

# Testing Report

Customer Name: Guangdong Welland Technology Co.,Ltd

Product Name: HM2049B

Reference Standard: *GB/T9410-2008; ANSI/IEEE Std 149-1979*

Issue Date: 2023.7.14

Engineer:	邱波	Date	2023.7.14
Auditor:	姚常青	Date	2023.7.14
Approve	黄俊杰	Date	2023.7.14

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# 1. General Information

## 1. 1 General information of testing institutions

Name	Shenzhen DBT Communication Device Co., Ltd
Address	Rm505, 8th building, Yungu 2nd period, pingshan No.1 Road, Xili Town, Nanshan District, ShenZhen , China
Tel	0755-83763273
E-mail	Dbt yang@ 163.com
Equipment	1. ETS 2. Keysight E5071C

## 1.2 Test equipment



ETS



E5071C

Model No.	Manufacturer	Calibration date	Next calibration date
ETS	RFI-LAB-RF-A00	2022.11.13	2023.11.13
E5071C	Agilent	2022.09.20	2023.09.20

### 1.3 Test environment

<b>Temperature</b>	25. 0°C
<b>Humidity</b>	59%RH
<b>Pressure</b>	100.12kPa

### 1.4 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) Any objection to this report shall be raised 30 days after formal confirmation of the report.
- (3) The report is invalid without the signature of the auditor and approver.

## 2. Sample Information

### 2.1 Client information

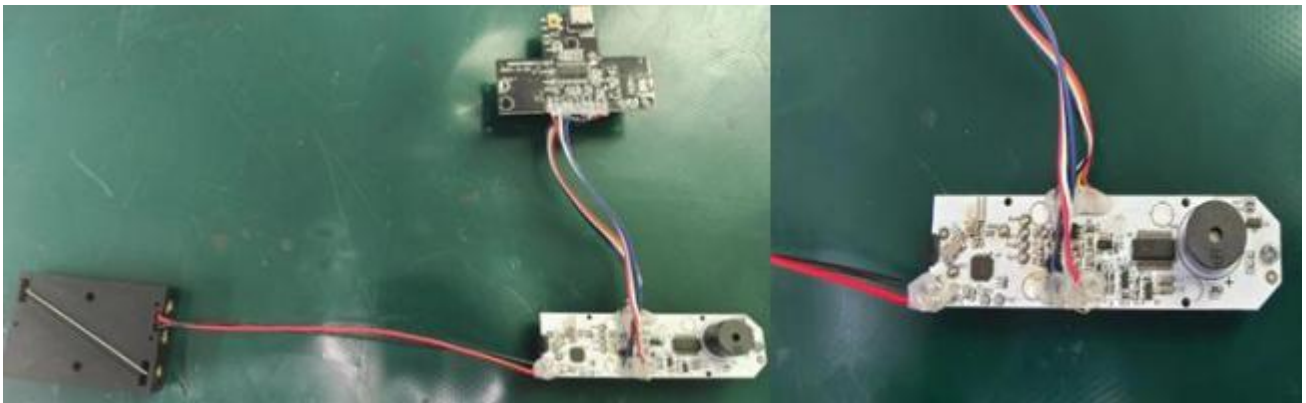
<b>Name</b>	Guangdong Welland Technology Co.,Ltd
<b>Address</b>	Room222, Building 4 TOP Business Park, No.9 Boai Three Road, Zhongshan,Guangdong,China
<b>Contacts</b>	
<b>Tel</b>	
<b>E-mail</b>	

### 2.2 Description of EUT(S)

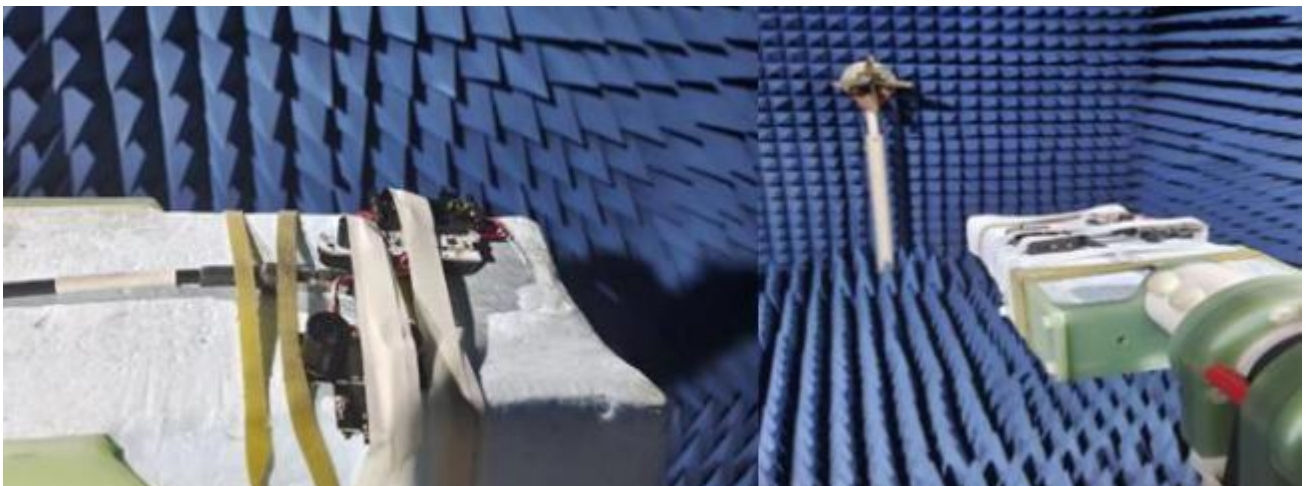
<b>Product Name</b>	HM2049B
<b>Antenna Size</b>	10.75*2.7mm

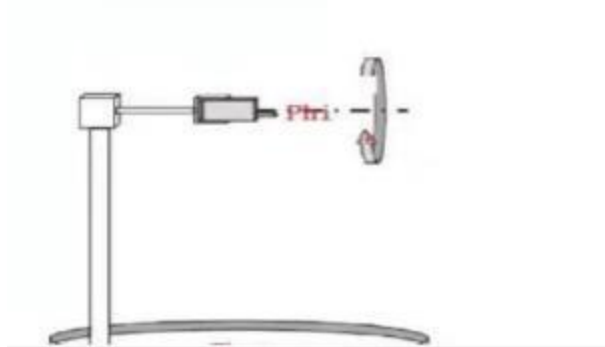
<b>Antenna Type</b>	PIFA / PCB Antenna
<b>Test Item</b>	VSWR; Gain; Efficiency; Radiation pattern
<b>Manufacturer</b>	HE SHAN RUN CHANG ELECTRON AND ELECTRIC CO.,LTD
<b>Frequency Range</b>	2400-2500MHZ
<b>Received Date</b>	2023.7.10
<b>Test Date</b>	2023.7.14
<b>Remark</b>	

### 2.3 EUT appearance

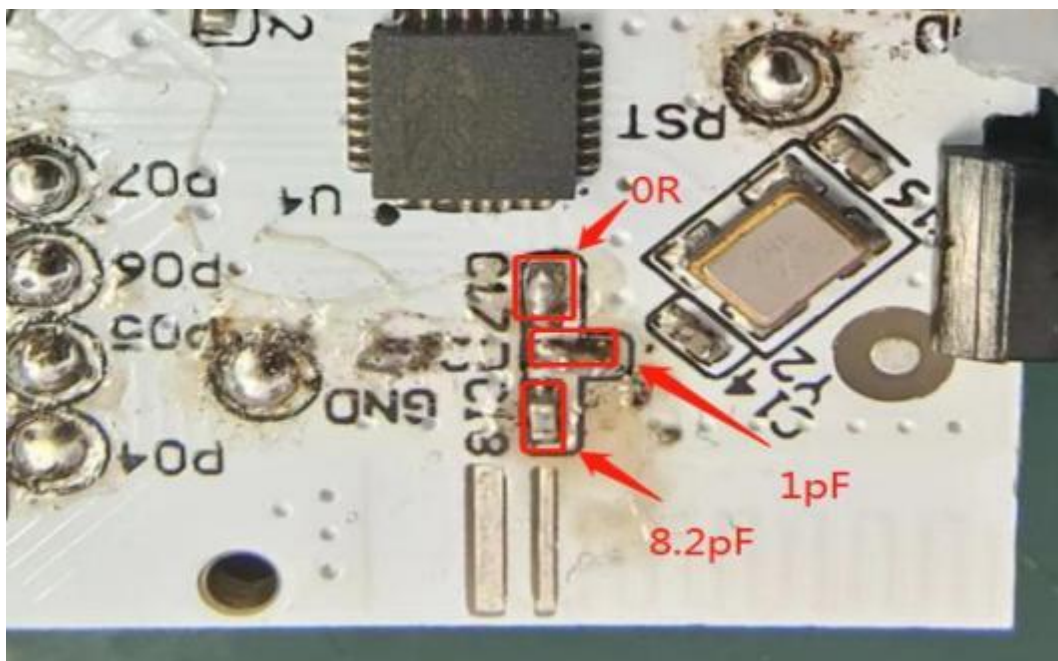


### 2.4 DUT setup photo of free space OTA testing





## 2.5 Matching circuit



### 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

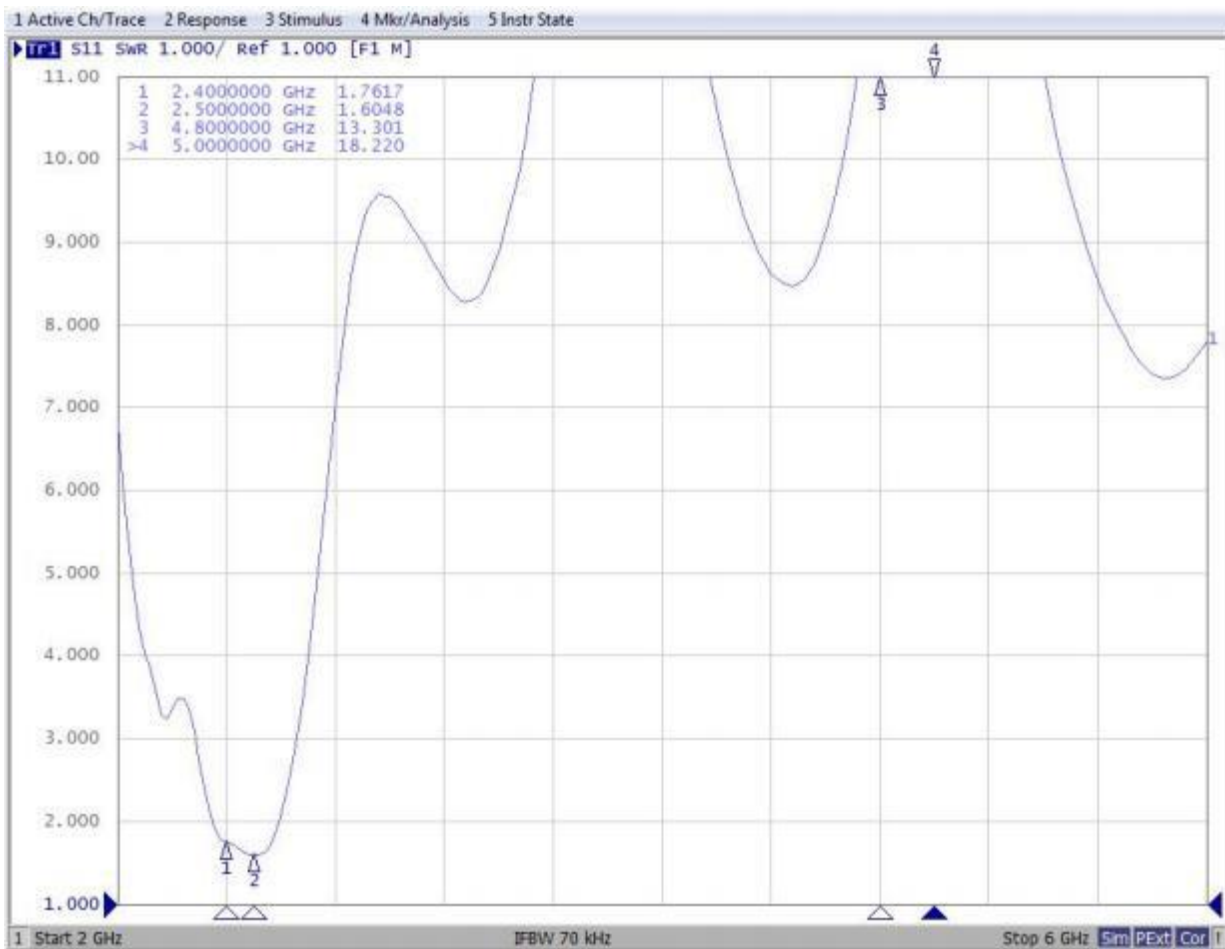
#### 3.2 Test uncertainty

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	+ 1dB
Radiation efficiency	$\pm 10\%$

### 3.3 Test data

#### 3.3.1 S11 parameters



#### 3.3.2 VSWR

Frequency/MHz	2400	2500
VSWR	1.76	1.6

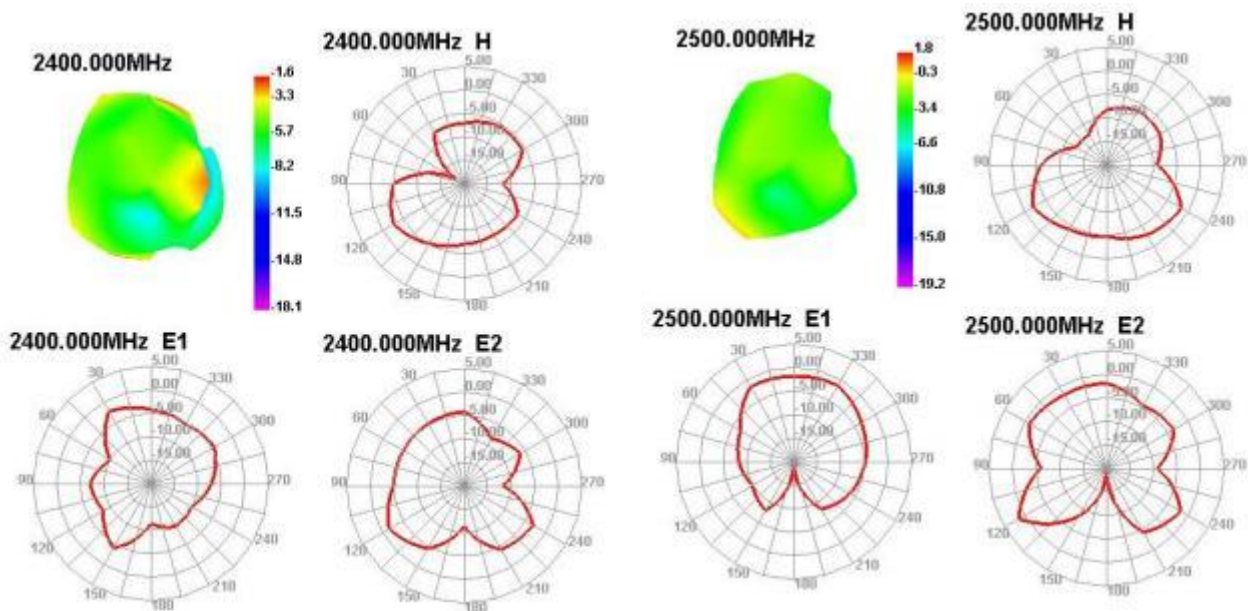
#### 3.3.3 Max Gain

Antenna Gain	
2400-2500MHZ	1.85dbi

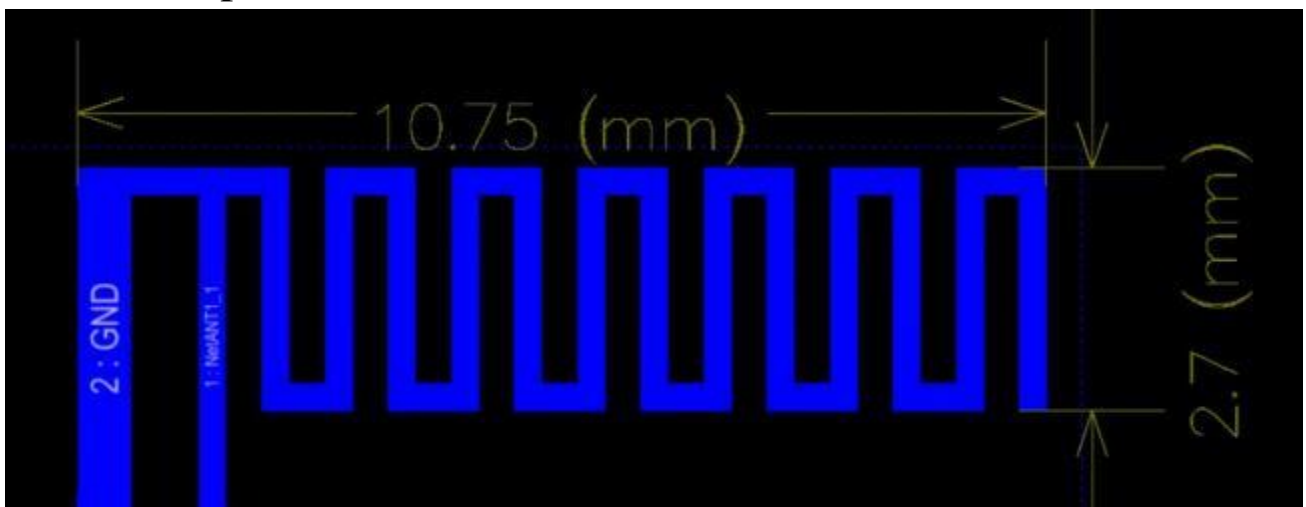


### 3.3.4 Typical free space efficiency and gain

Freq (MHz)	Effi (%)	Gain (dBi)
2400	26.32	-1.61
2410	25.65	-1.43
2420	27.04	-0.73
2430	26.57	-0.54
2440	30.3	0.21
2450	29.88	0.08
2460	30.41	0.14
2470	31.34	0.25
2480	36.9	0.85
2490	36.47	1.06
2500	39.67	1.85



## 4. Product specifications



## **5. Environmental regulations and packaging**

Operating Temperature Range: -40. C ~ +85. C

Storage Temperature Range: -40. C ~ +120. C

Antenna be exposed in a 35°C, 5% salt fog chamber for 24 hours then check the appearance and performance against the specifications in normal temperature.

The antenna is subjected to the following test:

Temperatures: +70°C and 90%--95%RH

Test Duration: 24 Hours

The antenna should not undergo any structural or functional change and remain within the electrical/mechanical specification.

The antenna will be installed on the PCB.