

Shenzhen ATN communication equipment co., ltd

Antenna test report

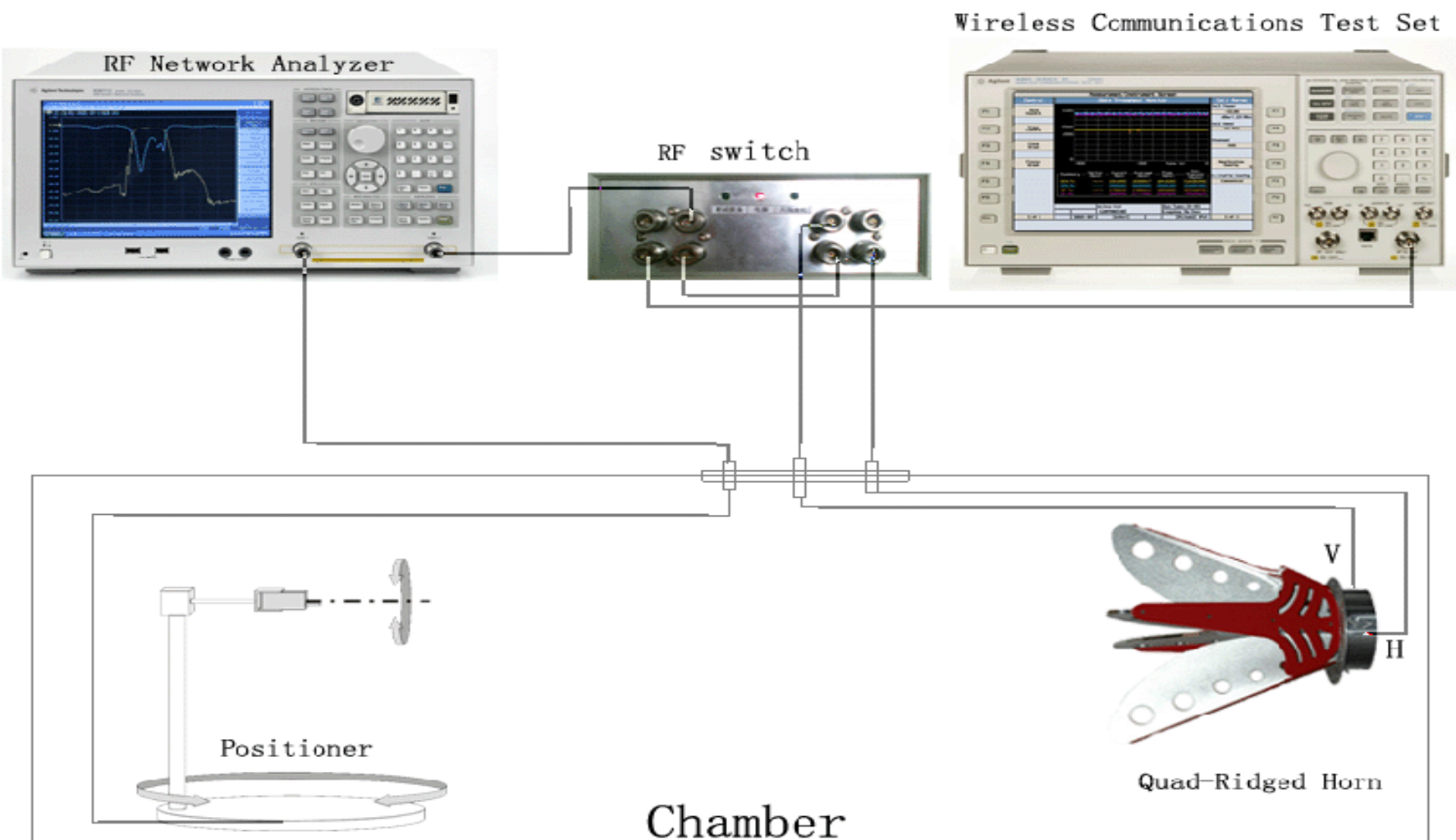
Customer:	Bei jing Ancsonic Technology Co.,Ltd	Project:	T9	Date:	2026.07.04
Frequency band	2.4G-2.48G				
Report version number	A4.0				
Antenna structure	FPC, PIFA antenna				

Address: 504-505, Meishengchuanggu Xiagu, Longchang Road, Xin 'an Street, Baoan District, Shenzhen.

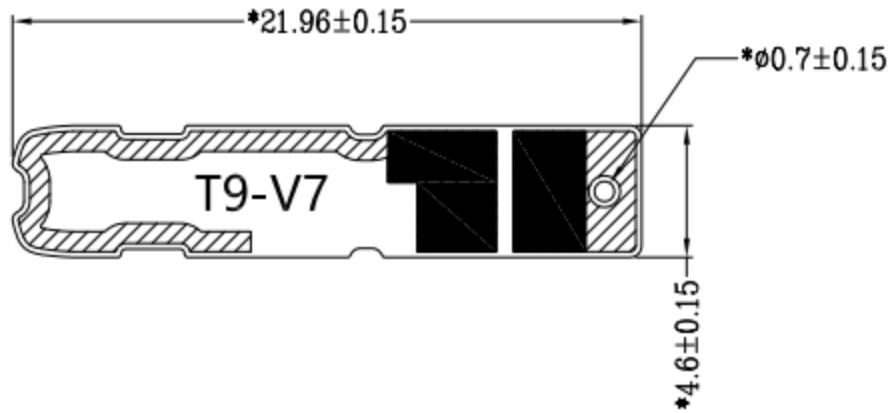
Tel: 0755-29308863

Fax: 0755-29308861

test macro



Antenna size (mm)



resume		
version	date	content
A1.0	2026.04.20	3D printing shell, output antenna debugging data, the antenna is a PIFA antenna. antenna version: T9-V1.
A2.0	2026.04.21	Increase the efficiency of the die and the conductive welding diagram.
A3.0	2026.06.25	Die shell debugging, antenna version: T9-V7, PCBA version: T9-8970H-ZXL-Y2.0-2605.
A4.0	2026.07.14	Increasing free space data

catalogue

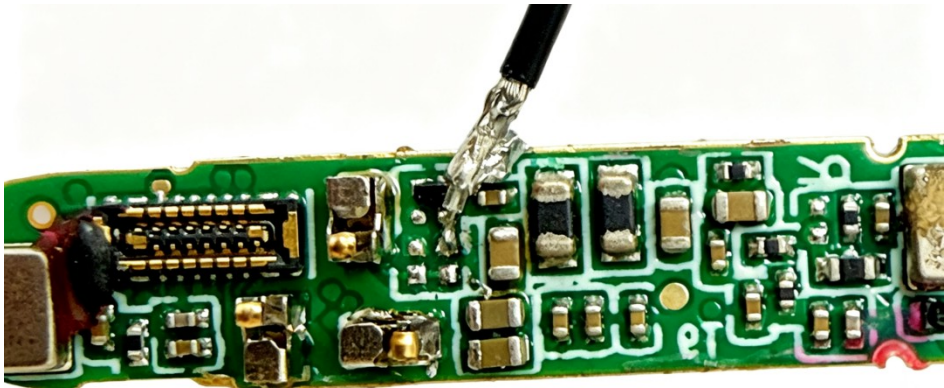
1. PCBA conduction test data
2. Antenna matching circuit
3. Passive test data
4. OTA test data of the whole machine
5. Assembly requirements
6. Practical distance test

1. PCBA conduction test data

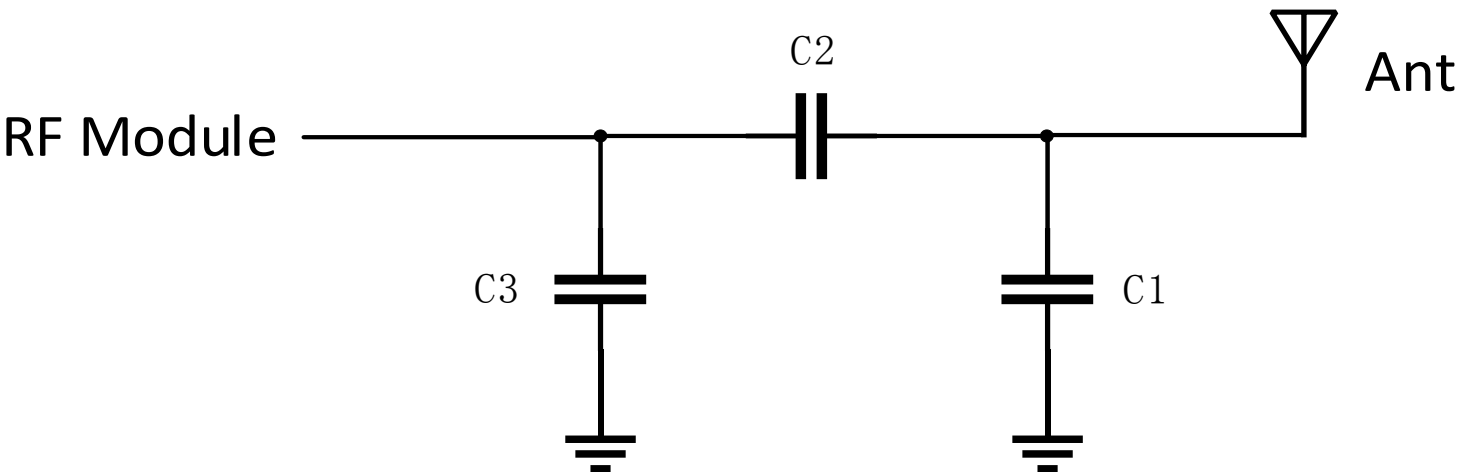
Bluetooth BR Chip model: BT8970H	L		
	Channel	Frequency (MHz)	TX (dBm)
	0	2402	11.2
	39	2441	10.9
	78	2480	10.5
	Channel	Frequency (MHz)	RX (dBm)
	0	2402	-95
	39	2441	-95
	78	2480	-95

R		
Channel	Frequency (MHz)	TX (dBm)
0	2402	11.1
39	2441	10.8
78	2480	10.5
Channel	Frequency (MHz)	RX (dBm)
0	2402	-95
39	2441	-95
78	2480	-95

1.1, PCBA conductive welding diagram



2. Antenna matching circuit

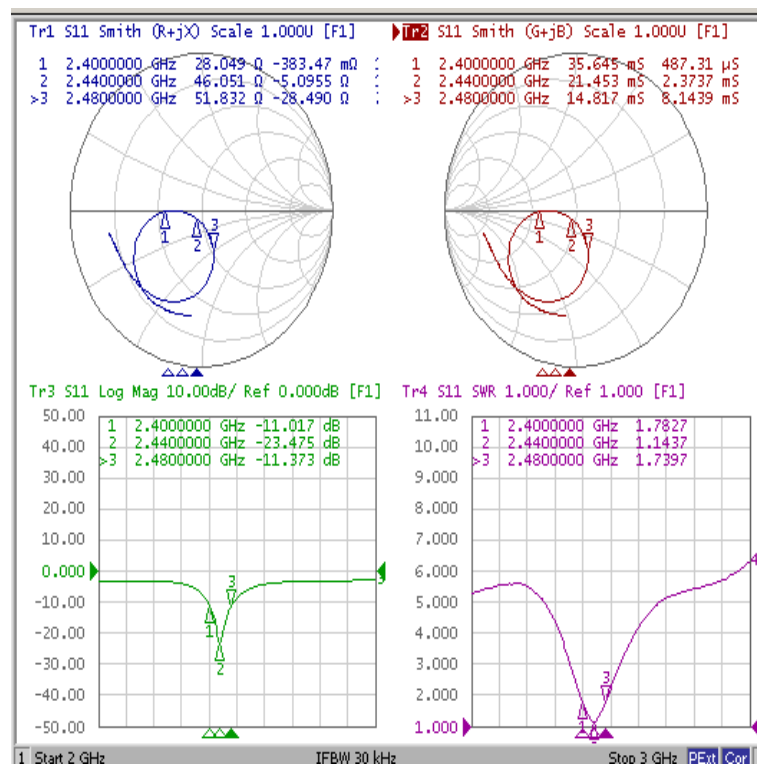


Element	Value
C1(0201)	NC
C2(0201)	0R
C3(0201)	NC
L/R matching circuit is the same.	

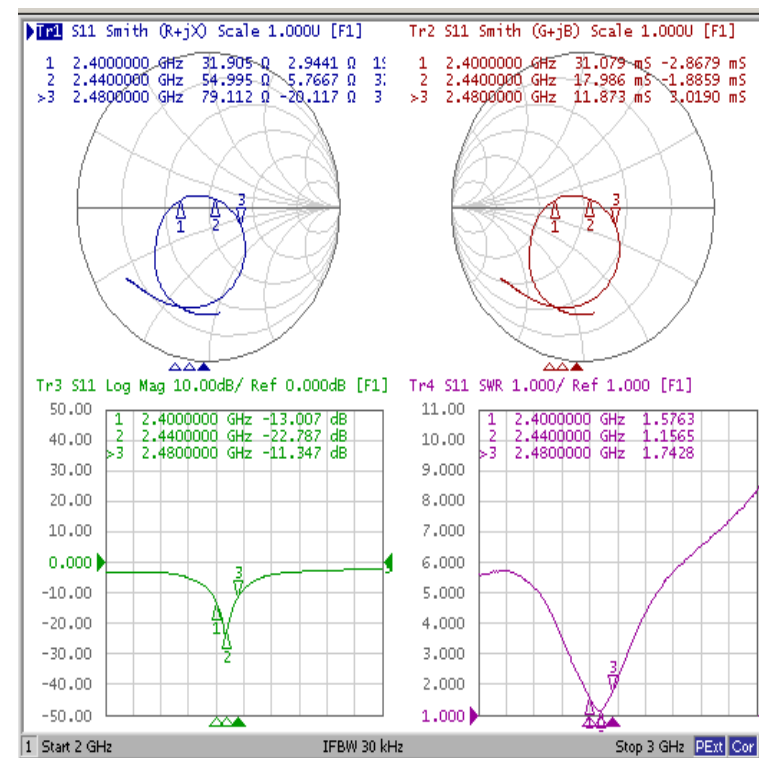
3. Passive test data

3.1 S11 Parameter

L



R



3.2 Gain & Efficiency (Free space)

L

Freq(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400.00	-5.32	-8.19	15.18
2410.00	-4.87	-7.81	16.54
2420.00	-4.57	-7.62	17.30
2430.00	-4.23	-7.37	18.30
2440.00	-4.00	-7.21	19.03
2450.00	-3.90	-7.16	19.25
2460.00	-3.92	-7.20	19.05
2470.00	-4.01	-7.36	18.37
2480.00	-4.14	-7.52	17.70

R

Freq(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400.00	-2.36	-7.61	17.35
2410.00	-2.17	-7.35	18.39
2420.00	-2.06	-7.23	18.94
2430.00	-1.84	-7.05	19.74
2440.00	-1.64	-6.90	20.42
2450.00	-1.55	-6.86	20.63
2460.00	-1.58	-6.91	20.38
2470.00	-1.68	-7.06	19.66
2480.00	-1.77	-7.22	18.98

3.2 Gain & Efficiency (Head phantom)

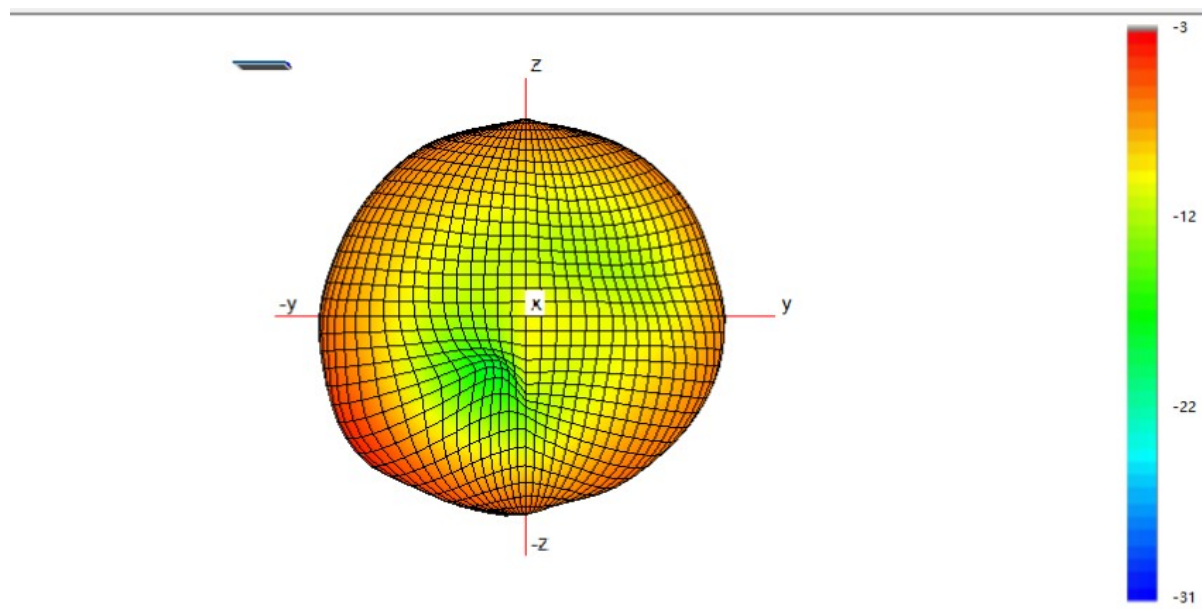
L

Freq(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400.00	-4.92	-10.16	9.64
2410.00	-4.52	-9.86	10.32
2420.00	-4.36	-9.76	10.57
2430.00	-4.18	-9.60	10.95
2440.00	-4.06	-9.55	11.09
2450.00	-4.03	-9.60	10.97
2460.00	-4.14	-9.78	10.53
2470.00	-4.37	-10.07	9.85
2480.00	-4.53	-10.34	9.25

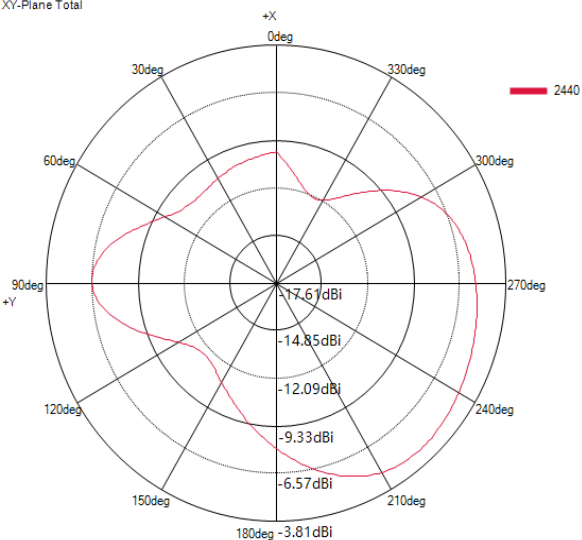
R

Freq(MHz)	Gain(dBi)	Efficiency(dB)	Efficiency(%)
2400.00	-3.52	-9.66	10.82
2410.00	-3.43	-9.41	11.45
2420.00	-3.27	-9.33	11.68
2430.00	-3.28	-9.23	11.95
2440.00	-3.26	-9.21	12.00
2450.00	-3.37	-9.27	11.83
2460.00	-3.61	-9.46	11.32
2470.00	-3.89	-9.76	10.56
2480.00	-4.21	-10.04	9.90

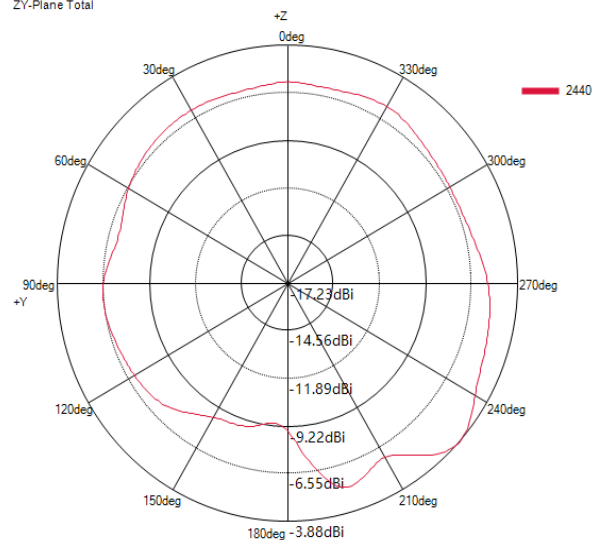
3.4 Radiation pattern (Free space-L)



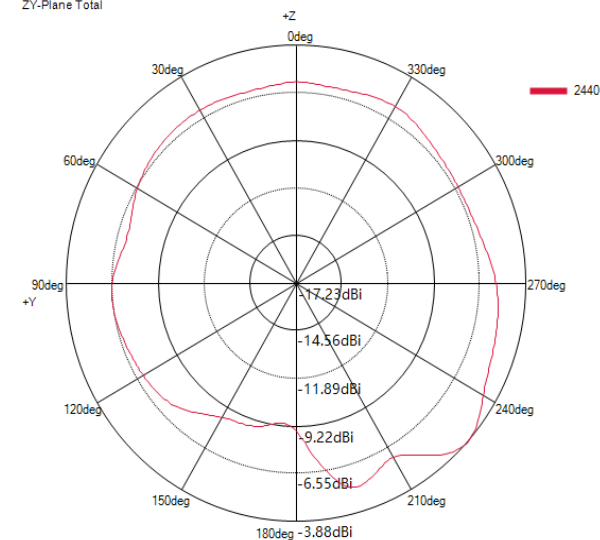
XY-Plane Total



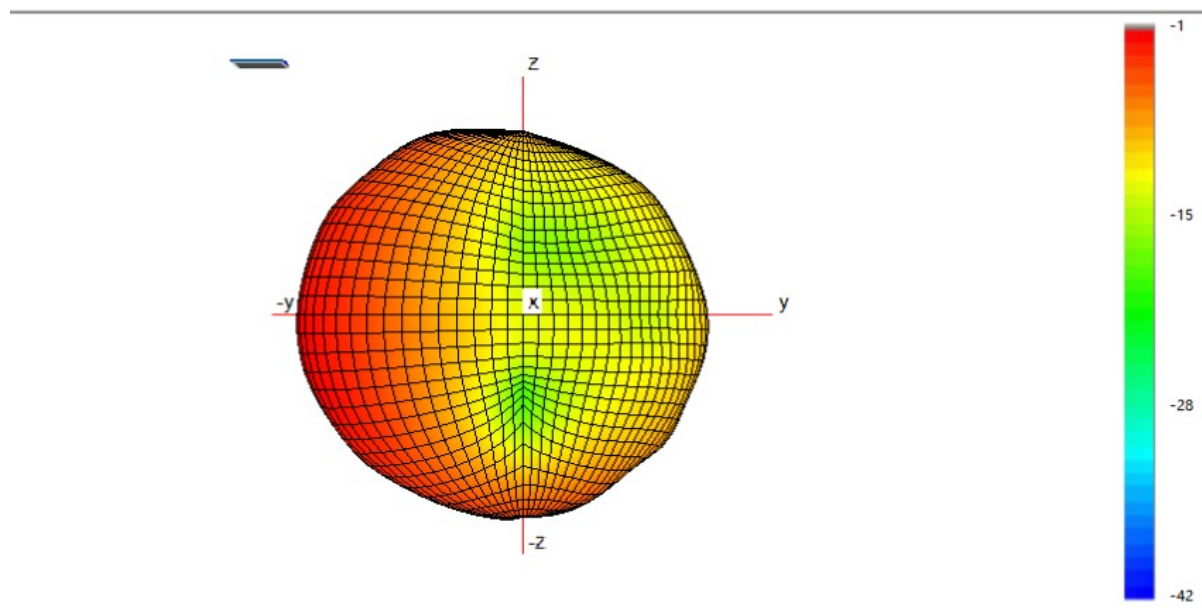
ZY-Plane Total



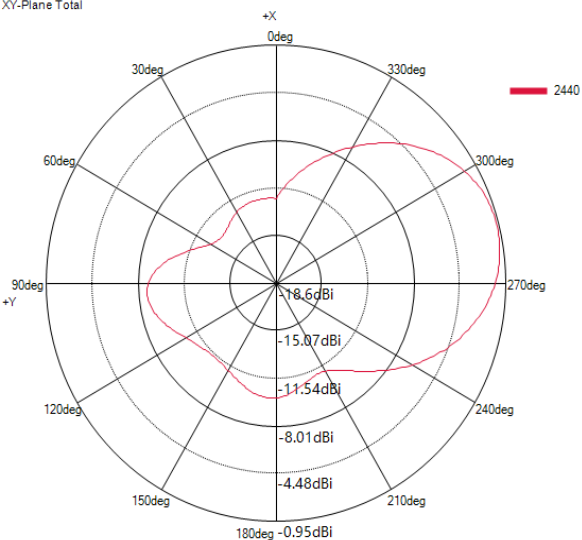
ZY-Plane Total



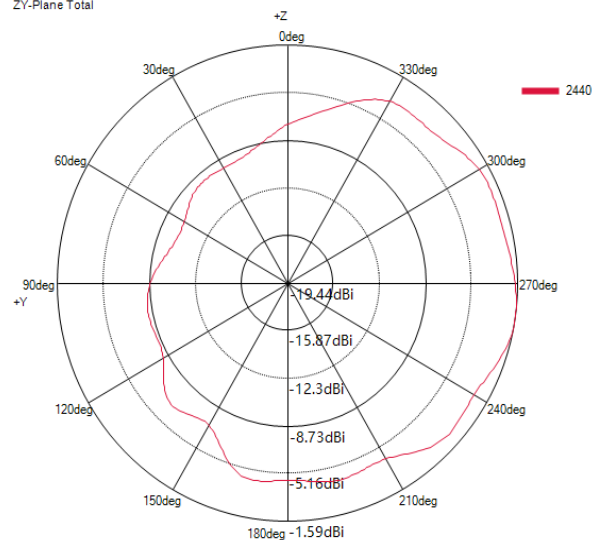
3.4 Radiation pattern (Free space-R)



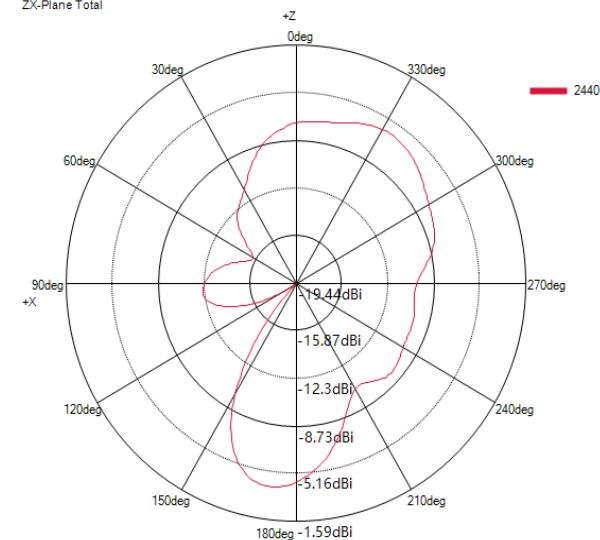
XY-Plane Total



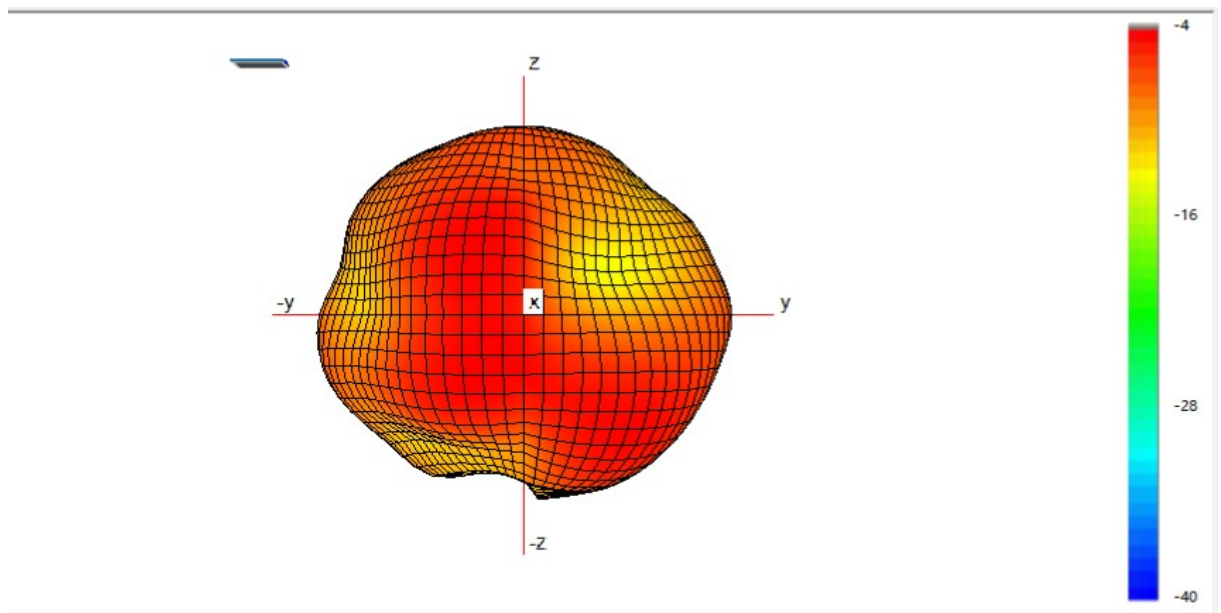
ZY-Plane Total



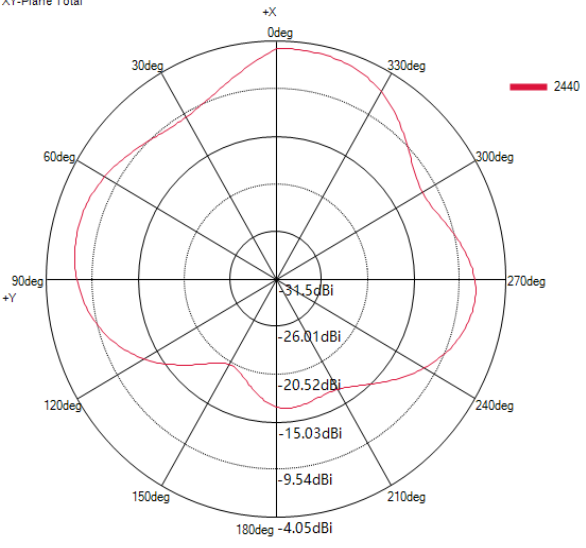
ZX-Plane Total



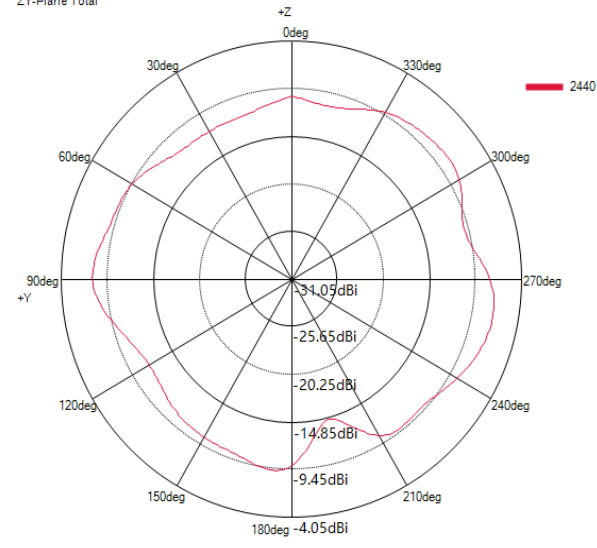
3.5 Radiation pattern (Head phantom-L)



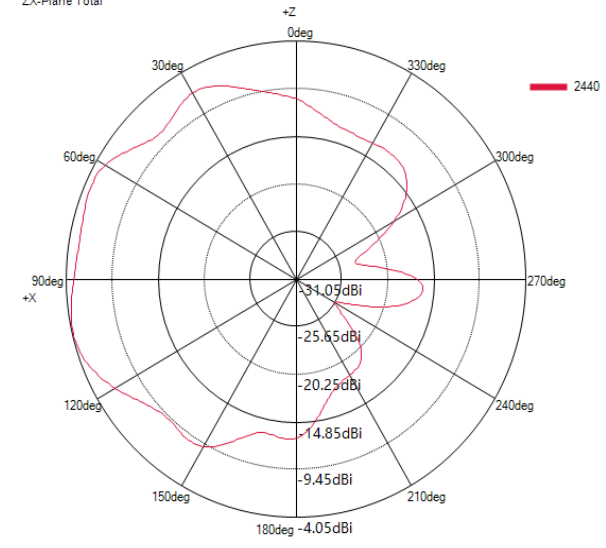
XY-Plane Total



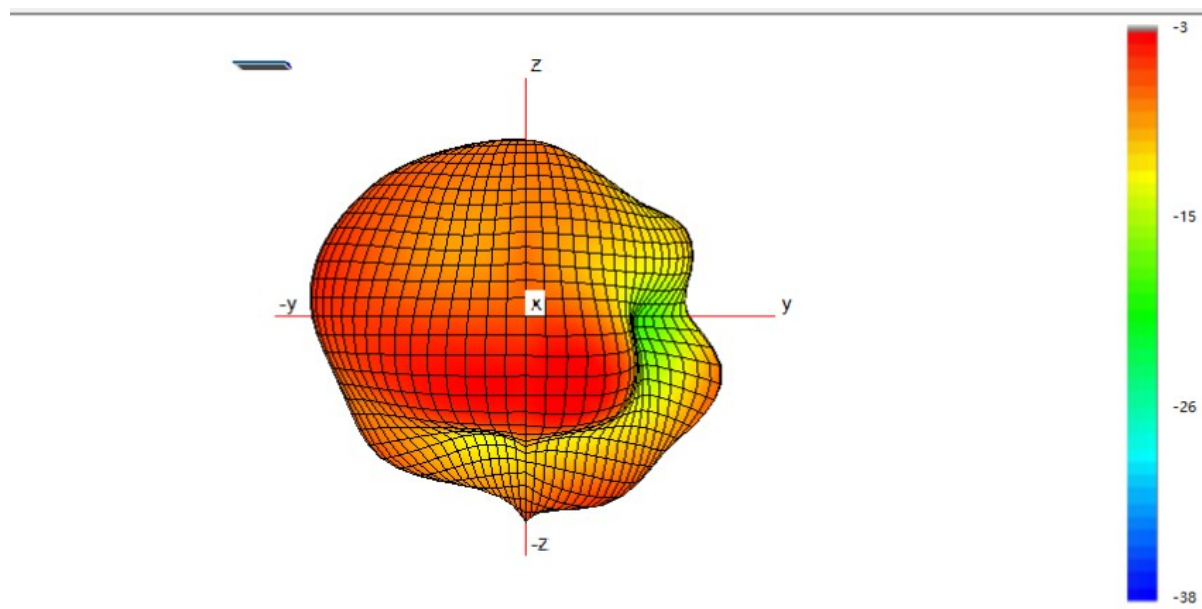
ZY-Plane Total



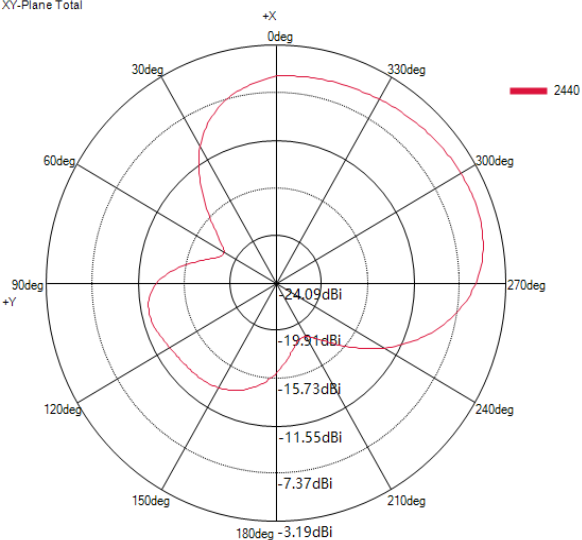
ZX-Plane Total



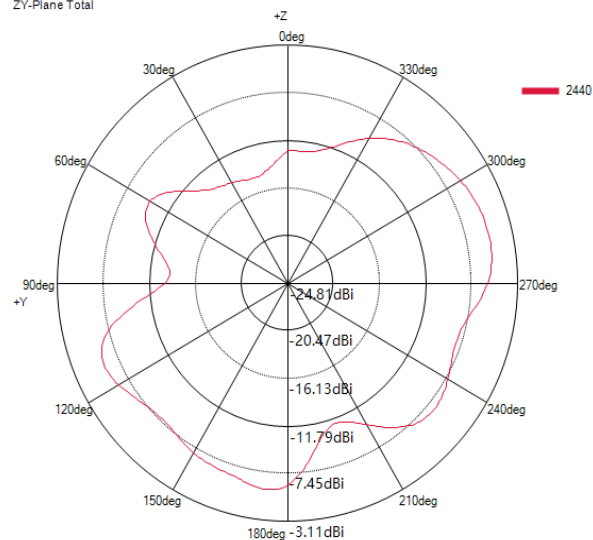
3.5 Radiation pattern (Head phantom-R)



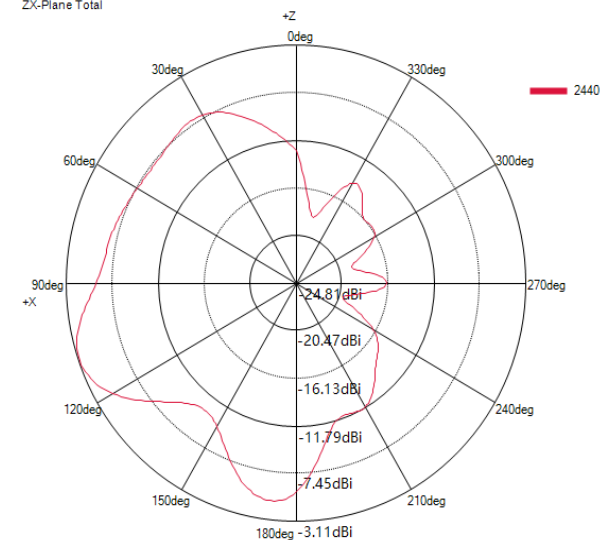
XY-Plane Total



ZY-Plane Total



ZX-Plane Total



4. OTA test data of the whole machine

Bluetooth BR 1# (Free Space)	L				R		
	Channel	Frequency (MHz)	TRP (dBm)		Channel	Frequency (MHz)	TRP (dBm)
	0	2402	1. 02		0	2402	2. 34
	39	2441	3. 51		39	2441	4. 19
	78	2480	3. 79		78	2480	3. 18
	Channel	Frequency (MHz)	TIS (dBm)		Channel	Frequency (MHz)	TIS (dBm)
	0	2402	-87. 76		0	2402	-87. 48
	39	2441	-88. 92		39	2441	-88. 23
	78	2480	-89. 26		78	2480	-88. 74

Bluetooth BR 2# (Free Space)	L				R		
	Channel	Frequency (MHz)	TRP (dBm)		Channel	Frequency (MHz)	TRP (dBm)
	0	2402	0. 21		0	2402	1. 56
	39	2441	3. 16		39	2441	4. 04
	78	2480	5. 27		78	2480	4. 88
	Channel	Frequency (MHz)	TIS (dBm)		Channel	Frequency (MHz)	TIS (dBm)
	0	2402	−86. 17		0	2402	−87. 16
	39	2441	−87. 4		39	2441	−87. 66
	78	2480	−88. 94		78	2480	−88. 56

4. OTA test data of the whole machine

Bluetooth BR 1# (head phantom)	L				R		
	Channel	Frequency (MHz)	TRP (dBm)		Channel	Frequency (MHz)	TRP (dBm)
	0	2402	-0.41		0	2402	-1.48
	39	2441	-0.07		39	2441	0.1
	78	2480	-2.02		78	2480	-1.16
	Channel	Frequency (MHz)	TIS (dBm)		Channel	Frequency (MHz)	TIS (dBm)
	0	2402	-83.83		0	2402	-83.41
	39	2441	-84.28		39	2441	-84.1
	78	2480	-83.88		78	2480	-84.49

Bluetooth BR 2# (head phantom)	L				R		
	Channel	Frequency (MHz)	TRP (dBm)		Channel	Frequency (MHz)	TRP (dBm)
	0	2402	-2.04		0	2402	-0.22
	39	2441	-0.78		39	2441	-0.47
	78	2480	-2.15		78	2480	-2.4
	Channel	Frequency (MHz)	TIS (dBm)		Channel	Frequency (MHz)	TIS (dBm)
	0	2402	-83.02		0	2402	-83.91
	39	2441	-83.63		39	2441	-84.44
	78	2480	-83.51		78	2480	-84.11

5. Assembly requirements

5.1, no special equipment requirements.



6. Practical distance test

Test location: Longchang Road, South Gate of Meisheng Chuanggu

Test mobile phone	Samsung S8
Omnidirectional listening to music (M)	13