



# OTA TEST REPORT

|                   |                     |
|-------------------|---------------------|
| <b>Applicant</b>  | Espressif Systems   |
| <b>Product</b>    | ESP-ANT A           |
| <b>Model</b>      | ESP-ANT A           |
| <b>Report No.</b> | YXA1711-1424OTA01R3 |
| <b>Issue Date</b> | November 27, 2020   |

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.

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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 .....                                           | 8  |
| 5.   | Test Equipment List .....                                   | 9  |
|      | APPENDIX A: 2-D Pattern Plots .....                         | 10 |
|      | APPENDIX B: The EUT Appearance and Test Configuration ..... | 11 |
|      | B.1 EUT Appearance .....                                    | 11 |



## 1. General Information

### 1.1. Notes of the Test Report

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### 1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.  
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City: Shanghai  
Post code: 201201  
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### 1.3. Laboratory Environment

|                   |                        |         |
|-------------------|------------------------|---------|
| Temperature       | Min. =19℃ , Max. = 25℃ |         |
| 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: #204, Block 2, 690 Bibo Road, Zhang Jiang High-Tech Park,  
Shanghai, P. R. China

### 2.2. Manufacturer Information

Company: Espressif Systems  
Address: #204, Block 2, 690 Bibo Road, Zhang Jiang High-Tech Park,  
Shanghai, P. R. China

### 2.3. Information of EUT

#### General information

| EUT Description       |                             |
|-----------------------|-----------------------------|
| Product Name:         | ESP-ANT A                   |
| Model                 | ESP-ANT A                   |
| HW Version:           | /                           |
| SW Version:           | /                           |
| Antenna Type:         | Fixed Antenna (PCB 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.: YXA1711-1424OTA01R3) supersedes and replaces the previously issued report (Report No.: YXA1711-1424OTA01R2 & YXA1711-1424OTA01R1 & YXA1711-1424OTA). Please discard or destroy the previously issued report and dispose of it accordingly.

### 2.4. Test Date

The test is performed on August 30, 2017 and November 22, 2017.



## 2.5. Applied Standards

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

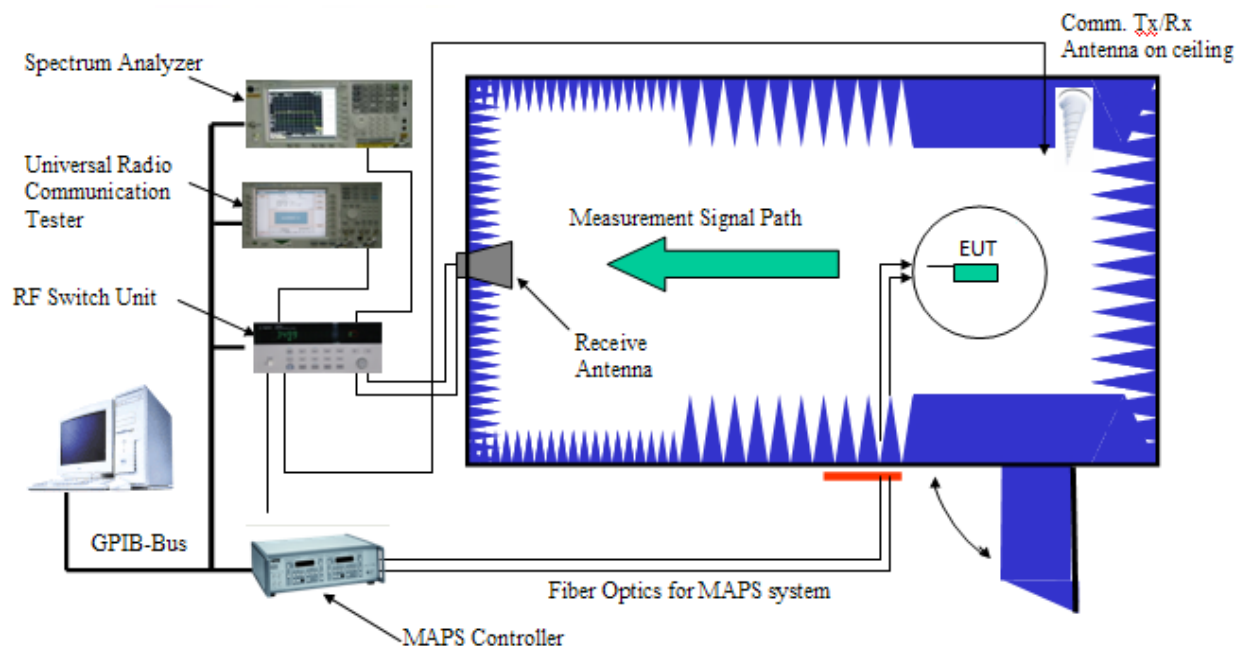
Test Method: **ANSI/IEEE Std 149-2008**



## 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

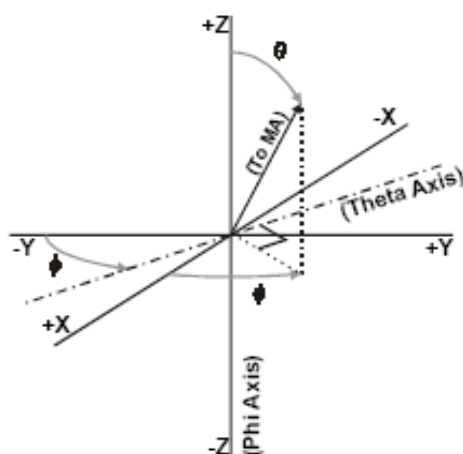


Figure 1 Test coordinate system

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.



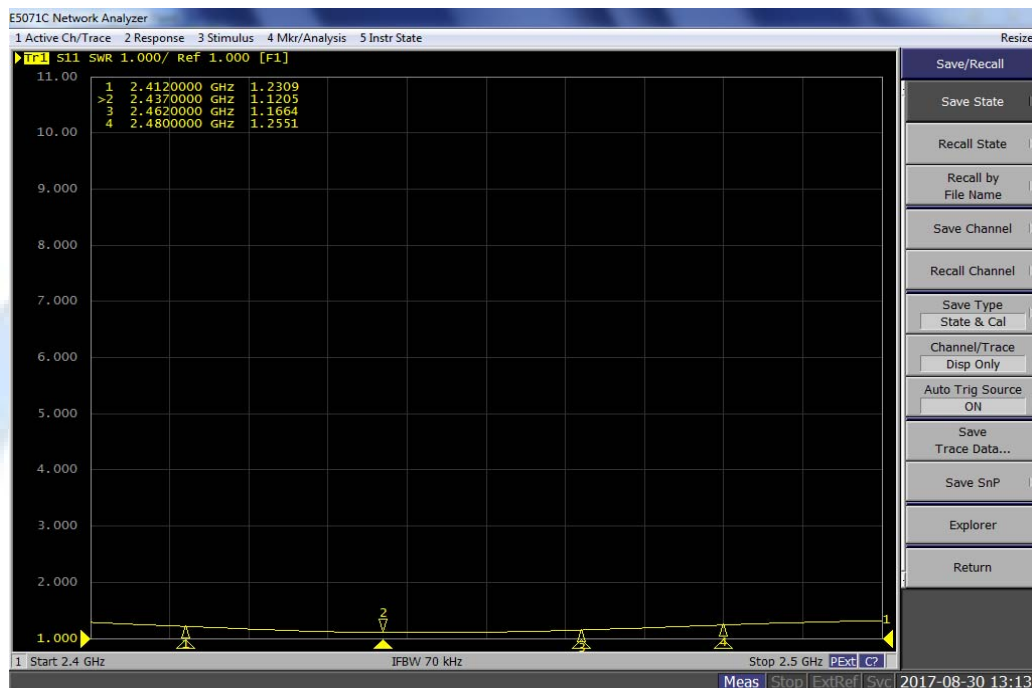
## 4. Test Results

### 4.1. Gain and Efficiency

| Model     | Test Item | Test State | Frequency (MHz) | Efficiency (%) | Peak Gain (dBi) | Note         |
|-----------|-----------|------------|-----------------|----------------|-----------------|--------------|
| ESP-ANT A | Gain      | Free Space | 2400            | 67.24          | 3.08            | Vertical 30° |
|           |           |            | 2402            | 68.24          | 3.18            |              |
|           |           |            | 2410            | 70.74          | 3.27            |              |
|           |           |            | 2420            | 77.67          | 3.66            |              |
|           |           |            | 2430            | 78.20          | 3.71            |              |
|           |           |            | 2440            | 78.11          | 3.68            |              |
|           |           |            | 2450            | 77.14          | 3.64            |              |
|           |           |            | 2460            | 74.79          | 3.52            |              |
|           |           |            | 2470            | 75.60          | 3.60            |              |
|           |           |            | 2480            | 74.55          | 3.52            |              |
|           |           |            | 2490            | 73.05          | 3.56            |              |
|           |           |            | 2500            | 71.38          | 3.48            |              |

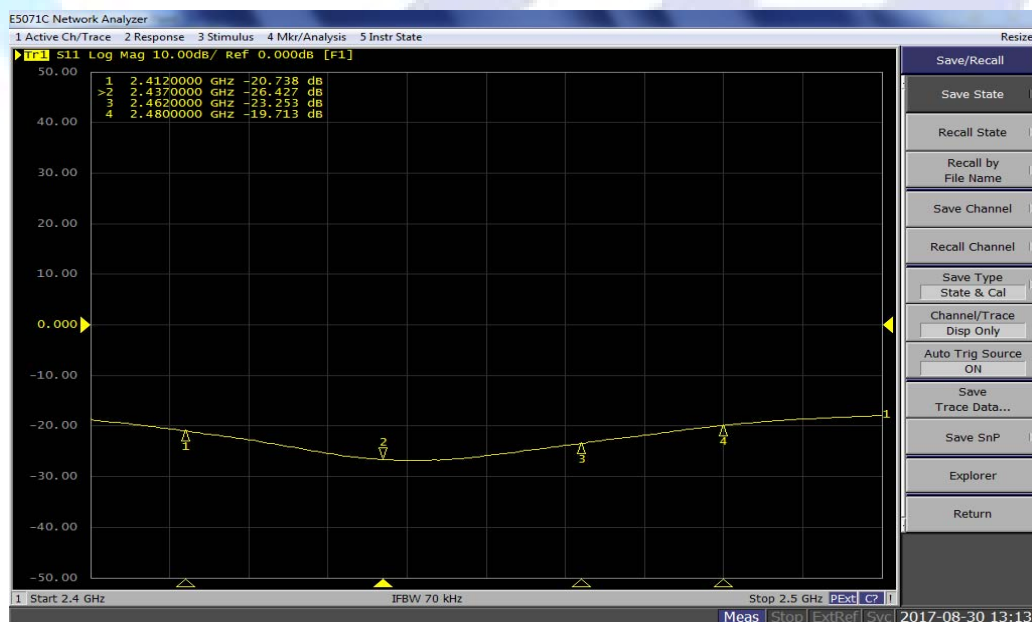


## 4.2. Voltage Standing Wave Ratio (VSWR)



| Frequency (MHz) | 2412 | 2437 | 2462 | 2480 |
|-----------------|------|------|------|------|
| VSWR            | 1.23 | 1.12 | 1.17 | 1.26 |

## 4.3. Antenna S11



| Frequency (MHz) | 2412   | 2437   | 2462   | 2480   |
|-----------------|--------|--------|--------|--------|
| S11(dB)         | -20.74 | -26.43 | -23.25 | -19.71 |

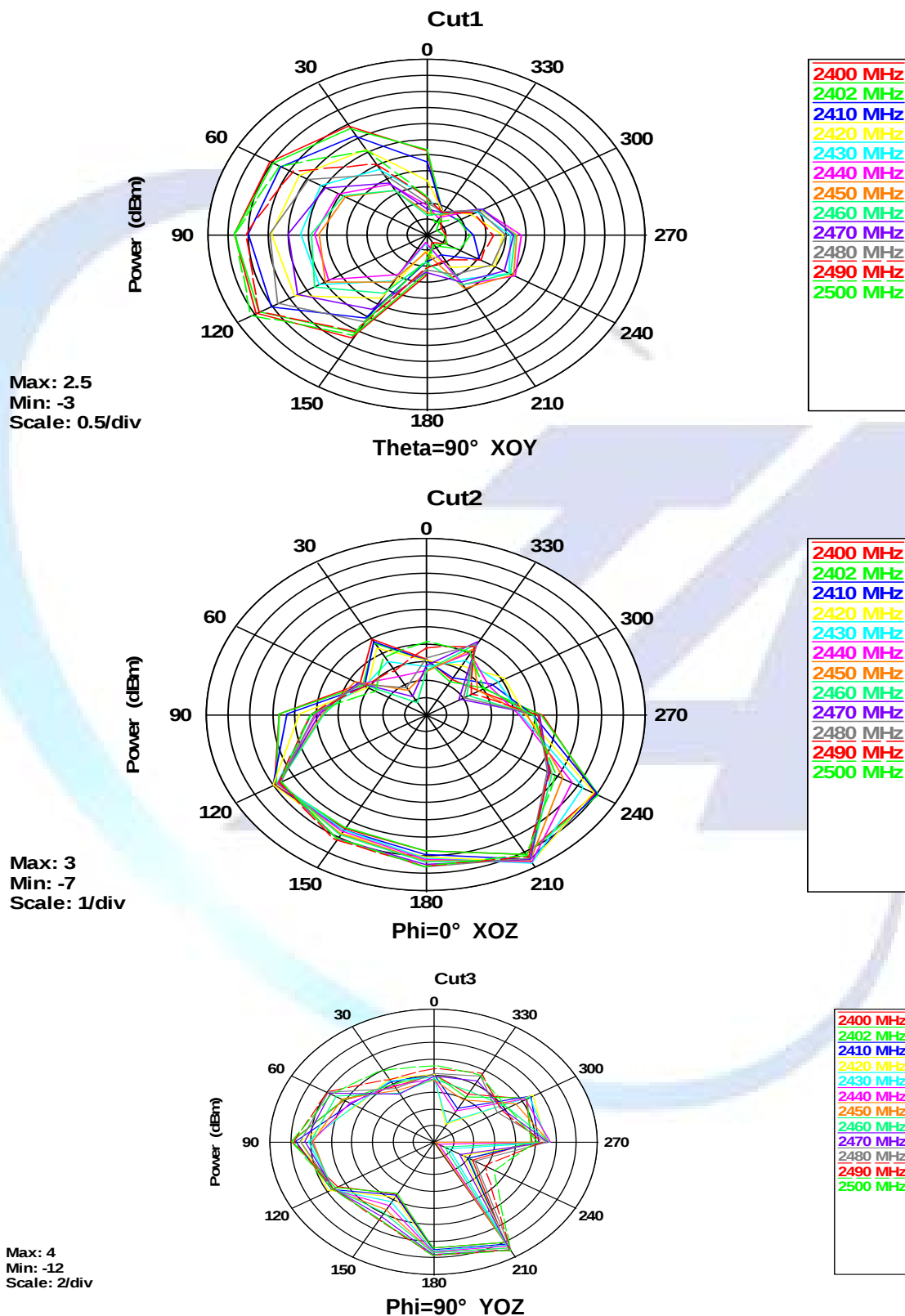


## 5. Test Equipment List

| Type of Equipment                        | Model Number | SN         | Manufacture |
|------------------------------------------|--------------|------------|-------------|
| Network Analyzer                         | E5071B       | MY48360957 | Agilent     |
| Quad-Ridge Horn Antenna<br>700 MHz-6 GHz | 3164-04      | 00062743   | ETS         |
| MAPS Controller                          | 7006         | 00059957   | ETS         |
| Switch Control System                    | 7001         | MY42001152 | ETS         |



## APPENDIX A: 2-D Pattern Plots

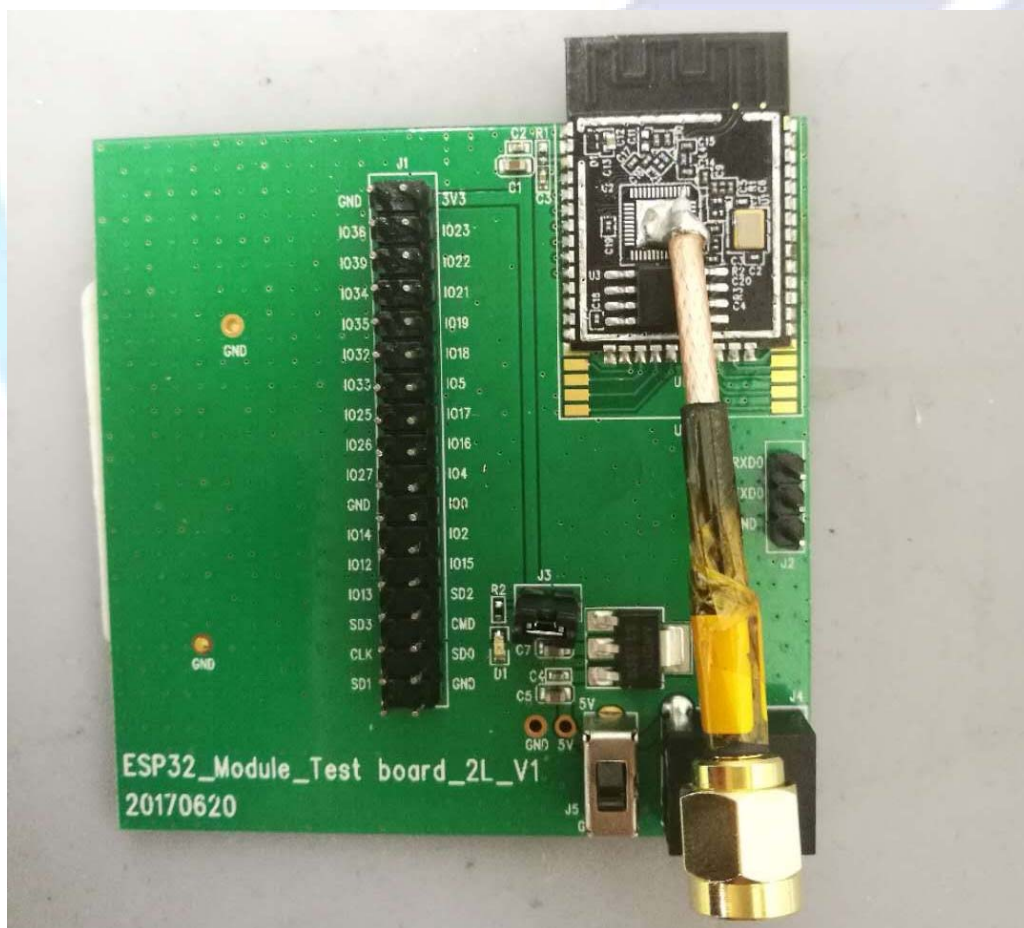


## APPENDIX B: The EUT Appearance and Test Configuration

### B.1 EUT Appearance



ESP-ANT A



Picture 1 Constituents of EUT

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