



OTA TEST REPORT

Applicant SHANGHAI MOUNTAIN
VIEW SILICON CO LTD
Product SMARTRF_BOARD_2In1
Model AT2
Report No. Y2003A0190-T1
Issue Date April 2, 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.	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	4
2.	General Description of Equipment under Test	5
2.1.	Applicant and Manufacturer Information.....	5
2.2.	General information	5
2.3.	Test Date	5
2.4.	Applied Standards	6
3.	Test Conditions.....	7
3.1.	Test Configuration	7
3.2.	Test Measurement.....	7
4.	Test Results.....	8
4.1.	Gain and Efficiency.....	8
4.2.	Voltage Standing Wave Ratio (VSWR).....	9
4.3.	Antenna S11.....	12
4.4.	Impedance.....	15
5.	Equipment List	17
	APPENDIX A 3-D Pattern Plots	18
	ANNEX A: The EUT Appearance and Test Configuration	19
	A.1 Test Configuration	19



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 electromagnetic emission measurement.

1.3. Testing Location

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



1.4. 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 and Manufacturer Information

Applicant Name	SHANGHAI MOUNTAIN VIEW SILICON CO LTD
Applicant address	Floor 4C, Building 3, Hengyue International Building, Lane 1238, Zhangjiang Road, Pudong New Area, Shanghai City
Manufacturer Name	SHANGHAI MOUNTAIN VIEW SILICON CO LTD
Manufacturer address	Floor 4C, Building 3, Hengyue International Building, Lane 1238, Zhangjiang Road, Pudong New Area, Shanghai City

2.2. General information

EUT Description	
Product Name:	SMARTRF_BOARD_2In1
Model	AT2
HW Version:	V1.0
SW Version:	/
Antenna Type:	PCB
Antenna Manufacturer:	MVSilicon
Test Frequency:	2401MHz ~ 2495MHz
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.	

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

2.3. Test Date

The test is performed from March 23, 2020 to March 24, 2020.



2.4. 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

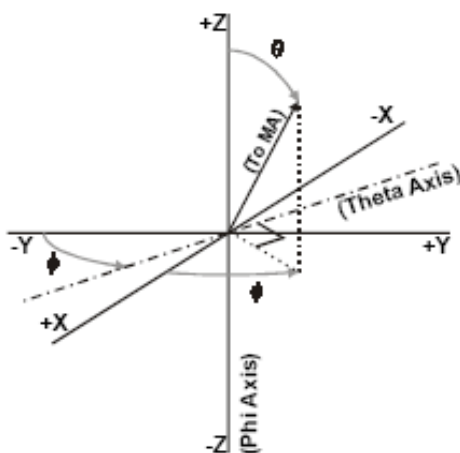
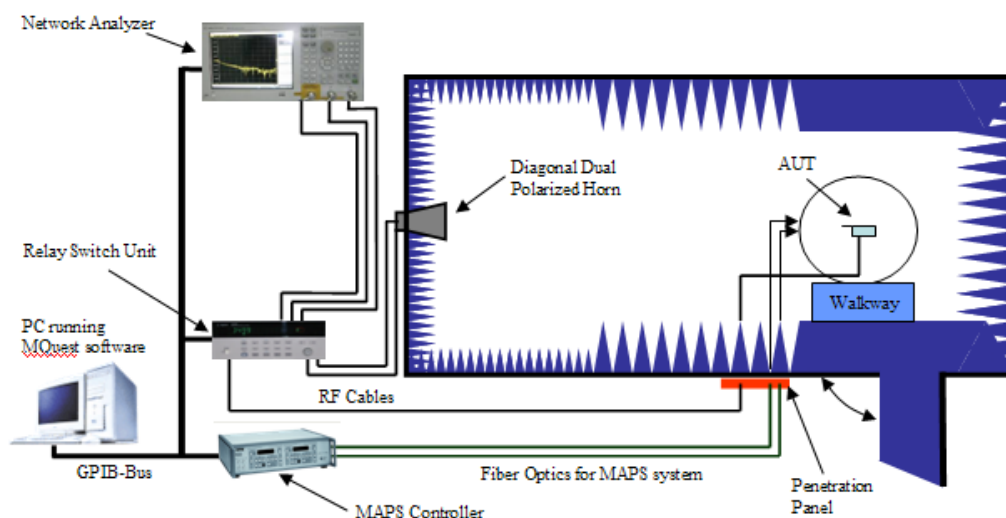


Figure 1 Test coordinate system

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.

Test Setup





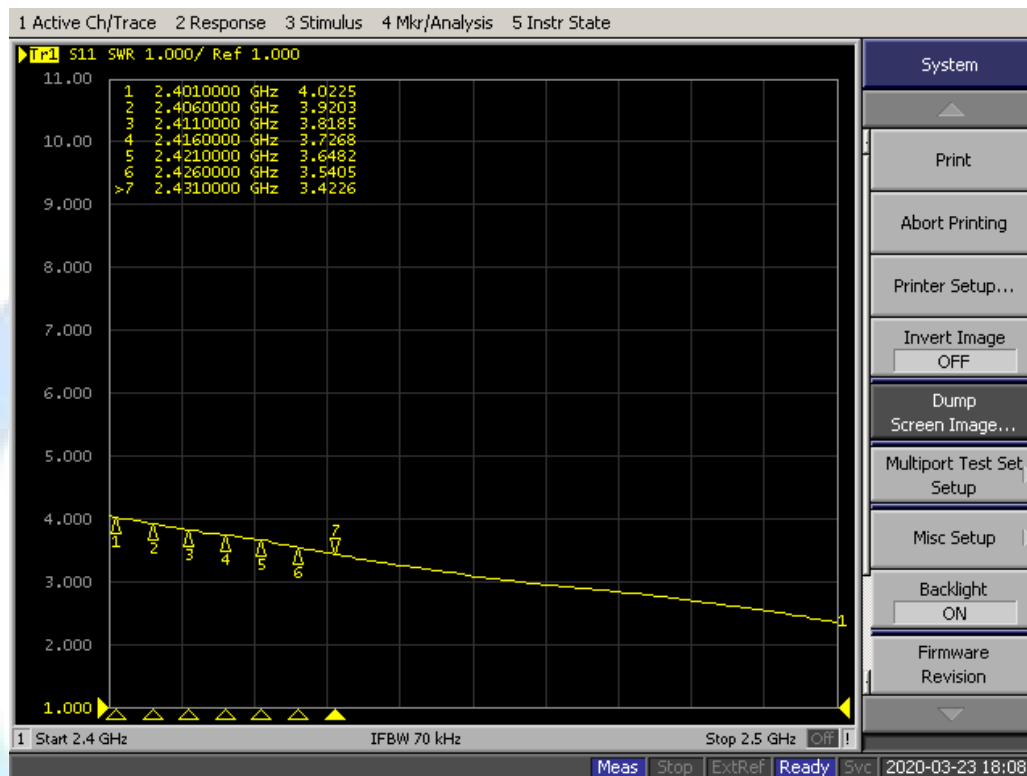
4. Test Results

4.1. Gain and Efficiency

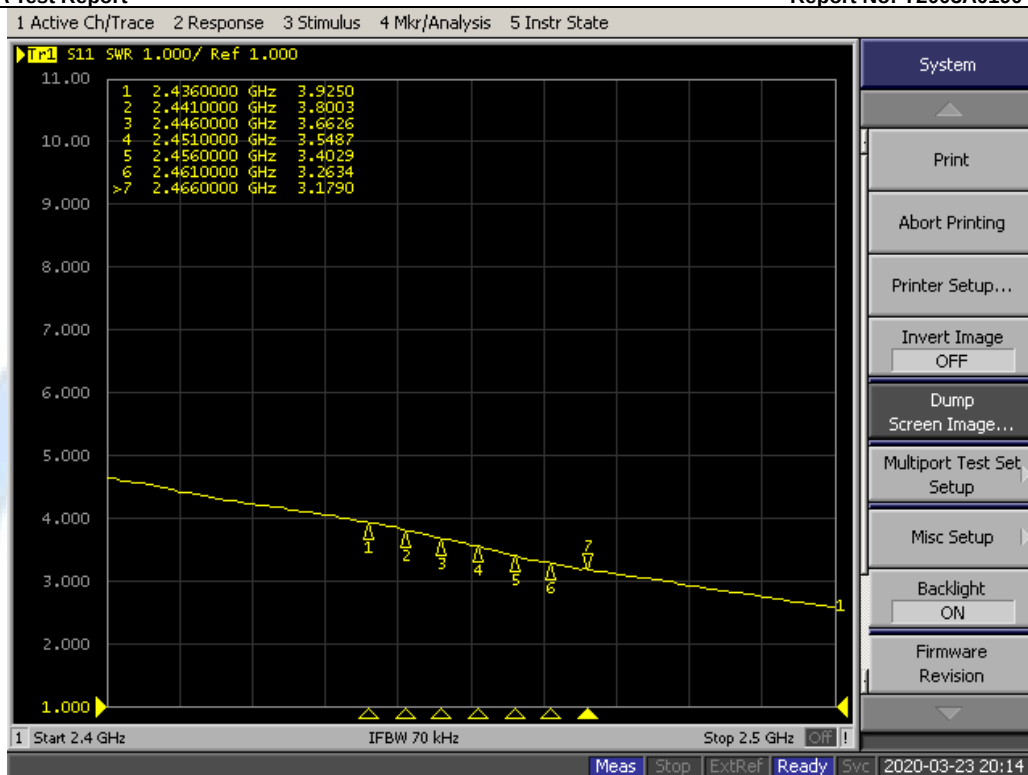
Model	Test State	Frequency (MHz)	Efficiency (%)	Gain (dBi)
AT2	Free Space	2401	39.87	1.43
		2406	40.98	1.69
		2411	41.35	1.78
		2416	42.43	2.14
		2421	42.54	2.16
		2426	41.89	1.94
		2431	42.50	1.94
		2436	43.93	1.99
		2441	45.87	2.06
		2446	47.27	2.24
		2451	49.32	2.42
		2456	51.01	2.45
		2461	52.80	2.82
		2466	54.05	3.01
		2471	54.79	2.92
		2476	56.10	3.22
		2481	57.36	3.11
		2486	58.61	3.22
		2491	59.78	3.37
		2495	59.74	3.27



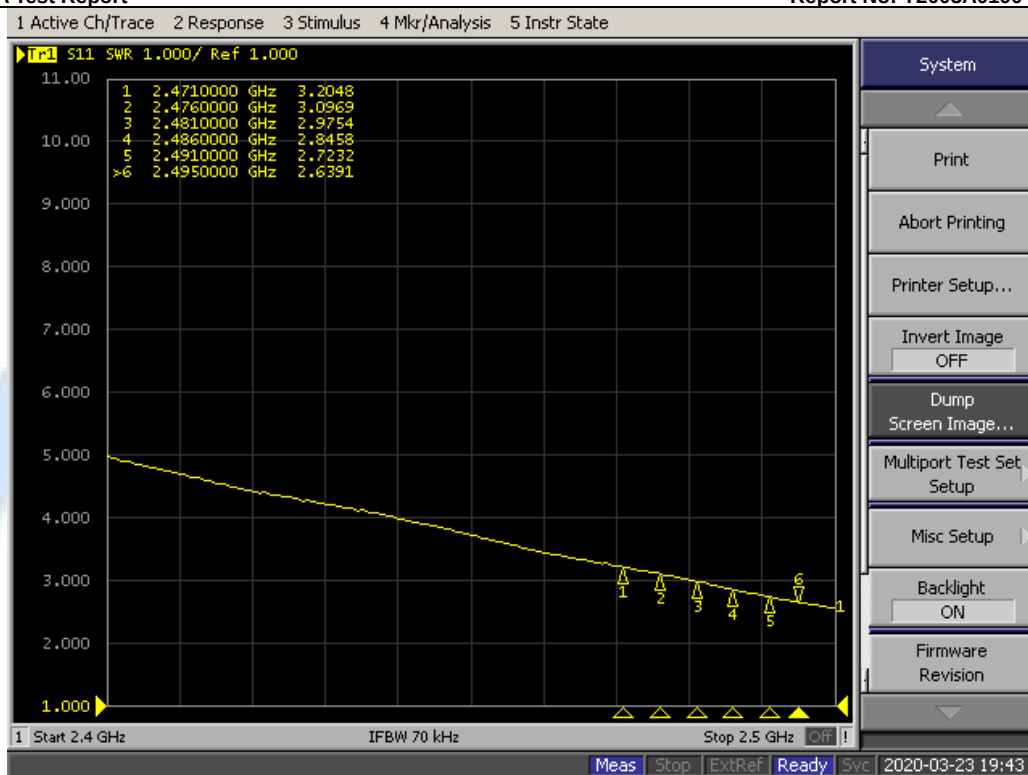
4.2. Voltage Standing Wave Ratio (VSWR)



Frequency (MHz)	2401	2406	2411	2416	2421	2426	2431
VSWR	4.0225	3.9203	3.8185	3.7268	3.6482	3.5405	3.4226



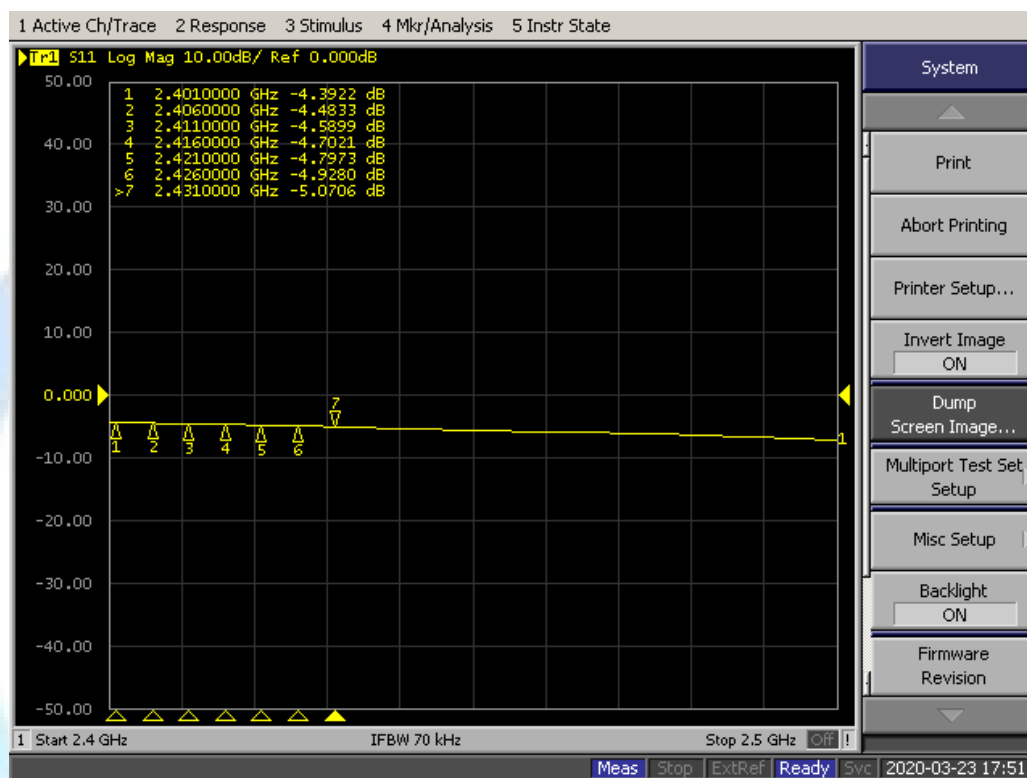
Frequency (MHz)	2436	2441	2446	2451	2456	2461	2466
VSWR	3.9250	3.8003	3.6626	3.5487	3.4029	3.2634	3.1790



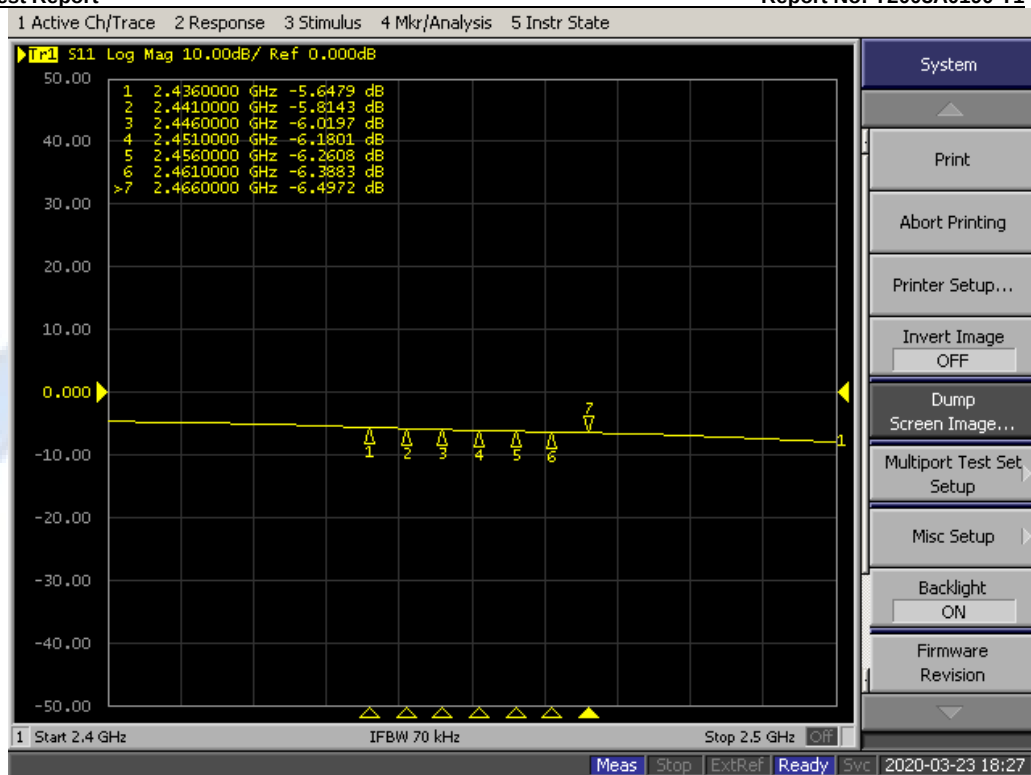
Frequency (MHz)	2471	2476	2481	2486	2491	2495
VSWR	3.2048	30.969	2.9754	2.8458	2.7232	2.6391



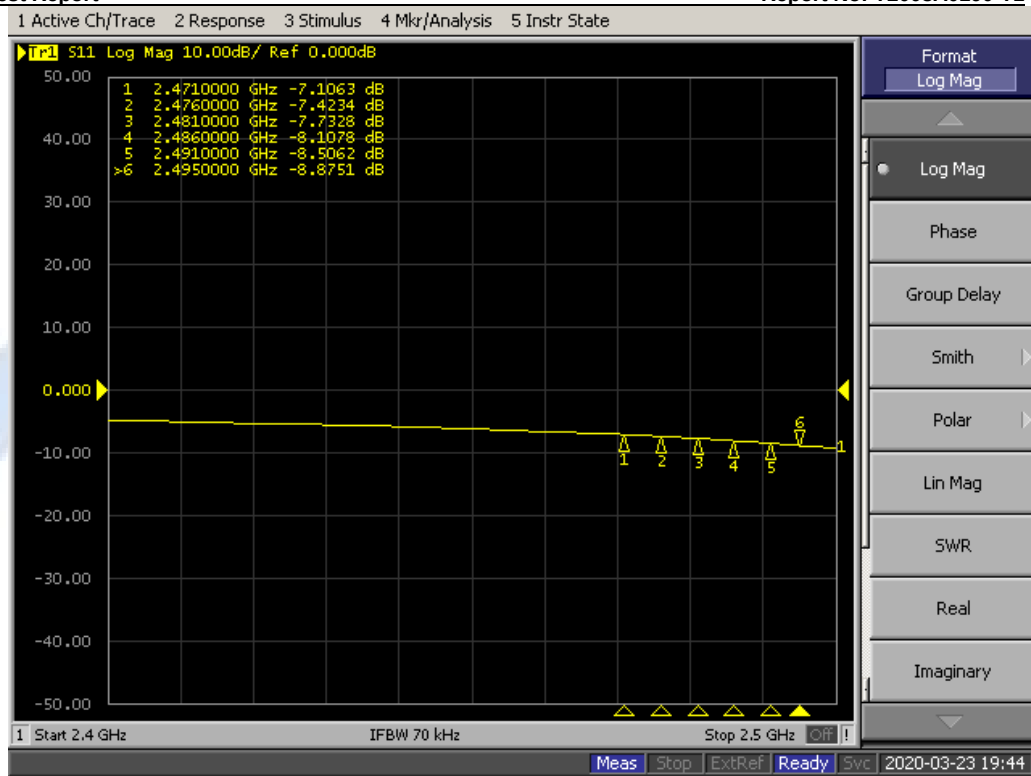
4.3. Antenna S11



Frequency (MHz)	2401	2406	2411	2416	2421	2426	2431
S11	-4.3922	-4.4833	-4.5899	-4.7021	-4.7973	-4.9280	-5.0706

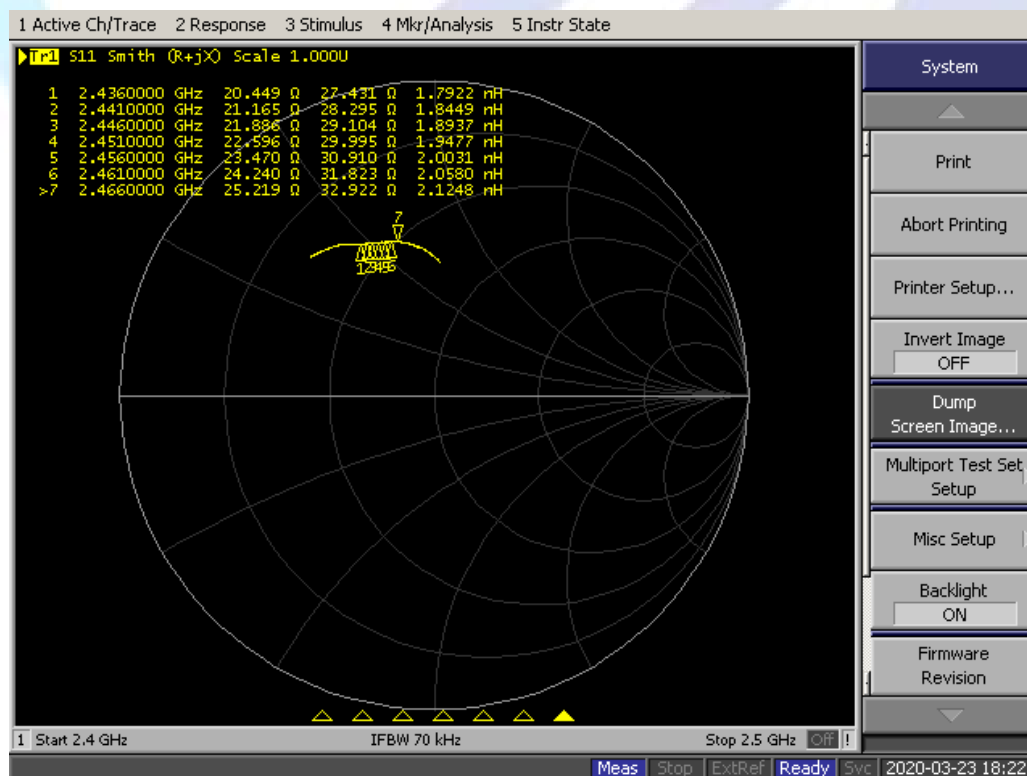
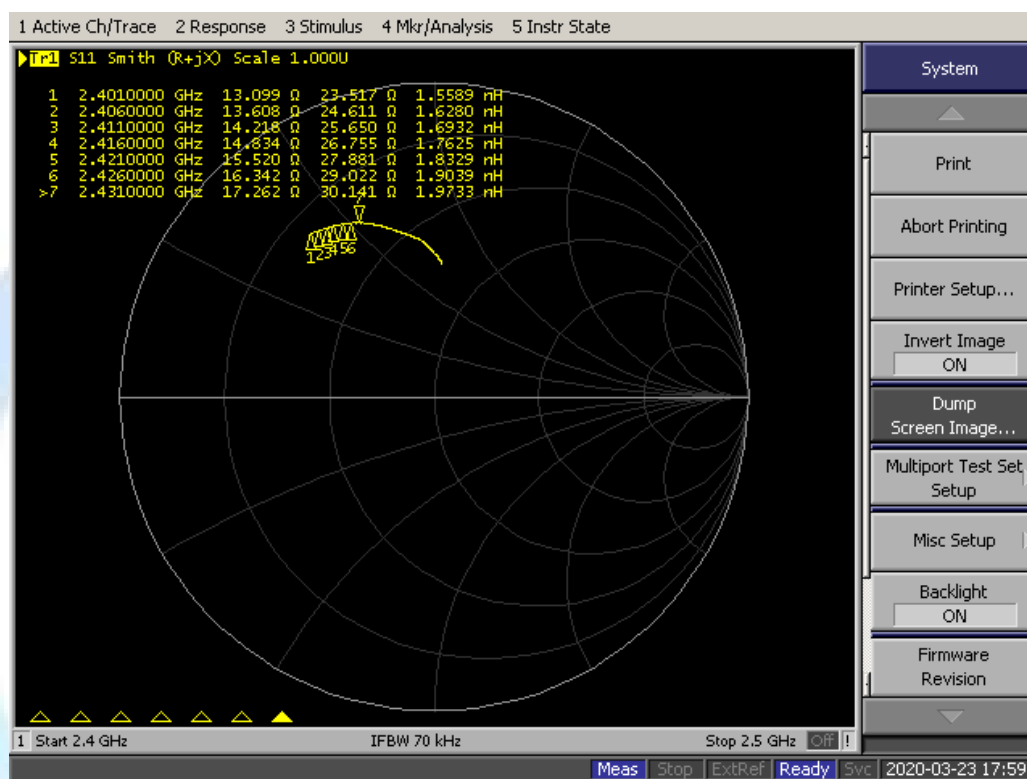


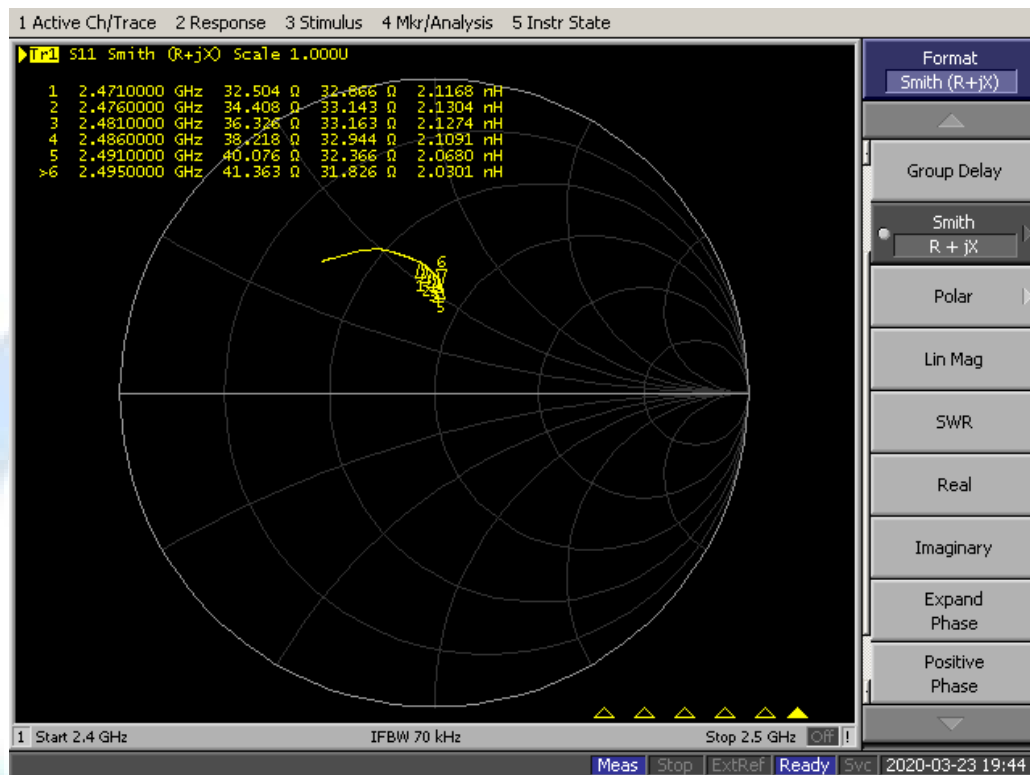
Frequency (MHz)	2436	2441	2446	2451	2456	2461	2466
S11	-5.6479	-5.8143	-6.0197	-6.1801	-6.2608	-6.3883	-6.4972



Frequency (MHz)	2471	2476	2481	2486	2491	2495
S11	-7.1063	-7.4234	-7.7328	-8.1078	-8.5062	-8.8751

4.4. Impedance



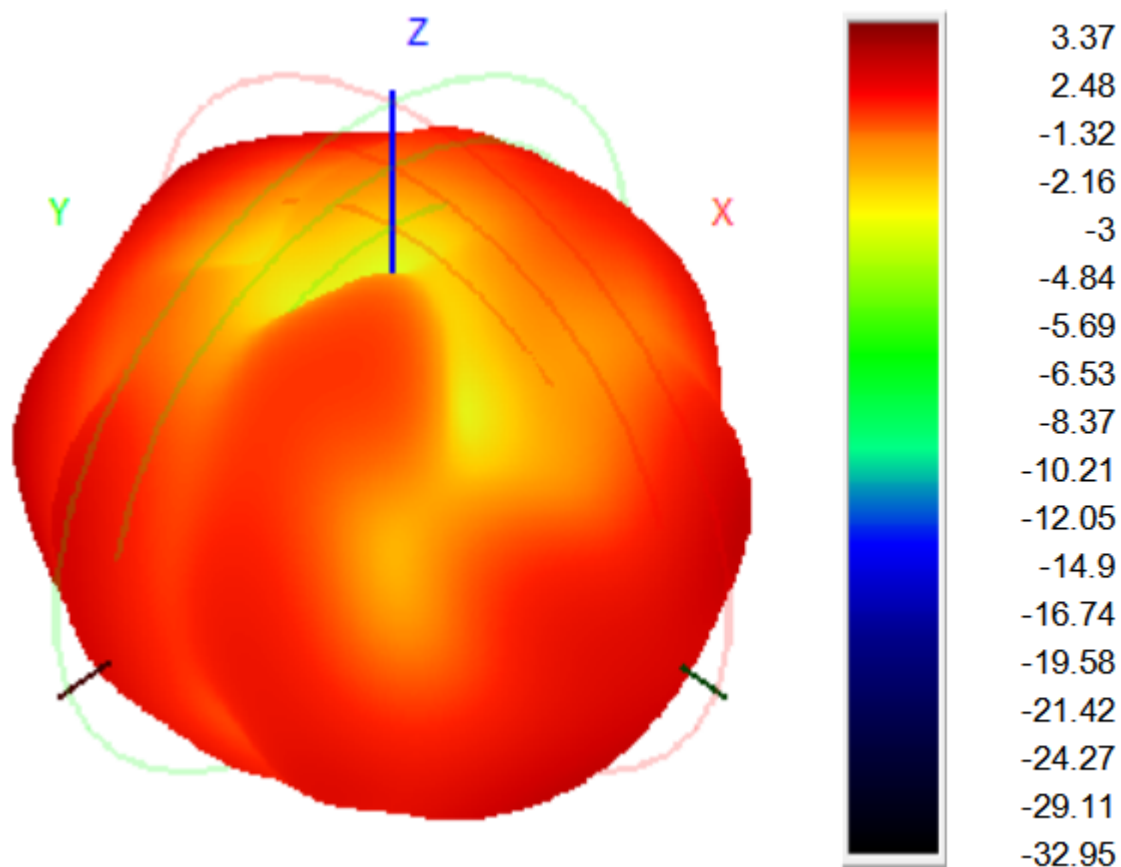




5. Equipment List

Type of Equipment	Manufacture	Model Number	S/N	Calibration Date	Expiration Time
Network Analyzer	Key sight	E5071B	MY42404014	2019-05-19	2020-05-18
Switch Control System	ETS	7006/7001	00059957/MY 42001152	2019-05-19	2020-05-18
Dual polarized horn antenna	ETS	3164-04	00062743	2019-05-19	2020-05-18
Software	ETS-lindgren	EMQ-100 Pattern Measurement software	1.09	N/A	N/A

APPENDIX A 3-D Pattern Plots (dBi) 2491MHz



ANNEX A: The EUT Appearance and Test Configuration

A.1 Test Configuration



Picture 1 Test Setup

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

