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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	2020-04-20	One year
Chamber	AMS-8923-195	EST-LINDGERN	2020-04-20	One year

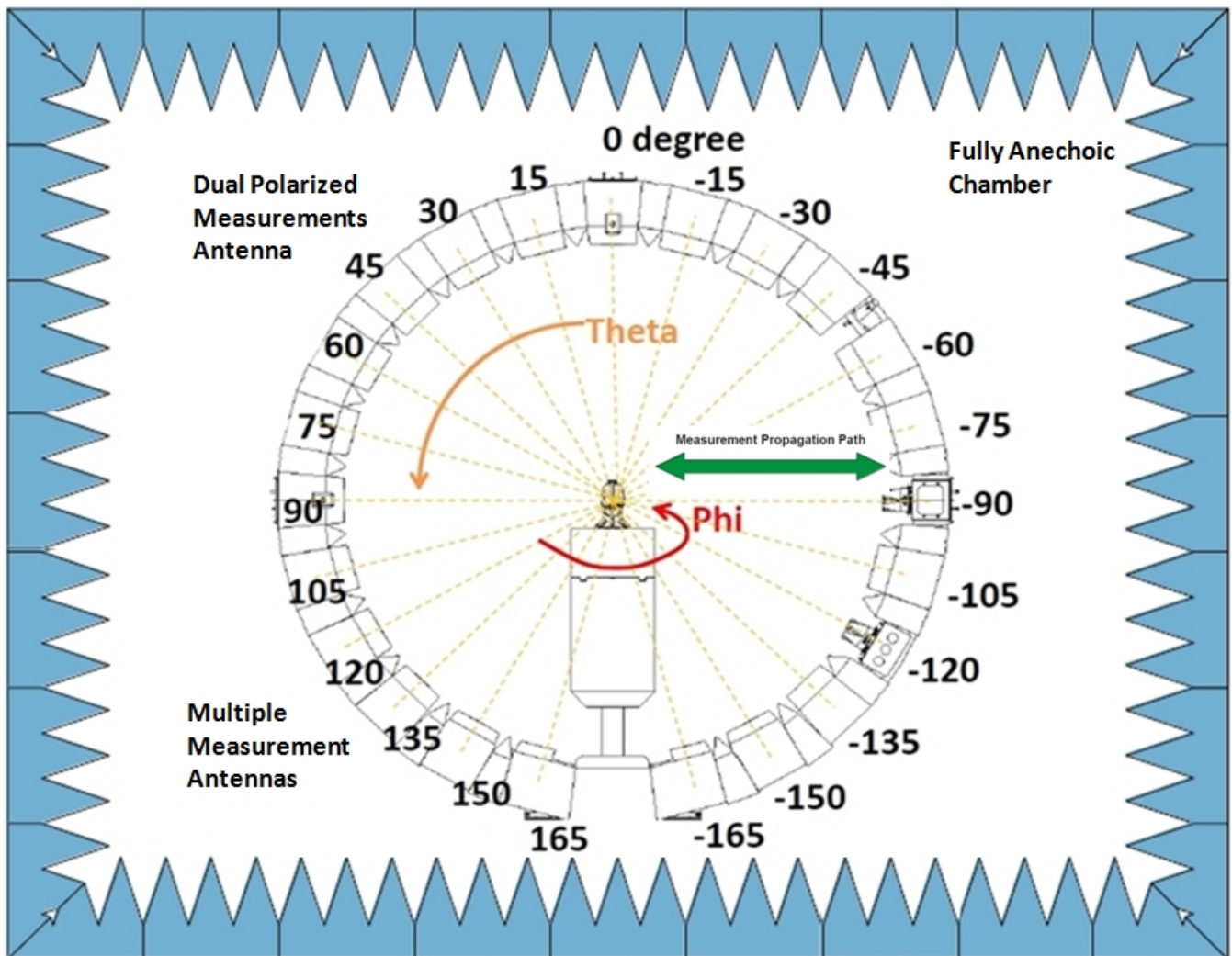
1.5 Measurement Uncertainty

Item	2.4GHZ-2.5GHZ(dBi)
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.

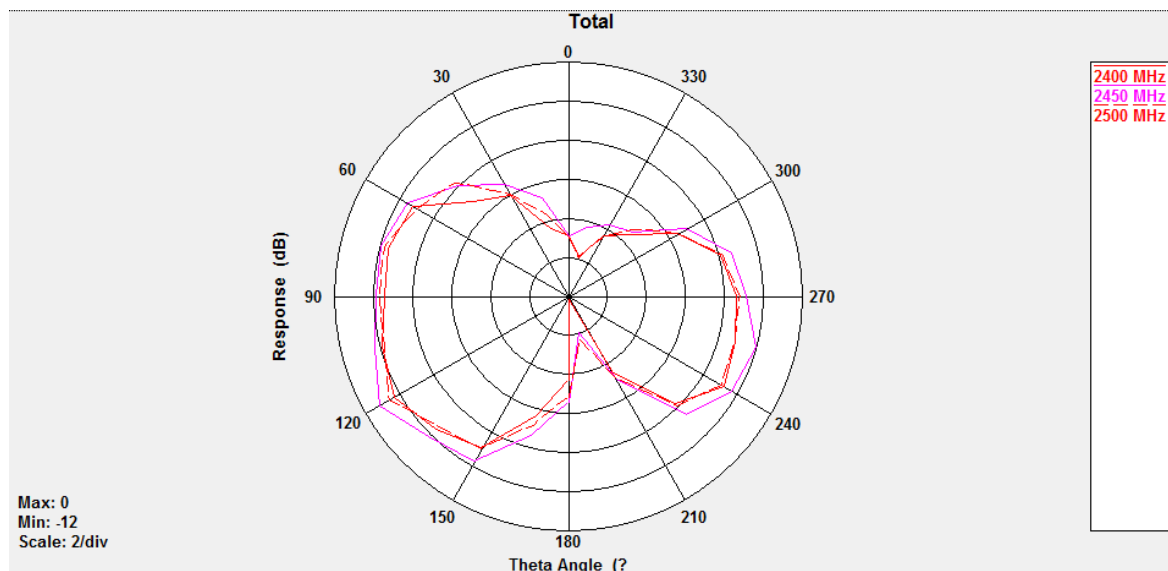


3. TEST RESULTS

3.1 Efficiency & Gain

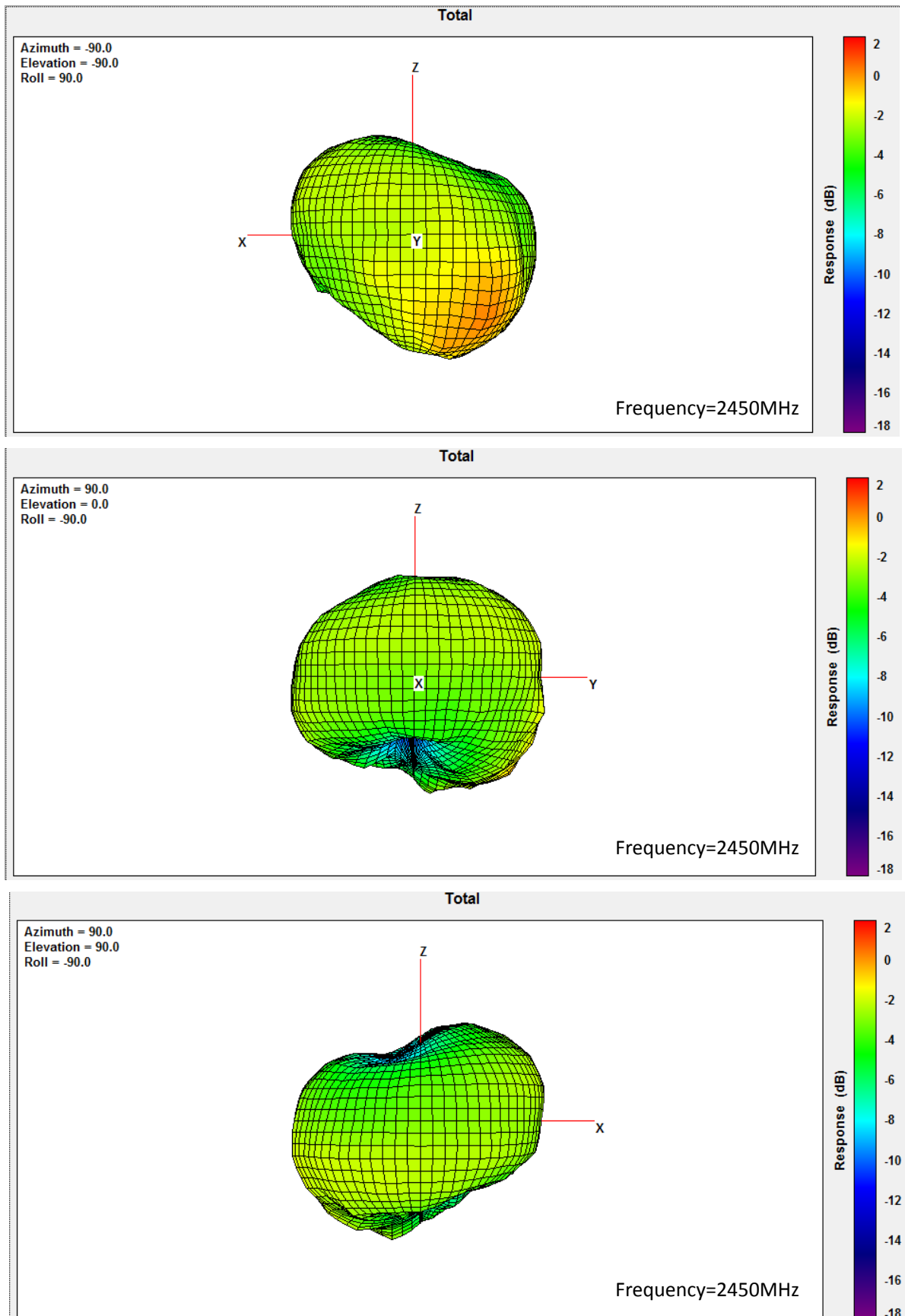
Frequency (Mhz)	Efficiency (dB)	Efficiency (%)	Gain (dBi)
2400	-3.98	40.0	-0.27
2410	-3.81	41.6	0.06
2420	-3.63	43.3	0.10
2430	-3.59	43.8	0.15
2440	-3.53	44.3	0.21
2450	-3.42	45.5	0.26
2460	-3.44	45.3	0.29
2470	-3.52	44.5	0.28
2480	-3.76	42.1	0.01
2490	-3.83	41.4	0.02
2500	-4.04	39.5	-0.07

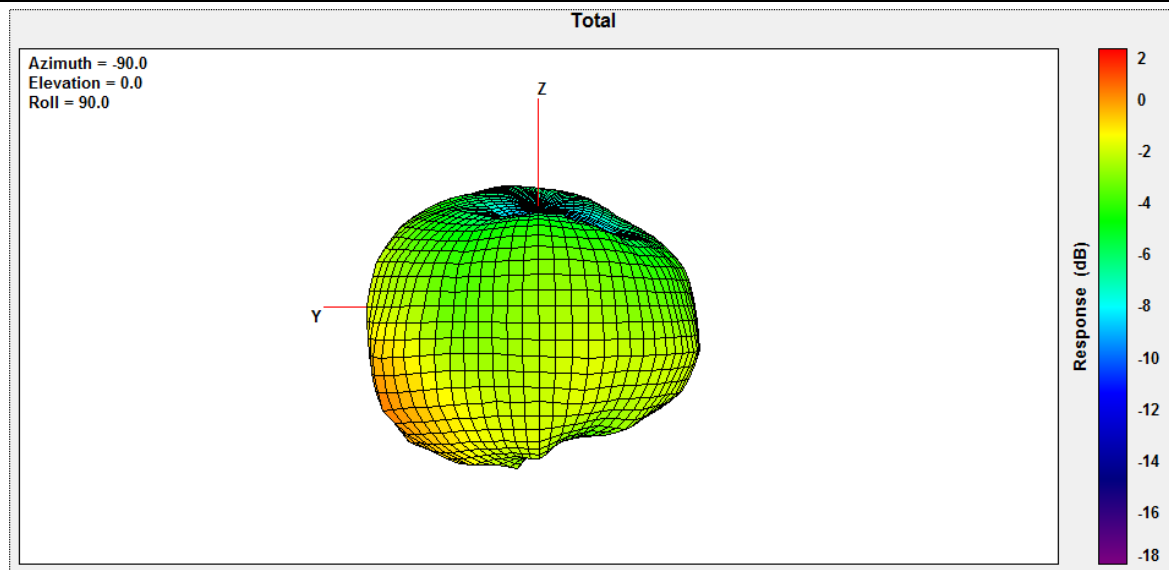
3.2 2-D antenna pattern (Phi=90°)





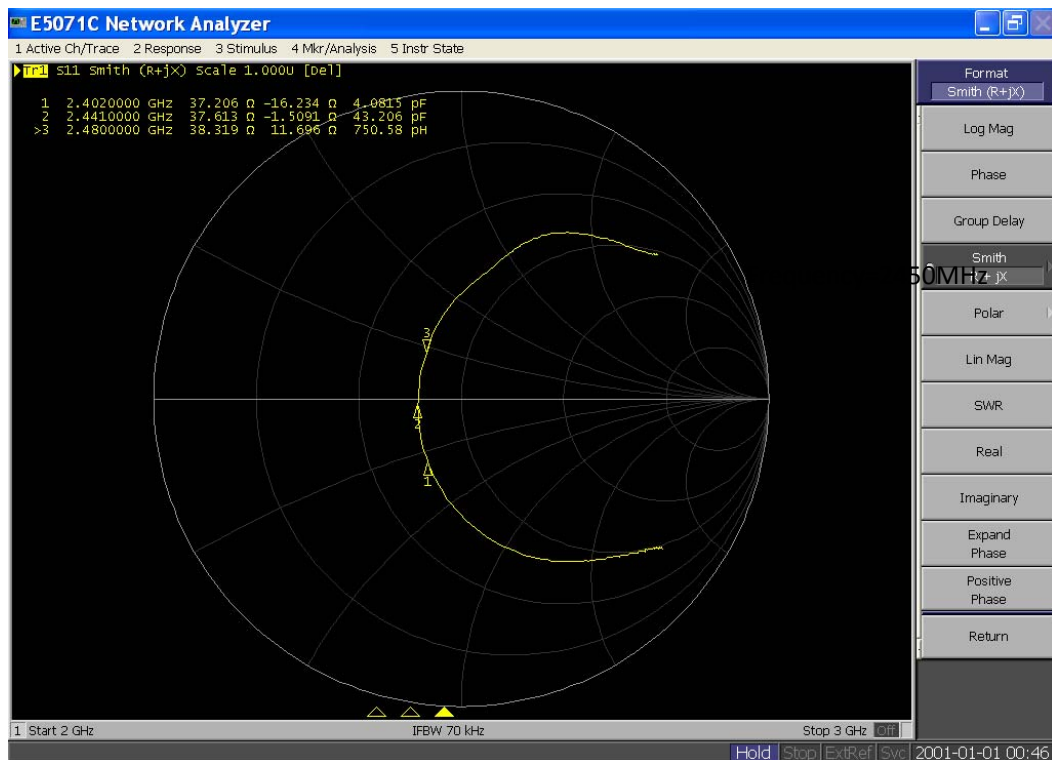
3.3 3-D antenna pattern





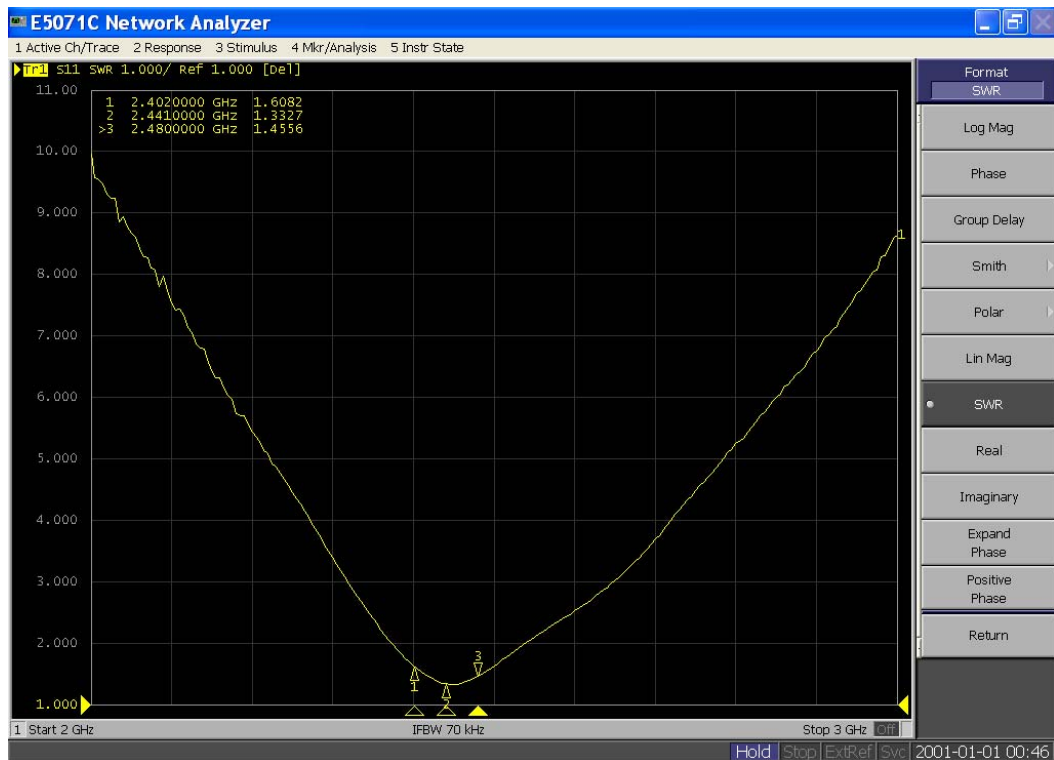
3.4 Passive pattern

3.4.1 Impedance





3.4.2 VSWR



3.4.3 Return loss

