

# ANTENNA

# TEST REPORT

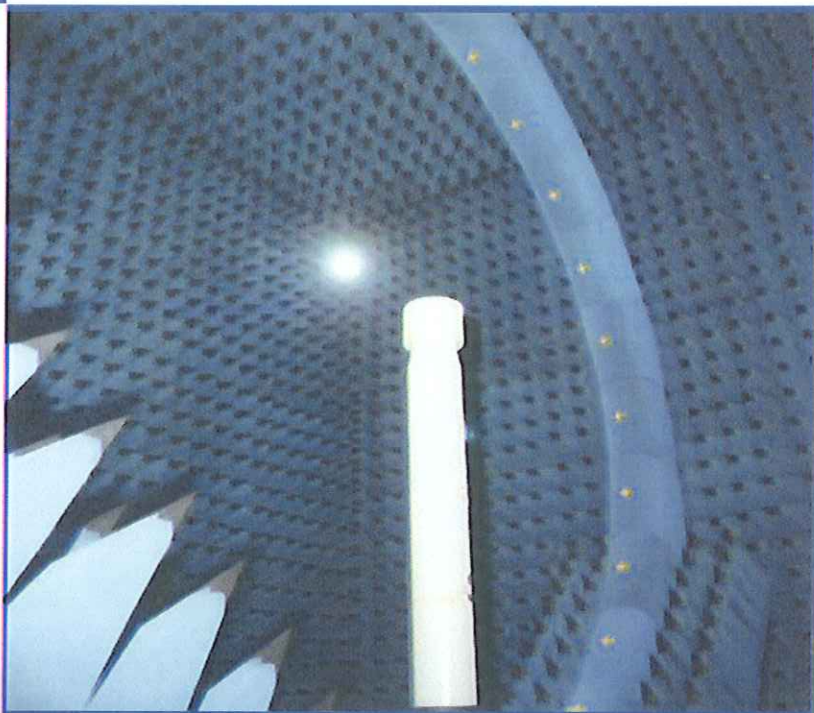
ISSUED BY  
Shenzhen BALUN Technology Co., Ltd.



FOR  
**HORIPAD ULTIMATE**

ISSUED TO  
HORI Co., Ltd.

640 Saedo-Cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-0054, Japan



Tested by: Zou Lin

Zou Liu  
(Engineer)

Date Sep. 30, 2015

Approved by: Wei Yanqun

Wei Yanqun  
(Chief Engineer)

Date Sep. 30, 2015

Report No: BL-SZ1580204-901

EUT Type: HORIPAD ULTIMATE

Model Name: HIP-047(U/E)

Brand Name: HORI

Test Standard: IEEE149-1979

Maximum: Gain: -3.41dBi

Efficiency: 19%

Test Date: Aug. 24, 2015

Date of Issue: Sep. 30, 2015

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**Revision History**

| <u>Version</u> | <u>Issue Date</u>    | <u>Revisions</u>     |
|----------------|----------------------|----------------------|
| <u>Rev. 01</u> | <u>Sep. 30, 2015</u> | <u>Initial Issue</u> |

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# 1 GENERAL INFORMATION

## 1.1 Identification of the Testing Laboratory

|              |                             |
|--------------|-----------------------------|
| Company Name | Hatch International Limited |
| Address      | blanche@hatchmfg.com        |
| Phone Number | 0755-83689256               |
| Fax Number   | 0755-83689256               |

## 1.2 Identification of the Responsible Testing Location

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Location 1           | 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 | <p>The laboratory has met the requirements of the IAS Accreditation Criteria for Testing Laboratories (AC89), has demonstrated compliance with ISO/IEC Standard 17025:2005. The accreditation certificate number is TL-588.</p> <p>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.</p> |
| 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 Announce

- (1) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (2) The test report is invalid if there is any evidence and/or falsification.
- (3) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (4) 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.
- (5) 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

|           |                                                                       |
|-----------|-----------------------------------------------------------------------|
| Applicant | HORI Co., Ltd.                                                        |
| Address   | 640 Saedo-Cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken 224-0054, Japan |

### 2.2 Manufacturer

|              |                                                                                                 |
|--------------|-------------------------------------------------------------------------------------------------|
| Manufacturer | Dongguan City Fuze Electronic CO., LTD.                                                         |
| Address      | No.2, Dongyiheng Road, Huanshidong Road, Tangxia Town, Dongguan City, Guangdong Province, China |

### 2.3 General Description for Equipment under Test (EUT)

|                  |                  |
|------------------|------------------|
| EUT Type         | HORIPAD ULTIMATE |
| Model Name       | HIP-047(U/E)     |
| Antenna Type     | PCB Antenna      |
| Hardware Version | N/A              |
| Serial Number    | N/A              |
| Dimensions       | 20mm×3mm         |

### 2.4 Technical Information

|                  |                         |
|------------------|-------------------------|
| Frequency Range  | 2402MHz~ 2480MHz        |
| Test Frequencies | 2402MHz,2441MHz,2480MHz |

### 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 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) | $\pm 0.2\text{dB}$ |
| Gain      | $\pm 0.5\text{dB}$ |

## 4 GENERAL TEST CONFIGURATIONS

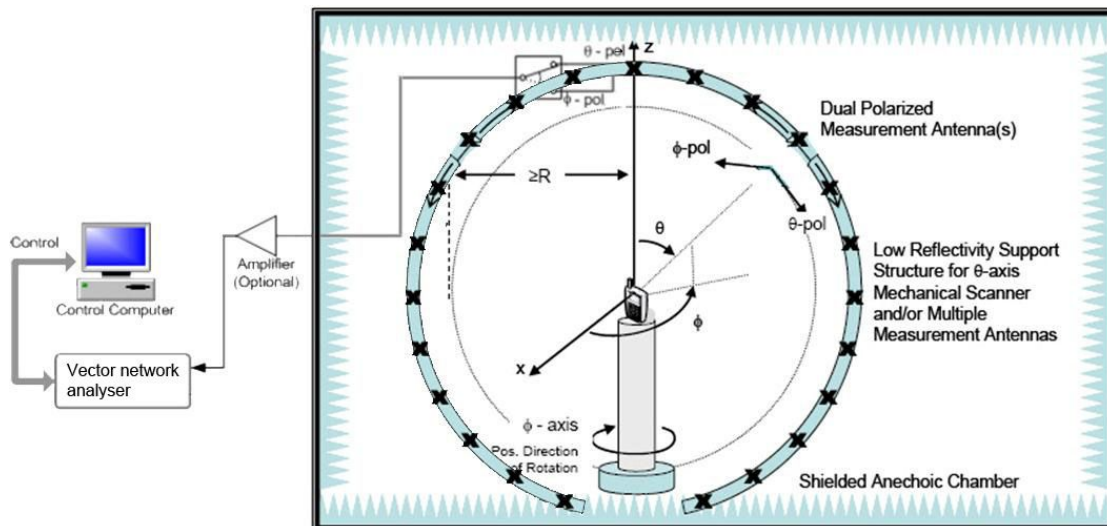
### 4.1 Test Condition

| Environment Parameter                     | Selected Values During Tests |                 |         |                      |
|-------------------------------------------|------------------------------|-----------------|---------|----------------------|
|                                           | Ambient Pressure(KPa)        | Temperature(°C) | 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   | 2015.1.28  | 2016.1.27  |
| 5*5*5 Full Anechoic Chamber                 | SATIMO       | 5*5*5  | CN-1307-555  | 2014.09.28 | 2015.09.27 |
| SG24 Multi-probe Antenna Measurement System | SATIMO       | SG24-L | 1101855-0001 | 2014.09.14 | 2015.09.13 |

### 4.3 Test Setup



## ANNEX A TEST RESULTS

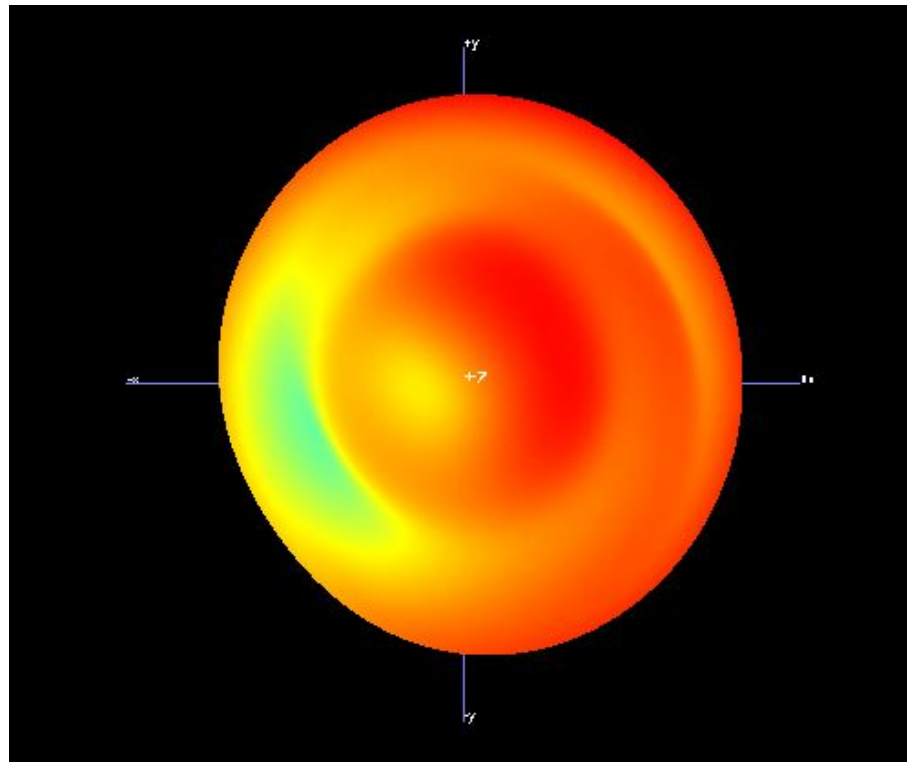
### A.1 Gain and Efficiency

| Frequency | Gain (dBi) | Efficiency (%) |
|-----------|------------|----------------|
| 2402MHz   | -3.41      | 18             |
| 2441MHz   | -4.80      | 19             |
| 2480MHz   | -4.75      | 19             |

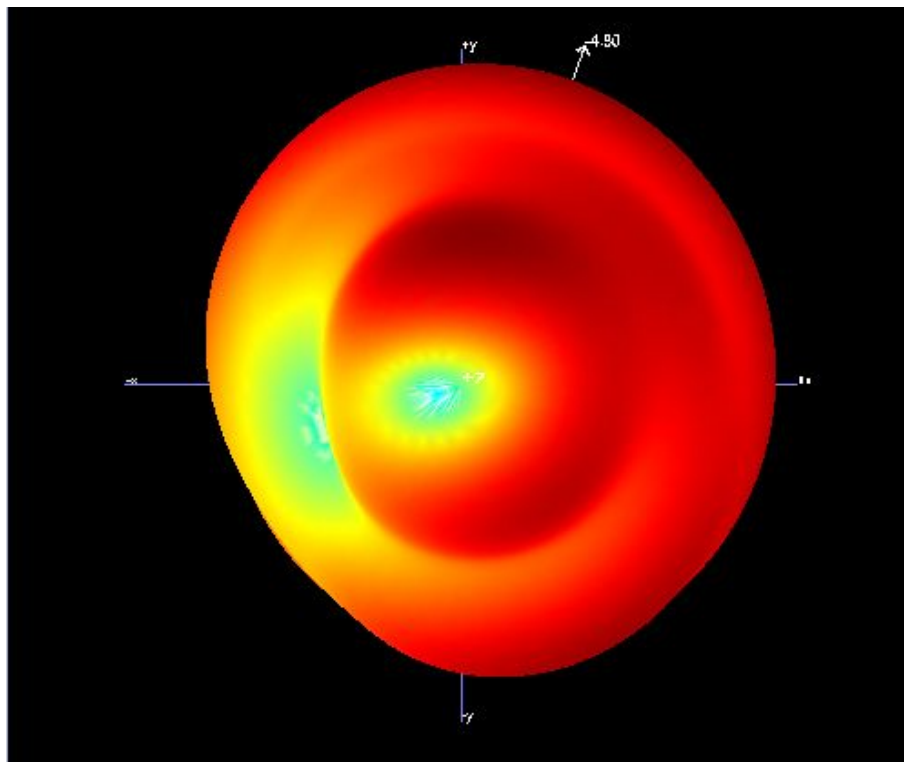
## ANNEX B RADIATION PATTERN

### B.1 3D Pattern

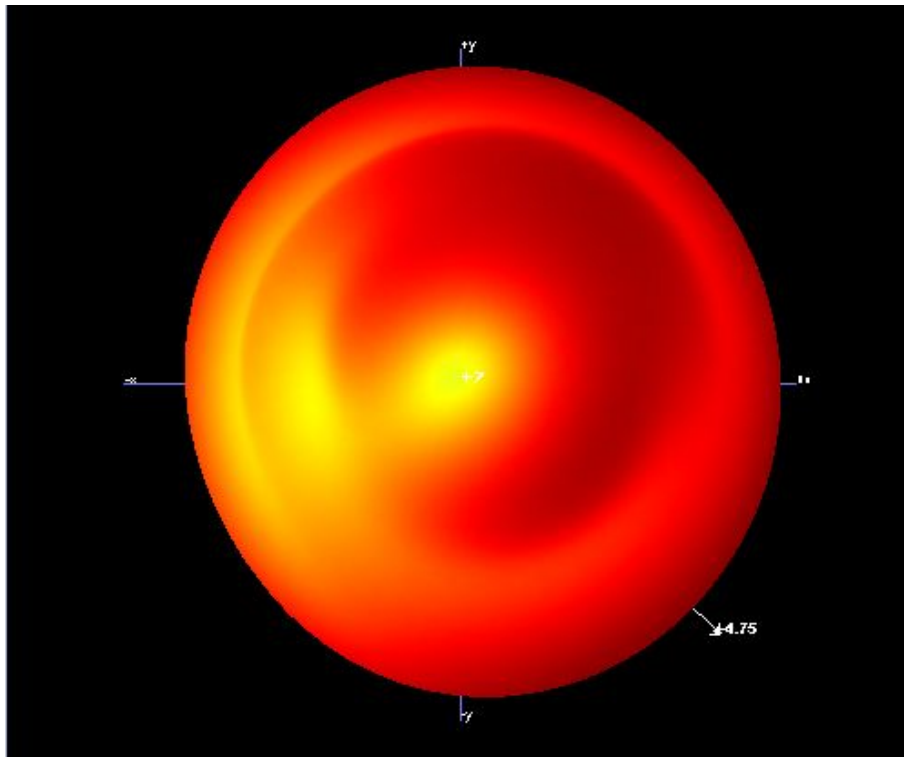
B1.1 3D Pattern for 2402MHz



B1.2 3D Pattern for 2441MHz

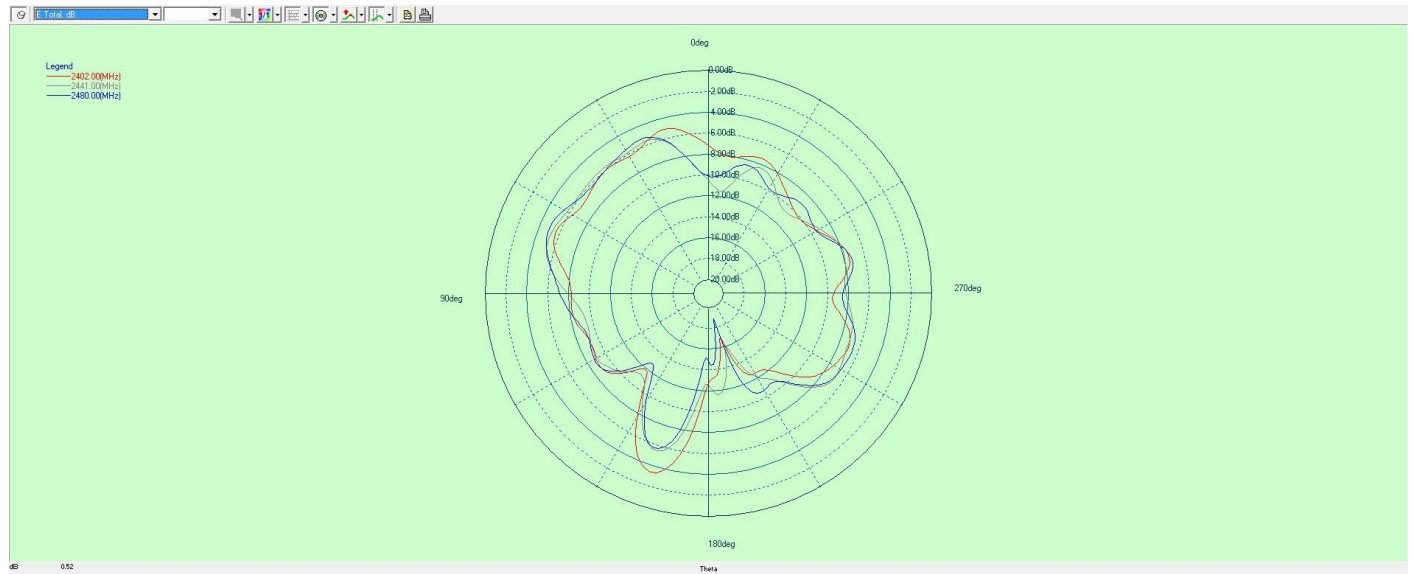


B1.3 3D Pattern for 2480MHz

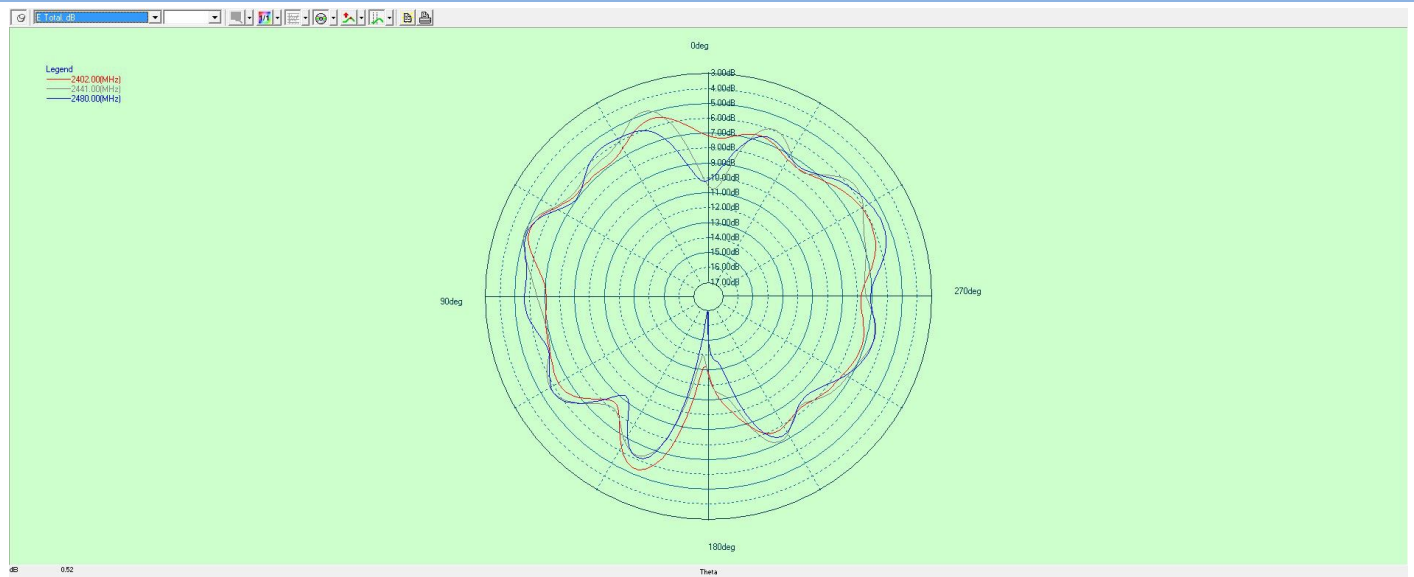


## B.2 1D Radiation Pattern

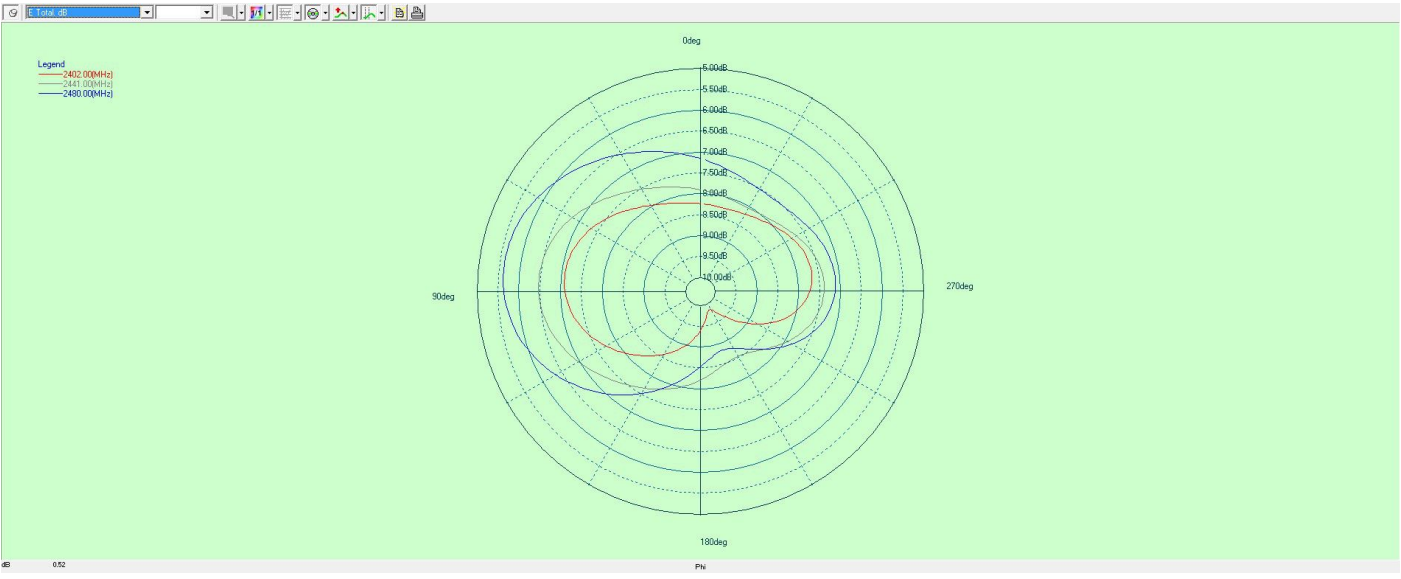
### B2.1 PHI=0



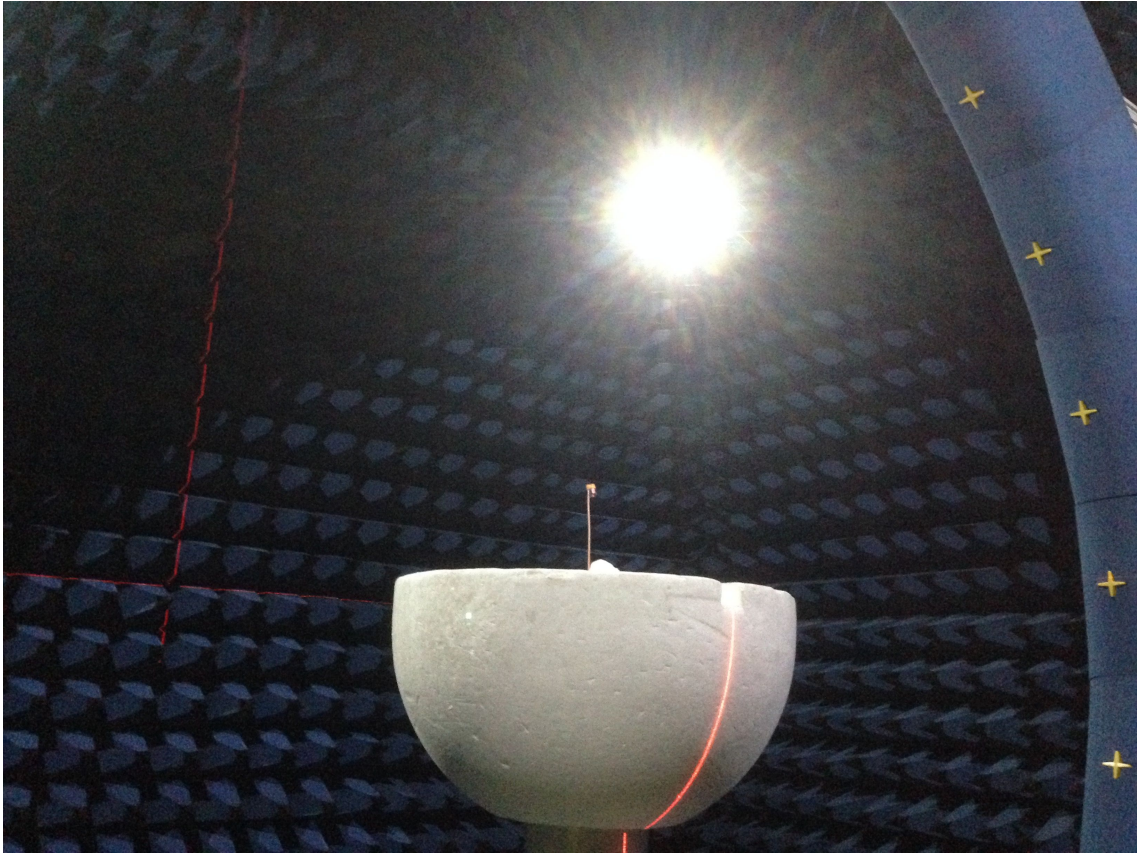
### B2.2 PHI=90



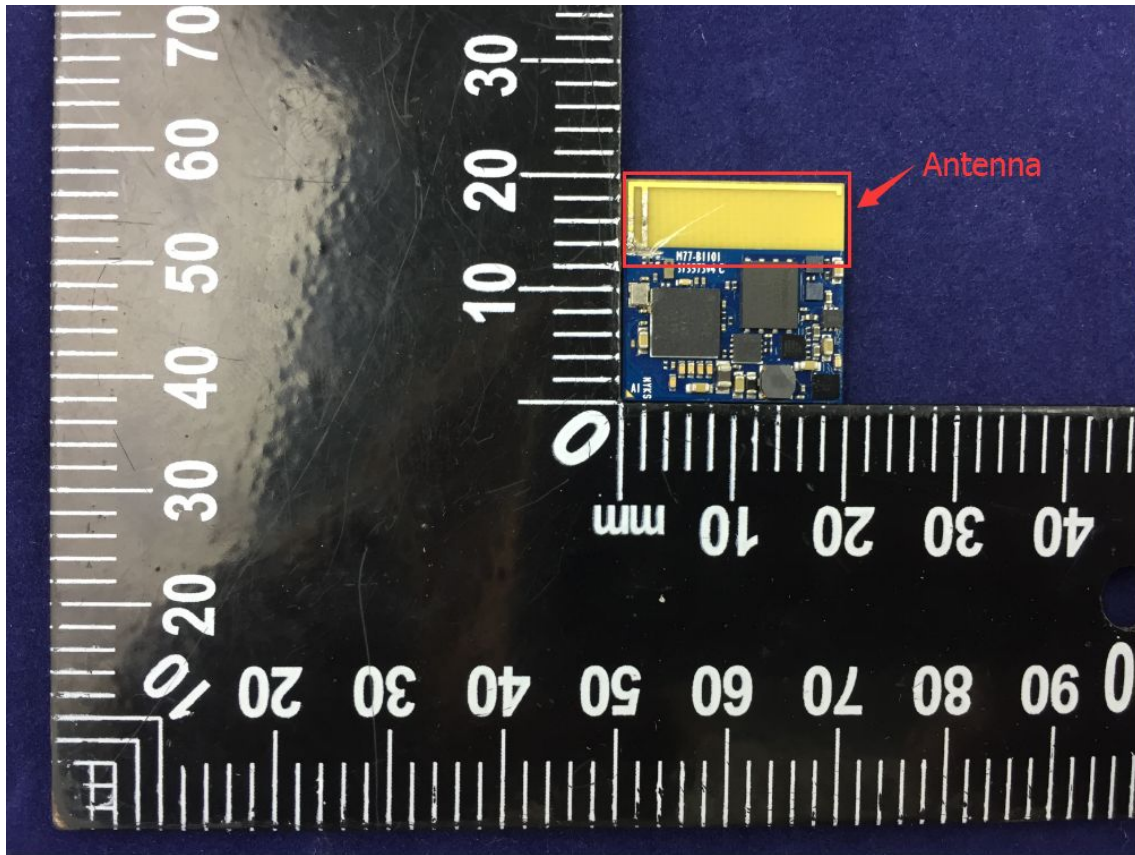
B2.3 THETA=90



## ANNEX C TEST SETUP PHOT



## ANNEX D EUT PHOTO



--END OF REPORT--