TAOGLAS

Datasheet

Part No:
XAHP.60.W.301111

Description

Active Multiband High Precision GNSS White Permanent Mount

Features:

Embedded Active Antenna
Covering: L1/L2/L5 + L-Band
Permanent mount, robust IP67 rated enclosure
Dims: Ø94 x 57mm
Cable: 3m RG-174 with SMA(M) ST connector
RoHS & Reach Compliant

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1. Introduction

The Taoglas XAHP.60 is a Permanent Mount active multi-band GNSS antenna that has been carefully designed for high performance cm-level positional accuracy on the full GNSS spectrum. Bands covered include GPS/QZSS L1/L2/L5, GLONASS G1/G2/G3, Galileo E1/E5a/E5b/E6, BeiDou B1/B2a/B2b/B3, L-Band, QZSS L6, NAVIC L5, as well as SBAS (WAAS/EGNOS/GAGAN/SDCM/SNAS. This allows the user to achieve higher location accuracy, as well as stability of position tracking in urban environments with their device.

The XAHP.60 has excellent performance across the full bandwidth of the antenna and its design has an even gain across the hemisphere giving almost excellent, broad axial ratio which in turn makes it resilient to multipath rejection and excellent phase centre stability. The LNA used in the XAHP.60 ensures excellent out of band rejection and provides excellent positioning stability and reliability of GNSS signals.

Typical applications for the XAHP.60 include:

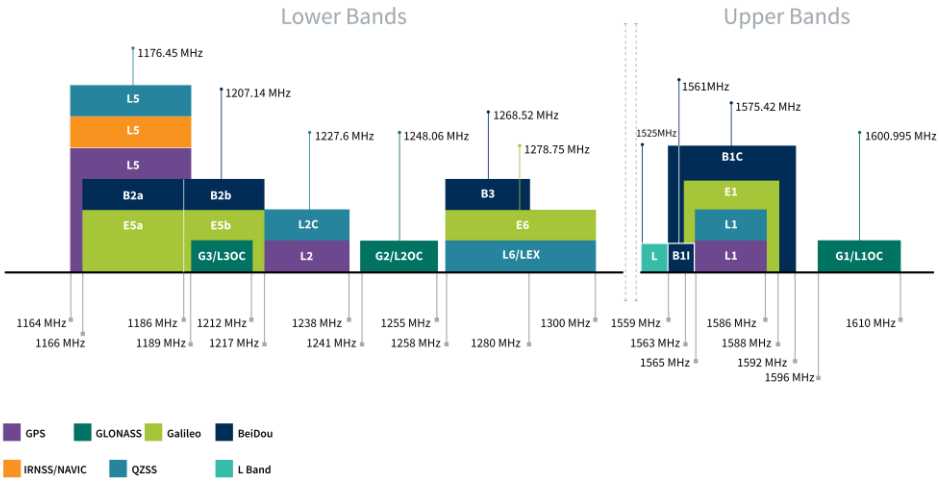
- Autonomous Driving
- Precision Positioning for Robotics
- Precision Agriculture
- Inventory Management & Container tracking
- Telematics & Asset Tracking
- Timing Accuracy Synchronization

The XAHP.60 is the latest addition to an ongoing product road map of high precision antennas by Taoglas. For RTK applications, when used on the base and/or the rover, the XAHP.60 can achieve genuine cm-level accuracy.

Cable and connectors are fully customizable, and the XAHP.60 is also available in black (XAHP.60.A.301111). Please contact your regional Taoglas customer support team for further information.

2. Specification

GNSS Frequency Bands					
GPS	L1 1575.42 MHz	L2 1227.6 MHz	L5 1176.45 MHz		
	■	■	■		
GLONASS	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz		
	■	■	■		
Galileo	E1 1575.24 MHz	E5a 1176.45 MHz	E5b 1201.5 MHz	E6 1278.75 MHz	
	■	■	■	■	
BeiDou	B1C 1575.42 MHz	B1I 1561 MHz	B2a 1176.45 MHz	B2b 1207.14 MHz	B3 1268.52 MHz
	■	■	■	■	■
L-Band	L-Band 1542 MHz				
	■				
QZSS (Regional)	L1 1575.42 MHz	L2C 1227.6 MHz	L5 1176.45 MHz	L6 1278.75e6	
	■	■	■	■	
IRNSS (Regional)	L5 1176.45 MHz				
	■				
SBAS	L1/E1/B1 1575.42 MHz	L5/B2a/E5a 1176.45 MHz	G1 1602 MHz	G2 1248 MHz	G3 1207 MHz
	■	■	■	■	■



GNSS Bands and Constellations

GNSS Electrical									
Frequency (MHz)	**1176.45**	**1207**	**1227.6**	**1248**	**1278.75**	**1542**	**1561**	**1575.42**	**1603**
VSWR (max.)	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
Passive Antenna Efficiency (%)	65.84	66.6	72.85	75.74	67.42	60.04	55.58	52.95	47.65
Passive Antenna Gain at Zenith (dBic)	6.67	6.24	6.76	6.76	6.27	4.74	3.74	3.74	2.57
Axial Ratio (dB)	2.94	3.08	1.7	0.89	0.66	1.84	1.63	1.51	1.27
PCO_x (cm)	0.05	0.49	0.49	0.45	0.45	0.22	0.23	0.2	0.15
PCO_y (cm)	-1.68	-1.34	-1.14	-1.27	-1.33	-1.16	-1.24	-1.27	-1.28
PCV (cm)	0.5	0.6	0.6	0.6	0.5	0.1	0.1	0.1	0.1
Group Delay Mean (ns)	9.65	10.69	10.89	12.47	12.17	11.23	11.3	10.85	10.8
Polarization	RHCP								
Impedance	50 Ω								
Tested on a 30x30cm Ground Plane									

LNA and Filter Electrical Properties									
Frequency (MHz)	**1176.45**	**1207**	**1227.6**	**1248**	**1278**	**1542**	**1561**	**1575.42**	**1603**
VSWR (max.)	<2								
Gain (dBic)	27.3	25.3	25.9	25.3	25.0	27.1	27.2	26.2	26.2
Noise (dBic)	3.7	3.1	4.8	3.9	4	3.8	4.2	4.3	3.8
Voltage In	1.8V~5.5V								
ESD	20KV for Contact and 30KV for Air								
Out Of Band Rejection	-70dB for frequencies <1GHz -60dB for frequencies <1.7GHz								
Power Consumption (mA)	22								
LTE Band 13 interference filter circuit									

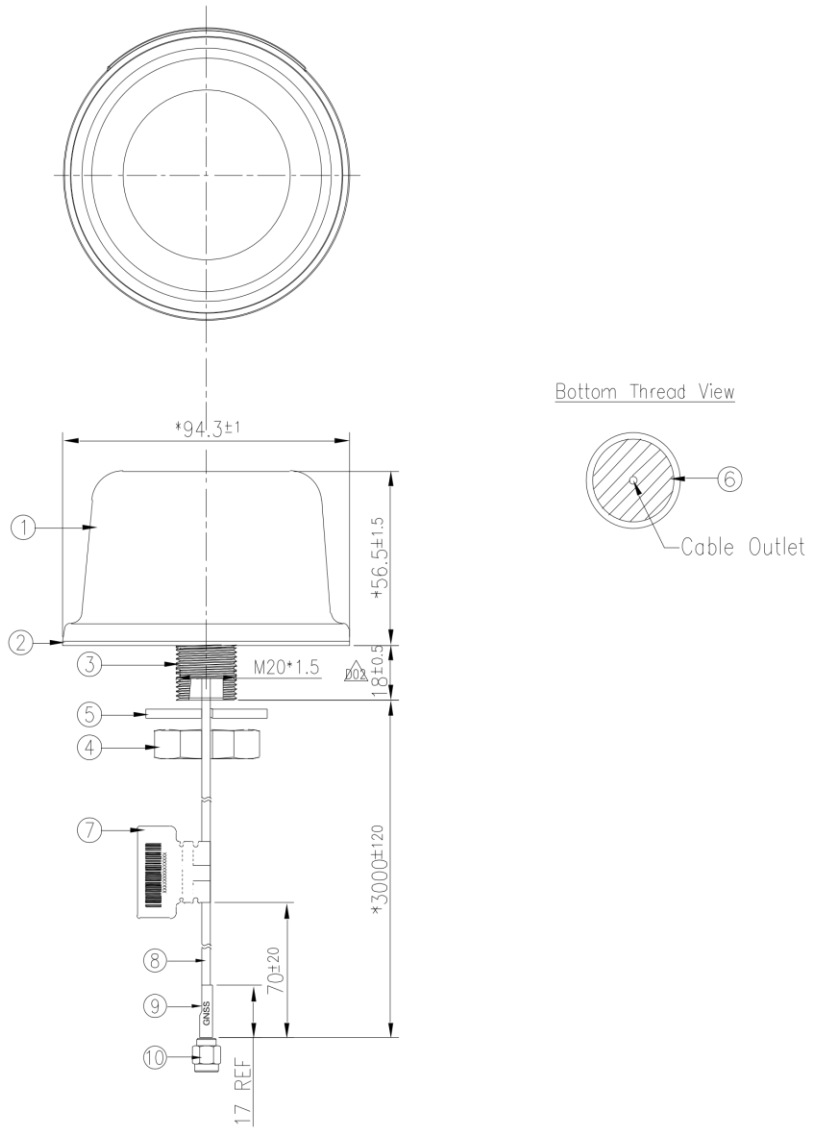
Mechanical	
Dimensions	Ø94 x 57mm
Weight	395g
Connector	SMA(M) ST
Cable	3m of RG-174

Environmental	
Operation Temperature	-40°C to 85°C
IP Rating	IP67
Relative Humidity	Non-condensing 65°C 95% RH
RoHS Compliant	Yes
REACH Compliant	Yes

3. Mechanical Drawing

ISO NO.: EDW.003744
STATE: Release
NOTES: 1. All material must be RoHS compliant.
2. "*" Critical Dimensions.

REV.	DESCRIPTION	ENG.	APPROVED	DATE
D01	Initial Design	Aron	Chozen	2024/8/30
D02	Amend dimension	Aron	Chozen	2024/9/9



	Name	Material	Finish	QTY
1	Mini S1 Short Case	ASA/CHIMEI PW-978B	White	1
2	Adhesive Foam Mini S1(Black Foam)	3M9448HK+CR4305	Black/White Liner	1
3	Mini S1 Base	Zinc Alloy	Ni Plated	1
4	Nut_M20x1.5Px9.5ft Cut	Steel Carbon	Zn-Ni Plated	1
5	Washer_Cut	Steel Carbon	Zn-Ni Plated	1
6	Cable Rubber	Silicone Rubber	Black	1
7	Empty Label	PEPA	White	1
8	RG174 Coaxial Cable	PVC	Black	1
9	Heat Shrink Tube (GNSS)	PE	Blue Tube/White Text	1
10	SMA(M)S1	Brass	Au Plated	1

APPROVED BY:	Chozen
CHECK BY:	Aaron
DRAWN BY:	Aron
DATE:	2024/8/30
UNLESS OTHERWISE SPECIFIED TOLERANCES ON:	XX.±0.5 X.±0.3 .X±0.2 .XX±0.1 .XXX±0.05
THIRD ANGLE PROJECTION	

TAOGLAS. TW Design Centre

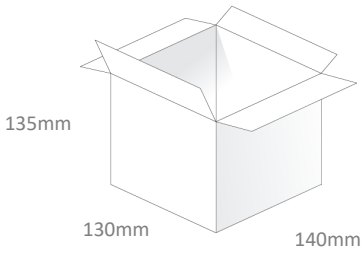
TITLE : Active Multi-band GNSS White Permanent Mount Antenna with 3m RG-174 & SMA(M)

PART NO. : XAHP.60.W.301111

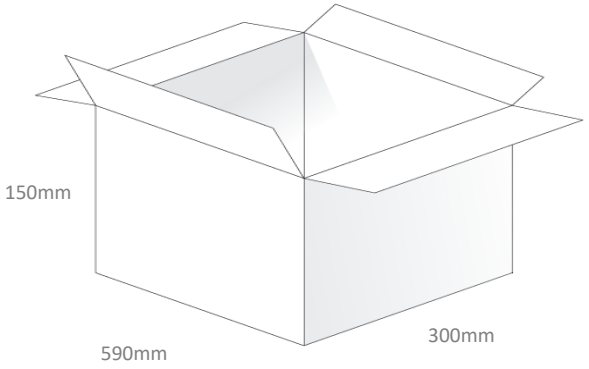
UNIT:	SCALE:	PAGES:	REV.
mm	1:2	1/1	D02

4. Packaging

1pc XAHP.60.W.301111 per Small Box
Dimensions – 135 x 30 x 140mm
Weight - 395g

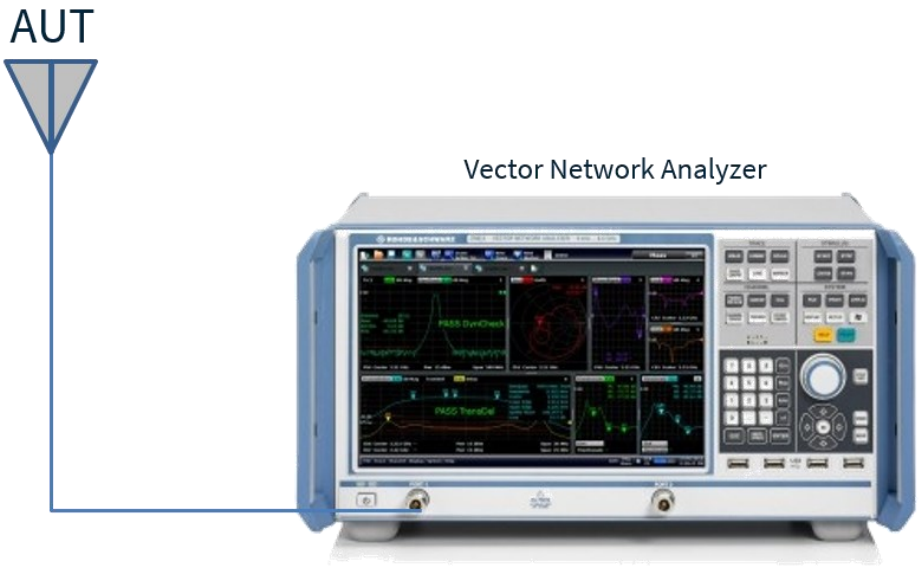


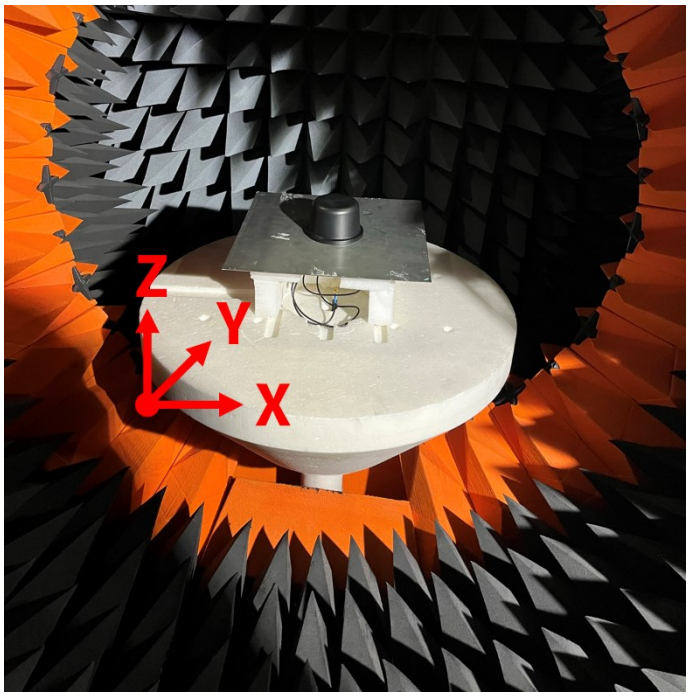
8pcs XAHP.60.W.301111 per Carton
Dimensions – 588 x 296 x 142mm
Weight – 4Kg



5. Antenna Characteristics

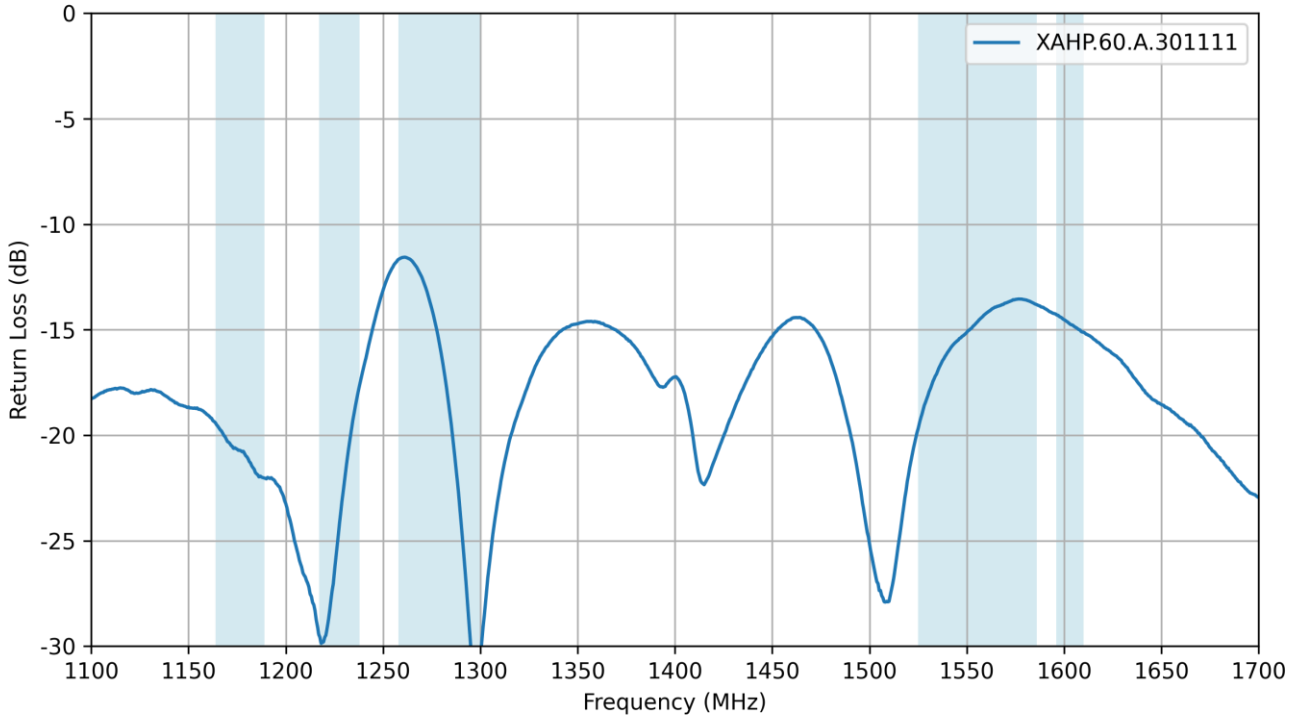
5.1 Test Setup



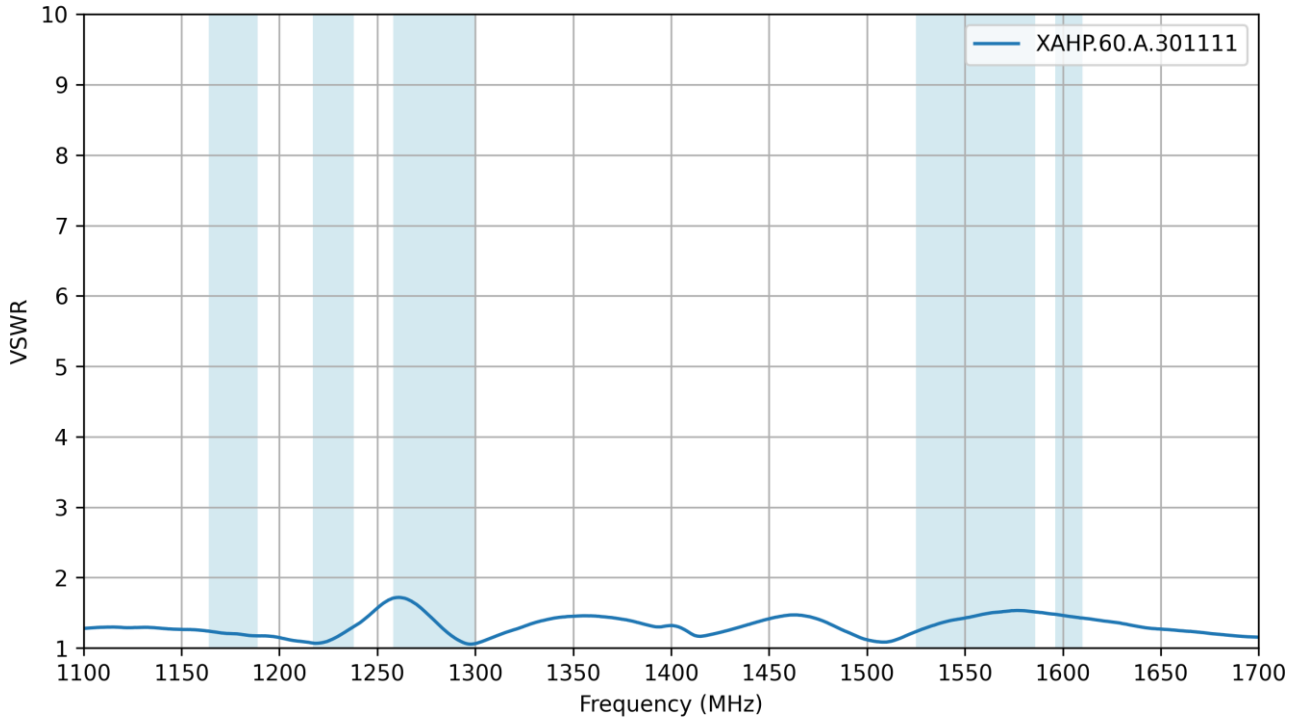


VNA Test Set-up on a 30x30cm Ground Plane

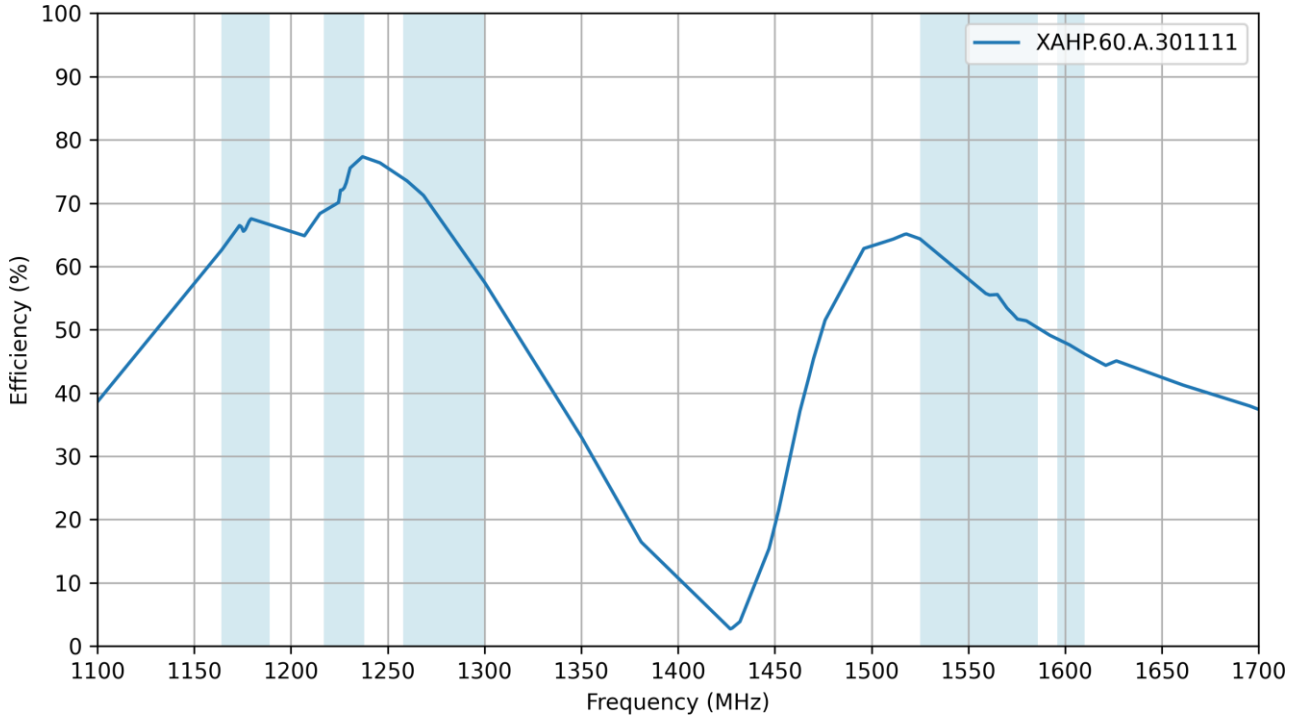
5.2 Return Loss



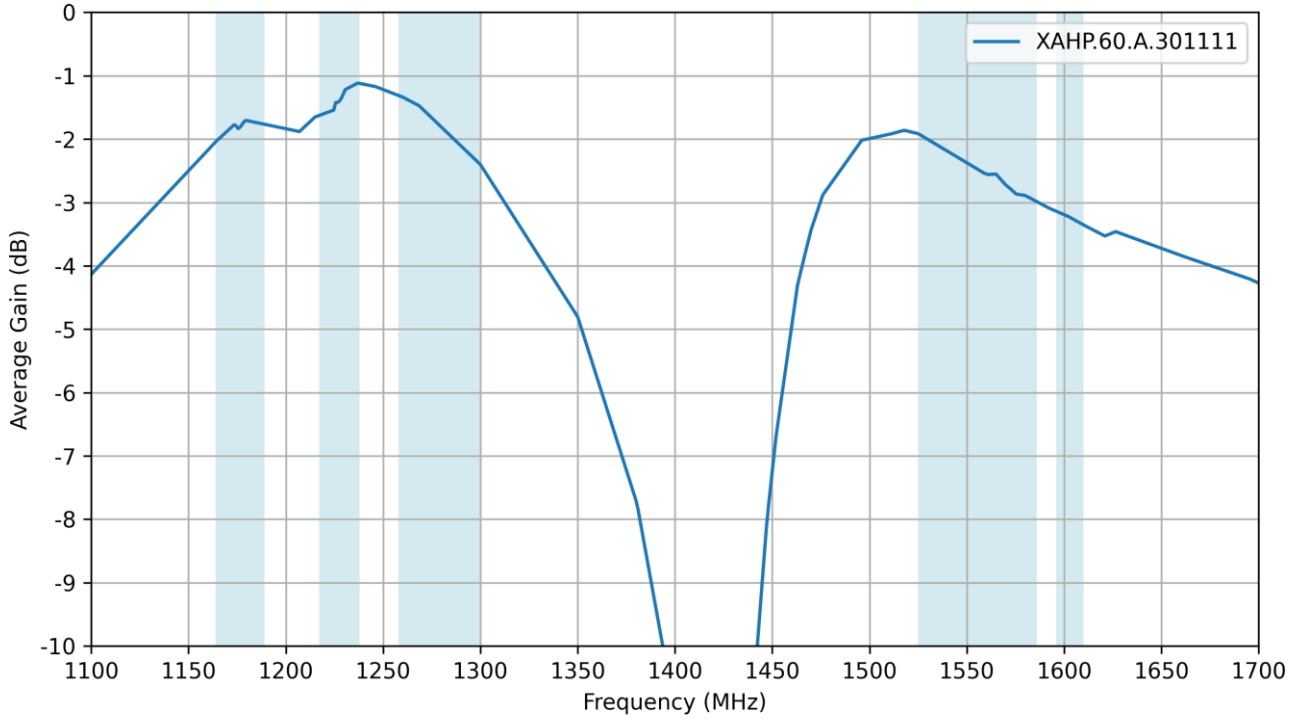
5.3 VSWR



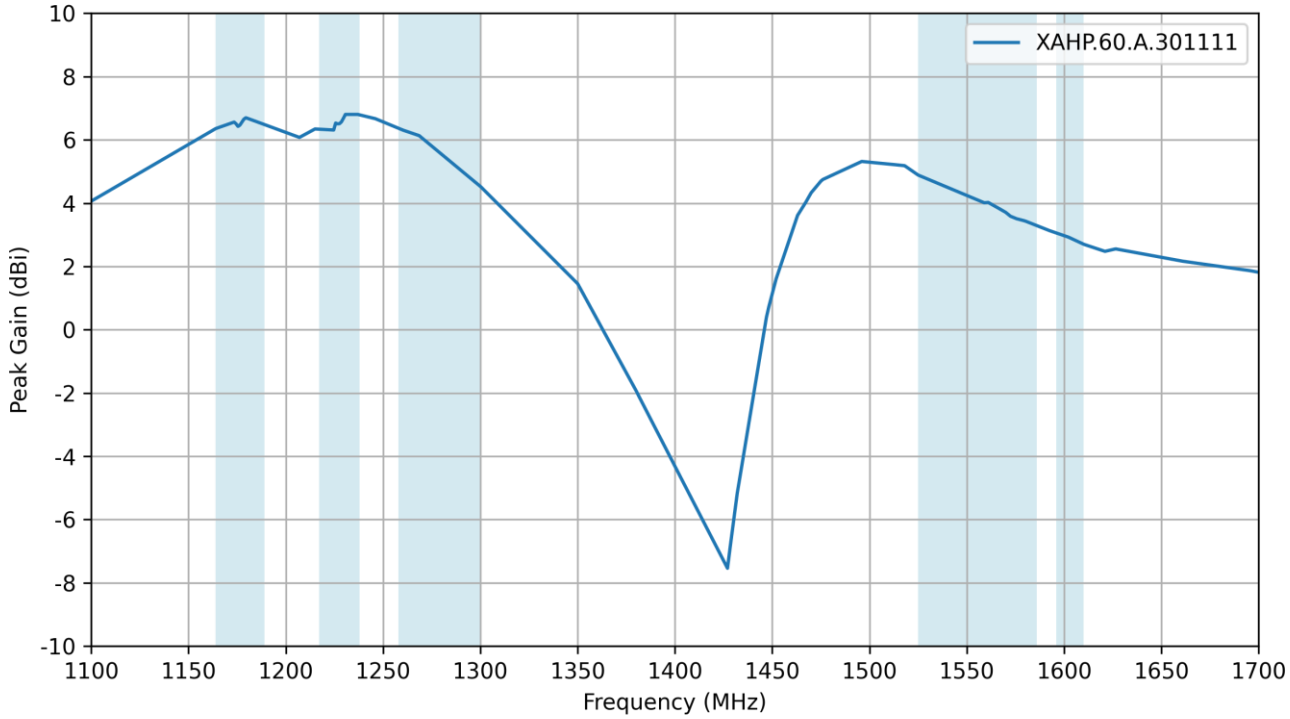
5.4 Efficiency



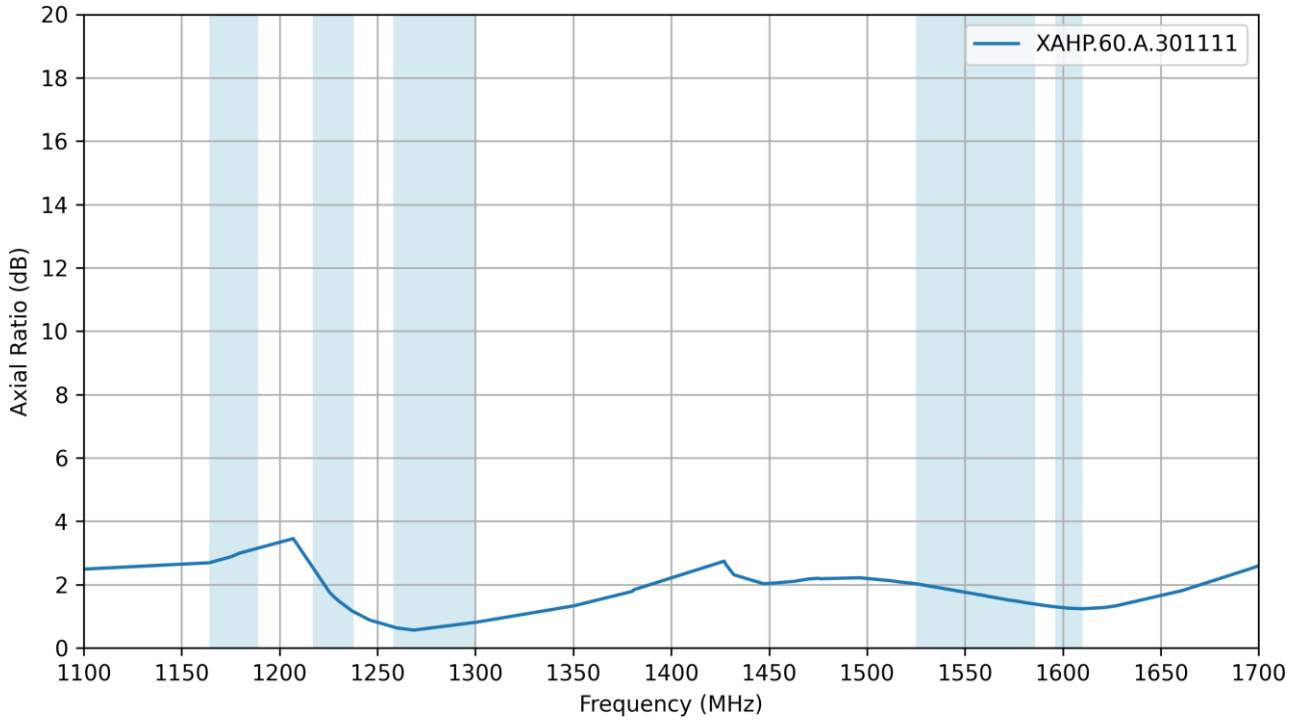
5.5 Average Gain



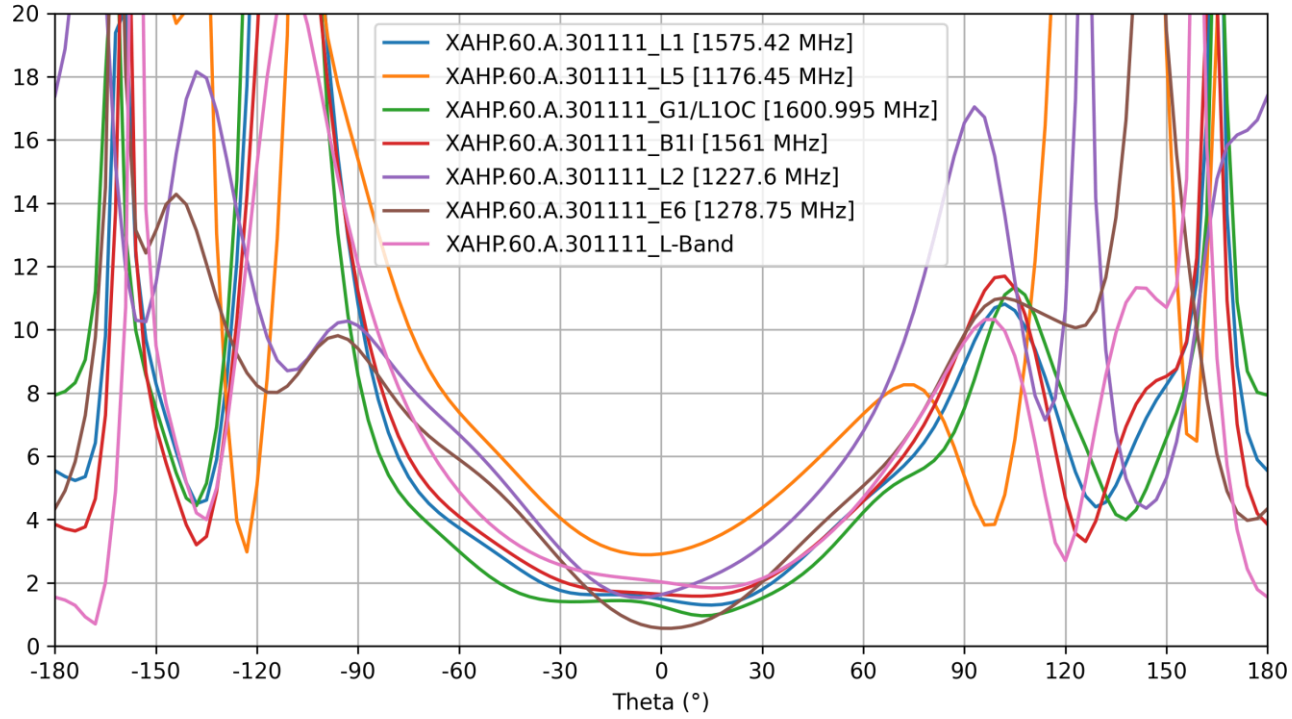
5.6 Peak Gain



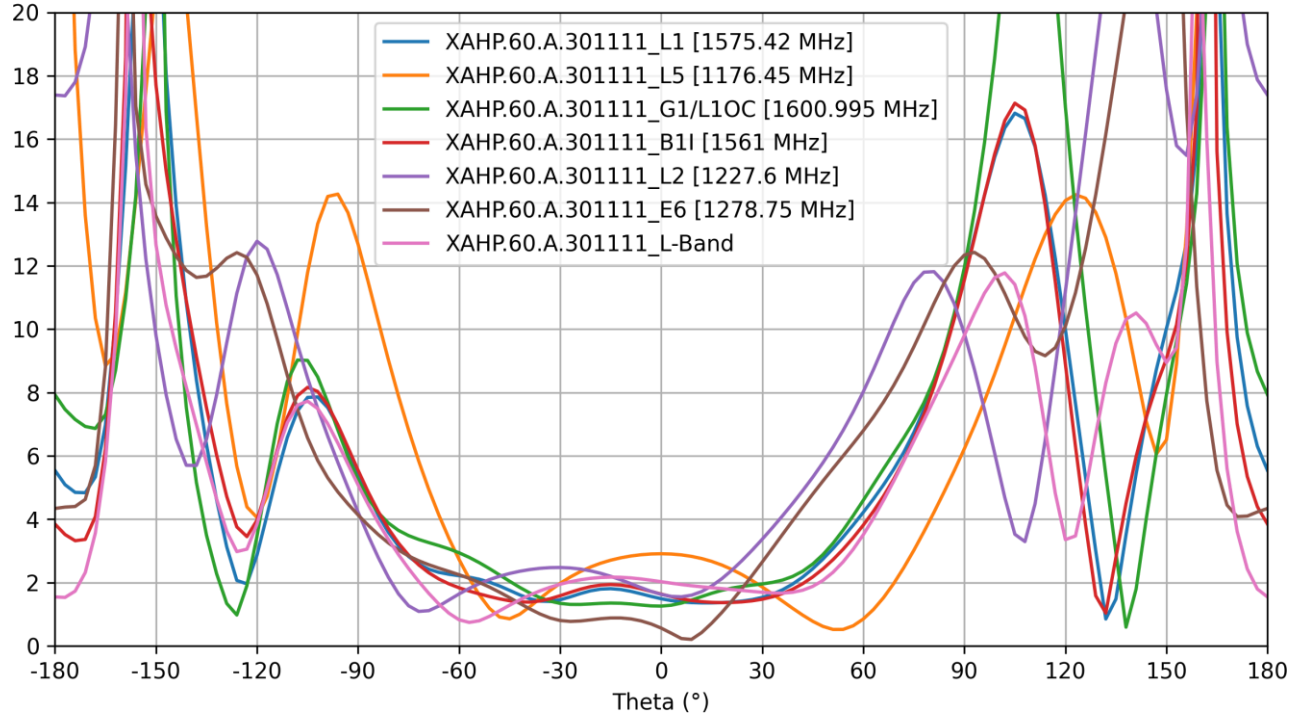
5.7 Axial Ratio



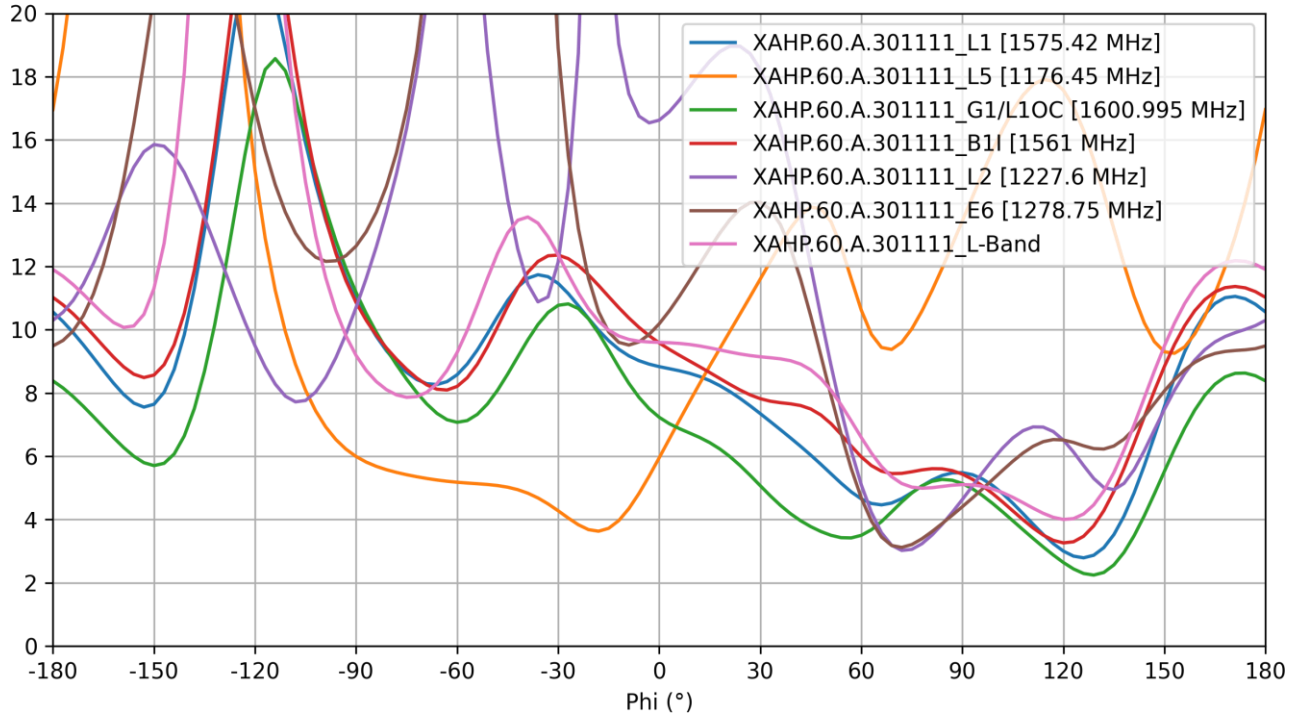
5.8 AR vs Angle for Phi=0



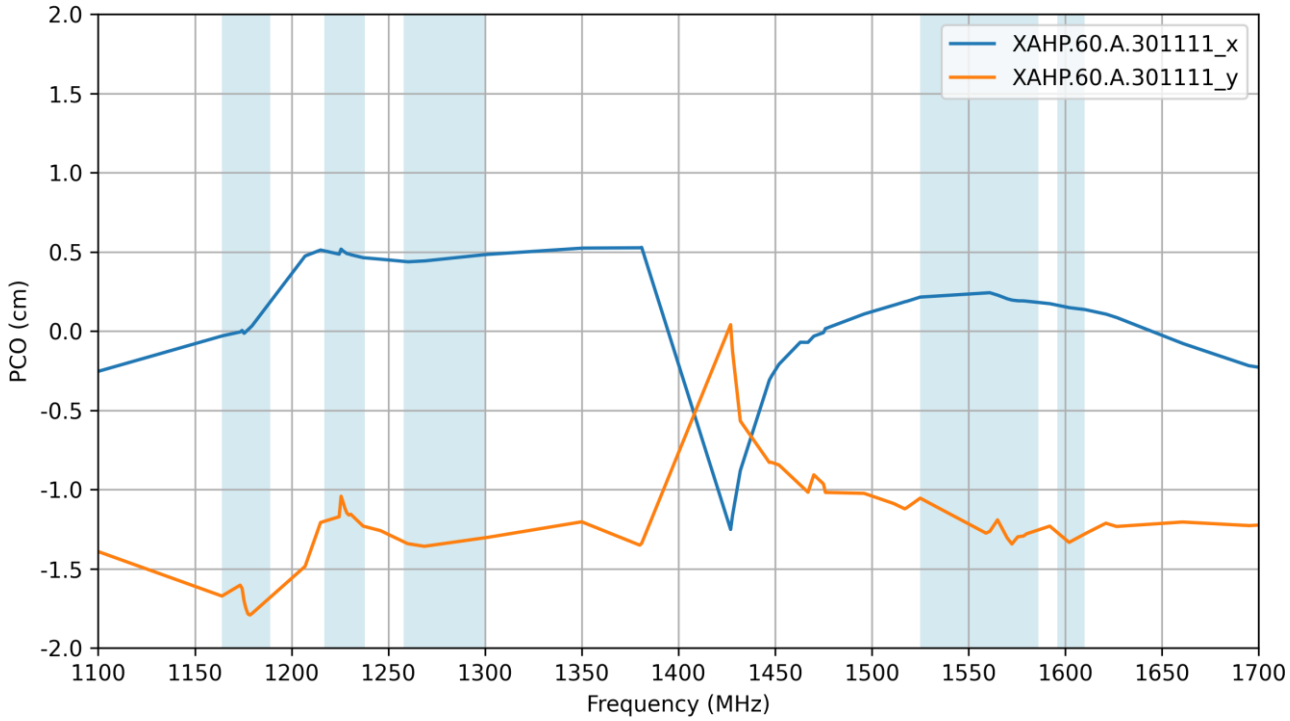
5.9 AR vs Angle for Phi=90



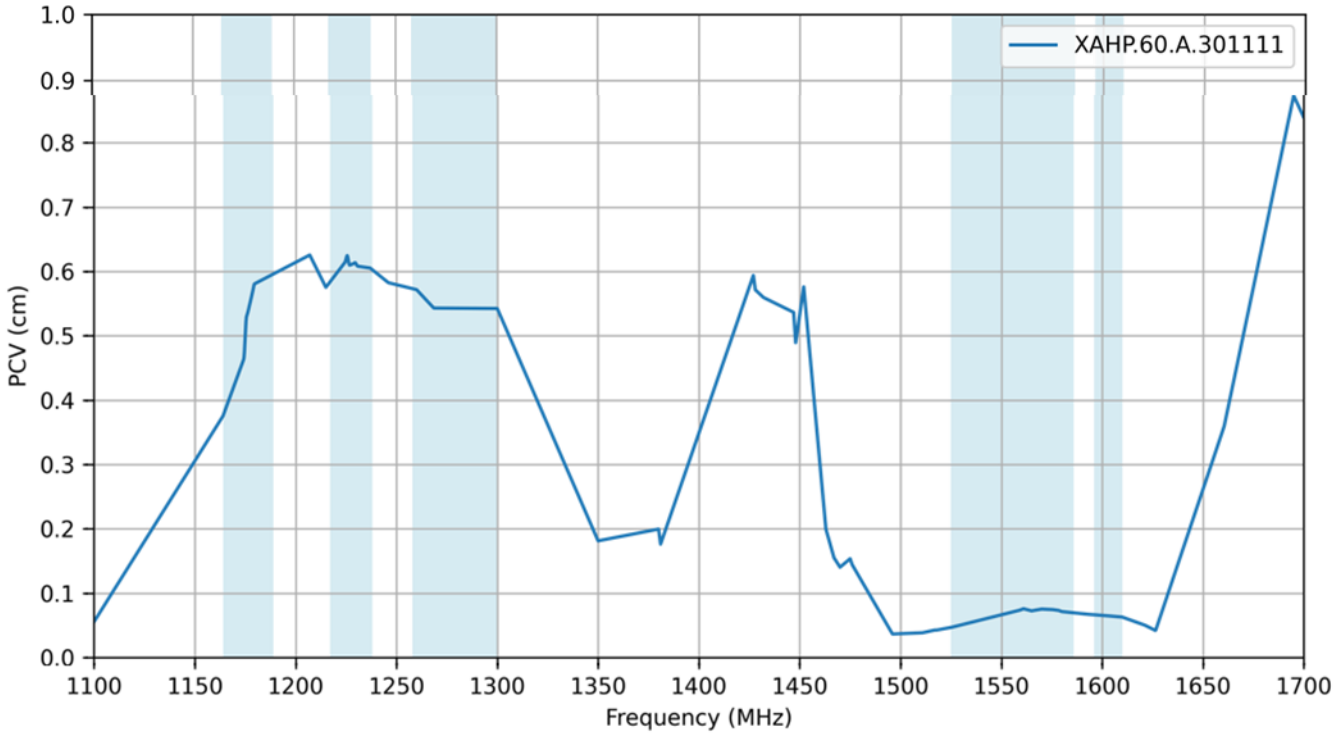
5.10 AR vs Angle for Theta=90



5.11 PCO

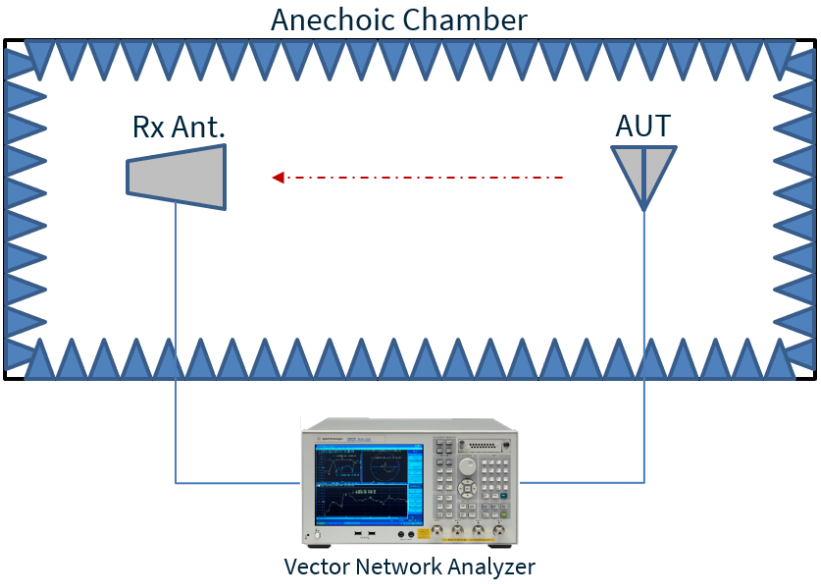


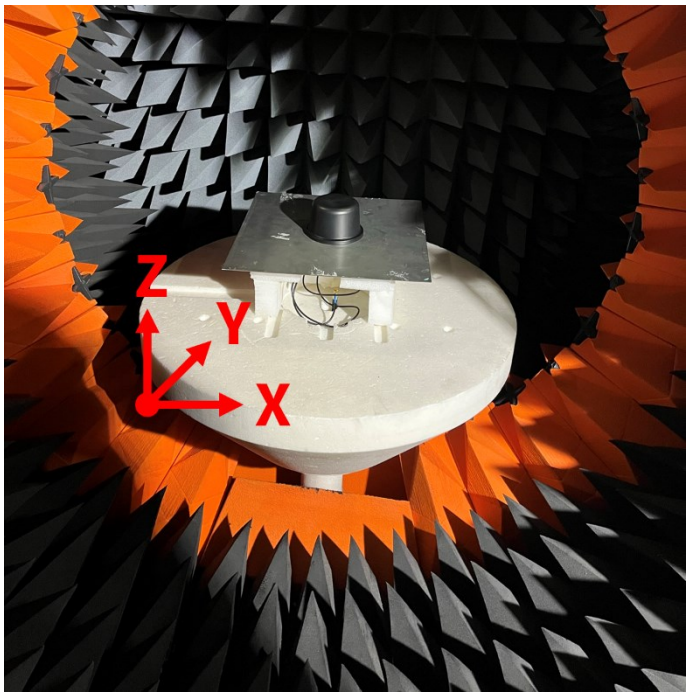
5.12 PCV


XAHP.60.A.301111
PCV (cm)
Frequency (MHz)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
1700

6. Radiation Patterns

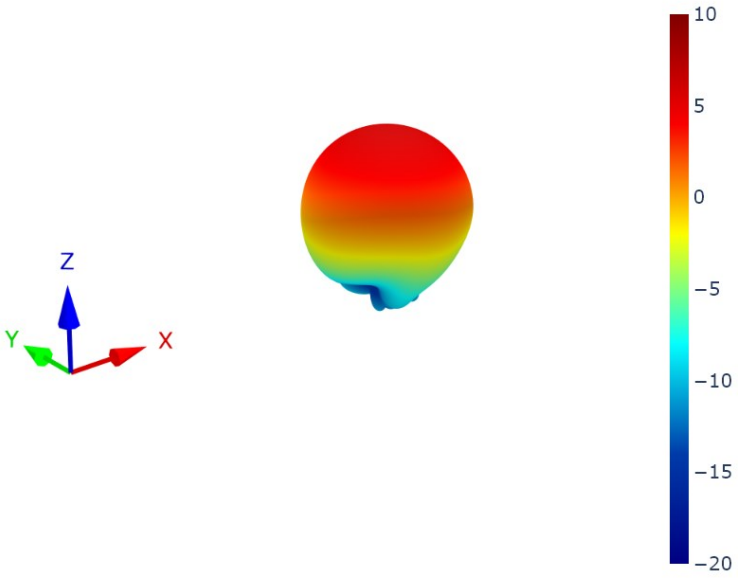
6.1 Test Setup



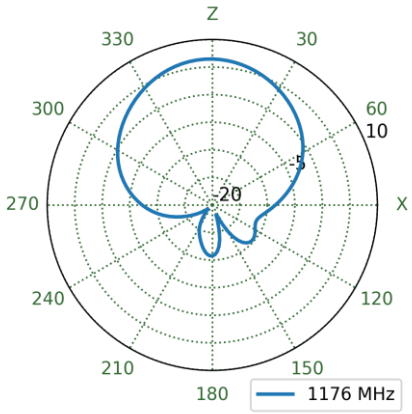


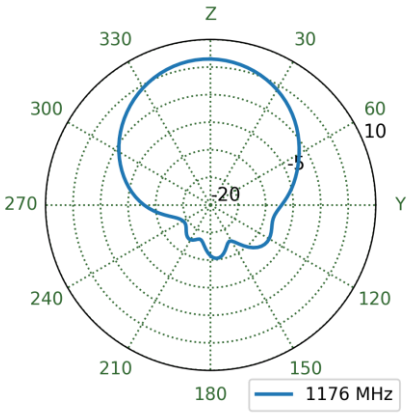
Chamber Test Set-up on a 30x30cm Ground Plane

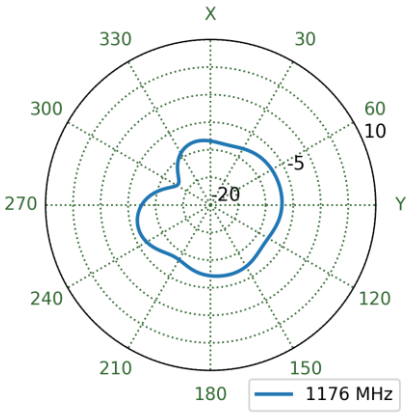
6.2 Patterns at 1176 MHz



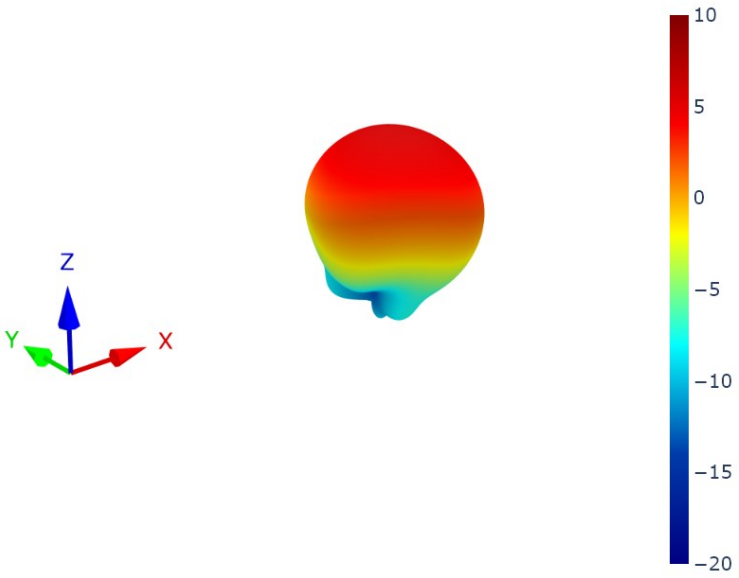
XZ Plane	YZ Plane	XY Plane

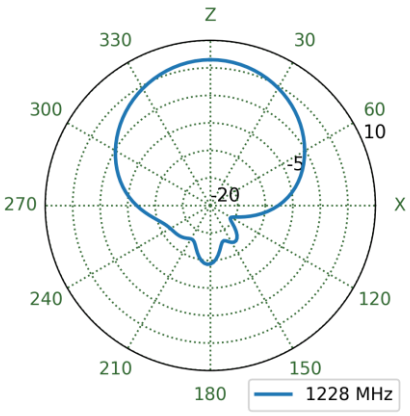
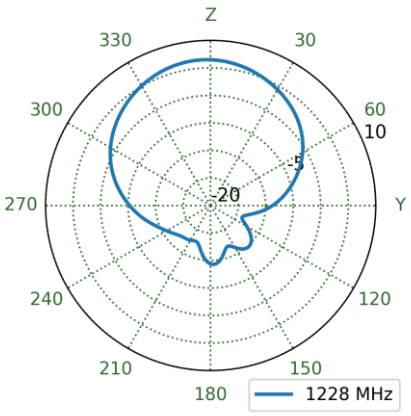
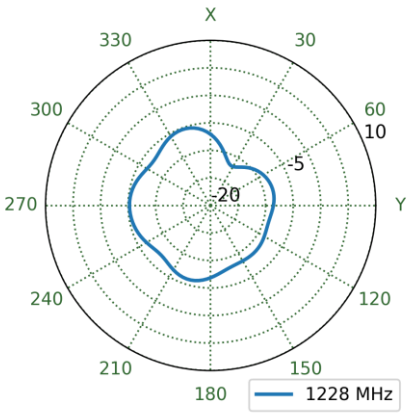




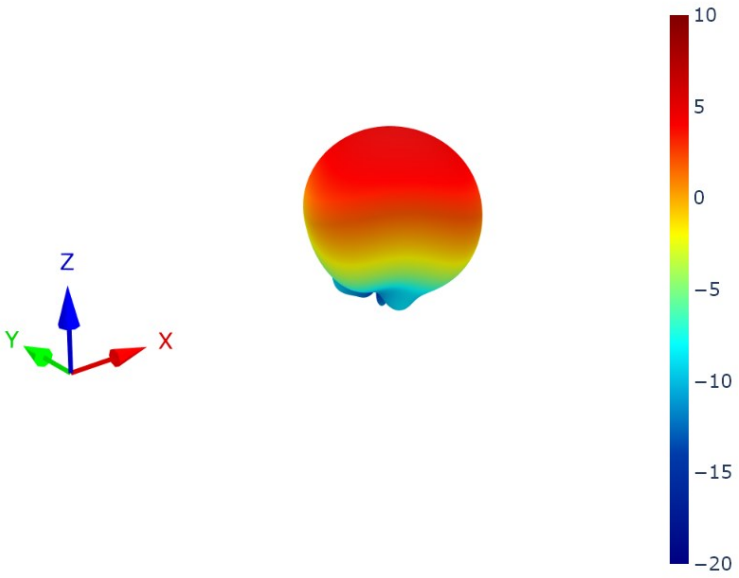


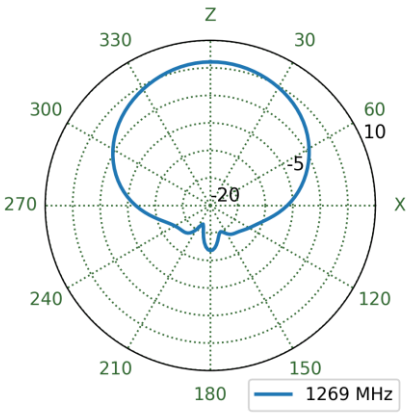
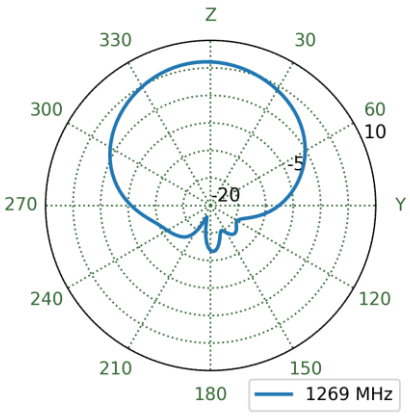
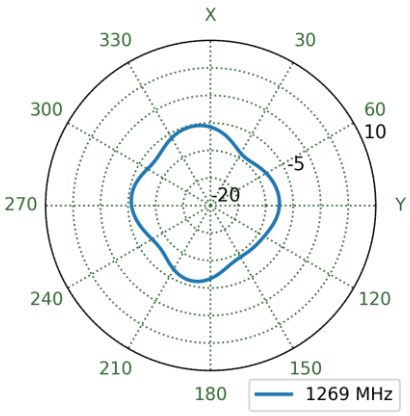
6.3 Patterns at 1228 MHz



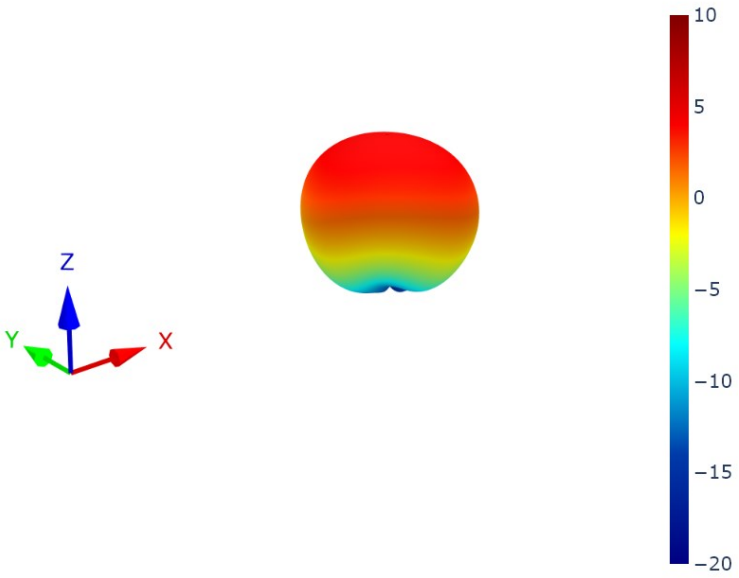
XZ Plane	YZ Plane	XY Plane
		

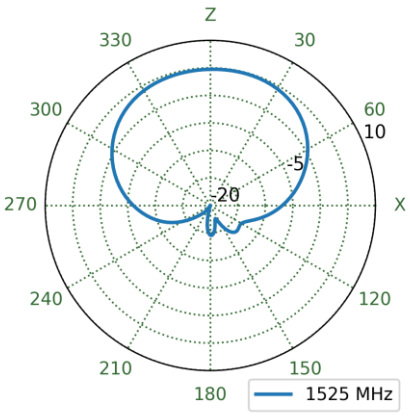
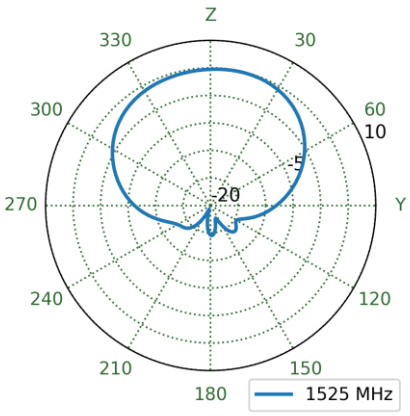
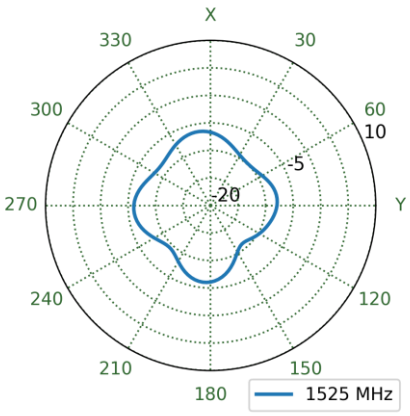
6.4 Patterns at 1278 MHz



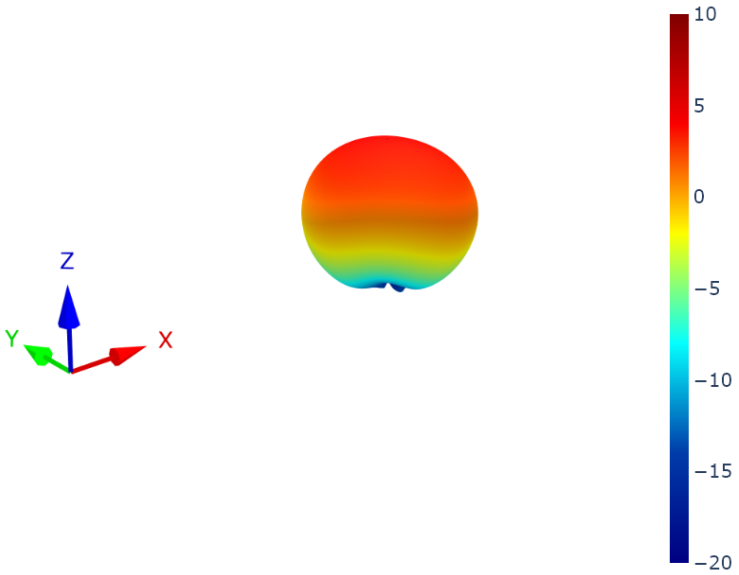
XZ Plane	YZ Plane	XY Plane
		

6.5 Patterns at 1542 MHz

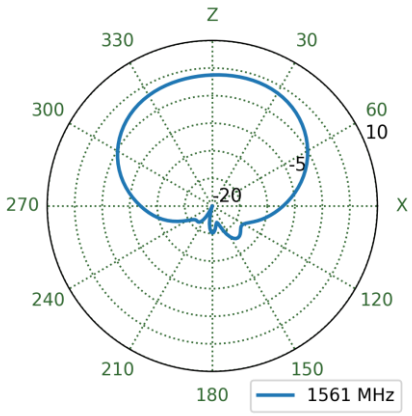


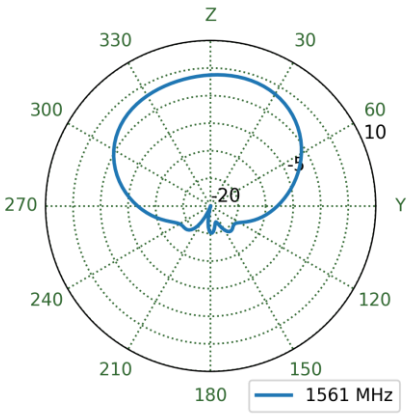
XZ Plane	YZ Plane	XY Plane
		

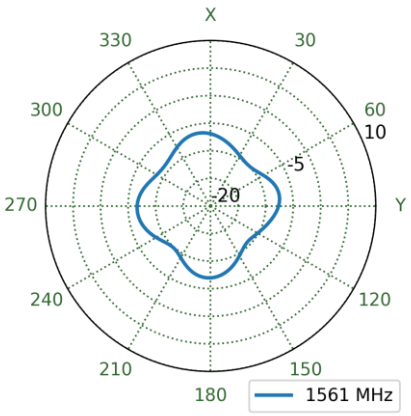
6.6 Patterns at 1561 MHz



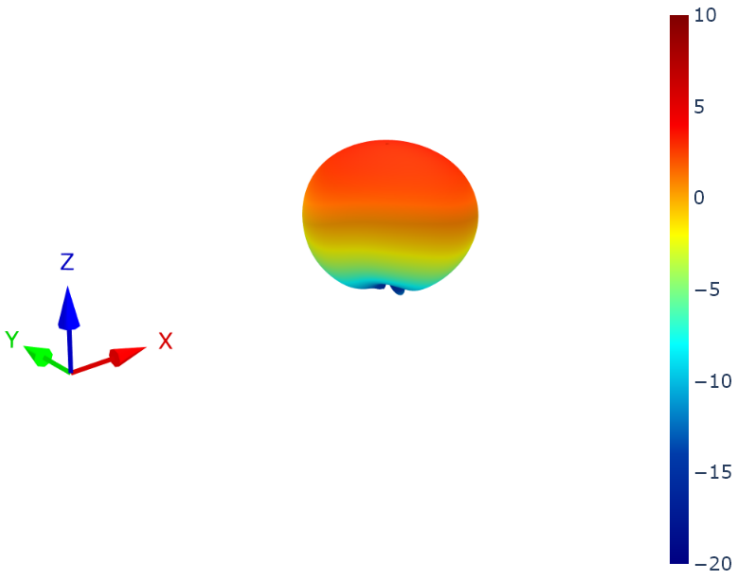
XZ Plane	YZ Plane	XY Plane

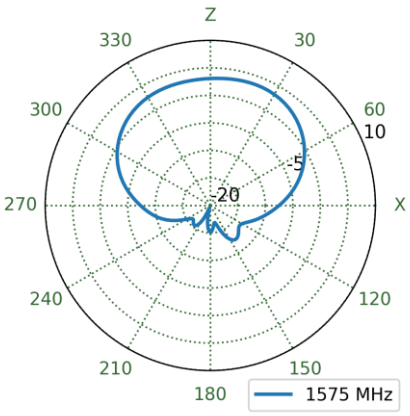
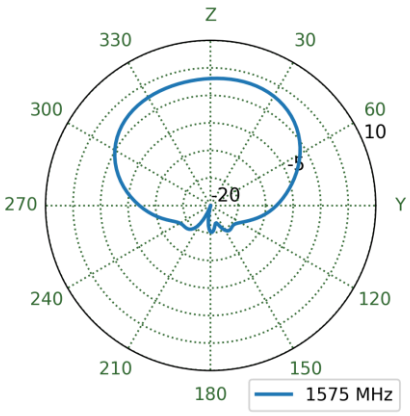
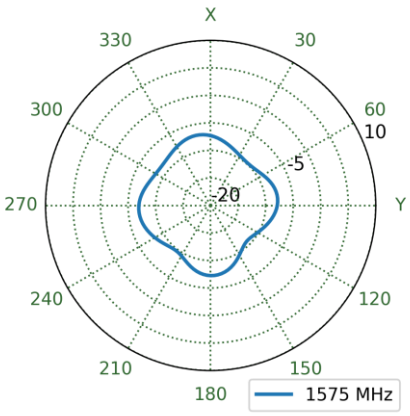




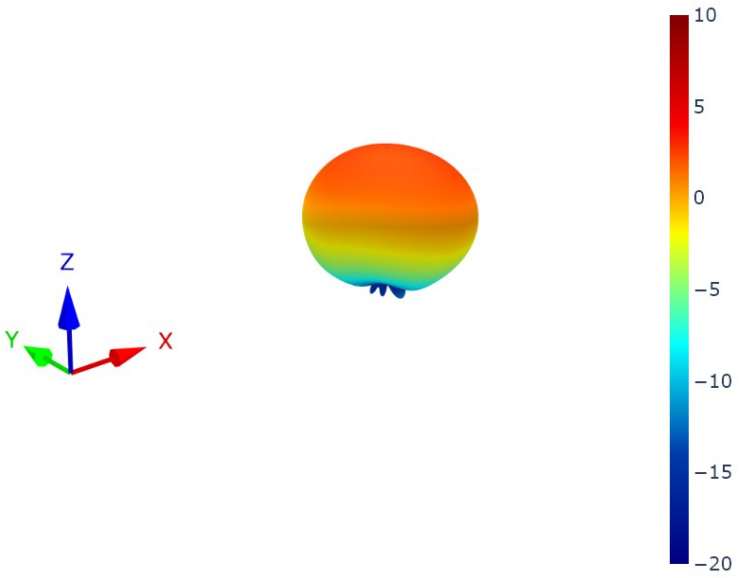


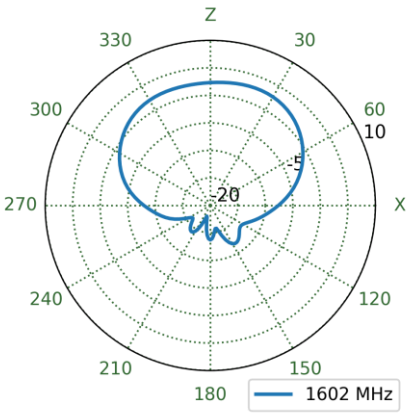
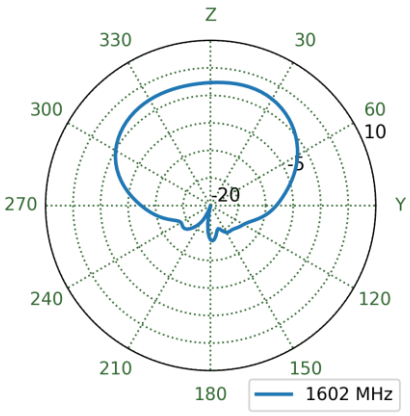
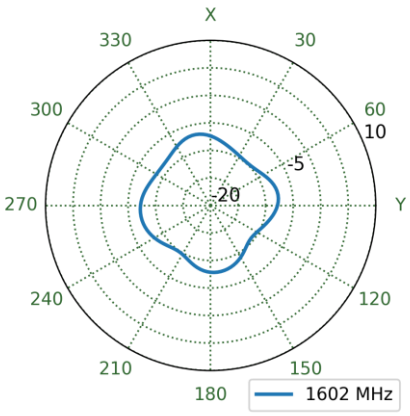
6.7 Patterns at 1576 MHz



XZ Plane	YZ Plane	XY Plane
		

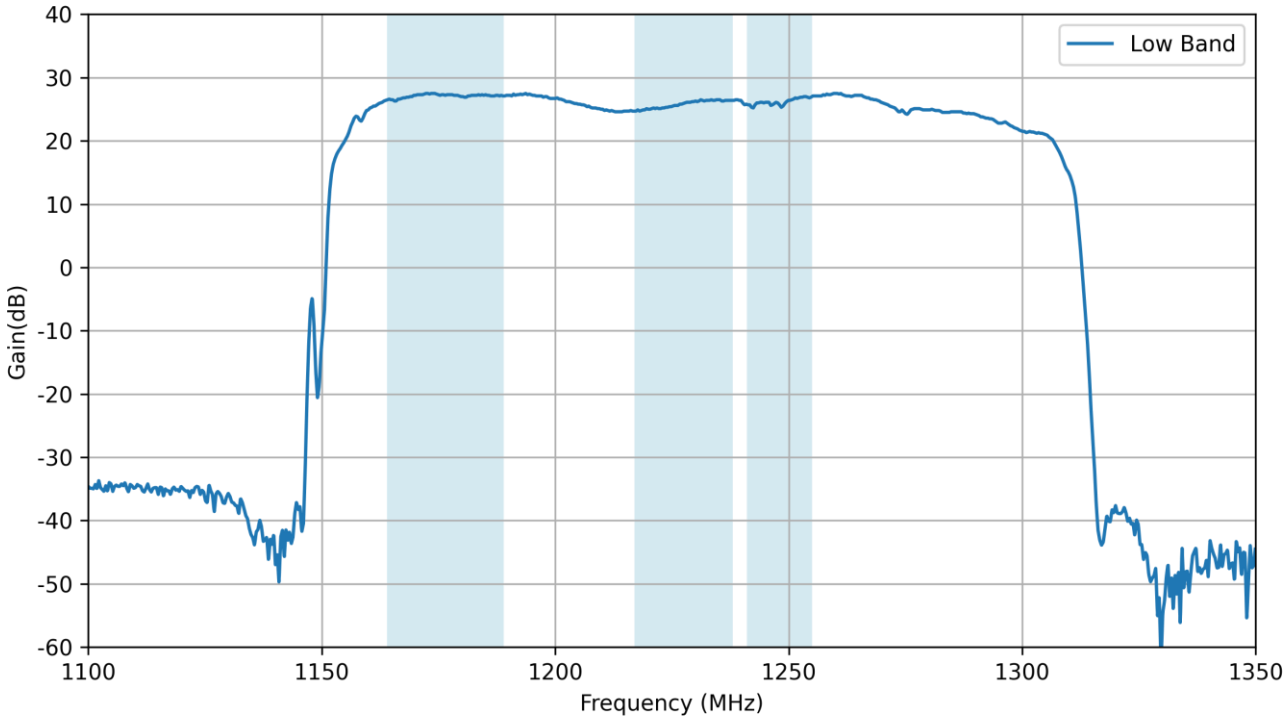
6.8 Patterns at 1602 MHz



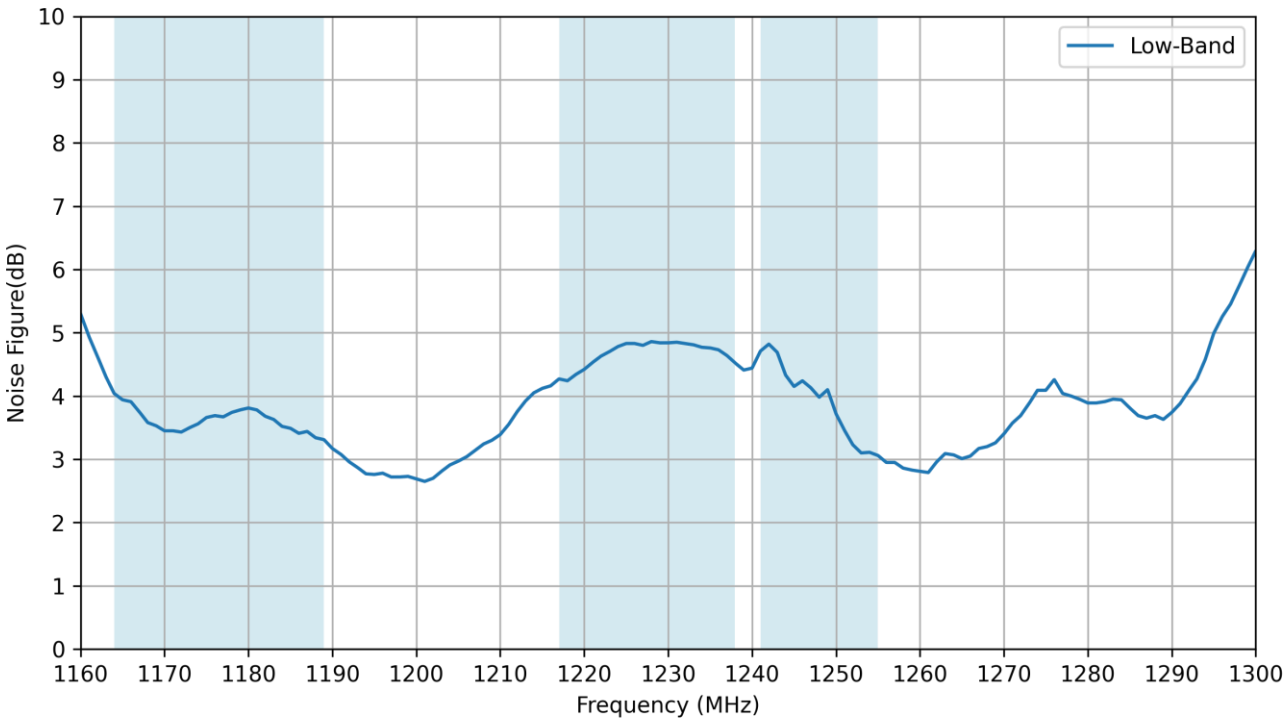
XZ Plane	YZ Plane	XY Plane
		

7. LNA Characteristics

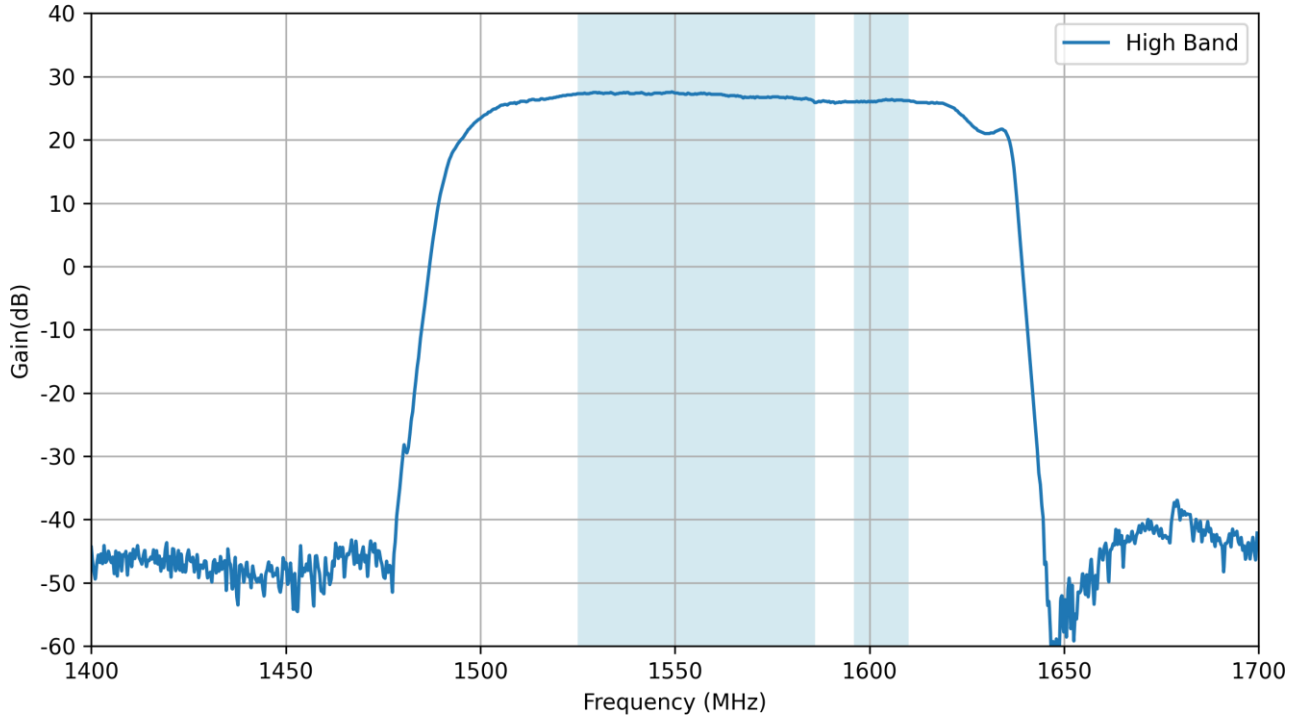
7.1 Low-Band - Gain



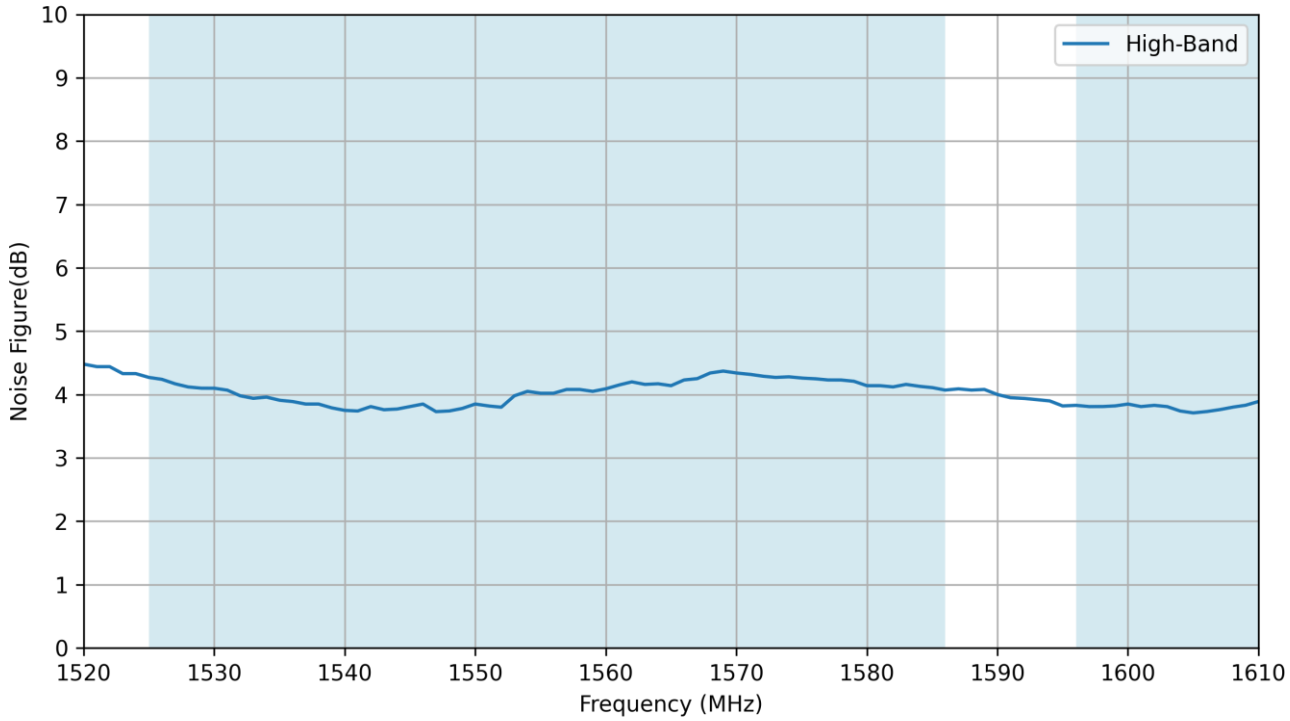
7.2 Low-Band – Noise Figure



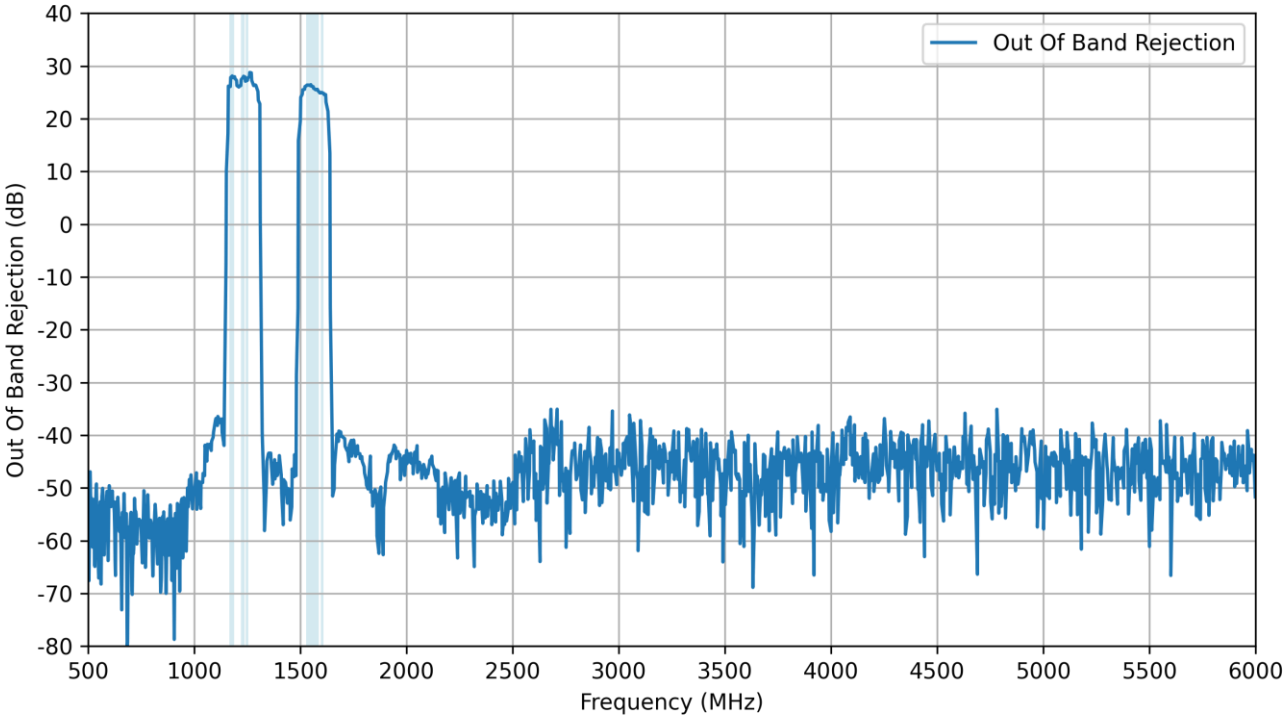
7.3 High-Band Gain



7.4 High-Band Nosie Figure



7.5 Out Of Band Rejection



Changelog for the datasheet

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Author:	Cesar Sousa

Previous Revisions

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