

OTA TEST REPORT

Applicant	Shenzhen General Test System Co., Ltd
Product	RayZone1800
Issue Date	November 4, 2024

Shenzhen Fu Bang Wireless Technology Co., Ltd. tested the above equipment in accordance with the requirements in **ANTI/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.

Prepared by: Lunkang Yan

Approved by: Zhanghong Lai

Shenzhen Fu Bang Wireless Technology Co., Ltd.

Room 302, lianjian Industry Part, Huarong road, Longhua District, Shenzhen, P.R. China

1. Test Laboratory

1.1 Notes of the Test report

This report shall not be reproduced in full or partial. 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 applicable standards stated above.

1.2 Test facility

GTS1800 Microwave Anechoic Chamber : testing frequency ranges from 600MHz to 6GHz .

1.3 Testing Location

Company: Shenzhen Fu Bang Wireless Technology Co., Ltd

Address: Room 302, Lianjian Industry Part, Huarong road, Longhua District,
Shenzhen, P.R. China

Contact: lunkang Yan

Telephone: 13760182610

E-mail: 646363118@qq.com

1.4 Laboratory Environment

Temperature	Min.= 19°C , Max.=25°C	
Relative humidity	Min.=40% , Max.=72%	
Shield effect	0.6-7GHz	>100dB
Ground resistance	<0.5Ω	

2. General Description of Equipment under Test

2.1 Applicant and Manufacturer information

Applicant Name	Shenzhen General Test System Co., Ltd
Applicant address	Building C-A7 Suite 805,2190 Liuxian Avenue, Nanshan District, Shenzhen, P.R. China
Manufacturer Name	Shenzhen General Test System Co., Ltd
Manufacturer address	Building C-A7 Suite 805,2190 Liuxian Avenue, Nanshan District, Shenzhen, P.R. China

2.2 General information

EUT Description	
Product Name	RayZone1800
Model	GTS-ANT D-H
HW Version	RayZone1800 V1.0
SW Version	MaxSign 100
Antenna Type	PCB Antenna
Antenna Manufacturer	Shenzhen General Test System Co., Ltd
Test Frequency	600MHz-5.8GHz

2.3 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

The 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 1m.

3.2 Test Measurement

Spherical coordinate system

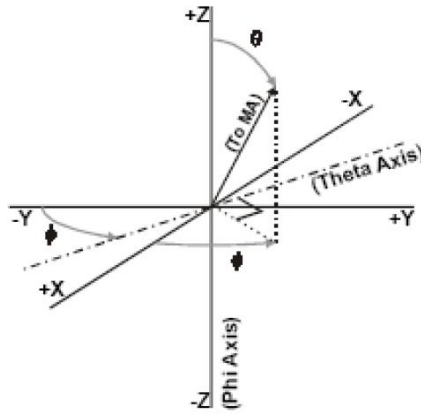
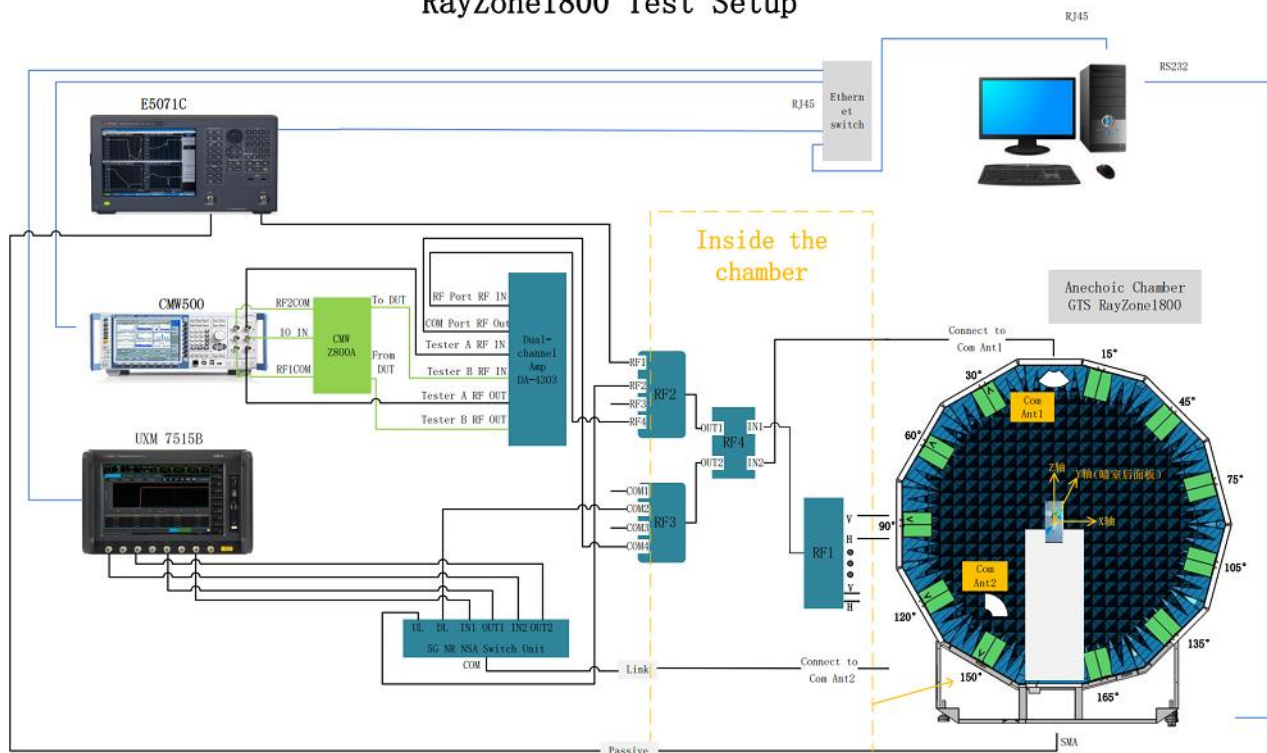


Figure 1 Test coordinate system

Note: Theta is from 0-180degree. Phi is from EUT and record the Date, the step of rotation is 15 degree.

Test Setup

RayZone1800 Test Setup



4. Test Results

4.1 Gain and Efficiency

Shenzhen Fu Bang Wireless Technology Co., Ltd.

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OTA Test Report

Model	Test State	Frequency (MHz)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (%)	Gain (dBi)	Note
	Free Space	620	14.2	-6.5	1820	27.2	-0.3	
		630	14.5	-6.3	1840	27.7	-0.4	
		640	15.0	-5.9	1860	27.9	-0.3	
		650	15.5	-5.5	1880	29.4	-0.3	
		660	15.9	-5.1	1900	30.6	-0.2	
		670	15.4	-5.1	1920	32.3	-0.1	
		680	14.8	-6.1	1940	32.2	-0.5	
		690	14.4	-6.4	1960	33.2	-0.4	
		700	14.5	-6.3	1980	33.7	-0.7	
		710	14.7	-6.0	2000	34.3	-1.0	
		720	17.2	-5.2	2020	34.4	-1.3	
		730	18.3	-4.5	2040	32.3	-1.8	
		740	17.7	-4.4	2060	29.5	-1.5	
		750	16.9	-5.3	2080	25.6	-1.9	
		760	15.6	-5.5	2100	24.2	-1.9	
		770	14.9	-6.0	2120	23.1	-2.0	
		780	14.7	-6.3	2140	23.4	-1.7	
		790	14.4	-6.4	2160	24.0	-1.8	
		800	13.8	-6.6	2180	24.7	-2.0	
		810	15.7	-5.5	2200	24.9	-1.9	
		820	16.9	-5.0	2300	24.5	-1.8	
		830	17.8	-4.4	2320	24.3	-1.8	
		840	18.6	-4.2	2340	25.4	-1.6	
		850	19.8	-3.7	2360	26.4	-1.2	
		860	20.7	-3.5	2380	26.5	-1.2	
		870	21.8	-3.2	2400	26.0	-1.3	
		880	17.8	-4.0	2420	26.3	-1.6	
		890	20.2	-3.6	2440	26.2	-1.5	
		900	21.4	-2.9	2460	25.8	-1.4	
		910	22.0	-2.4	2480	26.3	-1.5	
		920	21.8	-2.6	2500	25.4	-1.6	
		930	20.3	-3.4	2520	25.4	-1.6	
		940	18.7	-3.8	2540	26.0	-1.3	
		950	17.3	-4.1	2560	26.3	-1.2	
		960	15.9	-5.4	2580	28.3	-0.9	
		1700	23.9	-1.5	2600	27.0	-1.0	
		1720	25.5	-1.1	2620	26.6	-1.0	
		1740	26.9	-0.9	2640	26.6	-1.1	
		1760	27.5	-0.8	2660	26.2	-0.9	
		1780	27.1	-0.9	2680	26.8	-1.2	
		1800	27.6	-0.7	2700	25.7	-1.4	

Model	Test State	Frequency (MHz)	Efficiency (%)	Gain (dBi)	Frequency (MHz)	Efficiency (%)	Gain (dBi)	Note
	Free Space	1560	37.2	-0.6				
		1570	38.9	-0.2				
		1580	38.3	-0.4				
		1590	38.8	0.0				
		2400	30.1	-0.6				
		2410	30.2	-1.2				
		2420	30.6	-1.7				
		2430	31.7	-2.1				
		2440	32.6	-1.9				
		2450	33.3	-1.6				
		2460	33.2	-1.4				
		2470	33.0	-1.3				
		2480	33.6	-1.2				
		2490	34.0	-1.1				
		2500	33.7	-1.0				
		5100	38.6	0.7				
		5140	38.0	0.9				
		5180	38.6	1.2				
		5220	42.7	1.5				
		5260	40.3	1.0				
		5300	41.3	0.8				
		5340	43.4	0.6				
		5380	43.9	0.3				
		5420	44.4	0.4				
		5460	42.9	0.1				
		5500	39.1	-0.2				
		5540	38.6	-0.4				
		5580	39.7	0.3				
		5620	40.6	0.8				
		5660	41.5	1.0				
		5700	40.6	1.0				
		5740	35.5	0.3				
		5780	34.8	0.2				
		5820	31.5	-0.2				
		5850	30.3	-0.3				

4.1 TRP and TRS

The average TRP of low, mid and high channel in beside head position shall be higher than minimum performance requirements for roaming bands refer to EN 301 908-2 V13.1.1&EN 301 908-13 V13.2.1

The average TRS of low, mid and high channel in beside head position shall be lower than minimum performance requirements for roaming bands refer to EN 301 908-2 V13.1.1&EN 301 908-13 V13.2.1

Test State	Band	TRP/TIS	OTA		
			Channel		
			I	M	H
2G	GSM850	TRP	27.3	27.6	27.8
		TIS			-101.6
	E-GSM	TRP	29.4	28.0	25.8
		TIS			-103.5
	DCS	TRP	24.0	24.4	24.9
		TIS			-104.3
	PCS	TRP	25.7	25.4	26.0
		TIS			-102.8
3G	WCDMA Band 1	TRP	18.4	18.1	17.7
		TIS			-106.8
	WCDMA Band 2	TRP	17.5	18.1	18.5
		TIS			-107.2
	WCDMA Band 4	TRP	17.2	17.2	17.6
		TIS			-104.5
	WCDMA Band 5	TRP	16.7	17.0	17.7
		TIS			-104.8
	WCDMA Band 8	TRP	18.2	17.1	16.7
		TIS			-104.2
4G	FDD Band 1	TRP	18.7	18.5	17.5
		TIS			-95.0
	FDD Band 2	TRP	18.5	18.5	17.3
		TIS			-95.2
	FDD Band 3	TRP	17.1	17.8	18.0
		TIS			-94.3
	FDD Band 4	TRP	17.0	17.5	17.8
		TIS			-93.5
	FDD Band 5	TRP	17.6	18.1	18.5
		TIS			-93.0
	FDD Band 7	TRP	18.2	18.1	18.3
		TIS			-95.9
	FDD Band 8	TRP	18.0	18.1	16.6
		TIS			-94.3

Test State	Band	TRP/TIS	OTA		
			Channel		
			I	M	H
4G	FDD Band 12	TRP	14.96	15.0	15.0
		TIS			-94.1
	FDD Band 13	TRP	17.0	17.2	17.1
		TIS			-93.1
	FDD Band 17	TRP	15.4	15.6	15.7
		TIS			-92.5
	FDD Band 18	TRP	17.5	17.4	17.5
		TIS			-92.2
	FDD Band 19	TRP	17.0	17.5	17.2
		TIS			-90.7
	FDD Band 20	TRP	17.5	17.3	17.1
		TIS			-95.0
	FDD Band 25	TRP	18.1	17.8	17.4
		TIS			-97.6
	FDD Band 26	TRP	18.5	17.6	17.3
		TIS			-95.0
	FDD Band 28A	TRP	16	16.2	16.5
		TIS			-92.8
	FDD Band 28B	TRP	16.2	16.5	16.4
		TIS			-92.5
	TDD Band 38	TRP	18.4	18.5	18.2
		TIS			-92.9
	TDD Band 39	TRP	18.5	18.8	18.7
		TIS			-91.3
	TDD Band 40	TRP	17.2	17.3	17.2
		TIS			-91.1
	TDD Band 41	TRP	19.0	19.2	18.9
		TIS			-90.6
	FDD Band 66	TRP	17.6	18.5	18.5
		TIS			-93.4
	FDD Band 71	TRP	13.5	14.2	14.5
		TIS			-88.8
	FDD Band 32	TRP			
		TIS			-91.5

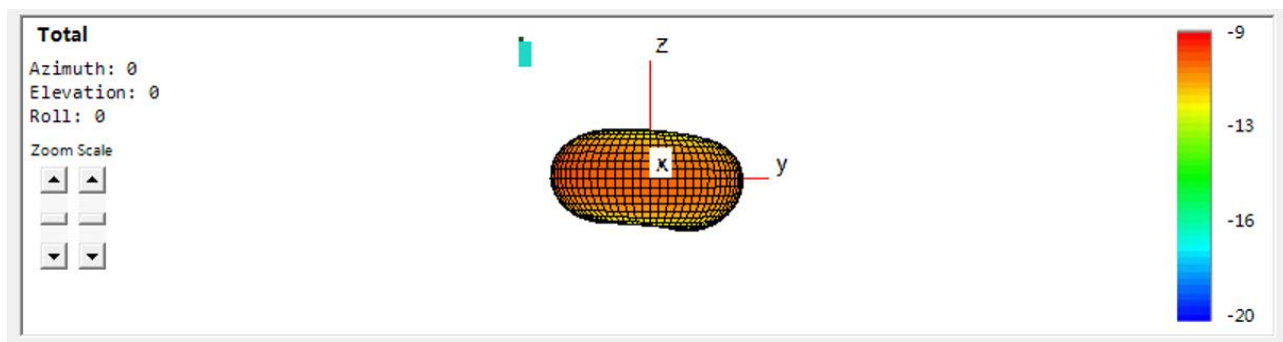
Test State	Band	Channel	传导		OTA (GTS Lab)	
			TRP(dBm)	TIS(-dBm)	TRP(dBm)	TIS(-dBm)
WIFI	11b	1			11.1	
		6			11.6	
		11			11.9	-81.8
	11a	40			11.0	
		56			11.6	
		156			11.5	-72.0

Test State	Band	传导	OTA (GTS Lab)
		TIS(-dBm)	TIS(-dBm)
GPS	L1		-143.0

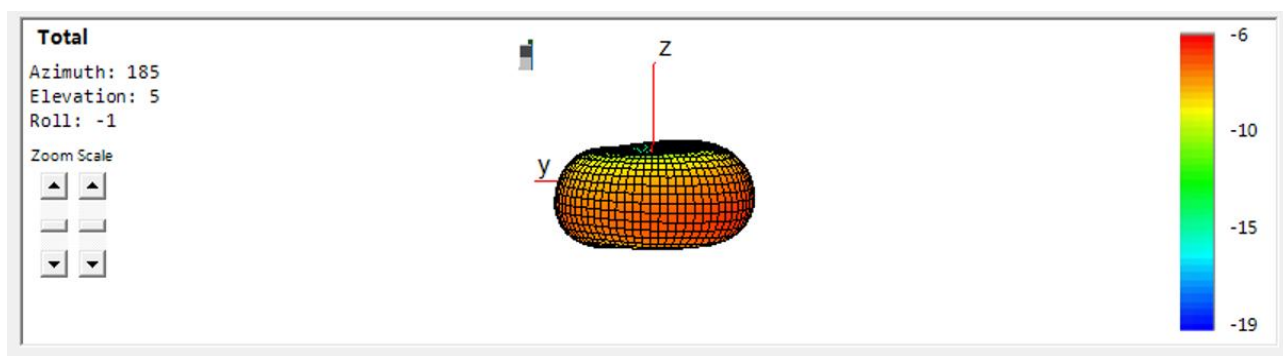
5. Equipment List

Type of Equipment	Manufacture	Model Number
Network Analyzer	Key sight	E5071C
Switch control System	GTS	RayZone1800
Software	GTS	MaxSign 100 Patten Measurement software
Radio Communication Tester	Rohde&Schwarz	CMW 500
	Anritsu	MT8000A
	Agilent	E4438C

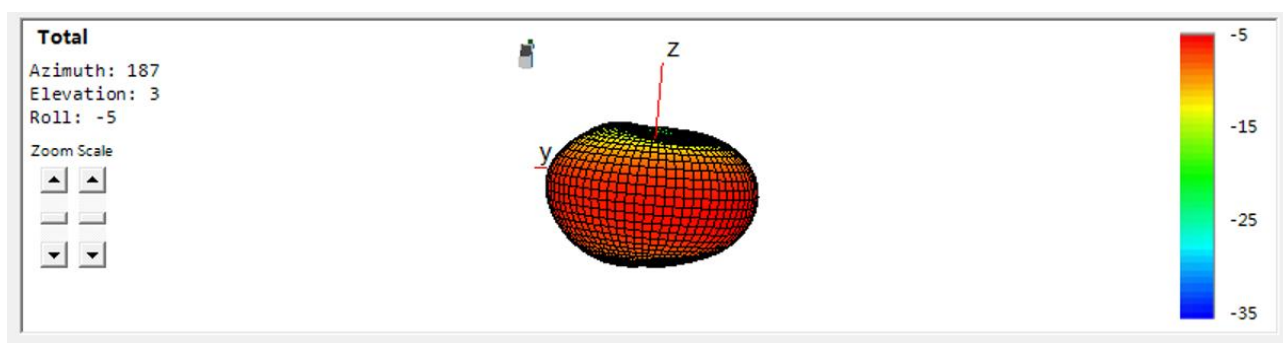
ANNEX A 3-D Patten Plots



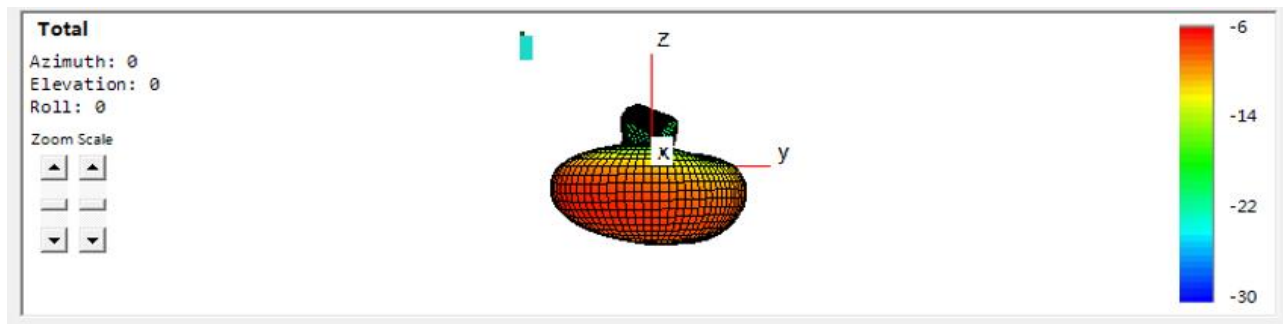
620MHz



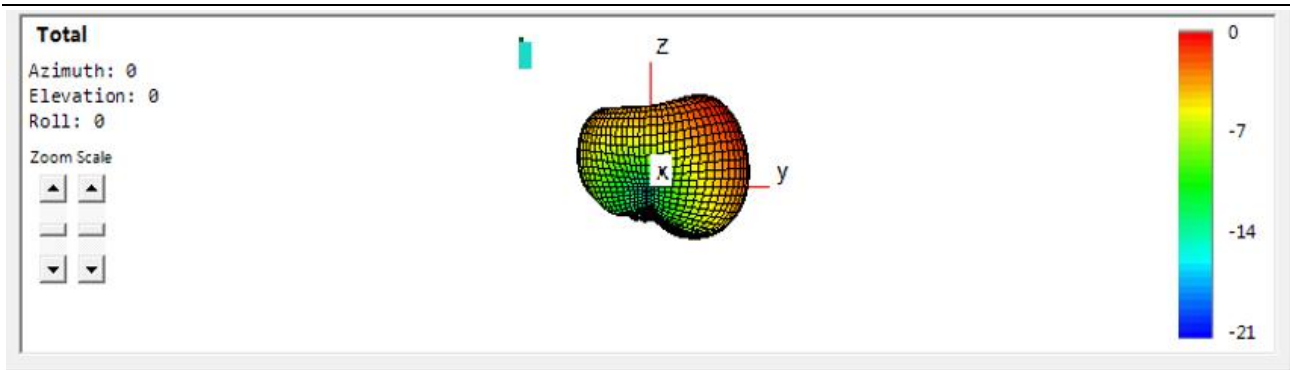
700MHz



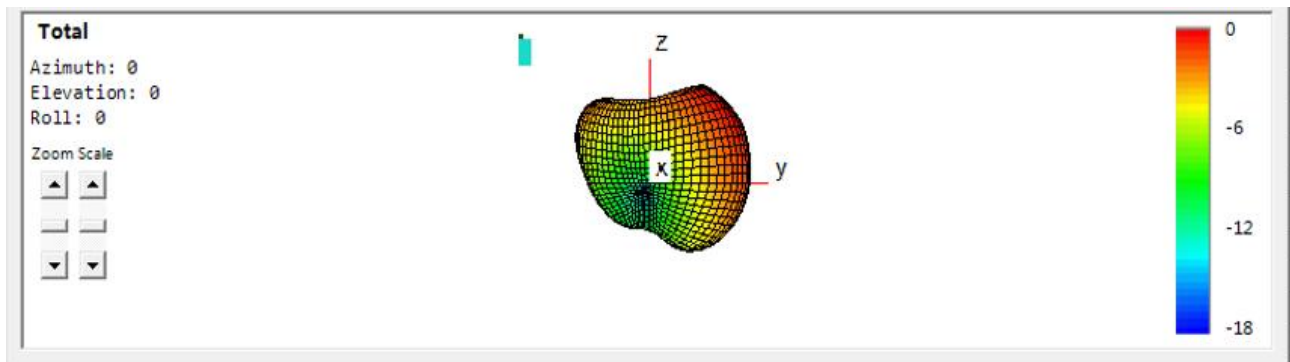
850MHz



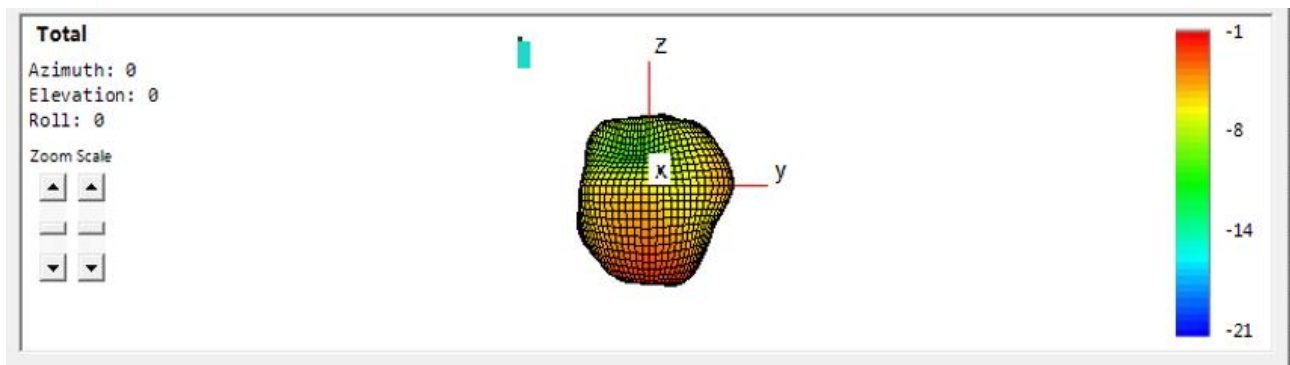
900MHz



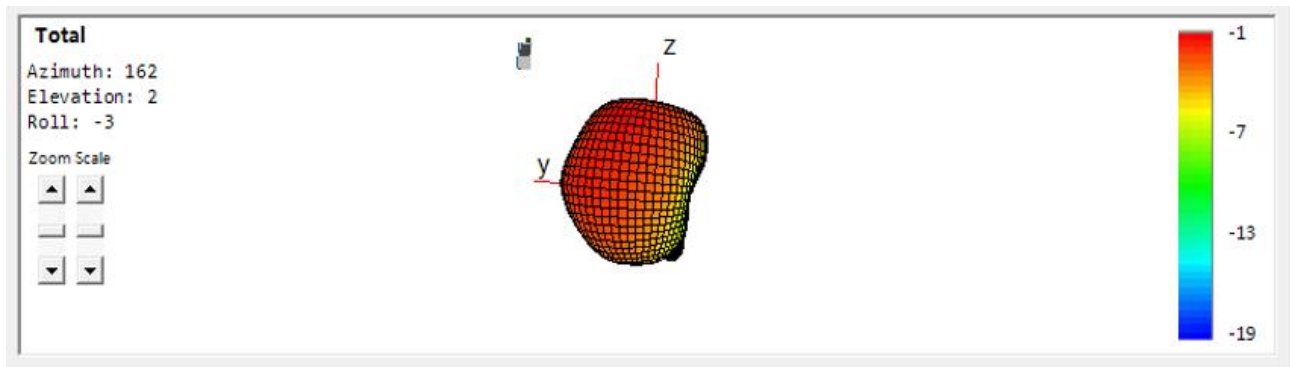
1800MHz



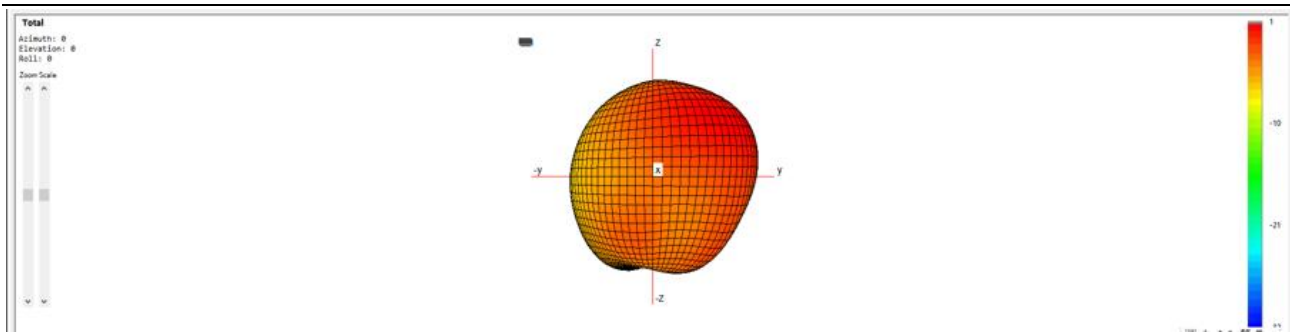
1900MHz



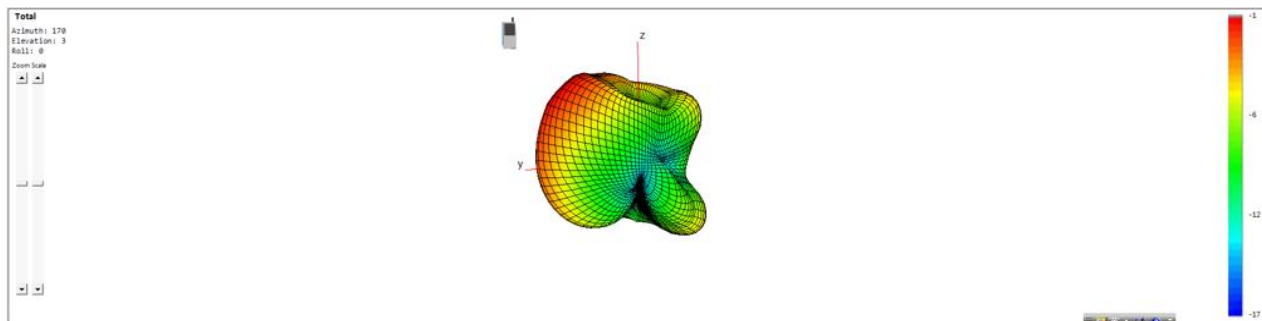
2100MHz



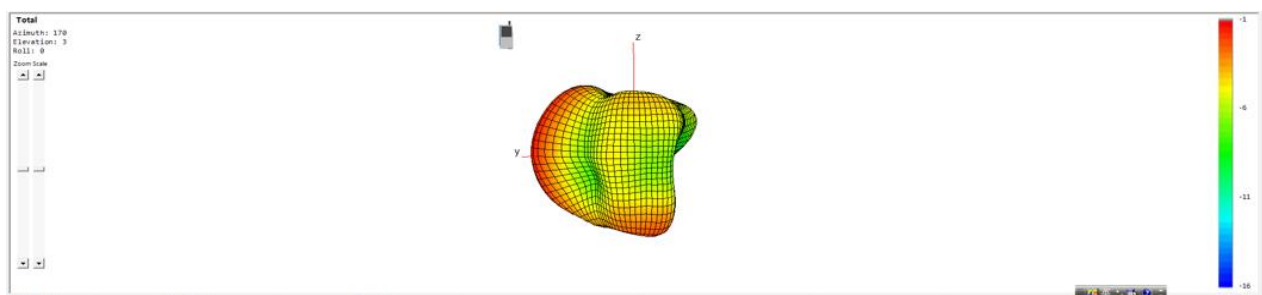
2700MHz



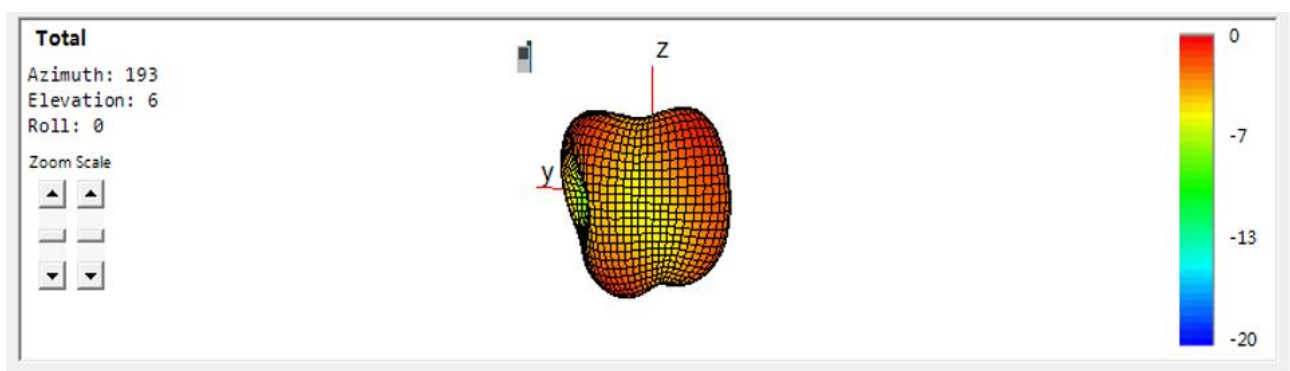
3300MHz



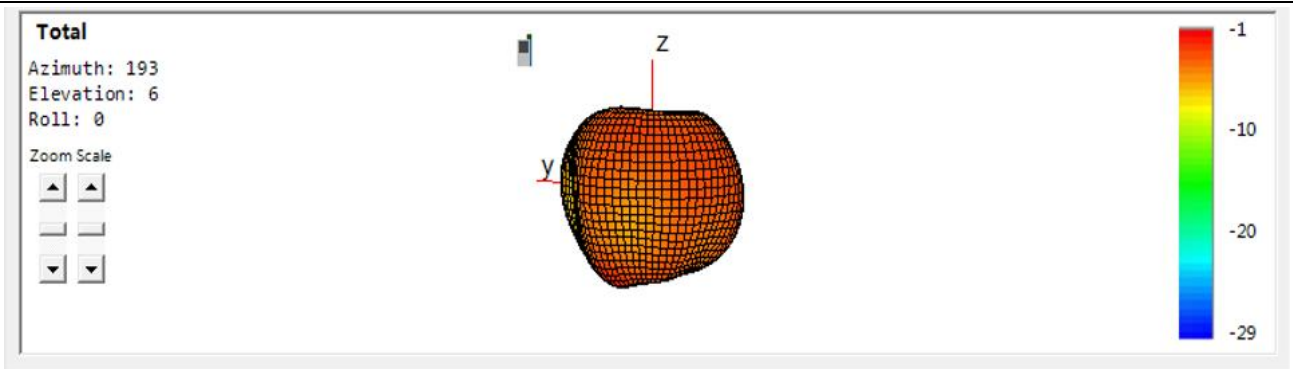
3800MHz



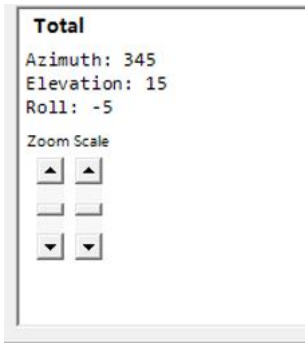
4200MHz



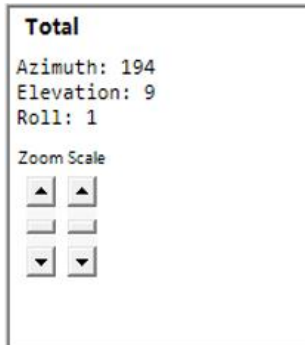
1575MHz



2400MHz



5100MHz



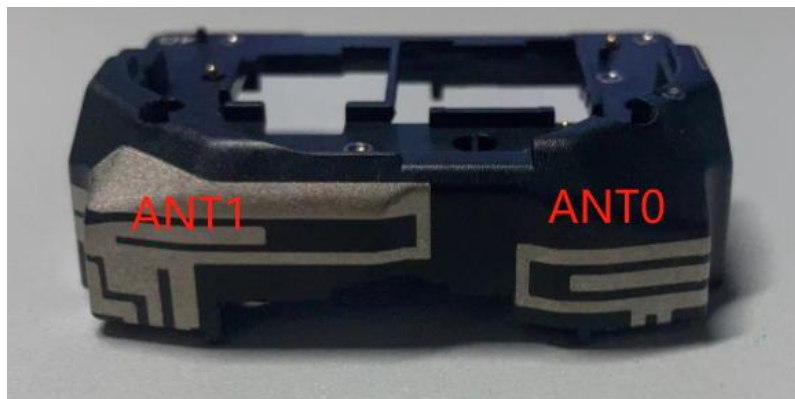
5850MHz

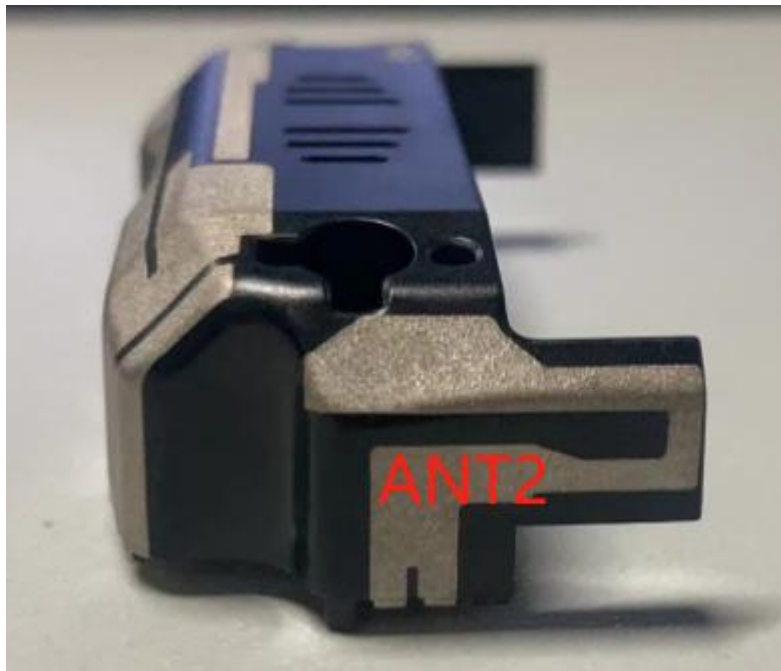
ANNEX B: The
Appearance and
Configuration
B.1 EUT

EUT
Test

Appearance







B.2 Test Configuration

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