

Antenna

YQDM044LA Datasheet

Antenna Services

Version: 1.0

Date: 2022-10-27

Status: Preliminary



At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: info@quectel.com

Or our local offices. For more information, please visit:

<http://www.quectel.com/support/sales.htm>.

For technical support, or to report documentation errors, please visit:

<http://www.quectel.com/support/technical.htm>.

Or email us at: support@quectel.com.

Legal Notices

We offer information as a service to you. The provided information is based on your requirements and we make every effort to ensure its quality. You agree that you are responsible for using independent analysis and evaluation in designing intended products, and we provide reference designs for illustrative purposes only. Before using any hardware, software or service guided by this document, please read this notice carefully. Even though we employ commercially reasonable efforts to provide the best possible experience, you hereby acknowledge and agree that this document and related services hereunder are provided to you on an “as available” basis. We may revise or restate this document from time to time at our sole discretion without any prior notice to you.

Use and Disclosure Restrictions

License Agreements

Documents and information provided by us shall be kept confidential, unless specific permission is granted. They shall not be accessed or used for any purpose except as expressly provided herein.

Copyright

Our and third-party products hereunder may contain copyrighted material. Such copyrighted material shall not be copied, reproduced, distributed, merged, published, translated, or modified without prior written consent. We and the third party have exclusive rights over copyrighted material. No license shall be granted or conveyed under any patents, copyrights, trademarks, or service mark rights. To avoid ambiguities, purchasing in any form cannot be deemed as granting a license other than the normal non-exclusive, royalty-free license to use the material. We reserve the right to take legal action for noncompliance with abovementioned requirements, unauthorized use, or other illegal or malicious use of the material.

Trademarks

Except as otherwise set forth herein, nothing in this document shall be construed as conferring any rights to use any trademark, trade name or name, abbreviation, or counterfeit product thereof owned by Quectel or any third party in advertising, publicity, or other aspects.

Third-Party Rights

This document may refer to hardware, software and/or documentation owned by one or more third parties ("third-party materials"). Use of such third-party materials shall be governed by all restrictions and obligations applicable thereto.

We make no warranty or representation, either express or implied, regarding the third-party materials, including but not limited to any implied or statutory, warranties of merchantability or fitness for a particular purpose, quiet enjoyment, system integration, information accuracy, and non-infringement of any third-party intellectual property rights with regard to the licensed technology or use thereof. Nothing herein constitutes a representation or warranty by us to either develop, enhance, modify, distribute, market, sell, offer for sale, or otherwise maintain production of any our products or any other hardware, software, device, tool, information, or product. We moreover disclaim any and all warranties arising from the course of dealing or usage of trade.

Privacy Policy

To implement module functionality, certain device data are uploaded to Quectel's or third-party's servers, including carriers, chipset suppliers or customer-designated servers. Quectel, strictly abiding by the relevant laws and regulations, shall retain, use, disclose or otherwise process relevant data for the purpose of performing the service only or as permitted by applicable laws. Before data interaction with third parties, please be informed of their privacy and data security policy.

Disclaimer

- a) We acknowledge no liability for any injury or damage arising from the reliance upon the information.
- b) We shall bear no liability resulting from any inaccuracies or omissions, or from the use of the information contained herein.
- c) While we have made every effort to ensure that the functions and features under development are free from errors, it is possible that they could contain errors, inaccuracies, and omissions. Unless otherwise provided by valid agreement, we make no warranties of any kind, either implied or express, and exclude all liability for any loss or damage suffered in connection with the use of features and functions under development, to the maximum extent permitted by law, regardless of whether such loss or damage may have been foreseeable.
- d) We are not responsible for the accessibility, safety, accuracy, availability, legality, or completeness of information, advertising, commercial offers, products, services, and materials on third-party websites and third-party resources.

Copyright © Quectel Wireless Solutions Co., Ltd. 2022. All rights reserved.

About the Document

Revision History

Version	Date	Author	Note
-	2022-10-27	Owen DENG Jason LONG	Creation of the document
1.0	2022-10-27	Owen DENG Jason LONG	First official release

Contents

About the Document.....	3
Contents	4
1 Product Description.....	5
2 Product Features	5
3 Product Specifications	6
4 Overall Performance	11
4.1. Test Environment	11
4.2. VSWR.....	12
4.3. Efficiency	16
4.4. Gain.....	20
4.5. Radiation Pattern	24
5 Product Size	41

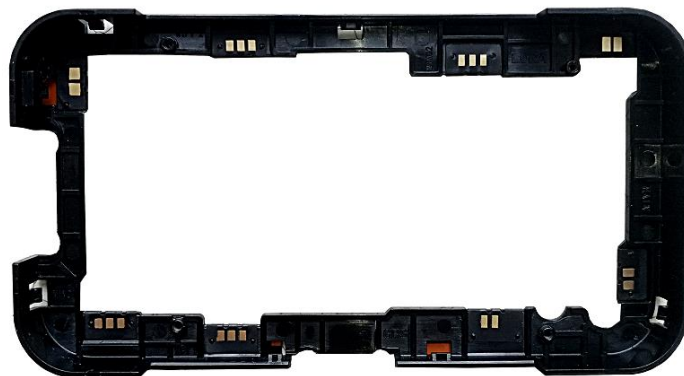
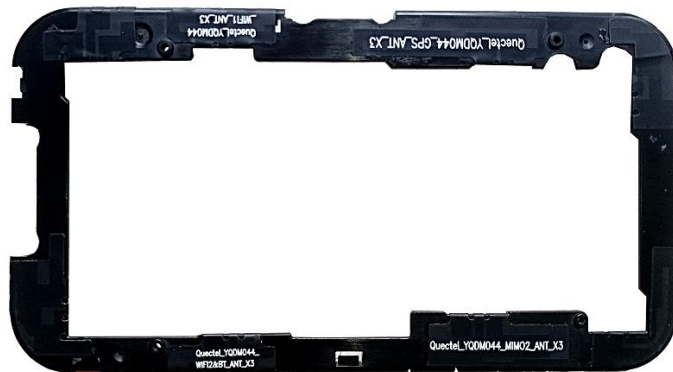
1 Product Description

The antenna is designed for superior performance, and can be widely used for wireless applications.

We provide comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

2 Product Features

- LTE&5G 、WIFI&BT 、GPS 、LORA
- High efficiency
- Excellent performance



3 Product Specifications

Passive Electrical Specifications(MAIN_ANT)

Frequency Range	600–4200 MHz
Input Impedence	50 Ω
VSWR	≤ 17
Gain	≤ 3.67 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(MAIN_ANT)

Frequency								
Range	698–824	824–960	1400–1610	1710–2170	2170–2690	3300–4200	4400–5000	5000-6000
(MHz)								
VSWR								
(Max.)	13.1	16.6		5.0	5.0	2.2		
Average								
Efficiency	29.8	1.3		32	52	50		
(%)								
Max. Peak								
Gain (dBi)	1.17	-9.04		1.17	2.34	3.67		

Passive Electrical Specifications(AUX_ANT)

Frequency Range	600–4200 MHz
Input Impedence	50 Ω
VSWR	≤ 9.7
Gain	≤ 4.15 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(AUX_ANT)

Frequency								
Range	698–824	824–960	1400–1610	1710–2170	2170–2690	3300–4200	4400–5000	5000-6000
(MHz)								
VSWR								
(Max.)	8.0	9.7		3.0	2.6	2.2		
Average								
Efficiency	36	23		39	50	46		
(%)								
Max. Peak								
Gain (dBi)	2.44	2.31		2.1	3.44	4.15		

Passive Electrical Specifications(MIMO1_ANT)

Frequency Range	1710–4200 MHz
Input Impedence	50 Ω
VSWR	≤ 3.0
Gain	≤ 4.68 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(MIMO1_ANT)

Frequency								
Range	698–824	824–960	1400–1610	1710–2170	2170–2690	3300–4200	4400–5000	5000-6000
(MHz)								
VSWR				2.7	2.0	2.3		
(Max.)								
Average								
Efficiency				51	48	54		
(%)								
Max. Peak				3.45	2.97	4.68		
Gain (dBi)								

Passive Electrical Specifications(MIMO2_ANT)

Frequency Range	1710–4200 MHz
Input Impedence	50 Ω
VSWR	≤ 3.5
Gain	≤ 2.18 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(MIMO2_ANT)

Frequency								
Range	698–824	824–960	1400–1610	1710–2170	2170–2690	3300–4200	4400–5000	5000-6000
(MHz)								
VSWR				3.41	2.65	2.3		
(Max.)								
Average								
Efficiency				30	28	33		
(%)								
Max. Peak				-0.06	0.23	2.18		
Gain (dBi)								

Passive Electrical Specifications(WIFI1_ANT)

Frequency Range	2400–2500 MHz & 5150-5850 MHz
Input Impedence	50 Ω
VSWR	≤ 2.0
Gain	≤ 5.07 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(WIFI1_ANT)

Frequency		
Range	2400-2500	5150-5850
(MHz)		
VSWR		
(Max.)	1.68	2.0
Average		
Efficiency	46	51
(%)		
Max. Peak		
Gain (dBi)	1.31	5.07

Passive Electrical Specifications(WIFI2 & BT_ANT)

Frequency Range	2400–2500 MHz & 5150-5850 MHz
Input Impedence	50 Ω
VSWR	≤ 2.2
Gain	≤ 3.98 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(WIFI2 & BT_ANT)

Frequency		
Range	2400-2500	5150-5850
(MHz)		
VSWR		
(Max.)	1.65	2.17
Average		
Efficiency	58	46
(%)		
Max. Peak		
Gain (dBi)	2.08	3.98

Passive Electrical Specifications(GPS_ANT)

Frequency Range	1176.45±10 MHz & 1575.42±10 MHz
Input Impedence	50 Ω
VSWR	≤ 2.0
Gain	≤ 1.59 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(GPS_ANT)

Frequency		
Range	1176	1575
(MHz)		
VSWR		
(Max.)	1.3	1.68
Average		
Efficiency	46	56
(%)		
Max. Peak		
Gain (dBi)	-0.28	1.56

Passive Electrical Specifications(LORA_ANT)

Frequency Range	820-960 MHz
Input Impedence	50 Ω
VSWR	≤ 2.0
Gain	≤ 3.91 dBi
Polarization Type	Linear

Detailed Passive Electrical Specifications(LORA_ANT)

Frequency	
Range	820-960
(MHz)	
VSWR	
(Max.)	1.9
Average	
Efficiency	63
(%)	
Max. Peak	
Gain (dBi)	3.91

Mechanical Specifications

Antenna Size(mm)	129.33 × 70.28 × 11.12
Material	PC+ABS
Working Temperature	-30 °C to +75 °C
Weight	Typical 9.4g
Color	Black
Mounting Type	Screw

4 Overall Performance

4.1. Test Environment

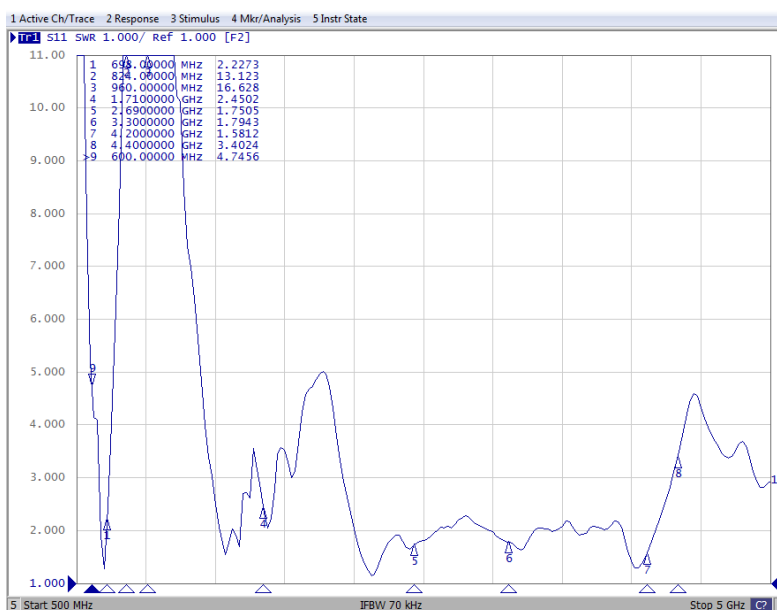
- KEYSIGHT ENA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone® 2800 Chamber 5G (FR1) SISO/MIMO, 600 MHz – 8.5 GHz



Other description:

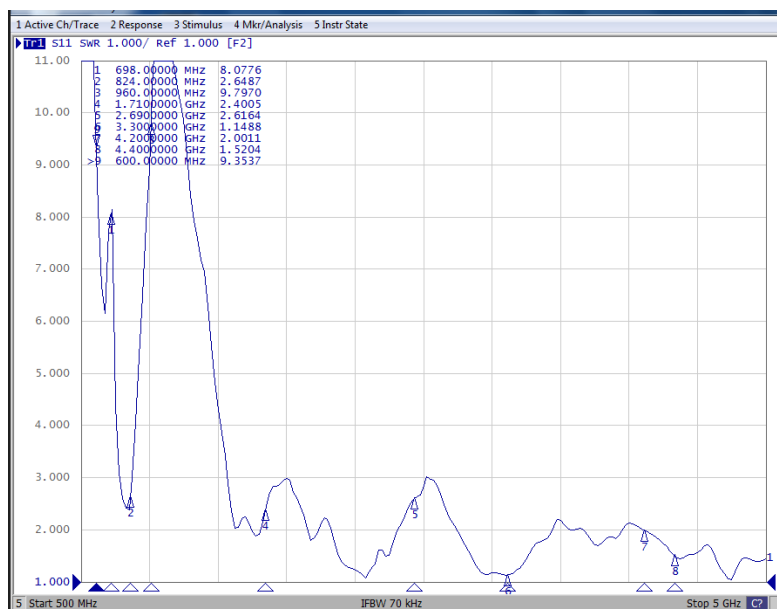
4.2. VSWR

MAIN:



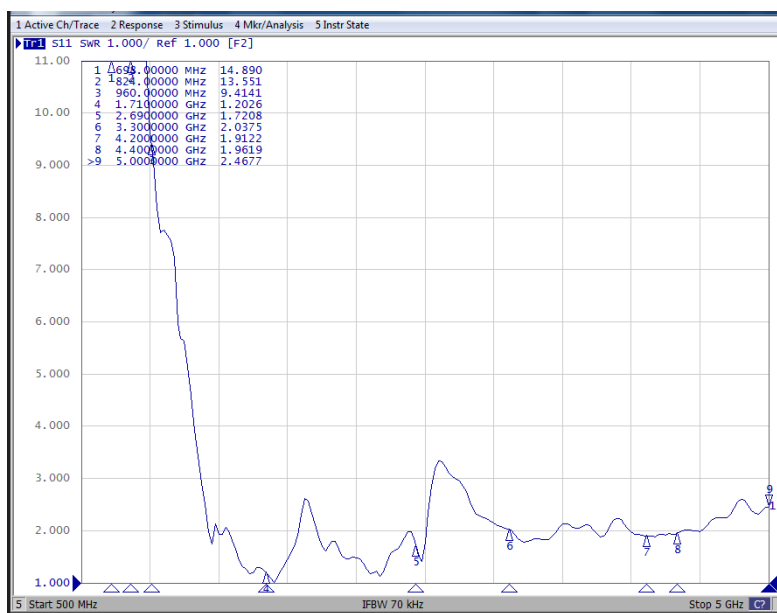
Frequency (MHz)	698	824	960	1200	1575	1710	2690	3300	5000	5925
VSWR	2.22	13.12	16.6			2.45	1.75	1.79		

AUX:



Frequency (MHz)	698	824	960	1200	1575	1710	2690	3300	5000	5925
VSWR	8.07	2.64	9.79			2.40	2.61	1.14		

MIMO1:



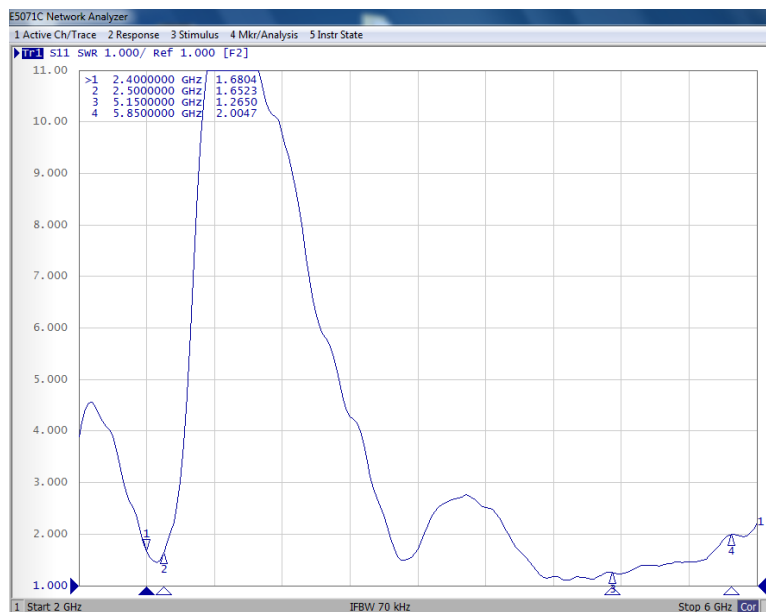
Frequency (MHz)	698	824	960	1200	1575	1710	2690	3300	5000	5925
VSWR						1.20	1.72	2.03		

MIMO2:



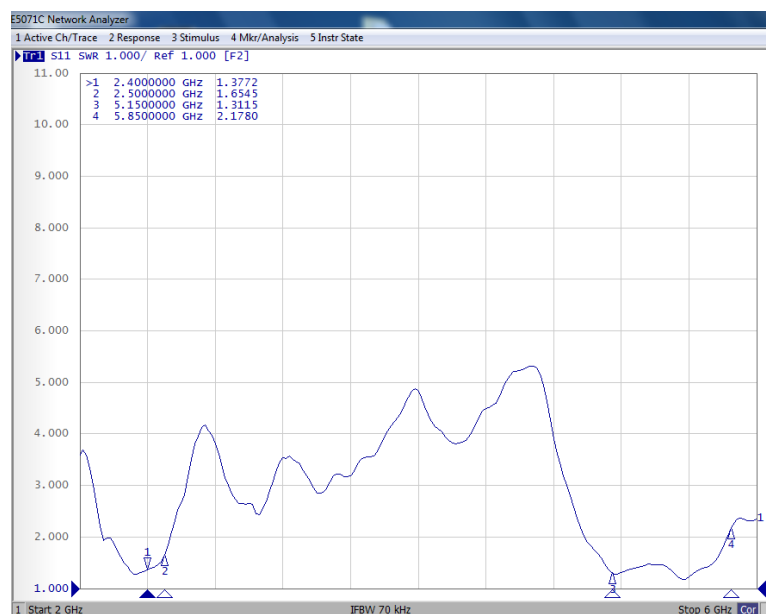
Frequency (MHz)	698	824	960	1200	1575	1710	2690	3300	5000	5925
VSWR						3.41	2.65	1.21		

WiFi1:



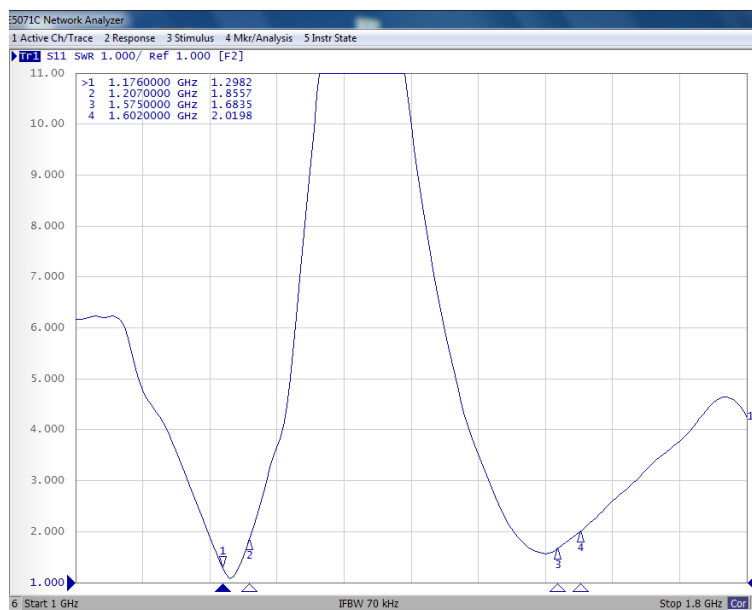
Frequency (MHz)	2400	2450	2500	5150	5500	5850
VSWR		1.68	1.65	1.26		2.00

WiFi2 & BT:



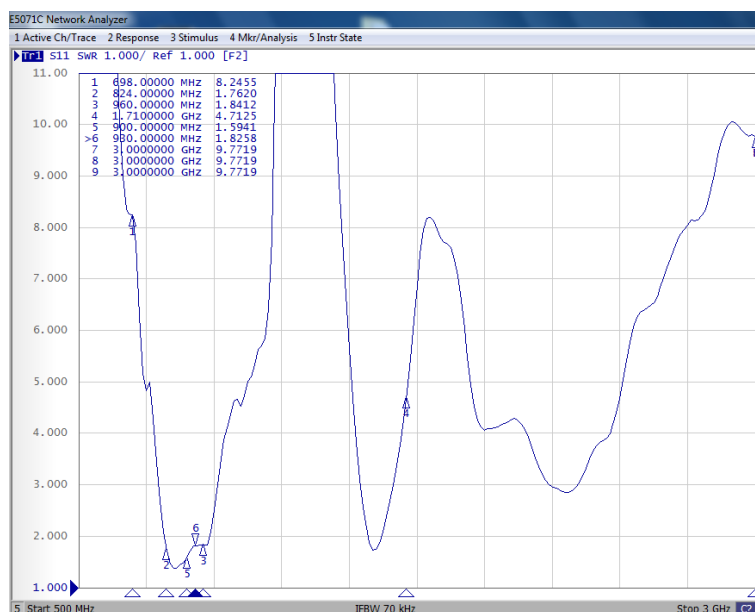
Frequency (MHz)	2400	2450	2500	5150	5500	5850
VSWR		1.37	1.65	1.31		2.17

GPS:



Frequency (MHz)	1176	1575
VSWR	1.29	1.68

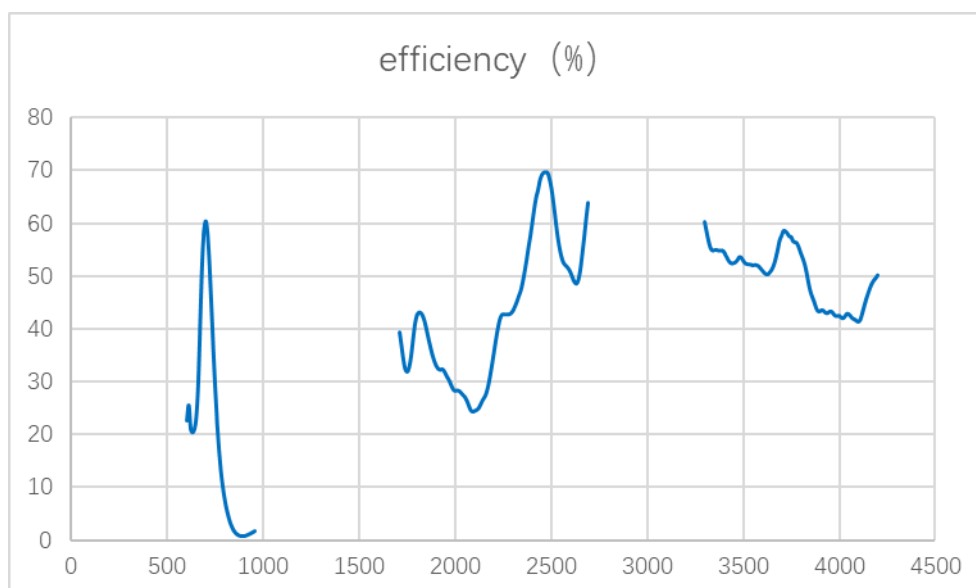
LOAR:



Frequency (MHz)	900	915	930
VSWR	1.59	1.70	1.82

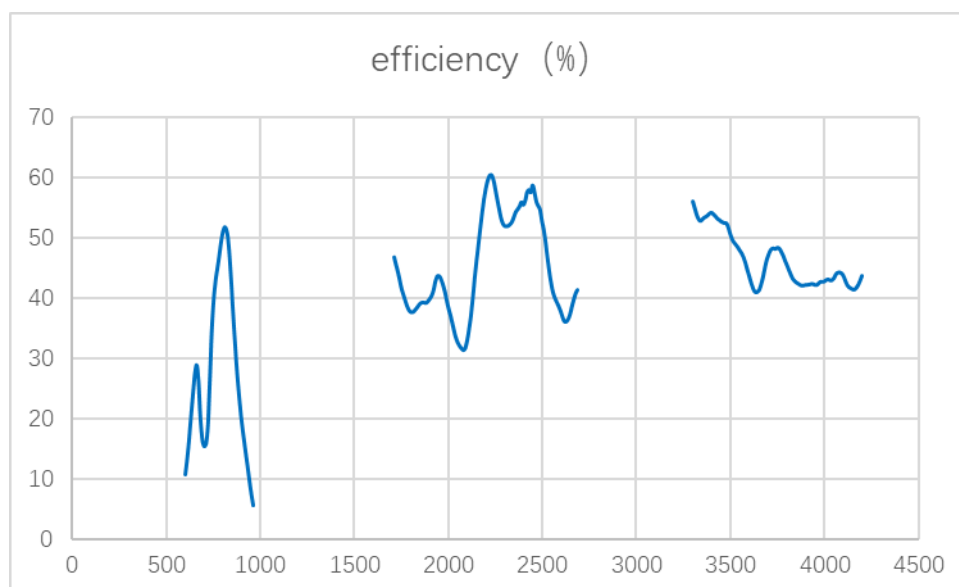
4.3. Efficiency

MAIN:



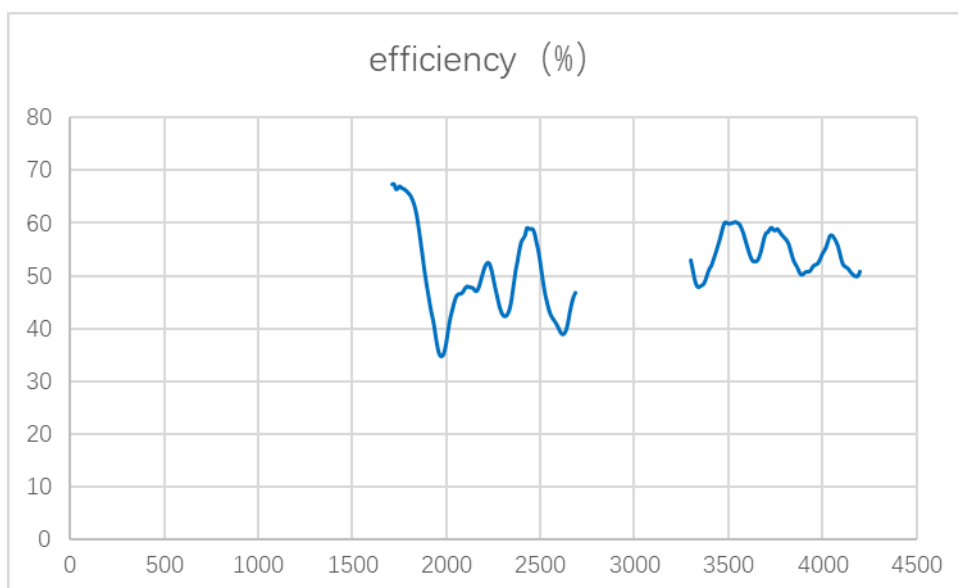
Frequency (MHz)	610	820	960	1200	1575	1710	2690	3300	5000	5925
Efficiency (%)	25.52	4.4	1.68			39.39	63.92	60.3		

AUX:



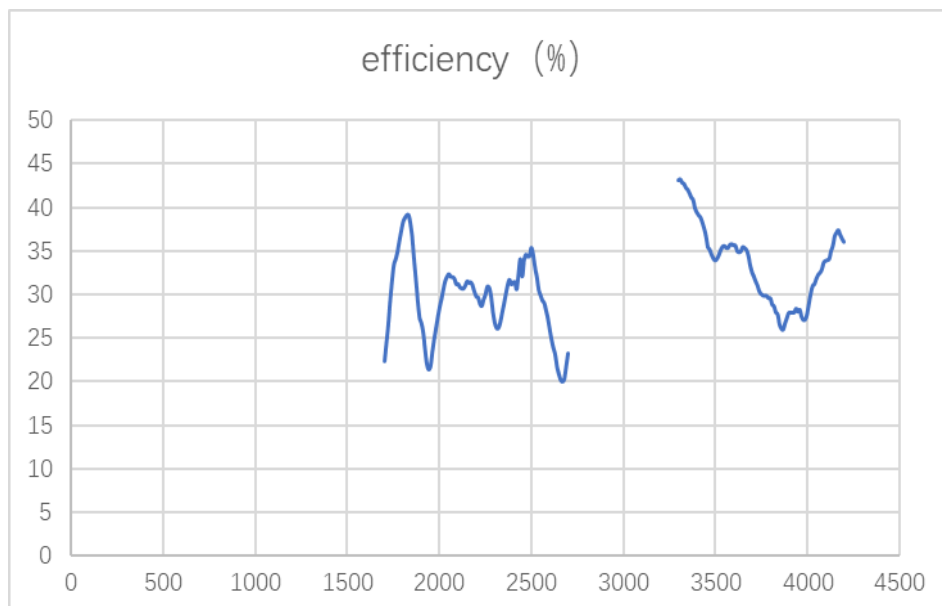
Frequency (MHz)	610	820	960	1200	1575	1710	2690	3300	5000	5925
Efficiency (%)	13.49	51.12	5.72			46.89	41.47	56.14		

MIMO1



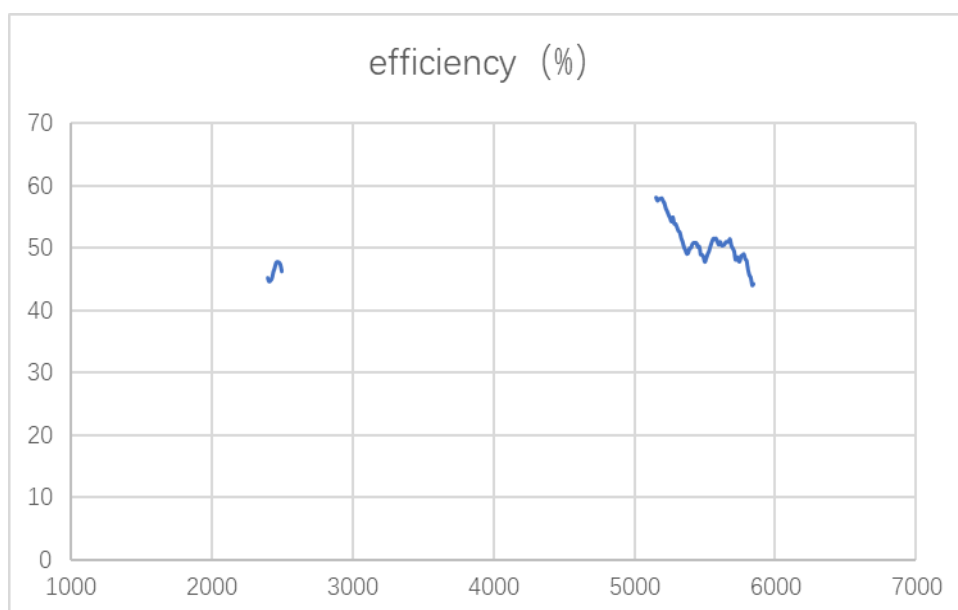
Frequency (MHz)	610	820	960	1200	1575	1710	2690	3300	5000	5925
Efficiency (%)						67.46	46.95	53.04		

MIMO2



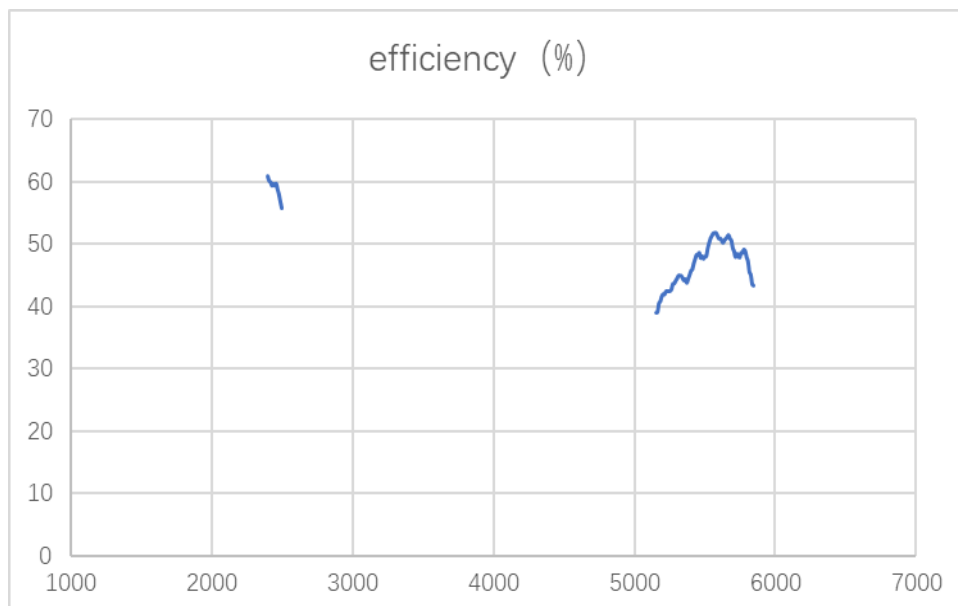
Frequency (MHz)	610	820	960	1200	1575	1710	2690	3300	5000	5925
Efficiency (%)						24.49	21.88	43.18		

WIFI1:



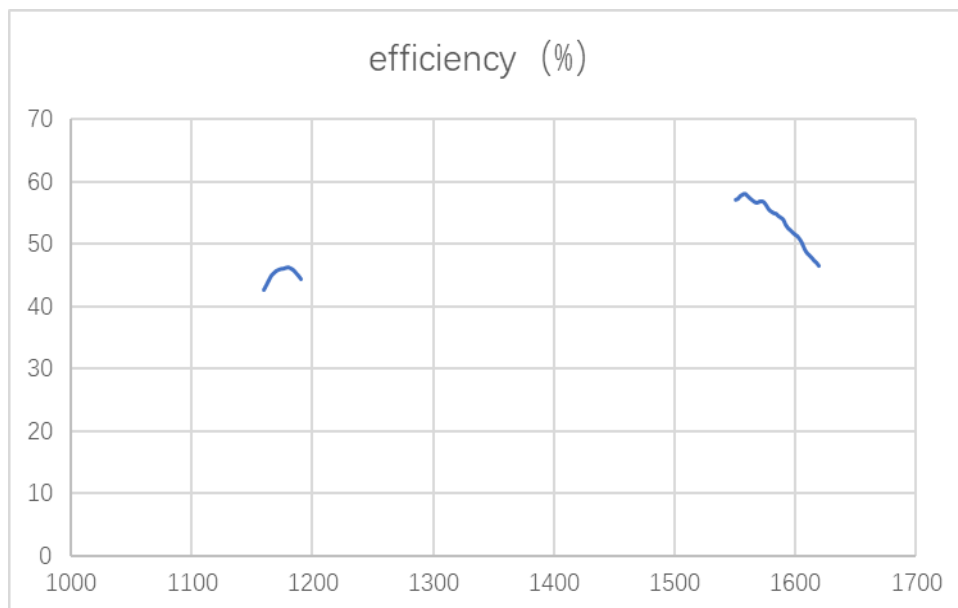
Frequency (MHz)	2400	2450	2500	5150	5500	5850
Efficiency (%)	45.15	46.74	46.18	58.04	47.83	44.33

WIFI2 & BT:



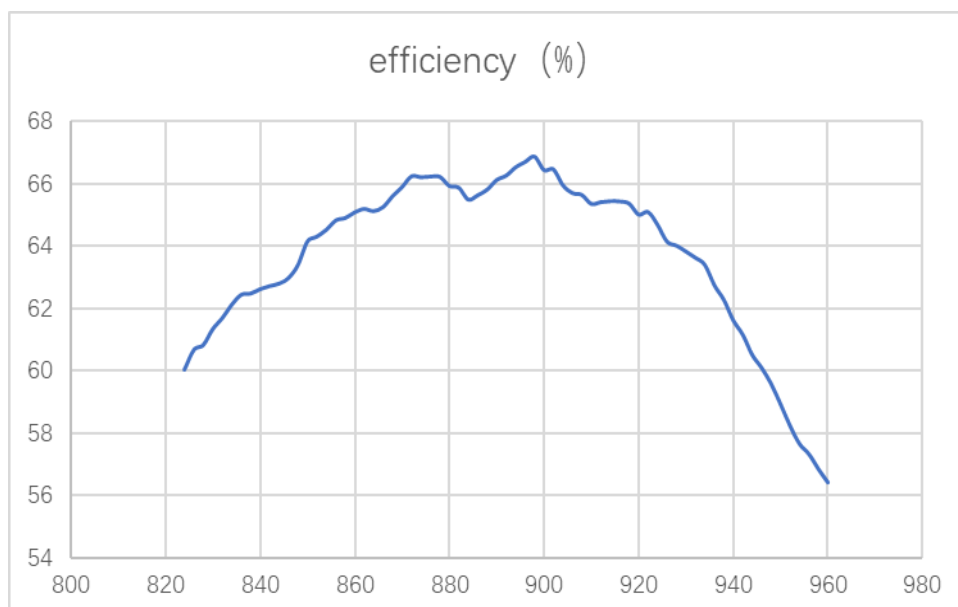
Frequency (MHz)	2400	2450	2500	5150	5500	5850
Efficiency (%)	60.94	59.42	55.77	39.08	47.95	43.37

GPS:



Frequency (MHz)	1160	1176	1190	1560	1574	1590
Efficiency (%)	42.65	46.04	44,.37	57.8	56.75	54.01

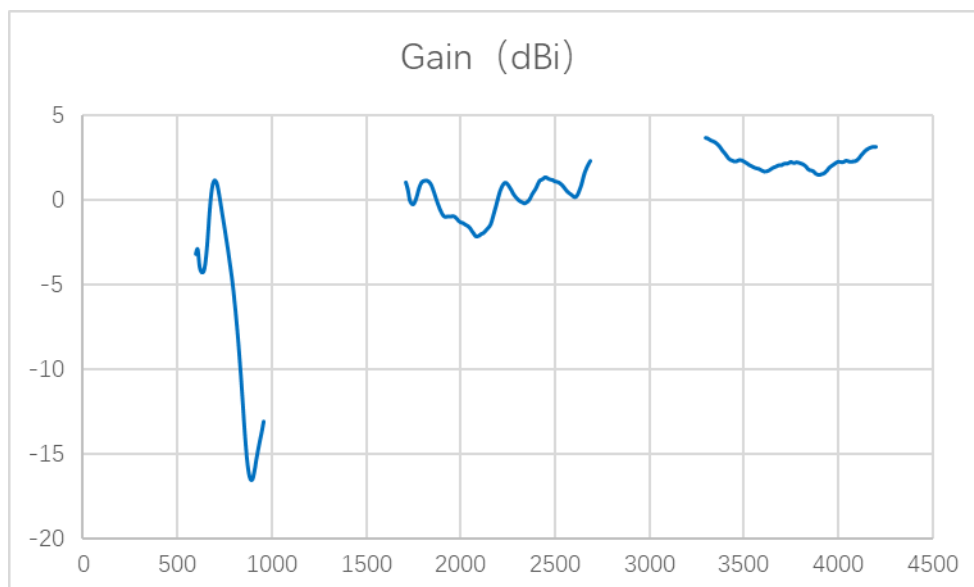
LORA



Frequency (MHz)	820	880	900	930	960
Efficiency (%)	59.29	65.93	66.44	63.82	56.4

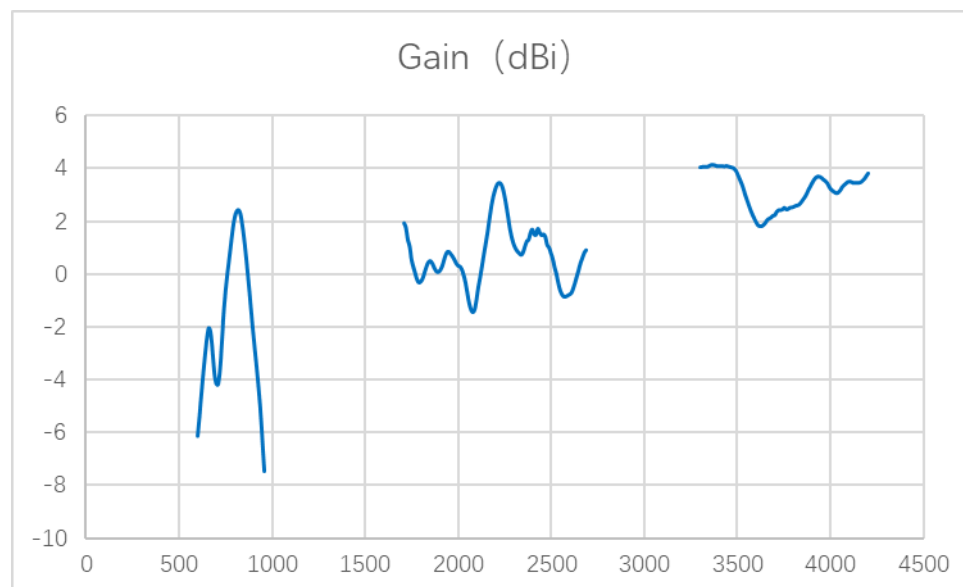
4.4. Gain

MAIN:



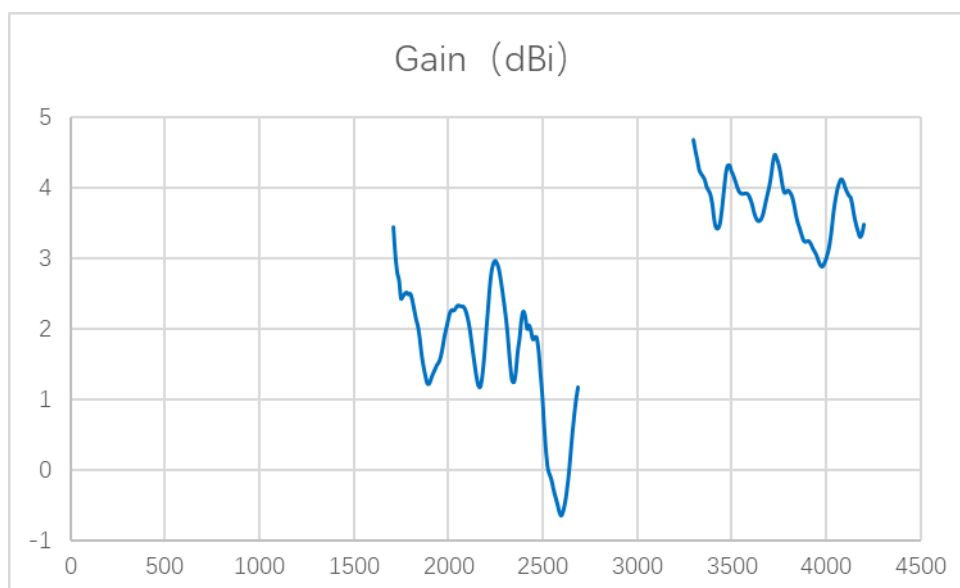
Frequency (MHz)	700	820	960	1200	1575	1710	2690	3300	5000	5925
Gain (dBi)	-2.9	-7.7	-13.0			1.06	2.34	3.67		

AUX:



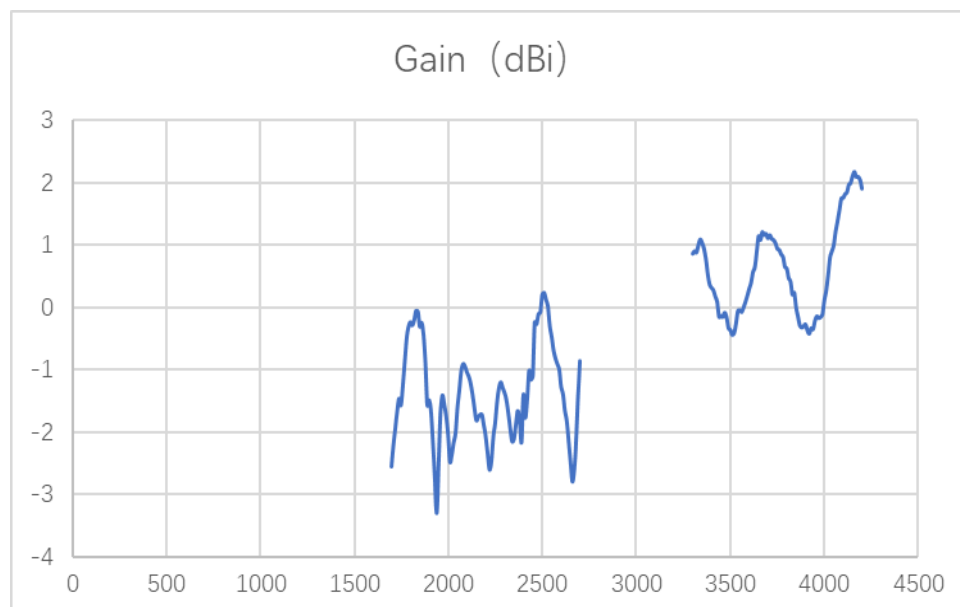
Frequency (MHz)	700	820	960	1200	1575	1710	2690	3300	5000	5925
Gain (dBi)	-5.38	2.44	-7.49			1.92	0.9	4.06		

MIMO1:



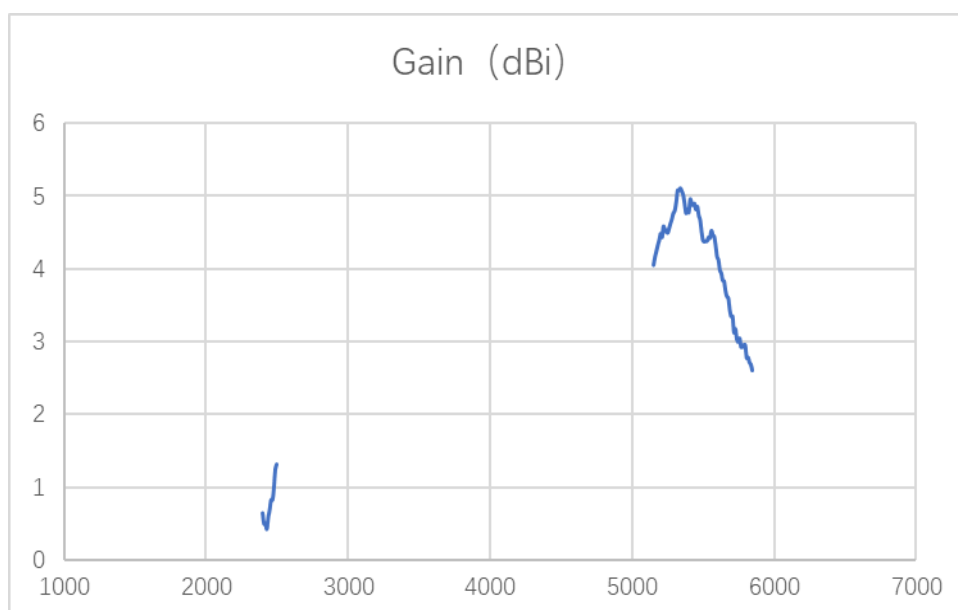
Frequency (MHz)	700	820	960	1200	1575	1710	2690	3300	5000	5925
Gain (dBi)						3.45	1.17	4.68		

MIMO2:



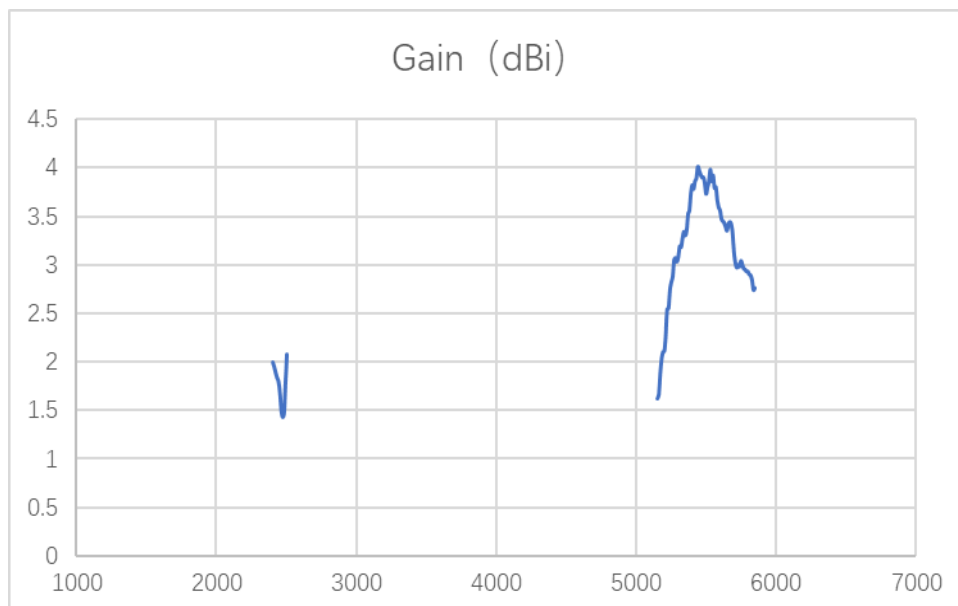
Frequency (MHz)	700	820	960	1200	1575	1710	2690	3300	5000	5925
Gain (dBi)						-2.21	-1.43	0.86		

WIFI1:



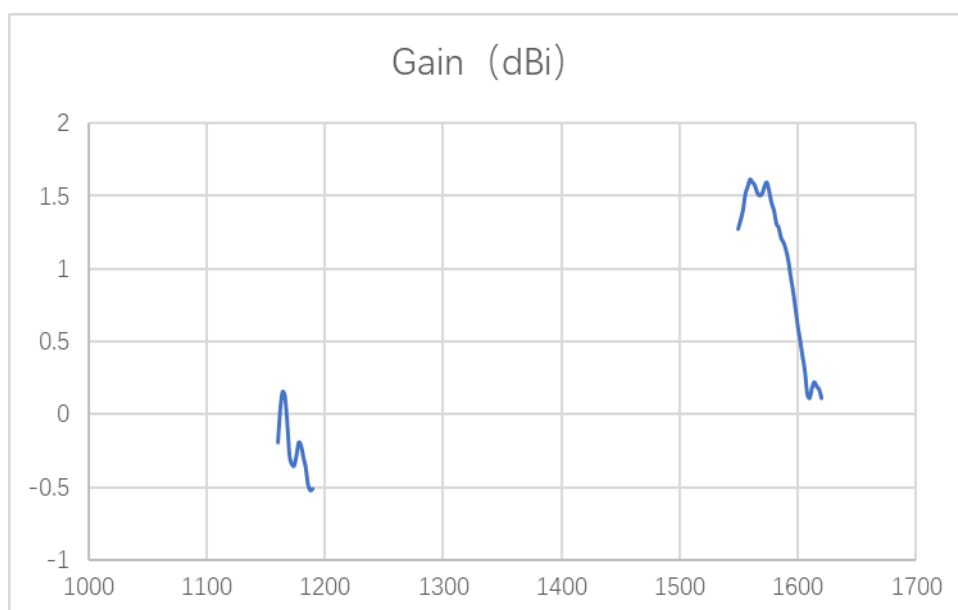
Frequency (MHz)	2400	2450	2500	5150	5500	5850
Gain (dBi)	0.64	0.68	1.31	4.05	4.39	2.61

WIFI2 & BT:



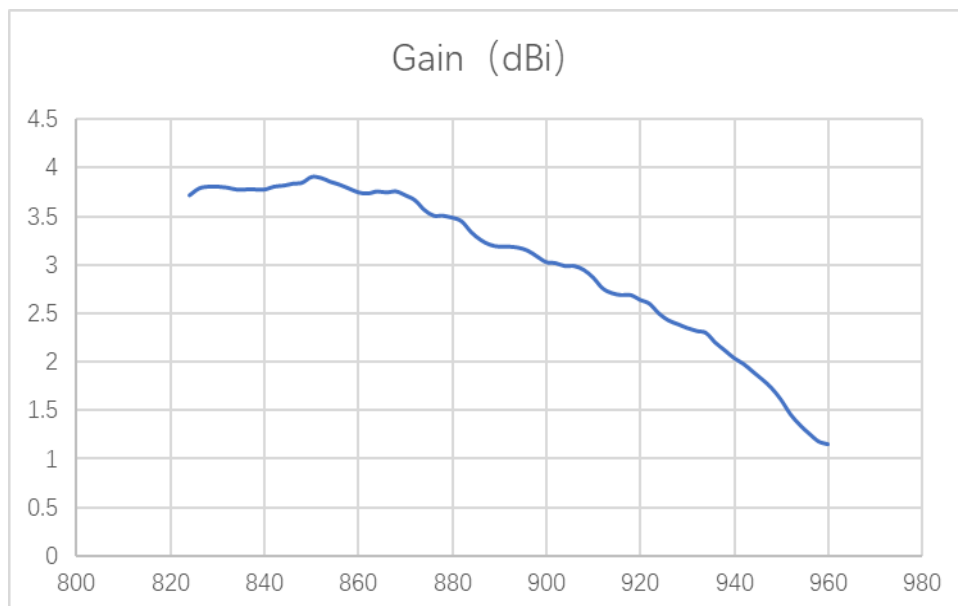
Frequency (MHz)	2400	2450	2500	5150	5500	5850
Gain (dBi)	2	1.69	2.08	1.62	3.73	2.76

GPS:



Frequency (MHz)	1160	1176	1190	1560	1574	1590
Gain (dBi)	-0.19	-0.28	-0.51	1.61	1.59	1.13

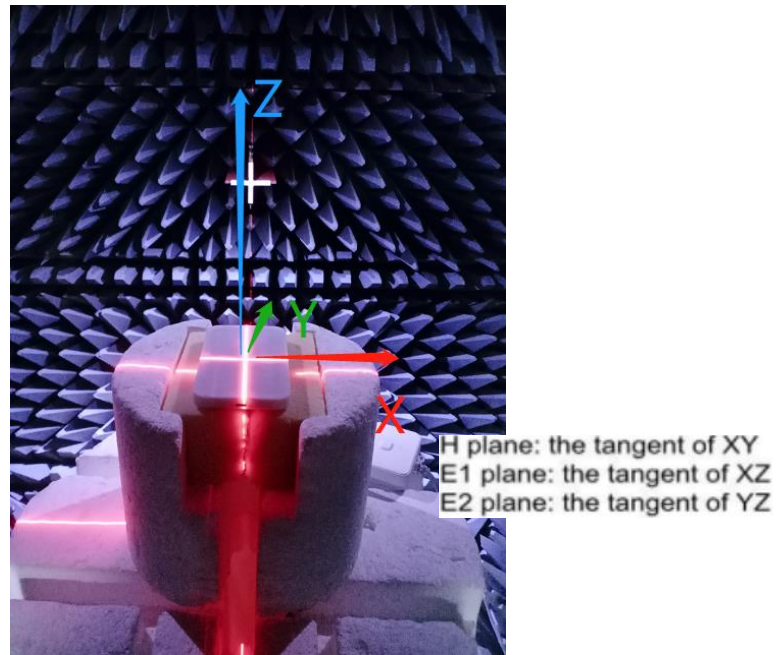
LORA:



Frequency (MHz)	820	880	900	930	960
Gain (dBi)	3.61	3.49	3.03	2.35	1.15

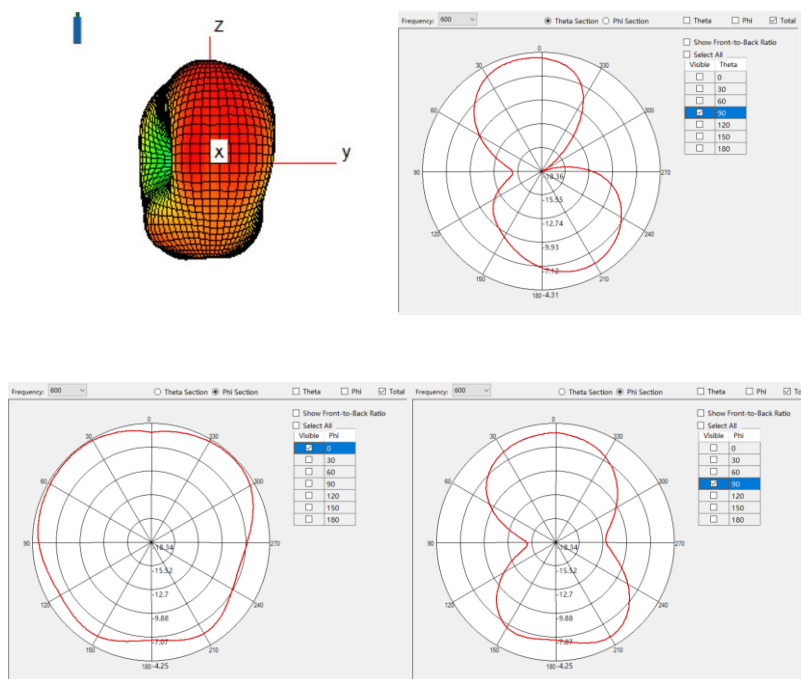
4.5. Radiation Pattern

- Test condition: free space.

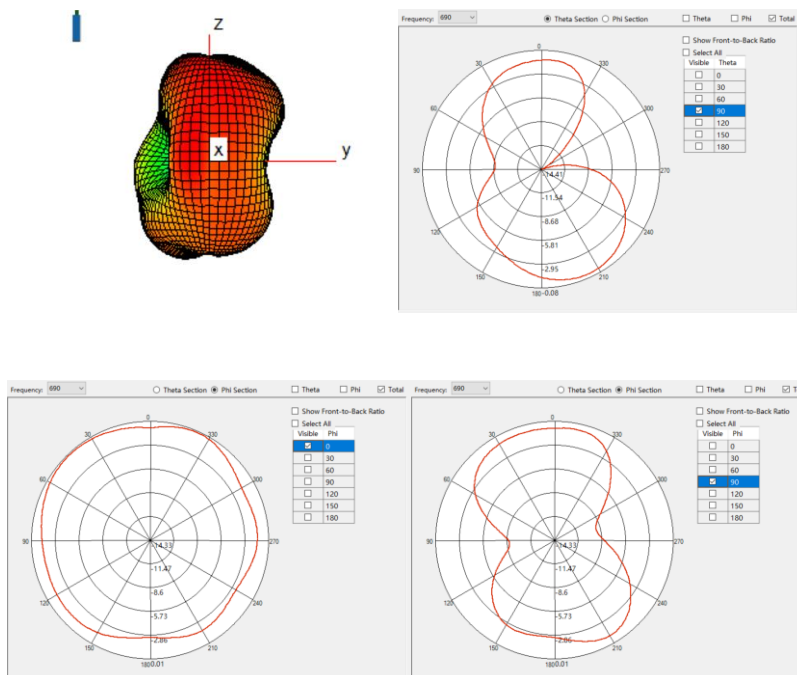


MAIN:

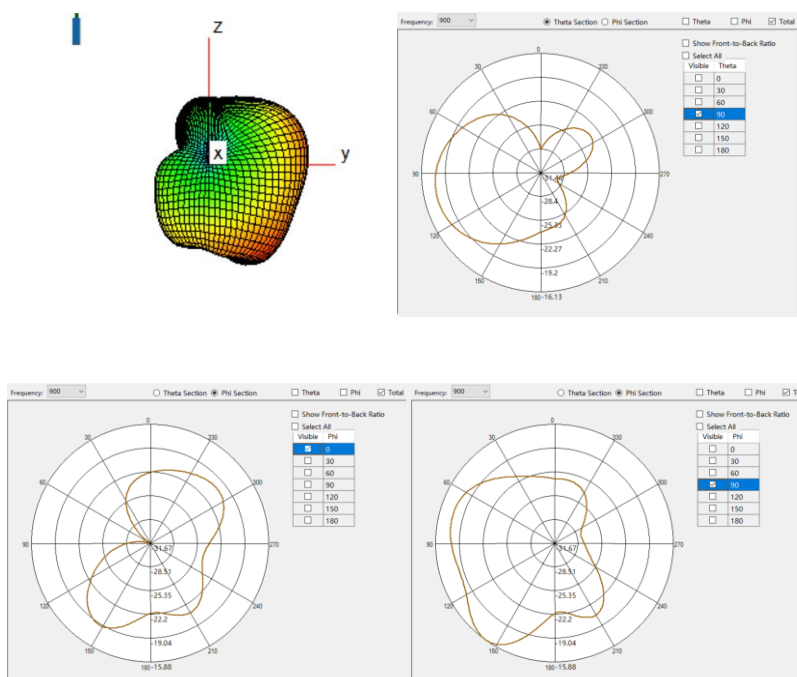
600MHz



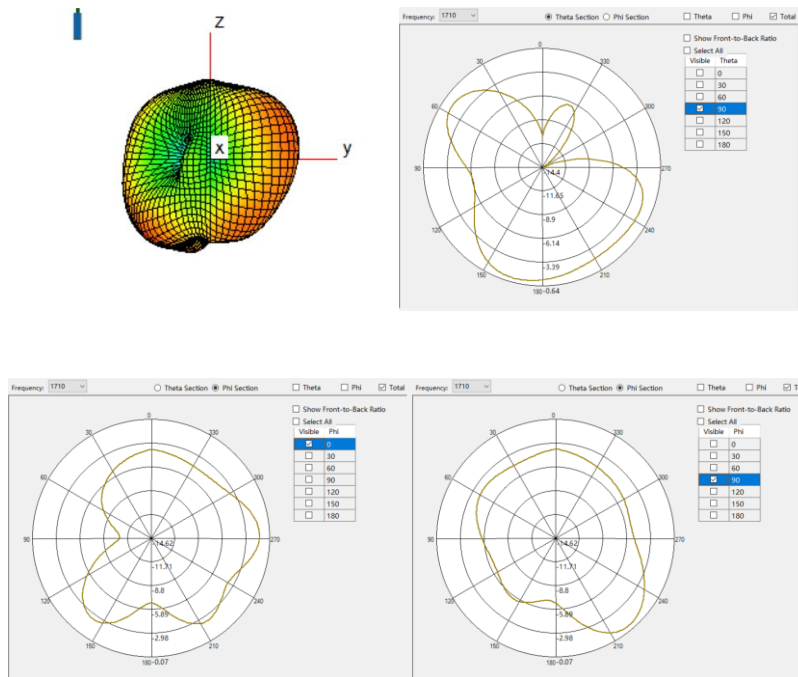
690MHz



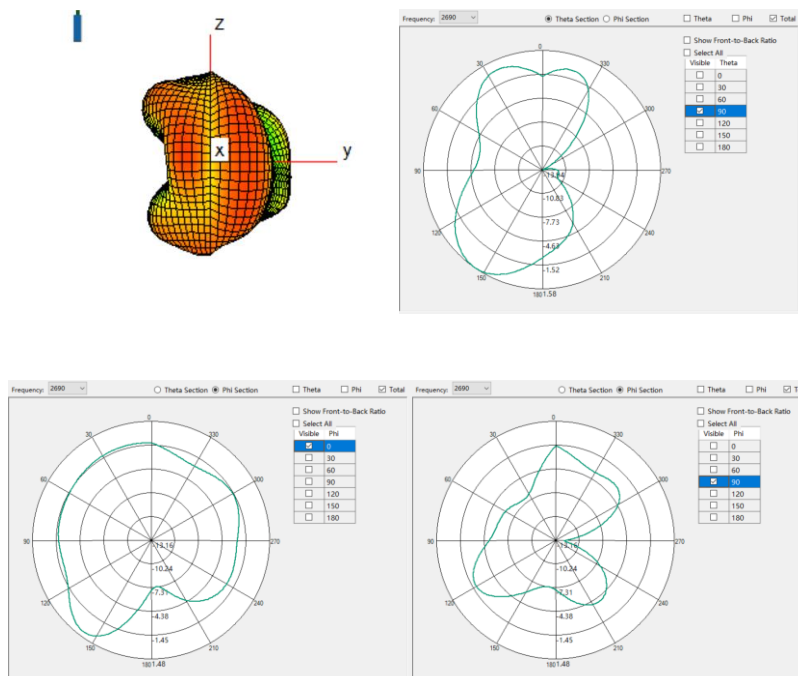
900MHz



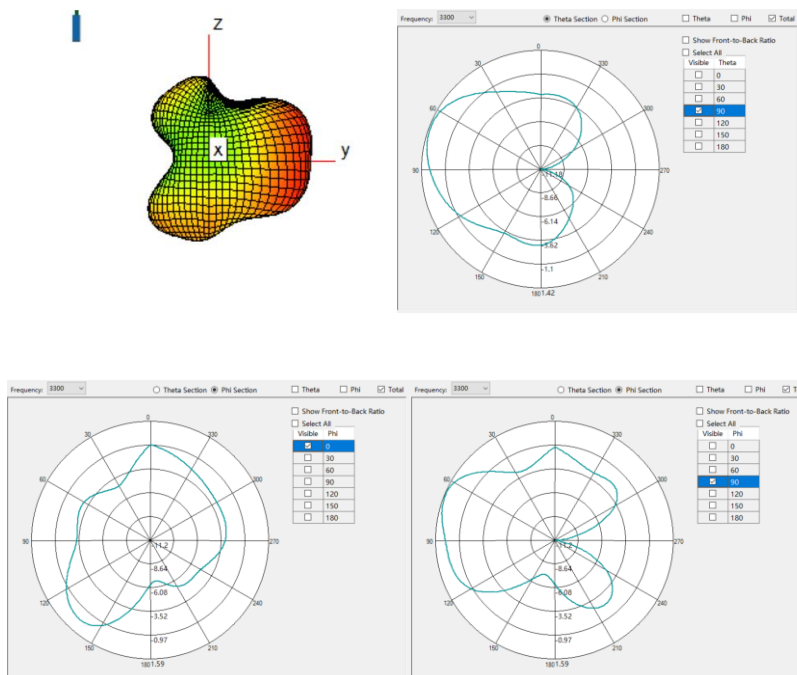
1710MHz



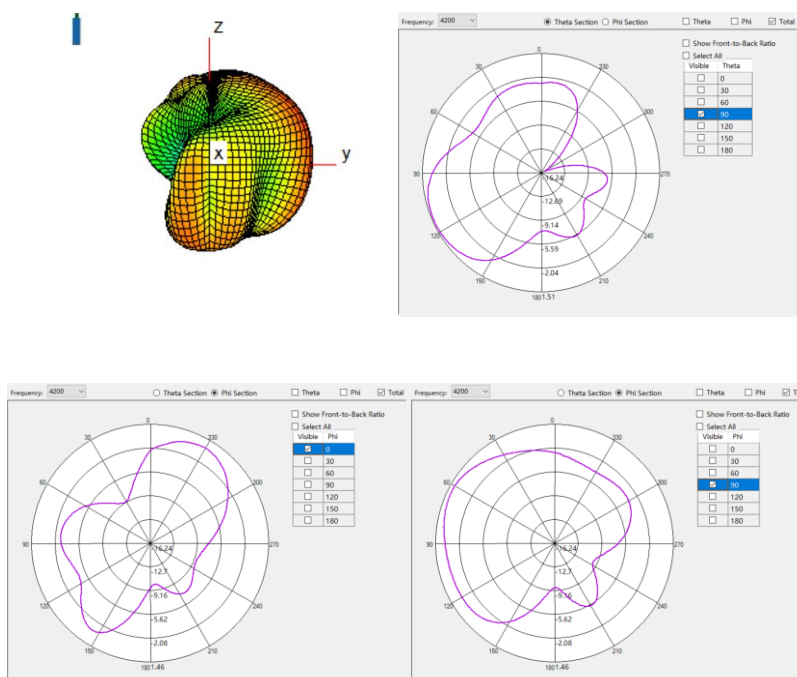
2690MHz



3300MHz

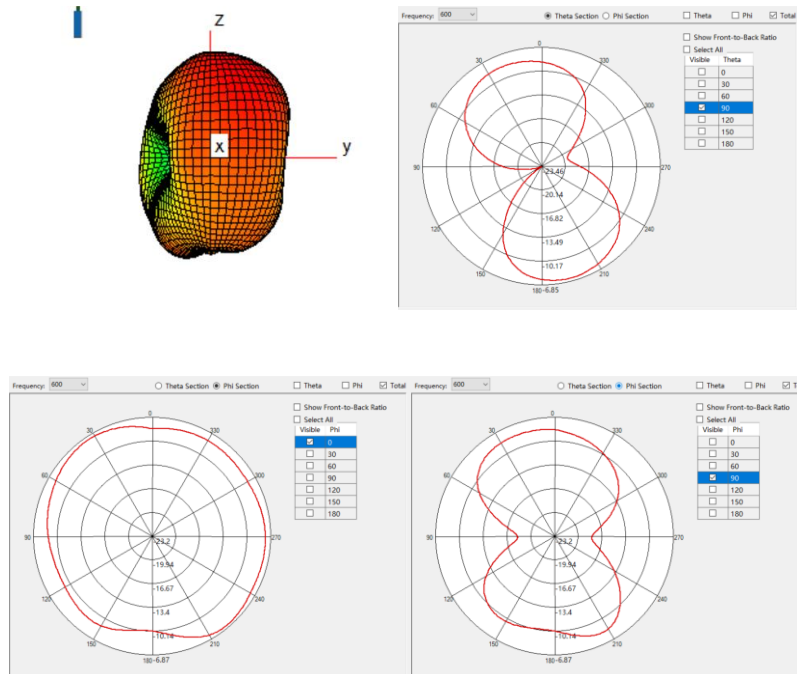


4200MHz

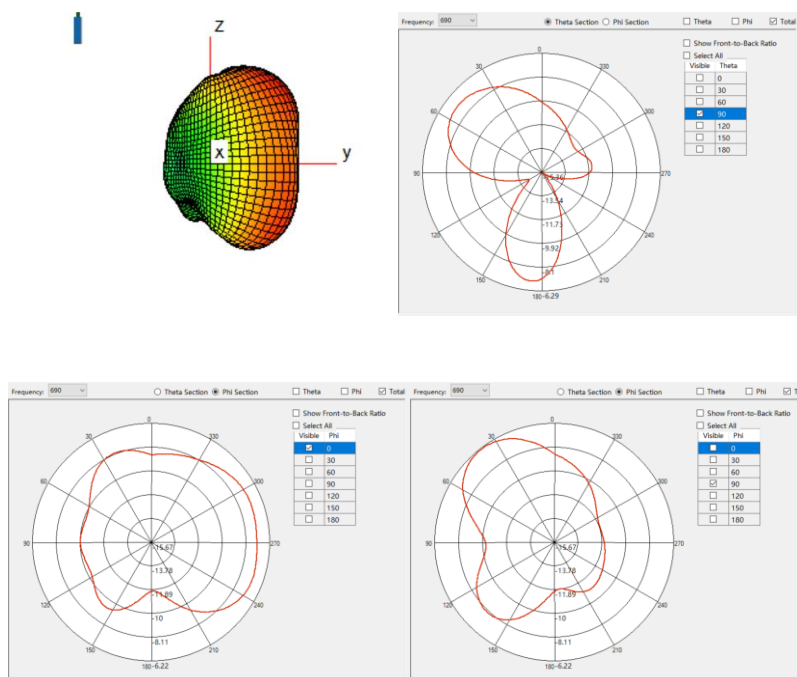


AUX:

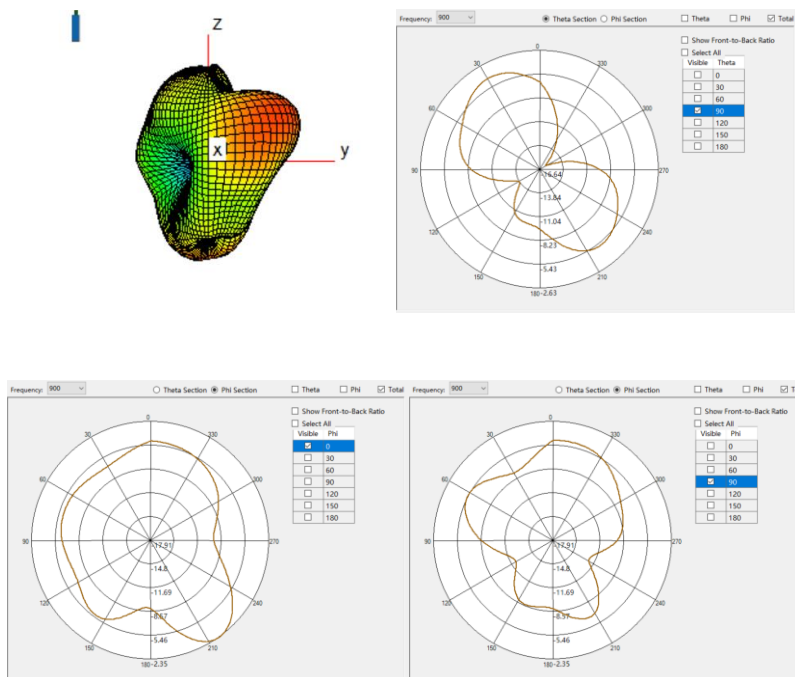
600MHz



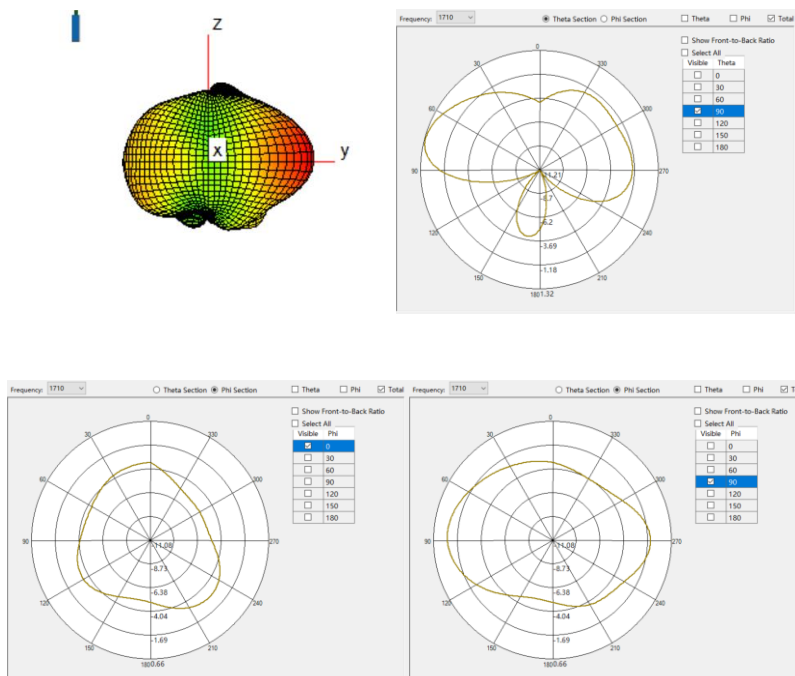
690MHz



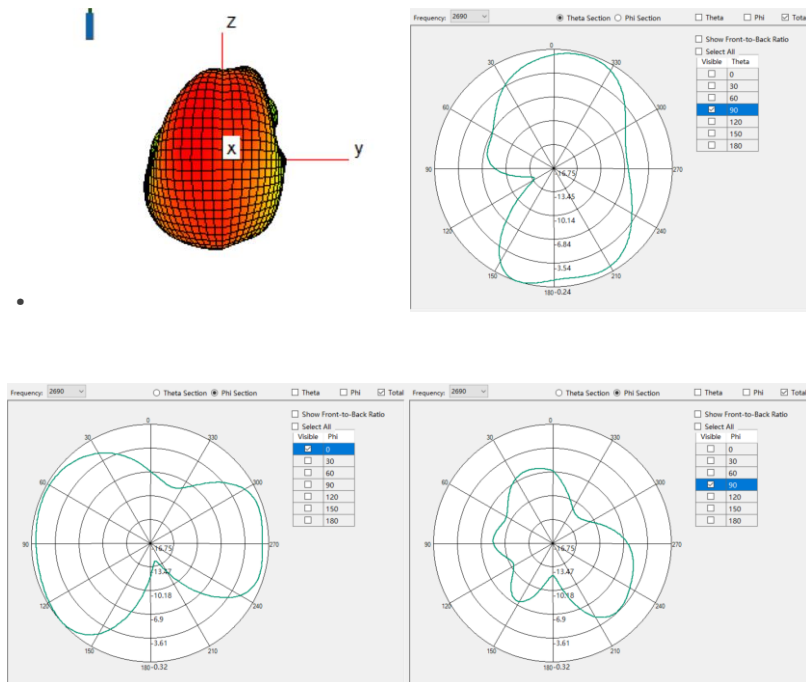
900MHz



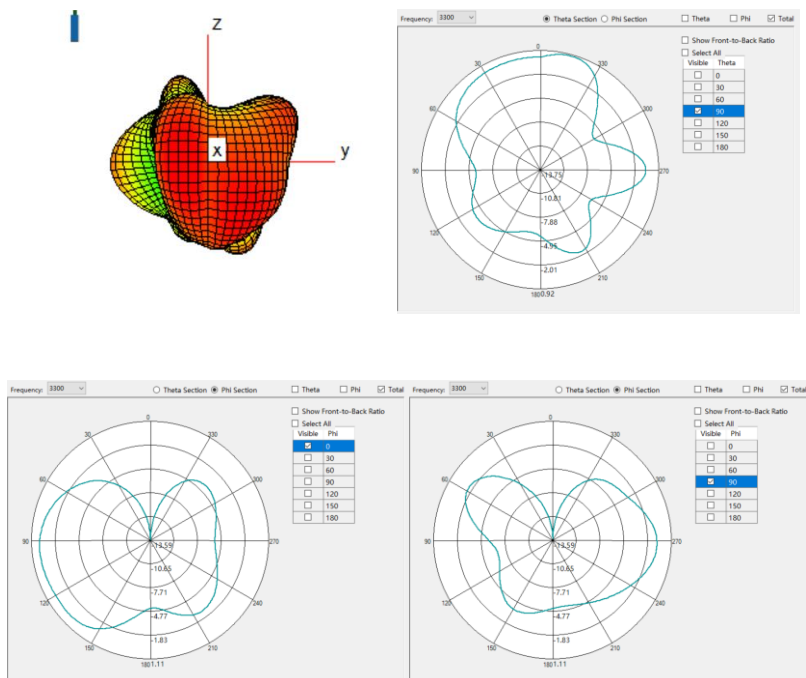
1710MHz



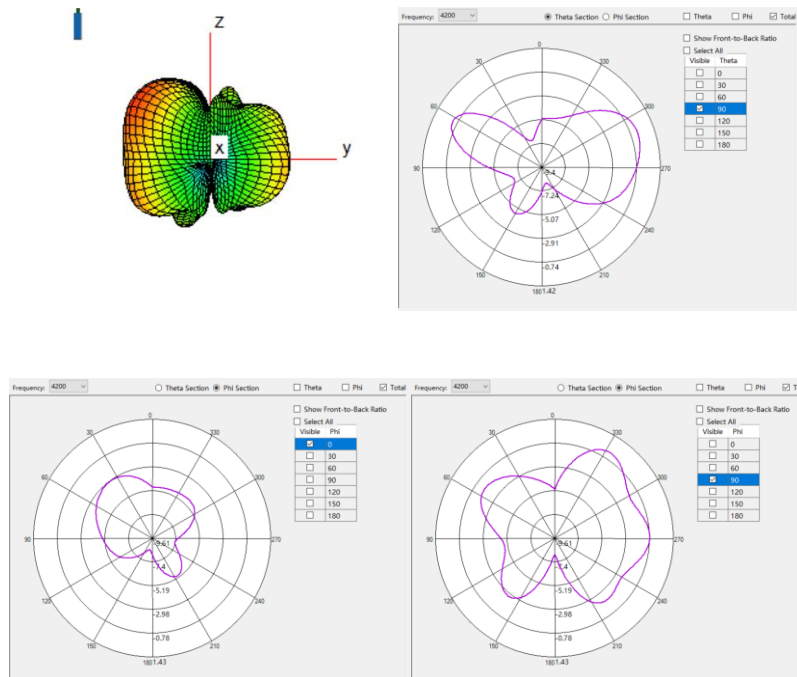
2690MHz



3300MHz

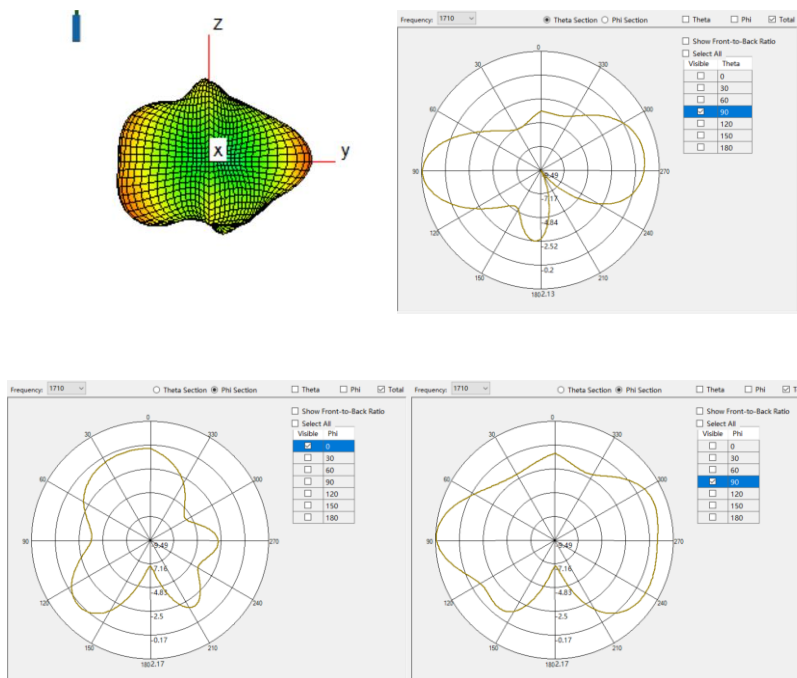


4200MHz

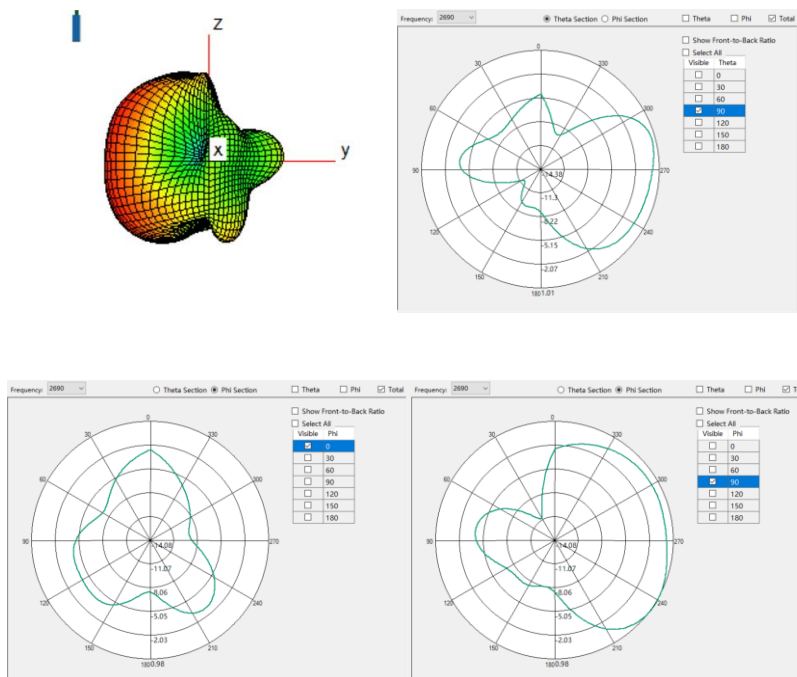


MIMO1:

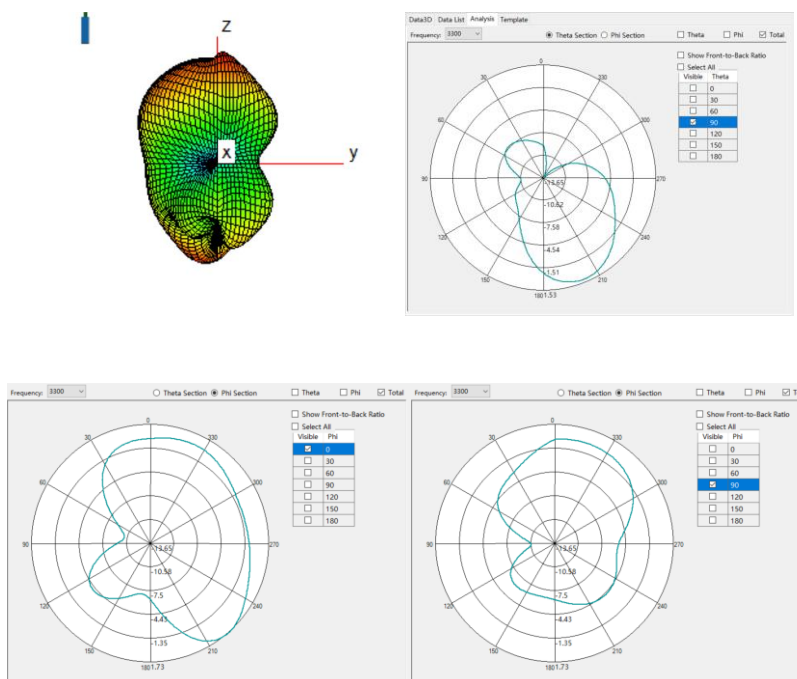
1710MHz



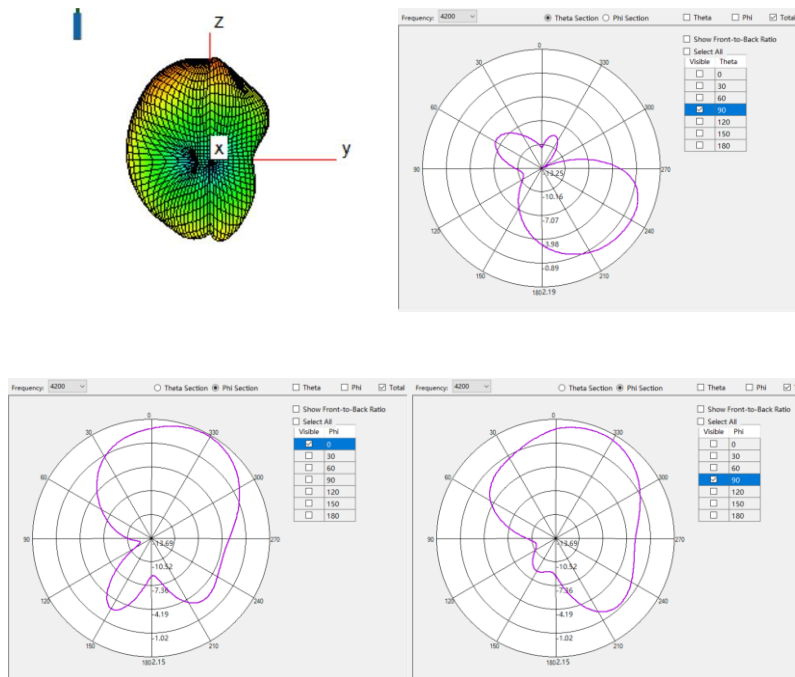
2690MHz



3300MHz

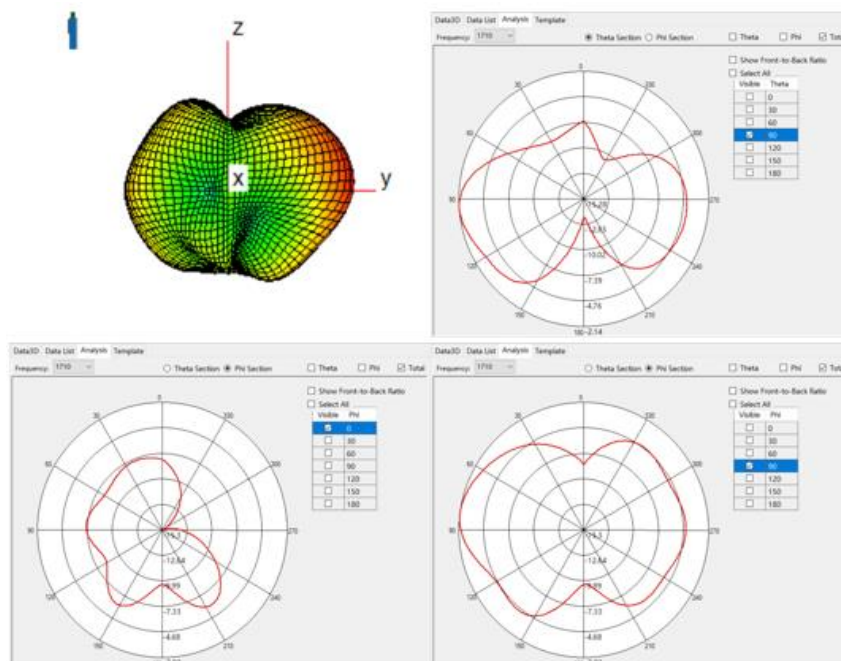


4200MHz

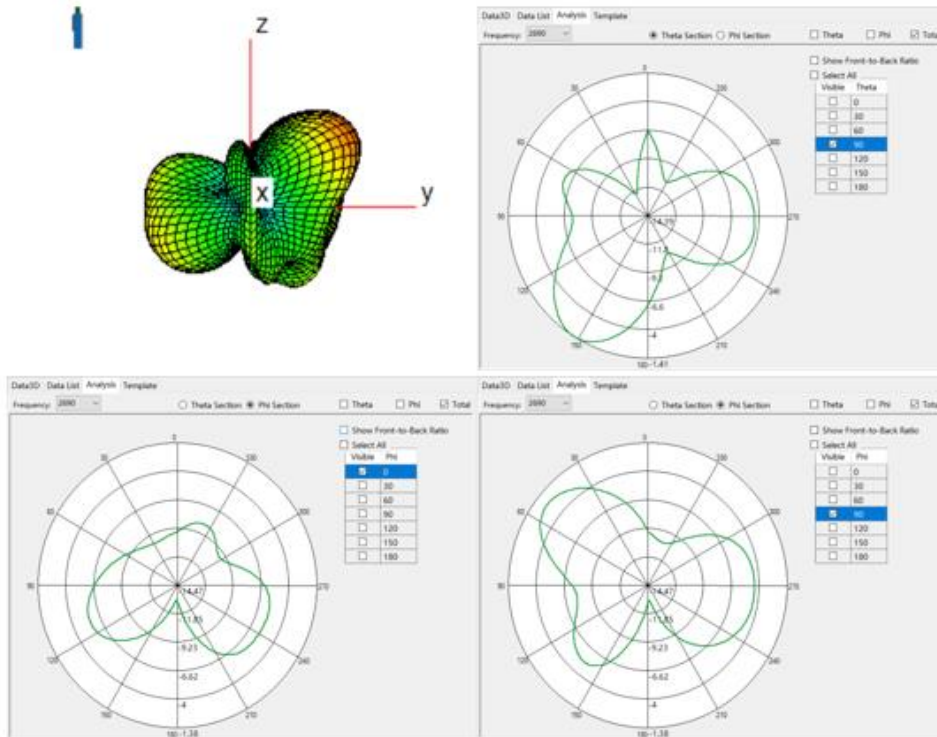


MIMO2:

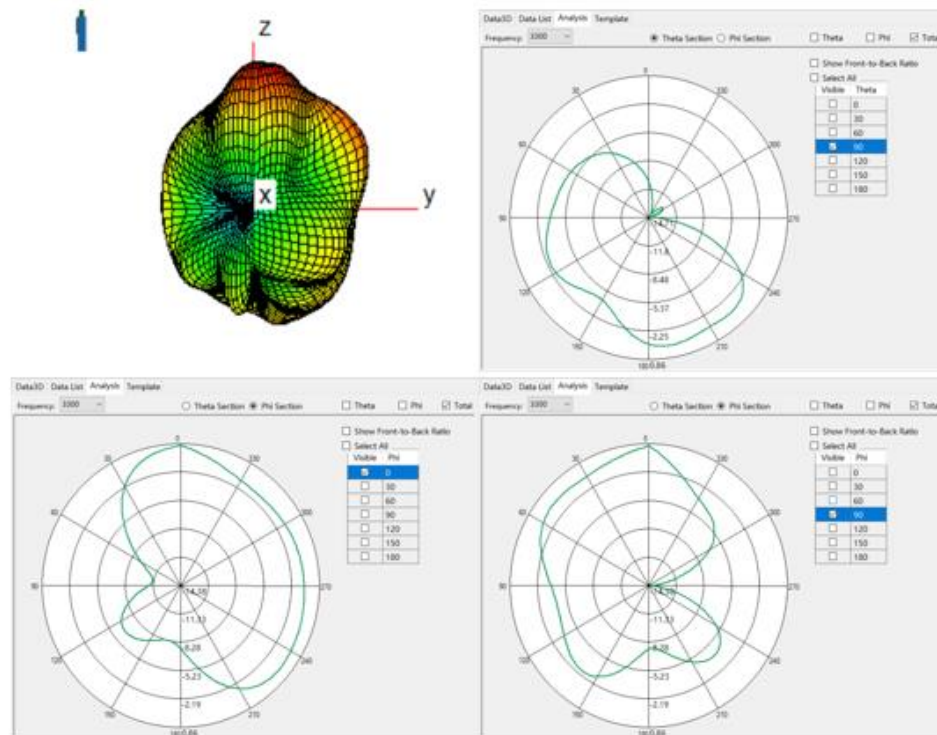
1710MHz



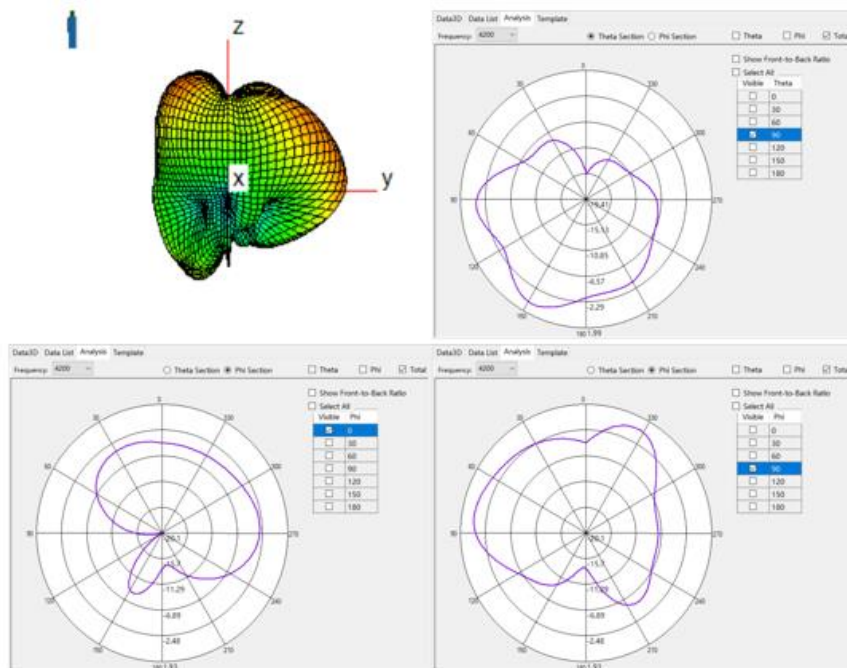
2690MHz



3300MHz

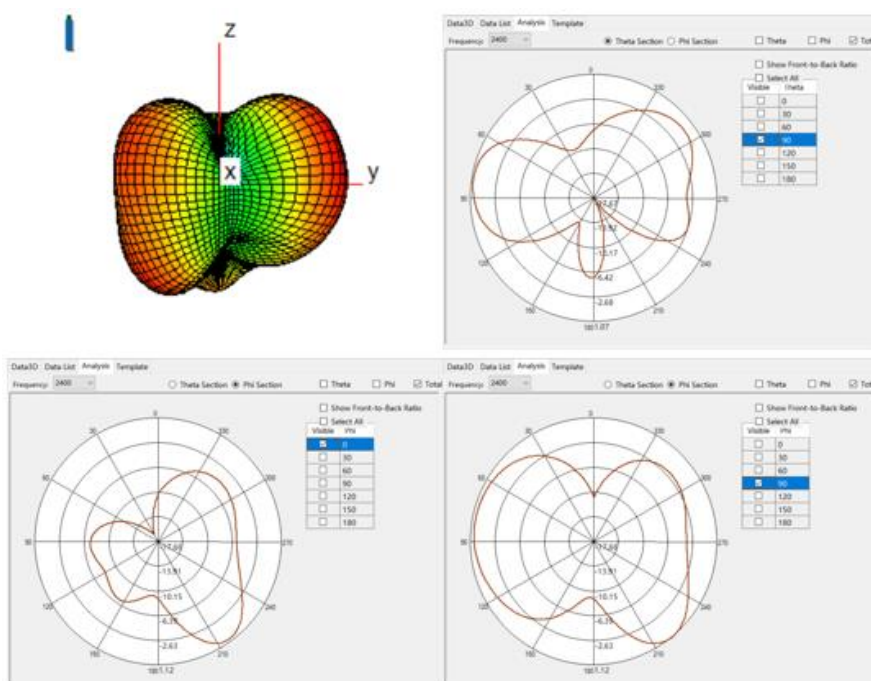


4200MHz

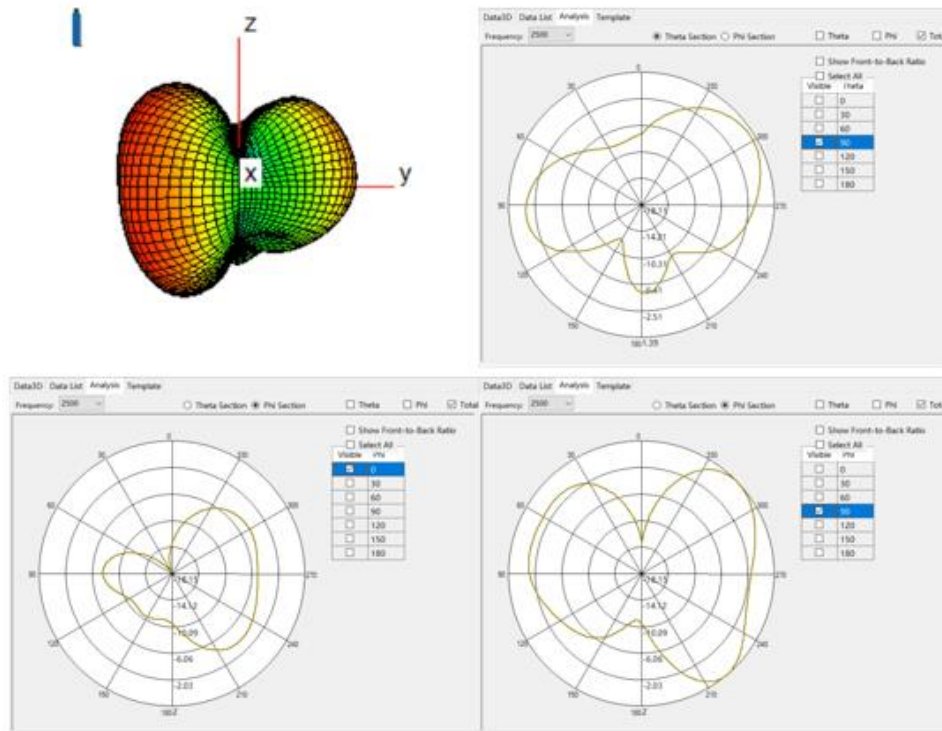


WIFI1:

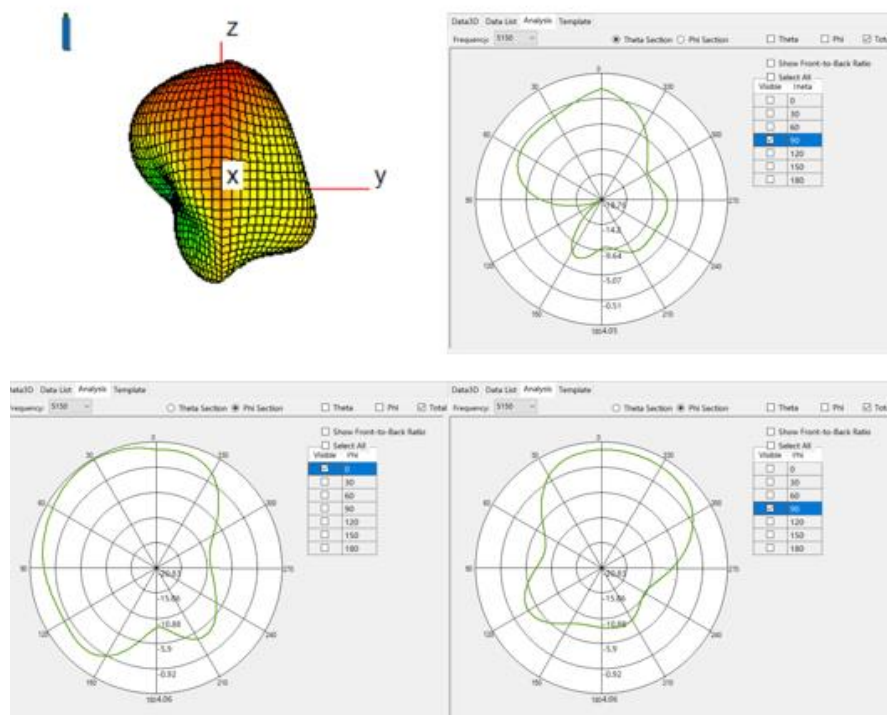
2400MHz



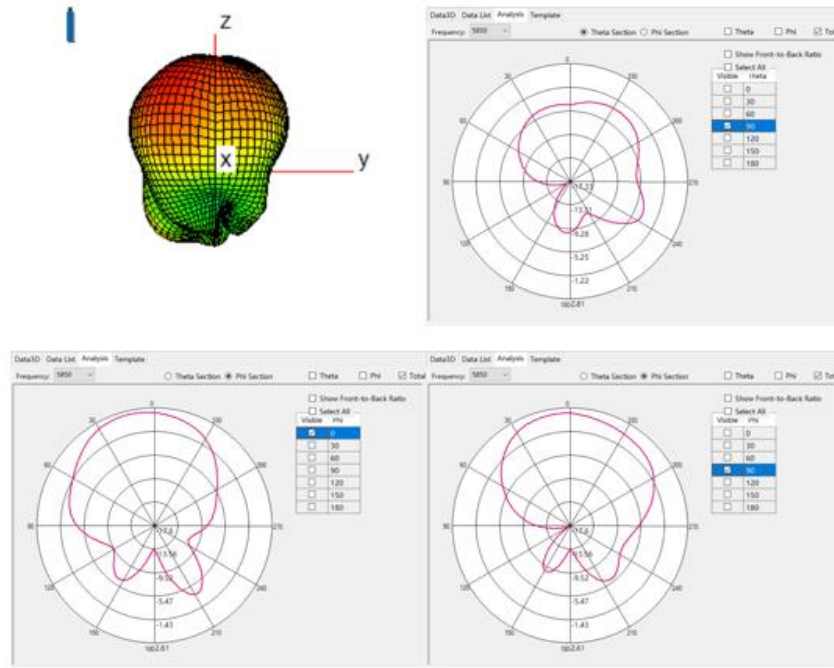
2500MHz



5150MHz

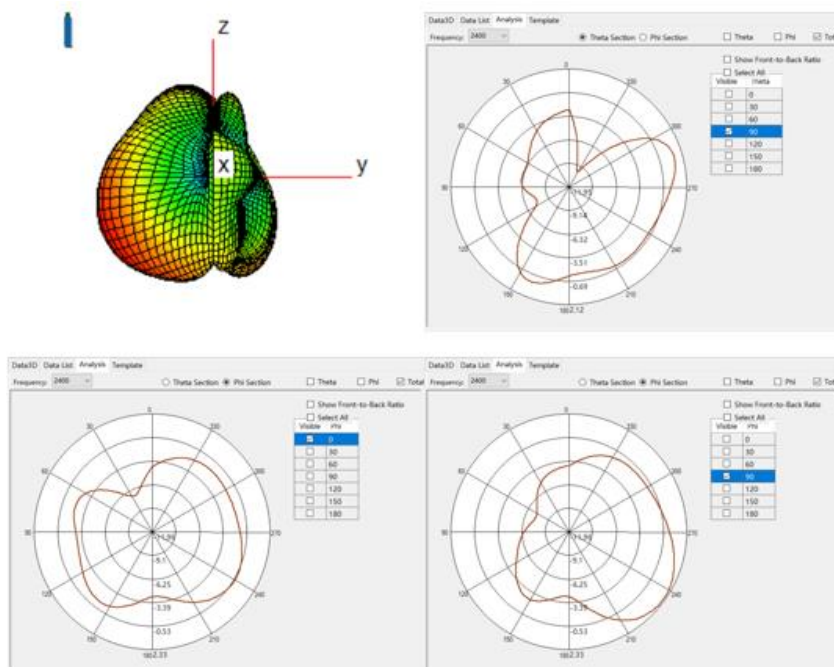


5850MHz

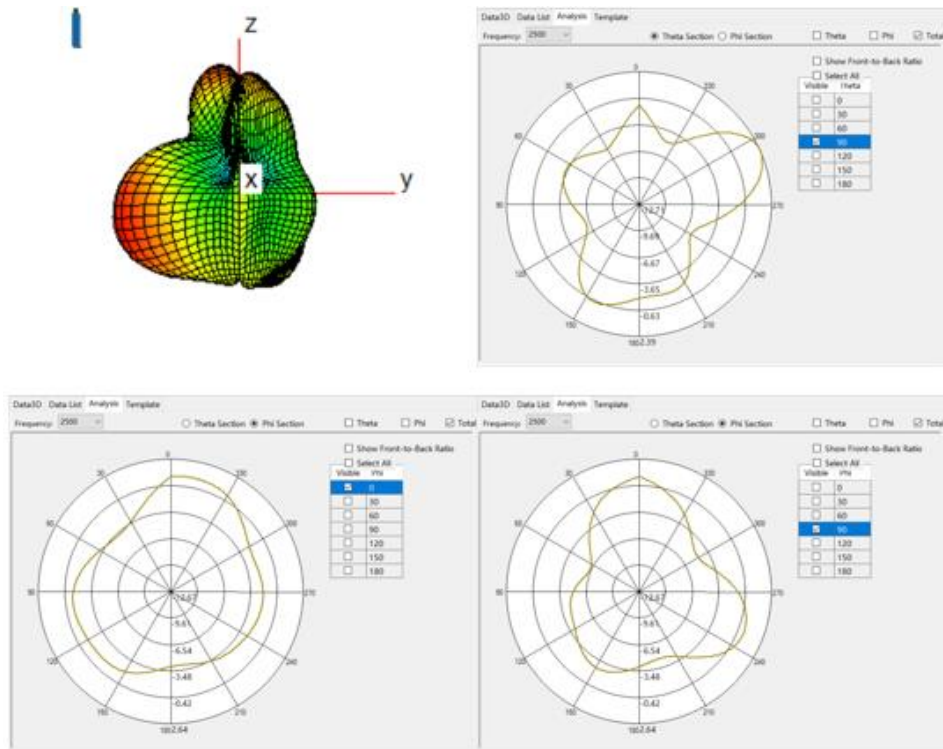


WIFI2 & BT:

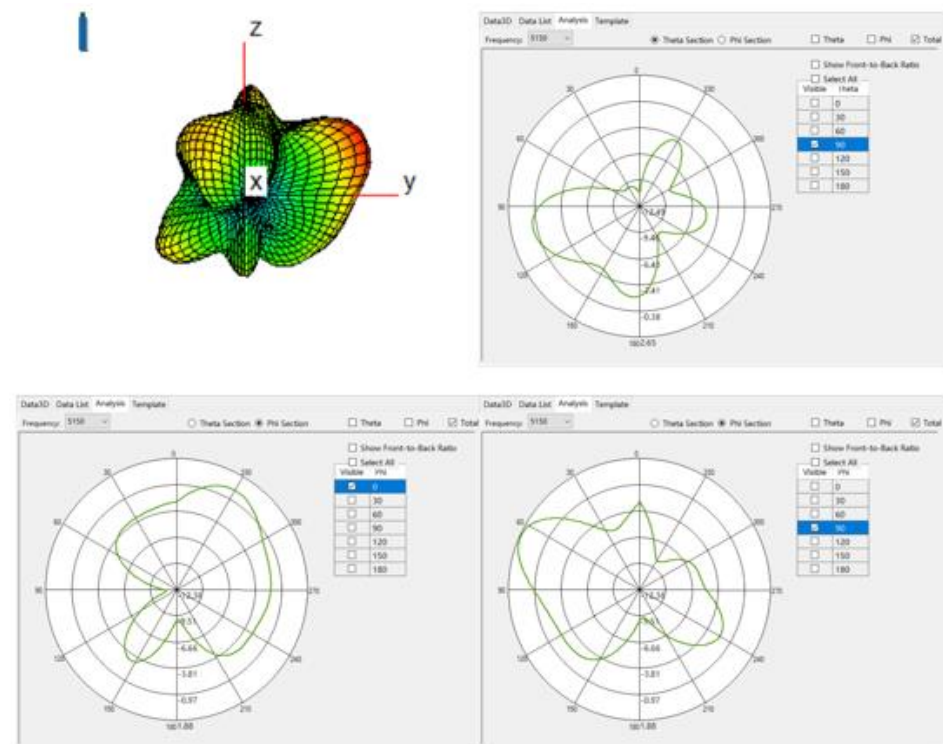
2400MHz



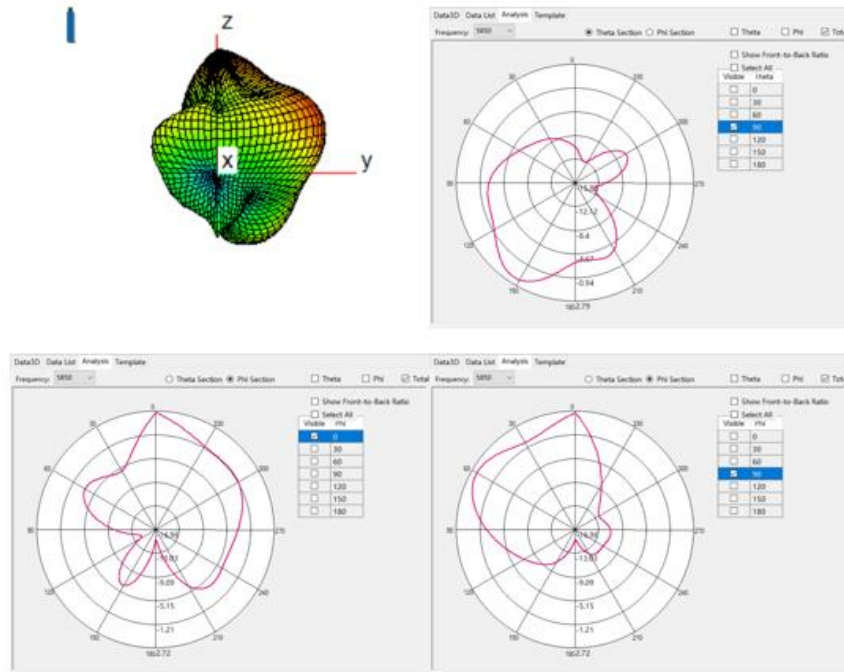
2500MHz



5150MHz

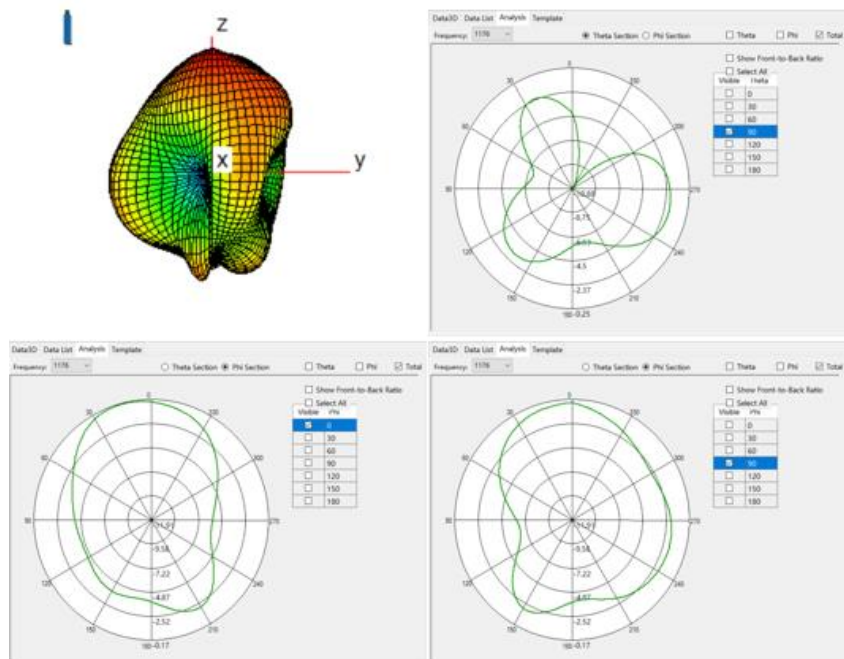


5850MHz

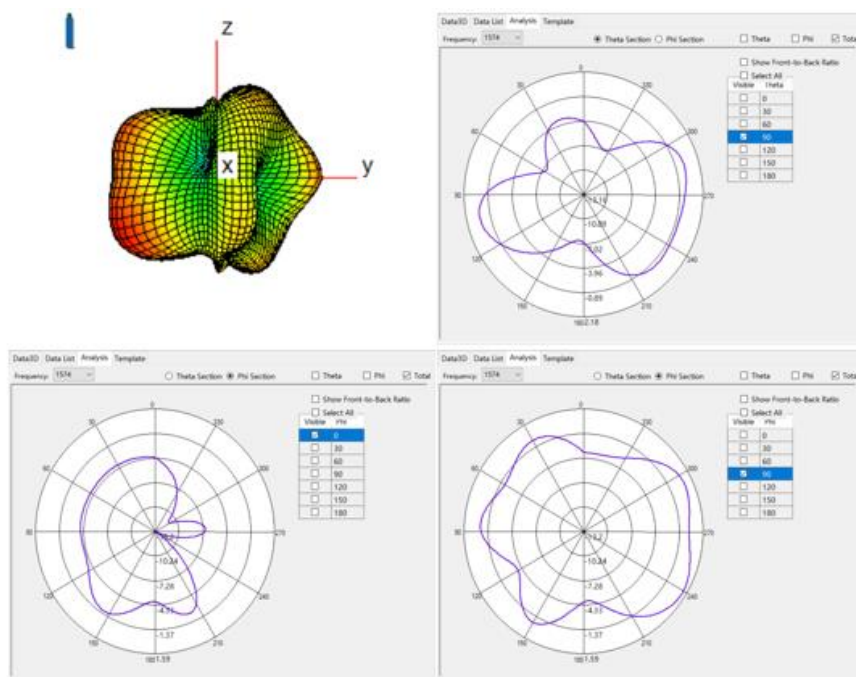


GPS:

1176MHz



1574MHz



LORA:

915MHz

