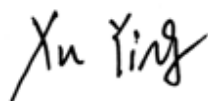


OTA TEST REPORT

Applicant Espressif Systems (Shanghai) Co.,Ltd.
Product H0920 WIFI PIFA
Report No. Y2305A0512-T1
Issue Date May 18, 2023

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **ANSI/IEEE Std 149-2021**. 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.	Test Laboratory.....	3
1.1.	Notes of the Test Report	3
1.2.	Test Facility	3
1.3.	Testing Location	3
1.4.	Laboratory Environment	3
2.	General Description of Equipment Under Test	4
2.1.	Applicant and Manufacturer Information.....	4
2.2.	General Information.....	4
2.3.	Test Date.....	4
2.4.	Received 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
5.	Equipment List	8
	ANNEX A: 3-D Pattern Plots	9
	2-D Pattern Plots.....	10
	ANNEX B: The EUT Appearance and Test Configuration.....	11
	B.1 EUT Appearance.....	11
	B.2 Test Configuration	12

1. Test Laboratory

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.

1.2. Test Facility

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

1.4. 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 and Manufacturer Information

Applicant Name	Espressif Systems (Shanghai) Co.,Ltd.
Applicant address	Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China
Manufacturer Name	Espressif Systems (Shanghai) Co.,Ltd.
Manufacturer address	Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

2.2. General Information

EUT Description	
Product Name:	H0920 WIFI PIFA
HW Version:	V1.0
SW Version:	/
Antenna Type:	SMD Antenna
Antenna Manufacturer:	Espressif Systems
Test Frequency:	2439MHz ~ 2497MHz
Note: The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.	

2.3. Test Date

The test is performed on May 16, 2023.

2.4. Received Date

The sample was received on May 16, 2023.

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 149-2021**

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

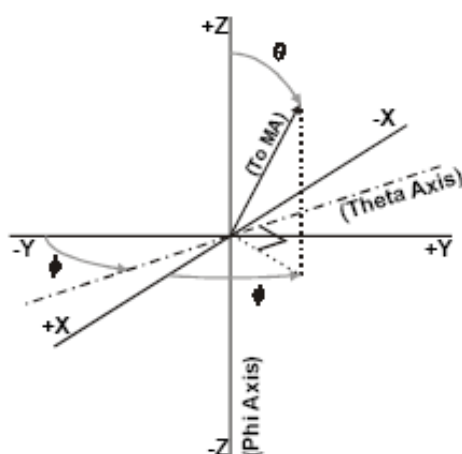
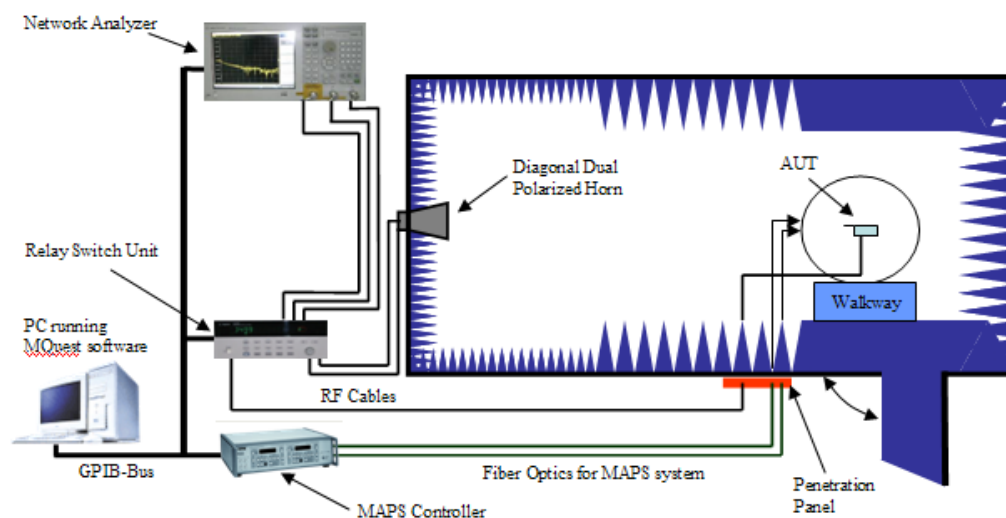


Figure 1 Test coordinate system

Note: Theta is from 0~180 degree. Phi is from 0~360. Rotate the EUT and record the Data, the step of rotation is 15 degree.

Test Setup



4. Test Results

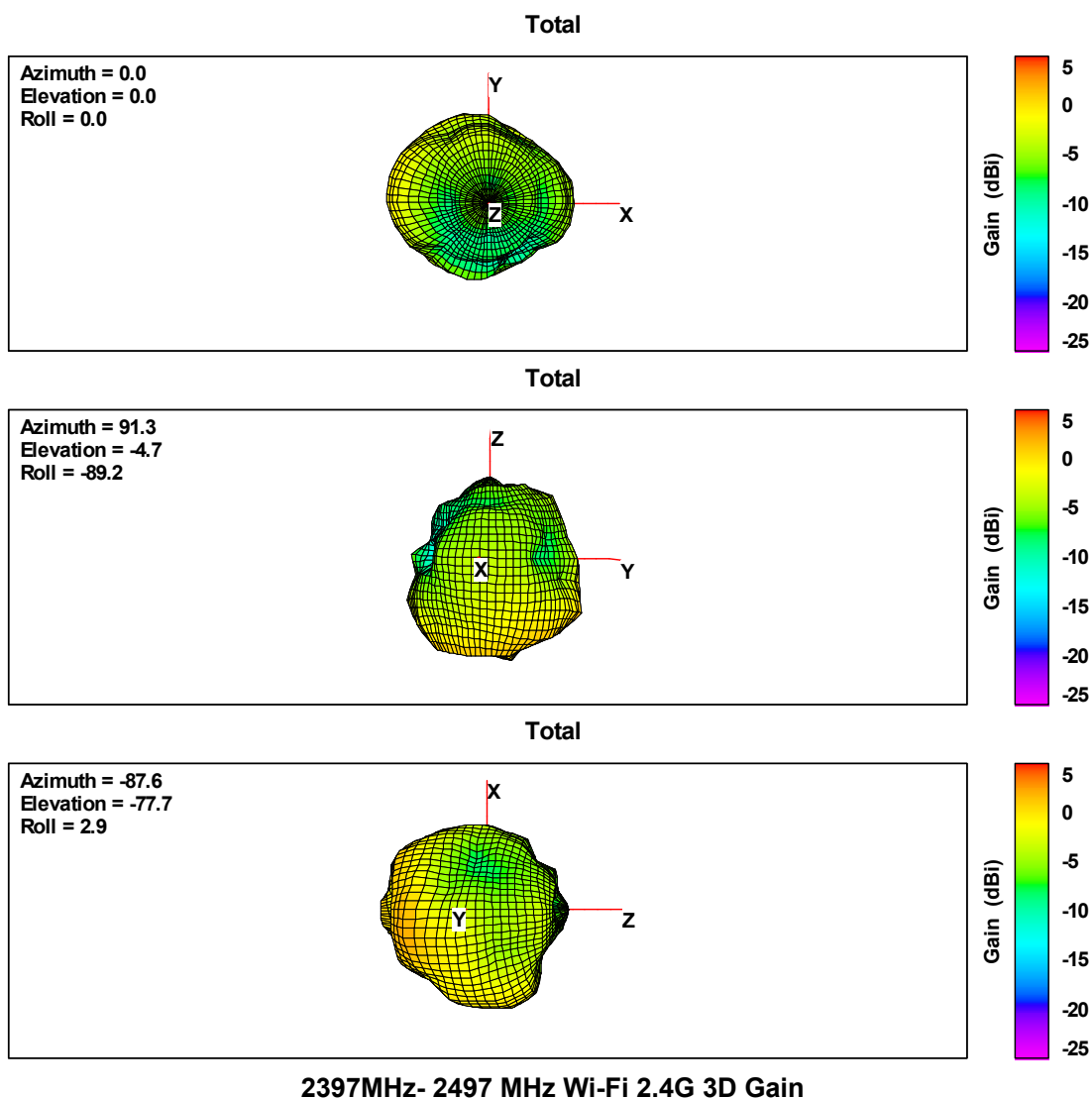
4.1. Gain and Efficiency

Test Item	Test State	Frequency (MHz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)	Directivity (dBi)	Note
3D Gain	FS	2397	-3.36	46.12	2.16	5.52	15°
		2402	-3.13	48.66	2.76	5.89	
		2407	-2.81	52.34	2.65	5.46	
		2412	-2.45	56.94	3.07	5.52	
		2417	-2.32	58.58	3.18	5.50	
		2422	-2.35	58.20	2.94	5.29	
		2427	-2.26	59.41	3.11	5.37	
		2432	-2.15	61.01	3.33	5.48	
		2437	-2.04	62.51	3.40	5.44	
		2442	-1.83	65.62	3.72	5.54	
		2447	-1.77	66.60	3.60	5.37	
		2452	-1.66	68.17	3.72	5.39	
		2457	-1.61	68.95	3.74	5.36	
		2462	-1.47	71.35	3.82	5.29	
		2467	-1.41	72.22	3.98	5.39	
		2472	-1.70	67.59	3.49	5.19	
		2477	-1.66	68.16	3.72	5.38	
		2482	-1.58	69.54	3.84	5.42	
		2487	-1.65	68.34	3.81	5.47	
		2492	-1.54	70.21	4.12	5.65	
		2497	-1.39	72.69	4.23	5.61	

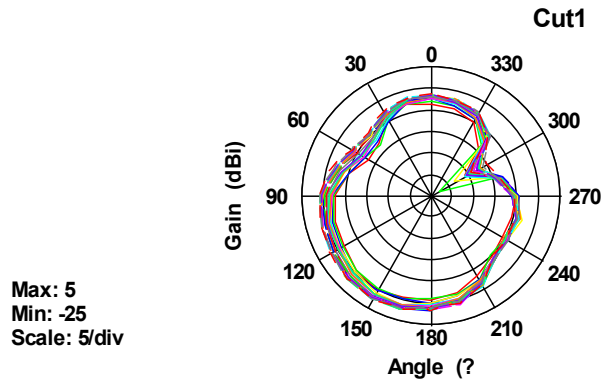
5. Equipment List

Type of Equipment	Manufacture	Model Number	S/N	Calibration Date	Expiration Time
Anechoic Chamber	ETS	AMS-8500	CT-001157-1219	2020-05-17	2025-05-16
Test Software	ETS	EMQuest™	REV 1.16	/	/
EMCenter_Switch Control System	ETS	7006/7001	00059957/ MY42001152	/	/
Diagonal Dual Polarized Horn	ETS	ETS 3164-04	00062743	2020-04-14	2025-04-13
Network Analyzer	Keysight	E5071B	MY42404014	2023-05-12	2024-05-11

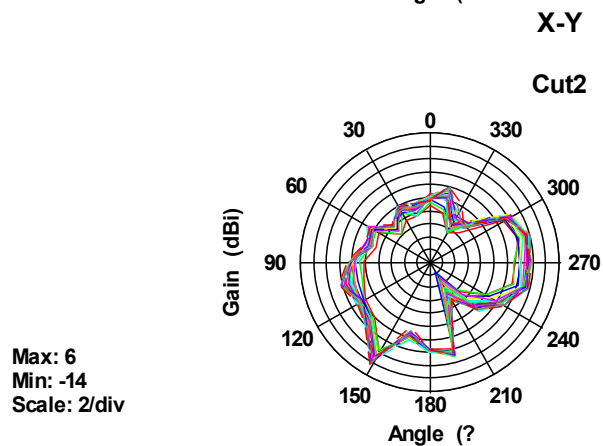
ANNEX A: 3-D Pattern Plots



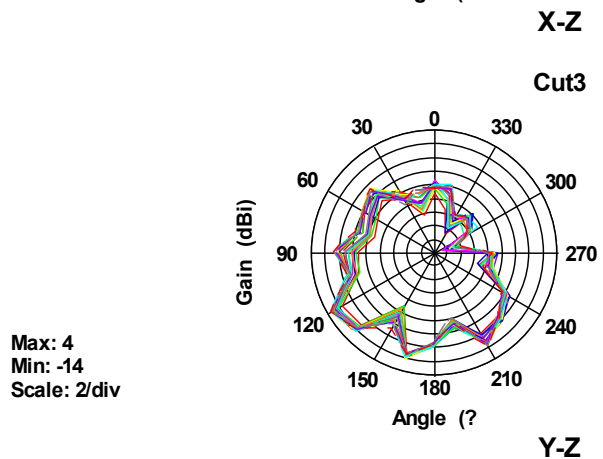
2-D Pattern Plots



2397 MHz	2447 MHz	2497 MHz
2402 MHz	2452 MHz	
2407 MHz	2457 MHz	
2412 MHz	2462 MHz	
2417 MHz	2467 MHz	
2422 MHz	2472 MHz	
2427 MHz	2477 MHz	
2432 MHz	2482 MHz	
2437 MHz	2487 MHz	
2442 MHz	2492 MHz	



2397 MHz	2447 MHz	2497 MHz
2402 MHz	2452 MHz	
2407 MHz	2457 MHz	
2412 MHz	2462 MHz	
2417 MHz	2467 MHz	
2422 MHz	2472 MHz	
2427 MHz	2477 MHz	
2432 MHz	2482 MHz	
2437 MHz	2487 MHz	
2442 MHz	2492 MHz	

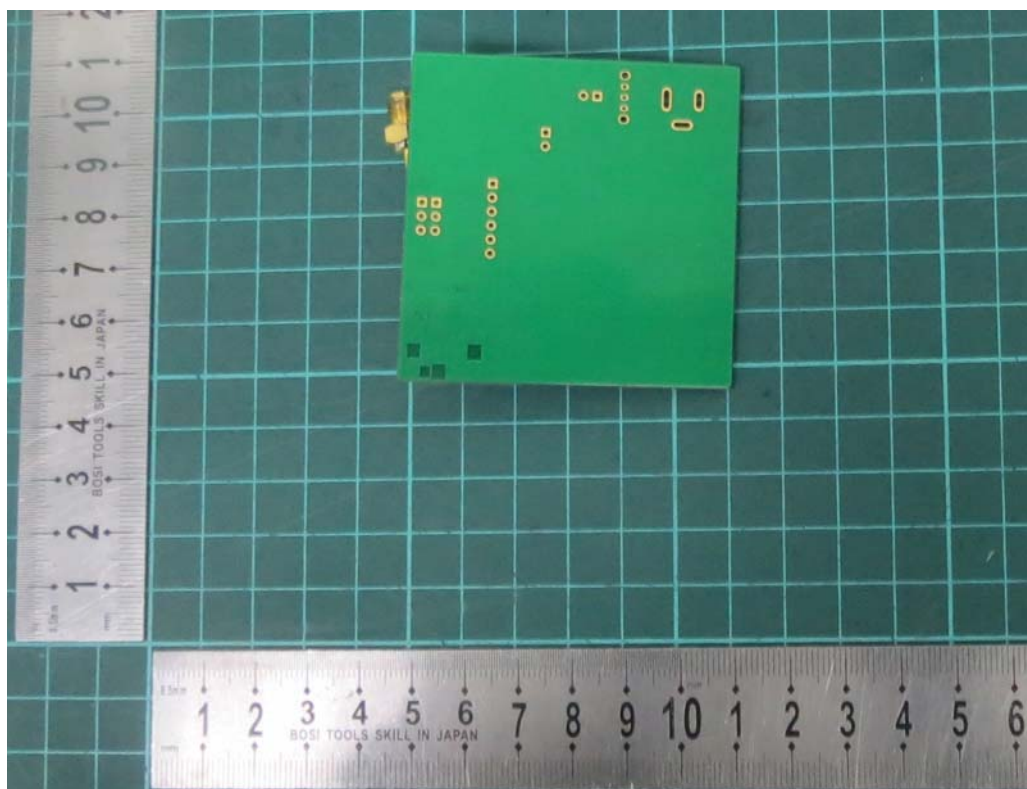
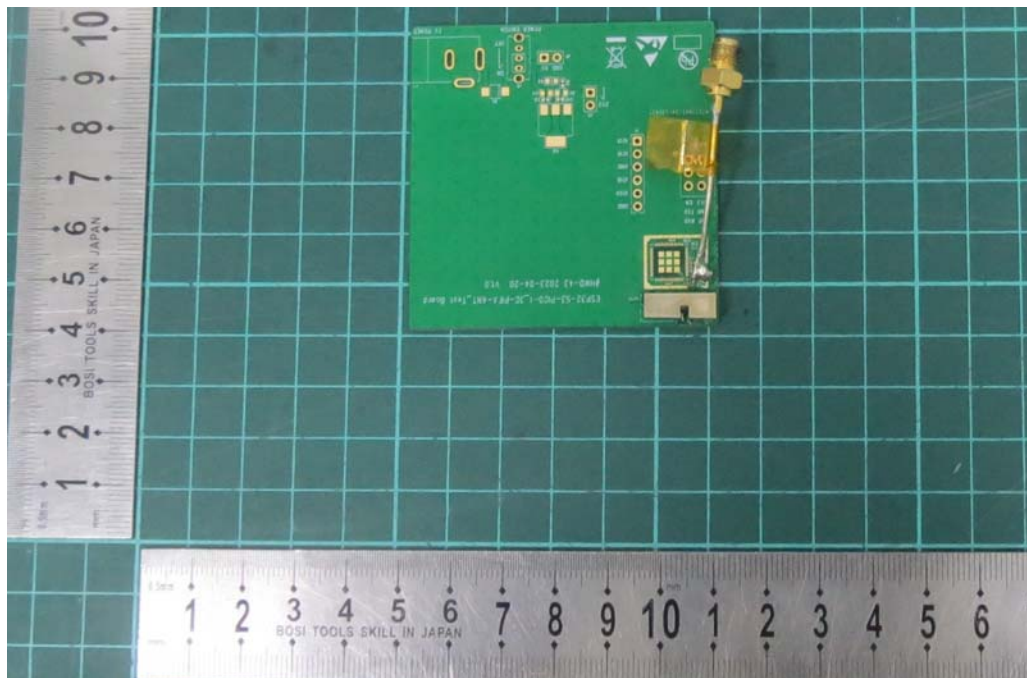


2397 MHz	2447 MHz	2497 MHz
2402 MHz	2452 MHz	
2407 MHz	2457 MHz	
2412 MHz	2462 MHz	
2417 MHz	2467 MHz	
2422 MHz	2472 MHz	
2427 MHz	2477 MHz	
2432 MHz	2482 MHz	
2437 MHz	2487 MHz	
2442 MHz	2492 MHz	

2397MHz- 2497 MHz Wi-Fi 2.4G 3D Gain

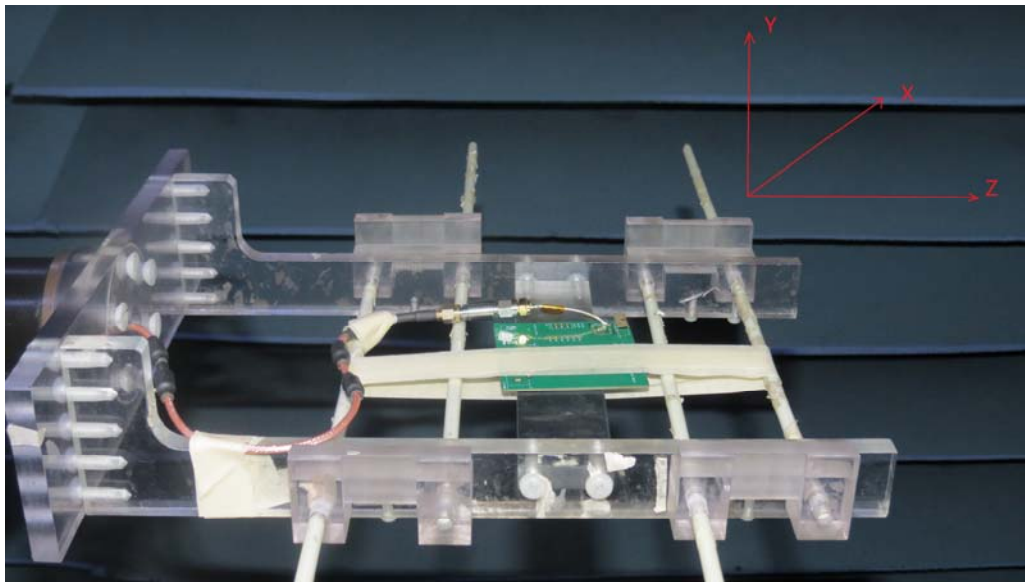
ANNEX B: THE EUT APPEARANCE AND TEST CONFIGURATION

B.1 EUT Appearance



Picture 1 Constituents of EUT

B.2 Test Configuration



Picture 2 Test Setup

*****END OF REPORT *****