TAOGLAS

Datasheet

Part No:
ADFGP.60A.01.0150D

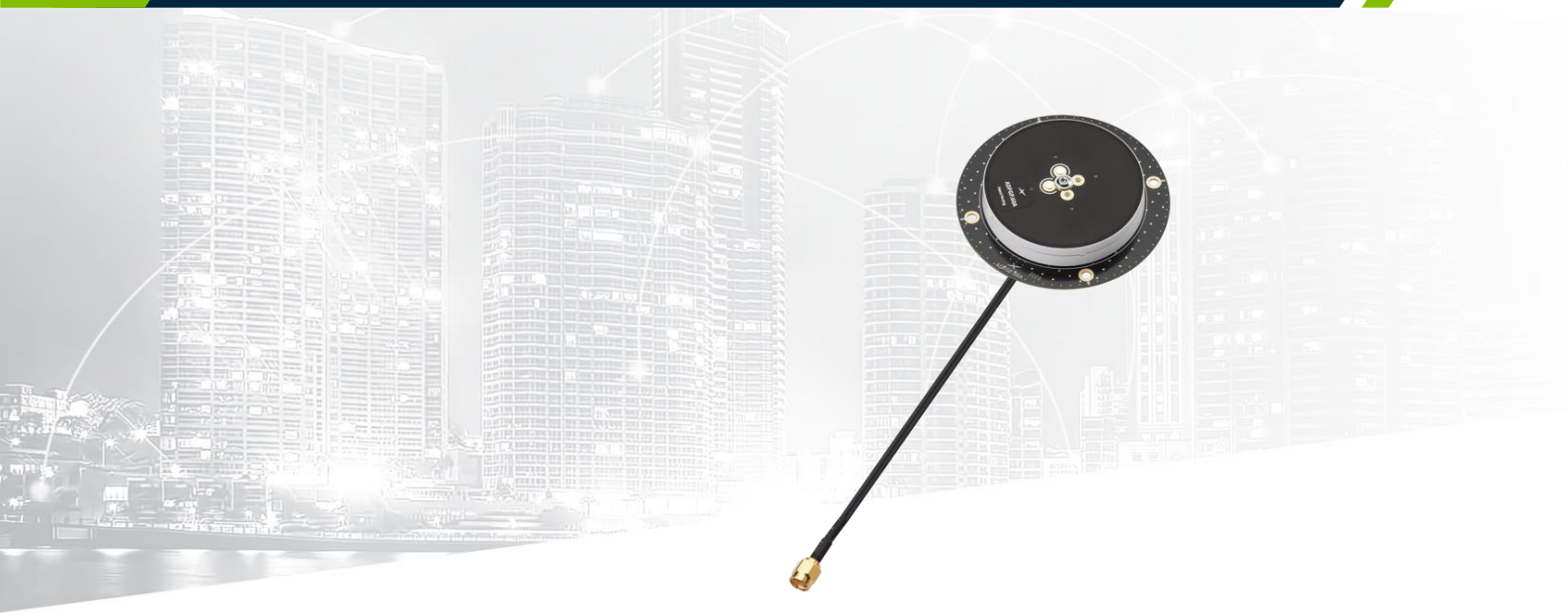
Description:

Active All Band GNSS High Precision Antenna
with 150mm of RG-174 & SMA (M)

Features:

Embedded Dual Patch, Dual Feed 4-Pin Assembly
Covering all worldwide GNSS bands including the L-bands
Low Axial Ratio
Cable: 150mm of RG-174
Connector: SMA (M)
Dimensions: Ø80 x 19.1mm
RoHS & Reach Compliant

1. Introduction



The Taoglas ADFGP.60A.01.0150D is an innovative high performance, multi-band active, high precision GNSS antenna that has been carefully designed to provide fantastic positional accuracy on the full GNSS spectrum. It covers GPS/QZSS L1/L2/L5/L6, GLONASS G1/G2/G3, Galileo E1/E5a/E5b, BeiDou B1/B2a/B2b/B3, NAVIC L5, as well as SBAS (WAAS/EGNOS/GAGAN/SDCM/SNAS) and L-band corrections.

Correct implementation of the ADFGP.60A allows the user to achieve higher location accuracy, as well as stability of position tracking in urban environments. The novel Terrablast circular stacked patch construction has excellent performance across the full bandwidth of the antenna while reducing weight by nearly 40% compared to other antenna options. Its unique design provides excellent polarization and phase performance, providing exceptional positional and timing accuracy.

Typical applications that benefit from high precision capabilities include:

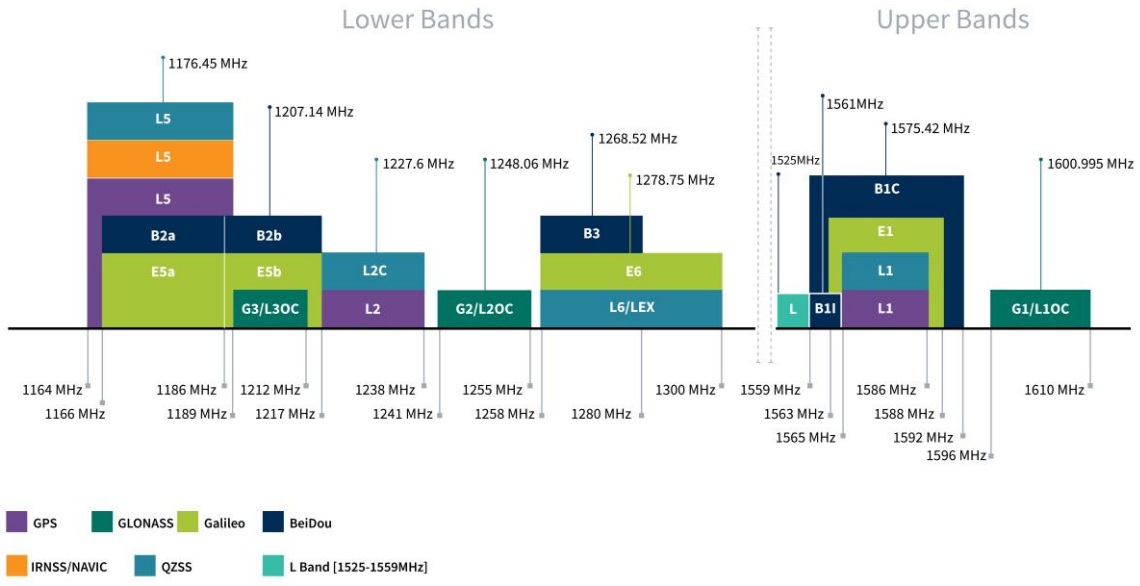
- Autonomous Driving
- Unmanned Aerial Vehicles
- Precision Positioning for Robotics
- Precision Agriculture
- Timing Accuracy Synchronization

The ADFGP.60A is the latest embedded addition to Taoglas' product portfolio of high precision GNSS antennas. When used on the base and/or the rover as part of an RTK configuration, the ADFGP.60A can achieve genuine cm-level accuracy with proven results.

Contact your regional Taoglas Customer Services team for more information or for support regarding integration.

2. Specifications

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**	**1227.6**	**1278**	**1561**	**1575.42**	**1602**
VSWR (max.)	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1	2.0:1
Efficiency (%)[1]	29%	45%	18%	49%	50%	45%
Peak Gain (dBi)[1]	1.6	3.8	-0.3	4.1	4.4	3.7
Axial Ratio (dB)	0.25	1.03	1.25	1.24	1.00	0.47
Group Delay Average (ns)	8.2	6.5	7.5	4.6	4.1	5.0
Group Delay Variation (ns)[2]	6.5	6.2	6.4	3.4	4.1	1.9
PCO (cm)	0.6	1.0		0.7	0.7	0.8
PCV (cm)	0.6	0.4		0.3	0.7	0.6
Polarization	RHCP					
Impedance	50Ω					

Note 1: tested on a 150mm-diameter ground plane
Note 2: Maximum variation within the applicable band

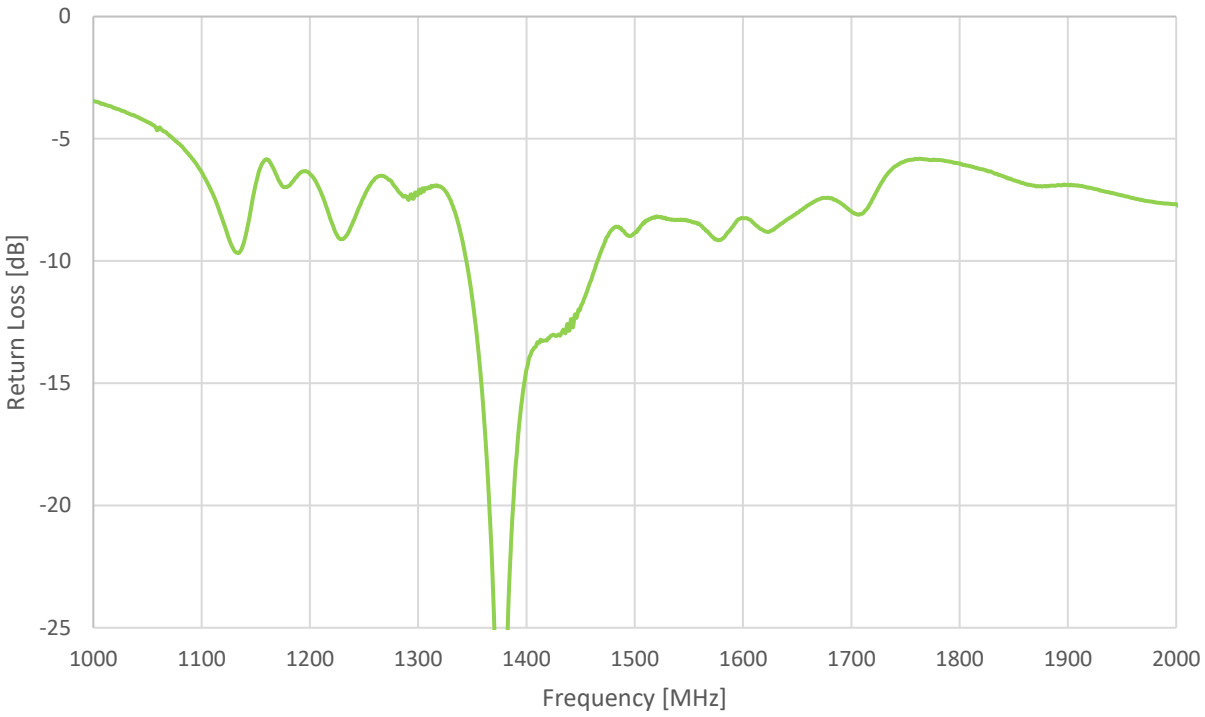
LNA and Filter Electrical Properties						
Frequency (MHz)	**1176.45**	**1227.6**	**1278**	**1561**	**1575.42**	**1602**
Gain (dB) (Typ.)	26.3	27.0	24	25.3	25.1	24.6
Noise Figure (dB) (Typ.)	3.5	3.4	3.3	3.6	3.6	3.9
Current Draw (Typ.)	19 mA					
Supply Voltage	+2.0 ~ +5.5V					

Total Specification (Through Antenna, SAW Filter and LNA)						
Frequency (MHz)	**1176.45**	**1227.6**	**1278**	**1561**	**1575.42**	**1602**
Gain (dBi)	26	29.8	29.8	29.8	29.9	28.7
Output Impedance	50 Ω					

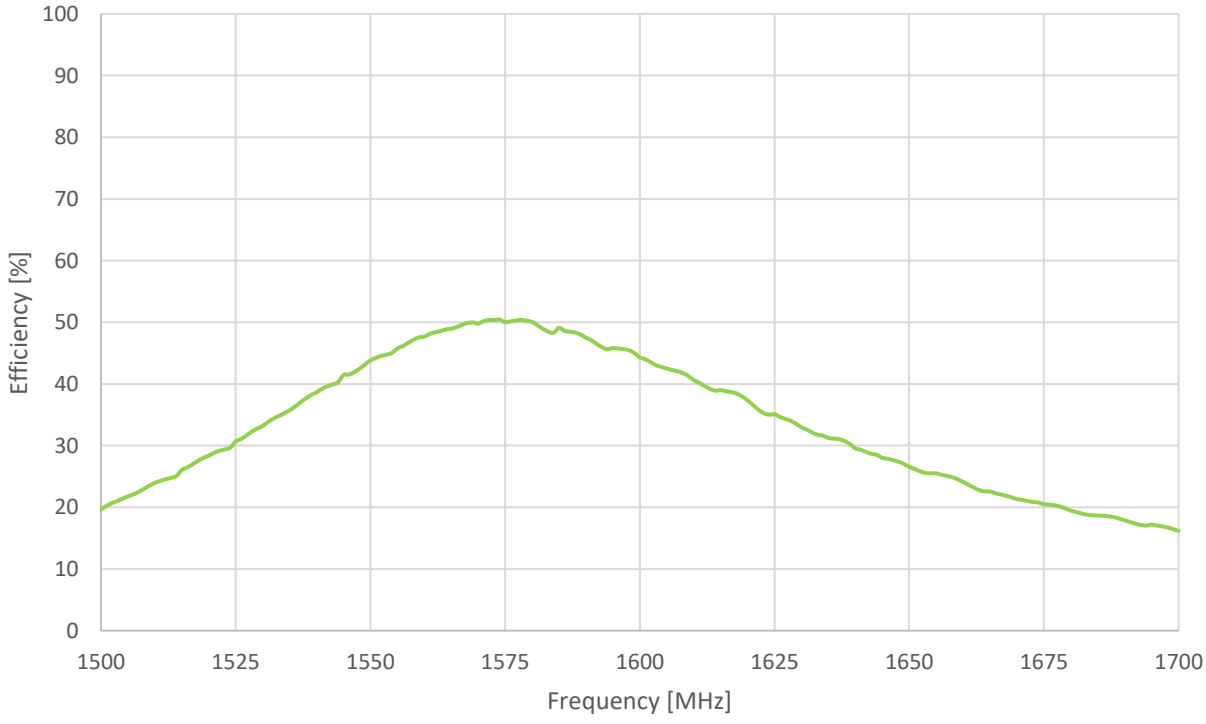
Mechanical	
Dimensions	Ø80mm x 19.1mm
Connector	SMA (M)
Cable	150mm RG-174
Weight	73g
Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

3. Antenna Characteristics

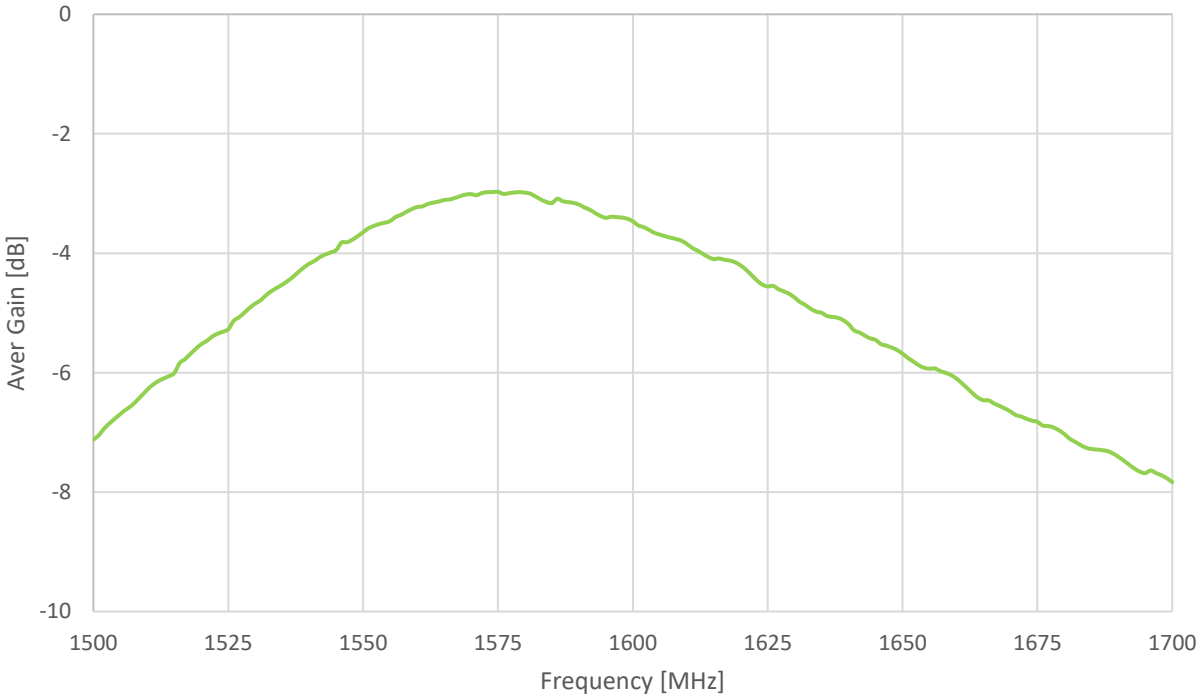
3.1 Return Loss



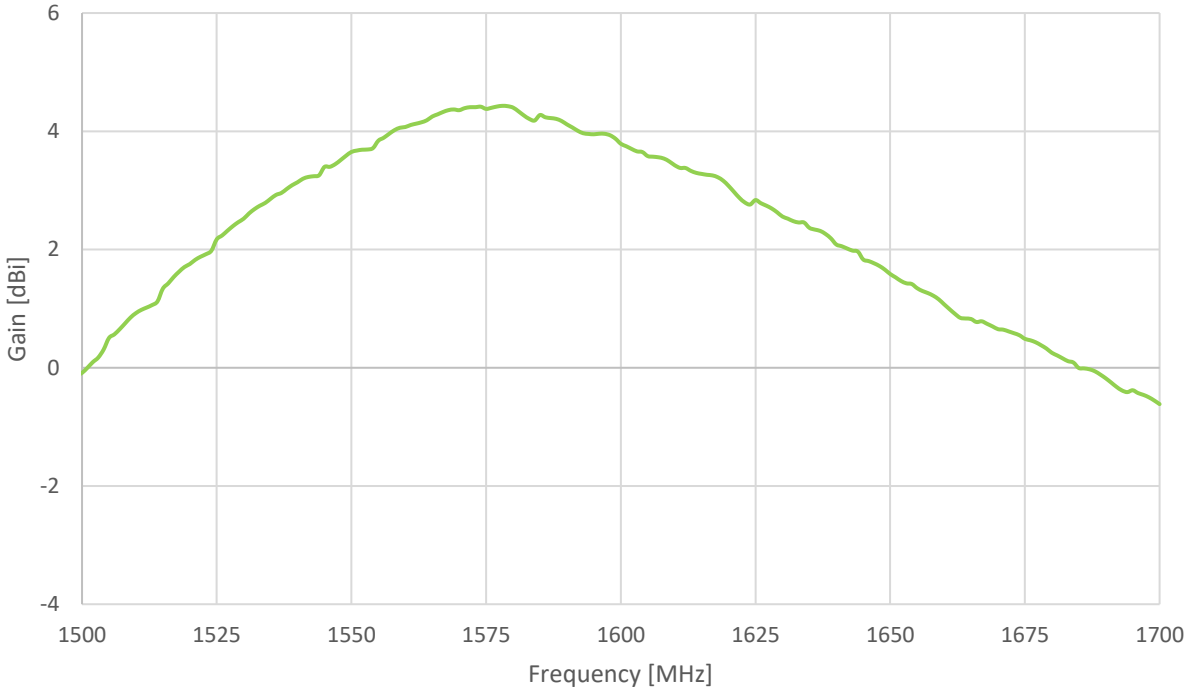
3.2 Efficiency (High Band)



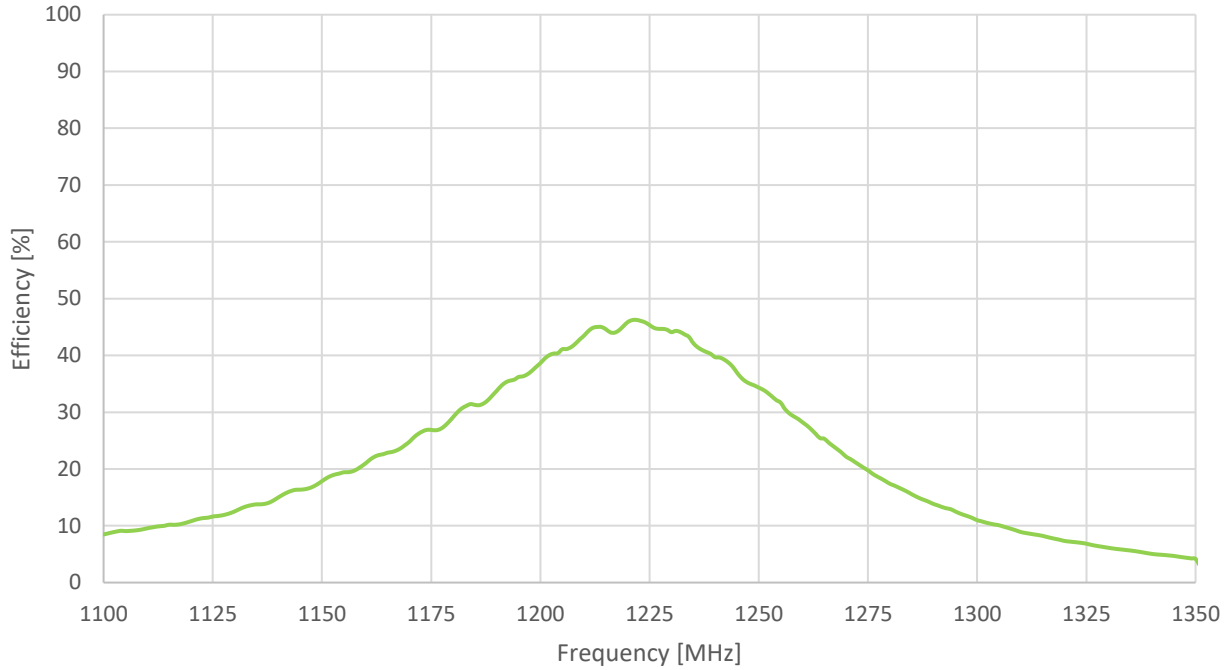
3.3 Average Gain (High Band)



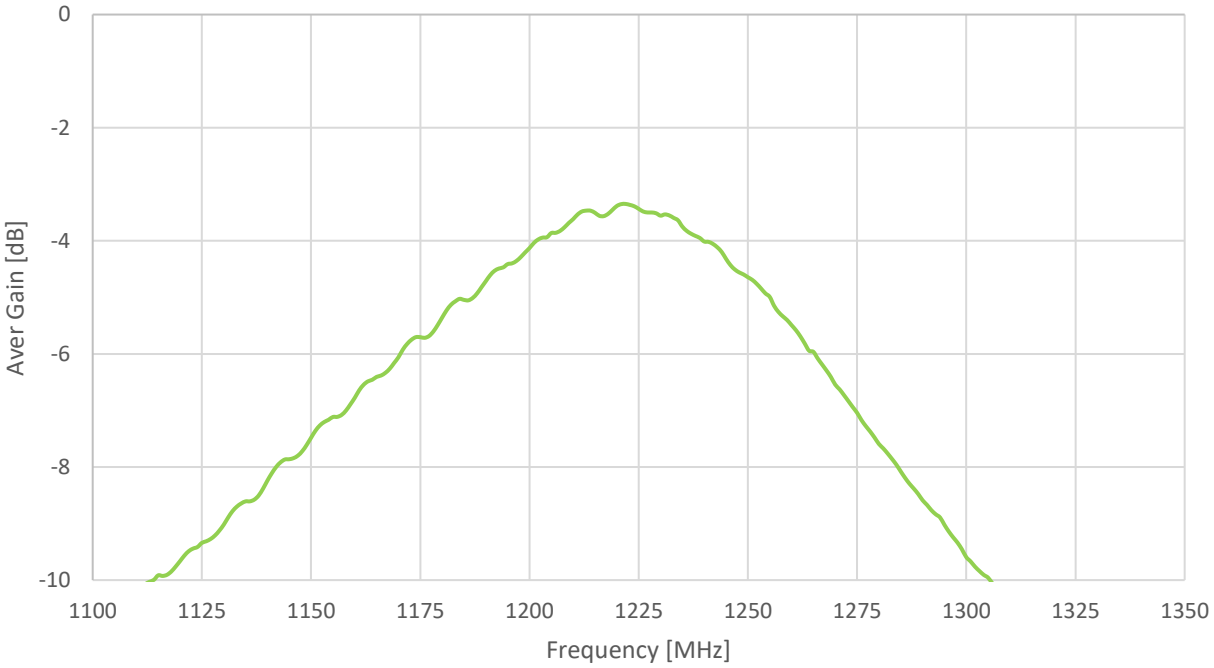
3.4 Peak Gain (High Band)



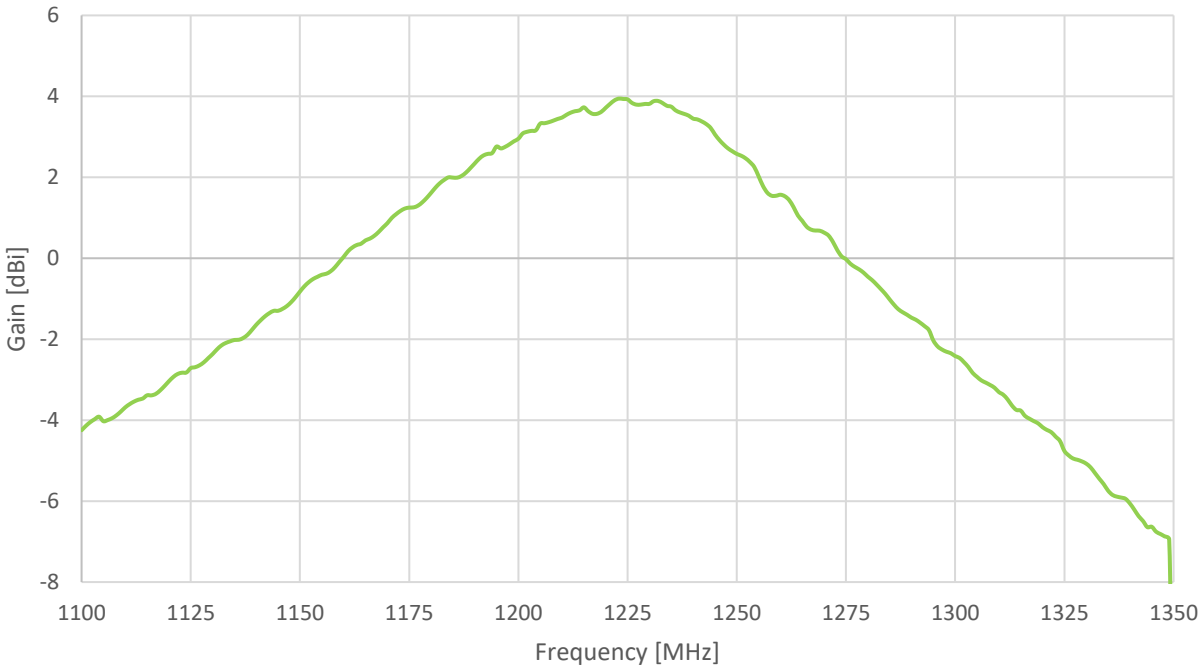
3.5 Efficiency (Low Band)



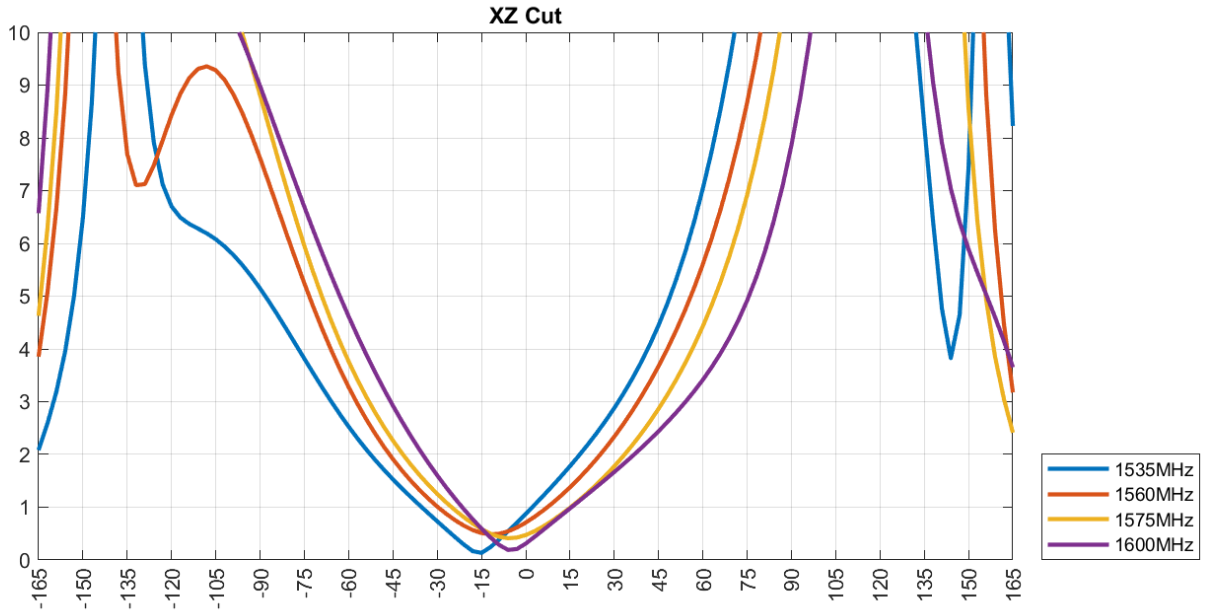
3.6 Average Gain (Low Band)

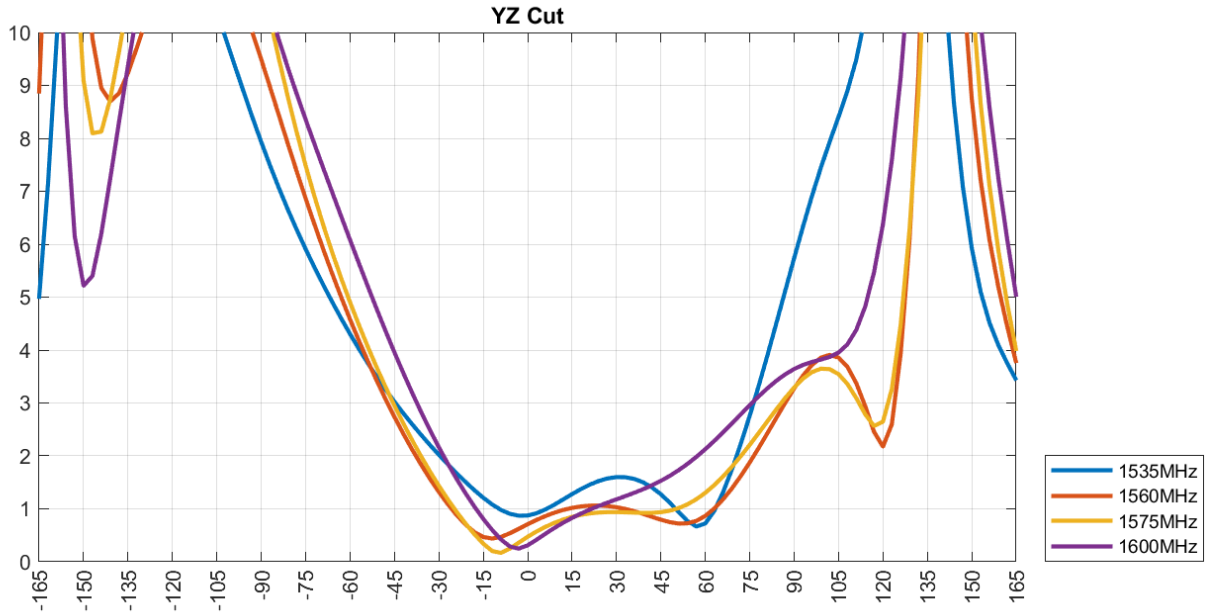


3.7 Peak Gain (Low Band)

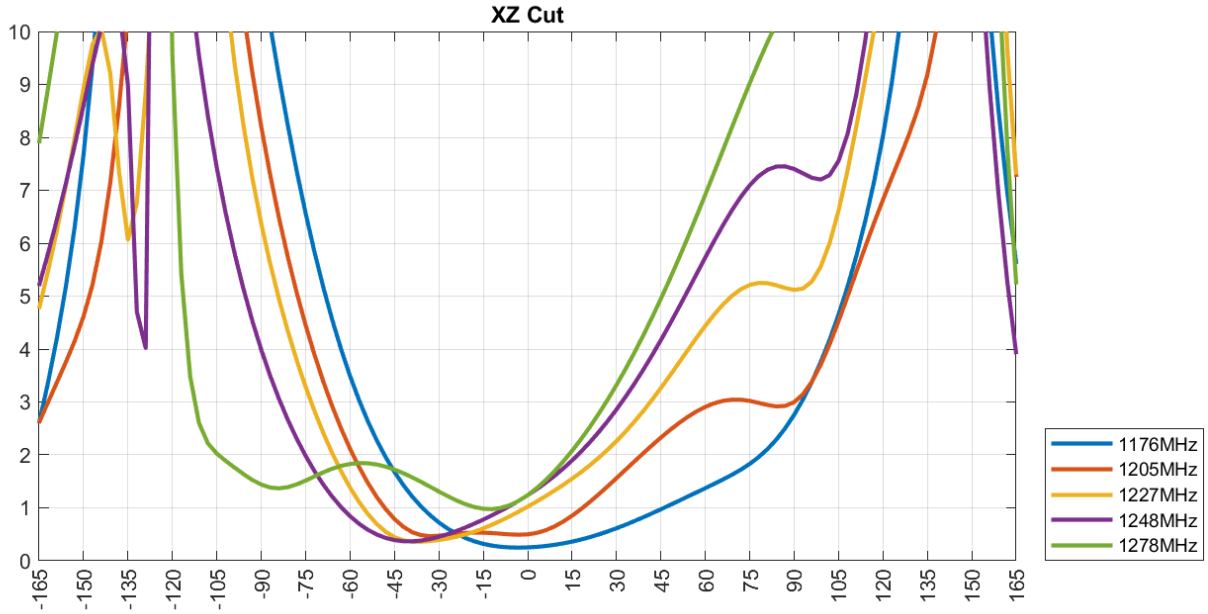


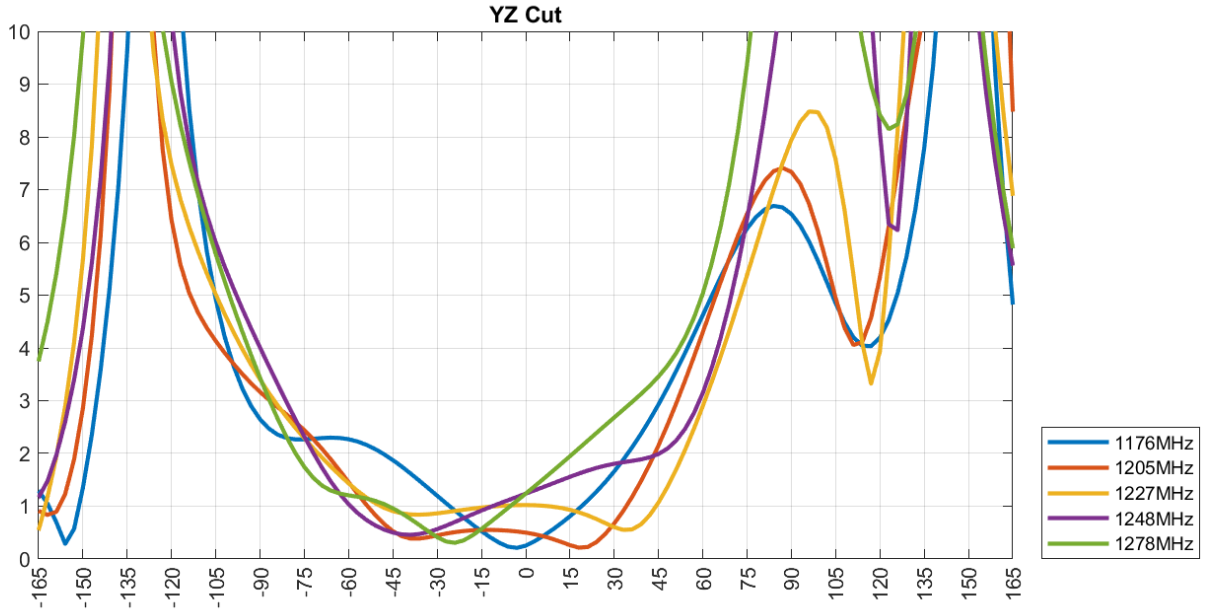
3.8 Axial Ratio (High Band)





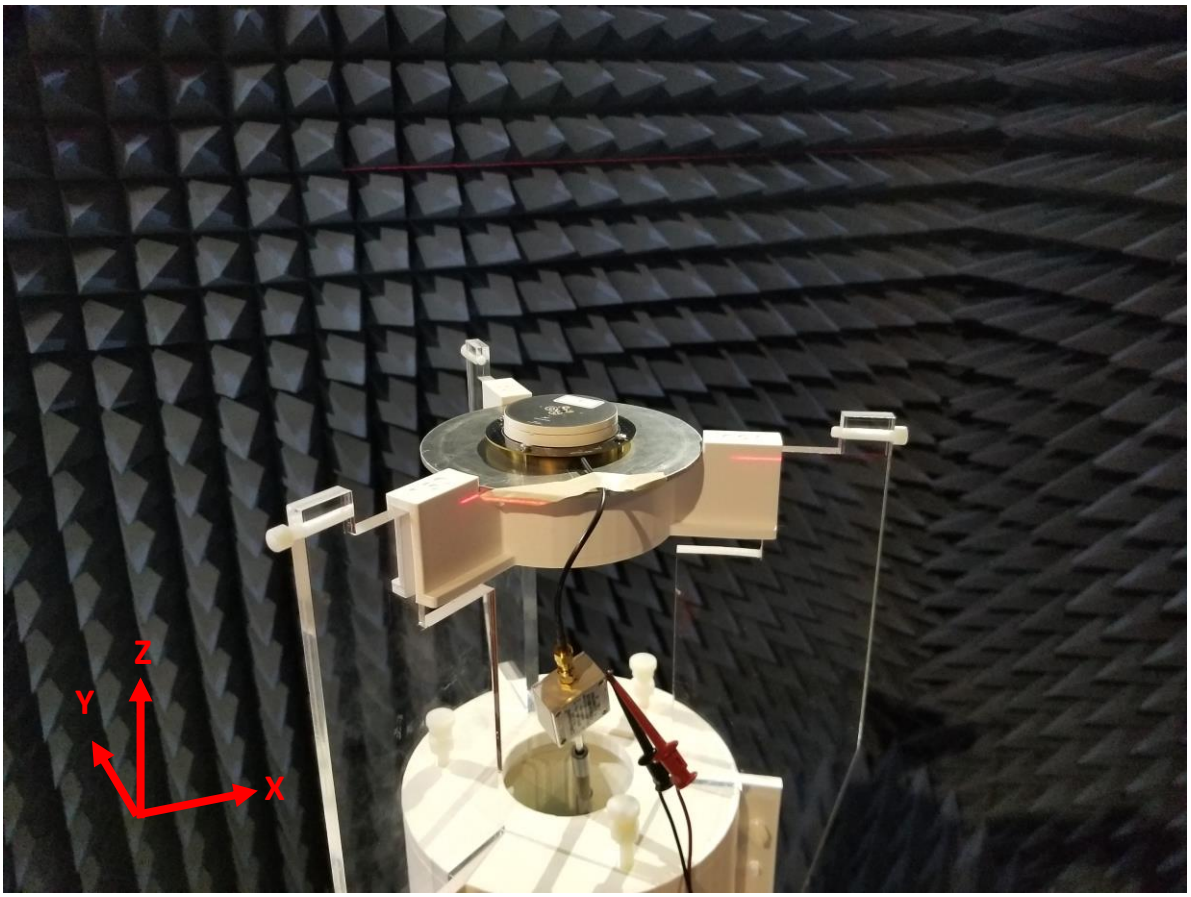
3.9 Axial Ratio (Low Band)





4. Radiation Patterns

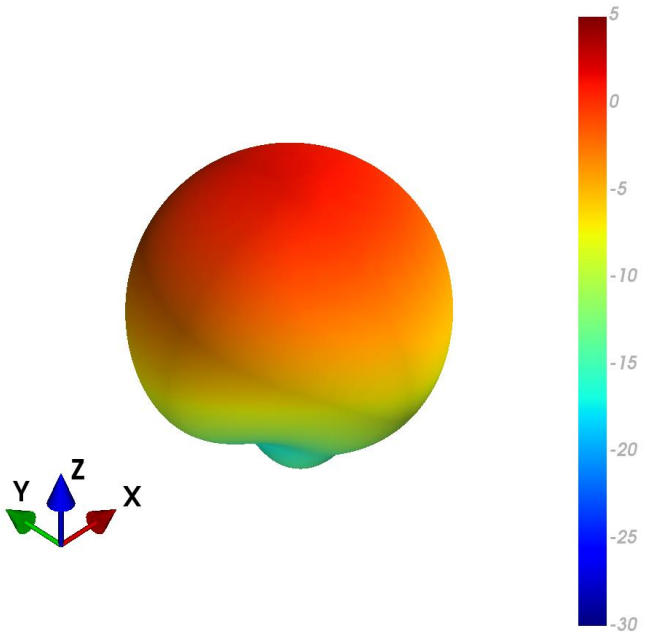
4.1 Test Setup



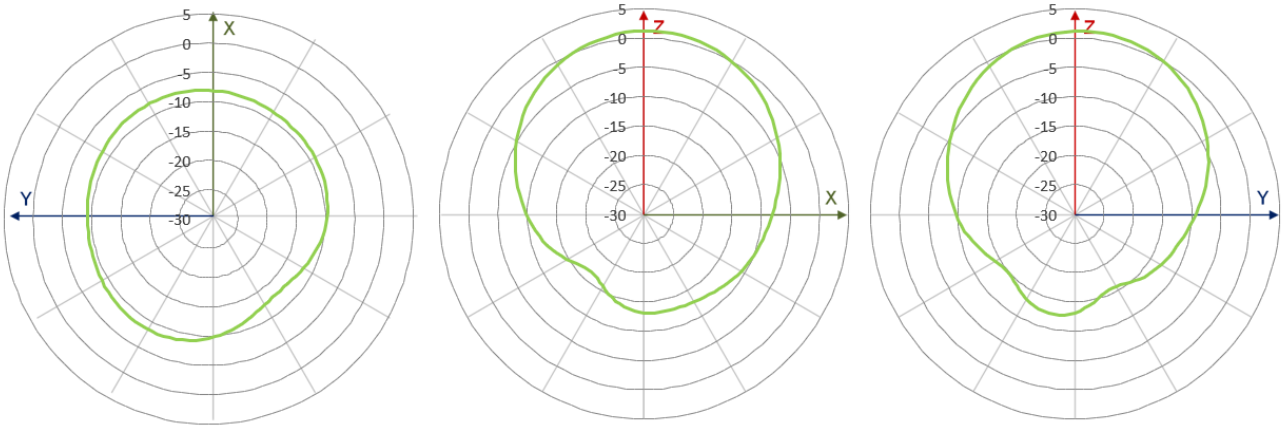
Chamber test setup on a 150mm circular ground plane.

4.2 3D and 2D Radiation Patterns

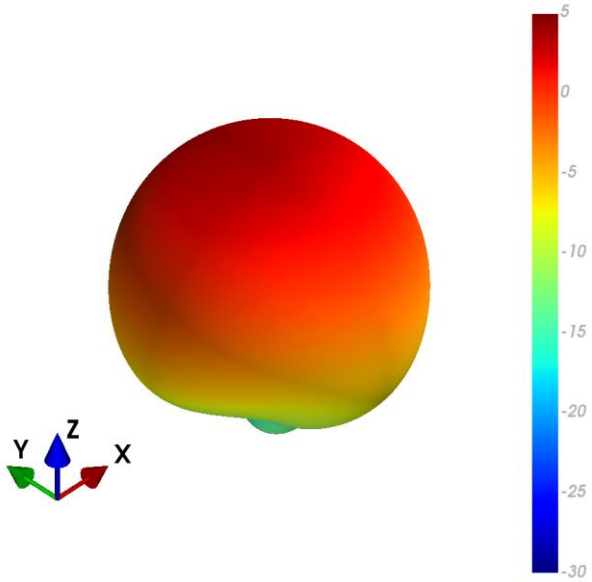
1176.45MHz



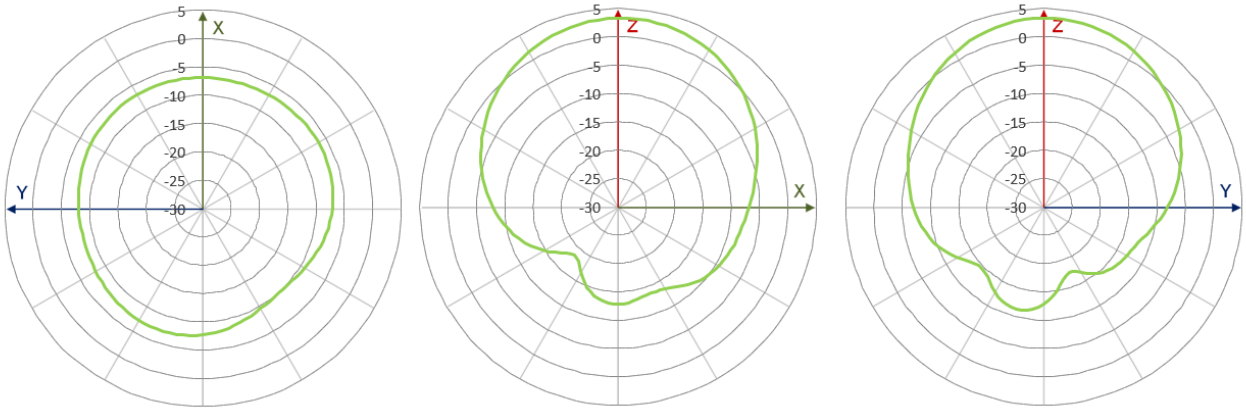
XY Plane	XZ Plane	YZ Plane



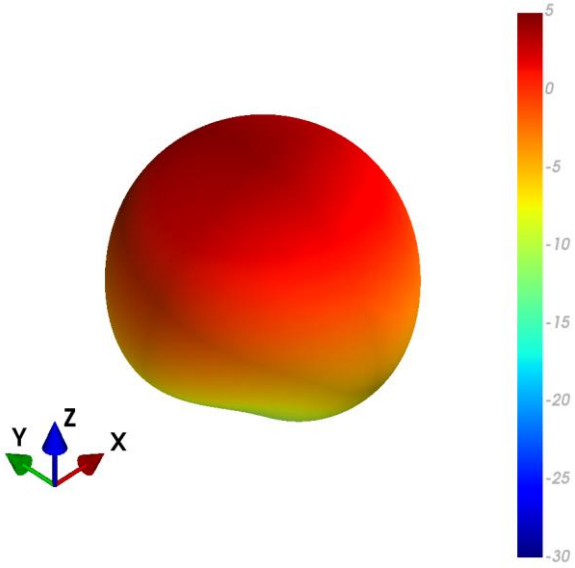
1205MHz



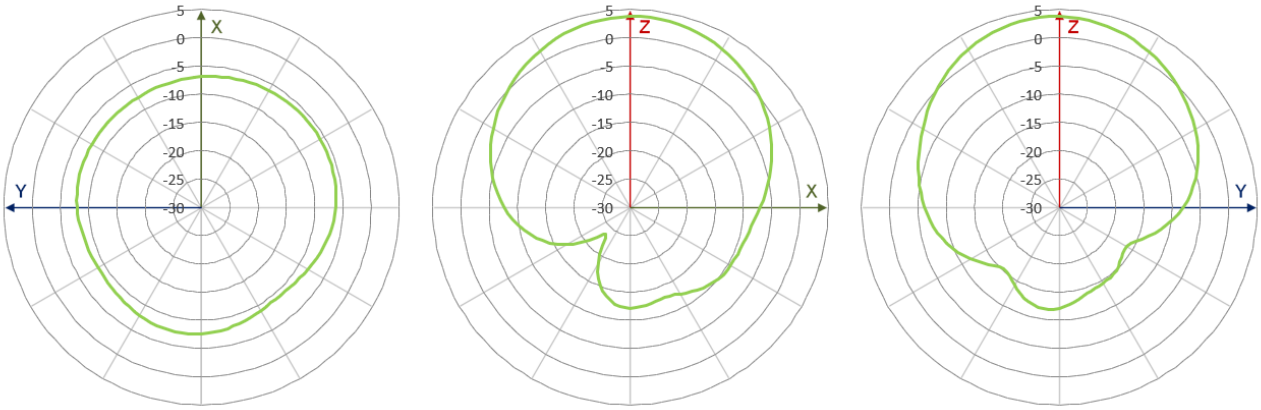
XY Plane	XZ Plane	YZ Plane



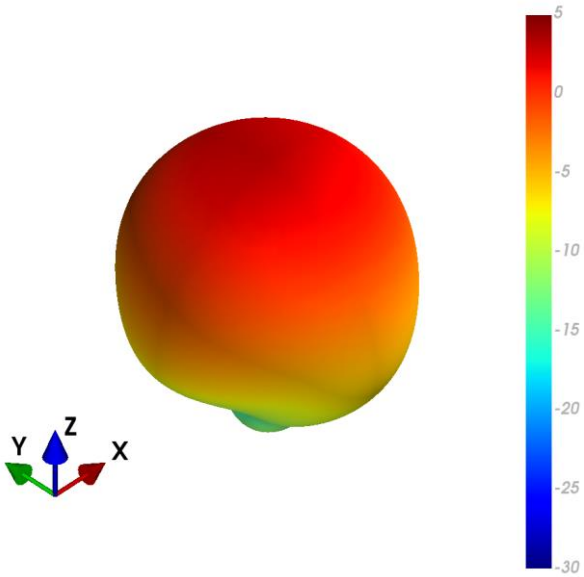
1227MHz



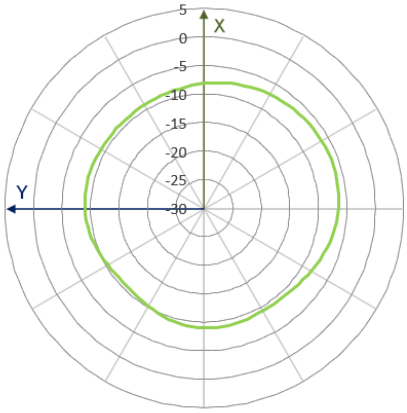
XY Plane	XZ Plane	YZ Plane

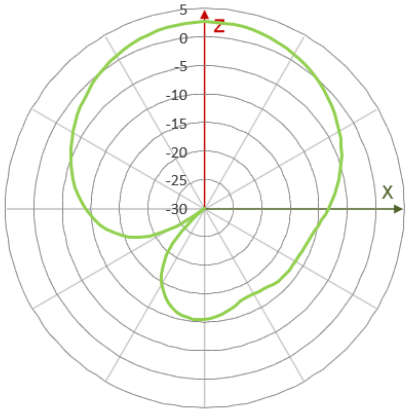


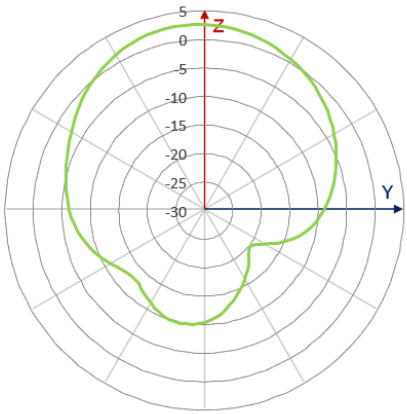
1248MHz



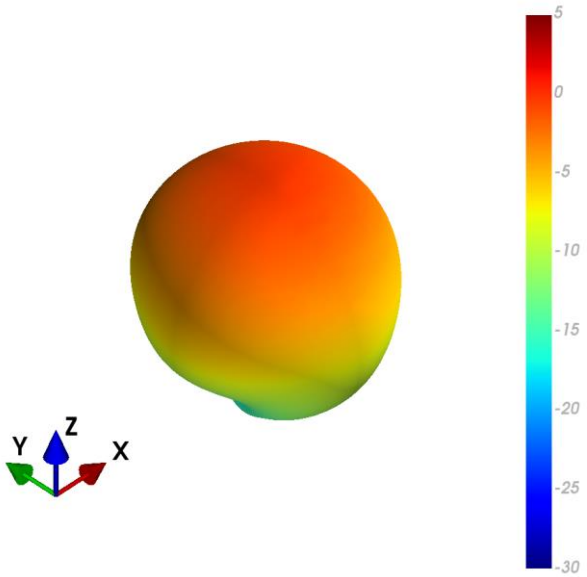
XY Plane	XZ Plane	YZ Plane



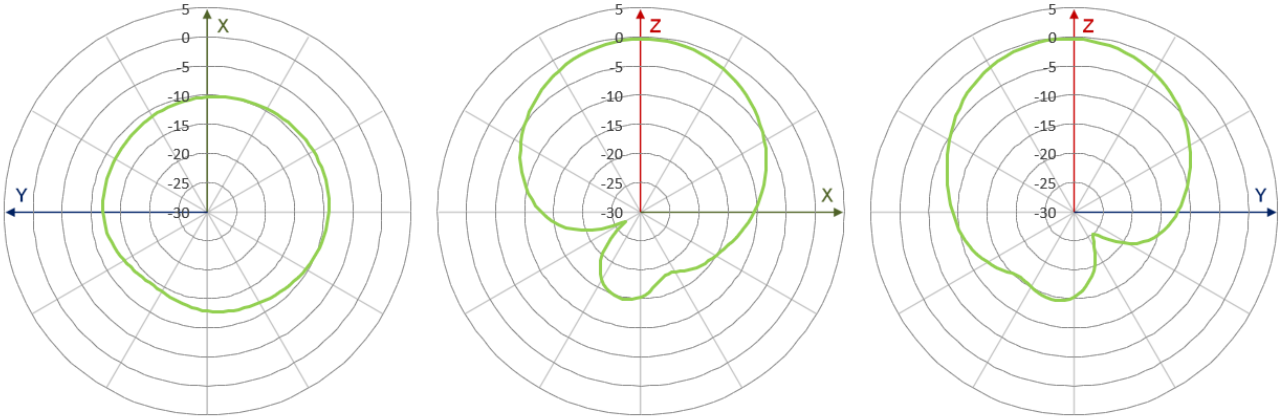




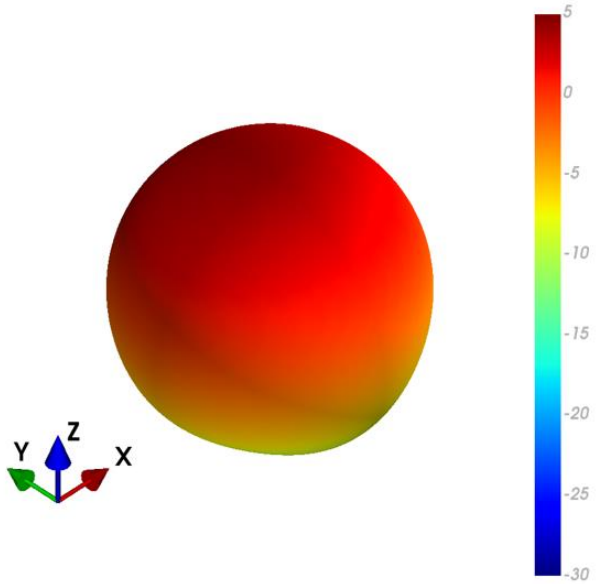
1278MHz

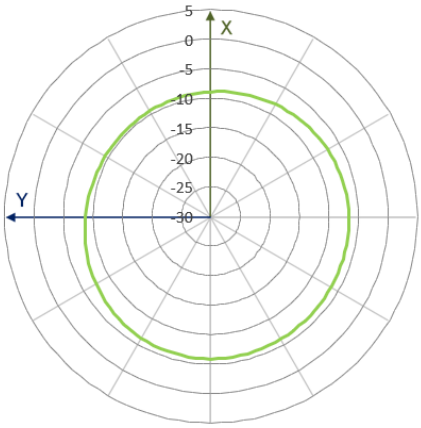
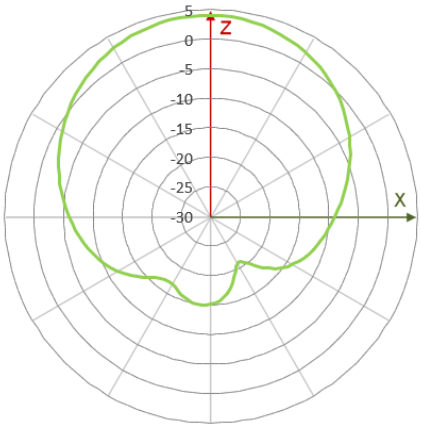
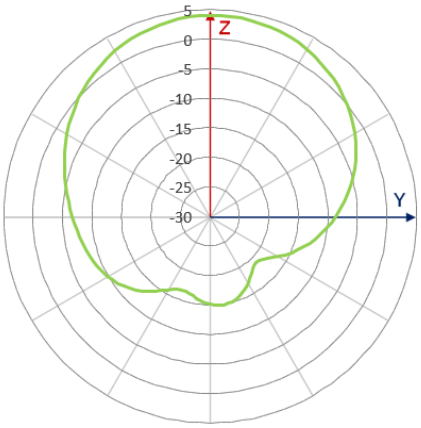


XY Plane	XZ Plane	YZ Plane

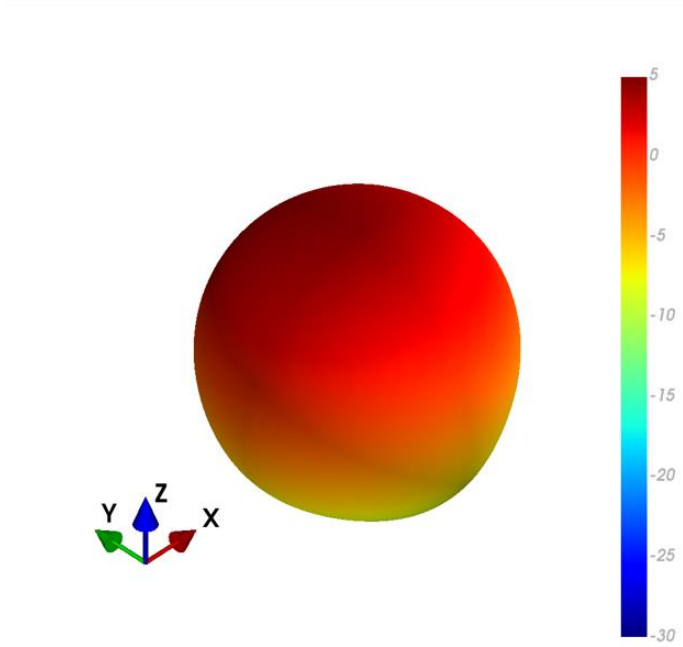


1561MHz

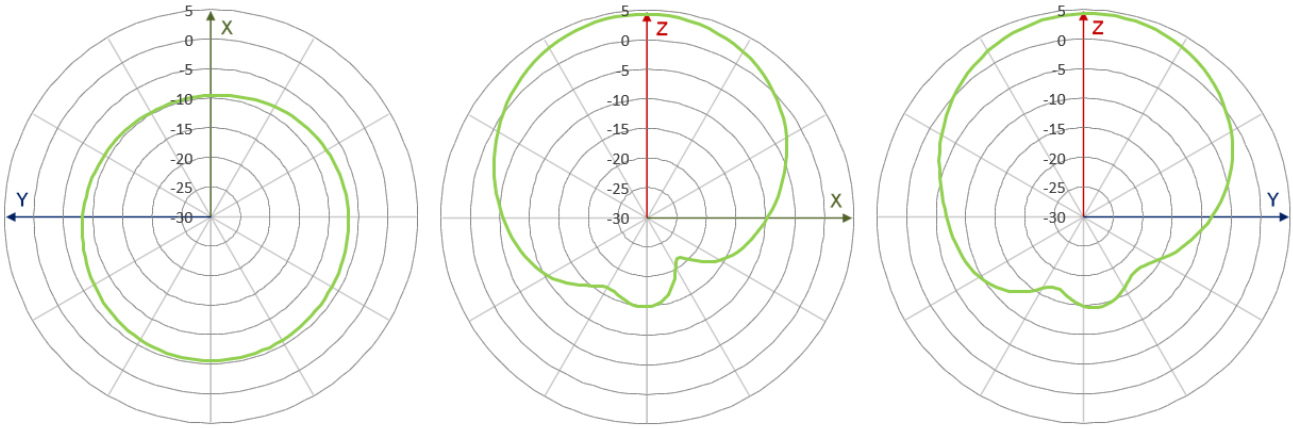


XY Plane	XZ Plane	YZ Plane
		

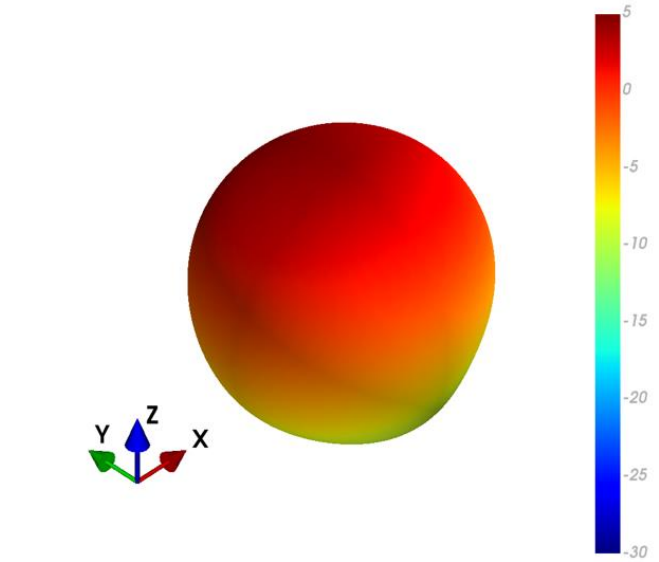
1575MHz



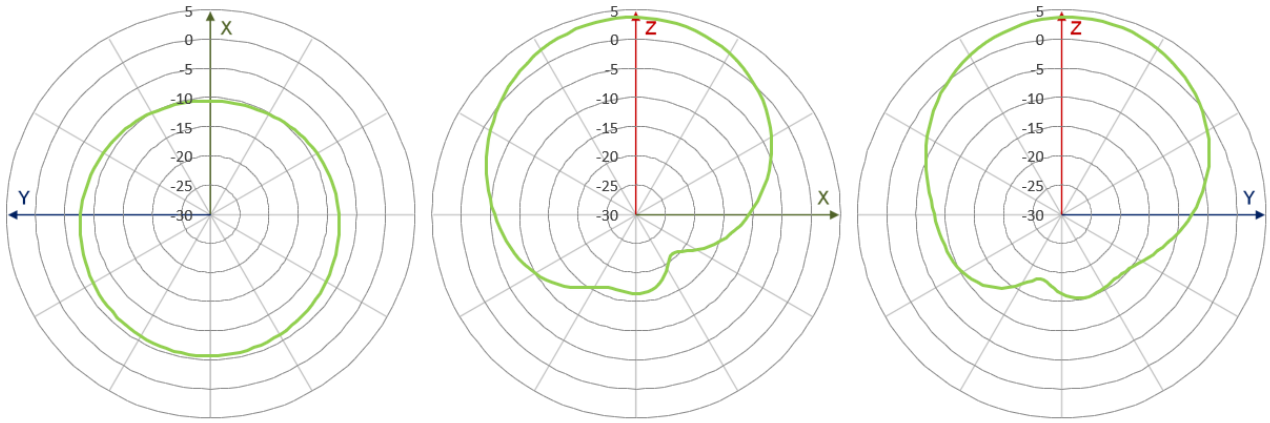
XY Plane	XZ Plane	YZ Plane



1602MHz

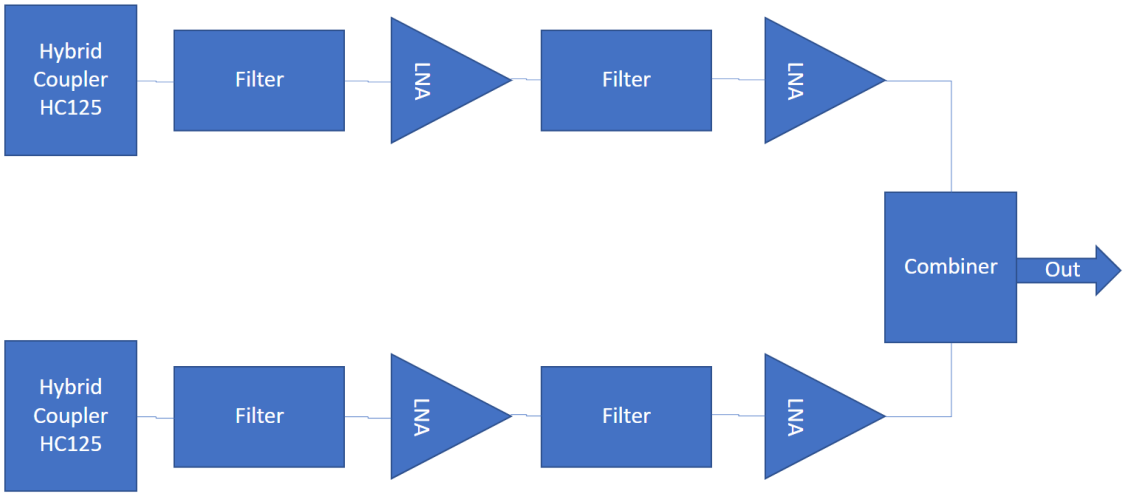


XY Plane	XZ Plane	YZ Plane

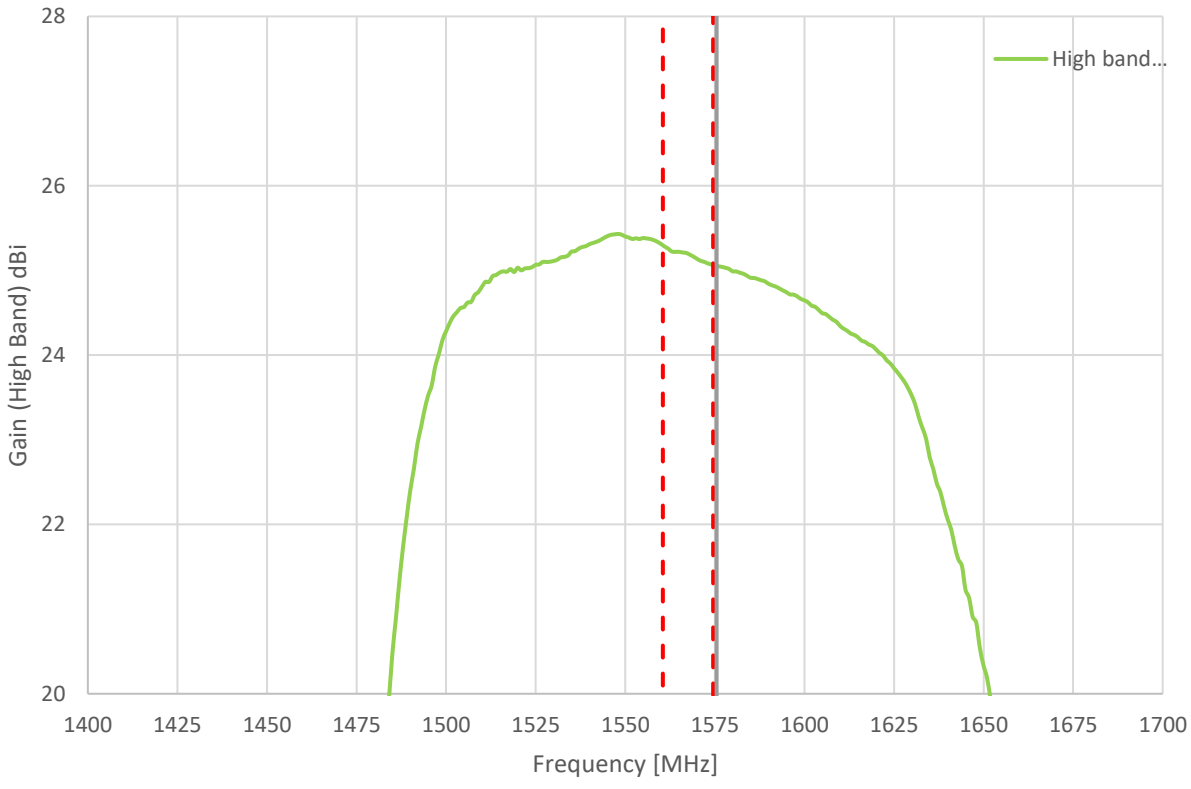


5. LNA Characteristics

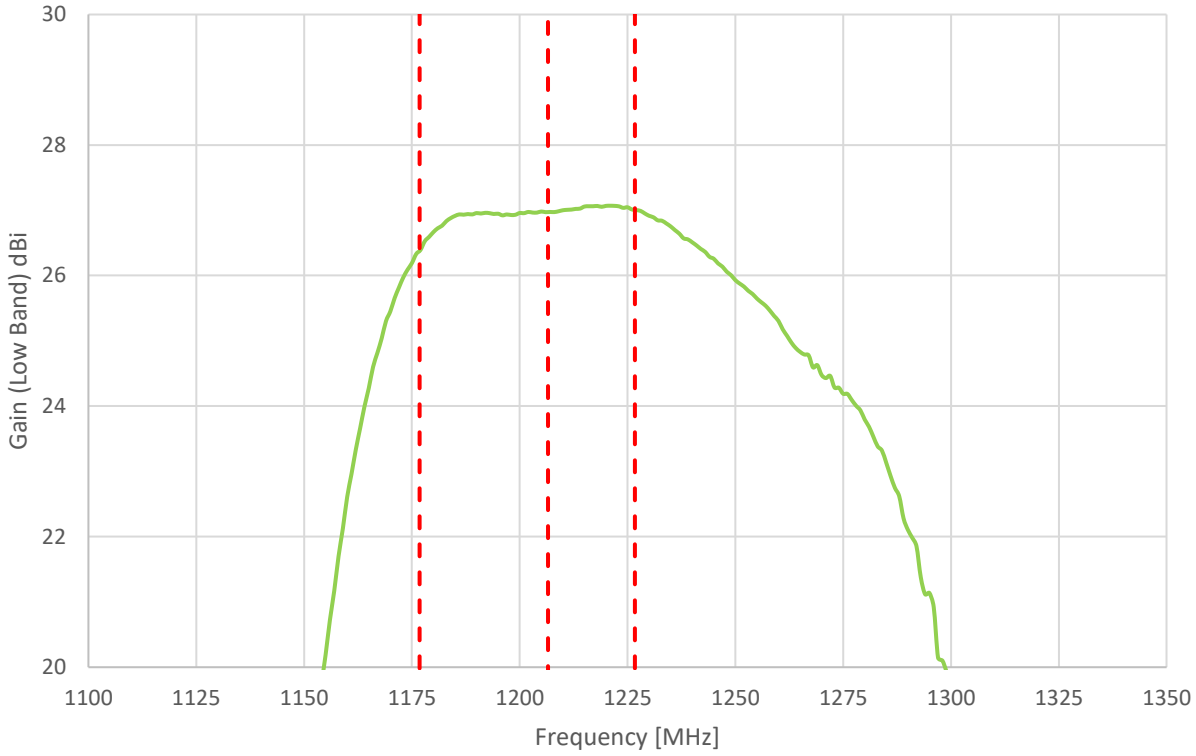
5.1 Block Diagram (Active Antenna)



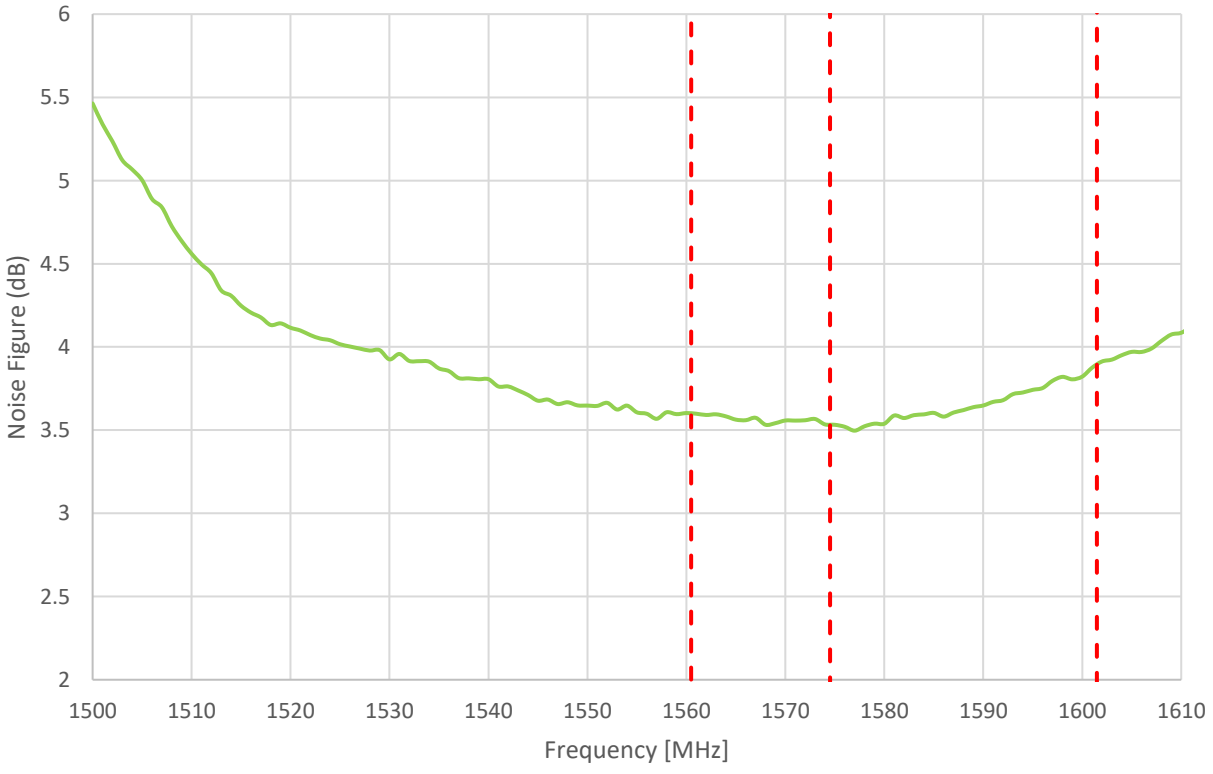
5.2 LNA Gain (High Band)



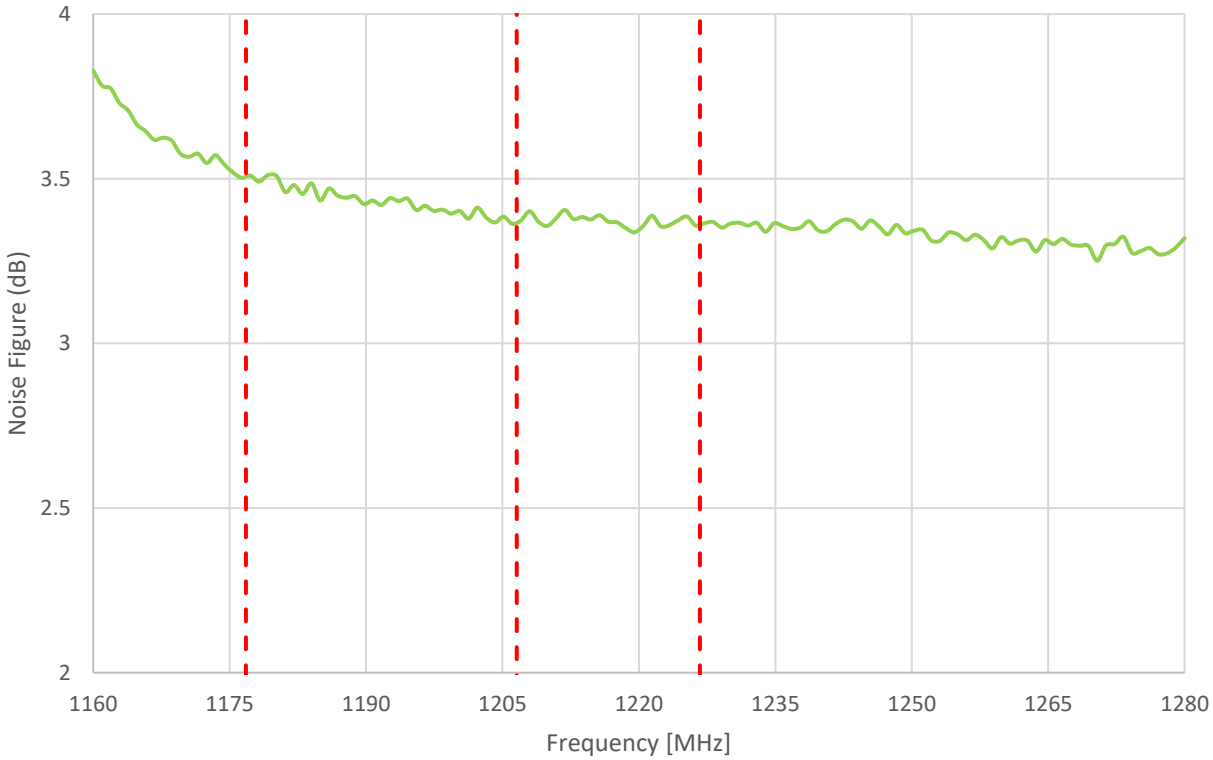
5.3 LNA Gain (Low Band)



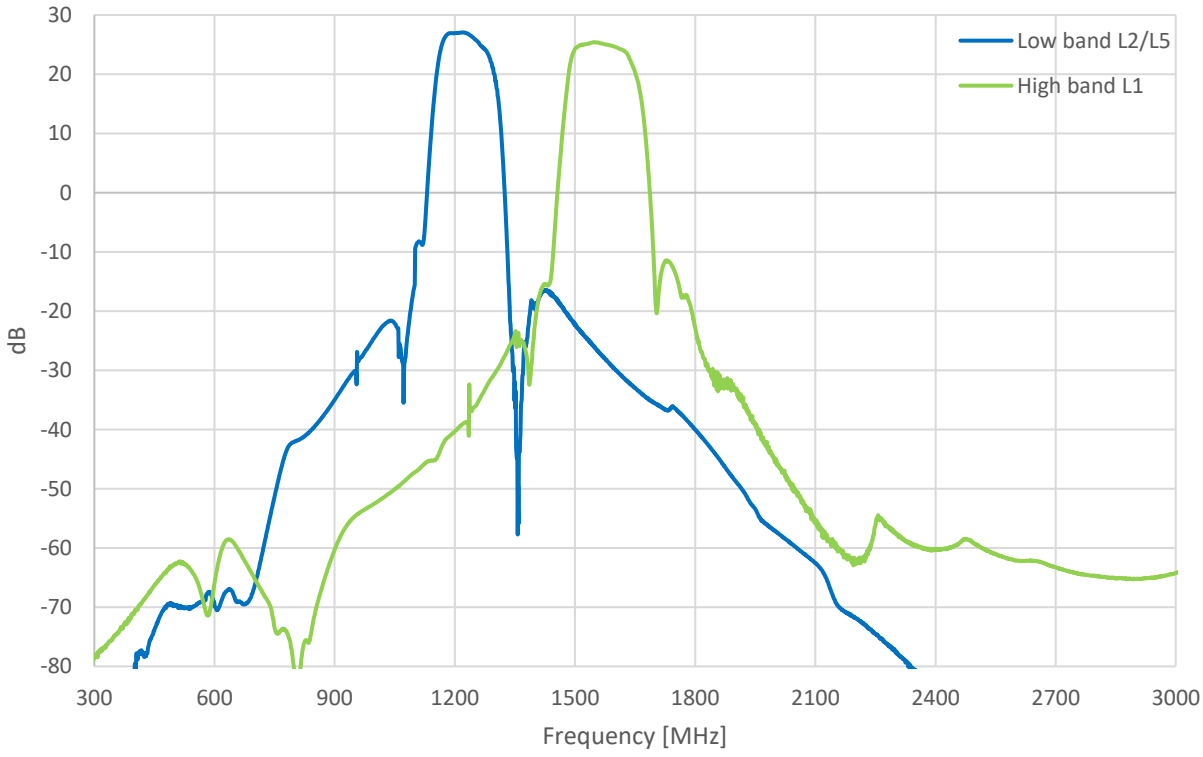
5.4 Noise Figure (High Band)



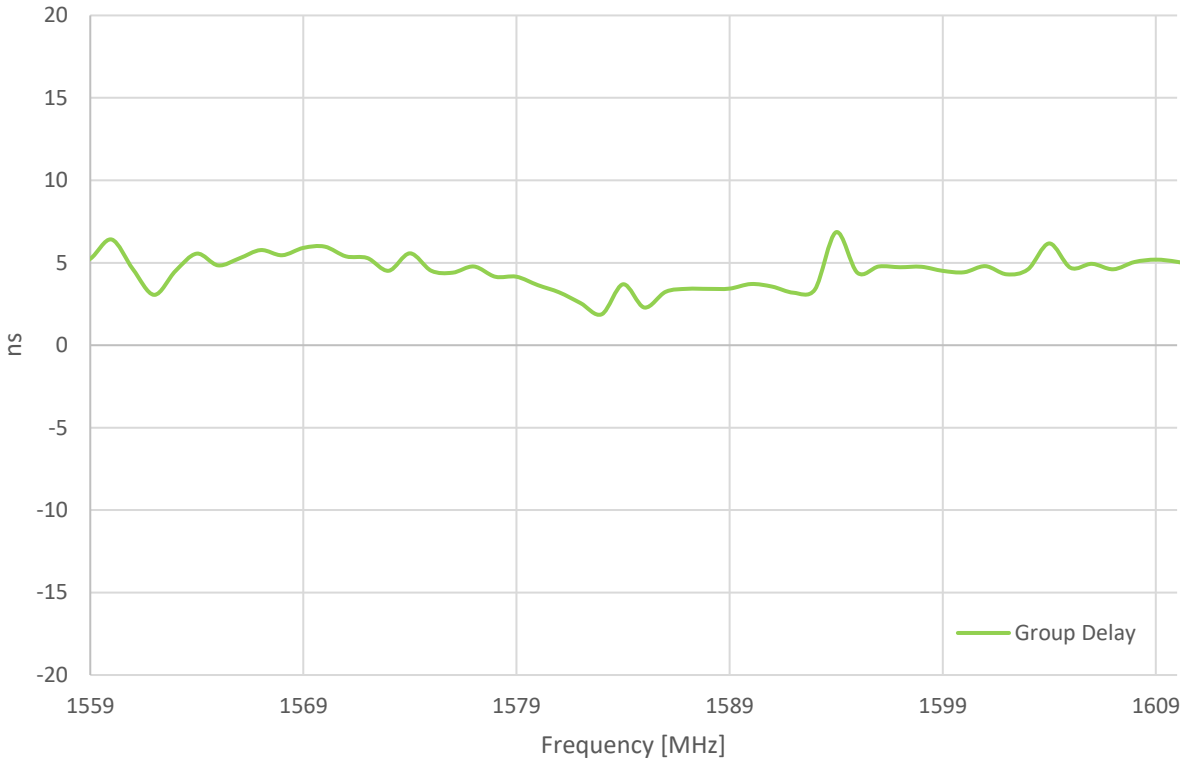
5.5 Noise Figure (Low Band)



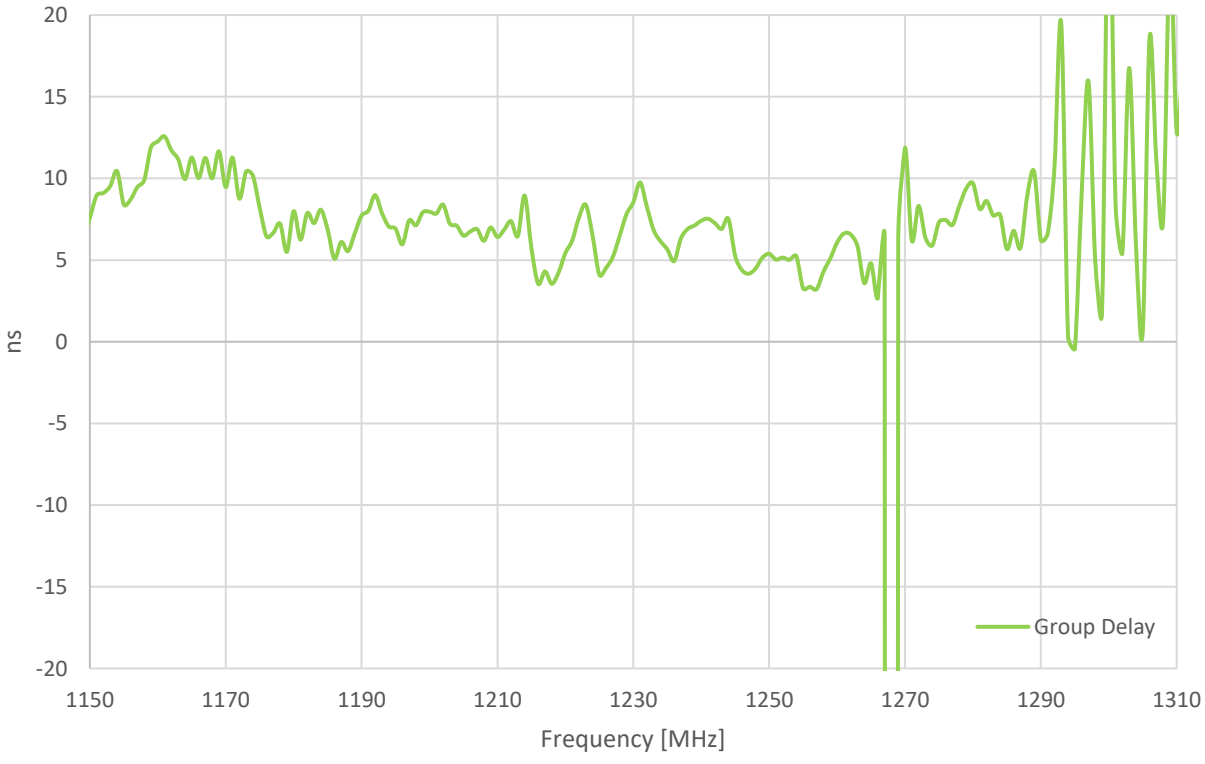
5.6 LNA Gain (Wide Band)



5.7 Group Delay (High Band)



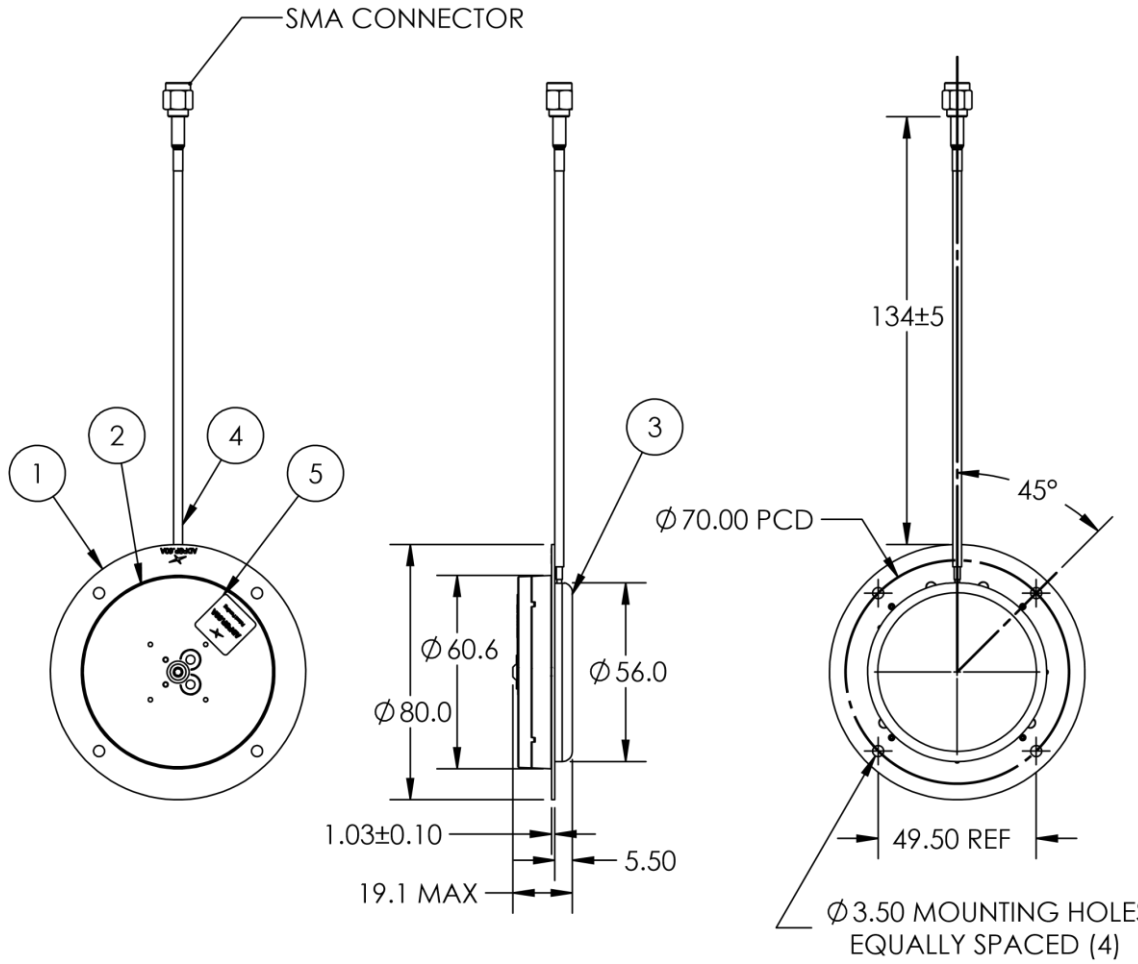
5.8 Group Delay (Low Band)



6. Mechanical Drawing (Units: mm)

ISO NO.: EDW-21-8-1471
STATE: Released
NOTES: 1. All material RoHS compliant.

REV	ZONE	DESCRIPTION	ENG	APPROVED	DATE
D01	All	Initial Release	G. Samson	I. Mendez	12/16/2021
D02	All	Active board artwork was updated	G. Samson	I. Mendez	12/27/2021
D03	All	Changed cable length dimension reference location.	G. Samson	I. Mendez	1/7/2022
D04	All	Updated PCB artwork. Added label and added sht 2 customer mounting detail	G. Samson	I. Mendez	9/21/2022

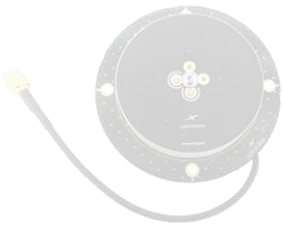


	Name	Material	Finish	QTY
1	PCB, Rigid, IT180A, 1 m Thk, 80 mm Dia.	FR4	NA	1
2	GNSS Dual Feed Stacked Antenna	NA	NA	1
3	Shield, Round, 56.1 mm Diameter	Steel	Tin	1
4	Cable Assy, ADFGP6010A, RG-174 150 mm Lg SMA (M)	NA	NA	1
5	Label, Product Part Number, ADFGP.60A	PET	NA	1

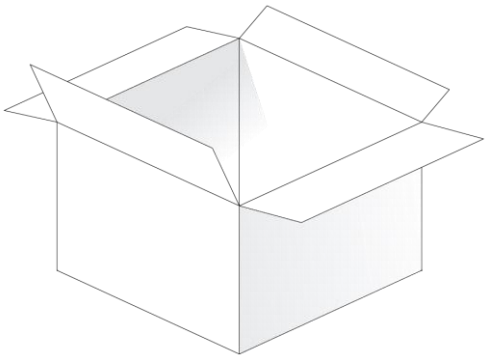
APPROVED BY: P. Frank	TAOGLAS. TW Design Centre
CHECK BY: I. Mendez	This drawing and its inherent design concepts are property of Taoglas. Not to be copied or given to third parties without the written consent of Taoglas.
DRAWN BY: G. Samson	TITLE : Active All Band GNSS High Precision Antenna
DATE: 12/16/2021	PART NO. : ADFGP.60A.01.0150D
UNLESS OTHERWISE SPECIFIED TOLERANCES ON: XX.±0.5 X.±0.3 .X±0.2 .XX±0.1 .XXX±0.05	UNIT: mm / SCALE: 1:5 / PAGES: 1/1 / REV: D04
THIRD ANGLE PROJECTION	

7. Packaging

1pcs ADFGP.60A.01.0150D per PE Bag
Weight: 73g



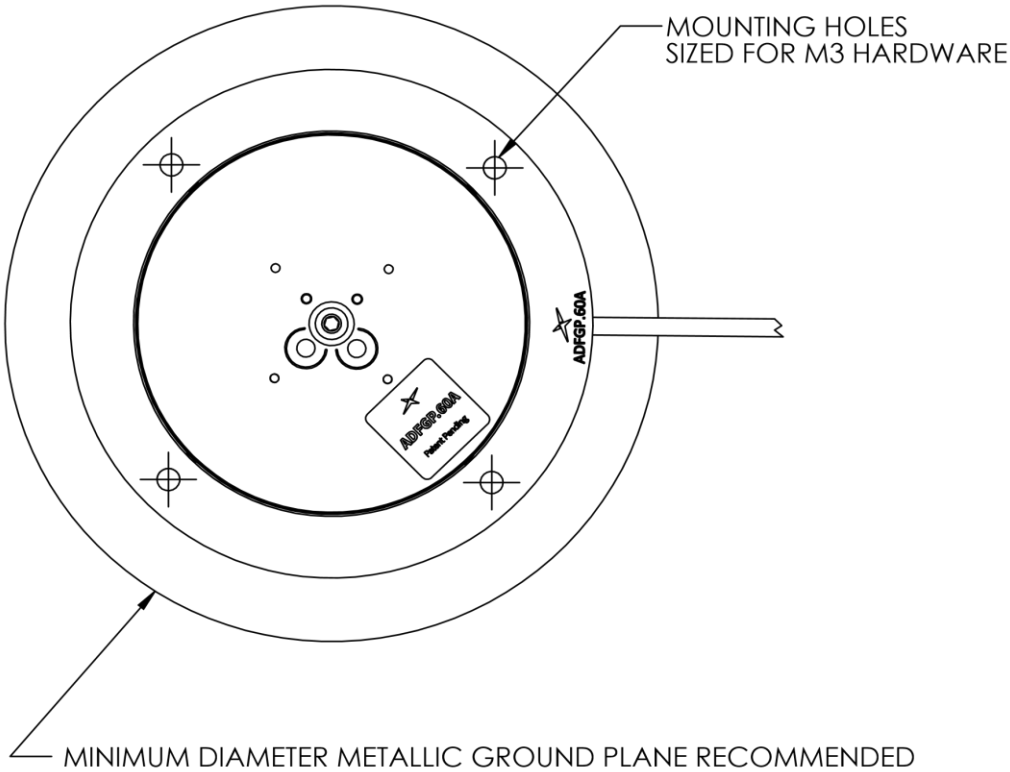
90pcs ADFGP.60A.01.0150D per Carton
Dimensions: 370*370*300 mm
Weight: 8Kg

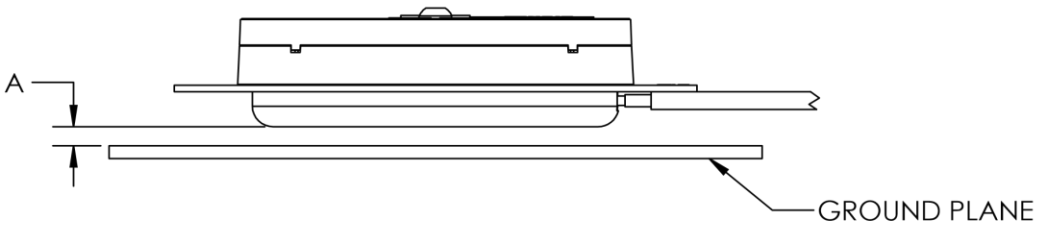


8. Installation Recommendation

ISO NO.: EDW-21-8-1471
STATE: Released

ANTENNA MOUNTING





ANTENNA MOUNTING RECOMMENDATIONS			
GROUND PLANE MATERIAL	DIMENSION "A" (millimeters)		MOUNTING HARDWARE
	MIN	MAX	
METALLIC	0.5	20	CONDUCTIVE FASTENERS/SPACERS
METALLIC	0.5	3	NON-CONDUCTIVE FASTENERS/SPACERS

APPROVED BY: P. Frank	TAOGLAS. TW Design Centre This drawing and its inherent design concepts are property of Taoglas. Not to be copied or given to third parties without the written consent of Taoglas.				
CHECK BY: I. Mendez					
DRAWN BY: G. Samson					
DATE: 12/16/2021	TITLE : Active All Band GNSS High Precision Antenna				
UNLESS OTHERWISE SPECIFIED TOLERANCES ON: XX.±0.5 X.±0.3 .X±0.2 .XX±0.1 .XXX±0.05	PART NO. : ADFGP.60A.01.0150D				
THIRD ANGLE PROJECTION	UNIT: mm	SCALE: 1:5	PAGES: 2/2	REV. D04	

Changelog for the datasheet

SPE-22-8-143 – ADFGP.60A.01.0150D

Revision: D (Current Version)	
Date:	2024-05-03
Changes:	Updated GNSS Bands Table
Changes Made by:	Cesar Sousa

Previous Revisions

Revision: C	
Date:	2023-02-22
Changes:	Updated GNSS Bands & Constellations Graphics
Changes Made by:	Cesar Sousa

Revision: B	
Date:	2022-10-06
Changes:	Updated electrical specifications
Changes Made by:	Cesar Sousa

Revision: A (Initial Release)	
Date:	2022-09-09
Changes:	Initial Release
Changes Made by:	Gary West

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