



# ***ANTENNA PASSIVE TEST REPORT***

*(Free Space)*

**Applicant:** Grandsun  
**Product Name:** 233621 悟空  
**Model No.(EUT):** 233621 悟空  
**Date of Receipt:** 2022-04-20  
**Date of Test:** 2022-04-20

**Tested by:** Max.Chen  
**Made by:** Max.Chen  
**Checked by:** Noki.Ho



**REVISION HISTORY**

<b>Revision Record</b>		
<b>Version</b>	<b>Date</b>	<b>Reason for change</b>
V0.1	2017-05-20	First edition



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## 1. GENERAL INFORMATION

### 1.1 Test Location

Company: Shenzhen Grandsun Electronics Co.,Ltd.  
Address: Gaoqiao Industry Zone,Pingdi Town,Longgang District,Shenzhen,China  
Post code: 518117  
Telephone: +86-755-89234568

### 1.2 Test item and results

Test detailed items/section as below:

NO	Items
1	Gain
2	Efficiency
3	2-D/3-D pattern

### 1.3 Laboratory Environment

Temperature	Min.=18℃ Max.=24℃
Relative humidity	Min.=30% Max.=70℃
Shield effect	0.5-10GHZ > 100dB
Ground resistance	<0.4 Ω

### 1.4 Test Equipments List

Equipment Name	Model NO.	Manufacture	Calibration	Valid Period
Network Analyzer	E5071C	Keysight	2022-04-20	One year
Chamber	AMS-8923-195	ETS-LINDGERN	2022-04-20	One year

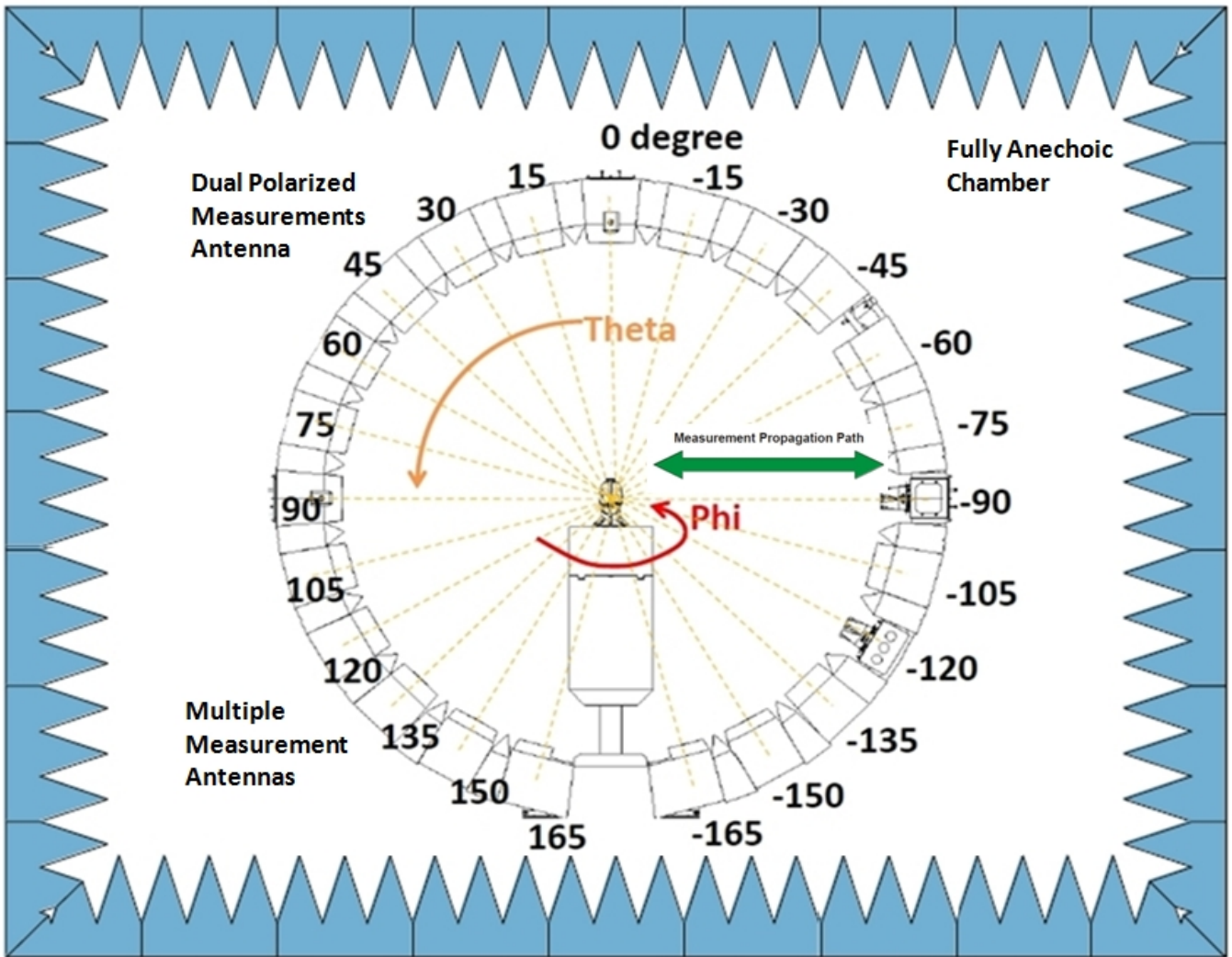
### 1.5 Measurement Uncertainty

Item	2.4GHZ-2.5GHZ(dB)
Gain	-1.0
Efficiency	0.3



## 2. OTA MEASUREMENTS SYSTEM CONFIGURATION

The system is designed for fully-compliant radiated wireless antenna measurements over the frequency range from 700 MHz to 6 GHz with a 1.95-meter path length. The system includes a multi-antenna array with twenty-three (23) dual-polarized measurement antennas spaced every 15°, The chamber size is 5m\*5m\*5m



OTA measurement System Configuration

Note: Phi(The turntable) is from 0~180°, Theta(the ring, multiple antennas) is from -165° ~165°, Rotate the AUT and multi-antenna array record the data, the step of rotation is 15 degree.

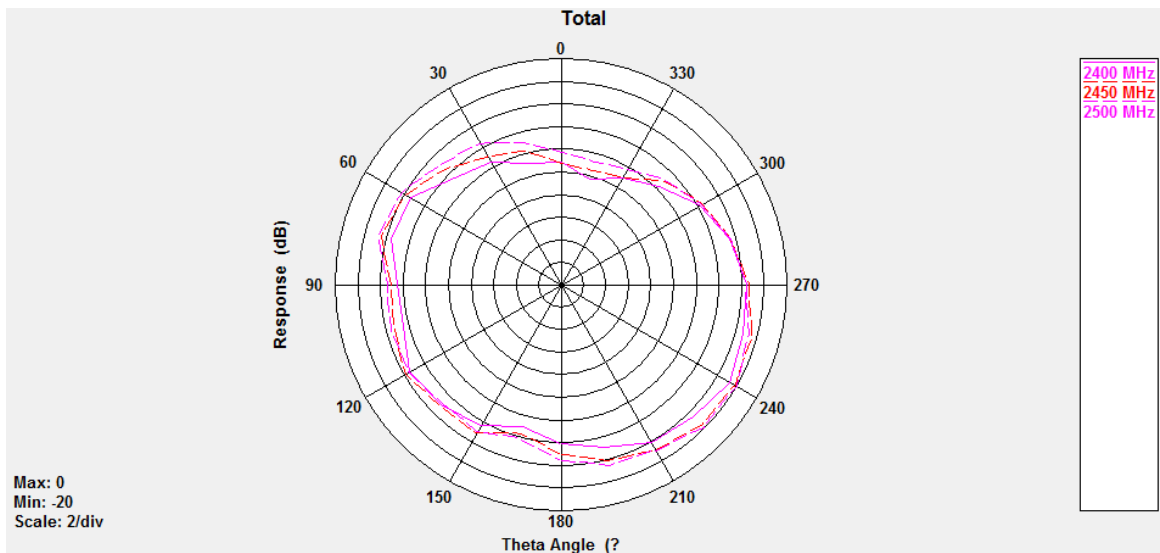


### 3. TEST RESULTS

#### 3.1 Efficiency & Gain

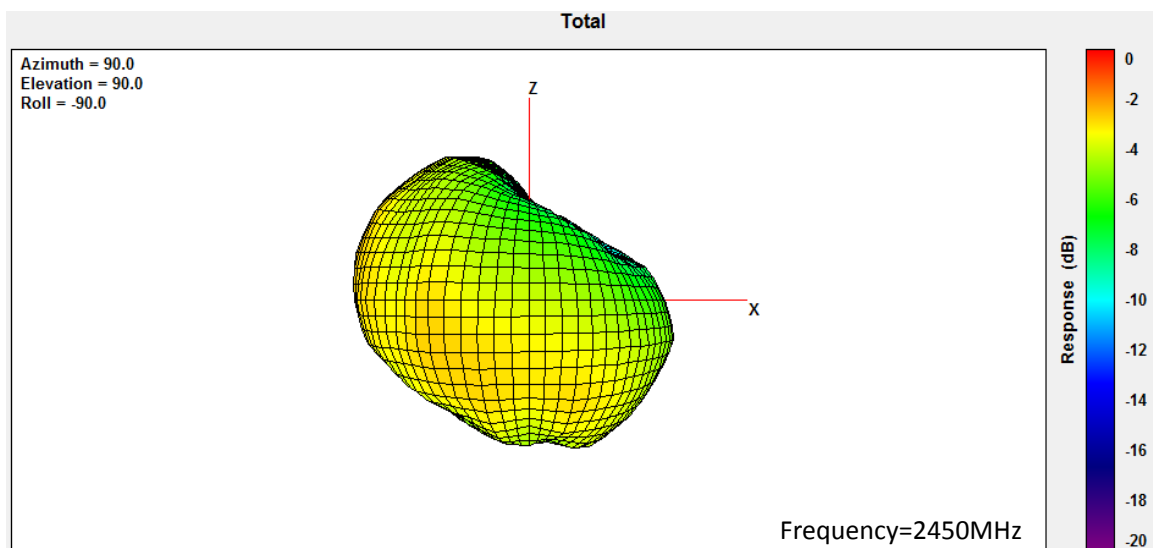
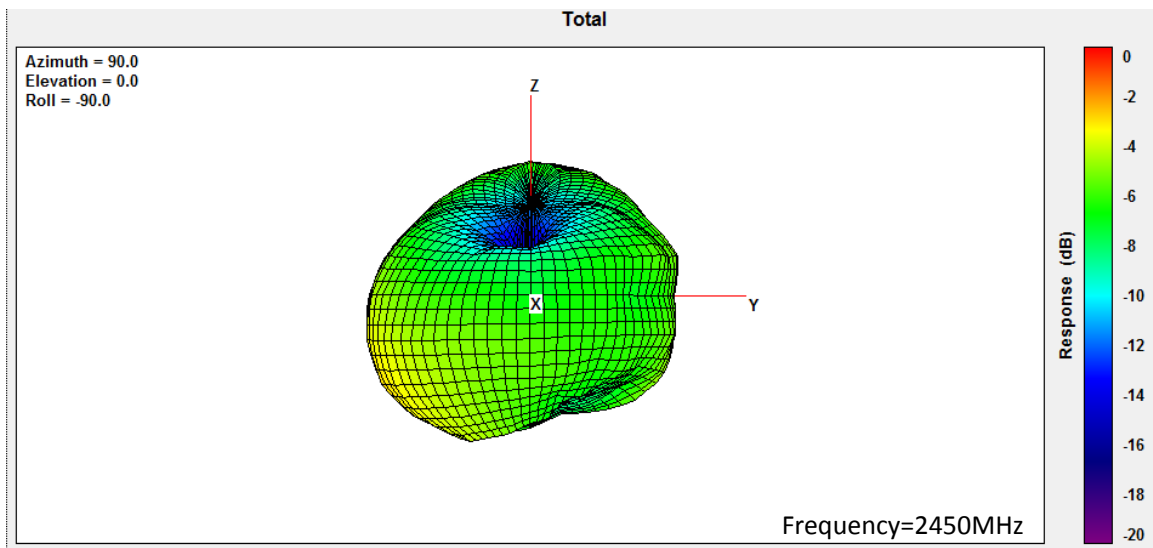
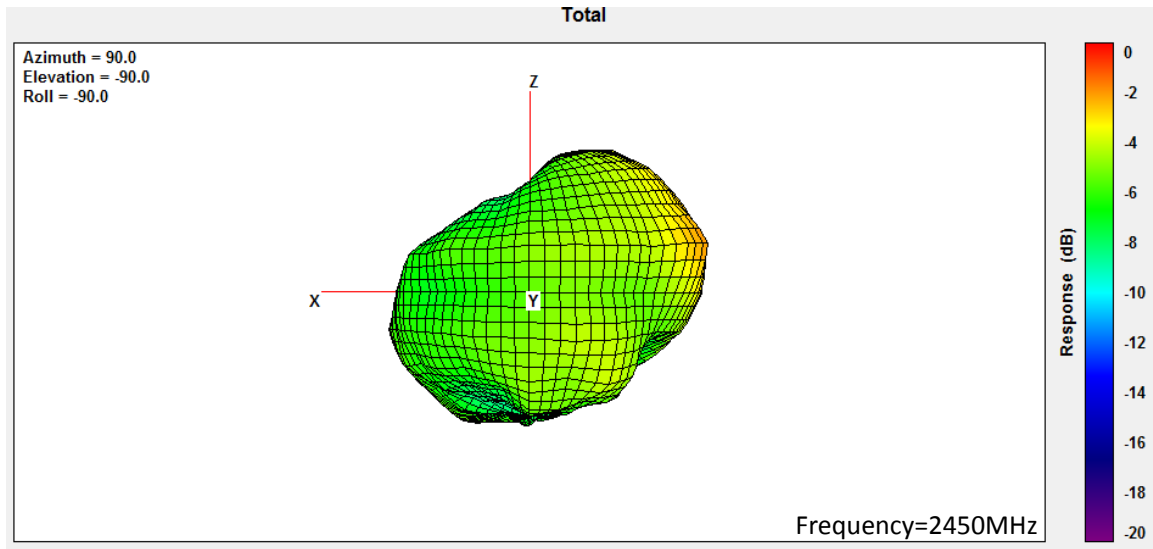
Frequency (Mhz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2400	-5.27	29.6	-1.93
2410	-5.09	30.9	-1.74
2420	-4.97	31.8	-1.57
2430	-4.93	32.1	-1.64
2440	-4.78	33.2	-1.70
2450	-4.59	34.6	-1.54
2460	-4.50	35.4	-1.28
2470	-4.36	36.6	-1.00
2480	-4.39	36.3	-1.13
2490	-4.32	36.9	-1.20
2500	-4.34	36.7	-1.23

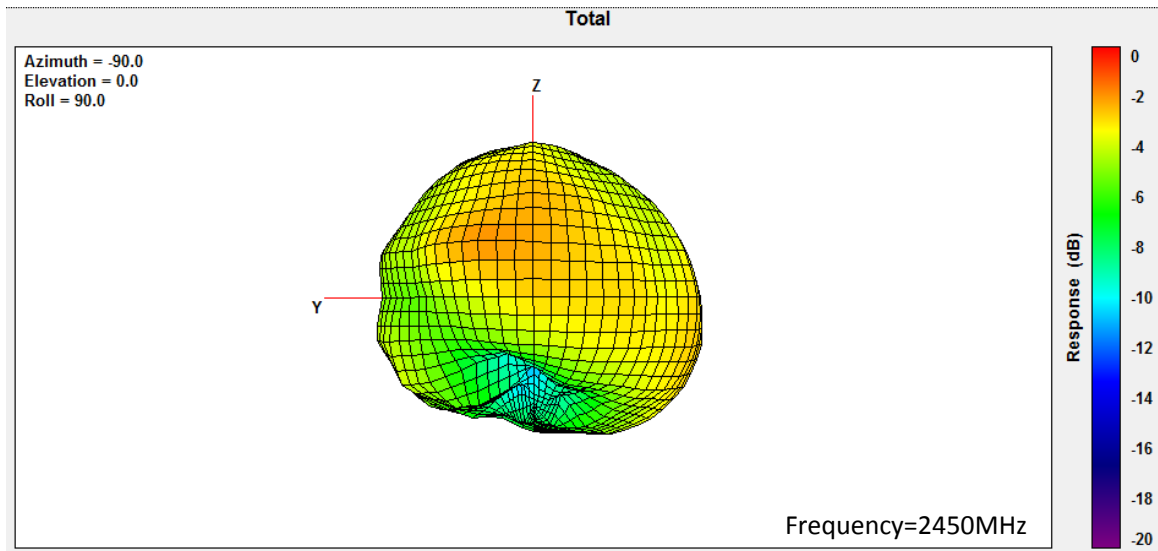
#### 3.2 2-D antenna pattern (Phi=90° )





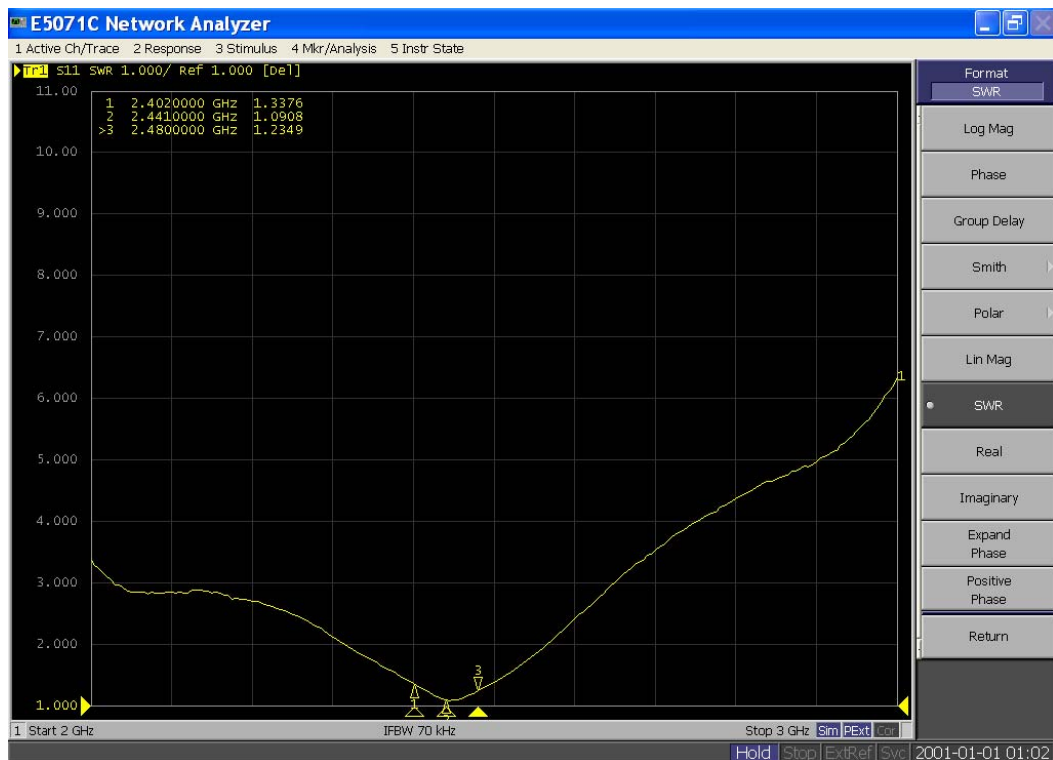
### 3.3 3-D antenna pattern





### 3.4 Passive pattern

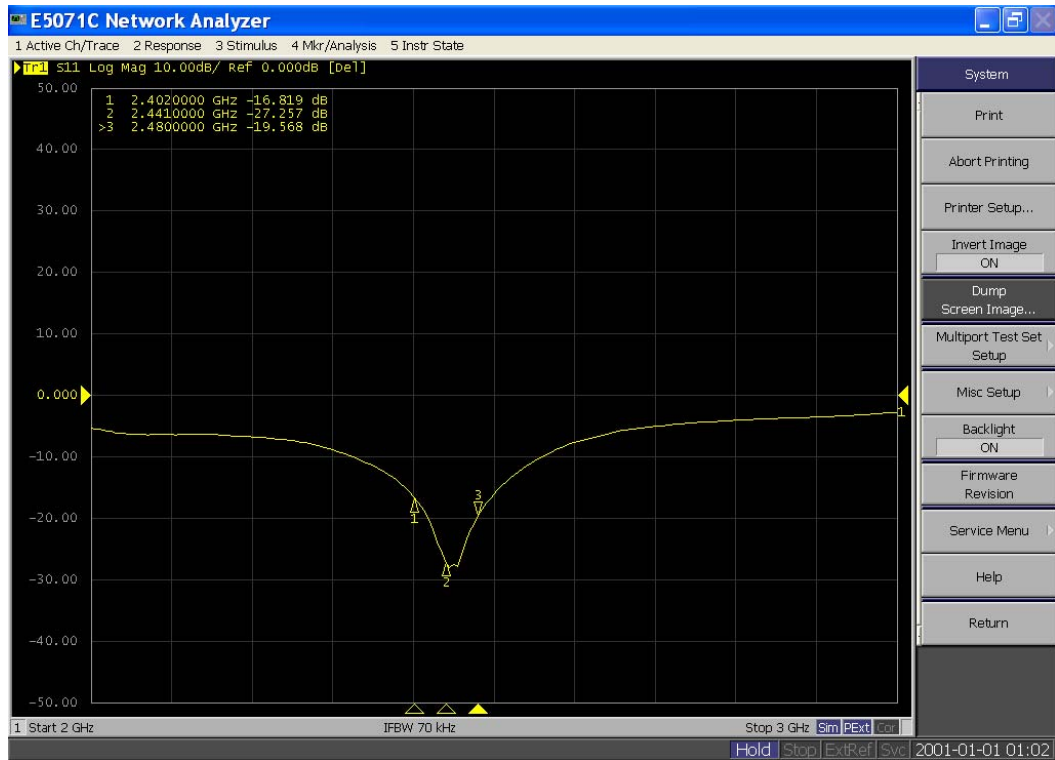
#### 3.4.1 VSWR



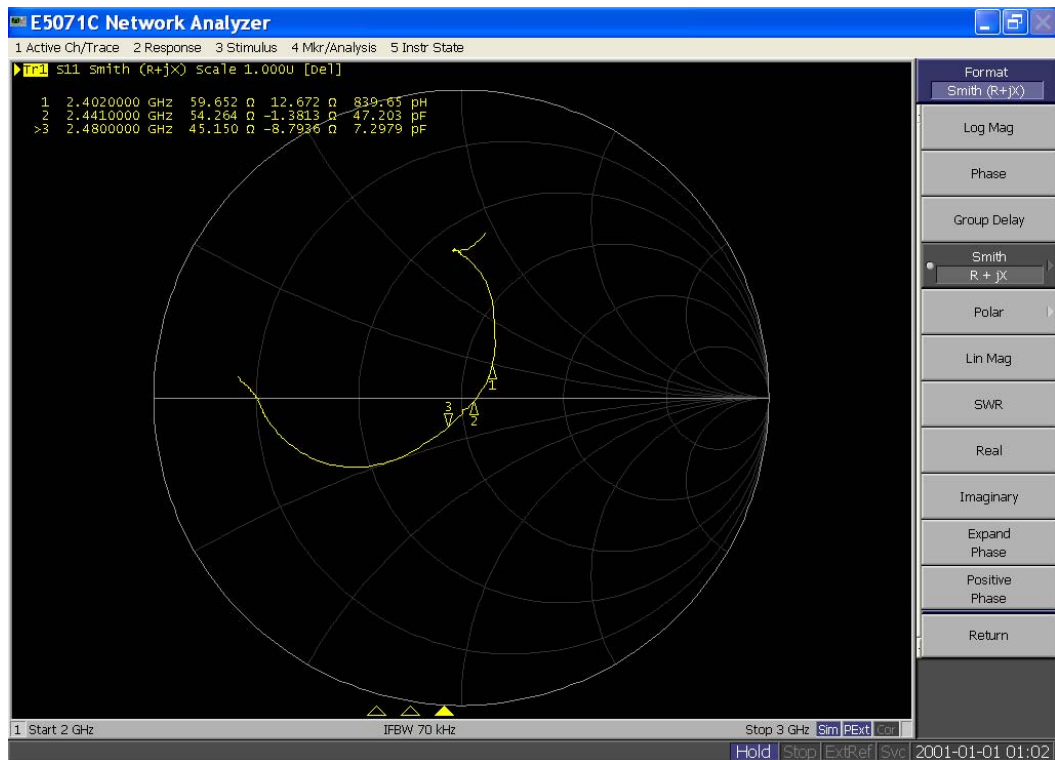




### 3.4.2 Return loss

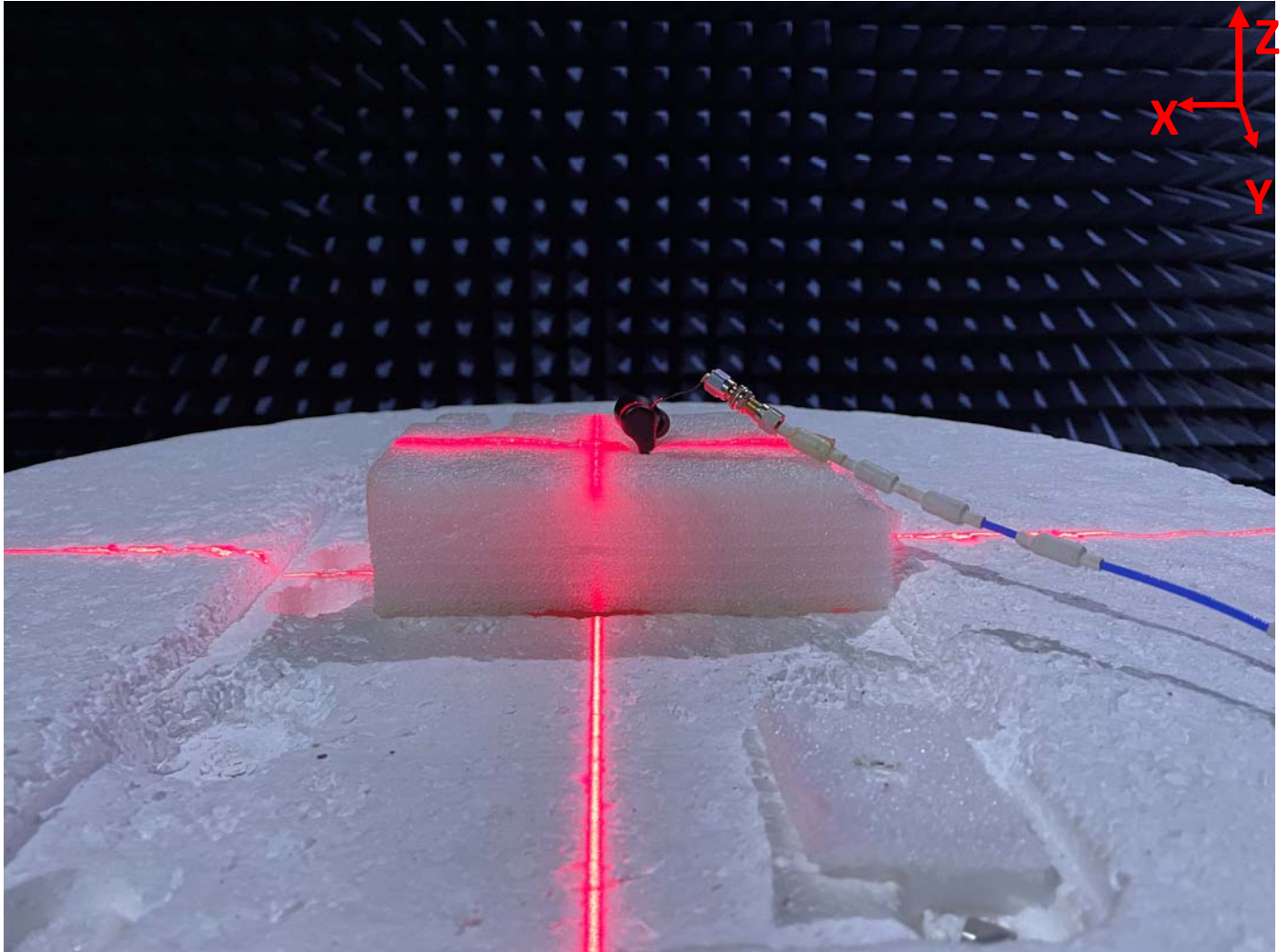


### 3.4.3 Impedance





#### 4.APPENDIX A THE EUT AND TEST CONFIGURATION



#### 5. Conclusion

1. Earbuds\_R and Earbuds\_L are the same design, So their performance is the same.