Formulate	Approval
A0	2024.3.6	For the first time, formulate	Zkris	Eason

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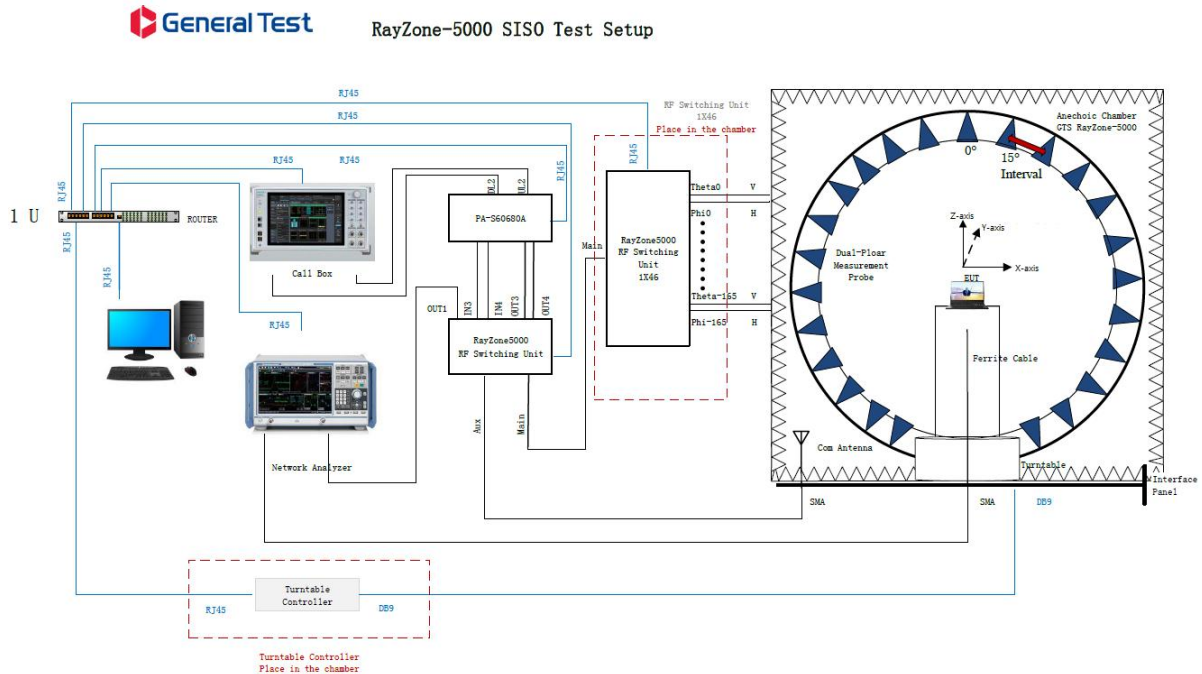
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# 1. General Information

## 1.1 General information of testing institutions

<b>Name</b>	Shenzhen RFI-LAB Communication Technology Co., Ltd.
<b>Address</b>	103 Building 1 Tingwei Industrial Park, No.6, Liufang Road, Zone 67Xingdong, Xin'an Subdistrict, Bao'an District, Shenzhen, Guangdong, China
<b>Tel</b>	/
<b>E-mail</b>	/
<b>Equipment</b>	All the equipment used in the report is fixed in 103 Building 1 Tingwei Industrial Park, No.6, Liufang Road, Zone 67Xingdong, Xin'an Subdistrict, Bao'an District, Shenzhen, Guangdong, China

## 1.2 Testing principle



### 1.3 Test equipment

Equipment	Model No.	Serial No.	Manufacturer	Calibration date	Next calibration date
OTA Test System	RayZone-5000	RFI-LAB-RF-D00	GTS	2023.3.14	2025.3.13
Network Analyzer	E5071C	RFI-LAB-RF-D01	KEYSIGHT	2023.5.11	2024.5.10
Network Analyzer	E5071C	RFI-LAB-RF-C02	KEYSIGHT	2023.5.11	2024.5.10

### 1.4 Test environment

Temperature	23.7°C
Humidity	58%RH
Pressure	100.17kPa

### 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>	Hayco Enterprises (Shenzhen) Ltd. Luotian Branch
<b>Address</b>	Building L,H and M, No.2 Longshan Eighth Road Luotian, Yanluo, Baoan District Shenzhen, Guangdong, PRC
<b>Contacts</b>	/
<b>Tel</b>	/
<b>E-mail</b>	/
<b>Manufacturer</b>	/
<b>Manufacturer Address</b>	/


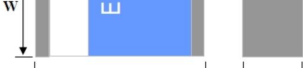


### 2.2 Description of EUT(S)

<b>Product Name</b>	Oralucet toothbrush
<b>Sample Model</b>	Model 2
<b>Antenna Size</b>	/
<b>Antenna Type</b>	Ceramic antenna
<b>Test Item</b>	VSWR;Antenna gain; Efficiency; Radiation pattern
<b>Frequency Range</b>	2400-2500MHz
<b>Received Date</b>	2024.2.22
<b>Test Date</b>	2024.2.28
<b>Remark</b>	/

### 2.3 EUT appearance

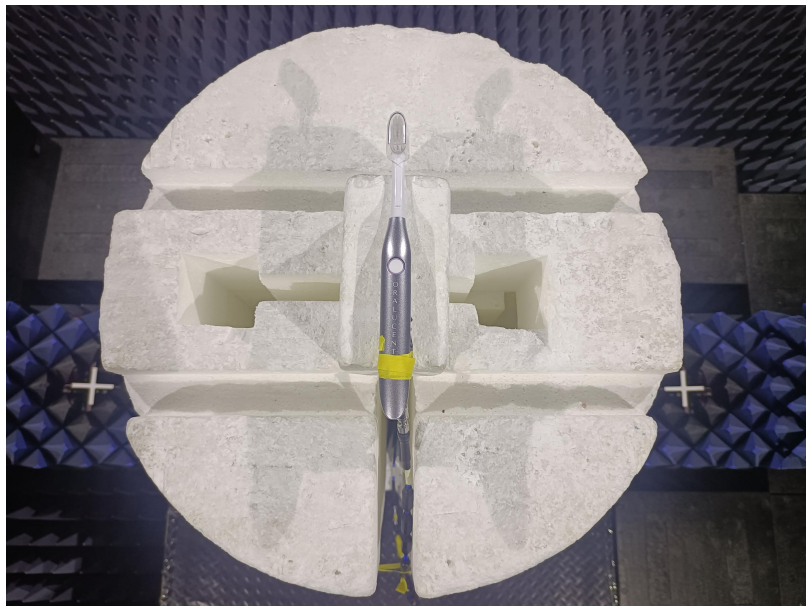


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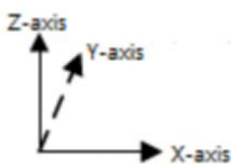
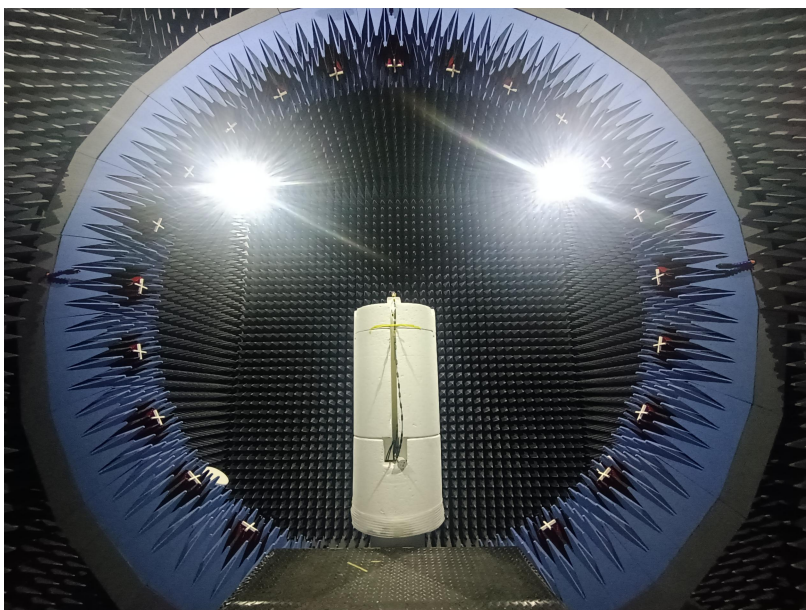
Figure	Symbol	Dimension (mm)
	L	3.20 ± 0.20
	W	1.60 ± 0.10
	T	1.20 ± 0.10
	a	0.25 ± 0.15

### 2.4 EUT 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 149-2021
	Gain and directivity		

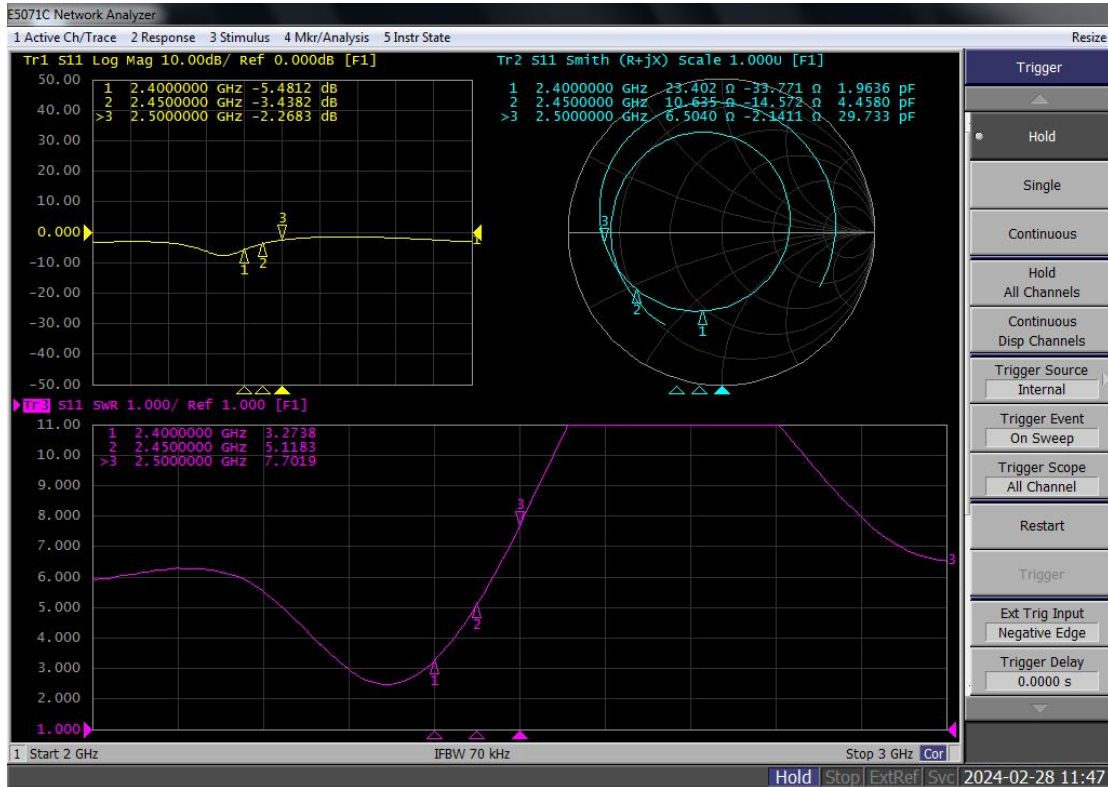
### 3.2 Test uncertainty

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	$\pm 0.72\text{dB}$
Radiation efficiency	$\pm 0.72\text{dB}$

### 3.3 Test data

#### 3.3.1 VSWR parameters



#### 3.3.2 VSWR data

Frequency/MHz	2400	2450	2500
VSWR	3.2738	5.1183	7.7019

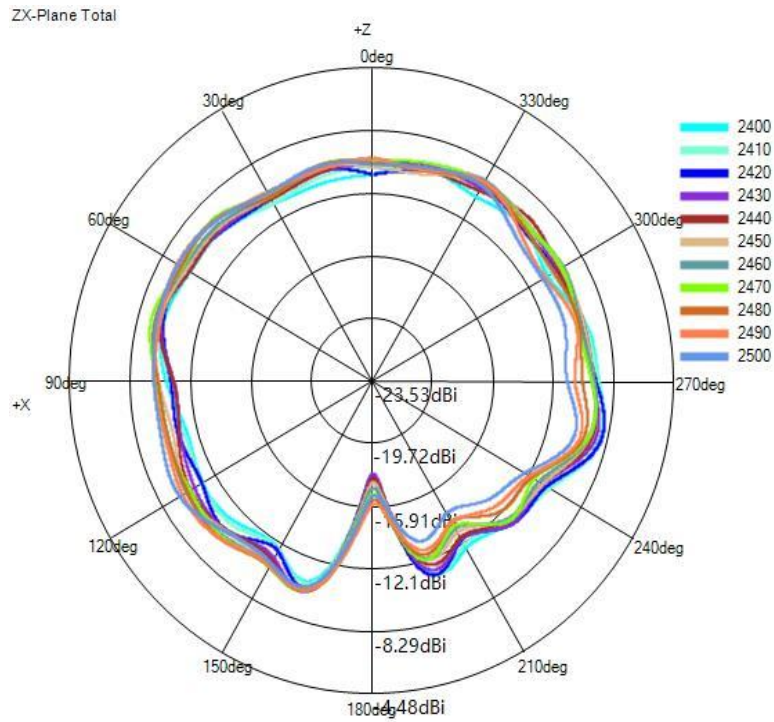
#### 3.3.3 Typical free space efficiency and gain

Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain/dBi	-5.57	-5.48	-5.44	-5.44	-5.20	-4.94	-4.72	-4.59	-4.59	-4.49	-4.52
Efficiency/%	8.87	9.11	9.35	9.36	9.50	9.76	10.04	10.15	9.84	9.88	9.76

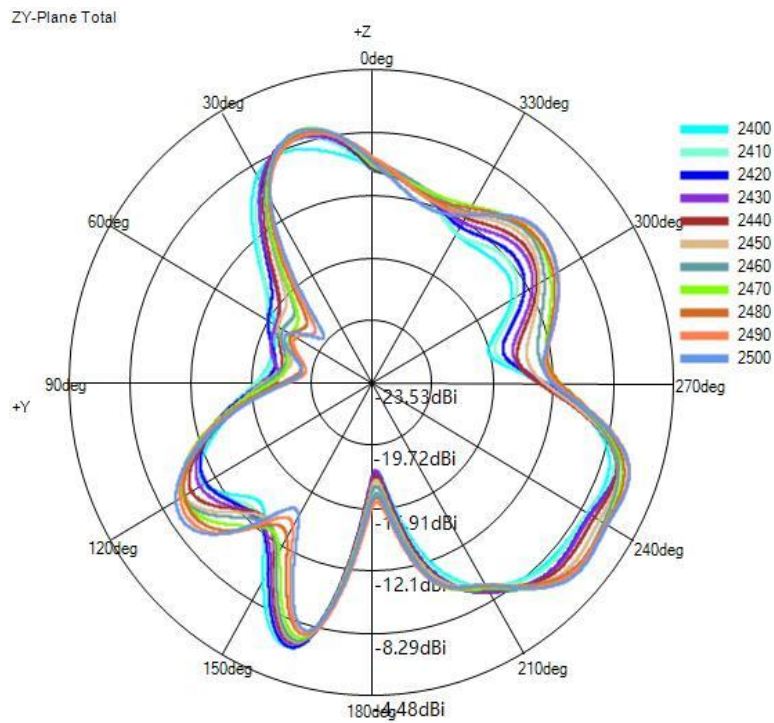


### 3.3.4 Typical free space radiation pattern

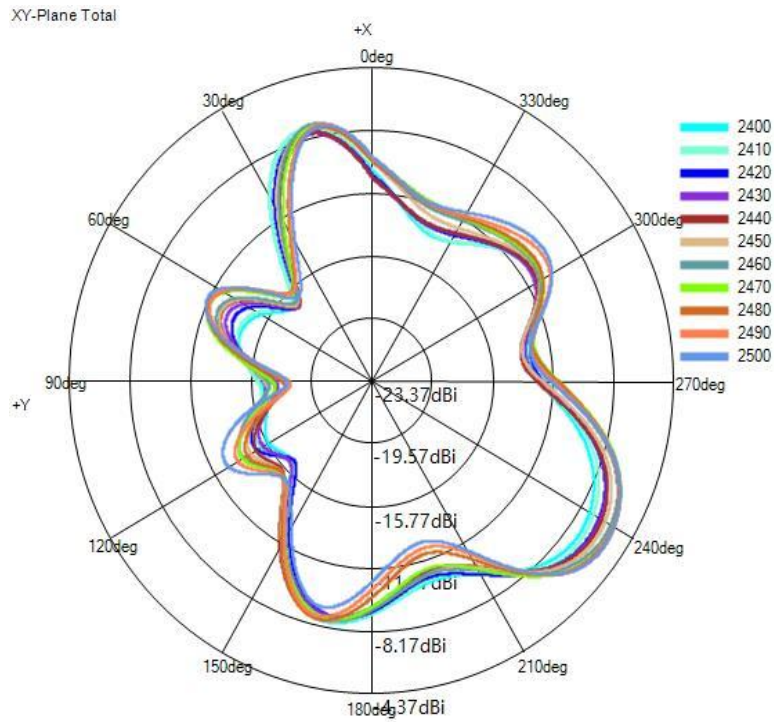
(1) X-Z Plane(unit:dBi):



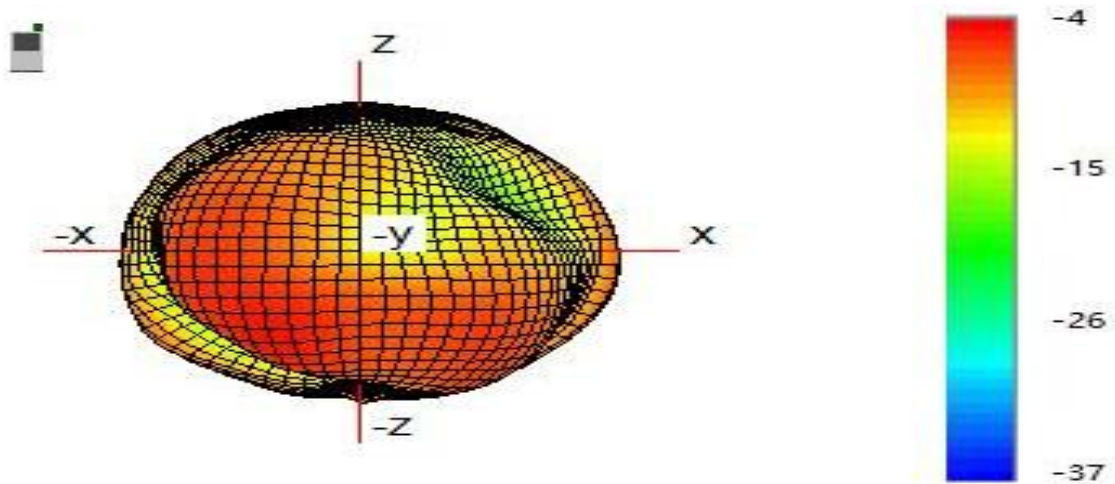
(2) Y-Z Plane(unit:dBi):



(3) X-Y Plane(unit:dBi):



(4) Typical Free Space 3D Radiation Pattern at 2490MHz(unit:dBi):



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End

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