

ANTENNA TEST REPORT

Applicant 翔鑫科技股份有限公司
台中市南屯區工業區 21 路 29 號 3 樓

Brand ORO

Manufacturer 翔鑫科技股份有限公司
台中市南屯區工業區 21 路 29 號 3 樓

Product Name 無線胎壓監測器

Model Name BTX-401

Report No 4791534844

Received Date 2024/10/25

Test Period 2024/11/5

Issued Date 2024/11/13

Prepared By:

Approved and Authorized By:



Sally Lu

Project Handler

Date : 2024/11/13



Kent Liu

Senior Laboratory Engineer

Date : 2024/11/13

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Release Note

Rev.	Date	Revisions	Contents
Original	2024/11/13	-	Initial issue

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1. Description of Antenna

Ant. No.	Brand Name	Model Name	Ant. Type	Operation Mode
1	ORO	M02AN00012	Monopole	2.4~2.48GHz

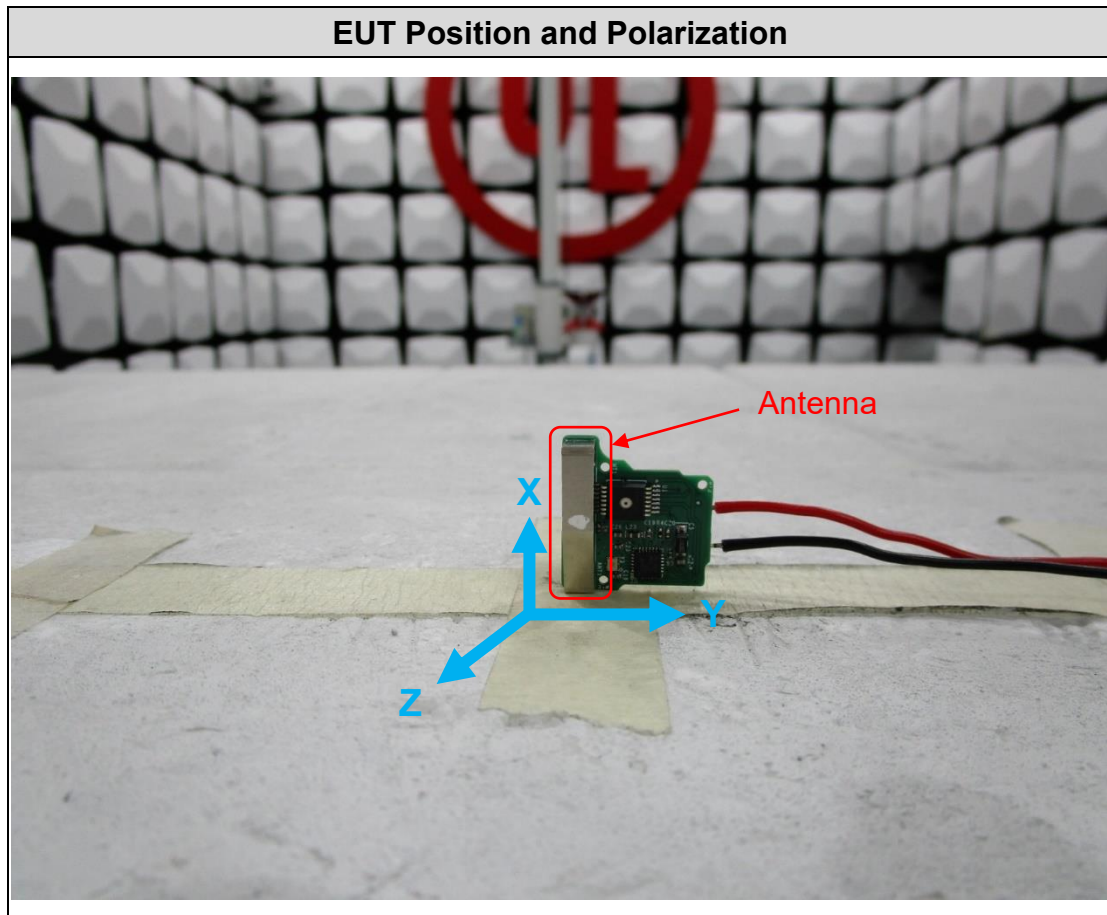
Note:

1. The above Antenna information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

2. Test Frequency and Polarization

The tests frequency is declared by manufacturer.

Band (MHz)	Test Frequency (MHz)
2400-2483.5	2402, 2426, 2480



3. Test Location and Address

Test Location	Underwriters Laboratories Taiwan Co., Ltd.,
Address	Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Description	All measurement facilities use to collect the measurement data are located at Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

4. Measuring Instrument List (Test Equipment)

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

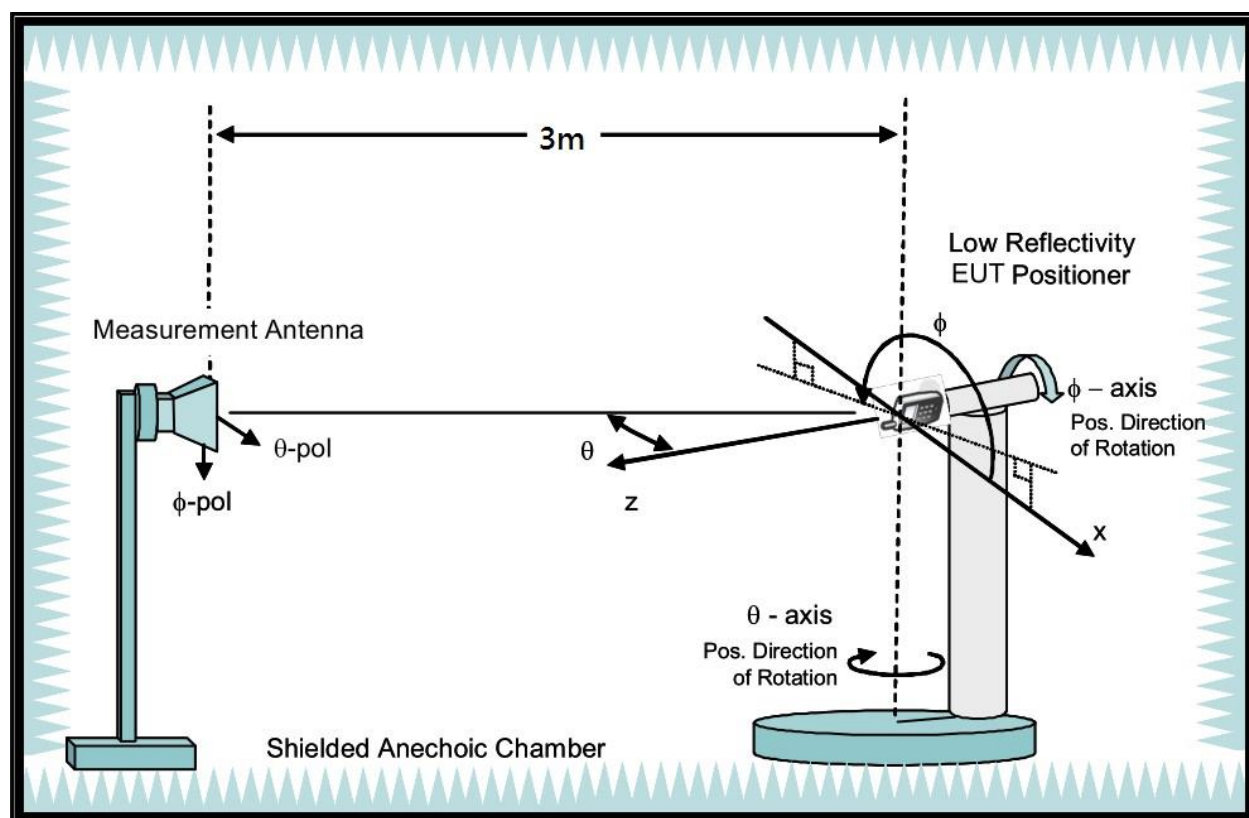
Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired Date
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	781	2023/12/27	2024/12/26
MXG Vector Signal Generator	Keysight Technologies	N5182B	MY56200244	2023/12/11	2024/12/10
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2023/11/29	2024/11/28
Cables	Hanyitek	HPMC40KM90KF	CB038	2024/2/12	2025/2/10
Support Calibration Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired Date
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	01690	2023/12/8	2024/12/7

UL Software

Software	Version
e3	6.191211 (V6)

5. Test Connection Diagram and Condition

Test Facility	Test Site No.	Environmental Condition	Test Date	Tested by
Fully Anechoic Chamber	1277	24°C/69%RH	2024/11/5	WaterNil Guan



6. Test Procedure

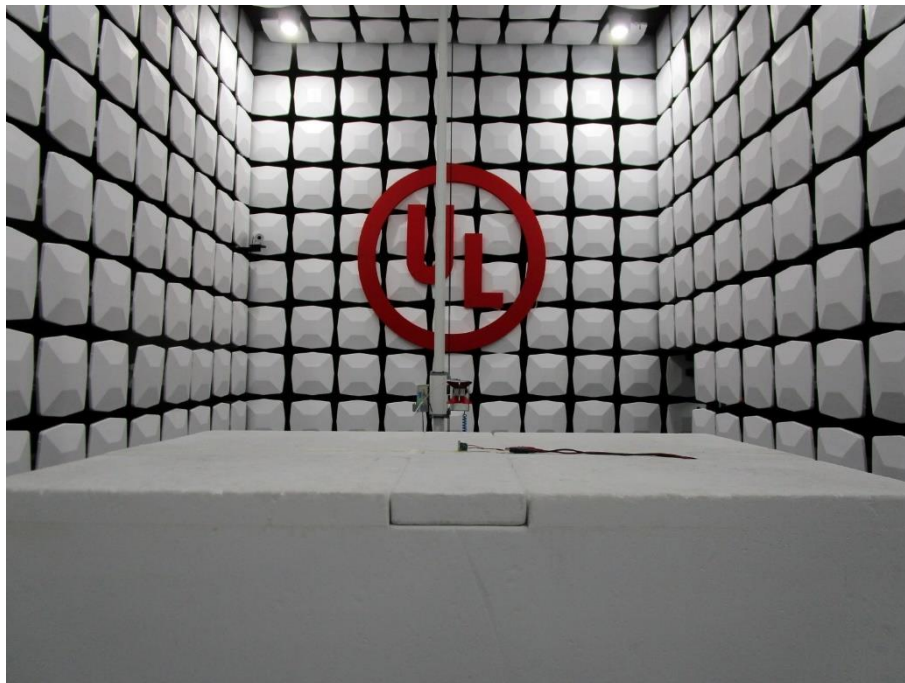
1. Set the Calibration Antenna on multi-axis positioner and connect to signal generator for capture the correction factor.
2. Signal generator insertion normalize and calculate the standard antenna factor with spectrum analyzer.
3. Calibration Antenna change to the EUT's antenna.
4. The EUT is then stepped between 0 to 360 degrees along the theta axis.

7. Test Result

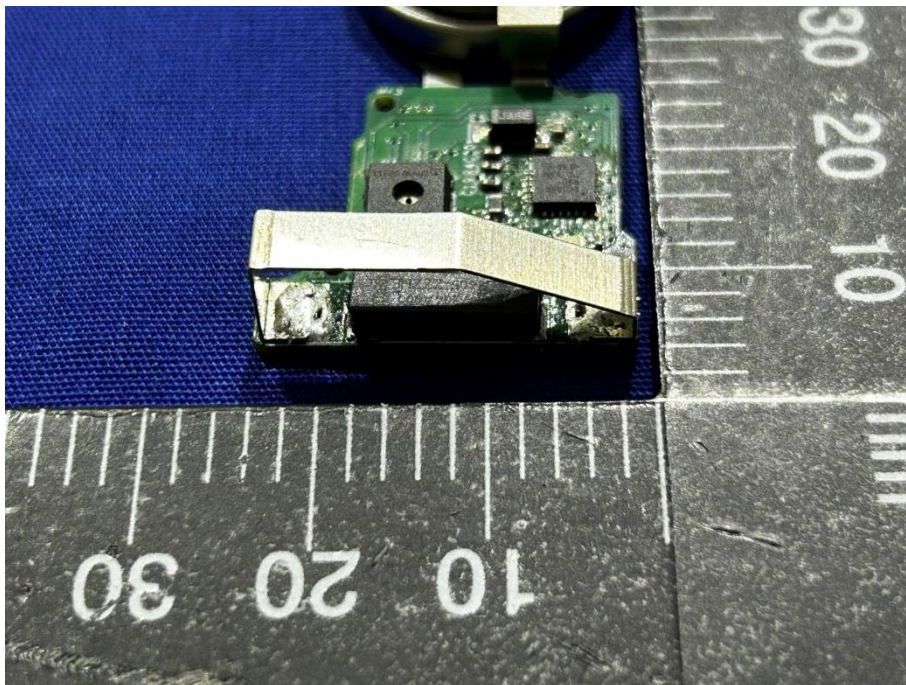
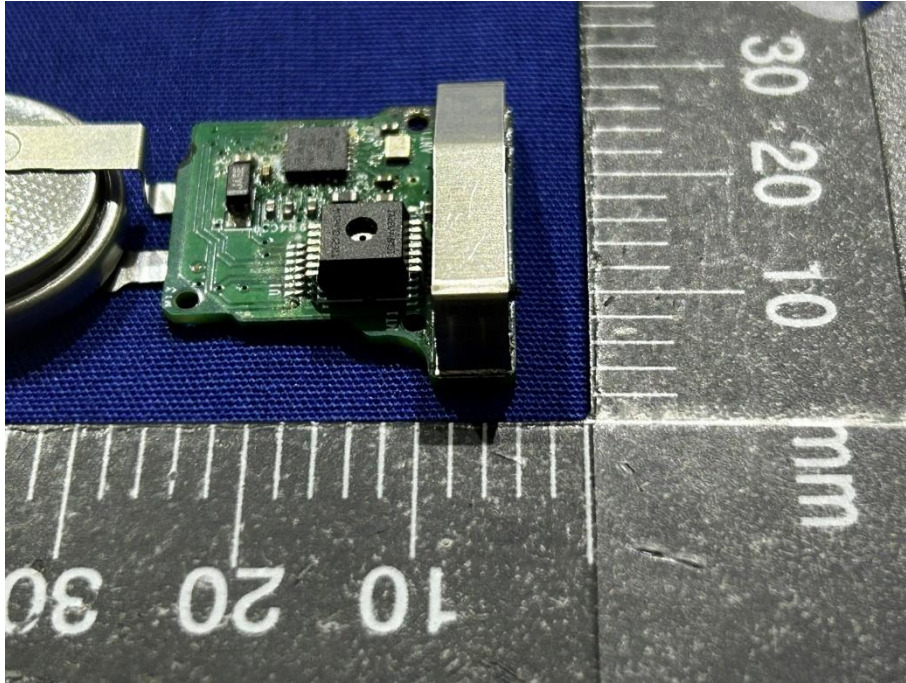
Maximum gain result refer below table:

Polarization	Test Frequency (MHz)	X-Y Plane Gain (dBi)	X-Z Plane Gain (dBi)	Y-Z Plane Gain (dBi)
Vertical	2402 MHz	-6.01	-3.24	-12.8
Vertical	2426 MHz	-7.68	-3.64	-14.74
Vertical	2480 MHz	-7.35	-3.51	-13.14
Horizontal	2402 MHz	-5.71	-10.33	-4.37
Horizontal	2426 MHz	-5.43	-10.29	-5.56
Horizontal	2480 MHz	-4.07	-9.35	-4.31

Appendix I : Photographs of Test Configuration

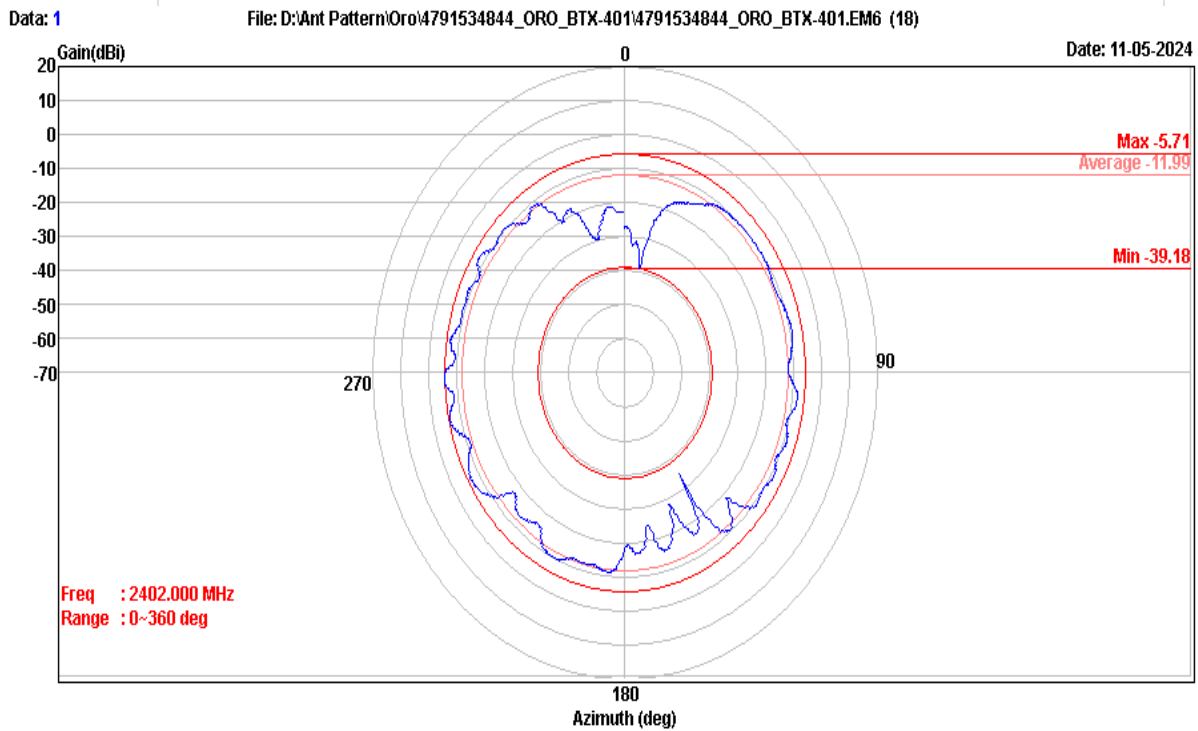


Appendix II : Photographs of the Antenna Outview



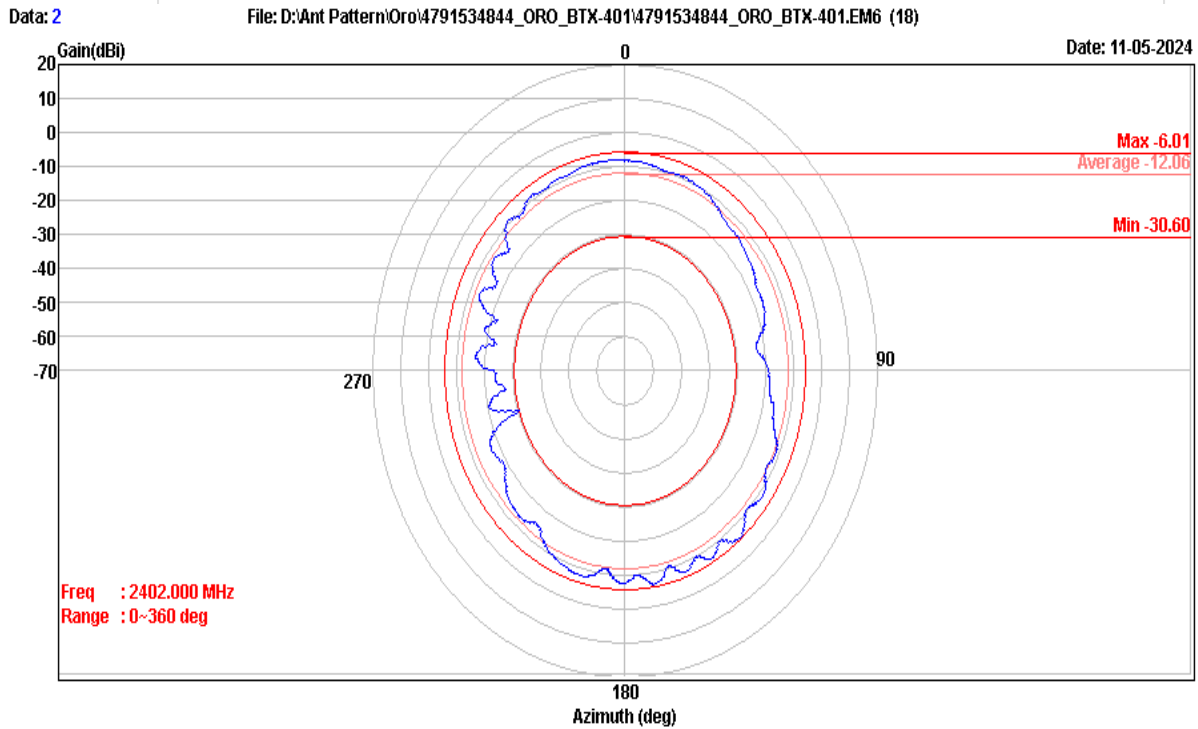
Appendix III : Antenna Pattern

Data	1
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	10:37:05



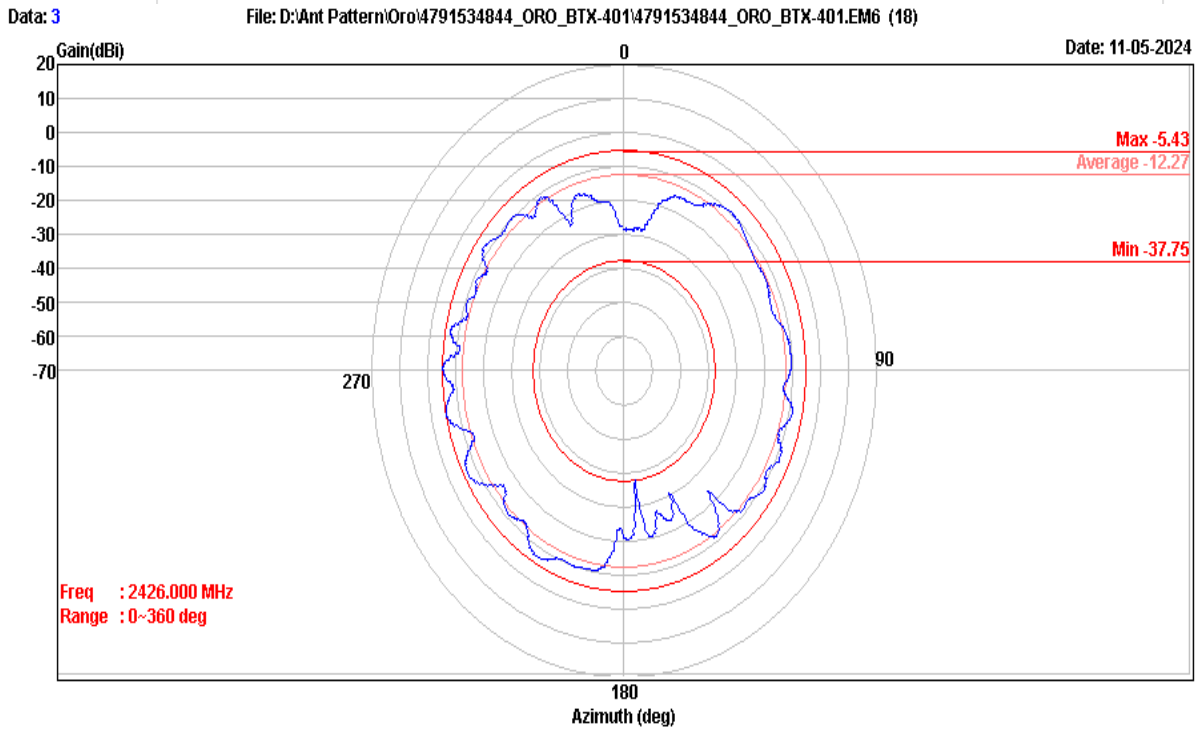
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2402_(XY)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.41 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	2
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
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Time	10:33:33



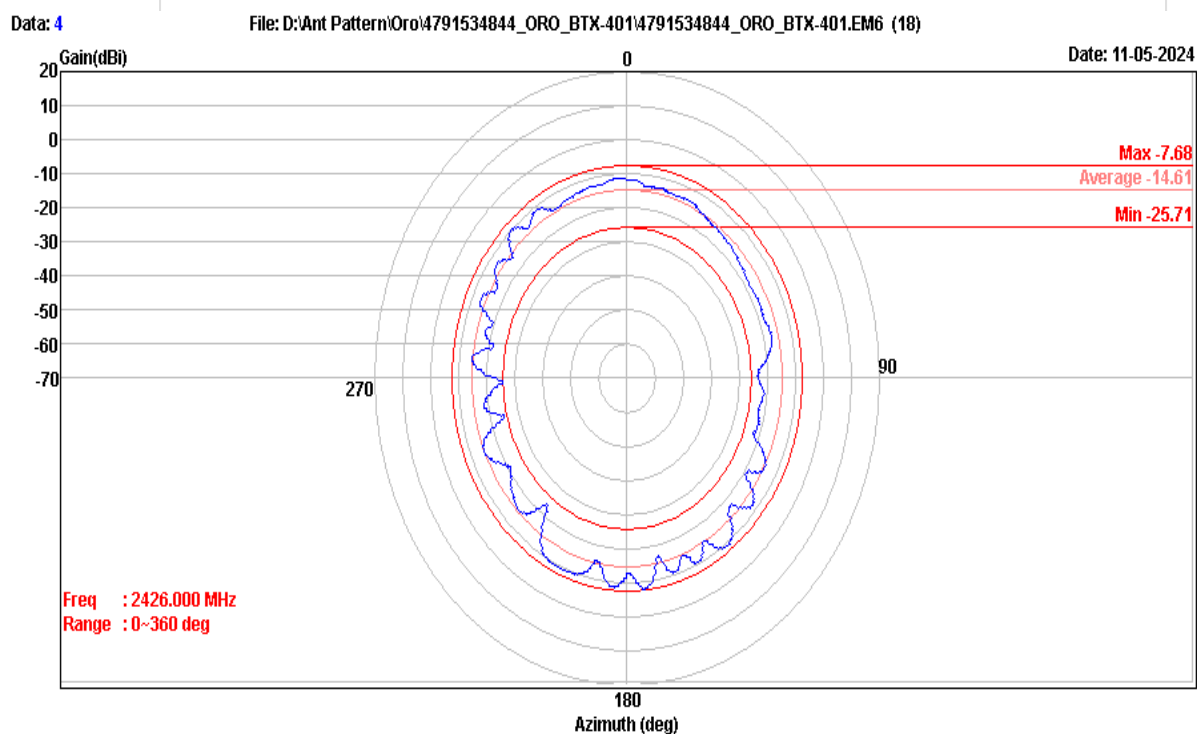
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2402_(XY)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.41 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	3
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	10:41:36



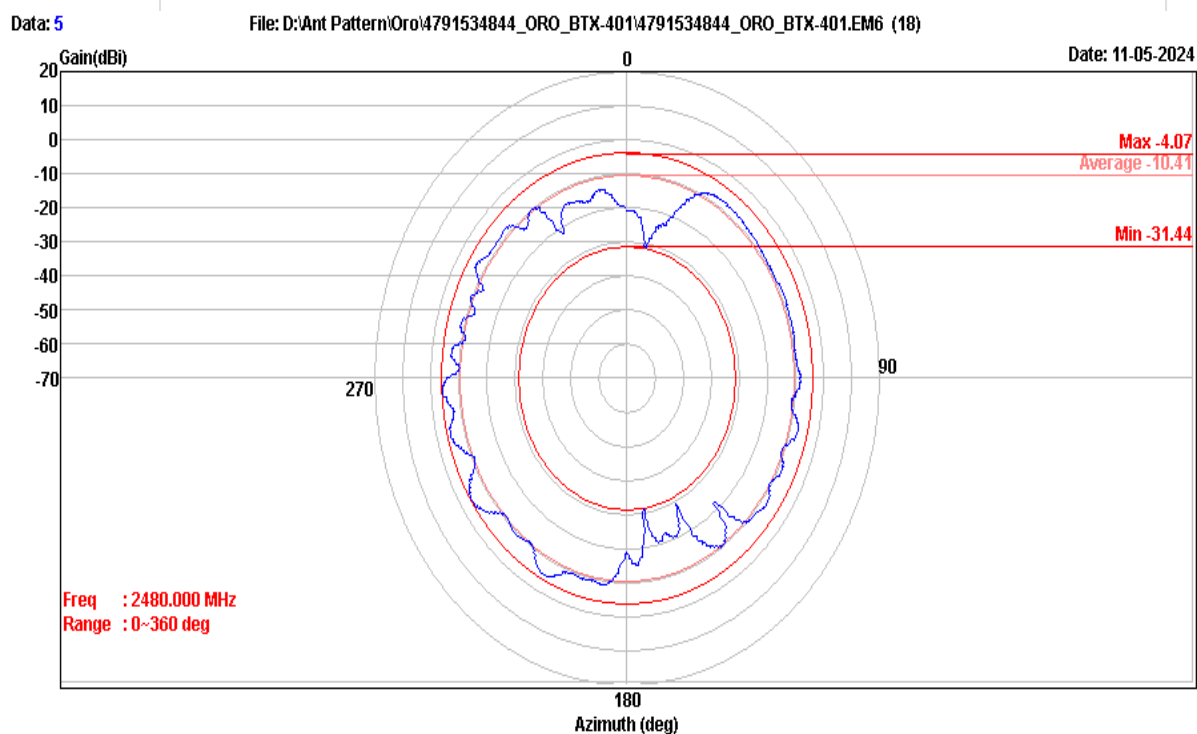
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2426_(XY)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.14 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data		4
File	D:\Ant Pattern\Oro\4791534844_ORO_BT-X-401\4791534844_ORO_BT-X-401.EM6	
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Time		10:44:43



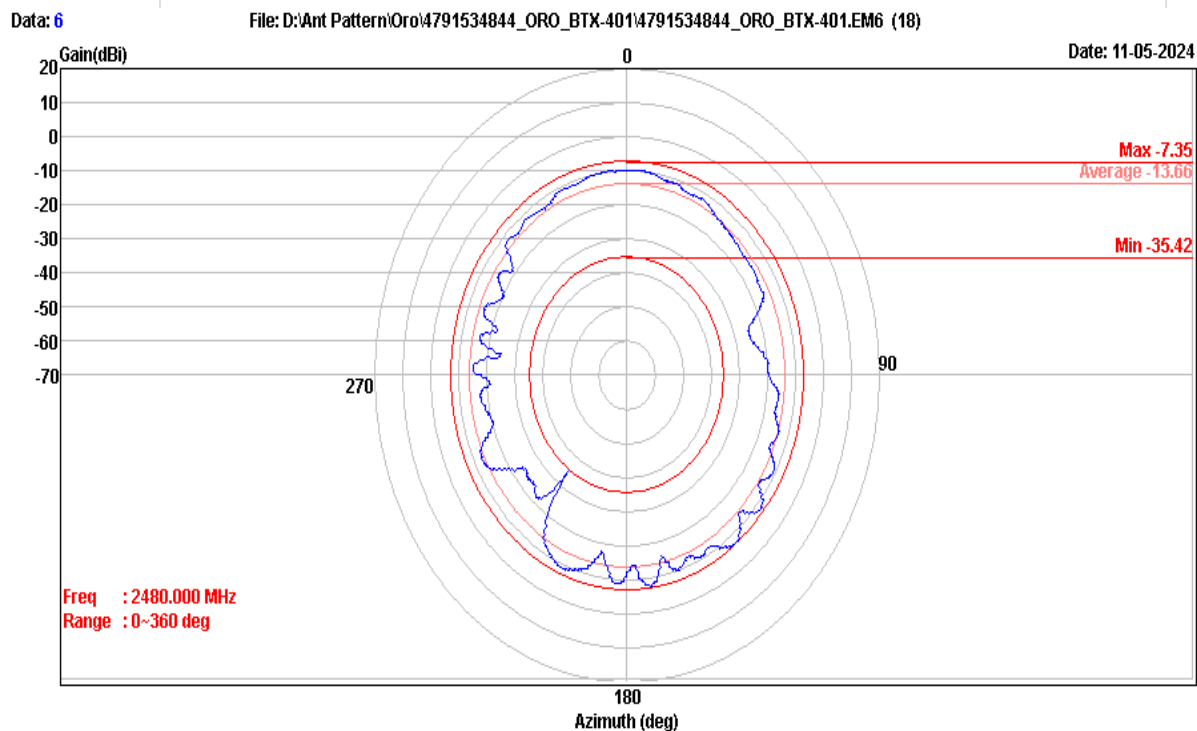
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BT-X-401
Temp/Humi	24(C)/69%RH
Test Mode	2426_(XY)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.14 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	5
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	10:50:01



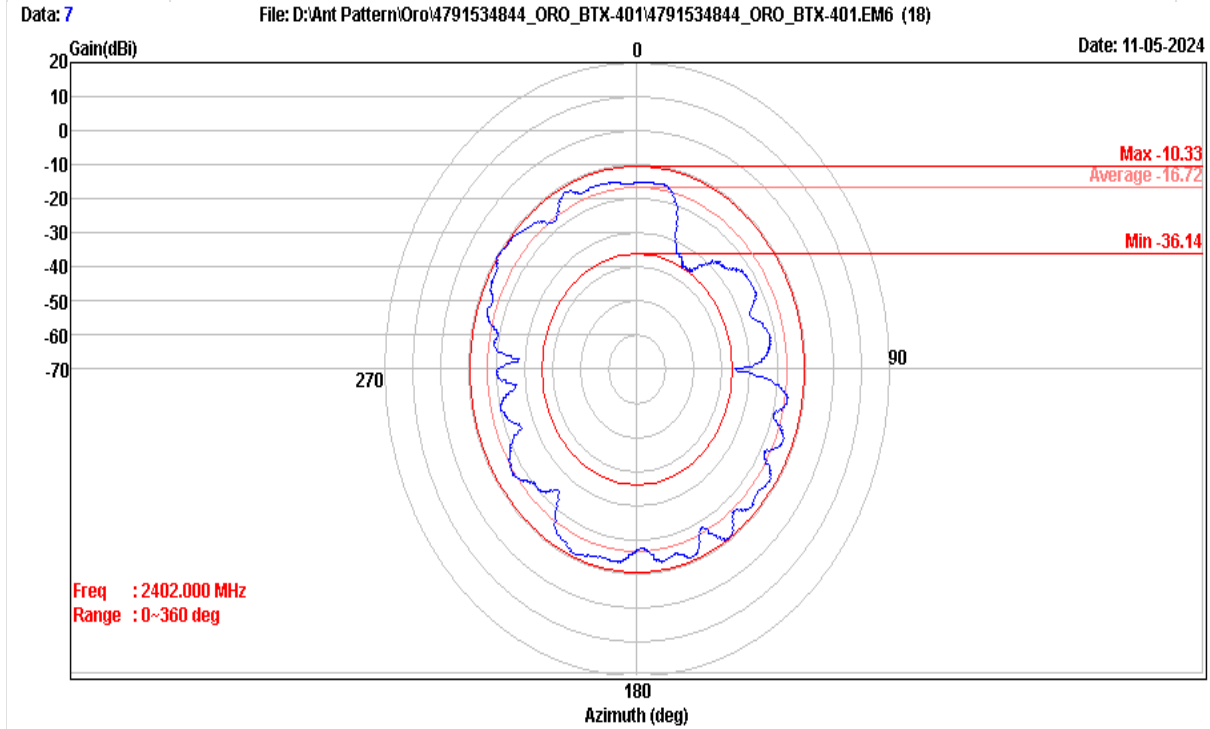
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2480_(XY)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.5 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data		6
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6	
Date		2024/11/5
Time		10:53:01



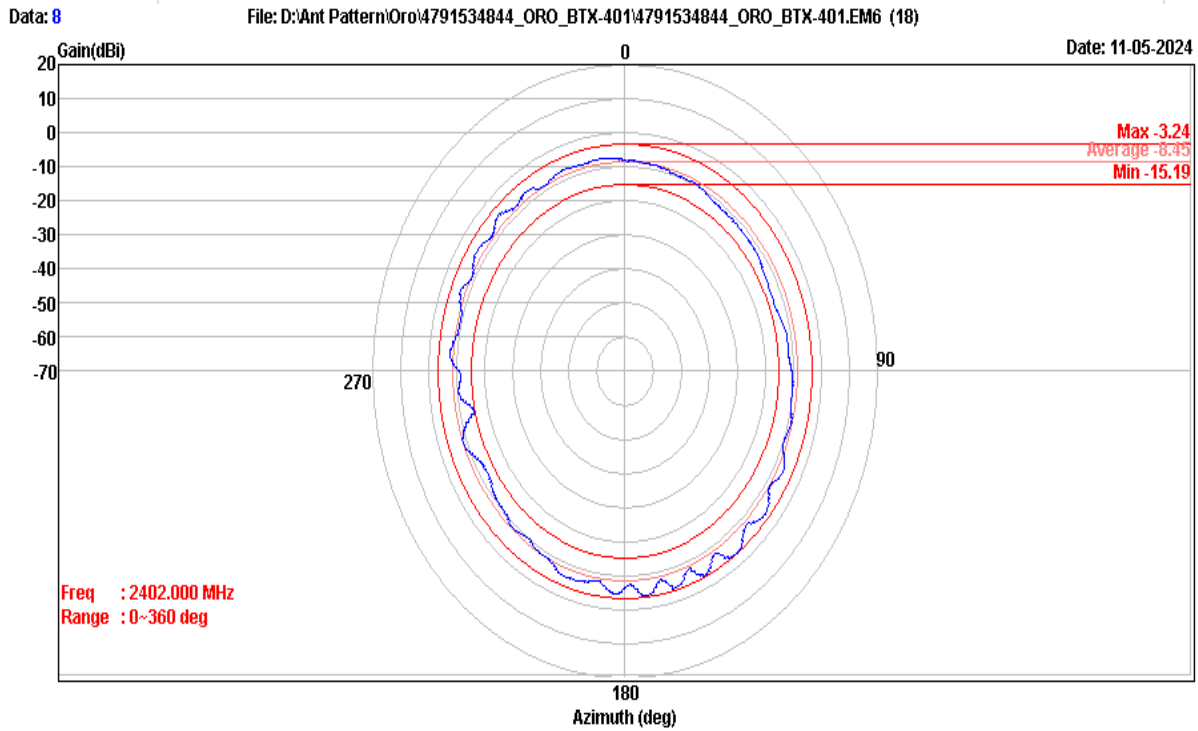
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2480_(XY)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.5 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	7
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	11:01:12



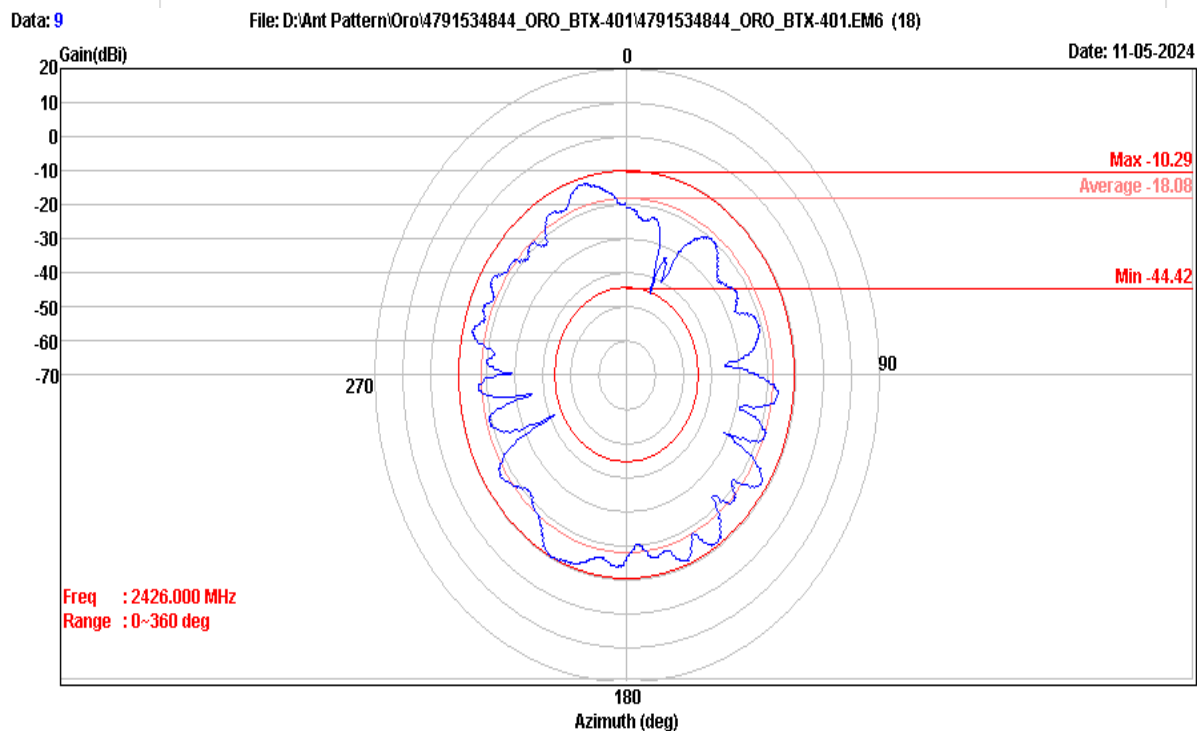
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2402_(XZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.41 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	8
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Time	11:04:11



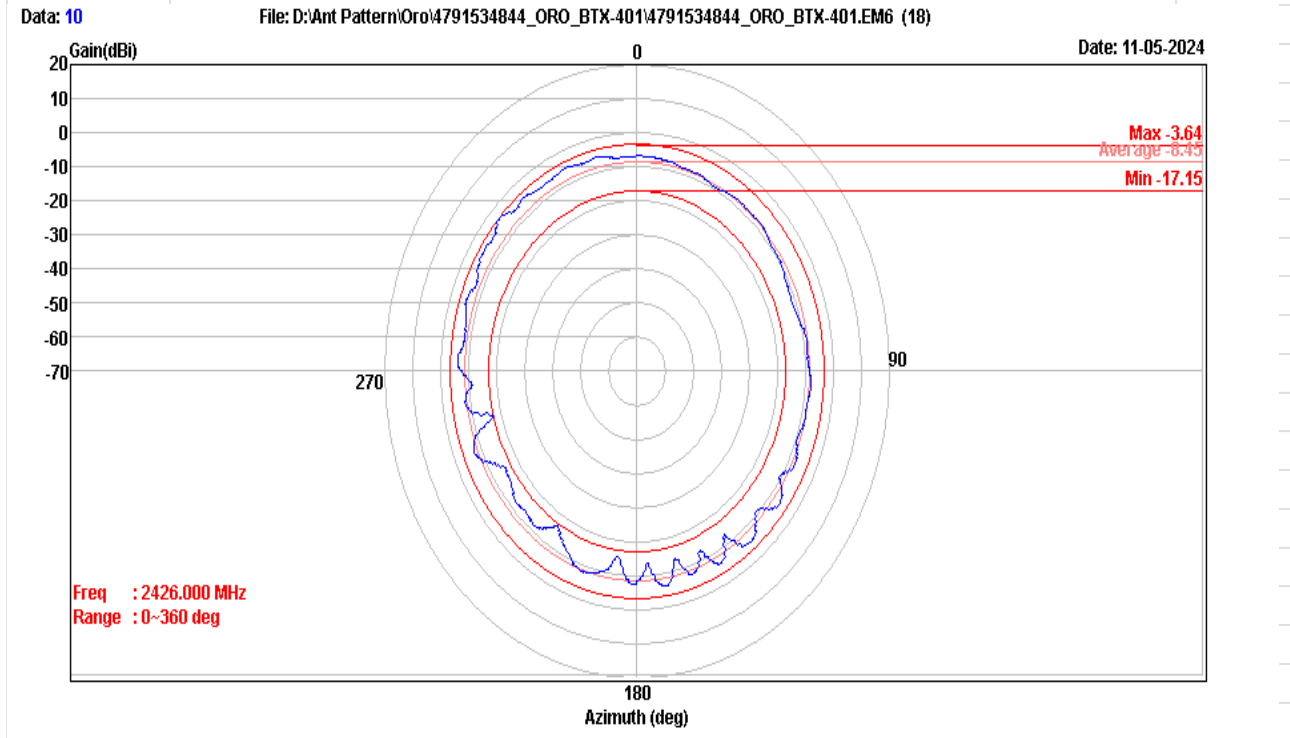
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2402_(XZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.41 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	9
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Date	2024/11/5
Time	11:08:35



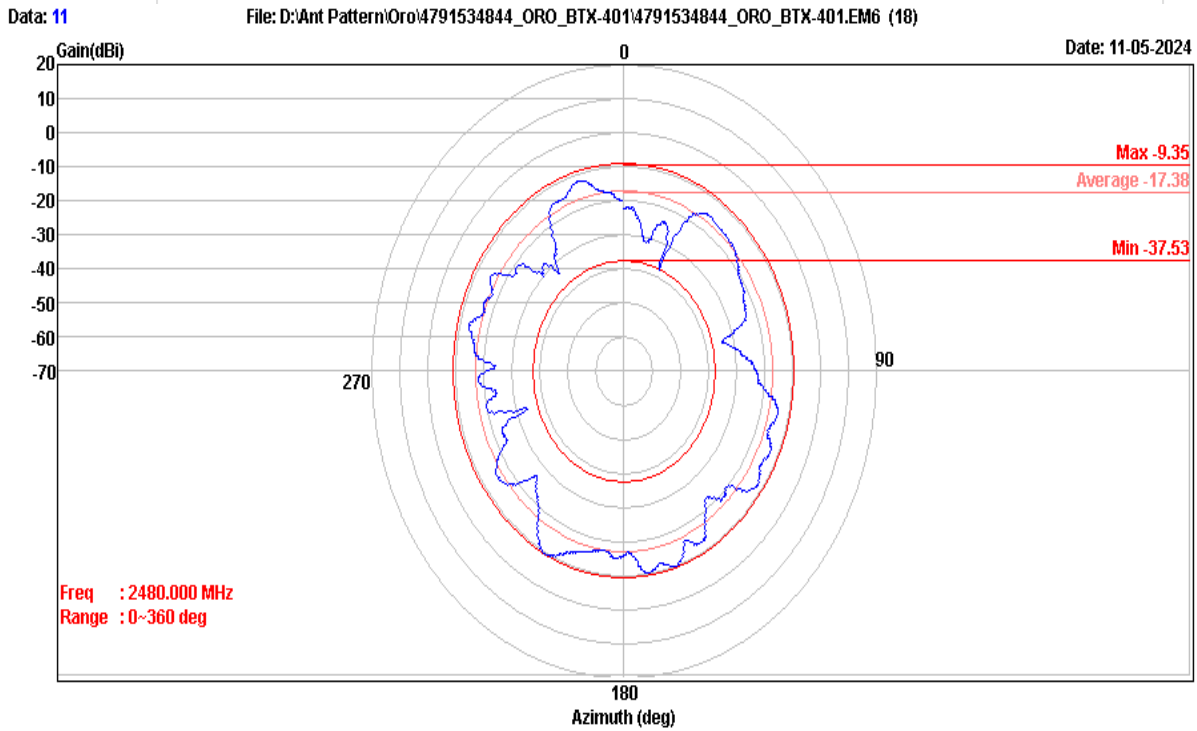
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2426_(XZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.14 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	10
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	11:11:17



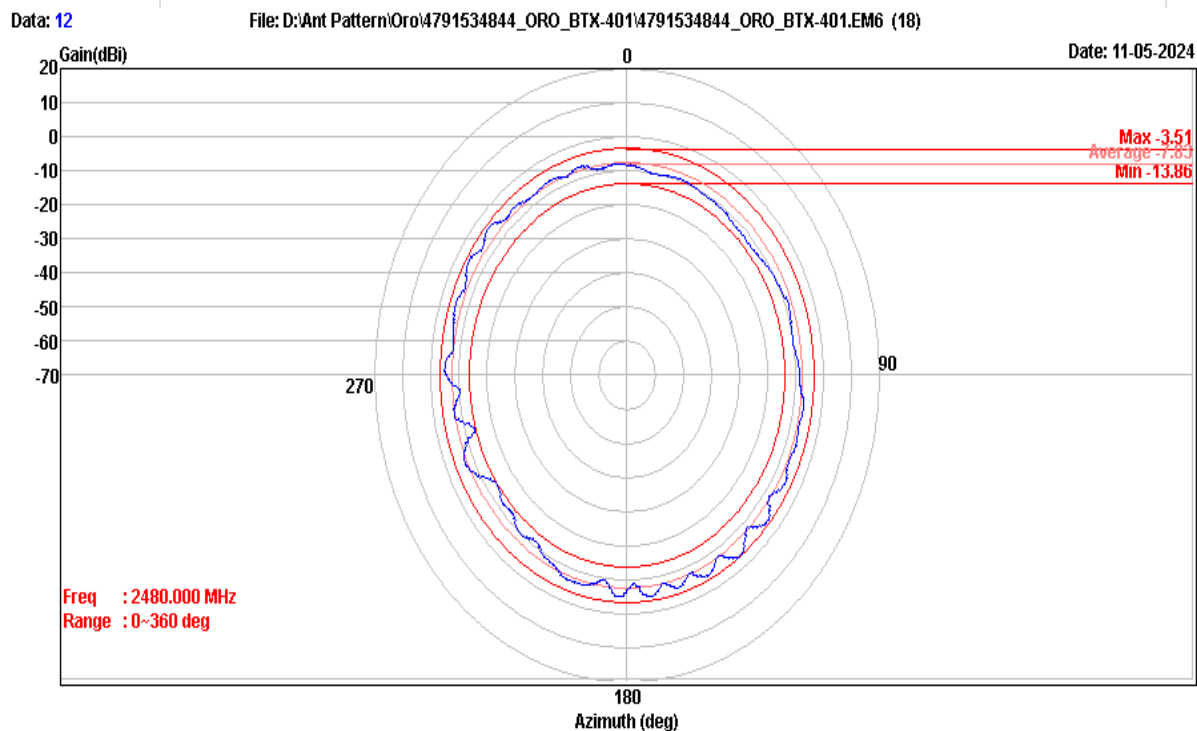
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2426_(XZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.14 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	11
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	11:16:41



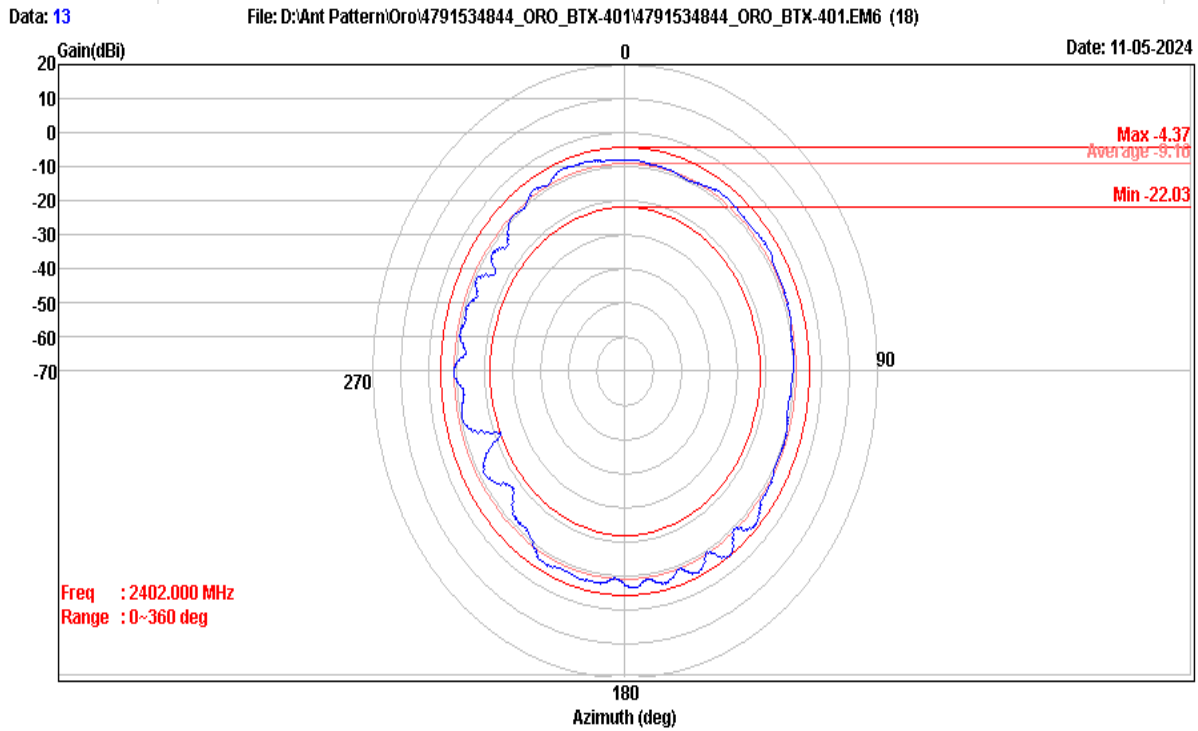
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2480_(XZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.5 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	12
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	11:17:51



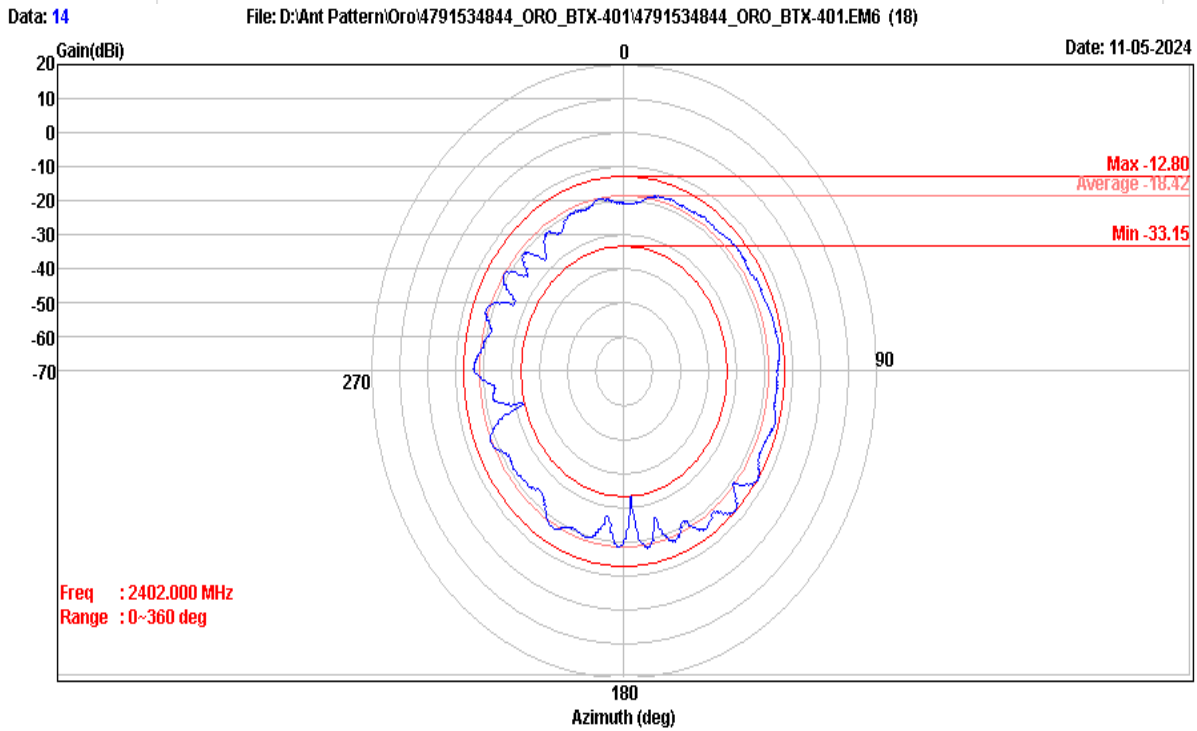
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2480_(XZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.5 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	13
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
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Time	11:28:27



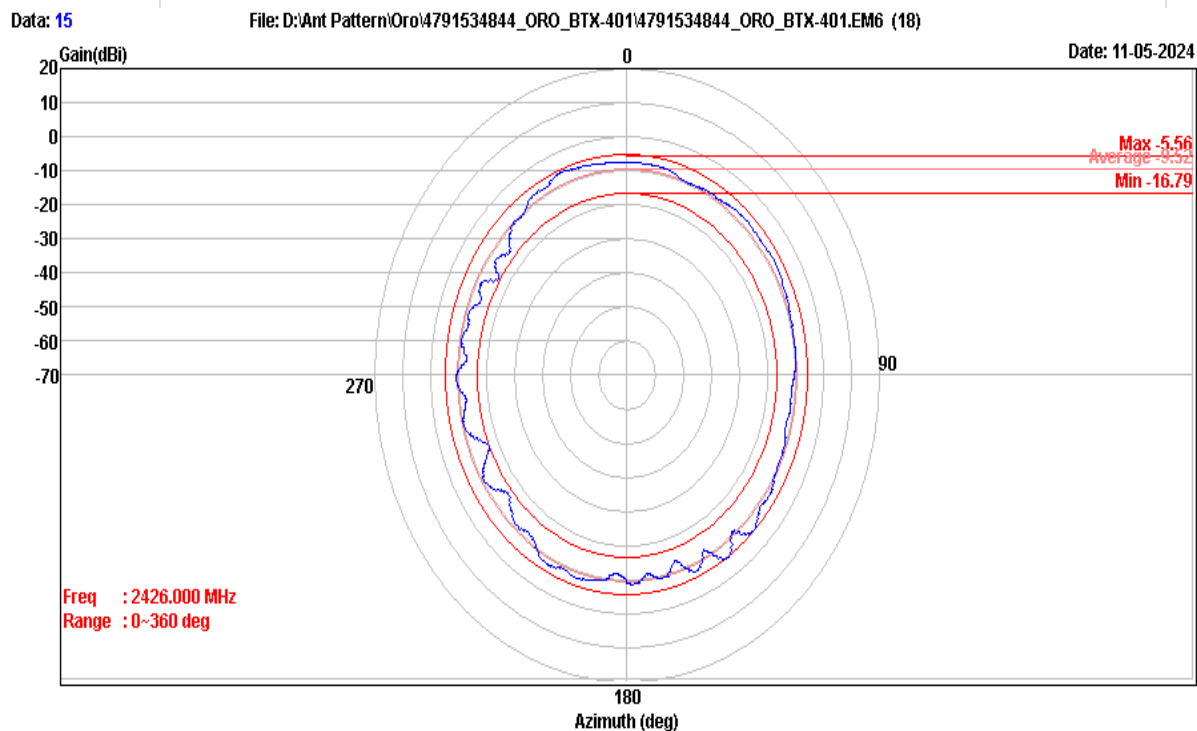
Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2402_(YZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.41 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	14
File	D:\Ant Pattern\Oro\4791534844_ORO_BT-X-401\4791534844_ORO_BT-X-401.EM6
Date	2024/11/5
Time	11:30:55



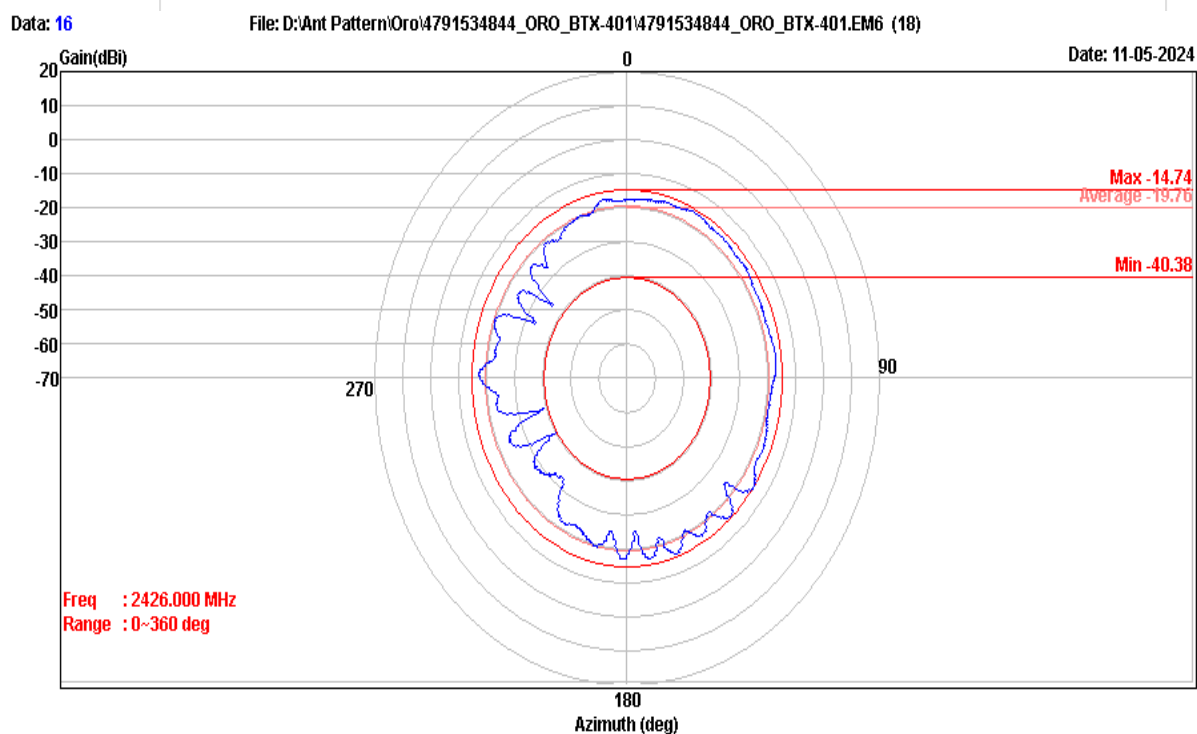
Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BT-X-401
Temp/Humi	24(C)/69%RH
Test Mode	2402_(YZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.41 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data	15
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Time	11:47:35

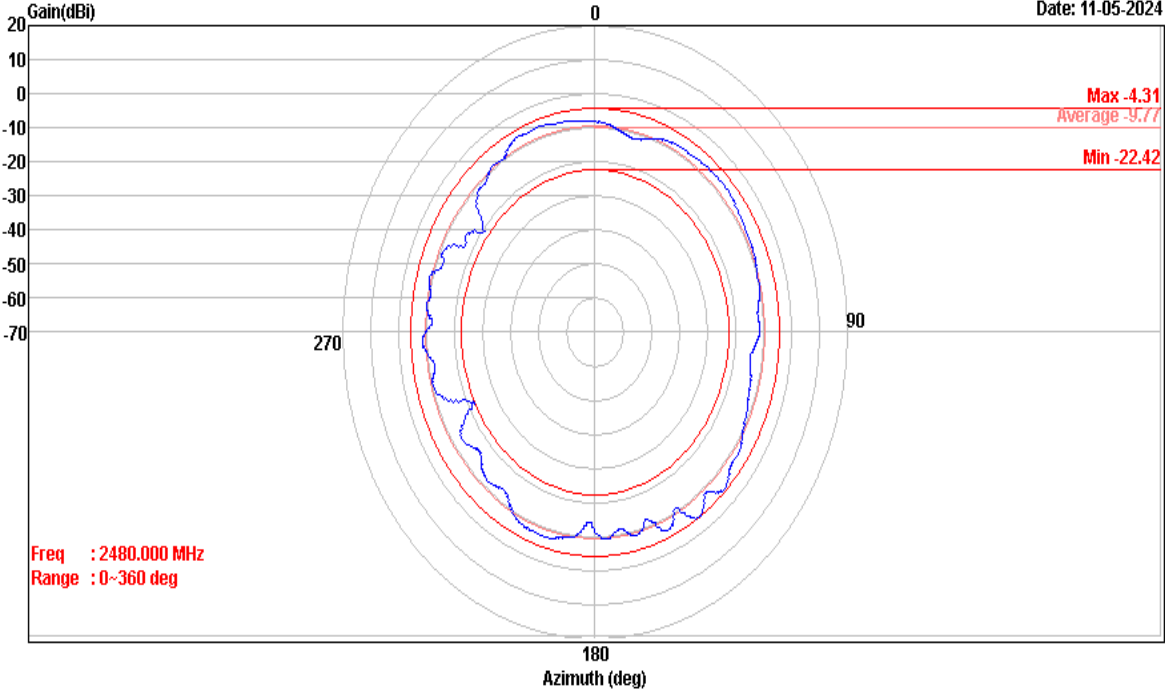


Site	1277 Chamber
Condition	HORIZONTAL
Model Name	4791534844_ORO_BT-X-401
Temp/Humi	24(C)/69%RH
Test Mode	2426_(YZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.14 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

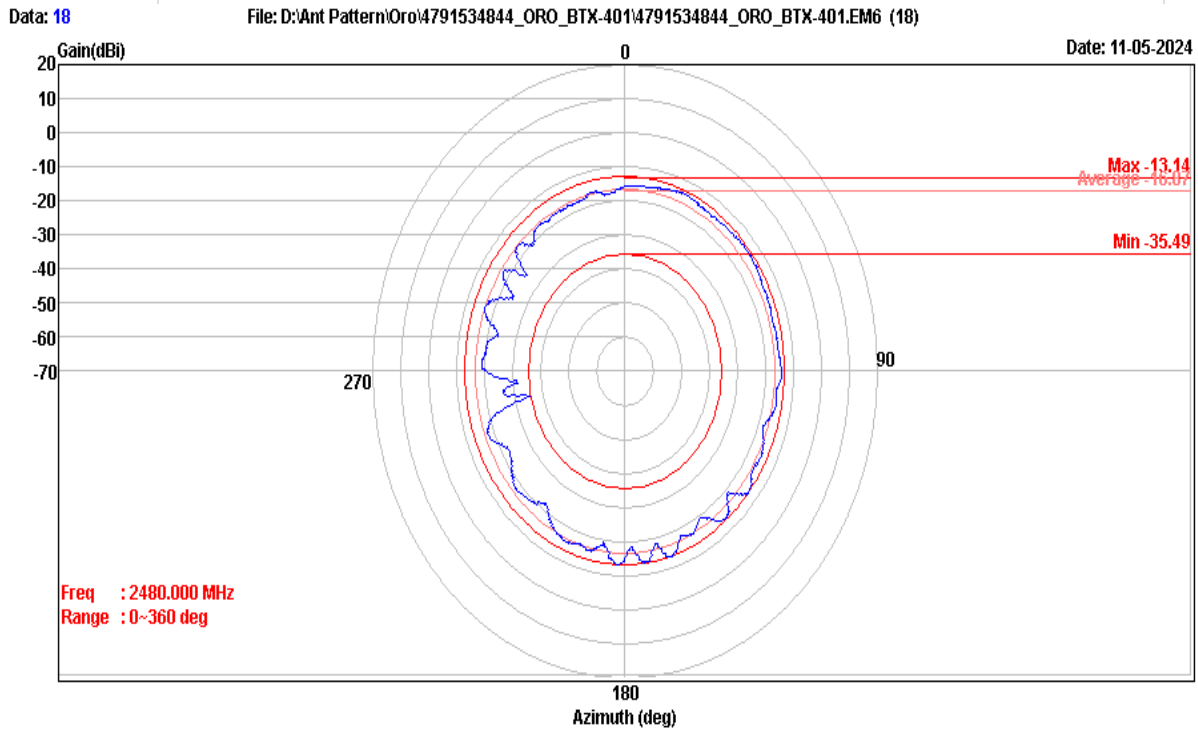
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Date	2024/11/5
Time	11:41:41



Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2426_(YZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.14 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

Data		17
File	D:\Ant Pattern\Oro\4791534844_ORO_BT-X-401\4791534844_ORO_BT-X-401.EM6	
Date		2024/11/5
Time		11:53:54
Data: 17 File: D:\Ant Pattern\Oro\4791534844_ORO_BT-X-401\4791534844_ORO_BT-X-401.EM6 (18) Date: 11-05-2024  Gain(dBi) 20 10 0 -10 -20 -30 -40 -50 -60 -70 0 90 180 270 Azimuth (deg) Max -4.31 Average -9.77 Min -22.42 Freq : 2480.000 MHz Range : 0~360 deg		
Site	1277 Chamber	
Condition	HORIZONTAL	
Model Name	4791534844_ORO_BT-X-401	
Temp/Humi	24(C)/69%RH	
Test Mode	2480_(YZ)	
Tested by	WaterNil	
Note		
Note2		
Note3	Conducted Power -0.5 dBm	
Note4	Gain(dBi) -> RSE Power - CSE Power	

Data	18
File	D:\Ant Pattern\Oro\4791534844_ORO_BTX-401\4791534844_ORO_BTX-401.EM6
Date	2024/11/5
Time	11:55:03



Site	1277 Chamber
Condition	VERTICAL
Model Name	4791534844_ORO_BTX-401
Temp/Humi	24(C)/69%RH
Test Mode	2480_(YZ)
Tested by	WaterNil
Note	
Note2	
Note3	Conducted Power -0.5 dBm
Note4	Gain(dBi) -> RSE Power - CSE Power

END OF REPORT