

# Testing Report

Customer Name: NINGBO DIYA ELECTRIC APPLIANCE CO., LTD.

Product Name: PCB Antenna

Sample Model: 50839

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

Issue Date: 2023.02.23

Engineer: Zkmis	Date: 2023. 2. 23
Auditor: Eason	Date: 2023. 2. 23
Approver: Janson	Date: 2023. 2. 23



## Version

Version No.	Date	Description	Formulate	Approval
A0	2023.02.23	For the first time, formulate	Zkris	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 Zone B, West Side of 1/F, Building 1, Tingwei Industrial Park, No.6 Liufang Road, Bao 'an District, Shenzhen

## 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	2021.3.15	2023.3.14
Network Analyzer	E5071C	RFI-LAB-RF-D01	KEYSIGHT	2022.5.13	2023.5.12

### 1.4 Test environment

Temperature	23.9°C
Humidity	57%RH
Pressure	100.25kPa

### 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

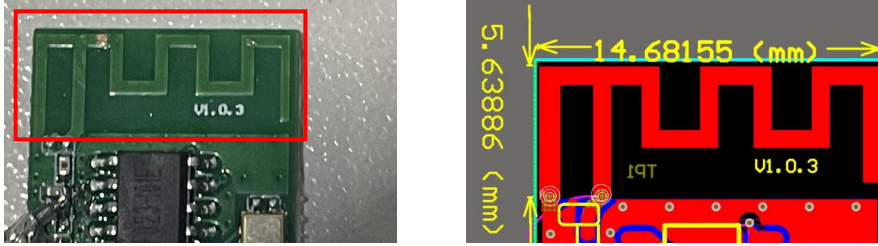
### 2.1 Client information

<b>Manufacturer</b>	NINGBO DIYA ELECTRIC APPLIANCE CO., LTD.
<b>Address</b>	SIMEN TOWN YUYAO CITY ZHEJIANG CHINA
<b>Contacts</b>	/
<b>Tel</b>	/
<b>E-mail</b>	/

### 2.2 Description of EUT(S)

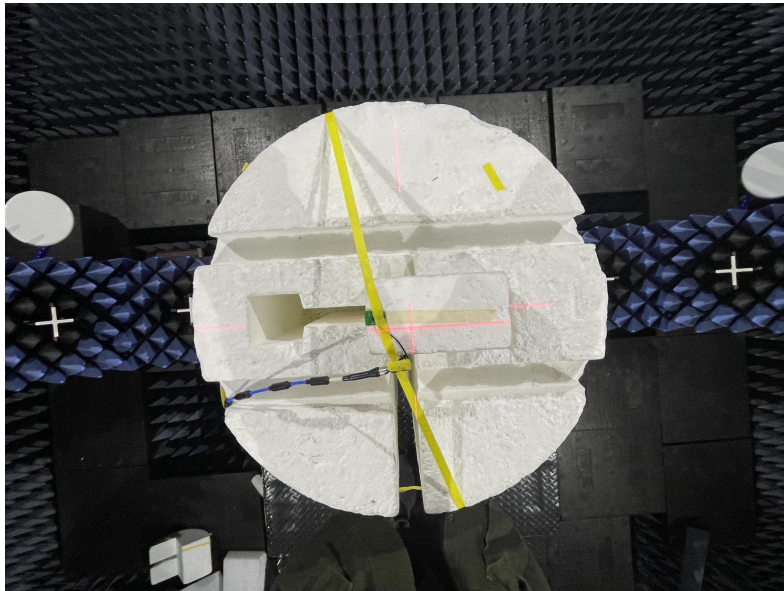
<b>Product Name</b>	PCB Antenna
<b>Sample Model</b>	50839
<b>Antenna Size</b>	/
<b>Serial No.</b>	/
<b>Antenna Type</b>	PCB Antenna
<b>Test Item</b>	Antenna gain; Efficiency; Radiation pattern
<b>Frequency Range</b>	2400-2500MHz
<b>Received Date</b>	2023.02.17
<b>Test Date</b>	2023.02.23
<b>Remark</b>	The length of the RF cable is 50mm

### 2.3 EUT appearance

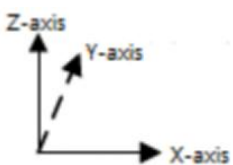
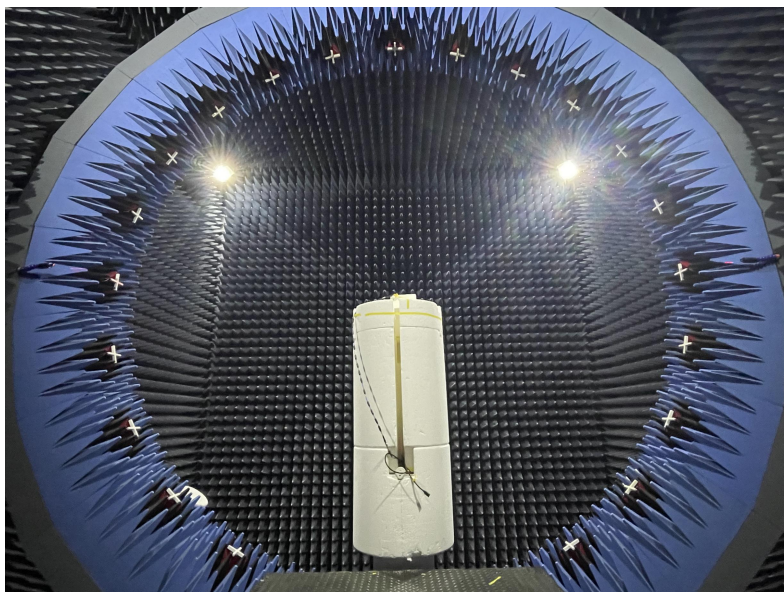


### 2.4 EUT setup photo of free space OTA testing

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		
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
Antenna gain	±0.72dB
Radiation efficiency	±0.72dB

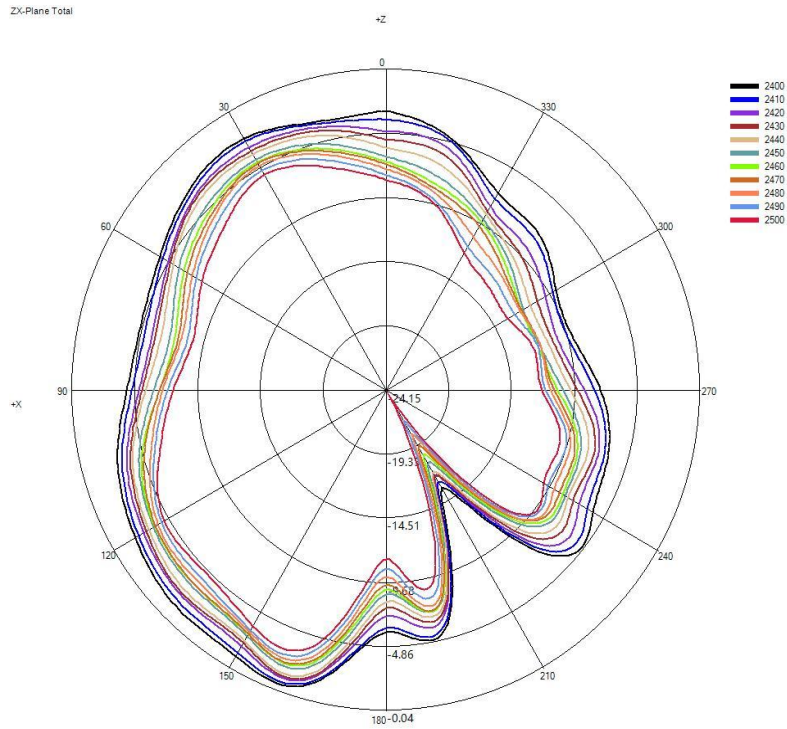
### 3.3 Test data

#### 3.3.1 Typical free space efficiency and gain

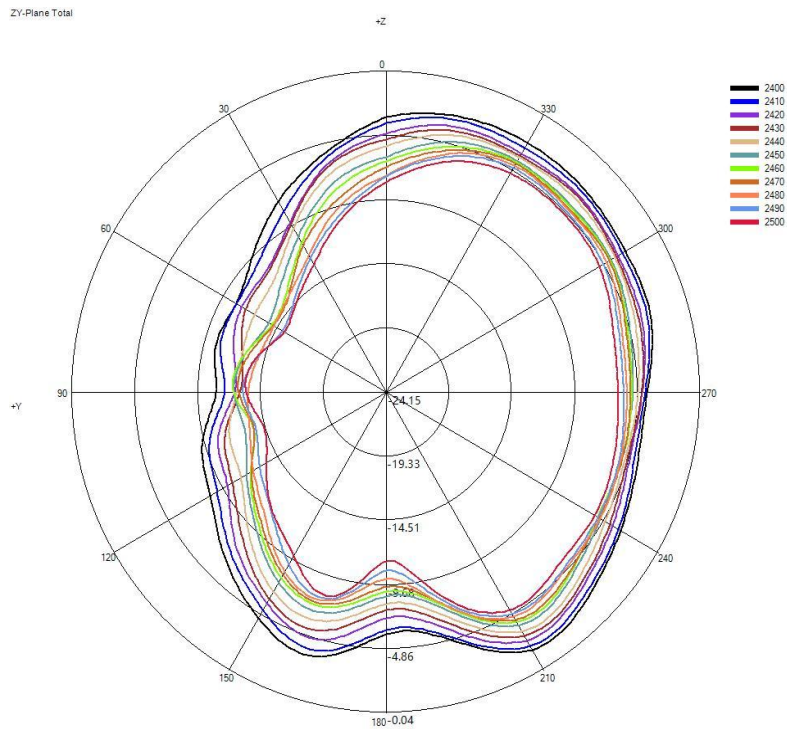
Frequency/MHz	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Peak Gain/dBi	-0.04	-0.25	-0.70	-0.99	-1.32	-1.79	-1.97	-2.14	-2.43	-2.67	-2.98
Efficiency/%	33.04	33.04	27.48	25.80	23.95	21.36	20.28	19.61	18.41	17.08	15.48

### 3.3.2 Typical free space radiation pattern

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

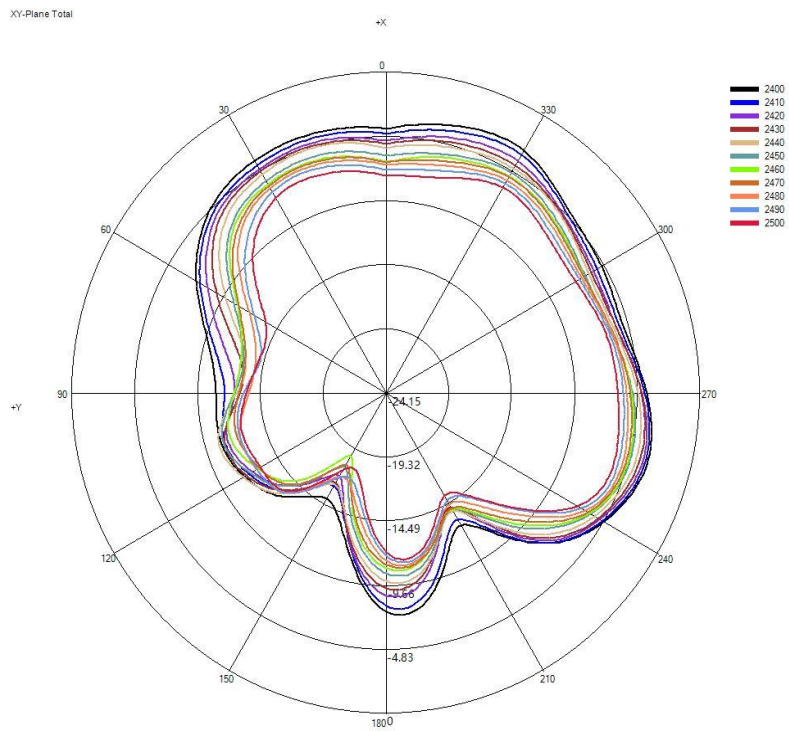


(2) Y-Z Plane(unit:dBi):

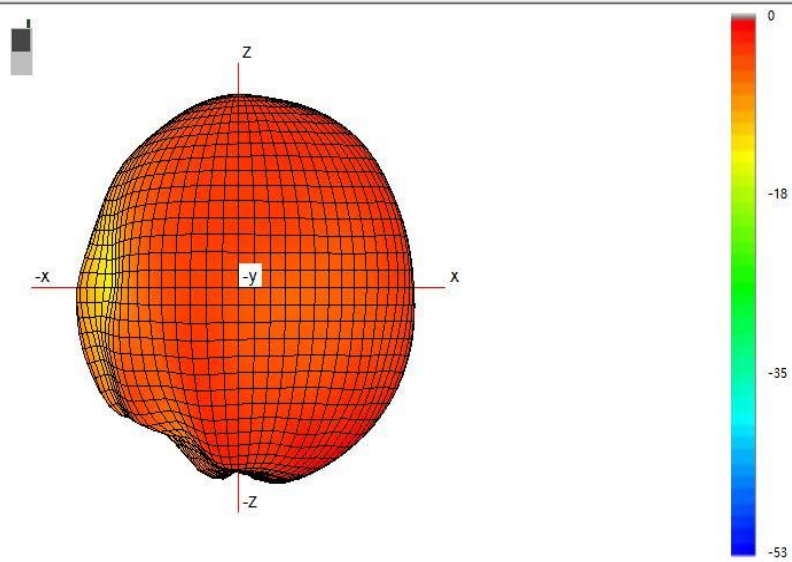




(3) X-Y Plane(unit:dBi):



(4) Typical Free Space 3D Radiation Pattern at 2.4GHz(unit:dBi):



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End

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