ANTENNA

TEST REPORT

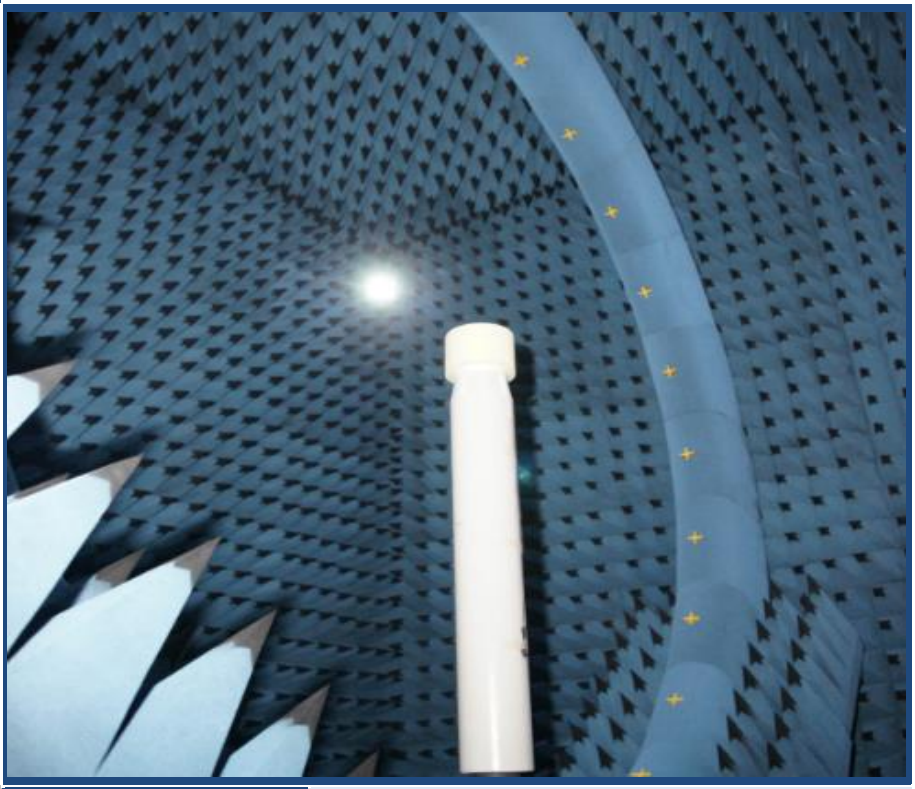
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

PCB Antenna

ISSUED TO
ShenZhen HuiJiaZhi Technology Co., Ltd

Room 1403, Building 3, COFCO Business Park, Liuxian 2nd Road, Bao'an District, ShenZhen, China



Tested by: Mai Jintian	Report No: BL-EC1950331-901
Mai Jintian (Engineer)	EUT Name: PCB Antenna
Date: May 23, 2019	Model Name: ANT-2.4G-1
	Brand Name: HJZ
	Test Standard: IEEE149-1979
	Maximum: Gain: 2.64 (dBi)
Approved by:	Efficiency: 79%
Wei Yanquan (Chief Engineer)	Test Date: May 23, 2019
Date: May 29, 2019	Date of Issue: May 29, 2019

Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
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Email: qc@baluntek.com
www.baluntek.com

Revision History

Version	Issue Date	Revisions
Rev. 01	May 29, 2019	Initial Issue

TABLE OF CONTENTS

1 Administrative Data (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791. The laboratory is a testing organization accredited by China Metrology Accreditation (CMA). The accreditation certificate number is 2017192290Z.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	19℃ to 25℃
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

(1) The test report reference to the report template version v2.2.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	ShenZhen HuiJiaZhi Technology Co., Ltd
Address	Room 1403, Building 3, COFCO Business Park, Liuxian 2nd Road, Bao'an District, ShenZhen, China
Telephone Number	18825827134
Fax Number	(+86) 0755-86307651
E-mail Address	hj20@sz-huijia.com

2.2 Manufacturer Information

Manufacturer	N/A
Address	N/A

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	PCB Antenna
Model Name Under Test	ANT-2.4G-1
Antenna Type	PCB Antenna
Dimensions	25mm * 7mm
Polarization	Vertical

2.5 Ancillary Equipment

Note: Not applicable.

2.6 Technical Information

Frequency Range	2400MHz ~ 2500MHz
Test Frequencies	2400MHz, 2402MHz, 2404MHz, 2406MHz, 2408MHz, 2410MHz, 2412MHz, 2414MHz, 2416MHz, 2418MHz, 2420MHz, 2422MHz, 2424MHz, 2426MHz, 2428MHz, 2430MHz, 2432MHz, 2434MHz, 2436MHz, 2438MHz, 2440MHz, 2441MHz, 2442MHz, 2444MHz, 2446MHz, 2448MHz, 2450MHz, 2452MHz, 2454MHz, 2456MHz, 2458MHz, 2460MHz, 2462MHz, 2464MHz, 2466MHz, 2468MHz, 2470MHz, 2472MHz, 2474MHz, 2476MHz, 2478MHz, 2480MHz, 2482MHz, 2484MHz, 2486MHz, 2488MHz, 2490MHz, 2492MHz, 2494MHz, 2496MHz, 2498MHz, 2500MHz

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	IEEE149-1979	IEEE Standard Test Procedures for Antennas

3.2 Test Verdict

Report Section	Description	Remark
ANNEX A.1	Gain and Efficiency	--
ANNEX A.2	VSWR	--
ANNEX B	Radiation Pattern	--

3.3 Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Item	Uncertainty
VSWR(S11)	±0.2
Gain	±0.5dB

4 GENERAL TEST CONFIGURATIONS

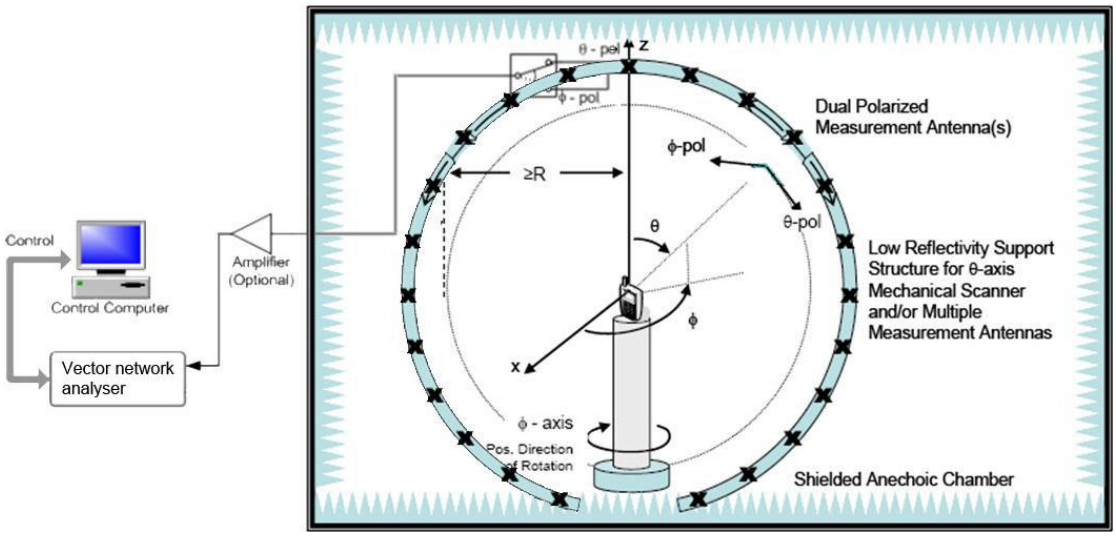
4.1 Test Condition

Environment Parameter	Selected Values During Tests			
	Ambient Pressure (KPa)	Temperature (℃)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	100 to 102	19 to 25	N/A	45 to 55

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Vector Network Analyzer	Agilent	E5071C	MY46103472	2019.02.28	2020.02.27
SG24 Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855-0001	2018.06.22	2020.06.21

4.3 Test Setup



ANNEX A TEST RESULTS

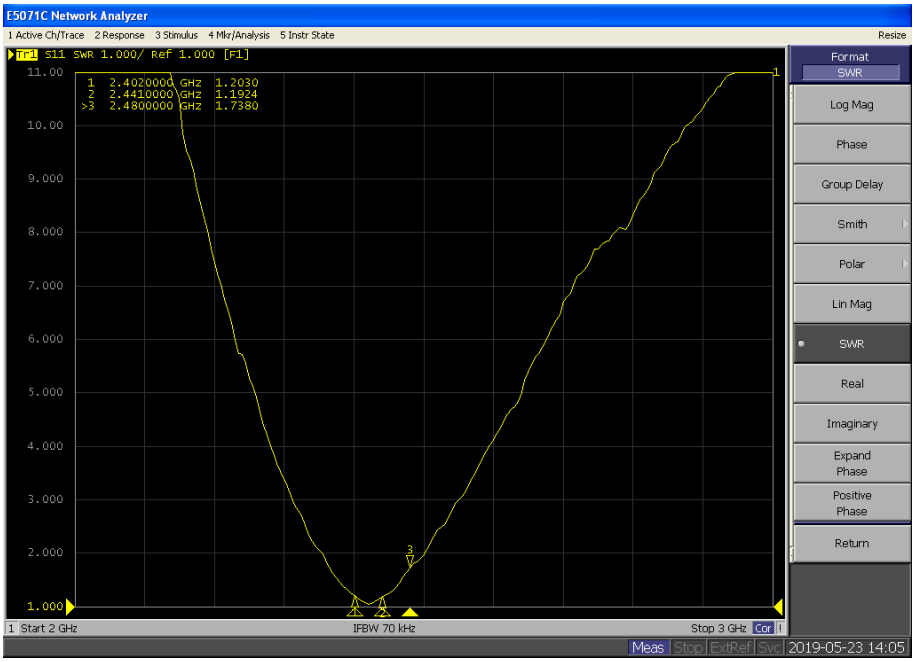
A.1 Gain and Efficiency

Frequency	Gain (dBi)	Efficiency (%)
2400MHz	1.97	77
2402MHz	2.16	77
2404MHz	2.32	77
2406MHz	2.47	76
2408MHz	2.58	77
2410MHz	2.64	77
2412MHz	2.62	77
2414MHz	2.59	77
2416MHz	2.53	77
2418MHz	2.45	78
2420MHz	2.39	78
2422MHz	2.39	78
2424MHz	2.39	78
2426MHz	2.59	79
2428MHz	2.56	79
2430MHz	2.49	79
2432MHz	2.45	79
2434MHz	2.42	79
2436MHz	2.42	79
2438MHz	2.34	78
2440MHz	2.31	78
2442MHz	2.31	78
2444MHz	2.28	78
2446MHz	2.34	78
2448MHz	2.38	78
2450MHz	2.42	78
2452MHz	2.46	79
2454MHz	2.49	79
2456MHz	2.45	79
2458MHz	2.50	79
2460MHz	2.52	79
2462MHz	2.50	79
2464MHz	2.47	78
2466MHz	2.39	78
2468MHz	2.39	78
2470MHz	2.35	77
2472MHz	2.32	77
2474MHz	2.33	77
2476MHz	2.32	77

2478MHz	2.28	76
2480MHz	2.28	76
2482MHz	2.27	76
2484MHz	2.23	75
2486MHz	2.20	75
2488MHz	2.18	74
2490MHz	2.16	74
2492MHz	2.15	74
2494MHz	2.12	74
2496MHz	1.98	73
2498MHz	1.96	73
2500MHz	1.95	73

A.2 VSWR

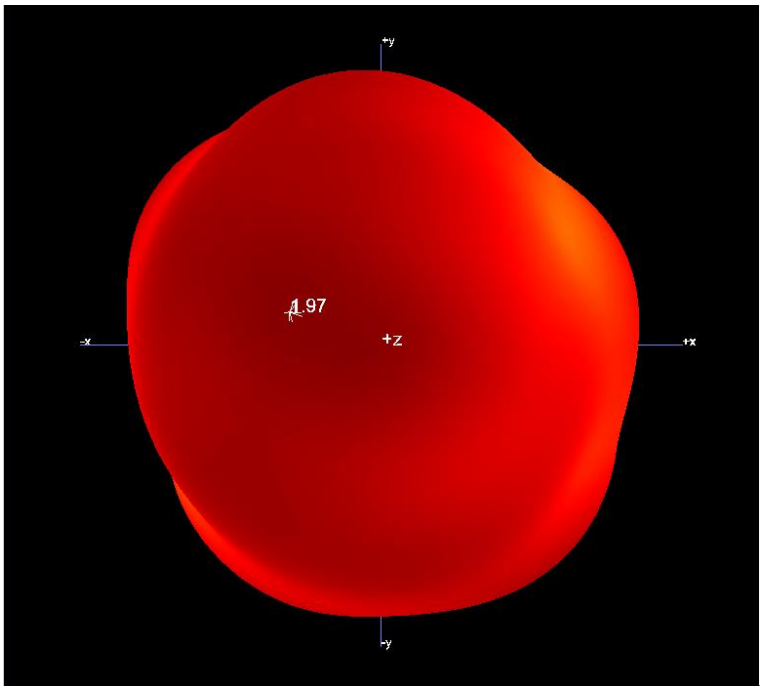
Frequency	VSWR
2402MHz	1.20
2441MHz	1.19
2480MHz	1.74



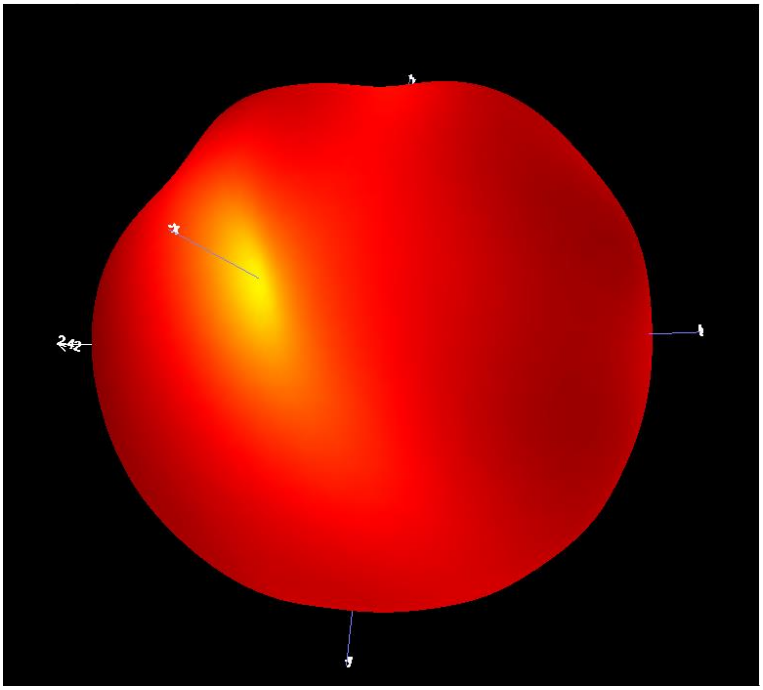
ANNEX B RADIATION PATTERN

B.1 3D Pattern

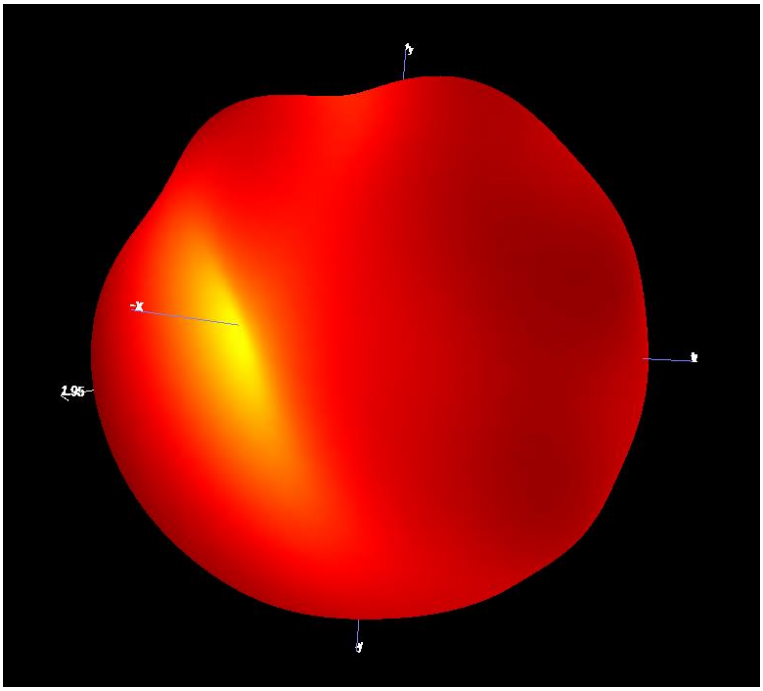
B1.1 3D Pattern for 2400MHz



B1.2 3D Pattern for 2450MHz



B1.3 3D Pattern for 2500MHz



B.2 1D Radiation Pattern

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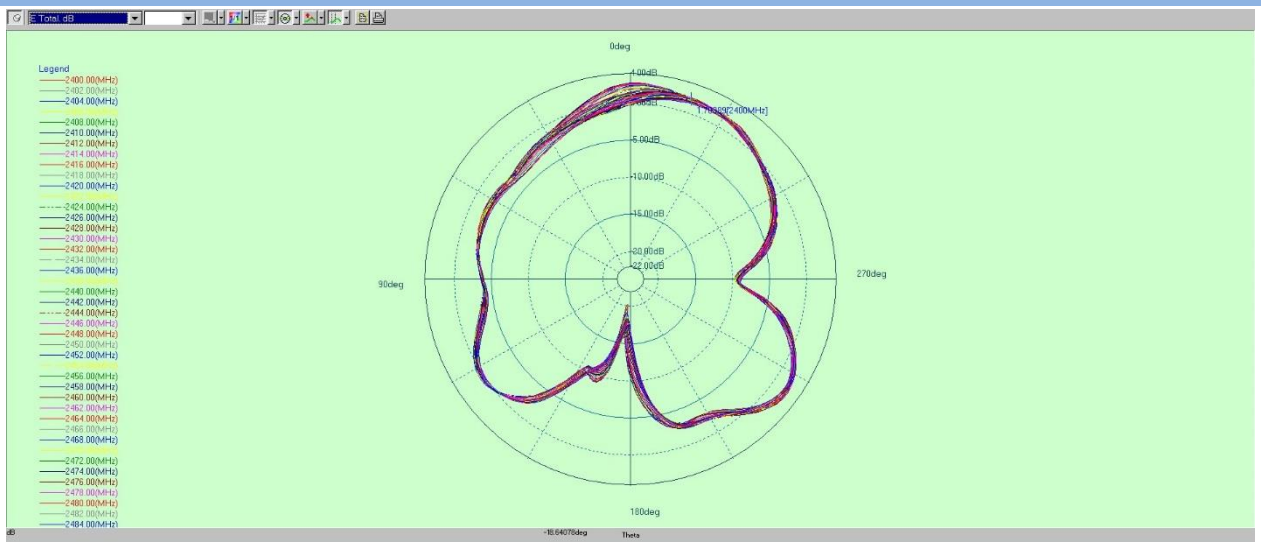
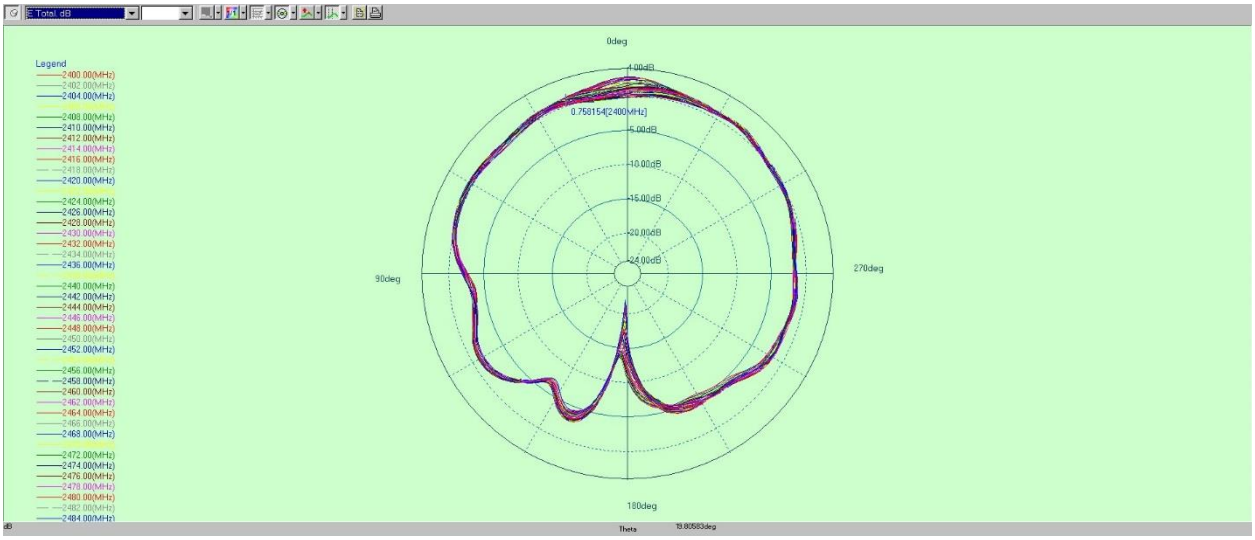
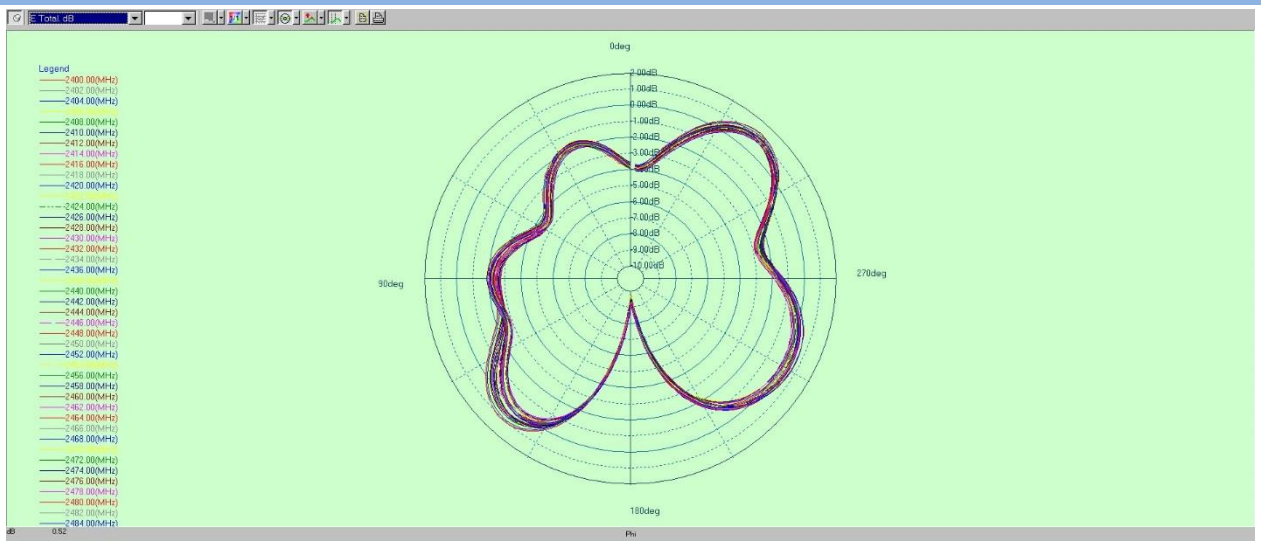


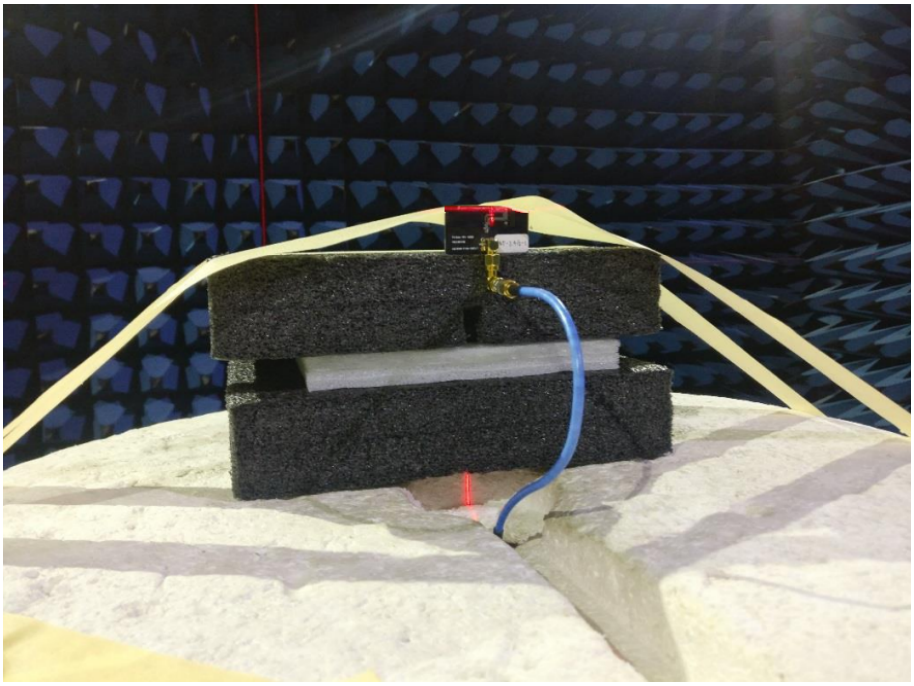
B2.2 PHI=90

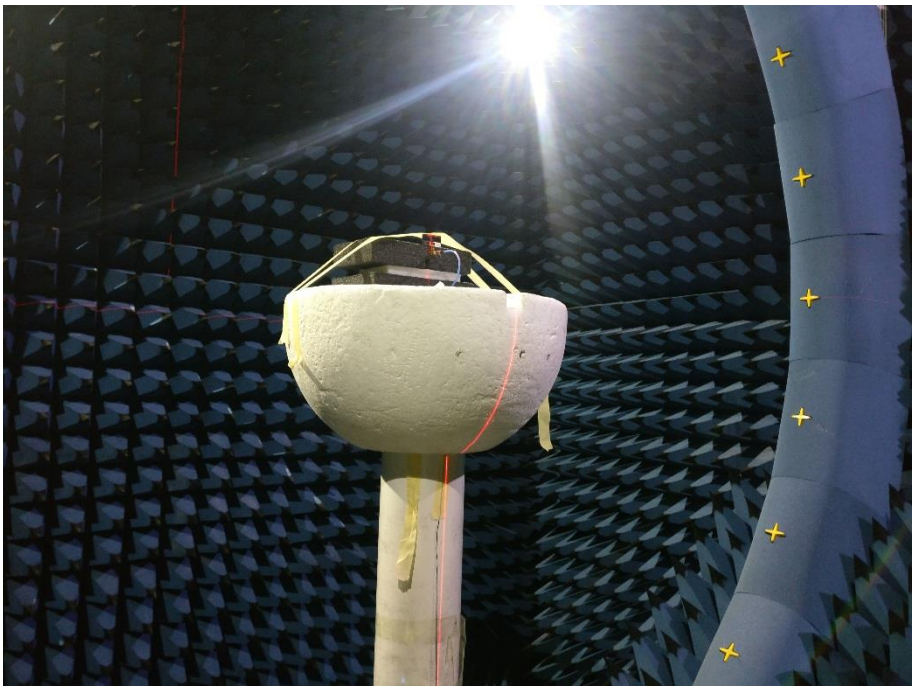


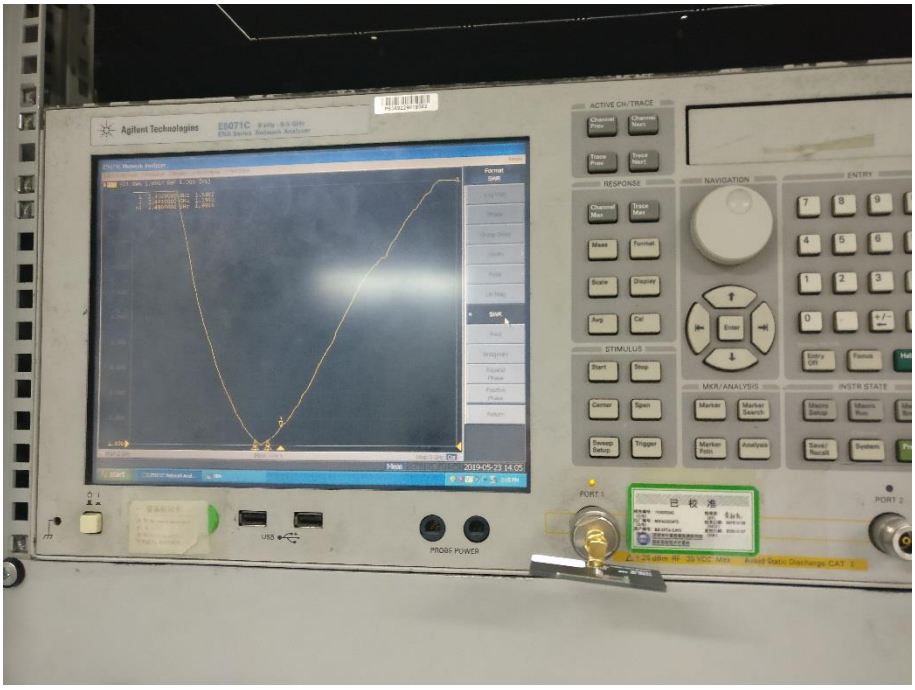
B2.3 THETA=90



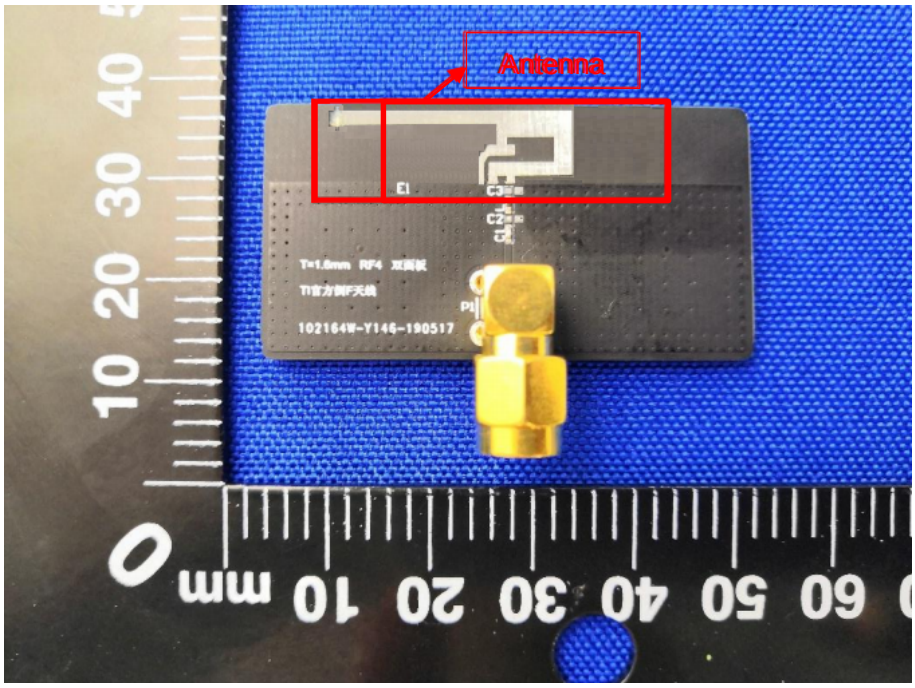
ANNEX C TEST SETUP PHOTO






Agilent Technologies
E6071C
PROBE POWER
PORT 1
PORT 2

ANNEX D EUT PHOTO



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