



# OTA TEST REPORT

|                   |                   |
|-------------------|-------------------|
| <b>Applicant</b>  | Espressif Systems |
| <b>Product</b>    | ESP ANT B         |
| <b>Model</b>      | ESP ANT B         |
| <b>Report No.</b> | Y1806A0621-T1V3   |
| <b>Issue Date</b> | November 1, 2021  |

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **ANSI/IEEE Std 149-2008**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Handwritten signature of Peng Tao in black ink.

*Prepared by: Peng Tao*

Handwritten signature of Kai Xu in black ink.

*Approved by: Kai Xu*

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## TABLE OF CONTENTS

|                                                             |                                                   |    |
|-------------------------------------------------------------|---------------------------------------------------|----|
| 1.                                                          | General Information .....                         | 3  |
| 1.1.                                                        | Notes of the Test Report .....                    | 3  |
| 1.2.                                                        | Testing laboratory .....                          | 3  |
| 1.3.                                                        | Laboratory Environment .....                      | 3  |
| 2.                                                          | General Description of Equipment under Test ..... | 4  |
| 2.1.                                                        | Applicant Information .....                       | 4  |
| 2.2.                                                        | Manufacturer Information .....                    | 4  |
| 2.3.                                                        | Information of EUT .....                          | 4  |
| 2.4.                                                        | Test Date .....                                   | 4  |
| 2.5.                                                        | Applied Standards .....                           | 5  |
| 3.                                                          | Test Conditions .....                             | 6  |
| 3.1.                                                        | Test Configuration .....                          | 6  |
| 3.2.                                                        | Test Measurement .....                            | 6  |
| 4.                                                          | Test Results .....                                | 7  |
| 4.1.                                                        | Gain and Efficiency .....                         | 7  |
| 4.2.                                                        | Voltage Standing Wave Ratio (VSWR) .....          | 8  |
| 4.3.                                                        | Antenna S11 .....                                 | 9  |
| 5.                                                          | Test Equipment List .....                         | 10 |
| APPENDIX A: 2-D Pattern Plots .....                         |                                                   | 11 |
| APPENDIX B: The EUT Appearance and Test Configuration ..... |                                                   | 13 |
| B.1 EUT Appearance .....                                    |                                                   | 13 |
| B.2 Test Configuration .....                                |                                                   | 14 |



## 1. General Information

### 1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of TA technology (shanghai) co., Ltd. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

### 1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.  
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### 1.3. Laboratory Environment

|                   |                         |         |
|-------------------|-------------------------|---------|
| Temperature       | Min. =19°C, Max. = 25°C |         |
| Relative humidity | Min. =40%, Max. =72%    |         |
| Shield effect     | 0.7-6GHz                | > 100dB |
| Ground resistance | <0.5Ω                   |         |

## 2. General Description of Equipment under Test

### 2.1. Applicant Information

Company: Espressif Systems  
Address: #101, Block 2, 690 Bibo Road, Zhang Jiang High-Tech Park, Shanghai, China

### 2.2. Manufacturer Information

Company: Espressif Systems  
Address: #101, Block 2, 690 Bibo Road, Zhang Jiang High-Tech Park, Shanghai, China

### 2.3. Information of EUT

#### General information

| EUT Description       |                   |
|-----------------------|-------------------|
| Product Name:         | ESP ANT B         |
| Model                 | ESP ANT B         |
| HW Version:           | /                 |
| SW Version:           | /                 |
| Antenna Type:         | Fixed Antenna     |
| Antenna Manufacturer: | Espressif Systems |
| Test Frequency:       | 2400MHz ~ 2500MHz |

Test lab. of the antenna gain and radiation pattern measurement: TA Technology (Shanghai) Co., Ltd.

This revised report (Report No.: Y1806A0621-T1V3) supersedes and replaces the previously issued report (Report No.: Y1806A0621-T1V2 & Y1806A0621-T1V1 & Y1806A0621-T1). Please discard or destroy the previously issued report and dispose of it accordingly.

### 2.4. Test Date

The test is performed from June 25, 2018 to August 3, 2018.



## 2.5. Applied Standards

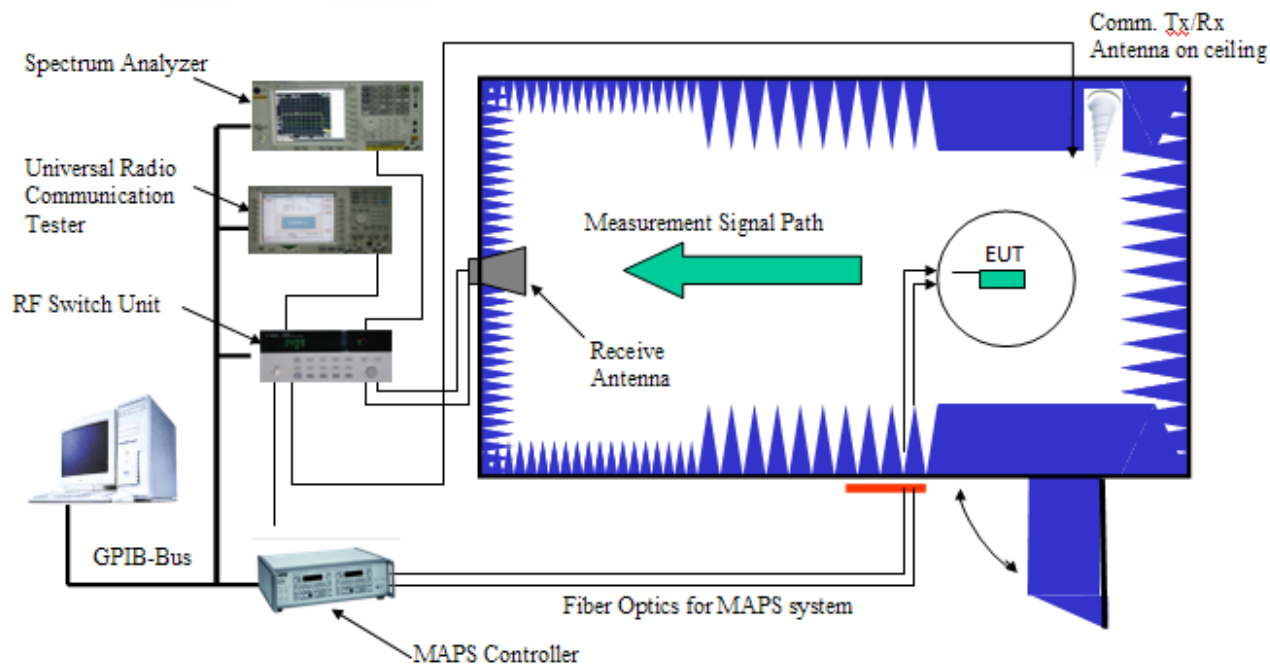
According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test Method: **ANSI/IEEE Std 149-2008**

### 3. Test Conditions

#### 3.1. Test Configuration

Great-Circle-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 5m.



#### 3.2. Test Measurement

Spherical coordinate system

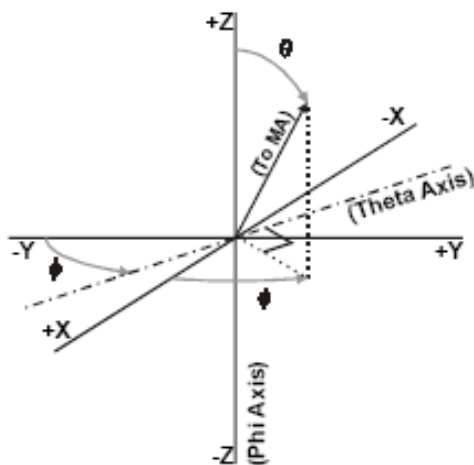


Figure 1 Test coordinate system

Note: Theta is from 0~180 degree. Phi is from 0~360. Rotate the EUT and record the Data, the step of rotation is 30 degree.



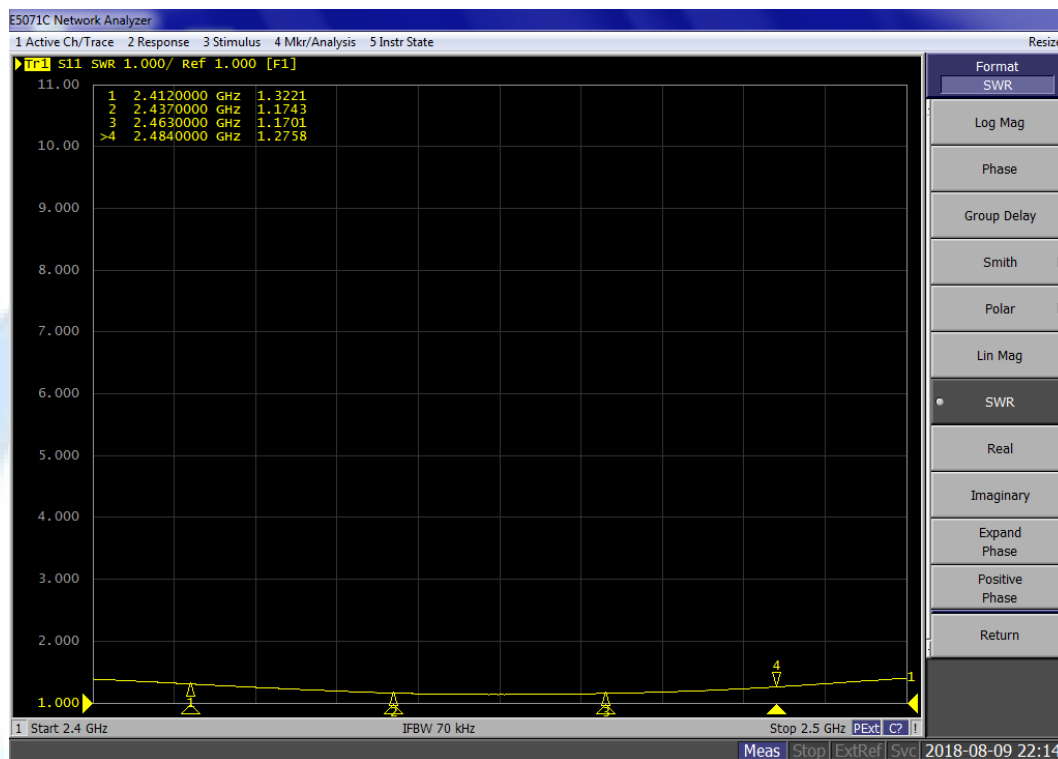
## 4. Test Results

### 4.1. Gain and Efficiency

| Model                                  | Test Item | Test State | Frequency (MHz) | Efficiency (%) | Gain (dBi) | Note         |
|----------------------------------------|-----------|------------|-----------------|----------------|------------|--------------|
| ESP-ANT B                              | Gain      | Free Space | 2412            | 73.79          | 2.39       | Vertical 30° |
|                                        |           |            | 2417            | 77.04          | 2.97       |              |
|                                        |           |            | 2422            | 79.83          | 2.80       |              |
|                                        |           |            | 2427            | 81.19          | 2.89       |              |
|                                        |           |            | 2432            | 80.54          | 3.04       |              |
|                                        |           |            | 2437            | 76.86          | 2.86       |              |
|                                        |           |            | 2442            | 76.17          | 2.99       |              |
|                                        |           |            | 2447            | 73.99          | 2.96       |              |
|                                        |           |            | 2452            | 72.00          | 2.80       |              |
|                                        |           |            | 2457            | 70.71          | 2.72       |              |
|                                        |           |            | 2462            | 71.31          | 2.94       |              |
|                                        |           |            | 2467            | 71.32          | 3.12       |              |
|                                        |           |            | 2472            | 72.03          | 3.28       |              |
|                                        |           |            | 2477            | 72.71          | 3.24       |              |
|                                        |           |            | 2482            | 75.42          | 3.42       |              |
| Note: comment variation is +/- 0.02dBi |           |            |                 |                |            |              |



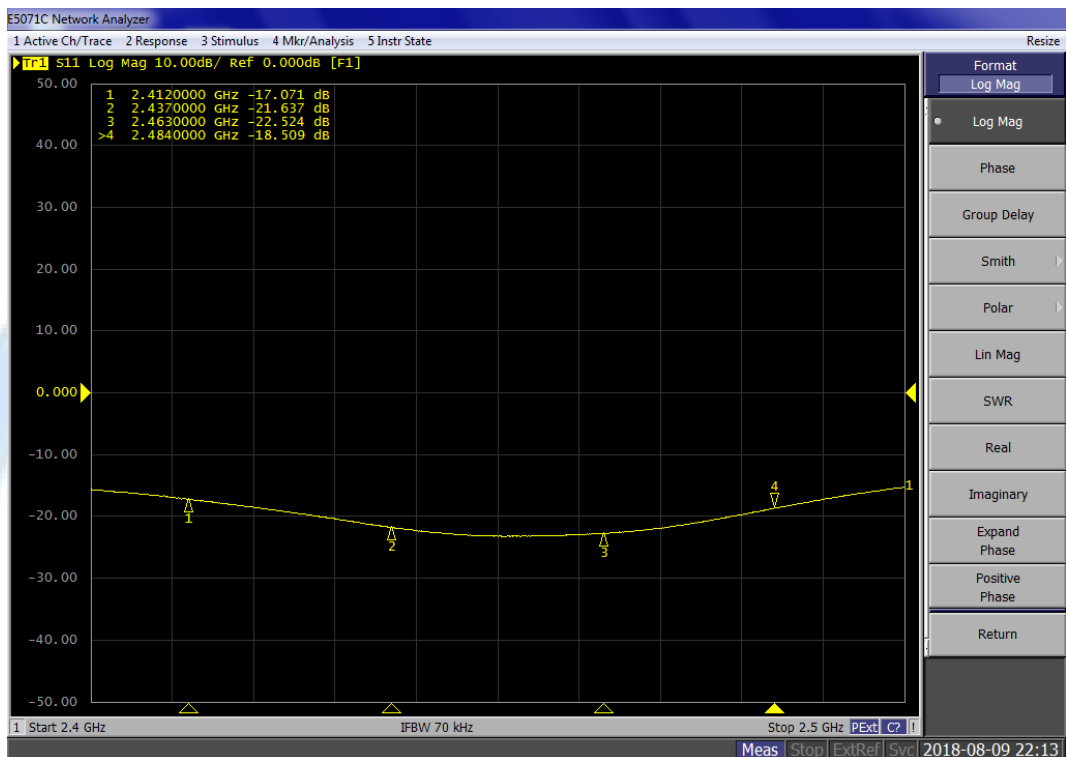
## 4.2. Voltage Standing Wave Ratio (VSWR)



| Frequency (MHz) | 2412 | 2437 | 2463 | 2484 |
|-----------------|------|------|------|------|
| VSWR            | 1.32 | 1.17 | 1.17 | 1.28 |



## 4.3. Antenna S11



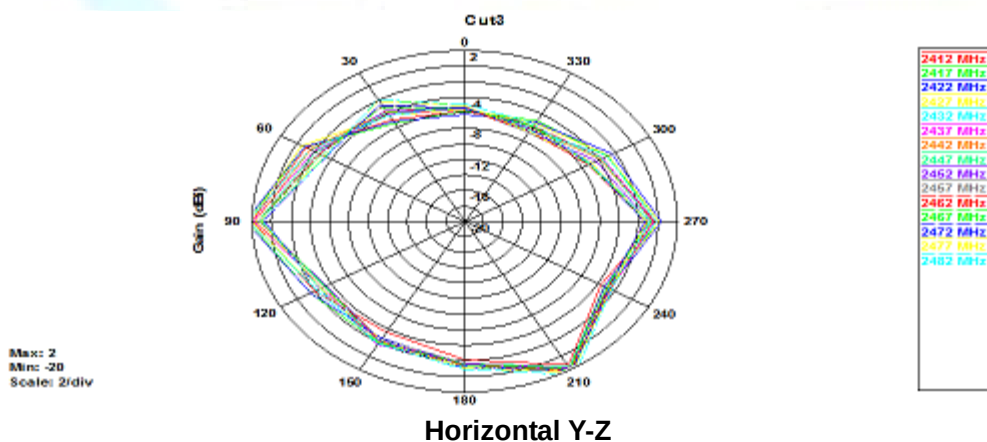
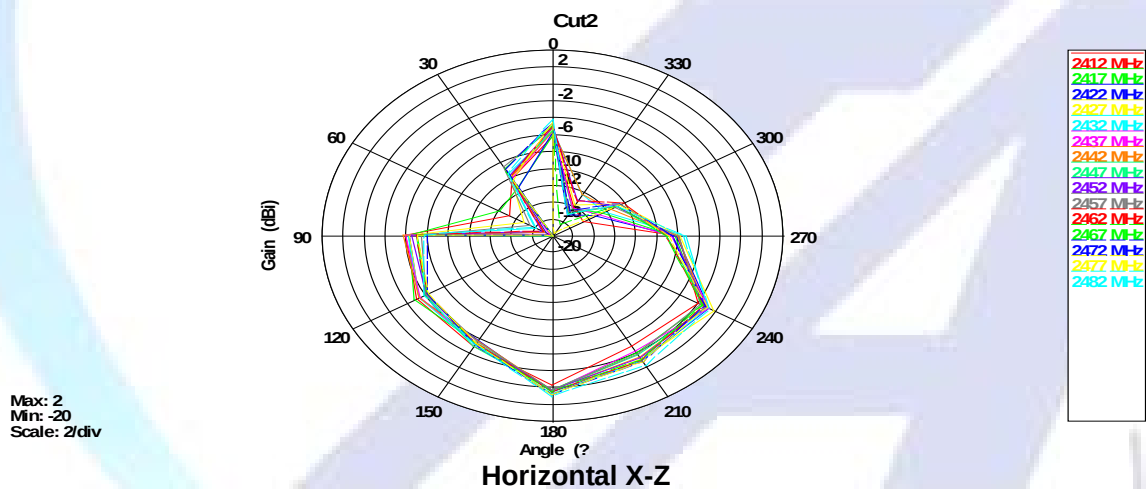
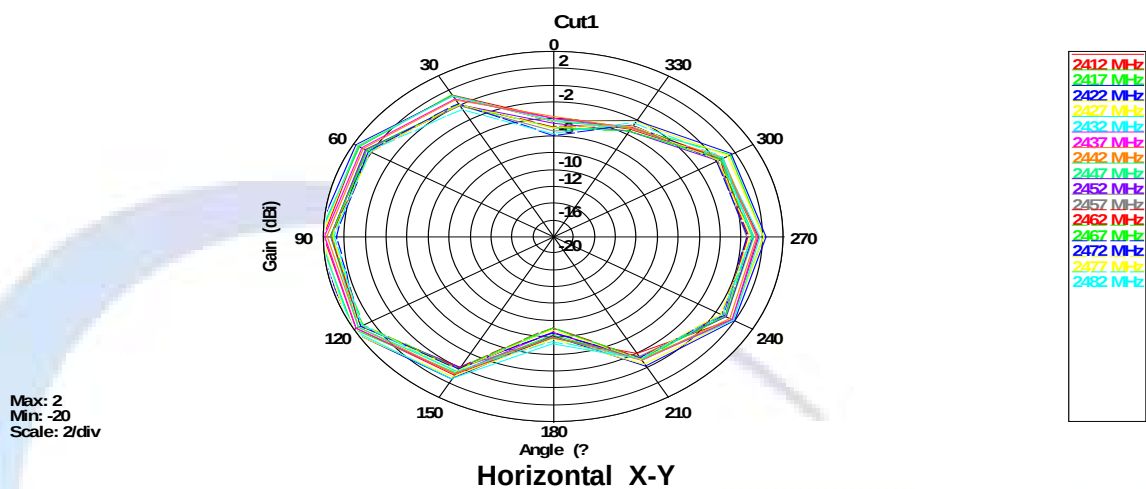
| Frequency (MHz) | 2412   | 2437   | 2463   | 2484   |
|-----------------|--------|--------|--------|--------|
| S11(dB)         | -17.07 | -21.64 | -22.52 | -18.51 |

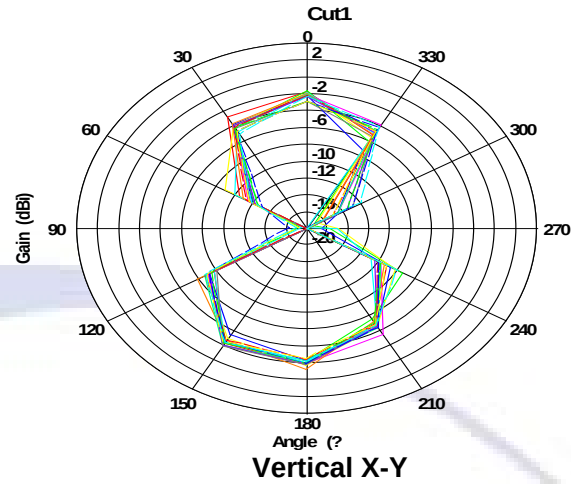
## 5. Test Equipment List

| Type of Equipment           | Manufacture  | Model Number                         | SN                  | Calibration Date | Expiration Time |
|-----------------------------|--------------|--------------------------------------|---------------------|------------------|-----------------|
| Network Analyzer            | Key sight    | E5071B                               | MY42404014          | 2018-05-20       | 2019-05-19      |
| Switch Control System       | ETS          | 7006/7001                            | 00059957/MY42001152 | 2018-05-20       | 2019-05-19      |
| Dual polarized horn antenna | ETS          | 3164-04                              | 00062743            | 2018-05-20       | 2019-05-19      |
| Anechoic Chamber            | ETS          | AMS-8500                             | CT-001157-1219      | /                | /               |
| Software                    | ETS-lindgren | EMQ-100 Pattern Measurement software | 1.09                | /                | /               |

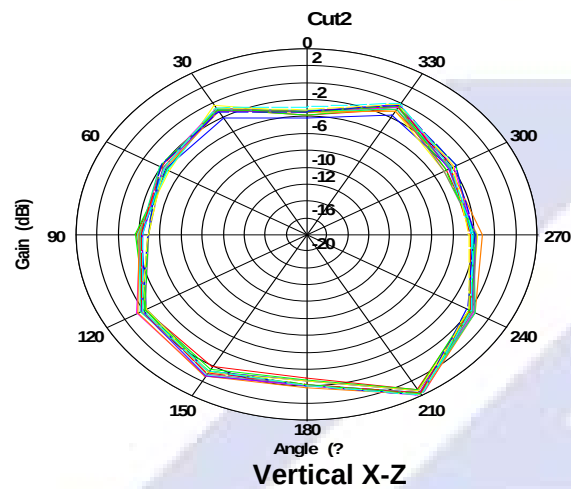


## APPENDIX A: 2-D Pattern Plots

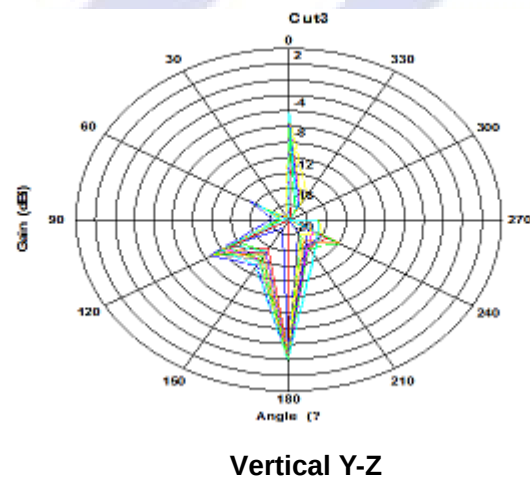




2412 MHz  
2417 MHz  
2422 MHz  
2427 MHz  
2432 MHz  
2437 MHz  
2442 MHz  
2447 MHz  
2452 MHz  
2457 MHz  
2462 MHz  
2467 MHz  
2472 MHz  
2477 MHz  
2482 MHz



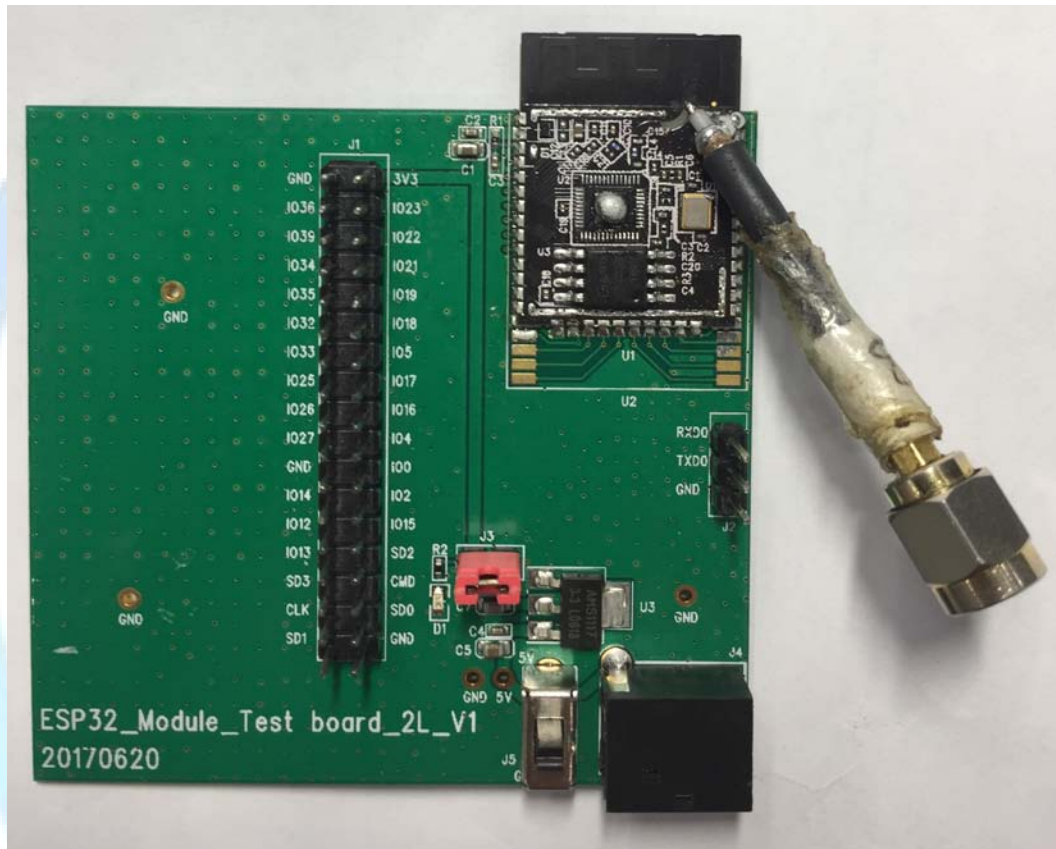
2412 MHz  
2417 MHz  
2422 MHz  
2427 MHz  
2432 MHz  
2437 MHz  
2442 MHz  
2447 MHz  
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2477 MHz  
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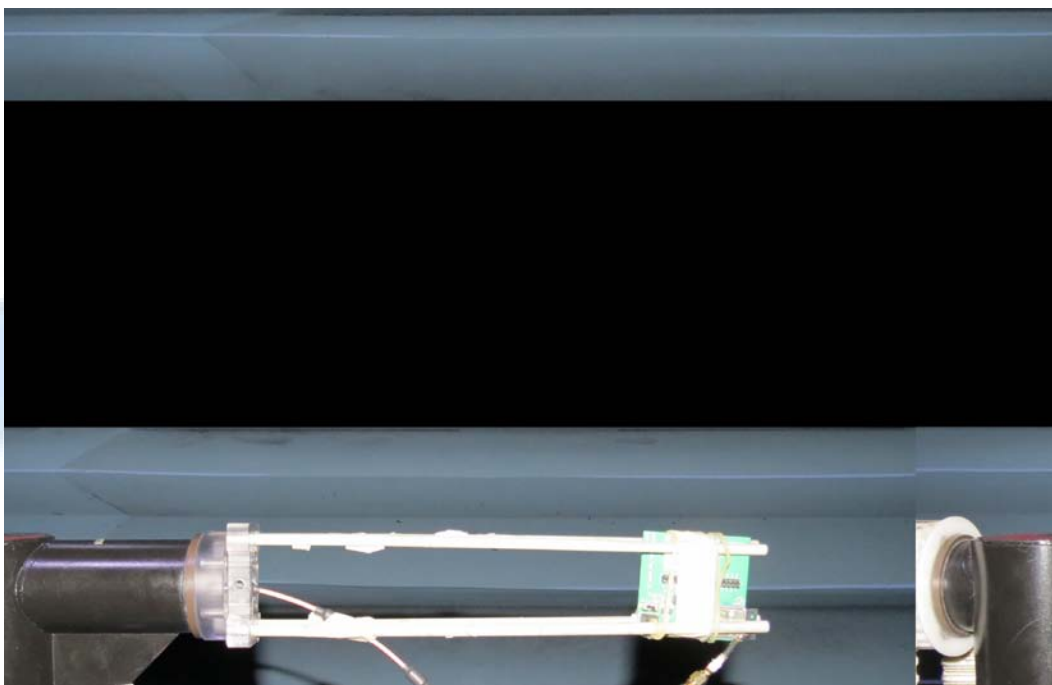
## APPENDIX B: The EUT Appearance and Test Configuration

### B.1 EUT Appearance



Picture 1 Constituents of EUT

## B.2 Test Configuration



ESP-ANT B

Picture 2 Test Setup

\*\*\*\*\*END\*\*\*\*\*