



ANTENNA PASSIVE TEST REPORT
(Free Space)

Applicant: Grandsun
Product Name: Cleer Dongle
Model No.(EUT): Cleer Dongle
Date of Receipt: 2022-02-10
Date of Test: 2022-02-10

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



REVISION HISTORY

Revision Record		
Version	Date	Reason for change
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

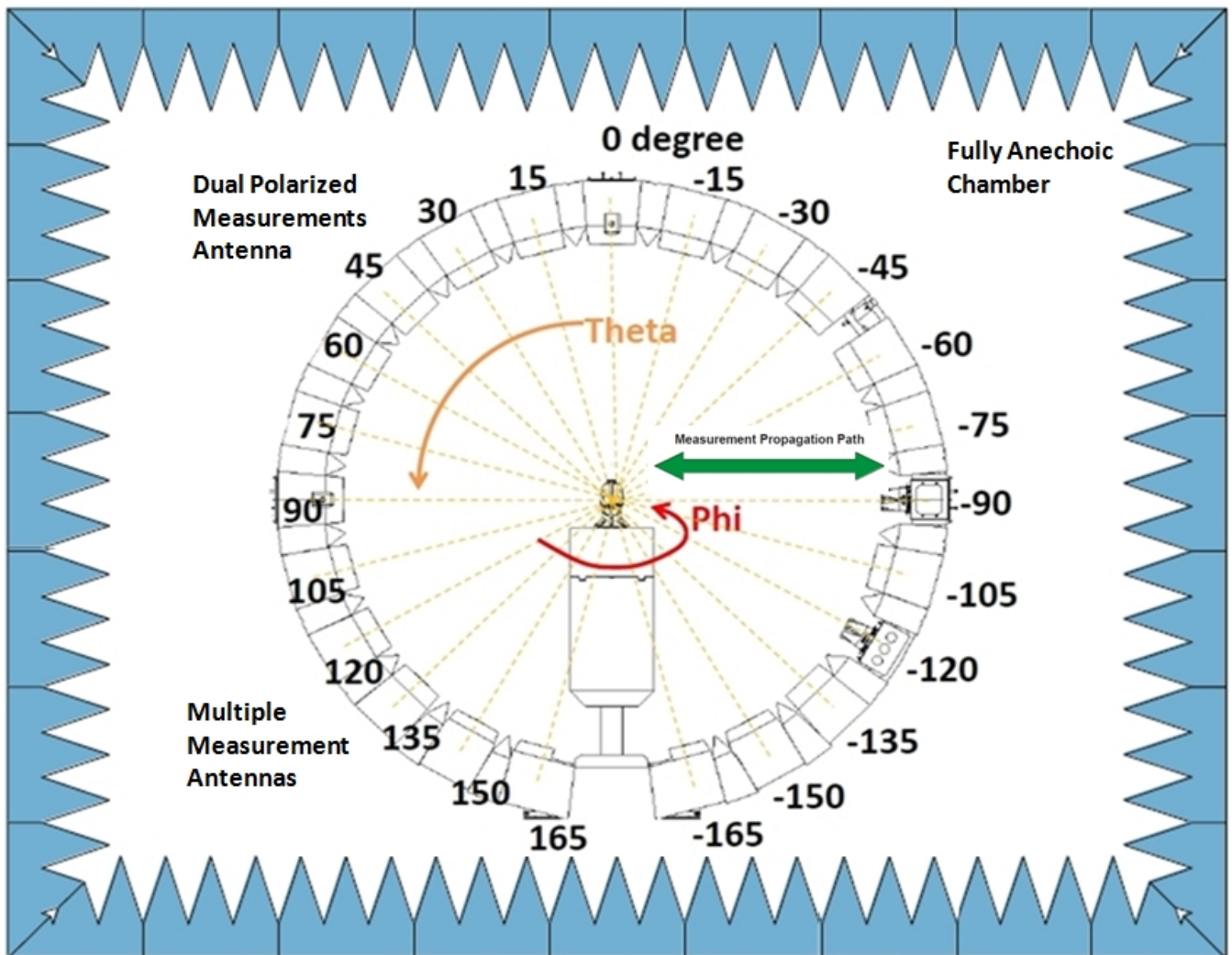
1.5 Measurement Uncertainty

Item	2.4GHZ-2.5GHZ(dB)
Gain	0.3
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 $0^\circ \sim 180^\circ$,Theta(the ring, multiple antennas) is from $-165^\circ \sim 165^\circ$, Rotate the AUT and multi-antenna array record the data ,the step of rotation is 15 degree.

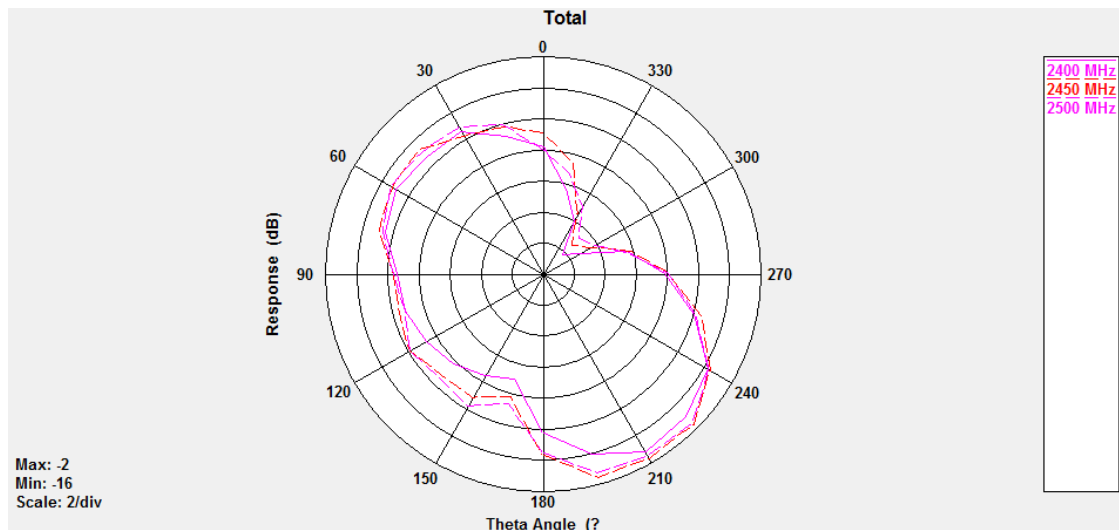


3. TEST RESULTS

3.1 Efficiency & Gain

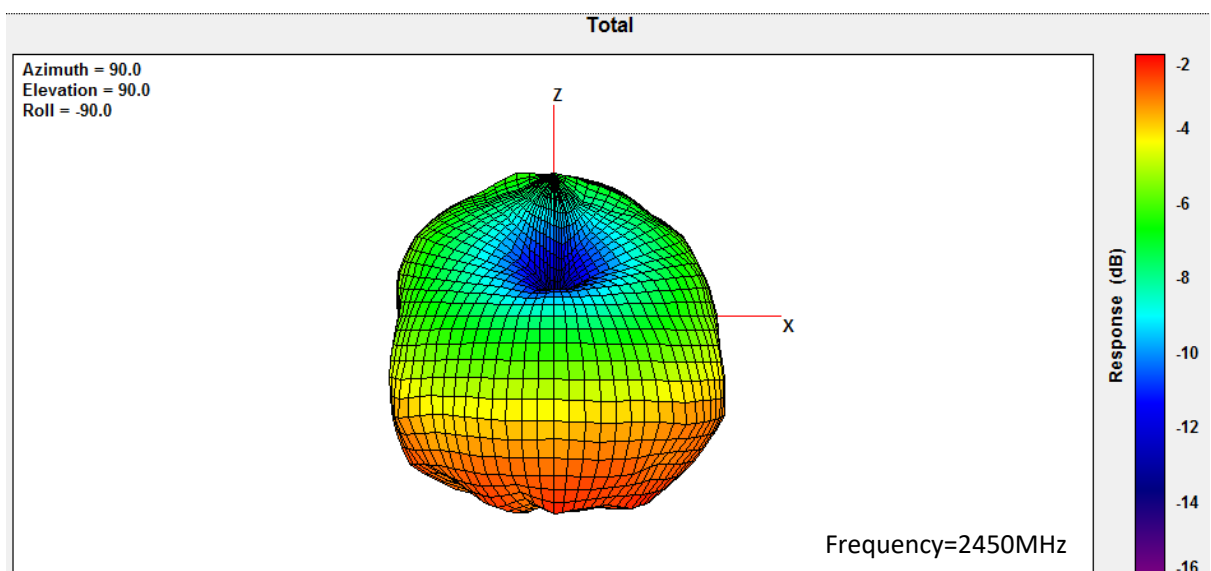
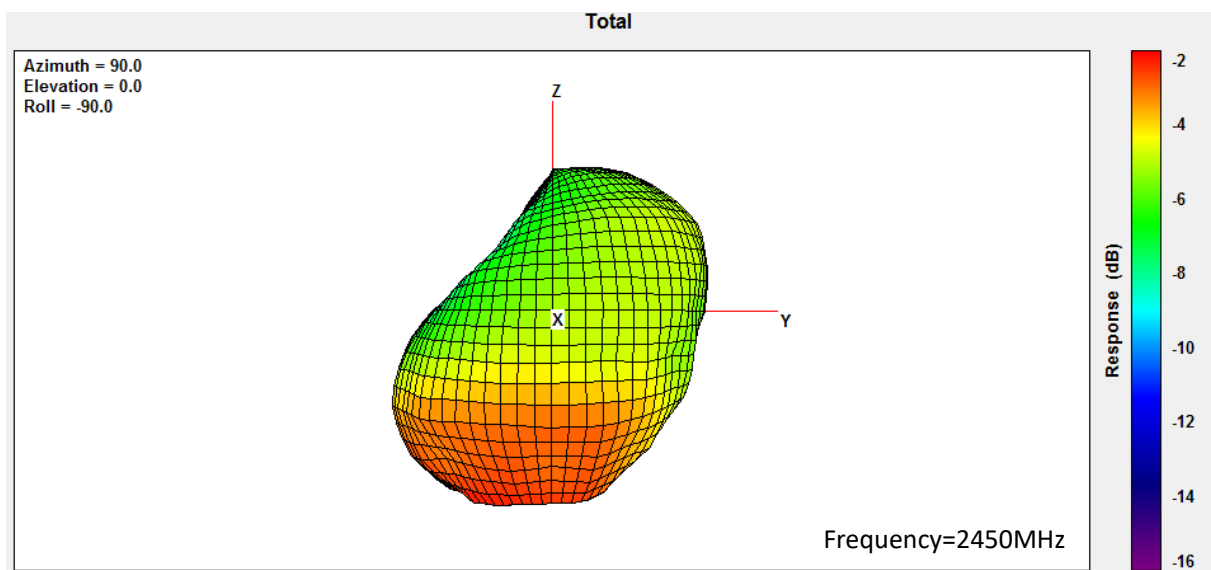
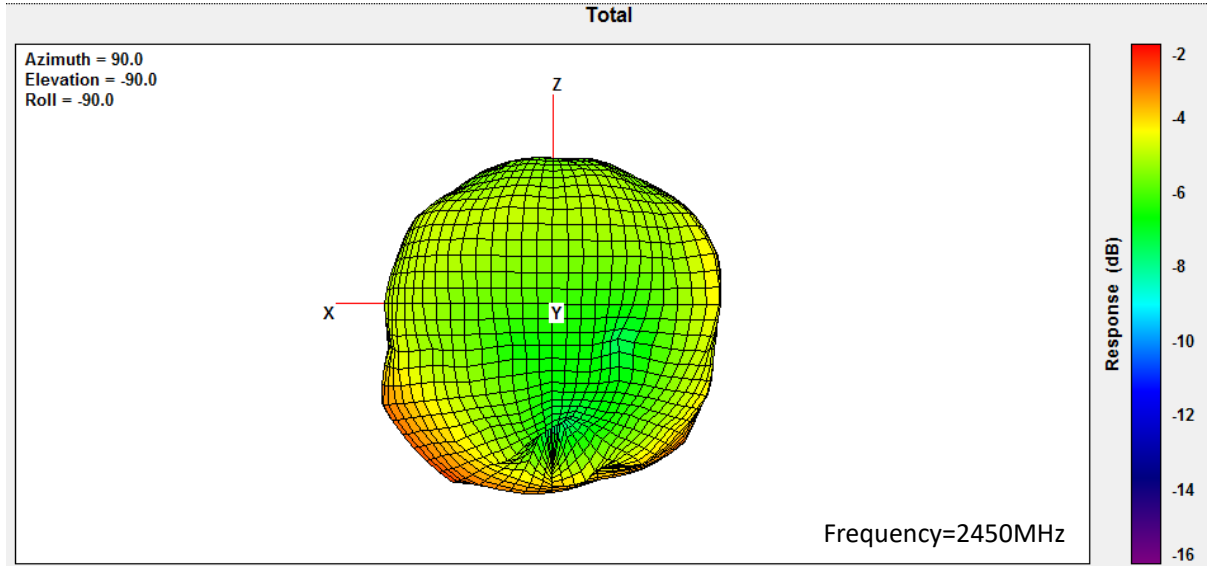
Frequency (Mhz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2400	-5.25	29.8	-2.76
2410	-5.27	29.6	-2.80
2420	-5.23	29.9	-2.55
2430	-5.23	29.9	-2.50
2440	-5.12	30.7	-2.40
2450	-5.12	30.7	-2.60
2460	-5.06	31.1	-2.59
2470	-5.05	31.2	-2.46
2480	-5.08	31.0	-2.00
2490	-5.18	30.3	-2.11
2500	-5.30	29.4	-2.32

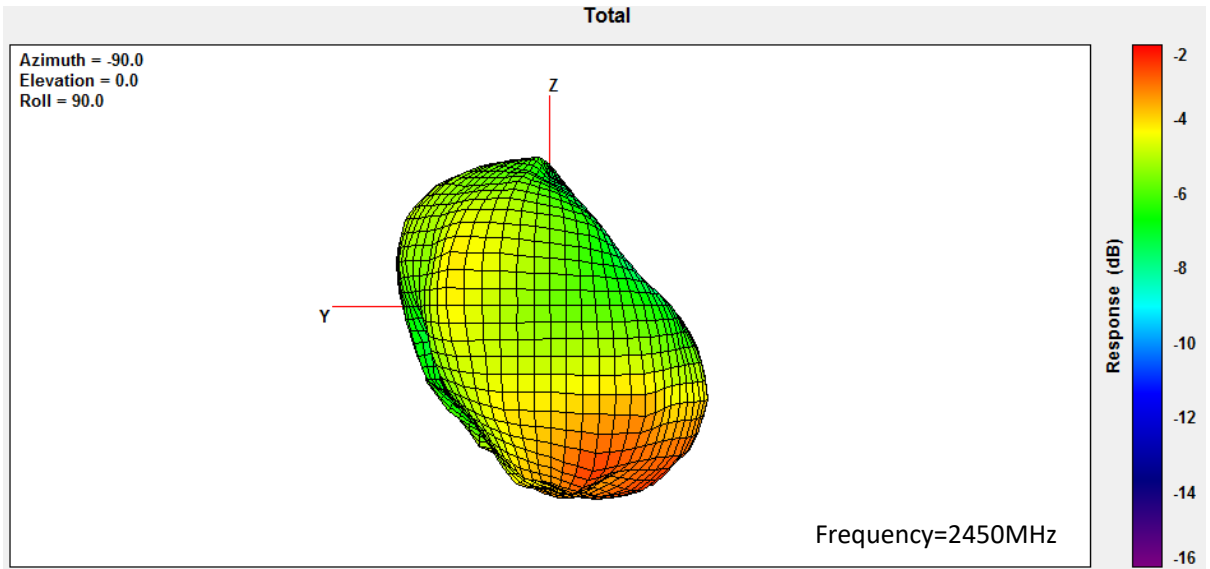
3.2 2-D antenna pattern (Phi=90°)





3.3 3-D antenna pattern

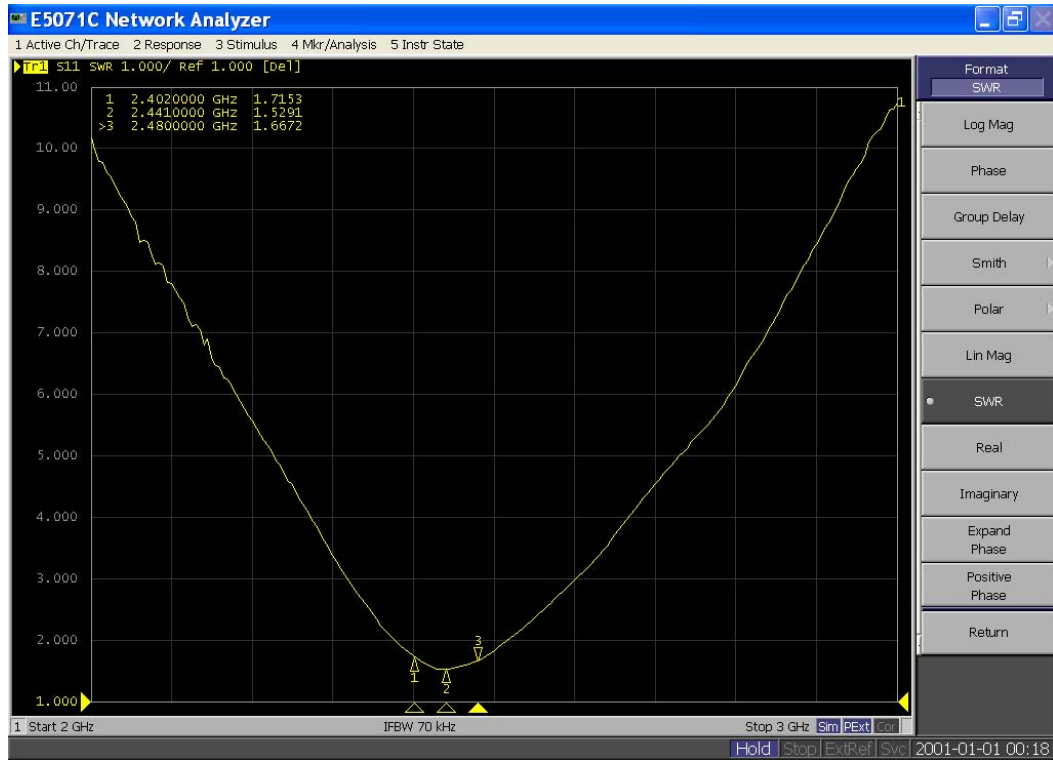




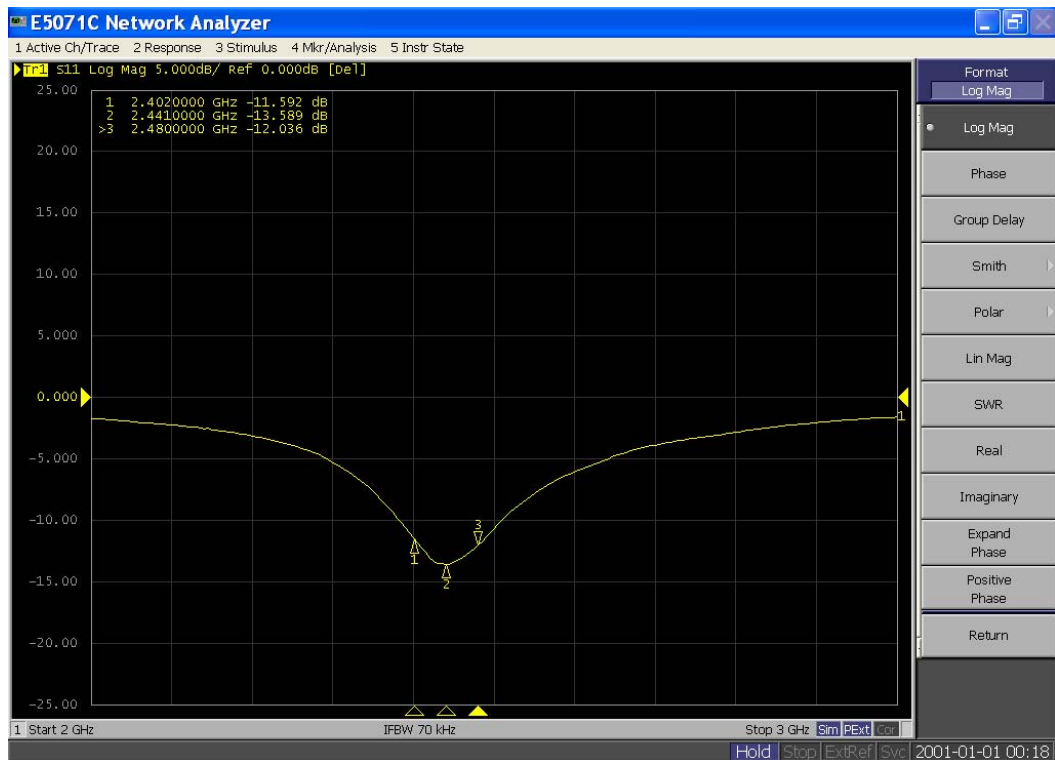


3.4 Passive pattern

3.4.1 VSWR

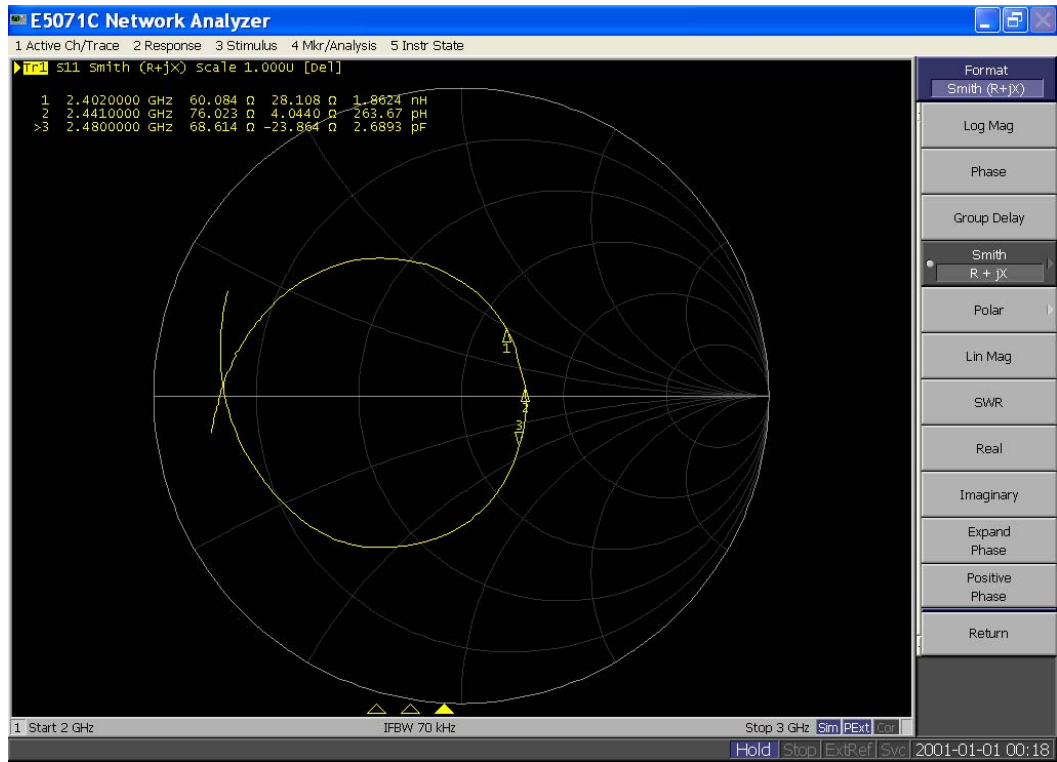


3.4.2 Return loss





3.4.3 Impedance





4.APPENDIX A THE EUT AND TEST CONFIGURATION

