

# WF 186

Customer: 剑桥

Designer: 邵卫

Date: 2023/09/21



Professional, Stringent & Innovation  
**Antenna Manufacturer**  
for WiFi WiMAX & RFID

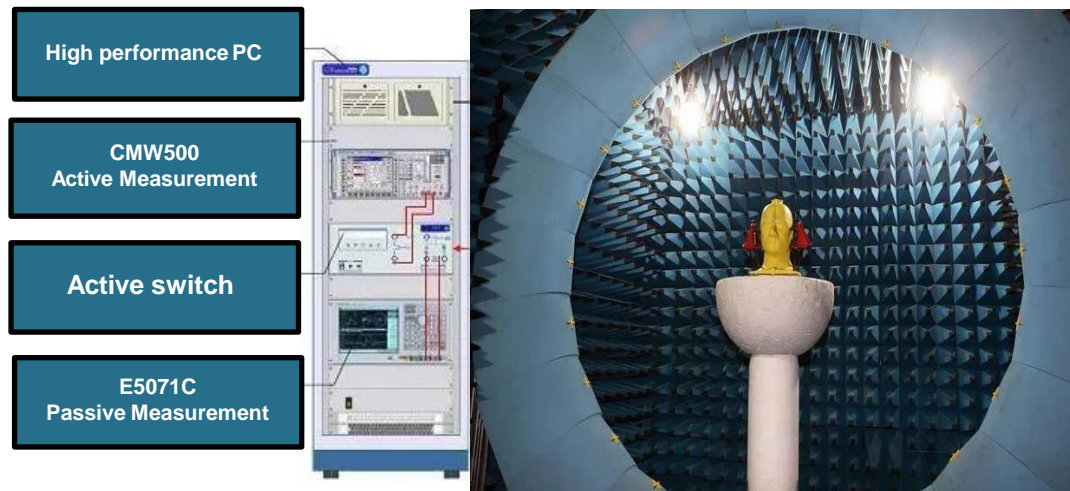


# OUTLINE

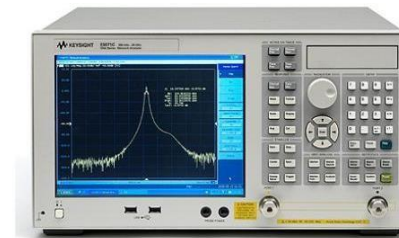
1. Benchmark
2. S-Parameters (VSWR&isolation)
3. Antenna Efficiency& Peak Gain
4. Radiation patterns
5. Summary

## JingHong 3D Chamber Structure

- EMT-24 Series System Components
- Chambers
- EMT Quest Software
- Positioning Systems
- Chamber Room Size: L\*W\*H=5\*5\*5M



VSWR were performed using a keysight S-parameter NetworkAnalyzer.



**E5071C**

The “great circle” cut method, whereby the Measurement Antenna remains fixed and the EUT is rotated about two axes in sequential order. The radiated RF performance of the Equipment Under Test (EUT) is measured by sampling the radiated transmit power of the mobile at various locations surrounding the device. A three-dimensional characterization of the 'transmit' performance of the EUT is pieced together by analyzing the data from the spatially distributed measurements.

Data points taken every 15 degrees in the theta and in the phi axes are deemed sufficient to fully characterize the EUT's Far-Field radiation pattern and total radiated power All of the measured power values will be integrated.

Test Condition	Test Engineer	Test Environment(° C/%)	Test Dste
Radiated	Lean.ni	20-24/45-60	06.17.2023
	Band(MHz)		Test Frequency(MHz)
	2400-2500		2400/2450/2500
	5150-5850		5150/5500/5850
Testing Location			
Shanghai,EM Testing			

Instrument	Manufacturer	Model NO.	Asset No	Cali.Interval	Cali.Due Date
ENA Network Analyzer	Keysight	E5071B	HLW-SC-19	1 Year	2024/2/27
RF Switch Box	EMT	NA	NA	NA	NA
EMT Chamber	EMT	EMT-24	HLW-SC-21	1 Year	2024/9/10
Horn Antenna	EMT	0.8-6GHz	NA	1Year	2024/9/10

Because the antennas are fixed in location within the device the directional antenna gain for MIMO is calculated over a sphere using the raw spatial data taken at 15 degree steps of theta and phi for each antenna using the equations from KDB 662911 D01. The raw antenna data is located in the appendix of this report.

The correlated antenna gain was calculated using KDB 662911 D01, F(2)(d)(i). The uncorrelated antenna gain was calculated using KDB 662911 D01, F(2)(d)(ii).

The uncorrelated and correlated gains were calculated for each point in the spatial data, and the highest values reported.

Note :

KDB 662911 D01, F(2)(d)(i)

$$\text{Correlated Gain} = 10 \log \left[ \left( 10^{\frac{G_1}{20}} + 10^{\frac{G_2}{20}} + \dots + 10^{\frac{G_n}{20}} \right)^2 / N_{Ant.} \right] \text{ dBi}$$

KDB 662911 D01, F(2)(d)(ii)

$$\text{Uncorrelated Gain} = 10 \log \left[ \left( 10^{\frac{G_1}{10}} + 10^{\frac{G_2}{10}} + \dots + 10^{\frac{G_n}{10}} \right) / N_{Ant.} \right] \text{ dBi}$$

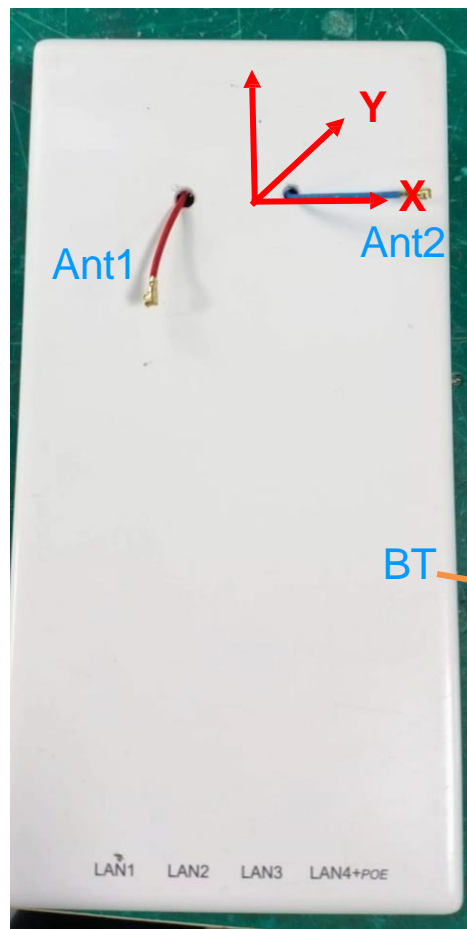
$N_{Ant.}$  : Number of antenna

$G_n$  : Gain of antenna

激活 Windows



# 1. Benchmark

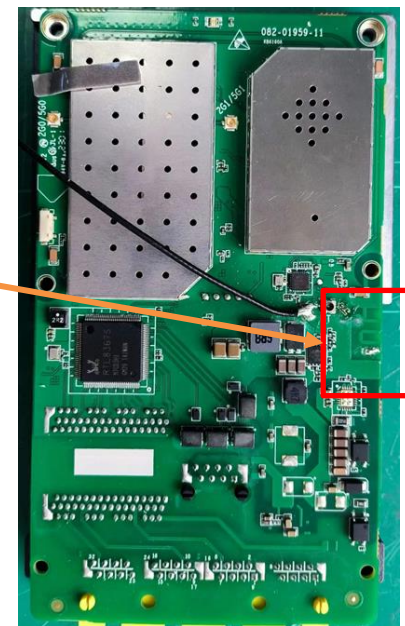


Antenna Frequency(MHz)

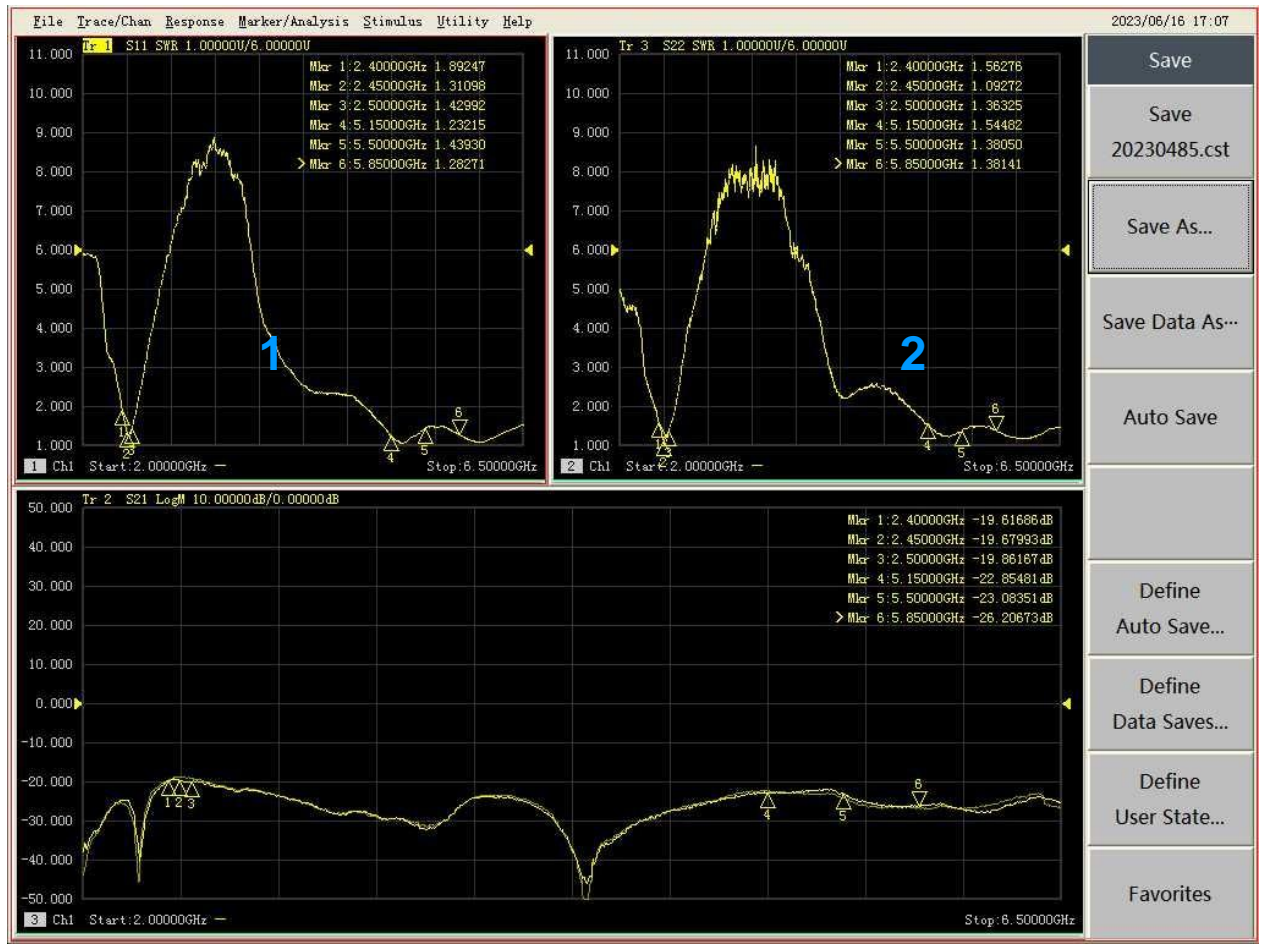
Ant1-2:2400-2500MHz

5150-5850MHz

BT:2400-2500MHz



# 2. S-Parameters(VSWR&isolation)

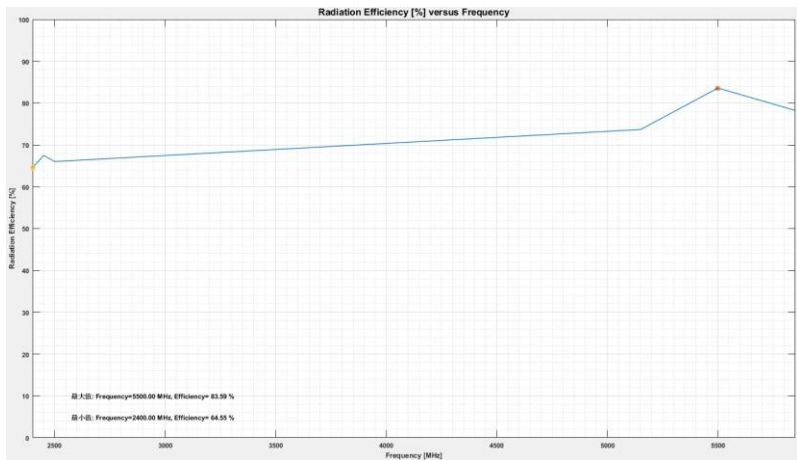




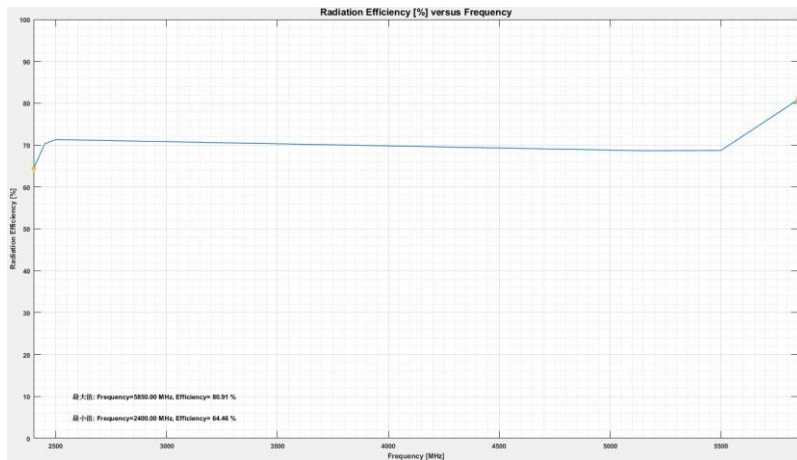
## 2. S-Parameters(VSWR BT )



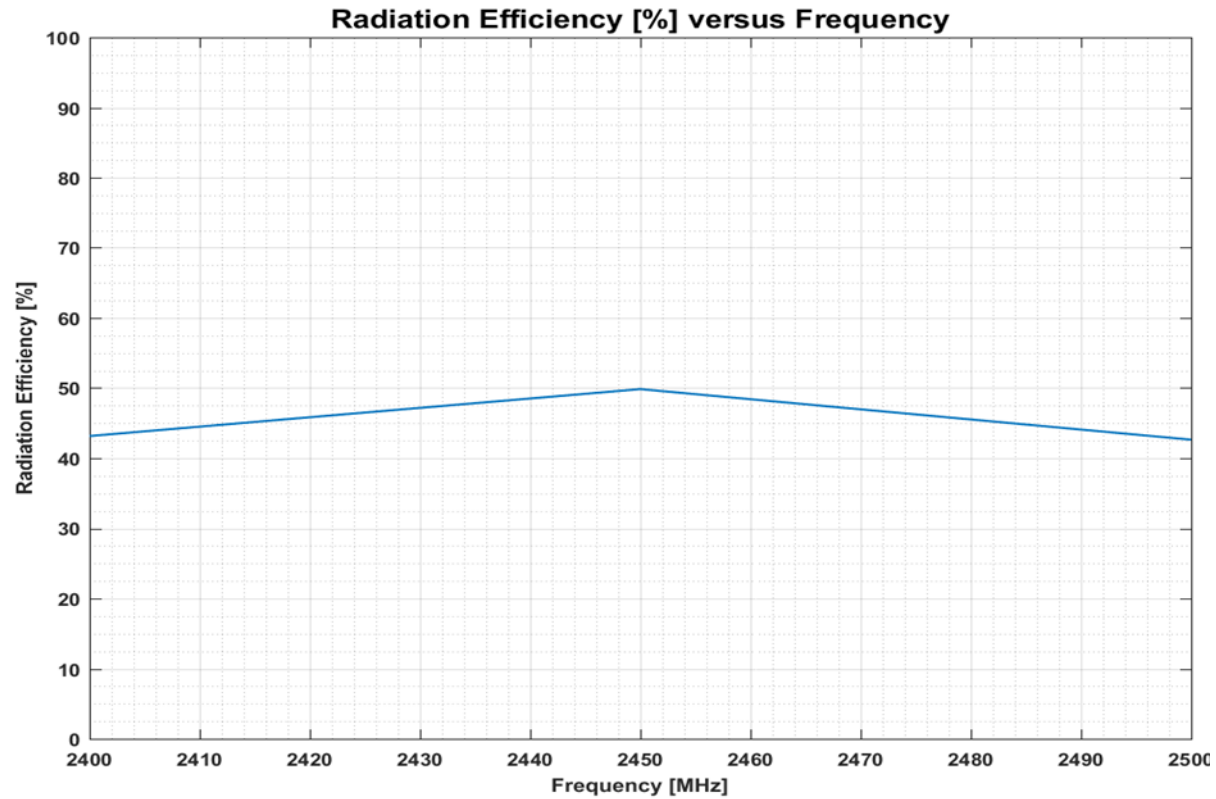
# 3. Antenna Efficiency



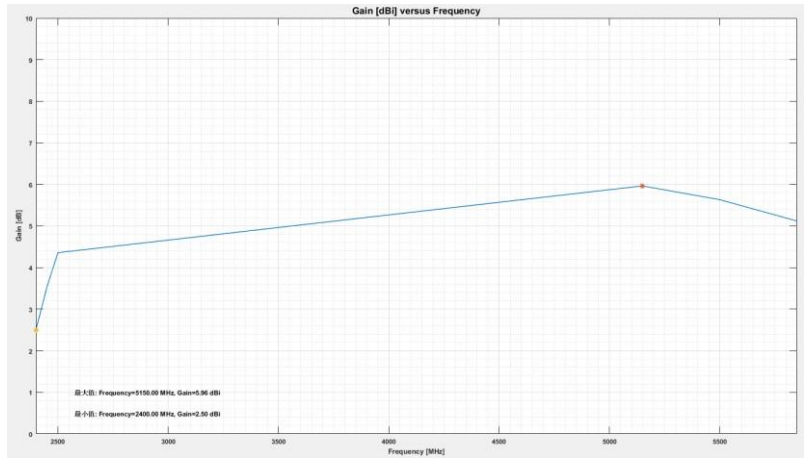
1



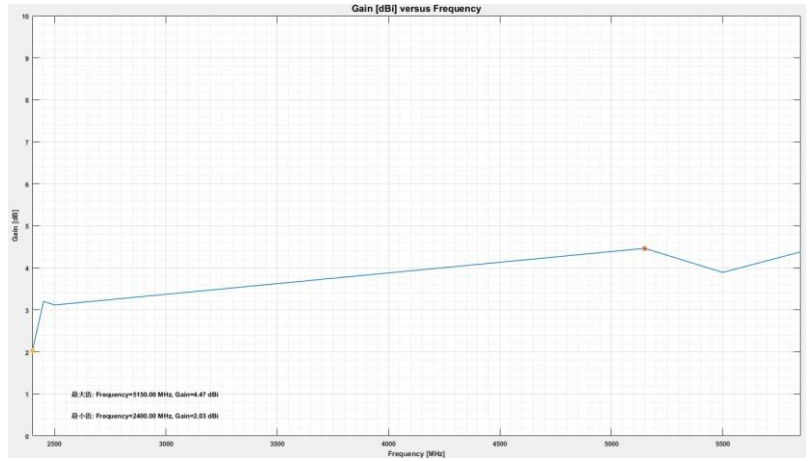
2



# 3. Peak Gain

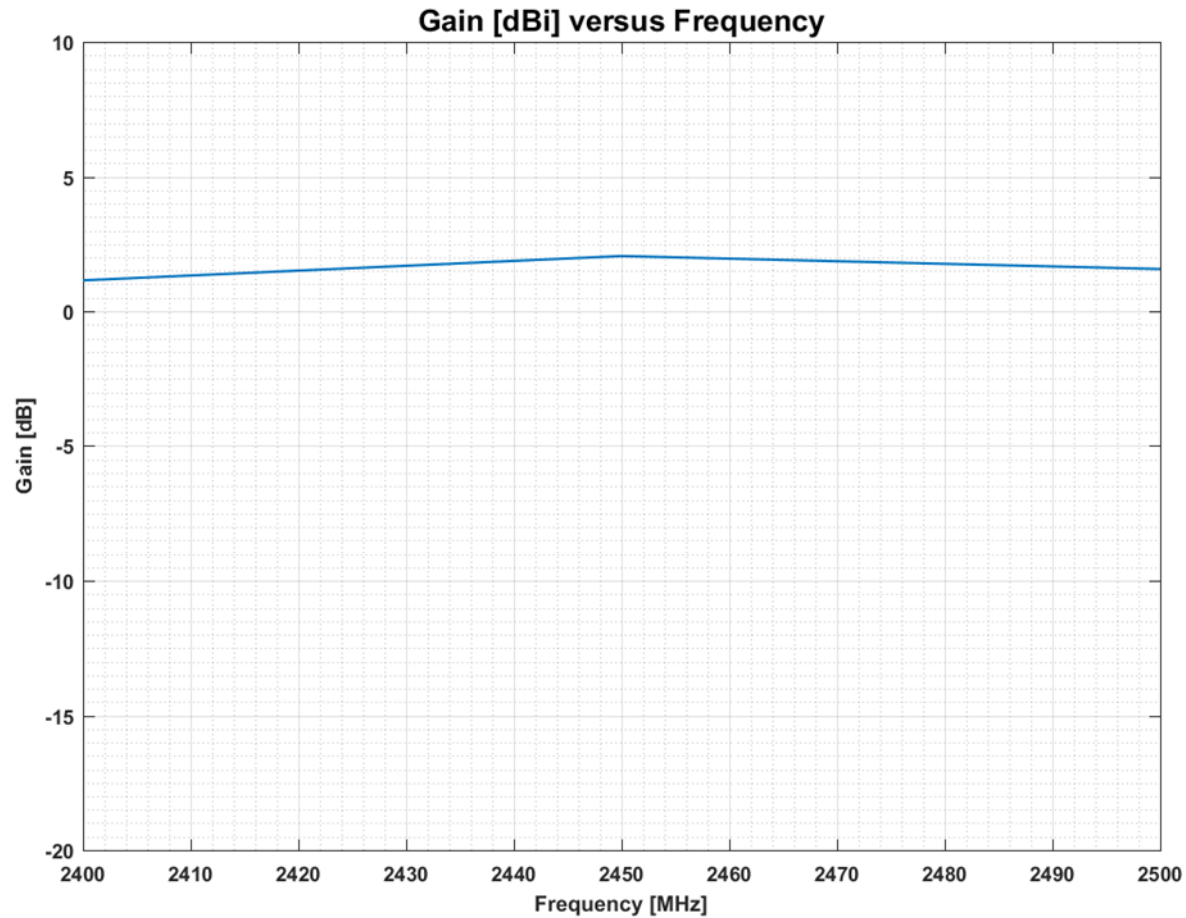


1



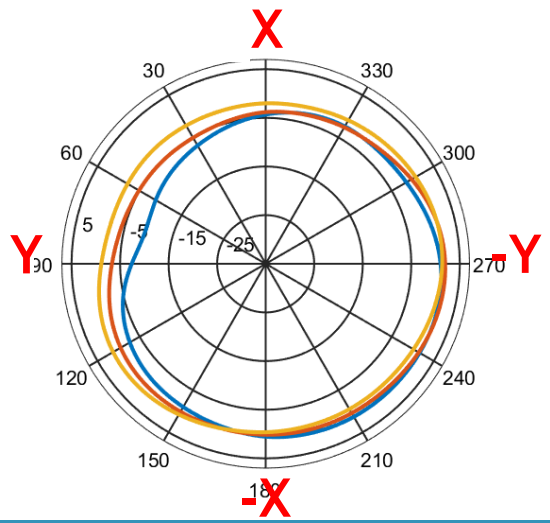
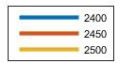
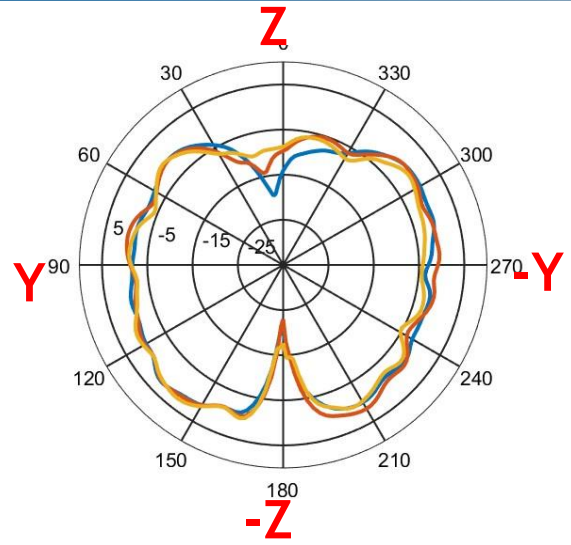
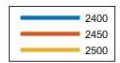
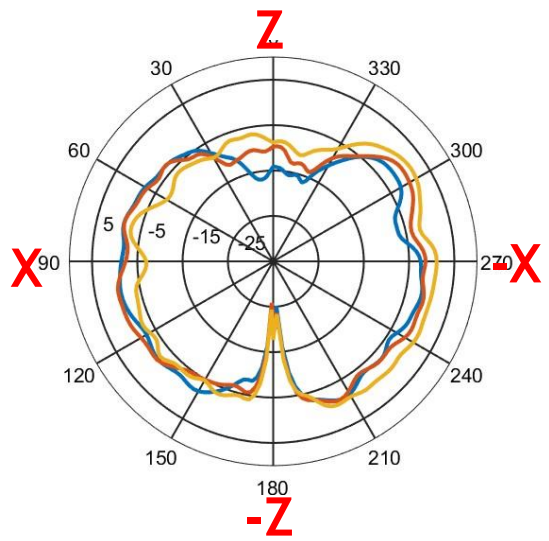
2

### 3. Peak Gain(BT)

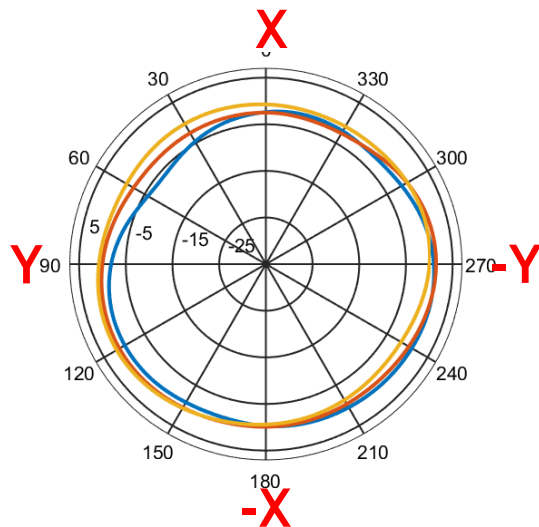
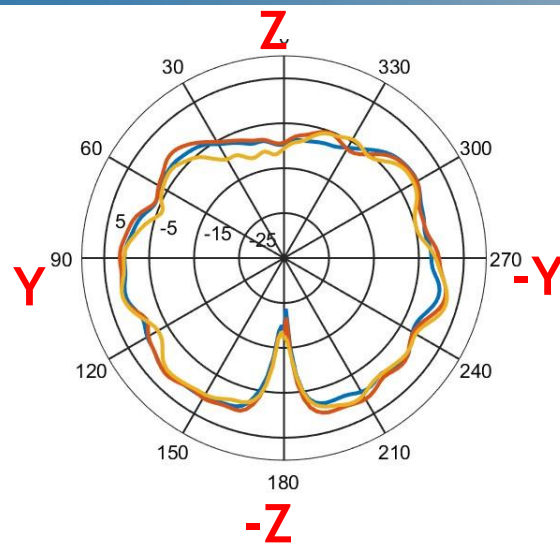
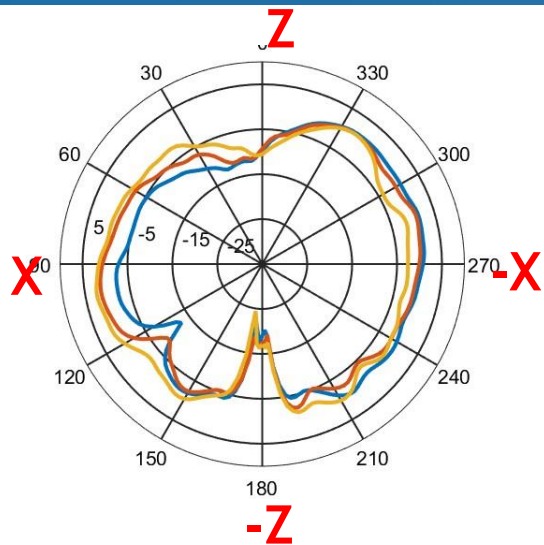




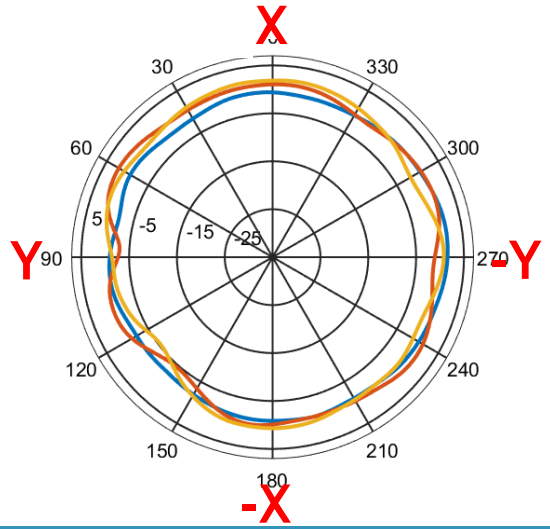
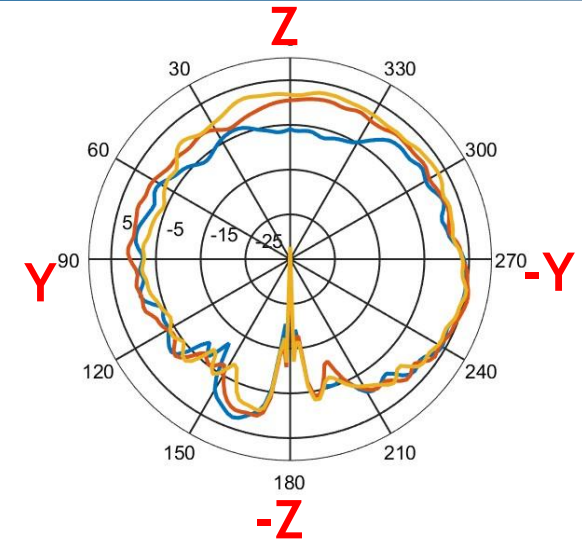
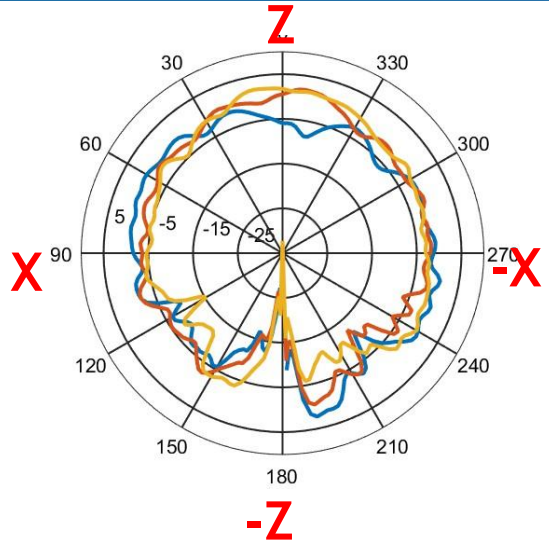
# 4. Radiation patterns (1-2G)



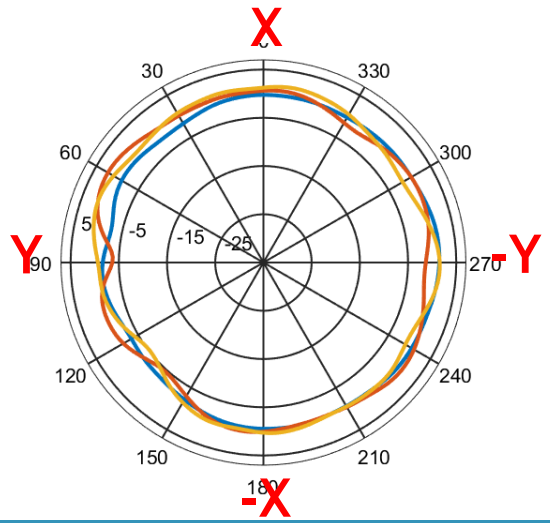
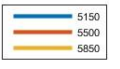
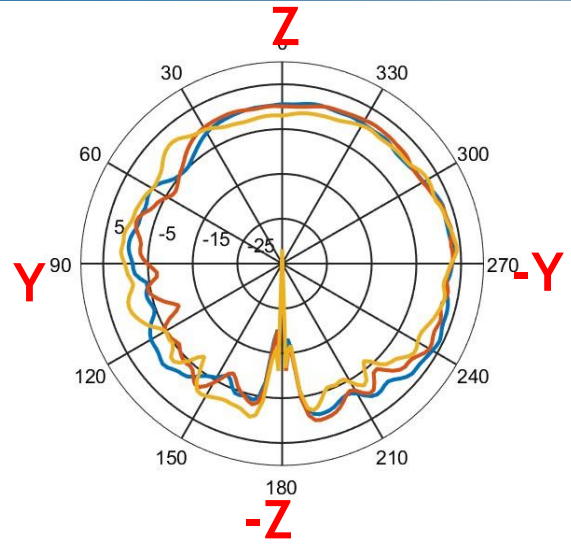
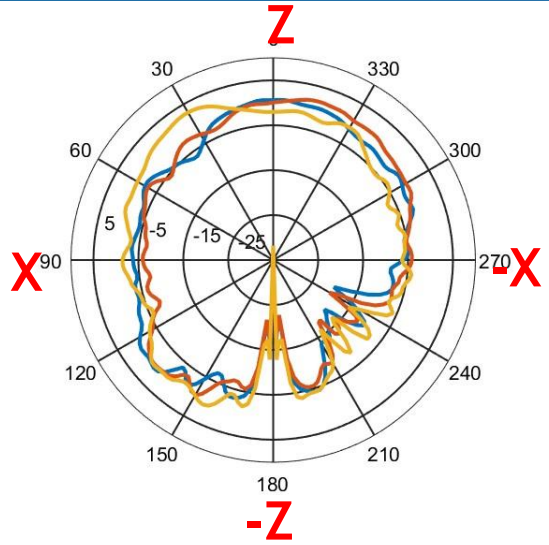
# 4. Radiation patterns (2-2G)



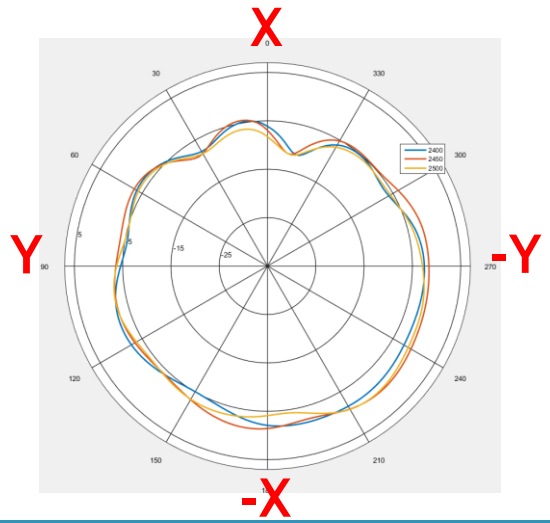
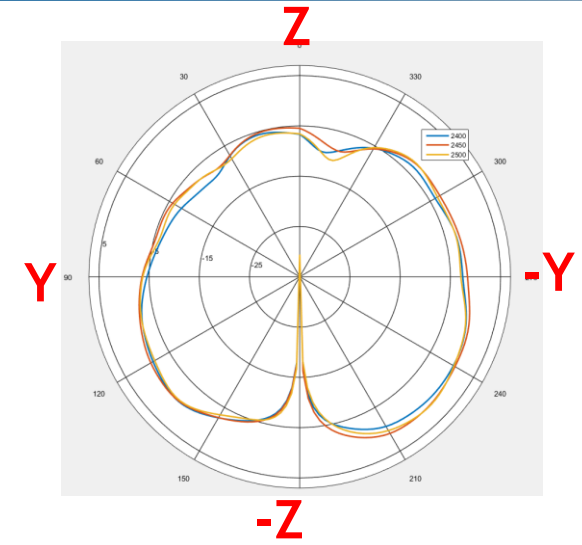
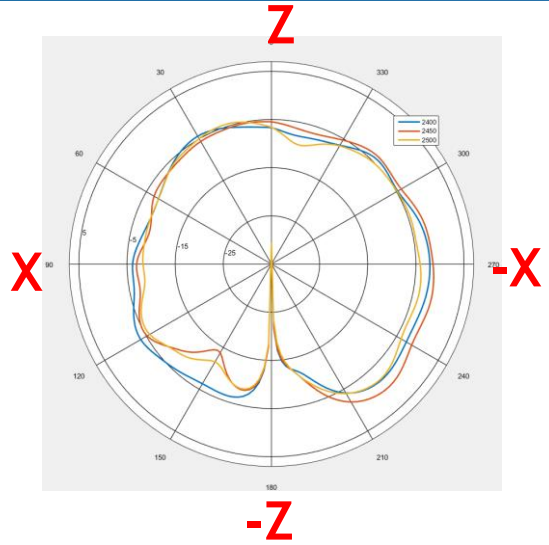
# 4. Radiation patterns (1-5G)



# 4. Radiation patterns (2-5G)

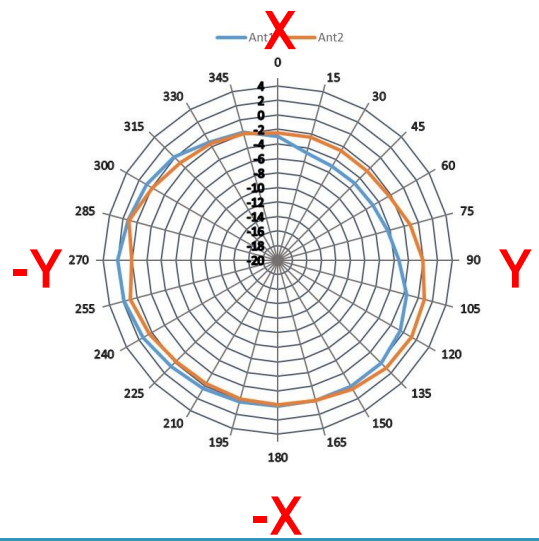
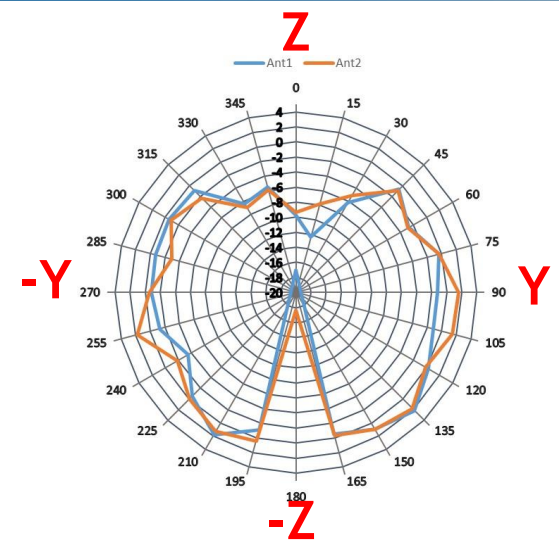
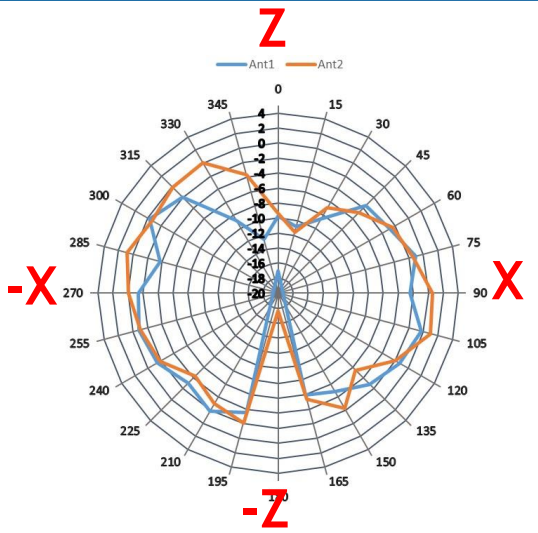


# 4. Radiation patterns (BT)

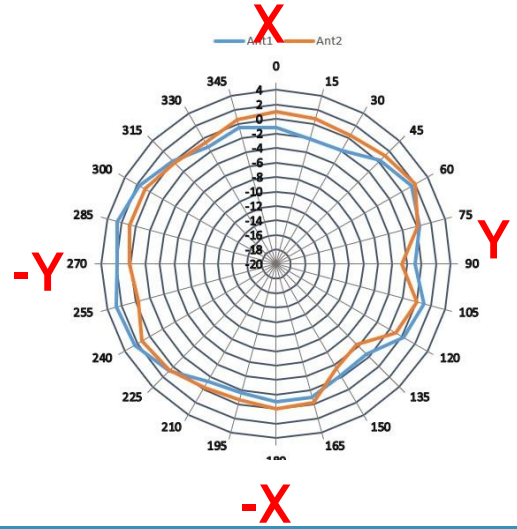
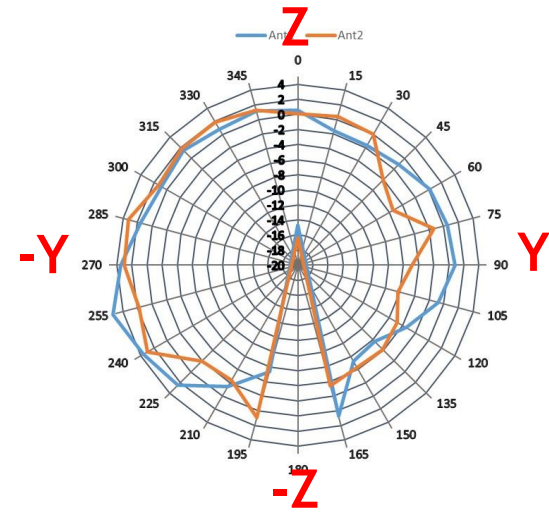
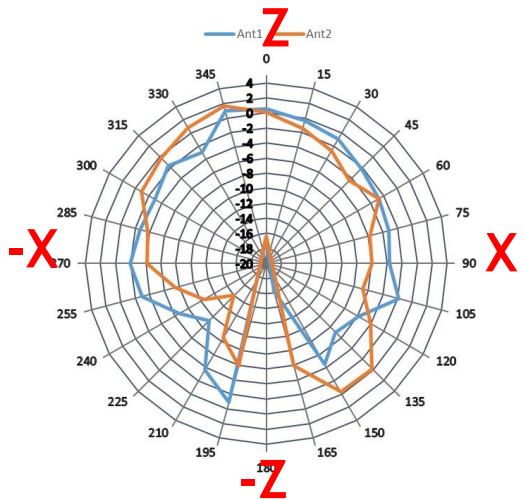




# 4. Radiation patterns (Ant1&Ant2 system coverage 2.45GHz)



# 4. Radiation patterns (Ant1&Ant2 system coverage 5.5GHz )



1.The measurements are as follows:

2/5G						
Frequency	Gain(dBi)			Efficiency(%)		
	1	2	BT	1	2	BT
2400	2.50	2.03	1.15	64.55	64.46	43.17
2450	3.53	3.20	2.05	67.47	70.32	49.85
2500	3.75	3.12	1.57	66.02	71.32	42.64
5150	5.96	4.47		73.68	68.66	
5500	5.63	3.89		83.59	68.72	
5850	5.12	4.38		78.24	80.91	

### 1.The measurements are as follows:

Frequency (MHz)	Degree		Gain(dBi)		Correlated Gain(dBi)	Uncorrelated Gain(dBi)
	Theta(°)	Phi(°)	1	2		
<b>2400</b>	94	134	2.34	1.73	5.05	2.05
<b>2450</b>	102	134	1.94	2.71	5.34	2.34
<b>2500</b>	132	132	0.72	2.93	4.91	1.97
<b>5150</b>	96	-108	4.49	3.77	7.14	1.36
<b>5500</b>	96	-102	5.16	3.39	7.33	4.39
<b>5850</b>	108	-70	3.27	4.10	6.71	3.80

1.The measurements are as follows:

Antenna	VSWR	Efficiency (%)	Highest Peak Gain (dBi)	E_total (avg) X-Y plane	Mutual Isolation (dBi) 2G Band		Mutual Isolation (dBi) 5G and	
					1-2G	1-5G	2-2G	2-5G
<b>1-2G</b>	1.89	64.55	4.36	-1.47			-19.61	
<b>1-5G</b>	1.43	73.68	5.96	-1.2				-22.85
<b>2-2G</b>	1.56	64.46	3.20	-0.65				
<b>2-5G</b>	1.54	68.66	4.47	-3.18				
BT	2.07	43.17	2.05	-2.75				



# 6.Ant1 data(2400MHz)



f=2400MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-20.12	-4.08	-1.21	-3.13	-3.48	-1.62	-2.42	-6.71	-2.44	-2.80	-10.64	-15.39	-14.10	-13.96	-7.44	-3.43	-2.36	-1.00	-1.47	-0.88	-2.72	-2.21	-1.96	-8.19	-20.12
15	-20.12	-4.06	0.12	-3.94	-4.73	-1.53	-3.21	-4.02	-1.77	-3.24	-9.60	-12.84	-14.10	-13.21	-6.08	-3.01	-1.96	0.23	-1.19	-0.87	-2.53	-1.33	-2.10	-11.18	-20.12
30	-20.12	-4.28	0.80	-3.11	-4.90	-2.18	-3.53	-3.90	-1.16	-3.54	-9.28	-11.10	-14.10	-12.57	-5.20	-2.32	-1.32	0.07	-0.19	-0.89	-1.91	-1.48	-0.55	-8.05	-20.12
45	-20.12	-4.48	1.18	-1.88	-3.79	-2.34	-3.16	-4.16	-1.23	-3.41	-8.56	-9.67	-14.10	-12.05	-4.55	-1.49	-0.82	-1.04	-0.14	-0.35	-1.50	-0.97	0.37	-4.26	-20.12
60	-20.12	-4.49	1.28	-0.86	-2.53	-1.71	-2.76	-3.39	-1.46	-2.74	-7.69	-8.91	-14.10	-11.96	-4.18	-0.75	-0.78	-1.94	-0.85	0.25	-1.40	0.56	0.67	-2.50	-20.12
75	-20.12	-4.22	0.89	-0.68	-1.72	-1.57	-2.71	-1.83	-1.05	-1.85	-6.77	-8.59	-14.10	-12.36	-4.09	-0.41	-1.45	-2.35	-1.63	0.13	-0.97	1.93	0.77	-1.69	-20.12
90	-20.12	-3.79	0.19	-1.43	-2.10	-1.85	-2.91	-0.64	-0.07	-1.03	-6.41	-8.74	-14.10	-13.16	-4.31	-0.54	-2.24	-1.75	-1.68	-0.54	-0.03	2.30	0.87	-1.75	-20.12
105	-20.12	-3.22	-0.59	-1.99	-2.11	0.12	-1.43	-0.10	0.48	-0.70	-6.72	-9.54	-14.10	-14.64	-5.07	-1.36	-3.46	-1.65	-2.20	-1.35	1.12	1.78	0.88	-2.71	-20.12
120	-20.12	-2.80	-0.29	-0.31	-0.09	2.20	0.10	-0.79	-0.27	-1.30	-7.93	-10.98	-14.10	-16.31	-6.47	-2.67	-4.90	-3.39	-3.25	-1.42	1.43	0.96	0.46	-4.33	-20.12
135	-20.12	-2.76	0.88	1.25	0.44	1.62	0.19	-2.54	-2.11	-2.50	-9.82	-13.32	-14.10	-18.31	-8.73	-4.31	-5.56	-6.90	-3.68	-1.72	0.28	0.32	-0.69	-5.95	-20.12
150	-20.12	-3.43	1.28	0.47	-1.97	-0.44	-0.01	-3.61	-3.01	-3.02	-10.36	-15.00	-14.10	-19.25	-10.93	-4.63	-3.92	-9.04	-3.64	-2.36	-1.54	-0.23	-1.85	-5.67	-20.12
165	-20.12	-5.28	0.13	-2.02	-3.54	-0.89	-0.42	-2.71	-2.61	-3.21	-8.63	-14.82	-14.10	-17.79	-12.42	-3.57	-2.56	-10.56	-3.09	-2.25	-2.61	-1.49	-2.46	-4.58	-20.12

# 6.Ant1 data(2450MHz)



f=2450MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-22.98	-3.52	-1.82	-3.03	-1.44	-0.82	-1.35	-3.70	-0.25	-1.96	-8.75	-12.60	-9.73	-10.80	-8.56	-3.52	-2.89	-1.09	-2.41	-0.24	-1.33	-2.80	-4.88	-5.94	-22.98
15	-22.98	-3.75	-0.28	-4.68	-2.72	-0.77	-2.29	-1.72	-0.60	-2.36	-7.82	-10.40	-9.73	-11.99	-7.21	-2.67	-2.68	-0.15	-1.72	-0.58	-1.84	-1.78	-4.26	-9.04	-22.98
30	-22.98	-3.81	0.37	-4.20	-4.08	-1.92	-3.42	-2.10	-0.50	-2.88	-7.86	-8.74	-9.73	-12.48	-6.40	-2.37	-1.74	-0.65	-0.44	-0.72	-1.74	-2.22	-1.18	-6.44	-22.98
45	-22.98	-3.49	0.92	-3.10	-4.38	-3.25	-4.28	-3.67	-0.72	-2.69	-7.97	-7.31	-9.73	-12.48	-5.80	-2.04	-0.99	-1.31	-0.44	-0.10	-1.86	-1.60	0.44	-2.75	-22.98
60	-22.98	-2.87	1.42	-1.76	-3.74	-2.46	-4.14	-4.10	-0.97	-1.87	-7.50	-6.44	-9.73	-12.34	-5.51	-1.40	-1.00	-0.89	-1.05	0.46	-2.15	0.31	0.87	-0.92	-22.98
75	-22.98	-1.95	1.77	-0.74	-3.08	-1.51	-2.41	-2.53	-0.85	-1.11	-6.69	-5.78	-9.73	-12.31	-5.69	-0.80	-1.89	-0.35	-1.17	-0.06	-1.25	1.87	0.90	-0.16	-22.98
90	-22.98	-1.14	1.82	-0.56	-3.51	-1.29	-0.78	-0.73	-0.60	-0.92	-6.40	-5.47	-9.73	-12.35	-6.24	-0.66	-2.73	-0.33	-1.22	-1.17	0.32	2.23	0.92	-0.51	-22.98
105	-22.98	-0.41	1.58	-0.21	-2.58	0.66	0.52	0.00	-1.04	-1.64	-6.77	-5.48	-9.73	-12.55	-7.34	-1.22	-3.58	-1.55	-2.57	-2.11	1.45	1.64	0.81	-1.84	-22.98
120	-22.98	0.02	1.57	1.33	0.70	2.67	0.72	-1.10	-2.40	-3.30	-8.14	-5.81	-9.73	-13.12	-9.04	-2.41	-4.05	-3.91	-4.25	-2.00	1.21	0.85	0.28	-3.45	-22.98
135	-22.98	0.01	1.88	2.51	1.53	1.92	-0.04	-3.79	-4.67	-5.93	-11.31	-6.58	-9.73	-14.12	-11.38	-3.94	-2.80	-4.80	-4.23	-1.81	-0.54	0.67	-0.98	-4.57	-22.98
150	-22.98	-0.79	1.61	1.34	-0.97	-0.04	-0.19	-5.57	-4.65	-6.26	-12.71	-7.75	-9.73	-14.63	-11.72	-4.08	-0.89	-4.19	-3.63	-1.68	-2.18	0.46	-2.40	-4.20	-22.98
165	-22.98	-2.90	-0.66	-2.37	-2.29	0.01	-0.70	-3.71	-3.00	-4.64	-9.81	-9.45	-9.73	-14.13	-10.47	-3.16	0.06	-5.05	-2.09	-1.20	-1.75	-0.91	-3.47	-3.57	-22.98

# 6.Ant1 data(2450MHz)



f=2500MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-17.69	-4.50	-0.63	-0.03	0.72	0.66	1.09	-1.76	1.48	0.27	-6.39	-10.68	-8.81	-6.95	-8.66	-6.36	-7.87	-2.80	-6.96	-3.88	-3.57	-3.70	-4.74	-4.47	-17.69
15	-17.69	-5.75	0.06	-1.71	-0.89	0.35	-0.28	-0.89	0.92	-0.60	-6.61	-9.97	-8.81	-7.60	-8.09	-5.59	-7.15	-2.65	-4.36	-4.94	-4.76	-3.70	-5.13	-8.14	-17.69
30	-17.69	-6.99	0.07	-3.10	-2.98	-1.44	-1.99	-1.57	0.62	-1.83	-7.57	-9.30	-8.81	-8.25	-7.51	-4.16	-5.26	-3.21	-2.39	-3.51	-3.99	-3.97	-1.25	-6.14	-17.69
45	-17.69	-7.60	-0.66	-4.85	-5.90	-5.35	-4.24	-3.40	-0.65	-3.36	-9.01	-8.37	-8.81	-8.90	-7.02	-2.29	-3.51	-2.08	-1.24	-0.86	-2.32	-1.57	0.75	-2.32	-17.69
60	-17.69	-7.06	-1.02	-4.99	-8.14	-7.25	-6.25	-4.81	-2.59	-4.23	-9.84	-7.54	-8.81	-9.28	-6.55	-0.94	-2.53	-0.53	-0.25	0.68	-0.90	1.13	1.33	-0.36	-17.69
75	-17.69	-5.35	-0.74	-3.42	-6.32	-5.02	-6.39	-4.62	-3.14	-3.85	-9.04	-6.71	-8.81	-9.67	-6.38	-0.37	-2.35	-0.39	0.03	0.35	0.30	2.45	1.40	0.43	-17.69
90	-17.69	-3.33	-0.07	-2.31	-5.14	-2.90	-4.17	-2.88	-1.41	-2.68	-7.75	-6.09	-8.81	-10.03	-6.62	-0.78	-2.62	-1.77	-1.42	-1.50	0.64	2.22	1.19	-0.02	-17.69
105	-17.69	-1.27	0.87	-0.70	-3.56	0.90	-0.54	-1.67	-0.46	-1.96	-6.37	-5.56	-8.81	-10.42	-7.64	-2.17	-2.79	-4.42	-5.91	-4.62	-0.04	0.83	0.60	-1.77	-17.69
120	-17.69	-0.09	1.89	1.83	0.42	3.48	0.92	-2.48	-1.42	-2.55	-5.77	-5.32	-8.81	-10.85	-9.02	-3.69	-2.35	-4.69	-7.67	-5.08	-1.00	0.03	-0.23	-4.00	-17.69
135	-17.69	0.47	2.90	3.60	1.65	2.52	-0.29	-5.18	-4.23	-4.31	-6.08	-5.36	-8.81	-11.39	-9.95	-3.65	-0.73	-2.27	-4.35	-2.50	-1.08	1.02	-1.05	-5.17	-17.69
150	-17.69	0.16	2.66	2.80	-1.42	-1.06	-2.31	-7.21	-6.75	-5.58	-7.22	-5.74	-8.81	-11.63	-8.85	-1.92	1.13	-1.41	-1.95	-0.52	-0.20	1.76	-1.32	-4.48	-17.69
165	-17.69	-1.52	0.33	-1.24	-4.60	-2.18	-5.13	-4.94	-7.61	-6.24	-8.67	-6.40	-8.81	-11.30	-7.60	-0.27	1.95	-2.24	0.39	0.47	0.89	1.20	-1.32	-4.05	-17.69

# 6.Ant1 data(5150MHz)



f=5150MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-35.28	1.93	-4.06	-9.28	-0.03	-0.91	-1.20	-2.76	-2.13	-6.14	-2.72	-6.79	-5.98	-2.02	-3.12	-0.25	0.08	-1.13	-1.63	-1.51	-6.67	-6.28	-5.66	-16.00	-35.28
15	-35.28	2.32	-2.55	-8.37	-2.07	-1.71	-0.94	-0.98	-2.24	-5.20	-2.25	-6.27	-5.98	-2.91	-3.48	-0.86	0.97	-0.34	-2.21	-4.43	-7.31	-12.29	-8.02	-8.69	-35.28
30	-35.28	2.32	-2.08	-6.54	-2.90	-2.46	-0.92	0.28	-2.27	-3.00	-2.26	-6.07	-5.98	-3.59	-4.07	-2.18	0.85	-1.32	-3.32	-3.94	-8.42	-11.83	-10.06	-3.43	-35.28
45	-35.28	1.60	-2.53	-3.33	-1.66	-2.73	1.66	1.90	-1.61	-1.77	-2.57	-6.17	-5.98	-4.24	-4.51	-5.20	-0.40	-3.87	-3.75	-3.09	-7.46	-5.94	-8.83	-1.02	-35.28
60	-35.28	0.36	-1.59	-0.43	0.00	-1.42	2.57	1.66	-1.68	-1.35	-2.94	-6.70	-5.98	-4.51	-4.73	-7.62	-2.07	-4.20	-4.17	-3.40	-7.00	-5.34	-4.66	0.14	-35.28
75	-35.28	-2.07	-0.53	0.82	2.13	2.29	3.87	0.80	-1.52	-0.77	-3.96	-7.24	-5.98	-4.64	-4.61	-6.65	-2.51	-1.55	-2.24	-3.02	-3.87	-7.56	-2.34	0.88	-35.28
90	-35.28	-4.92	-0.77	1.13	4.18	4.41	3.85	-0.01	-0.04	0.04	-4.87	-6.94	-5.98	-4.69	-4.15	-4.85	-1.40	-0.88	-2.17	-1.11	-3.54	-9.09	-1.30	0.68	-35.28
105	-35.28	-6.08	-1.33	1.68	5.96	3.17	0.68	1.38	1.06	0.19	-4.66	-5.69	-5.98	-4.84	-3.56	-2.91	-0.15	0.02	-2.57	1.29	-1.18	-8.31	-1.43	1.16	-35.28
120	-35.28	-4.51	-2.80	-1.88	2.78	0.16	1.51	1.60	0.31	-1.10	-3.37	-3.94	-5.98	-4.97	-3.50	-2.48	-0.67	-1.09	-0.23	0.42	-1.00	-6.03	-0.74	2.33	-35.28
135	-35.28	-3.36	-8.68	-10.34	-2.40	-3.93	-0.93	-1.49	-0.75	-2.15	-1.70	-2.30	-5.98	-5.28	-3.83	-4.13	-1.73	-2.98	0.86	-0.58	-0.28	-4.43	-0.76	2.81	-35.28
150	-35.28	-4.62	-11.47	-5.48	0.18	-3.74	-5.98	-5.84	-2.10	-1.47	-1.53	-1.51	-5.98	-5.98	-4.15	-5.65	-1.78	-1.03	-0.34	-1.54	1.12	-2.64	-1.94	2.33	-35.28
165	-35.28	-9.06	-8.17	-2.57	-1.41	-1.65	-2.00	-3.41	-1.74	-0.25	-2.34	-1.39	-5.98	-6.89	-3.57	-5.60	-2.62	-0.47	-1.88	-1.31	0.89	-3.77	-3.00	1.82	-35.28

# 6.Ant1 data(5500MHz)



f=5500MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-35.26	-0.95	-3.71	-9.20	-6.68	-2.95	-1.96	-2.63	-2.96	-1.64	-3.02	0.98	0.52	-0.36	-0.92	-2.23	-2.80	-3.16	-3.68	-1.79	-5.90	-7.05	-4.57	-16.23	-35.26
15	-35.26	-0.51	-2.16	-4.78	-4.20	-1.31	-2.25	-2.35	-1.55	-2.02	-2.25	1.09	0.52	-0.82	-1.75	-2.84	-2.14	0.10	-2.56	-5.05	-12.35	-16.53	-8.46	-6.71	-35.26
30	-35.26	-0.45	-1.59	-3.01	-2.51	-0.34	-1.50	-0.70	-1.16	-1.96	-1.15	1.39	0.52	-1.15	-1.78	-3.17	-1.05	-0.07	-2.40	-4.37	-9.51	-8.02	-9.44	-3.83	-35.26
45	-35.26	-0.84	-1.72	-1.77	-0.47	1.11	0.25	1.57	-0.57	-0.10	0.49	1.64	0.52	-1.48	-1.15	-1.79	-2.38	-1.90	-5.04	-3.73	-8.04	-7.29	-9.89	-3.15	-35.26
60	-35.26	-1.71	-1.34	-0.15	1.03	2.09	2.84	3.44	0.46	1.75	1.55	1.73	0.52	-1.74	-0.66	-0.52	-4.51	-3.01	-3.18	-1.98	-5.72	-5.92	-9.36	-2.23	-35.26
75	-35.26	-3.47	-1.18	1.42	1.79	3.91	3.44	3.03	0.69	2.72	1.76	1.55	0.52	-1.89	-0.91	0.07	-1.23	-0.56	-0.56	-1.86	-2.76	-4.31	-6.74	-0.55	-35.26
90	-35.26	-5.33	-1.41	2.44	3.62	5.38	3.45	1.60	0.86	1.46	0.77	1.19	0.52	-1.52	-1.65	-1.16	0.21	0.51	0.85	-0.72	-3.42	-5.66	-5.31	0.75	-35.26
105	-35.26	-5.24	-0.99	3.44	4.06	2.64	0.70	3.10	1.58	0.31	-0.67	0.47	0.52	-0.74	-2.38	-3.30	-0.08	0.74	-0.90	-0.24	-1.11	-5.11	-3.69	1.12	-35.26
120	-35.26	-3.42	-3.27	-0.33	1.03	-0.41	-0.52	2.00	0.69	0.36	-0.76	-0.01	0.52	0.09	-2.00	-1.91	0.38	0.28	-1.30	-0.86	-4.29	-5.16	-2.36	0.29	-35.26
135	-35.26	-2.28	-8.86	-16.76	-0.69	-0.32	-0.29	-2.23	-1.00	0.03	0.49	-0.17	0.52	0.71	-1.67	-0.77	1.11	-0.17	-0.24	-1.24	-8.96	-6.18	-2.46	-1.19	-35.26
150	-35.26	-3.13	-13.70	-3.65	2.26	-2.11	-4.71	-1.07	-0.31	-0.18	0.89	0.05	0.52	1.02	-2.05	-1.15	0.43	-1.88	0.14	-4.47	-4.87	-4.07	-3.96	-1.90	-35.26
165	-35.26	-7.82	-6.76	-1.00	1.14	-4.27	-9.19	-3.59	-1.67	-1.00	0.15	0.05	0.52	1.11	-2.72	-1.55	-1.08	-1.59	-1.97	-5.03	-4.90	-4.20	-3.83	-1.57	-35.26

# 6.Ant1 data(5850MHz)



f=5850MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-37.75	-7.60	-8.86	-6.63	-0.41	-1.35	-2.99	-2.43	-2.05	-2.36	-0.19	0.95	1.73	1.16	-0.93	-4.39	-3.49	-5.21	-4.61	-6.18	-15.18	-11.71	-3.15	-8.24	-37.75
15	-37.75	-5.67	-4.93	-4.87	-0.02	-0.69	-2.49	-2.35	-2.78	-1.50	-0.55	0.82	1.73	1.60	-0.95	-5.71	-5.62	-6.66	-4.33	-12.90	-13.98	-12.23	-9.06	-5.54	-37.75
30	-37.75	-4.20	-2.61	-1.89	0.73	-0.82	-1.90	-1.07	-3.11	-1.13	-0.99	0.90	1.73	2.00	-0.52	-4.33	-7.77	-8.47	-7.78	-12.58	-8.02	-9.32	-15.86	-6.57	-37.75
45	-37.75	-2.91	-1.42	-1.68	0.42	-0.28	-0.21	-0.47	-2.53	-0.76	-1.08	1.03	1.73	2.28	0.35	-2.14	-3.80	-5.14	-8.14	-6.60	-5.99	-5.74	-8.61	-5.76	-37.75
60	-37.75	-2.49	-0.14	-2.37	0.61	0.79	1.30	0.03	-1.72	0.36	-0.27	1.51	1.73	2.43	0.63	-0.65	-1.21	-1.10	-3.26	-1.87	-3.94	-4.64	-6.93	-2.76	-37.75
75	-37.75	-2.97	-0.52	-1.63	1.23	2.84	3.61	0.77	2.33	2.10	1.27	2.23	1.73	2.49	0.17	0.25	-1.93	-0.25	-1.63	-0.75	-4.02	-2.46	-7.25	-0.71	-37.75
90	-37.75	-4.75	-2.21	-0.63	3.29	4.32	3.57	2.15	3.28	2.11	2.18	2.79	1.73	2.37	-0.19	0.15	-2.73	-3.19	-2.39	-3.36	-4.04	-3.31	-6.73	-0.69	-37.75
105	-37.75	-6.87	-1.26	2.39	4.07	2.36	1.30	2.63	2.90	0.63	2.76	3.07	1.73	2.11	0.37	0.08	-1.62	-0.56	-1.14	-2.78	-1.42	-4.21	-5.46	-2.41	-37.75
120	-37.75	-5.69	-0.93	0.81	-0.68	0.66	1.09	0.74	1.29	1.39	2.79	2.79	1.73	1.81	0.70	0.15	-0.89	-0.13	-0.43	-2.90	-2.94	-4.88	-3.02	-4.32	-37.75
135	-37.75	-4.12	-5.19	-5.30	-3.61	-2.48	-2.85	0.82	-0.27	1.63	2.28	2.12	1.73	1.50	0.46	0.28	-1.00	-1.40	-1.31	-2.05	-3.51	-4.61	-1.26	-5.56	-37.75
150	-37.75	-6.11	-7.07	-1.88	-0.13	-4.86	-4.96	0.25	-0.70	-0.28	1.31	1.43	1.73	1.36	0.25	-0.11	-2.89	-2.44	-2.35	-3.77	-5.71	-5.43	-3.05	-6.58	-37.75
165	-37.75	-11.48	-1.90	-4.01	-1.88	-6.88	-5.72	-2.23	-1.48	-2.66	-0.02	1.01	1.73	1.22	0.22	-1.61	-2.96	-3.66	-2.00	-4.26	-2.79	-6.19	-7.92	-7.91	-37.75



# 6.Ant2 data(2400MHz)

f=2400MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-18.99	-4.51	-1.24	-1.40	-0.41	-0.53	0.79	1.38	0.53	0.83	0.34	-3.23	-9.77	-12.22	-10.51	-7.60	-5.31	-5.16	-3.00	-2.49	-7.06	-3.97	-1.82	-4.54	-18.99
15	-18.99	-4.42	-1.21	-1.78	-1.33	-0.24	0.14	0.51	0.11	0.74	-0.08	-3.38	-9.77	-12.74	-11.33	-7.23	-5.70	-5.82	-2.29	-3.04	-5.54	-3.64	-1.66	-4.67	-18.99
30	-18.99	-4.20	-1.76	-2.40	-2.30	-0.60	-0.63	-0.70	-0.03	0.66	-0.80	-3.89	-9.77	-12.77	-11.49	-7.36	-6.38	-7.53	-1.94	-4.24	-4.57	-2.52	-1.67	-4.16	-18.99
45	-18.99	-3.57	-2.24	-3.49	-3.68	-1.30	-2.13	-2.05	0.22	0.30	-2.10	-4.84	-9.77	-12.35	-11.05	-7.58	-7.36	-6.87	-1.72	-5.57	-3.64	-0.93	-1.77	-3.16	-18.99
60	-18.99	-2.74	-1.71	-3.03	-4.68	-1.56	-3.32	-2.52	0.54	-0.16	-3.54	-5.90	-9.77	-11.64	-9.78	-6.52	-6.75	-4.10	-0.95	-4.03	-2.32	0.27	-1.33	-2.35	-18.99
75	-18.99	-1.93	-0.93	-1.56	-3.26	-0.92	-3.22	-2.45	0.23	-1.02	-5.46	-7.19	-9.77	-10.25	-7.78	-4.62	-4.85	-2.21	-0.10	-0.95	-0.67	1.11	-0.14	-1.82	-18.99
90	-18.99	-1.68	-0.57	-0.75	-2.02	0.20	-2.22	-2.86	-0.79	-1.87	-6.66	-8.15	-9.77	-8.57	-5.75	-2.89	-3.16	-1.50	0.50	0.91	0.13	1.55	0.79	-1.77	-18.99
105	-18.99	-1.91	-0.68	-0.50	-2.42	0.08	-1.75	-4.53	-3.05	-3.11	-7.40	-9.10	-9.77	-6.80	-3.65	-1.36	-1.58	-1.45	0.59	1.58	-0.36	1.44	1.15	-2.08	-18.99
120	-18.99	-2.35	-1.02	-0.57	-3.55	-1.31	-2.60	-6.93	-5.84	-4.57	-7.74	-9.84	-9.77	-5.57	-2.13	-0.34	-0.30	-1.12	0.27	1.10	-1.41	0.99	0.61	-2.60	-18.99
135	-18.99	-2.89	-1.59	-1.02	-4.70	-2.83	-4.04	-9.05	-8.19	-6.73	-8.36	-10.45	-9.77	-4.41	-0.89	0.38	0.65	-0.10	0.23	-0.25	-1.80	0.27	-0.73	-3.31	-18.99
150	-18.99	-3.36	-1.99	-1.80	-5.95	-3.07	-4.20	-8.10	-7.31	-8.08	-8.96	-10.91	-9.77	-3.75	-0.15	0.60	0.89	0.76	0.70	-1.18	-1.04	-0.33	-1.78	-3.92	-18.99
165	-18.99	-4.00	-1.87	-3.00	-7.78	-2.68	-3.48	-6.20	-5.61	-8.08	-9.53	-11.58	-9.77	-3.38	0.19	0.65	0.70	1.32	1.04	-1.14	-0.37	-1.22	-1.86	-4.40	-18.99

# 6.Ant2 data(2450MHz)



f=2450MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-17.66	-2.07	-2.99	-4.39	-1.83	-0.98	-0.04	0.78	-0.65	-0.12	0.08	-3.70	-9.35	-11.57	-6.88	-4.87	-2.44	-1.40	0.55	1.02	-2.04	-5.44	-2.23	-5.41	-17.66
15	-17.66	-2.10	-2.46	-3.89	-1.91	-0.58	-0.30	0.37	-0.43	-0.06	-0.32	-3.82	-9.35	-12.17	-7.54	-4.84	-2.71	-1.61	1.03	0.74	-1.19	-5.01	-2.05	-4.73	-17.66
30	-17.66	-1.66	-1.16	-3.12	-2.04	-0.48	-0.94	-0.23	0.07	0.23	-1.08	-4.24	-9.35	-11.93	-8.82	-5.85	-3.51	-3.11	0.53	-0.30	-1.62	-4.39	-2.42	-3.67	-17.66
45	-17.66	-0.86	0.34	-1.79	-2.86	-0.25	-2.04	-0.78	0.78	0.28	-2.37	-4.74	-9.35	-11.21	-10.19	-7.58	-5.65	-5.94	-1.71	-2.71	-3.30	-3.64	-3.03	-2.36	-17.66
60	-17.66	-0.15	1.42	-0.27	-2.73	0.22	-2.17	-1.14	1.19	0.05	-3.75	-5.14	-9.35	-10.42	-10.05	-6.58	-7.30	-5.92	-3.10	-4.83	-4.44	-2.32	-2.70	-1.36	-17.66
75	-17.66	0.41	1.77	0.42	-1.43	1.33	-1.31	-1.81	0.66	-0.89	-5.62	-5.54	-9.35	-9.18	-7.64	-3.22	-5.46	-2.66	-0.69	-1.70	-2.53	0.04	-0.77	-0.61	-17.66
90	-17.66	0.47	1.28	-0.04	-1.83	1.78	-0.51	-2.92	-0.88	-2.27	-6.98	-5.85	-9.35	-7.83	-5.16	-0.84	-2.81	-0.38	1.53	1.46	-0.18	1.82	1.01	-0.33	-17.66
105	-17.66	-0.09	-0.17	-1.32	-4.65	0.05	-1.12	-5.33	-4.35	-4.94	-8.15	-6.38	-9.35	-6.55	-3.03	0.64	-1.00	0.47	2.22	2.84	0.92	2.65	2.11	-0.39	-17.66
120	-17.66	-1.07	-1.99	-2.33	-6.14	-3.00	-3.89	-10.10	-8.76	-8.46	-8.62	-7.04	-9.35	-5.80	-1.66	1.05	-0.30	0.19	1.38	2.53	0.62	2.32	2.08	-0.68	-17.66
135	-17.66	-2.57	-3.92	-3.26	-5.35	-3.79	-6.32	-14.43	-9.10	-11.62	-8.38	-7.97	-9.35	-5.03	-0.67	0.92	-0.20	-0.17	-0.22	1.00	-0.53	0.80	1.03	-1.09	-17.66
150	-17.66	-3.95	-4.15	-3.95	-4.81	-1.69	-3.20	-6.39	-5.29	-9.01	-7.62	-8.99	-9.35	-4.43	-0.14	0.53	-0.50	0.02	-0.82	-0.68	-1.34	-1.21	-0.62	-1.43	-17.66
165	-17.66	-5.15	-2.89	-4.60	-4.17	0.15	-0.49	-2.38	-2.84	-5.96	-7.02	-10.40	-9.35	-3.96	-0.05	0.22	-0.83	0.43	-0.47	-1.59	-1.64	-3.60	-2.34	-1.78	-17.66

# 6.Ant2 data(2500MHz)

f=2500MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-17.10	-1.02	0.08	-3.37	-1.96	-3.18	-2.56	-1.63	-3.93	-0.78	-0.11	-4.64	-10.58	-8.11	-4.79	-2.34	-1.53	-0.25	1.38	2.03	0.36	-1.79	-0.31	-6.24	-17.10
15	-17.10	-1.05	-0.41	-3.80	-2.29	-2.53	-2.02	-1.79	-2.67	-0.96	-0.78	-4.76	-10.58	-9.27	-5.67	-2.37	-1.90	-0.07	1.95	1.75	0.99	-1.17	-0.38	-5.18	-17.10
30	-17.10	-1.04	0.24	-3.29	-2.00	-1.15	-1.69	-1.57	-0.93	-0.70	-1.71	-5.24	-10.58	-10.23	-6.76	-3.32	-2.72	-1.09	1.92	0.96	0.61	-1.26	-1.06	-4.46	-17.10
45	-17.10	-0.74	1.42	-1.35	-2.56	0.15	-1.64	-1.22	0.55	-0.63	-3.29	-5.81	-10.58	-11.48	-9.25	-6.66	-5.11	-4.22	0.03	-1.11	-1.28	-2.41	-2.26	-3.70	-17.10
60	-17.10	-0.40	2.25	0.55	-1.79	0.62	-1.78	-1.27	0.99	-1.18	-4.63	-6.20	-10.58	-12.94	-12.36	-12.76	-9.21	-8.56	-3.43	-3.55	-4.32	-3.36	-2.80	-3.08	-17.10
75	-17.10	-0.41	1.86	0.75	-0.14	1.96	-2.12	-2.64	0.19	-2.59	-5.15	-6.37	-10.58	-13.55	-13.87	-10.25	-8.78	-7.89	-3.02	-1.43	-5.69	-1.46	-1.69	-2.42	-17.10
90	-17.10	-0.98	0.25	-1.05	-1.19	2.45	-1.28	-4.82	-1.65	-3.96	-4.51	-6.22	-10.58	-11.72	-9.66	-4.15	-3.86	-3.36	0.65	1.61	-2.63	1.04	0.11	-1.94	-17.10
105	-17.10	-2.40	-3.55	-5.16	-5.35	0.42	-1.82	-6.69	-4.57	-5.04	-3.84	-6.16	-10.58	-9.27	-5.23	-0.53	-0.71	-1.34	2.03	2.63	-0.33	2.56	1.69	-1.58	-17.10
120	-17.10	-4.34	-7.39	-8.02	-6.79	-2.58	-5.52	-10.96	-6.84	-5.64	-3.66	-6.33	-10.58	-7.65	-2.79	0.95	0.30	-1.21	1.22	1.99	0.46	2.82	2.34	-1.38	-17.10
135	-17.10	-6.89	-6.14	-6.22	-4.12	-2.12	-5.18	-9.95	-6.56	-5.69	-3.92	-6.49	-10.58	-6.23	-1.07	1.24	-0.21	-1.72	-0.86	0.38	0.39	2.08	2.25	-1.15	-17.10
150	-17.10	-8.10	-3.11	-3.94	-2.29	0.10	-1.11	-4.04	-4.08	-4.68	-4.07	-6.68	-10.58	-5.43	-0.31	0.75	-1.65	-1.89	-2.40	-1.32	-0.25	0.55	1.73	-1.02	-17.10
165	-17.10	-7.42	-1.10	-2.27	-1.06	1.62	0.88	-1.27	-2.01	-3.19	-4.19	-7.25	-10.58	-4.90	-0.05	-0.08	-3.53	-1.61	-2.80	-2.94	-1.30	-1.78	0.85	-1.01	-17.10

# 6.Ant2 data(5150MHz)



f=5150MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-37.88	-5.02	-13.58	-17.94	-13.84	-8.52	-5.92	-4.05	-1.83	-2.24	-1.32	0.19	0.57	-0.58	-4.17	-4.78	-2.03	-4.34	-3.82	-3.98	-0.79	-0.34	-4.37	-3.42	-37.88
15	-37.88	-7.07	-7.31	-9.97	-8.06	-4.13	-4.57	-5.42	-2.70	-1.90	-1.08	0.22	0.57	-0.91	-3.91	-5.35	-1.16	-3.63	-3.04	-3.11	0.58	-0.61	-5.44	-4.12	-37.88
30	-37.88	-9.25	-4.48	-6.65	-4.38	-1.04	-3.73	-6.57	-2.16	-1.58	-0.61	0.20	0.57	-1.07	-3.45	-5.42	-1.03	-4.06	-3.76	-2.09	1.24	-1.94	-7.86	-4.30	-37.88
45	-37.88	-7.58	-6.11	-4.72	-2.70	-2.92	-2.19	-1.33	-0.43	-1.71	-0.20	0.25	0.57	-1.07	-3.23	-4.37	-1.89	-2.85	-3.81	-2.90	0.22	-3.57	-11.04	-3.92	-37.88
60	-37.88	-4.26	-9.34	-3.91	-3.31	-1.08	0.94	1.05	-0.26	-1.44	-0.06	0.44	0.57	-0.86	-3.22	-3.47	-2.67	-2.04	-4.63	-4.18	-2.03	-3.37	-10.04	-3.75	-37.88
75	-37.88	-1.67	-6.12	-0.25	2.66	1.85	1.51	1.08	-0.22	-0.57	0.25	0.81	0.57	-0.44	-2.45	-3.91	-1.73	-2.36	-5.87	-4.19	-0.99	-1.14	-8.45	-4.10	-37.88
90	-37.88	-0.38	-1.52	0.93	3.78	3.36	3.02	2.82	1.45	0.45	1.00	1.22	0.57	0.05	-1.29	-5.00	-1.41	-1.52	-1.58	-4.13	-1.14	-1.56	-5.66	-4.18	-37.88
105	-37.88	-0.07	-0.18	2.20	1.72	3.81	3.34	3.07	2.05	0.99	1.38	1.50	0.57	0.51	-0.69	-4.39	-1.92	-1.95	-0.31	-4.71	-5.97	-3.61	-3.86	-3.36	-37.88
120	-37.88	-0.50	-1.83	0.89	1.94	0.72	1.10	0.50	0.34	-0.01	0.68	1.43	0.57	0.60	-1.01	-2.97	-2.44	-3.78	-3.52	-4.62	-6.81	-3.61	-3.31	-2.84	-37.88
135	-37.88	-0.96	-4.47	-1.93	0.34	-1.28	-2.38	-2.23	-3.41	-1.97	-0.91	1.03	0.57	0.65	-1.32	-1.20	-2.15	-4.22	-4.31	-4.04	-6.50	-2.73	-2.48	-2.79	-37.88
150	-37.88	-1.51	-5.27	-2.49	-1.18	-3.05	-4.75	-2.83	-4.07	-3.22	-2.59	0.50	0.57	0.48	-1.28	-1.19	-1.03	-2.53	-7.23	-4.89	-8.61	-4.73	-4.17	-3.05	-37.88
165	-37.88	-2.55	-5.35	-1.33	-1.24	-4.49	-4.95	-4.83	-3.01	-3.99	-3.99	-0.15	0.57	0.22	-1.21	-1.88	-0.67	-2.45	-6.62	-7.33	-14.14	-10.81	-9.58	-3.84	-37.88

# 6.Ant2 data(5500MHz)



f=5500MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-37.62	-5.94	-8.65	-13.95	-20.51	-7.54	-4.15	-3.75	-0.91	-0.26	0.76	1.68	0.06	-1.42	-2.73	-4.40	-2.79	-5.82	-5.96	-6.74	-4.00	-0.16	-0.28	-5.94	-37.62
15	-37.62	-9.69	-6.65	-7.92	-5.99	-3.25	-3.44	-5.12	-0.83	0.38	1.14	1.86	0.06	-0.97	-3.97	-4.56	-2.17	-4.48	-6.12	-6.90	-2.65	-0.33	-0.06	-5.14	-37.62
30	-37.62	-16.70	-6.24	-6.11	-3.93	-0.99	-4.55	-2.47	-0.08	0.85	1.57	1.84	0.06	-0.70	-4.54	-4.47	-0.93	-1.13	-3.83	-5.10	-2.40	-1.18	-1.82	-3.86	-37.62
45	-37.62	-11.45	-8.10	-7.16	-1.80	-1.93	-0.86	1.41	-0.61	1.30	2.04	1.84	0.06	-0.16	-3.24	-5.96	-1.01	0.50	-2.86	-3.25	-3.47	-2.01	-4.00	-2.91	-37.62
60	-37.62	-4.81	-6.91	-4.50	-2.26	-2.32	1.73	0.39	-0.61	2.01	2.27	1.80	0.06	0.16	-1.39	-7.70	-2.12	-1.14	-3.12	-2.06	-3.01	-2.90	-3.60	-2.28	-37.62
75	-37.62	-0.75	-5.62	-0.26	1.95	0.03	0.60	1.37	1.74	2.24	2.29	1.59	0.06	0.22	-0.24	-5.84	-2.91	-0.34	-2.84	-2.27	-2.89	-3.44	-2.60	-2.31	-37.62
90	-37.62	0.92	-2.35	-2.04	3.02	1.80	2.99	3.29	1.29	1.83	1.92	1.30	0.06	0.37	0.00	-4.00	-5.42	-1.33	-4.83	-6.26	-4.83	-4.13	-4.31	-3.45	-37.62
105	-37.62	1.36	-0.07	-0.17	0.39	3.18	1.92	1.54	-0.53	0.18	0.73	0.71	0.06	0.59	0.25	-3.77	-10.33	-3.47	-7.02	-7.07	-9.79	-8.15	-7.28	-4.84	-37.62
120	-37.62	0.89	-0.48	0.22	0.72	1.09	1.55	0.66	-0.59	-1.37	-0.47	0.02	0.06	0.77	0.05	-3.80	-3.28	-3.28	-7.42	-6.96	-8.85	-9.72	-7.65	-4.53	-37.62
135	-37.62	-0.22	-1.49	-1.42	-0.56	0.71	1.27	-0.08	0.19	-1.68	-1.40	-0.58	0.06	1.06	-0.05	-1.30	-0.60	-4.05	-8.23	-13.69	-12.59	-7.33	-7.12	-3.99	-37.62
150	-37.62	-1.60	-2.02	-1.01	-2.63	-2.44	-0.40	-1.20	-0.64	-2.04	-1.82	-1.07	0.06	1.23	0.11	-0.62	-0.53	-2.80	-6.44	-9.57	-13.70	-7.92	-6.35	-4.08	-37.62
165	-37.62	-3.98	-1.69	-0.52	-3.71	-6.04	-3.13	-4.09	-2.45	-3.29	-2.02	-1.61	0.06	1.39	0.39	-0.46	-0.17	-2.51	-6.24	-8.46	-13.23	-13.38	-8.57	-4.59	-37.62

# 6.Ant2 data(5850MHz)

f=5850MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-38.22	-4.03	-8.27	-15.72	-13.07	-6.02	-6.36	-6.07	-5.09	-5.04	-0.98	-2.13	-2.00	0.08	2.93	1.60	-0.12	-1.52	-1.45	-4.58	-3.24	0.10	-0.18	-2.45	-38.22
15	-38.22	-5.39	-6.61	-9.24	-3.85	-3.04	-7.01	-3.39	-3.09	-3.48	-0.70	-1.51	-2.00	-0.16	3.11	1.32	-1.37	-2.20	-2.10	-4.51	-3.93	-0.16	-0.99	-1.26	-38.22
30	-38.22	-7.32	-6.14	-4.23	-0.75	-2.05	-5.57	-1.87	-1.89	-3.31	-0.45	-1.06	-2.00	-0.53	3.18	1.58	-1.52	-2.20	-2.59	-4.88	-3.78	-0.46	-1.40	-0.06	-38.22
45	-38.22	-10.53	-6.23	-6.07	-4.05	-1.92	-2.61	-1.35	-2.33	-1.61	0.14	-0.67	-2.00	-0.98	2.63	2.69	0.47	-0.05	-0.99	-2.89	-2.79	-0.09	-0.90	0.23	-38.22
60	-38.22	-7.84	-5.77	-7.44	-2.15	-0.44	-0.05	0.06	0.47	0.74	0.77	-0.53	-2.00	-1.44	1.77	3.17	0.80	1.39	0.64	-1.04	-3.22	-0.26	-0.06	-0.22	-38.22
75	-38.22	-3.66	-4.12	-1.76	-0.30	1.07	1.32	2.22	2.32	1.08	1.02	-0.70	-2.00	-1.93	0.64	2.66	-0.15	2.18	1.02	1.33	-1.36	-1.85	0.26	-0.61	-38.22
90	-38.22	-2.09	-4.48	-3.84	-0.02	1.68	2.75	3.05	2.55	0.88	0.53	-0.83	-2.00	-2.30	-0.50	1.17	-1.56	0.30	0.18	0.58	-4.92	-4.75	-0.94	-0.73	-38.22
105	-38.22	-1.38	-3.60	-4.99	-0.55	3.10	2.31	4.00	3.42	1.22	0.05	-0.75	-2.00	-2.87	-1.64	-0.14	-3.40	-1.71	-1.36	-1.53	-3.67	-6.19	-3.10	-1.02	-38.22
120	-38.22	-1.05	-3.19	-3.17	-2.53	2.65	1.77	3.40	3.43	1.92	0.63	-0.54	-2.00	-3.25	-1.70	-1.60	-3.86	-0.85	-3.41	-3.52	-3.24	-6.77	-4.17	-0.98	-38.22
135	-38.22	-1.45	-1.58	-0.64	-4.23	0.25	1.42	1.50	2.44	1.85	1.29	-0.31	-2.00	-3.27	-1.76	-3.48	-3.30	-5.25	-7.46	-6.17	-8.46	-13.67	-9.20	-1.22	-38.22
150	-38.22	-2.13	-0.18	0.59	-4.15	-2.88	1.07	-0.35	1.16	1.65	2.03	-0.03	-2.00	-2.91	-2.01	-4.52	-6.18	-12.41	-12.34	-8.69	-7.79	-10.35	-12.39	-2.31	-38.22
165	-38.22	-2.39	0.23	0.51	-3.59	-4.92	-0.04	-1.44	0.31	1.57	2.56	0.20	-2.00	-2.52	-1.60	-5.84	-7.57	-6.90	-6.23	-6.86	-10.19	-13.73	-10.42	-3.38	-38.22



# 6.BT data(2400MHz)



f=2400MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-36.80	-11.72	-3.81	-1.53	-2.38	-2.15	-1.82	-2.55	-4.45	-3.87	-6.27	-7.49	-6.40	-5.24	-4.09	-5.72	-7.63	-7.41	-5.88	-5.01	-3.38	-5.02	-6.05	-6.26	-36.80
15	-36.80	-10.96	-1.78	-0.57	-0.51	-0.94	-1.42	-2.12	-3.96	-3.55	-6.11	-7.89	-6.40	-4.52	-3.20	-5.73	-7.88	-8.19	-5.22	-4.44	-2.51	-3.22	-4.99	-4.83	-36.80
30	-36.80	-9.88	-0.19	0.09	0.45	0.18	-1.29	-1.90	-3.76	-3.81	-6.13	-8.09	-6.40	-4.32	-3.64	-8.87	-17.77	-16.30	-7.43	-4.54	-2.27	-1.99	-4.28	-3.99	-36.80
45	-36.80	-8.26	0.77	0.63	0.49	0.74	-1.48	-2.12	-3.86	-4.12	-6.34	-8.25	-6.40	-4.46	-4.96	-11.93	-9.36	-5.79	-4.29	-2.21	-1.20	-1.18	-3.59	-3.66	-36.80
60	-36.80	-6.72	0.83	0.94	-0.22	0.03	-2.10	-3.12	-4.70	-4.42	-6.37	-8.40	-6.40	-4.76	-6.17	-9.86	-5.68	-3.61	-3.46	-1.76	-0.43	-1.06	-3.11	-3.88	-36.80
75	-36.80	-5.17	0.25	0.98	-0.01	-0.69	-2.23	-2.83	-4.35	-4.06	-5.85	-8.61	-6.40	-5.11	-6.96	-8.86	-6.50	-5.38	-5.08	-2.82	-0.53	-0.90	-2.69	-4.62	-36.80
90	-36.80	-4.27	-0.37	0.60	0.61	-0.28	-2.25	-2.50	-3.57	-3.30	-5.24	-8.85	-6.40	-5.34	-6.98	-8.77	-7.53	-6.14	-4.31	-2.10	-0.99	-0.14	-2.34	-5.63	-36.80
105	-36.80	-3.93	-0.88	-0.13	-0.03	-0.88	-3.51	-4.21	-4.20	-3.21	-5.12	-9.17	-6.40	-5.53	-6.56	-8.44	-6.76	-4.10	-2.19	-0.67	-1.23	0.62	-2.13	-7.09	-36.80
120	-36.80	-4.34	-1.44	-0.95	-1.70	-2.88	-5.73	-8.07	-6.14	-4.32	-5.96	-9.31	-6.40	-5.71	-6.31	-8.08	-6.93	-3.90	-2.18	-0.77	-1.63	0.47	-2.35	-8.55	-36.80
135	-36.80	-5.54	-2.55	-2.15	-3.82	-4.18	-5.00	-8.50	-8.12	-6.95	-7.93	-8.84	-6.40	-6.02	-6.31	-7.59	-8.14	-5.03	-3.73	-2.25	-3.07	-0.66	-3.12	-10.20	-36.80
150	-36.80	-6.81	-4.15	-3.88	-5.87	-5.78	-5.86	-8.21	-11.14	-9.75	-8.63	-7.77	-6.40	-6.43	-6.37	-6.68	-8.13	-5.42	-4.77	-3.52	-4.50	-1.81	-4.02	-11.33	-36.80
165	-36.80	-7.23	-6.07	-5.92	-5.56	-7.88	-11.00	-11.47	-12.58	-8.27	-6.20	-6.30	-6.40	-6.99	-6.37	-5.10	-6.18	-4.11	-3.50	-3.32	-4.21	-2.15	-4.60	-11.89	-36.80

# 6.BT data(2450MHz)



f=2450MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-39.06	-10.76	-1.68	0.56	-1.10	-0.84	-1.17	-1.84	-3.61	-3.31	-5.04	-6.29	-5.22	-5.09	-5.35	-6.08	-6.58	-8.53	-6.72	-6.31	-4.90	-9.43	-13.47	-7.92	-39.06
15	-39.06	-9.16	-0.33	0.11	-0.96	-1.36	-2.06	-3.15	-4.61	-4.35	-5.94	-7.17	-5.22	-4.64	-4.24	-5.47	-6.41	-8.01	-4.59	-4.49	-2.95	-5.90	-9.34	-6.06	-39.06
30	-39.06	-7.78	0.76	0.16	0.32	0.30	-0.61	-1.80	-3.90	-4.89	-6.77	-7.78	-5.22	-4.59	-4.48	-7.82	-14.93	-16.95	-7.92	-5.59	-3.00	-3.23	-6.82	-4.67	-39.06
45	-39.06	-6.27	1.61	1.13	1.44	1.83	0.18	-0.93	-2.99	-4.40	-7.11	-8.22	-5.22	-4.78	-5.55	-9.07	-8.54	-5.01	-4.53	-2.22	-1.45	-1.37	-4.56	-3.84	-39.06
60	-39.06	-4.98	1.81	1.89	0.96	1.44	-0.44	-1.95	-3.22	-3.85	-6.77	-8.43	-5.22	-4.97	-6.51	-7.44	-4.74	-2.38	-2.88	-1.04	0.03	-0.94	-3.30	-3.75	-39.06
75	-39.06	-3.60	1.52	2.08	0.48	0.17	-1.00	-2.09	-2.89	-3.04	-5.95	-8.54	-5.22	-5.06	-7.05	-6.76	-5.09	-3.98	-3.65	-1.95	0.21	-0.70	-2.59	-4.32	-39.06
90	-39.06	-2.69	1.23	1.67	0.98	0.31	-1.31	-1.94	-2.51	-2.49	-5.38	-8.57	-5.22	-4.98	-6.88	-6.97	-5.49	-5.02	-3.32	-1.68	-0.49	-0.24	-2.39	-5.35	-39.06
105	-39.06	-2.28	1.05	1.18	0.92	0.23	-1.85	-3.01	-3.07	-2.64	-5.42	-8.51	-5.22	-4.78	-6.14	-7.17	-5.47	-3.86	-2.50	-1.05	-1.49	-0.28	-2.79	-7.05	-39.06
120	-39.06	-2.65	0.55	0.80	-0.07	-1.20	-3.50	-5.79	-4.85	-3.89	-6.29	-8.29	-5.22	-4.63	-5.46	-6.99	-6.20	-3.73	-3.03	-1.67	-2.24	-1.03	-3.66	-8.85	-39.06
135	-39.06	-4.06	-1.02	-0.18	-1.98	-2.57	-4.53	-9.30	-8.82	-7.17	-8.19	-7.70	-5.22	-4.64	-4.94	-6.28	-6.61	-3.80	-3.79	-2.63	-2.90	-1.46	-4.45	-10.87	-39.06
150	-39.06	-6.06	-3.86	-2.30	-4.67	-4.05	-4.90	-7.92	-13.85	-11.61	-9.35	-6.88	-5.22	-4.91	-4.70	-4.95	-5.38	-2.94	-2.87	-1.89	-2.44	-0.64	-4.09	-11.99	-39.06
165	-39.06	-8.16	-10.08	-7.40	-7.92	-8.91	-10.72	-9.96	-11.87	-9.98	-7.53	-5.83	-5.22	-5.54	-4.68	-3.51	-3.69	-1.68	-1.30	-0.77	-1.47	0.38	-2.86	-11.85	-39.06

# 6.BT data(2500MHz)



f=2500MHz	E_total																								
Phi(deg)	Theta(deg)																								
0	-180	-165	-150	-135	-120	-105	-90	-75	-60	-45	-30	-15	0	15	30	45	60	75	90	105	120	135	150	165	180
0	-39.13	-10.74	-3.71	-1.79	-3.64	-3.61	-3.84	-4.32	-4.59	-4.81	-6.41	-9.19	-6.32	-4.30	-4.68	-5.86	-7.67	-7.94	-8.03	-6.76	-5.52	-8.34	-11.29	-8.12	-39.13
15	-39.13	-9.57	-2.07	-1.90	-2.31	-2.95	-3.14	-5.13	-5.39	-5.43	-6.97	-9.61	-6.32	-3.86	-4.14	-6.31	-9.05	-8.59	-6.37	-6.03	-4.35	-6.30	-9.55	-6.91	-39.13
30	-39.13	-8.44	-0.39	-0.67	0.07	-0.23	-0.55	-2.47	-3.88	-4.79	-7.10	-9.88	-6.32	-3.91	-4.91	-10.03	-23.40	-14.64	-7.94	-5.87	-4.16	-4.51	-7.62	-5.65	-39.13
45	-39.13	-7.25	0.91	0.81	1.32	1.29	-0.18	-1.48	-2.91	-4.03	-6.79	-10.15	-6.32	-4.32	-6.64	-11.81	-8.32	-5.69	-4.69	-2.32	-2.20	-2.82	-5.56	-4.72	-39.13
60	-39.13	-6.20	1.23	1.45	0.65	1.02	-1.09	-2.50	-3.55	-3.86	-6.31	-10.39	-6.32	-4.83	-7.86	-8.97	-5.20	-3.46	-3.85	-1.55	-0.66	-1.76	-4.20	-4.43	-39.13
75	-39.13	-4.93	0.93	1.80	0.02	-0.25	-1.63	-2.44	-3.60	-3.21	-5.56	-10.61	-6.32	-5.42	-8.06	-7.51	-5.85	-5.57	-4.90	-2.85	-0.62	-0.89	-3.29	-4.68	-39.13
90	-39.13	-3.94	0.59	1.76	0.74	-0.37	-2.63	-2.58	-3.05	-2.37	-5.09	-10.69	-6.32	-5.89	-7.64	-6.98	-5.93	-5.70	-3.47	-2.05	-1.38	-0.44	-3.03	-5.38	-39.13
105	-39.13	-3.28	0.30	1.23	0.51	-0.53	-3.92	-4.29	-3.24	-2.09	-5.32	-10.45	-6.32	-6.41	-7.30	-7.20	-5.93	-3.93	-2.41	-1.10	-2.21	-0.59	-3.51	-6.67	-39.13
120	-39.13	-3.35	-0.32	0.44	-0.75	-2.18	-5.34	-6.98	-4.51	-2.96	-6.43	-9.69	-6.32	-6.91	-7.29	-7.79	-7.26	-4.37	-3.39	-2.03	-2.77	-1.15	-4.53	-8.06	-39.13
135	-39.13	-4.30	-1.93	-0.98	-2.77	-3.83	-5.29	-9.76	-7.59	-5.81	-8.43	-8.16	-6.32	-7.54	-7.14	-7.34	-7.45	-4.39	-3.67	-2.60	-2.77	-1.41	-5.44	-9.69	-39.13
150	-39.13	-5.84	-4.44	-3.14	-5.54	-5.76	-6.38	-11.55	-13.42	-9.54	-8.72	-6.64	-6.32	-8.11	-6.59	-5.73	-5.62	-3.59	-2.96	-2.09	-2.69	-1.17	-5.29	-10.81	-39.13
165	-39.13	-7.72	-8.87	-7.12	-7.42	-8.40	-11.12	-10.97	-11.31	-8.21	-6.39	-5.16	-6.32	-8.72	-6.17	-4.56	-4.24	-3.38	-3.01	-2.47	-3.18	-1.24	-4.56	-11.24	-39.13

***Thanks!***