

## OTA TEST REPORT(Passive)

Applicant Shenzhen General Test System Co., Ltd

Product RayZone1800

Issue Date Dec 6, 2023

Shenzhen 3Good Wireless Communication 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: Zhonggui Xiong

Approved by: Wu Chou

**Shenzhen 3Good Wireless Communication Co., Ltd**

Room 501-508,jinfulai Building,No.49-1,Dabao Road,Baoan District,Shenzhen

# 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 3Good Wireless Communication Co., Ltd

Address: Room501-508,jinfulaiBuilding,No.49-1,DabaoRoad,BaoanDistrict,  
Shenzhen

Contact: Zhonggui xiong

Telephone: 13423911669

E-mail: xiongzhonggui@3good.net.cn

## 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

<b>Applicant Name</b>	Shenzhen General Test System Co., Ltd
<b>Applicant address</b>	Building C-A7 Suite 805,2190 Liuxian Avenue, Nanshan District, Shenzhen, P.R. China
<b>Manufacturer Name</b>	Shenzhen General Test System Co., Ltd
<b>Manufacturer address</b>	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	FPC Antenna
Antenna Manufacturer	Shenzhen 3Good Wireless Communication Co., Ltd
Test Frequency	600MHz-2700MHz

### 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**

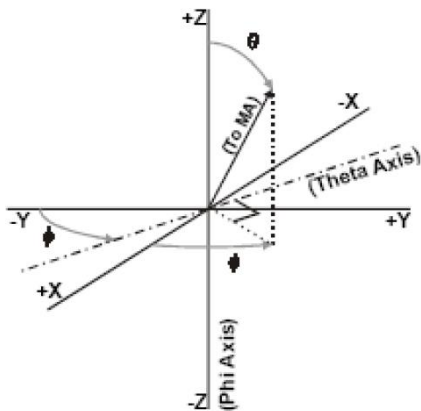
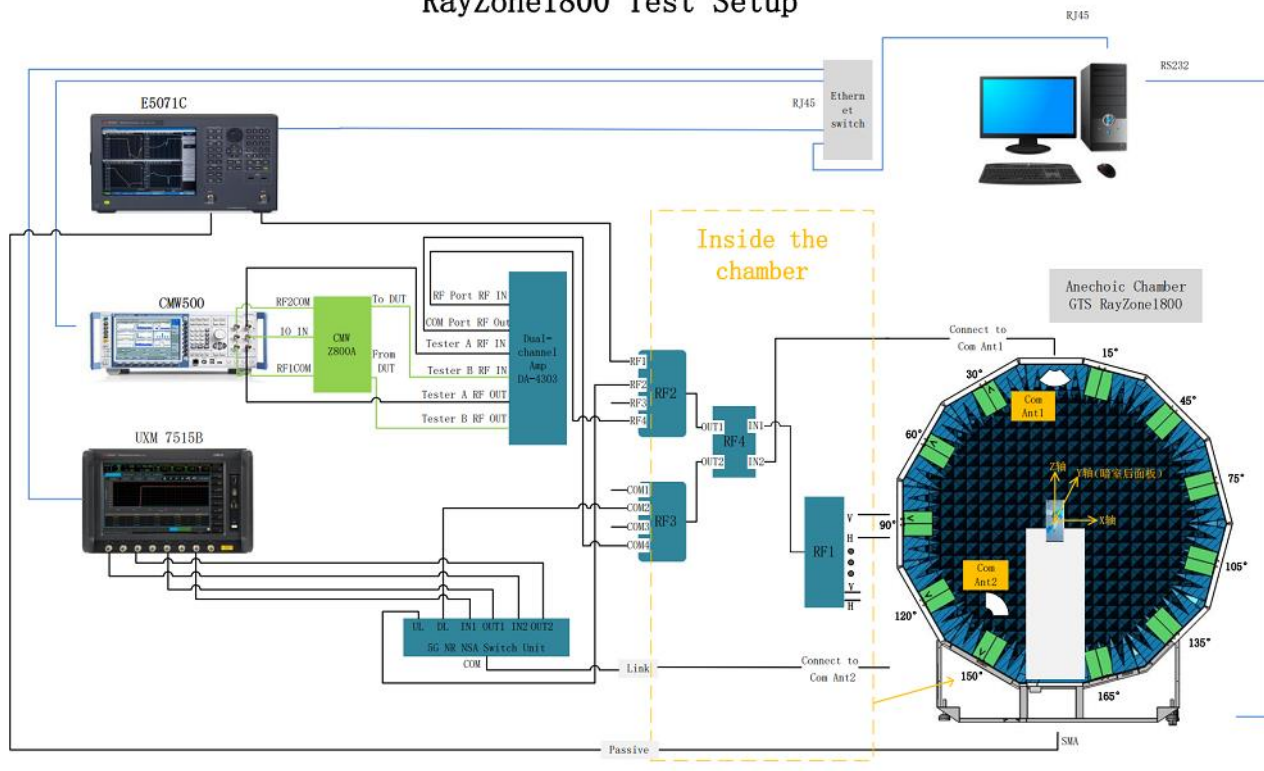


Figure 1 Test coordinate system

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 Antenna Effi.& Max. Peak Gain

### 4.1.1 Main Antenna

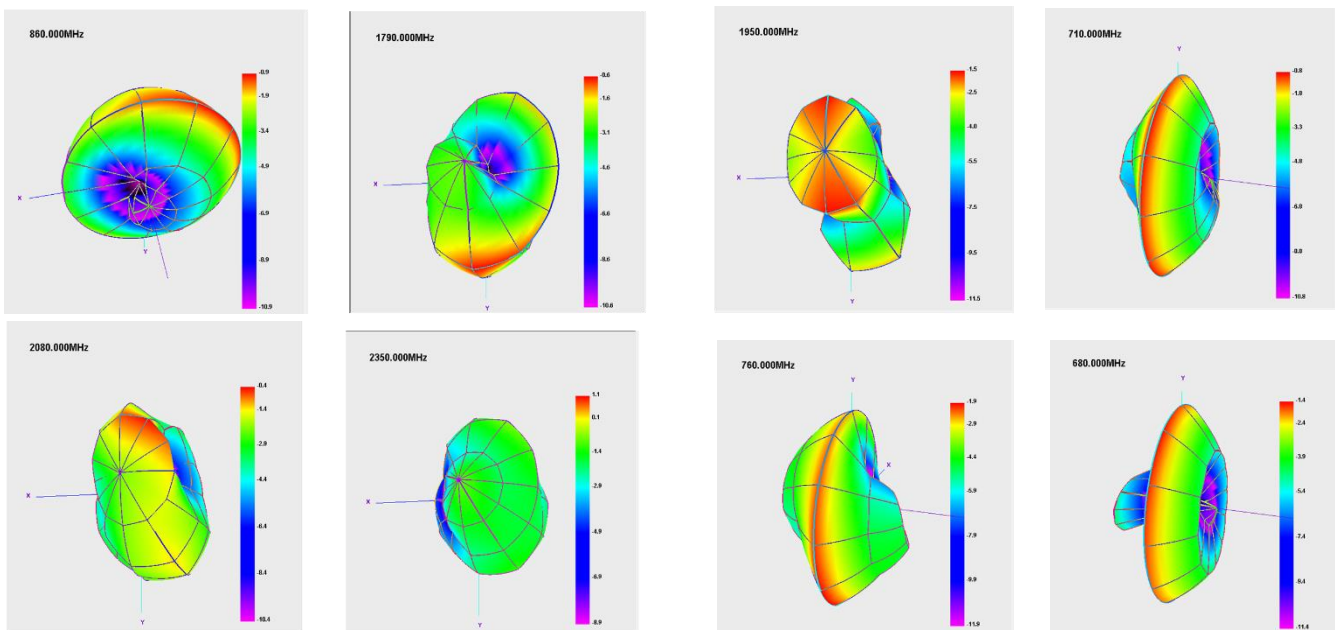
Band 2/4/5/25/26/41/66 3G 2/4/5

824MHz															
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
820	21.4	-6.7	-3.16	1890	32.63	-4.86	-1.38	2160	36.08	-4.43	-0.33	2430	37.13	-4.3	1.84
830	24.8	-6.06	-1.85	1900	33.06	-4.81	-1.29	2170	35.85	-4.46	-0.17	2440	38.1	-4.19	1.96
840	27.28	-5.64	-1.18	1910	31.76	-4.98	-1.49	2180	36.66	-4.36	0.08	2450	38.9	-4.1	2.06
850	27.99	-5.53	-0.9	1920	30.2	-5.2	-1.76	2190	38.62	-4.13	0.39	2460	37.85	-4.22	1.89
860	28.64	-5.43	-0.78	1930	30.59	-5.14	-1.73	2200	39.7	-4.01	0.7	2470	37.13	-4.3	1.75
870	27	-5.69	-0.97	1940	29.6	-5.29	-1.85	2210	39.87	-3.99	0.77	2480	37.08	-4.31	1.74
880	22.57	-6.46	-1.87	1950	30.99	-5.09	-1.58	2220	39.74	-4.01	0.92	2490	37.84	-4.22	1.74
890	17.88	-7.48	-2.93	1960	30.98	-5.09	-1.64	2230	39.08	-4.08	0.91	2510	38.53	-4.14	1.87
				1970	30.8	-5.11	-1.44	2240	38.22	-4.18	0.93	2520	37.11	-4.3	1.61
1710	28.69	-5.42	-2.47	1980	32.25	-4.91	-1.13	2250	37.91	-4.21	1.03	2530	36.77	-4.35	1.62
1720	33.45	-4.76	-1.71	1990	33.16	-4.79	-0.94	2260	36.48	-4.38	0.94	2540	35.97	-4.44	1.46
1730	35.62	-4.48	-1.6	2000	34.21	-4.66	-0.84	2270	37.18	-4.3	1.15	2550	34.78	-4.59	1.42
1740	36.86	-4.33	-1.45	2010	34.96	-4.56	-0.76	2280	35.5	-4.5	0.98	2560	34.76	-4.59	1.39
1750	38.12	-4.19	-1.37	2020	33.59	-4.74	-0.99	2290	33.94	-4.69	0.87	2570	34.66	-4.6	1.49
1760	39.99	-3.98	-1.19	2030	34.13	-4.67	-0.97	2300	33.72	-4.72	0.91	2580	33.67	-4.73	1.45
1770	40.68	-3.91	-1.14	2040	35.83	-4.46	-0.73	2310	33.61	-4.73	1.01	2590	32.09	-4.94	1.26
1780	41.65	-3.8	-1.03	2050	37.66	-4.24	-0.54	2320	34.21	-4.66	1.27	2600	30.69	-5.13	1.09
1790	39.77	-4	-1.28	2060	39.63	-4.02	-0.52	2330	36.83	-4.34	1.69	2610	31.71	-4.99	1.06
1800	37.7	-4.24	-1.66	2070	40.01	-3.98	-0.61	2340	38.14	-4.19	2.11	2620	31.67	-4.99	0.97
1810	35.81	-4.46	-1.84	2080	38.96	-4.09	-0.88	2350	38.69	-4.12	2.18	2630	29.87	-5.25	0.41
1820	35.21	-4.52	-1.76	2090	38.86	-4.1	-1.02	2360	38.49	-4.15	2.35	2640	29.68	-5.28	0.28
1830	34.08	-4.68	-1.75	2100	39.43	-4.04	-0.99	2370	36.82	-4.36	2.02	2650	30.98	-5.09	0.1
1840	35.5	-4.5	-1.62	2110	33.4	-4.76	-1.6	2380	37.36	-4.28	2.2	2660	31.16	-5.06	-0.06
1850	36.68	-4.36	-1.37	2120	33.25	-4.78	-1.66	2390	37.94	-4.21	2.12	2670	31.94	-4.96	0.12
1860	34.67	-4.6	-1.57	2130	34.68	-4.6	-1.26	2400	38.56	-4.14	2.19	2680	32.06	-4.94	0.21
1870	33.03	-4.81	-1.62	2140	36.33	-4.4	-0.85	2410	37.77	-4.23	1.94	2690	32.93	-4.82	0.46
1880	32.26	-4.91	-1.57	2150	36.03	-4.43	-0.59	2420	38.2	-4.18	1.96	2700	32.14	-4.93	0.46

band 13			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
710	26.64	-5.74	-2.04
720	24.62	-6.09	-2.44
730	25.54	-5.93	-2.29
740	28.65	-5.43	-1.91
750	30.96	-5.09	-1.72
760	30.68	-5.13	-1.88
770	24.78	-6.06	-2.89
780	22.23	-6.53	-3.44
790	19.75	-7.04	-4.27
800	21.26	-6.72	-3.69

band 12			
(MHz)	(%)	(dB)	(dBi)
690	26.6	-5.75	-1.6
700	27.8	-5.56	-1.66
710	34.12	-4.67	-0.8
720	32.17	-4.92	-1.26
730	29.52	-5.3	-1.59
740	29.91	-5.24	-1.66
750	26.59	-5.75	-2.25

band 71			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
610	16.43	-7.84	-4.66
620	20.98	-6.78	-3.68
630	25.47	-5.94	-2.1
640	28.76	-5.41	-1.41
650	27.77	-5.56	-1.58
660	25.82	-5.88	-2.21
670	26.67	-5.74	-2.1
680	22.57	-6.46	-3.05
690	15.59	-8.07	-4.51
700	13.03	-8.85	-5.36



4.1.2 DIV Antenna

LTE 2/4/5/25/26/41/66 3G 2/4/5															
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
820	26.14	-5.83	-2.45	1890	46.1	-3.36	-0.15	2160	38.71	-4.12	0.39	2430	37.76	-4.23	0.72
830	27.69	-5.58	-1.72	1900	46.89	-3.29	-0.02	2170	39.85	-4	0.51	2440	36.87	-4.33	0.47
840	28.58	-5.44	-1.34	1910	48.17	-3.17	0.19	2180	39.59	-4.02	0.56	2450	37.53	-4.26	0.63
850	28.13	-5.51	-1.26	1920	49.79	-3.03	0.36	2190	39.26	-4.06	0.63	2460	36.67	-4.36	0.64
860	28.08	-5.52	-1.31	1930	47.62	-3.22	0.16	2200	38.31	-4.17	0.66	2470	36.56	-4.37	0.78
870	26.91	-5.7	-1.57	1940	44.54	-3.51	-0.18	2210	36.64	-4.36	0.59	2480	37.72	-4.23	1.01
880	26.04	-5.84	-1.85	1950	44.25	-3.54	-0.13	2220	36.56	-4.37	0.63	2490	39.66	-4.02	1.3
890	23.81	-6.23	-2.41	1960	42.55	-3.71	-0.32	2230	37	-4.32	0.78	2500	39.64	-4.02	1.31
900	20.35	-6.91	-3.32	1970	42.53	-3.71	-0.25	2240	35.75	-4.47	0.68	2510	39	-4.09	1.24
				1980	43.98	-3.57	-0.2	2250	34.74	-4.59	0.65	2520	37.71	-4.24	1.11
1710	36.11	-4.42	-1.5	1990	43.29	-3.64	-0.21	2260	34.14	-4.67	0.72	2530	38.7	-4.12	1.22
1720	40.56	-3.92	-0.97	2000	44.32	-3.53	0.09	2270	33.61	-4.73	0.76	2540	37.91	-4.21	1.16
1730	40.83	-3.89	-0.97	2010	43.36	-3.63	0.16	2280	32.42	-4.89	0.73	2550	38.48	-4.15	1.23
1740	40.45	-3.93	-0.95	2020	41.77	-3.79	0.17	2290	31.59	-5	0.75	2560	38.33	-4.16	1.18
1750	41.58	-3.81	-0.76	2030	42.78	-3.69	0.42	2300	31.79	-4.98	0.86	2570	38.89	-4.1	1.16
1760	42.79	-3.69	-0.6	2040	42.59	-3.71	0.5	2310	32.05	-4.94	1.06	2580	36.02	-4.44	0.65
1770	44.98	-3.47	-0.4	2050	43.11	-3.65	0.66	2320	33.48	-4.75	1.36	2590	34.77	-4.59	0.4
1780	45.03	-3.47	-0.58	2060	44.97	-3.47	0.87	2330	35.15	-4.54	1.59	2600	34.8	-4.58	0.36
1790	43.19	-3.65	-0.97	2070	45.4	-3.43	1.05	2340	37.35	-4.28	1.81	2610	33.92	-4.7	0.28
1800	42.25	-3.74	-1.13	2080	45.54	-3.42	0.99	2350	36.87	-4.33	1.7	2620	31.28	-5.05	-0.14
1810	42.44	-3.72	-1.23	2090	46.7	-3.31	1.23	2360	37.14	-4.3	1.54	2630	29.7	-5.27	-0.4
1820	40.57	-3.92	-1.33	2100	46.78	-3.3	1.12	2370	36.33	-4.4	1.29	2640	30.09	-5.22	-0.41
1830	40.92	-3.88	-1.33	2110	41.91	-3.78	0.78	2380	37.01	-4.32	1.19	2650	29.62	-5.28	-0.48
1840	40.76	-3.9	-1.27	2120	40.23	-3.95	0.53	2390	36.57	-4.37	1.02	2660	29.29	-5.33	-0.54
1850	42.16	-3.75	-1.24	2130	40.46	-3.93	0.63	2400	37.57	-4.25	1.06	2670	28.79	-5.41	-0.7
1860	45.01	-3.47	-0.98	2140	40.59	-3.92	0.6	2410	36.63	-4.36	0.82	2680	29.45	-5.31	-0.67
1870	45.9	-3.38	-0.61	2150	39.89	-3.99	0.56	2420	38.15	-4.18	0.94	2690	28.47	-5.46	-0.82
1880	45.4	-3.43	-0.34												

band 13

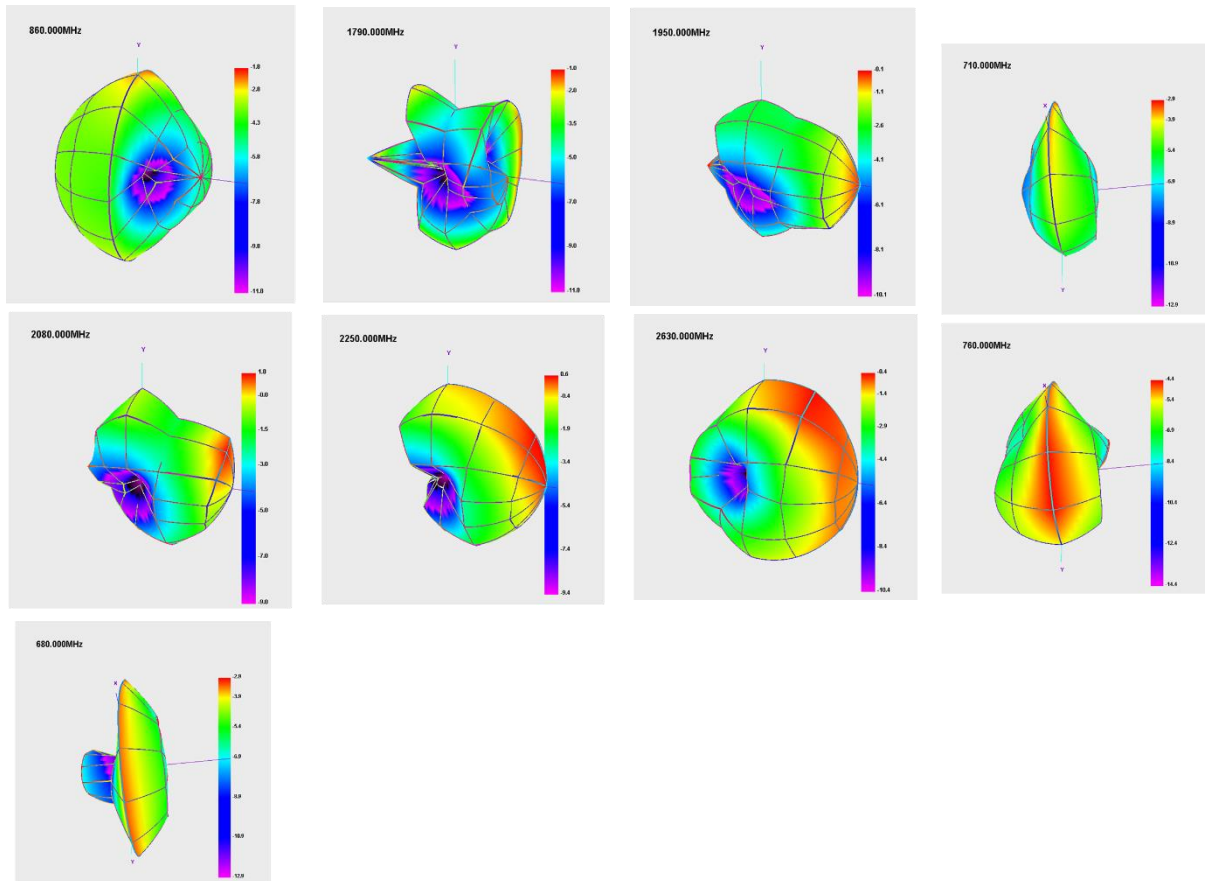
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710	22.58	-6.46	-2.2
720	19.85	-7.02	-2.88
730	20.15	-6.96	-2.7
740	20.6	-6.86	-2.86
750	19.7	-7.05	-3.5
760	18.28	-7.38	-4.37
770	14.33	-8.44	-5.22

Band 12

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
690	18.01	-7.44	-3.02
700	20.72	-6.84	-2.53
710	18.86	-7.24	-3.06
720	18.99	-7.21	-2.94

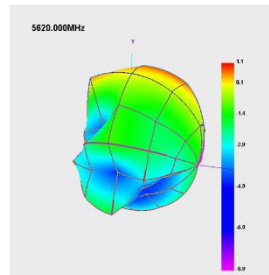
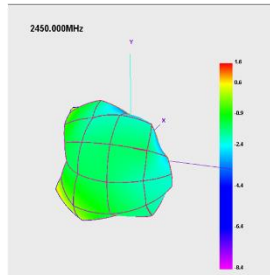
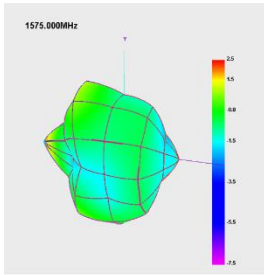
band 71

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
610	16.23	-7.9	-4.11
620	21.09	-6.76	-2.93
630	24.25	-6.15	-2.33
640	23.16	-6.35	-2.66
650	24.65	-6.08	-2.17
660	20.04	-6.98	-2.97



4.1.3 G/W/B Antenna

GPS /wifi BT															
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1565	35.29	-4.52	2.73	5250	30.48	-5.16	-0.14	5510	24.74	-6.07	-0.74	5770	26.61	-5.75	-0.04
1570	35.42	-4.51	2.58	5260	30.73	-5.12	-0.1	5520	24.39	-6.13	-0.56	5780	25.33	-5.96	-0.33
1575	34.78	-4.59	2.38	5270	30.85	-5.11	-0.08	5530	23.72	-6.25	-0.57	5790	24.46	-6.11	-0.3
1580	34.91	-4.57	2.25	5280	32.09	-4.94	0.08	5540	23.42	-6.3	-0.3	5800	23.84	-6.23	-0.39
1585	33.96	-4.69	1.92	5290	34.15	-4.67	0.46	5550	23.19	-6.35	-0.43	5810	23.96	-6.2	-0.04
				5300	32.59	-4.87	0.21	5560	24.32	-6.14	-0.06	5820	24.28	-6.15	-0.01
2400	33.36	-4.77	0.35	5310	33.77	-4.71	0.4	5570	25.78	-5.89	0.16	5830	24.88	-6.04	0.23
2410	34.69	-4.6	0.5	5320	35.71	-4.47	0.58	5580	26.27	-5.81	0.44	5840	26.48	-5.77	0.56
2420	36.41	-4.39	0.71	5330	35.39	-4.51	0.65	5590	26.5	-5.77	0.4	5850	28.46	-5.46	0.97
2430	36.76	-4.35	0.82	5340	37.37	-4.28	0.96	5600	28.07	-5.52	0.73				
2440	37.74	-4.23	1.04	5350	39.56	-4.03	1.1	5610	30.31	-5.18	0.88				
2450	38.97	-4.09	1.29	5360	38.91	-4.1	1.03	5620	31.97	-4.95	1.07				
2460	38.64	-4.13	1.33	5370	38.86	-4.1	0.97	5630	33.2	-4.79	1.17				
2470	38.14	-4.19	1.36	5380	38.64	-4.13	0.89	5640	34.53	-4.62	1.37				
2480	38.56	-4.14	1.41	5390	35.54	-4.49	0.51	5650	35.83	-4.46	1.64				
2490	40.45	-3.93	1.67	5400	40.71	-3.9	1.09	5660	37.89	-4.21	1.75				
2500	38.84	-4.11	1.32	5410	38.96	-4.09	0.83	5670	36.97	-4.32	1.6				
				5420	37.06	-4.31	0.62	5680	37.46	-4.26	1.75				
5150	24.42	-6.12	-0.76	5430	35.04	-4.55	0.3	5690	36.75	-4.35	1.75				
5160	23.22	-6.34	-0.87	5440	33.34	-4.77	0.19	5700	35.26	-4.53	1.52				
5170	22.96	-6.39	-0.92	5450	30.69	-5.13	-0.18	5710	33.53	-4.75	1.38				
5180	22.6	-6.46	-1.08	5460	29.96	-5.24	-0.38	5720	31.75	-4.98	1.13				
5190	23.08	-6.37	-0.93	5470	26.94	-5.7	-0.85	5730	30.19	-5.2	0.81				
5200	23.21	-6.34	-0.99	5480	25.72	-5.9	-0.99	5740	29.18	-5.35	0.62				
5210	24.05	-6.19	-0.76	5490	24.78	-6.06	-1.01	5750	28.5	-5.45	0.46				
5220	23.45	-6.3	-1	5500	24.47	-6.11	-0.84	5760	27.53	-5.6	0.19				
5230	25.35	-5.96	-0.72												
5240	24.32	-6.14	-0.87												

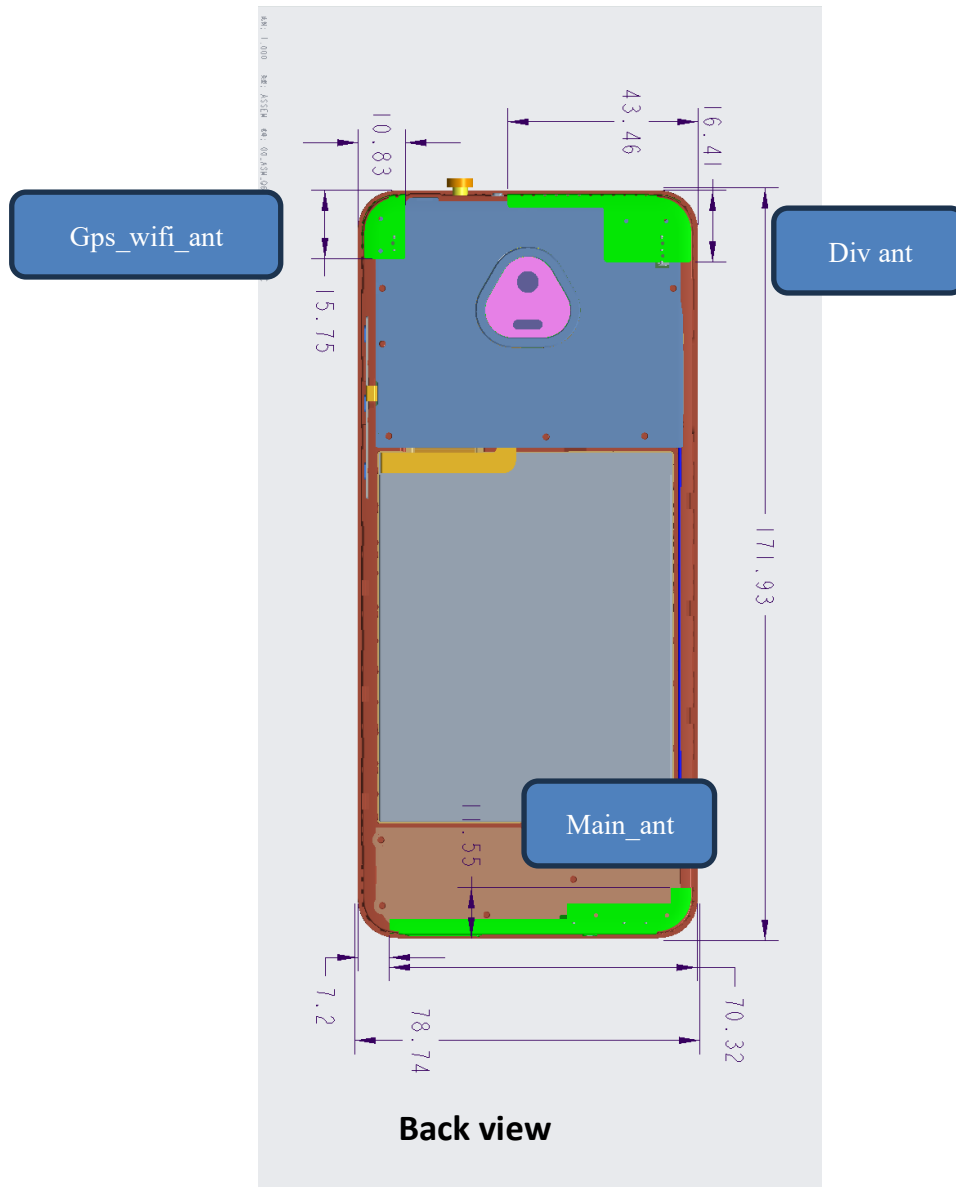


## 5. Equipment List

Type of Equipment	Manufacture	Model Number
Network Analyzer	Agilent Technologies	E5071B
Switch control System	GTS	RayZone1800
Software	GTS	MaxSign 100 Patten Measurement software

## ANNEX B: The EUT Appearance and Test Configuration

### B.1 EUT Appearance





## B.2 Test Configuration

