FCC Antenna OTA test report, EPOS SILK

Measurements performed by

Name	Title/Role & Function	Signature	Date
Wu Zechang	RF Engineer		2025/05/09

Approved by:

Name	Title/Role & Function	Signature	Date
Tangwei	RF Manager		2025/05/09

Manufacturer	Dongguan Wang 'Shi Anye Hardware Manufacturing Co ., Ltd
Test facility	505-506 ,ABlock,Donglian Building,Chuangye 2 road,Baoan District, Shenzhen,Guangdong,P.R china
Test date	2025-05-09
Antenna	Metal antenna
Antenna type	2.4GHz Internal inverted antenna

Revision history	
1.0	Initial Draft
1.1	Added the mechanical drawing

1. EUT Antenna specification and implementation

The radio system consists of the 2.4GHz transceiver QCC5181 with the internal Inverted F antenna.

Figure below shows the antenna implementation with feed point and dominant current path indicated.

Device serial number	
Device Model	EPOS Silk
Device SW version	V0.4.138
Antenna type	2.4GHz Internal inverted F Antenna
Operating frequency	2400MHz – 2480MHz
Interface impedance	50Ω

Drawing of antenna with indication of antenna feed point and dominant current path.
If separate antenna part is used, insert a technical drawing of the antenna part only.

Figure 1 Inverted F antenna part

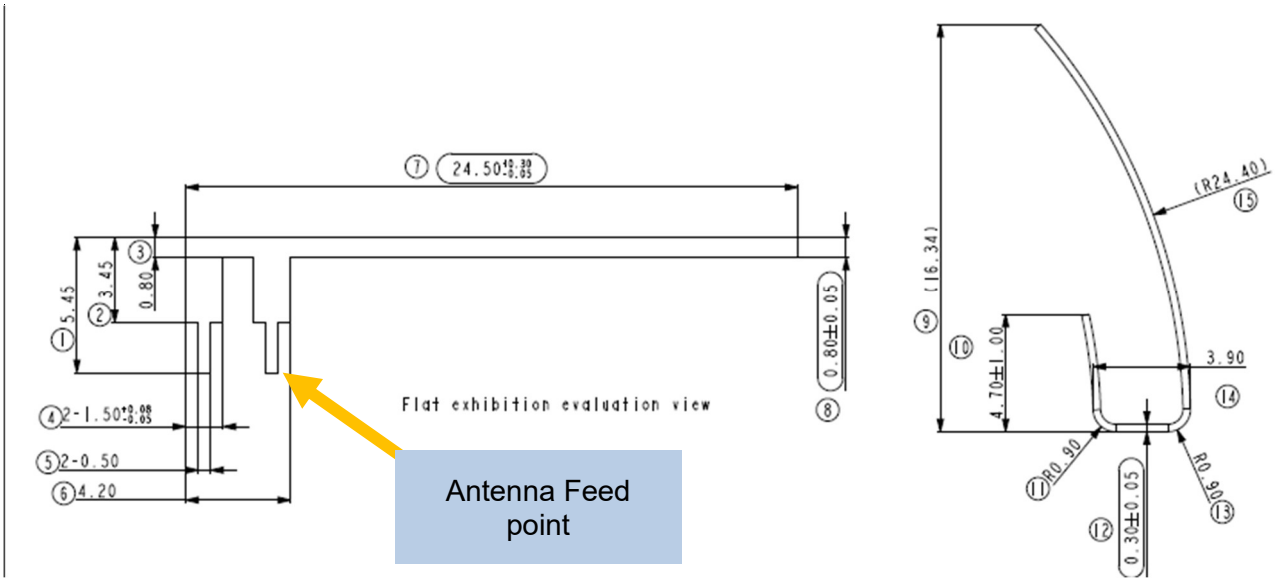
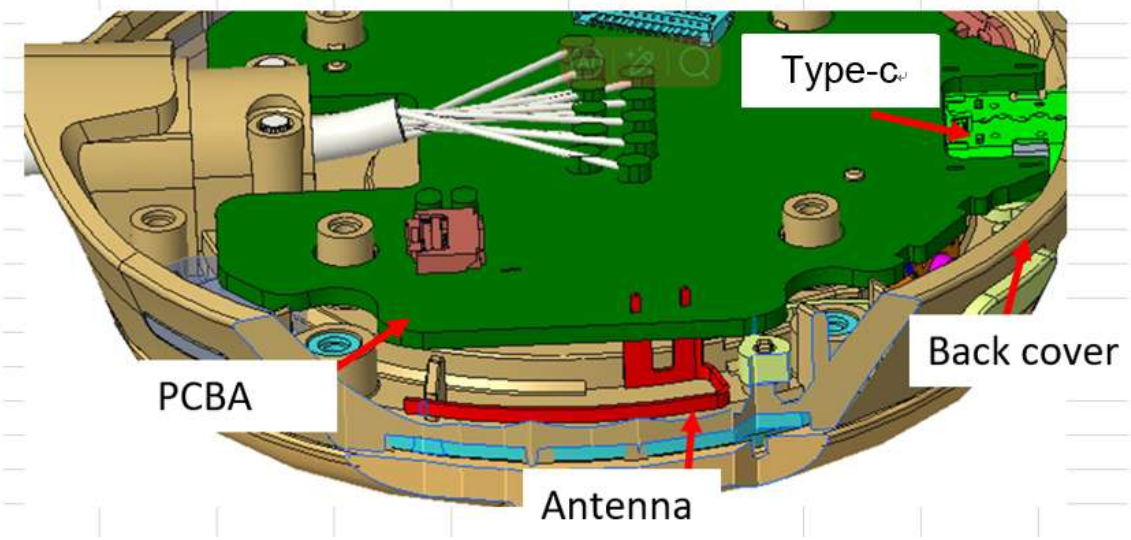
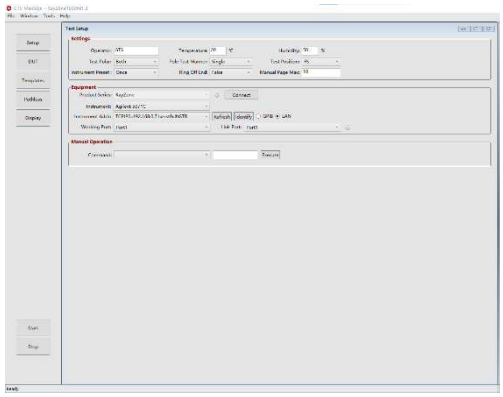
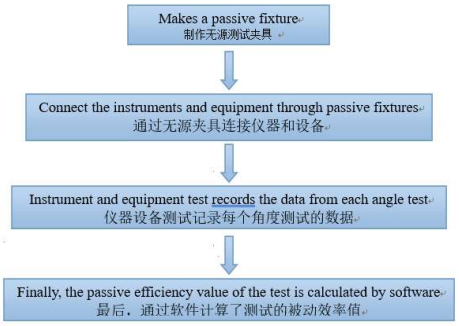
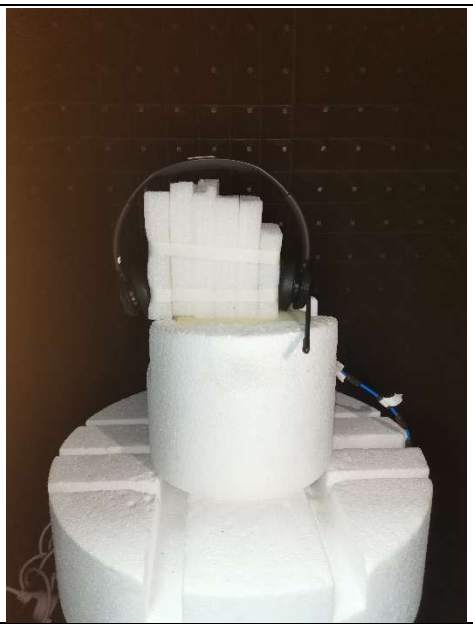


Figure 2 Integration of antenna part in Silk



2. Measurement setup

The OTA measurements are performed in a 3D capable shielded anechoic chamber.Measurements are performed using a Keysight ENA Network Analyzer E5071C and the GTS Maxsign - RayZone1800 Measurement Software Libra. Measurements are done under standard operating conditions at roomtemperature.

Measurement setup	Model
OTA chamber	General Test RayZone 1800
Network Analyzer	AKeysight ENA Network Analyzer E5071C,S/N:019285UNQ,Calibration date 2024-11-5 ,Calibration Due 2025-11-5
Measurement Software	GTS Maxsign - RayZone1800 Measurement Software Libra
Screenshot of measuring tools	 
Description of passive test methods	
Test photo	

3. Gain and directivity

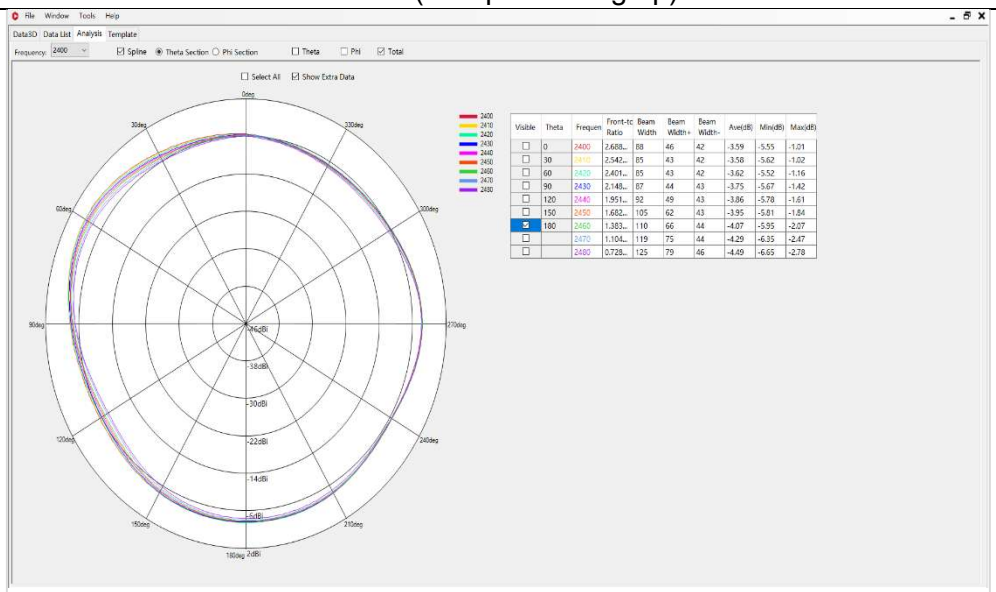
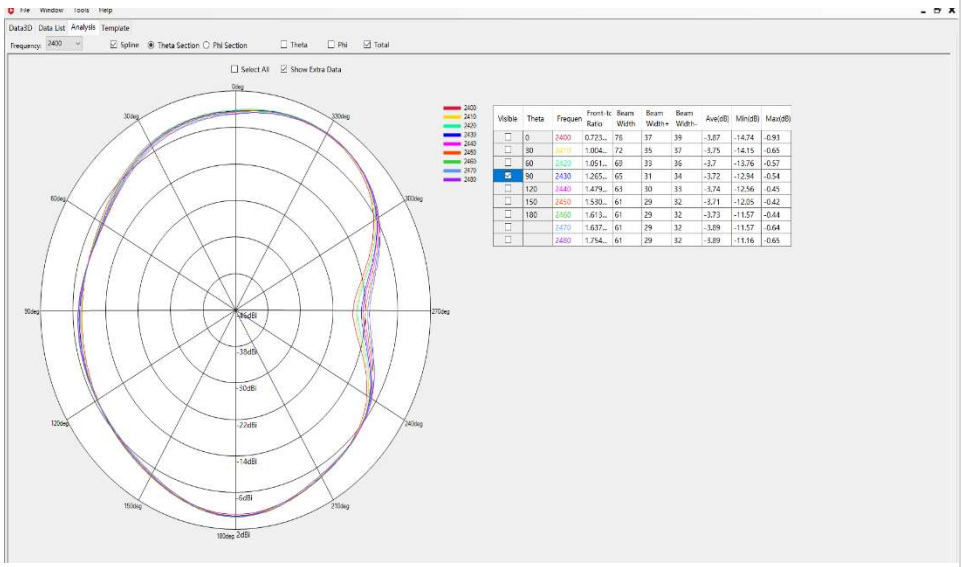
Passive testing result

Free (MIC pole facing up)				
Frequency	Gain dBi	Efficiency dB	Efficiency %	Directivity
2400	1.2	-3.3	46.8	3.2
2410	1.3	-3.2	47.7	3.2
2420	1.3	-3.2	48.0	3.2
2430	1.5	-3.2	48.2	3.2
2440	1.4	-3.2	48.2	3.2
2450	1.5	-3.1	48.8	3.3
2460	1.5	-3.1	49.2	3.3
2470	1.5	-3.2	48.1	3.4
2480	1.6	-3.1	48.5	3.5
AVG	1.4	-3.2	48.2	3.3

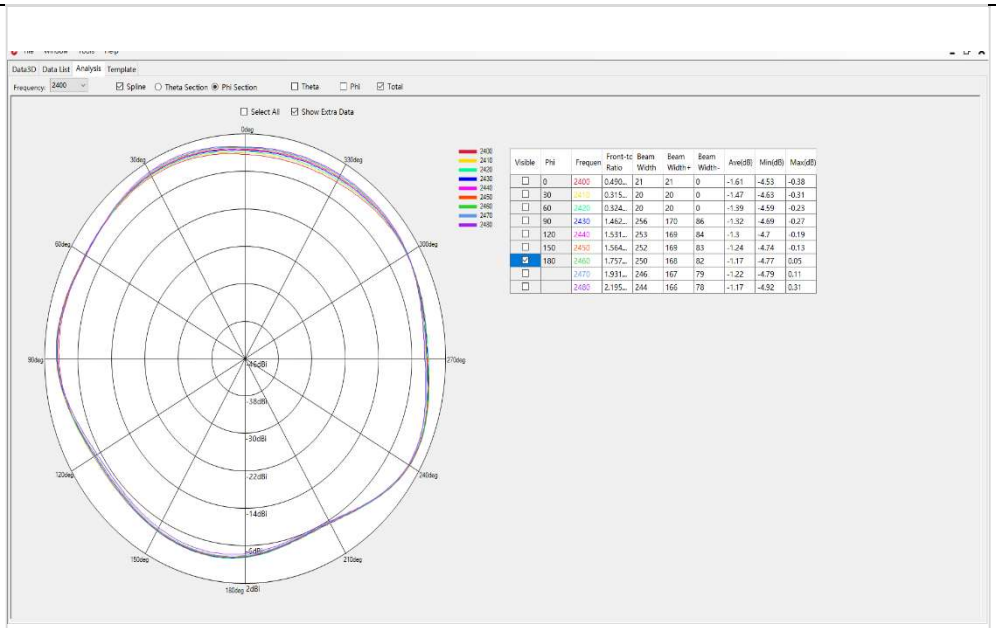
Free (MIC rod facing mouth)				
Frequency	Gain dBi	Efficiency dB	Efficiency %	Directivity
2400	1.6	-2.7	53.4	3.3
2410	1.6	-2.7	53.8	3.3
2420	1.6	-2.7	53.8	3.3
2430	1.7	-2.7	53.4	3.4
2440	1.6	-2.8	53.0	3.3
2450	1.7	-2.8	53.1	3.4
2460	1.8	-2.8	53.0	3.6
2470	1.9	-2.9	51.5	3.8
2480	2.0	-2.9	51.2	3.9
AVG	1.7	-2.8	52.9	3.5

4. Radiation pattern 2D and 3D

Patterns are radiation patterns – Not Gain – Values are not normalized with output power.

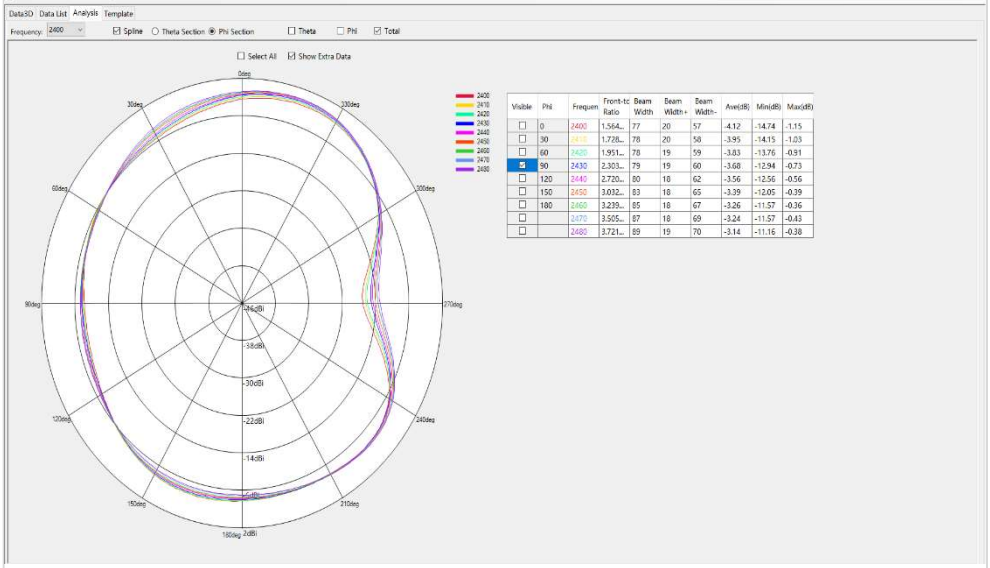
2D	Free (MIC pole facing up)
THETA 180°	
THETA 90°	

PHI 180°

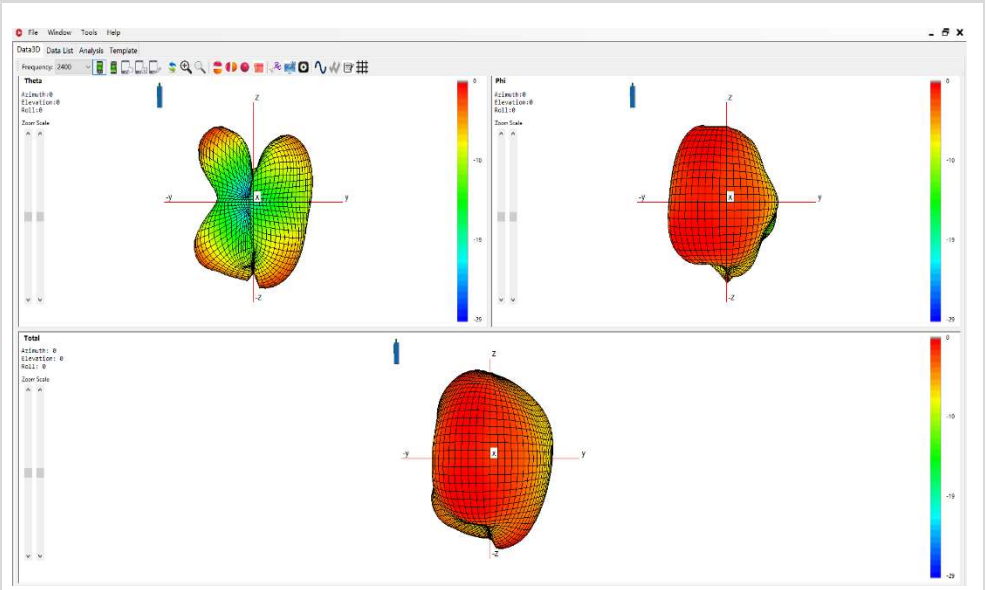


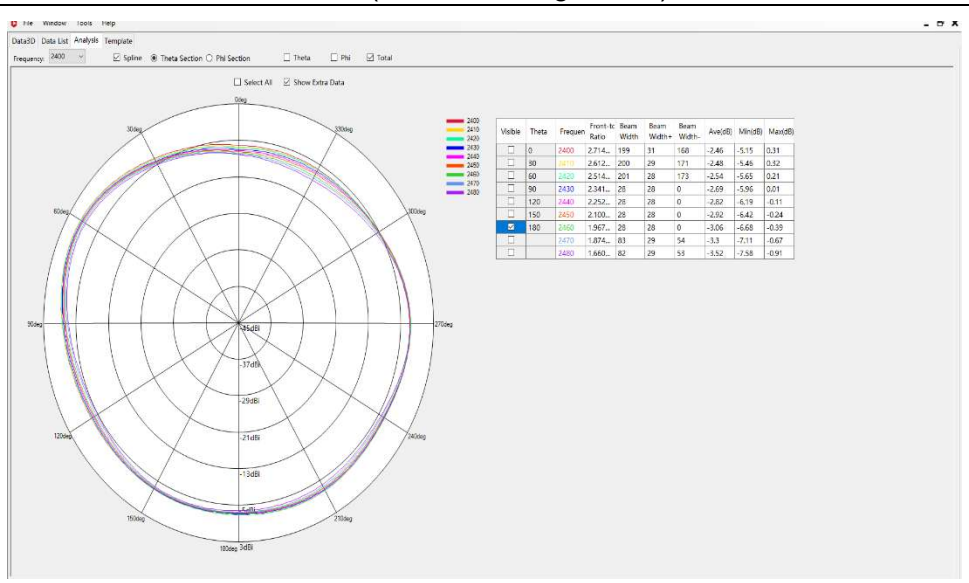
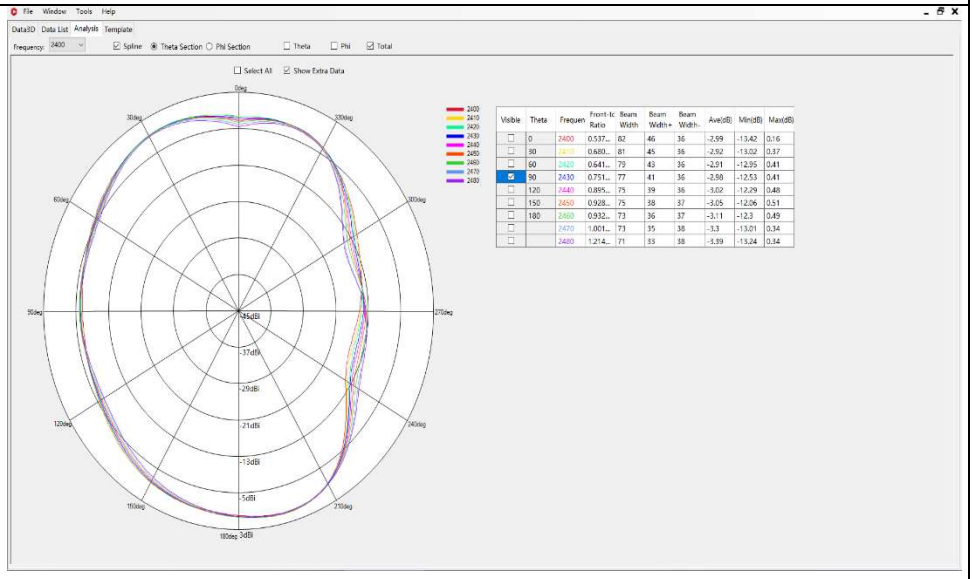
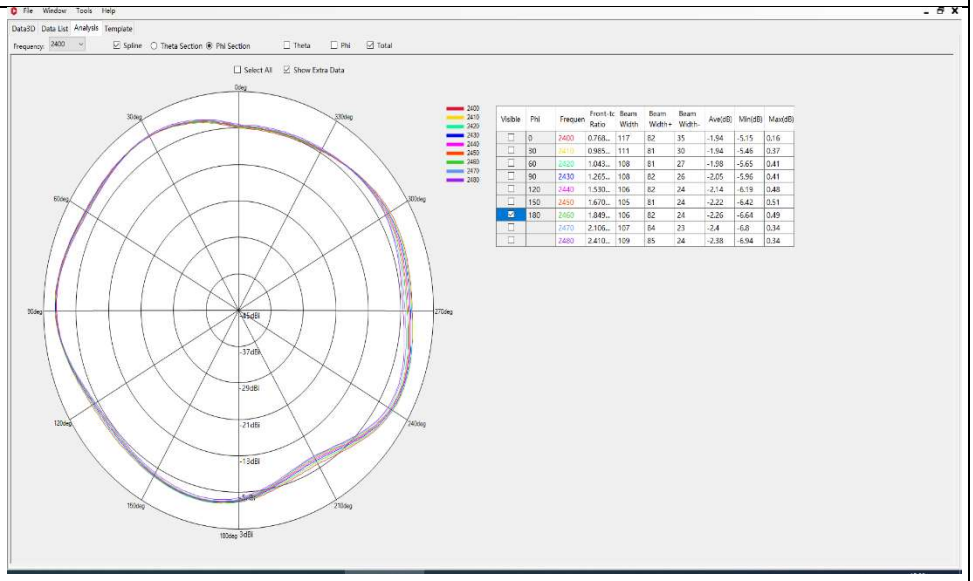
Visible	Phi	Frequen	Front-to Ratio	Beam Width	Beam Width+	Beam Width-	Ave(dB)	Min(dB)	Max(dB)
☐	0	2400	0.450...	21	21	0	-1.61	-4.53	-0.38
☐	30	2410	0.315...	20	20	0	-1.47	-4.63	-0.31
☐	60	2420	0.324...	20	20	0	-1.39	-4.59	-0.23
☐	90	2430	1.462...	256	170	86	-1.32	-4.69	-0.27
☐	120	2440	1.531...	253	169	84	-1.3	-4.7	-0.19
☐	150	2450	1.564...	252	168	83	-1.24	-4.74	-0.13
☑	180	2460	1.757...	250	168	82	-1.17	-4.77	0.05
☐		2470	1.931...	246	167	79	-1.22	-4.79	0.11
☐		2480	2.195...	244	166	78	-1.17	-4.92	0.31

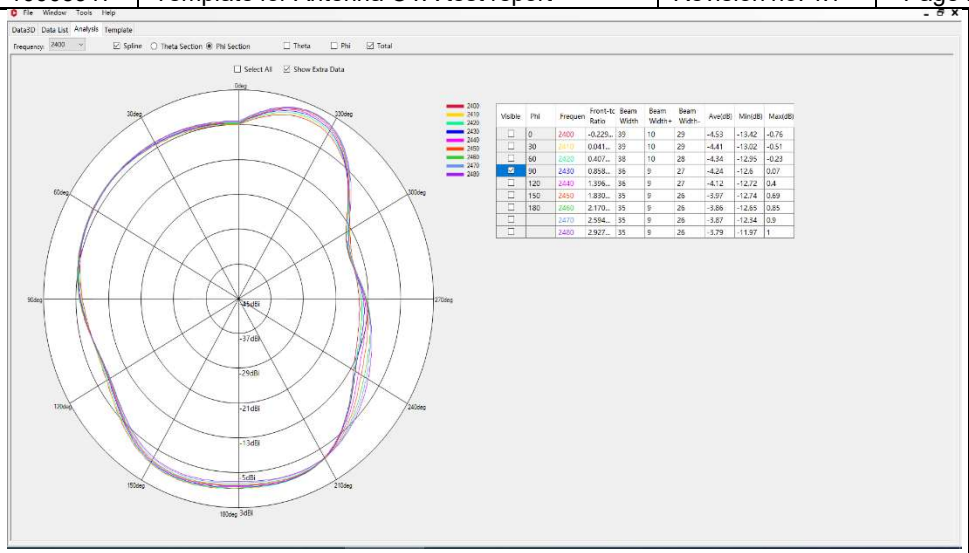
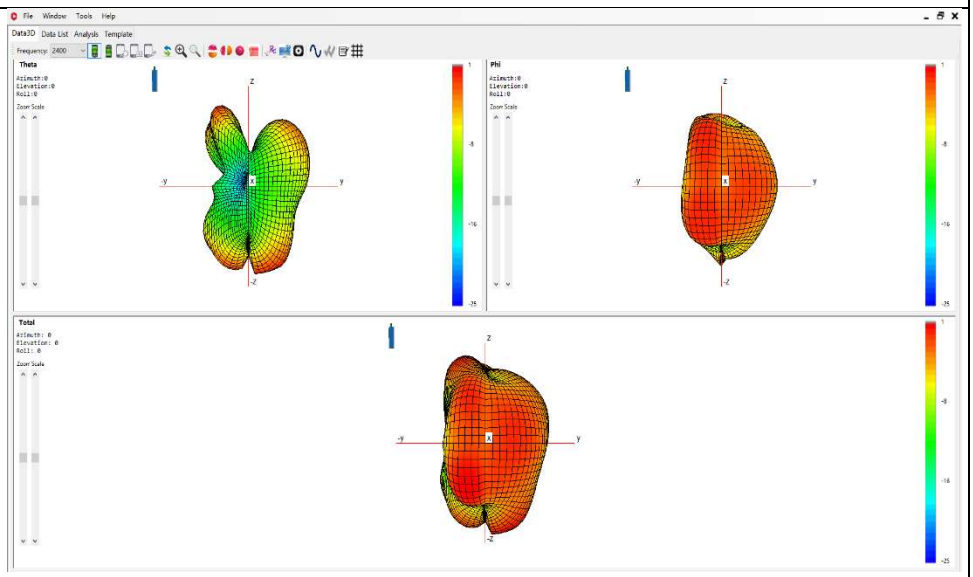
PHI 90



Visible	Phi	Frequen	Front-to Ratio	Beam Width	Beam Width+	Beam Width-	Ave(dB)	Min(dB)	Max(dB)
☐	0	2400	1.564...	77	20	57	-4.12	-14.74	-1.15
☐	30	2410	1.728...	78	20	58	-3.95	-14.15	-1.03
☐	60	2420	1.951...	78	19	59	-3.83	-13.76	-0.91
☑	90	2430	2.303...	79	19	60	-3.68	-12.94	-0.73
☐	120	2440	2.720...	80	18	62	-3.56	-12.56	-0.56
☐	150	2450	3.032...	83	18	65	-3.39	-12.05	-0.39
☐	180	2460	3.239...	85	18	67	-3.26	-11.57	-0.36
☐		2470	3.505...	87	18	69	-3.24	-11.57	-0.43
☐		2480	3.721...	89	19	70	-3.14	-11.16	-0.38

3D	

2D	Free (MIC rod facing mouth)
THETA 180°	
THETA 90°	
PHI 180°	

PHI 90°	
3D	

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