TAOGLAS®

Datasheet

Part No:
ADFGP.55A.07.0100C

Description

GPS L1/L2/L5, GLONASS and BeiDou 4-Pin Dual Feed Active Antenna 100mm 1.37 IPEX MHFHT

Features:

Embedded Dual Patch, Dual Feed Active Antenna
Covering Bands:
- GPS/QZSS (L1/L2)
- GPS/QZSS/IRNSS (L5)
- GLONASS (G1)
- BeiDou (B1/B2)

Low Axial Ratio
Low Noise Figure
Cable: 100mm of 1. 37mm
Connector: IPEX MHFHT
Dimensions: 50 x 50 x 17mm
RoHS & Reach Compliant

1. Introduction

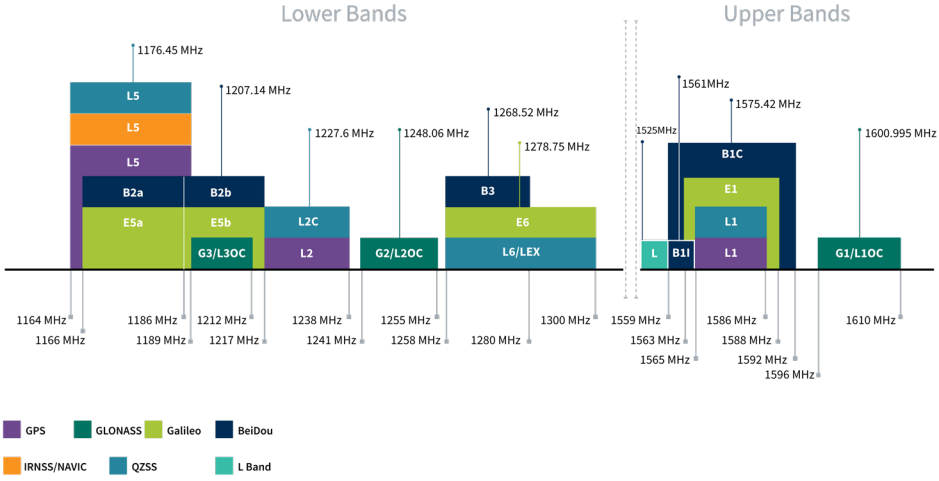
The ADFGP.55A, with Taoglas Sure Technology, is a precision-engineered active dual patch, dual-feed antenna for GPS (L1/L2/L5), GLONASS (G1), Galileo (E1/E5a) and BeiDou (B1/B2). The antenna comes mounted on a 50*50 mm PCB (ground plane). It consists of two stacked patches, 50mm, and 40mm in width and is 17mm thick. It has been tuned and tested on a 50*50mm ground plane specifically for GPS L1: 1575.42MHz, L2: 1227.6MHz and L5: 1176.45MHz as well as the GLONASS, Galileo, BeiDou and IRNSS bands shown in Section 2.

Each patch element uses two orthogonal feeds that are combined in a hybrid coupler to ensure optimal axial ratio. The antenna exhibits excellent gain and good radiation pattern stability leading to a reliable GNSS fix in areas of weaker signal strength. All these elements combined ensure the best possible positional accuracy for your device.

Both patch elements have a dual pin feed to ensure a low axial ratio and should be used in conjunction with a hybrid coupler. The ADFGP.55A includes the upgraded anti-noise capability, LNAs and front-end SAW filters to reduce out of band noise, such as from nearby cellular transceivers. It offers better protection from nearby radiated power surges and greatly reduces the probability of damaging your GNSS receiver from nearby transmissions.

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

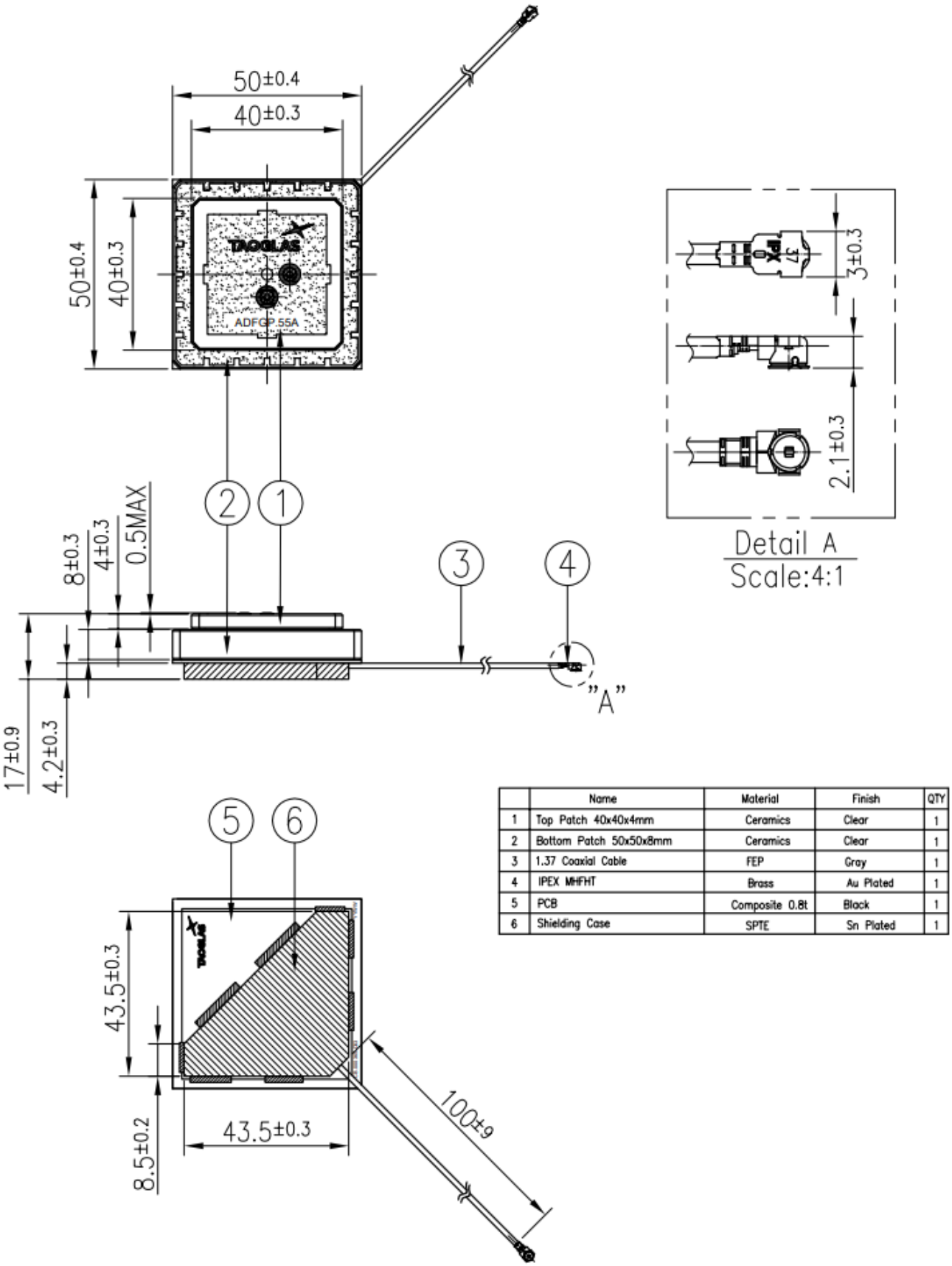
GNSS Electrical					
Frequency (MHz)	**1176.45**	**1227.6**	**1561**	**1575.42**	**1603**
VSWR (max.)	1.5:1				
Efficiency (%)	51.44	45.25	44.72	52.27	53.68
Peak Gain (dBi)	1.99	1.86	1.64	2.38	2.36
Average Gain (dB)	-2.89	-3.44	-3.49	-2.82	-2.70
Axial Ratio (dB)	3.1	1.5	1.53	1.3	0.8
PCO_x (cm)	-0.48	-0.3	-0.47	-0.48	-0.5
PCO_y (cm)	1.88	2.13	1.36	1.54	2.03
PCV (cm)	0.006	0.072	0.005	0.006	0.006
Polarization	RHCP				
Impedance	50 Ω				
***Tested on ø120mm ground plane**					

LNA and Filter Electrical Properties					
Frequency (MHz)	**1176.45**	**1227.6**	**1561**	**1575.42**	**1603**
Gain (dB)	29.68	29.49	28.60	27.50	27.00
Noise Figure (dB)	1.21	1.18	1.26	1.21	1.25
Group Delay (ns)	28.25	24.20	36.25	25.83	30.09
Out Of Band Rejection (dB)	> 75dB @ 600-1000 MHz; > 65dB @ 1700-6000 MHz				
ESD Protection (IEC61000-4-2)	Contact: ±20kV, Air: ±25kV discharge				
Current Consumption (mA)	18				
Input Voltage (V)	+ 1.8 to 5.5				

Mechanical	
Dimensions	50 x 50 x 17mm
Housing Material	Ceramic
Weight	97.5g
Connector	IPEX MHFHT
Cable	Coaxial Cable ø1.37: Length 100mm

Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Relative Humidity	Non-condensing 65°C 95% RH

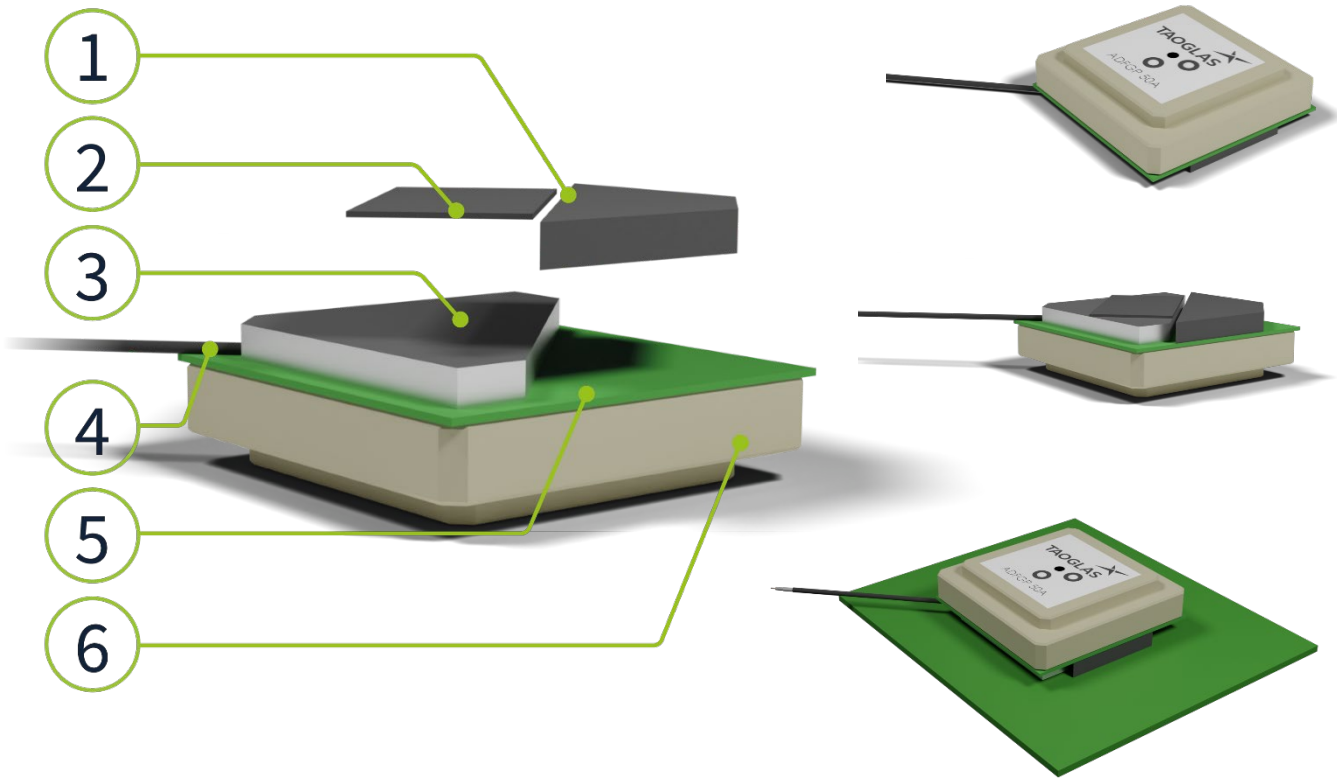
3. Mechanical Drawing



	Name	Material	Finish	QTY
1	Top Patch 40x40x4mm	Ceramics	Clear	1
2	Bottom Patch 50x50x8mm	Ceramics	Clear	1
3	1.37 Coaxial Cable	FEP	Gray	1
4	IPEX MHFHT	Brass	Au Plated	1
5	PCB	Composite 0.8t	Black	1
6	Shielding Case	SPTE	Sn Plated	1

4. Installation Suggestion

We do not supply our standard ADFGP.55A with adhesive backing however this can be requested via your regional Taoglas customer support team. The below details the optimum way to install the ADFGP.55A Antenna for use in conjunction with adhesive backing.

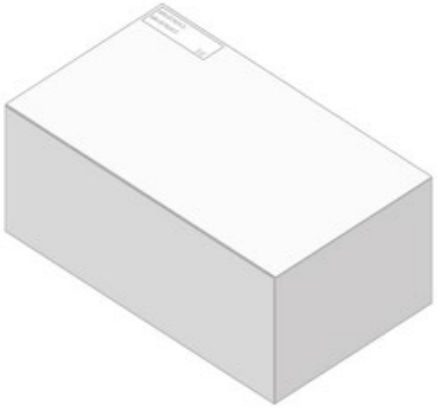


Item Number	Description	Material
1	Adhesive Mounting Pad for ADFGP.55A	Acrylic Foam
2	Small Adhesive Mounting Pad for ADFGP.55A	Acrylic Foam
3	Shielding Case	SPTE
4	1.37 Coaxial Cable	FEP
5	PCB	Composite 0.8†
6	Stacked Patch 40x40x4 mm & 50x50x8 mm	Ceramic

5. Packaging

ADFGP.55A.07.0100C
8 PCS / EPE foam board
24 PCS / Vacuum package
2 PCS / Desiccant 3g

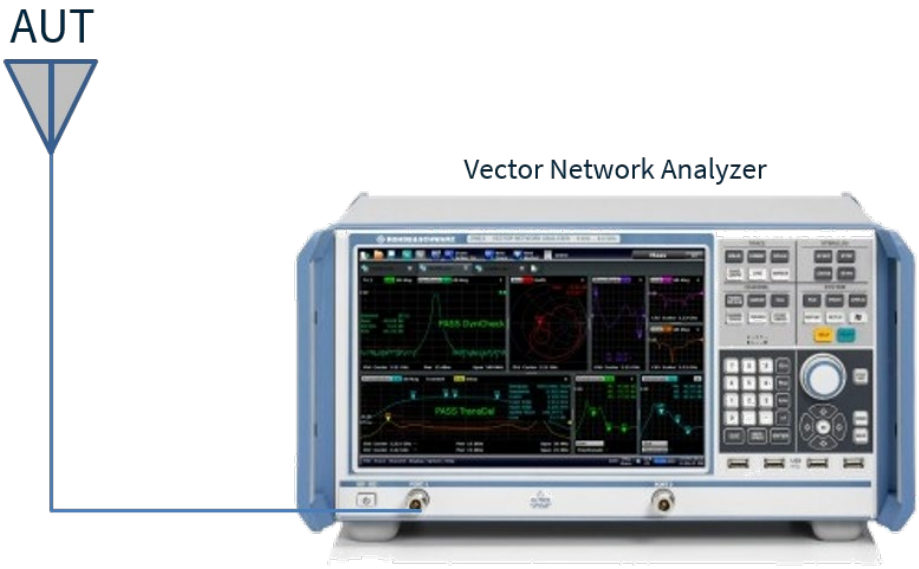
24 PCS / Box
Box (mm): 263 x 154 x 96
SPQ Label
Weight (Kg): 2.46 ±3%

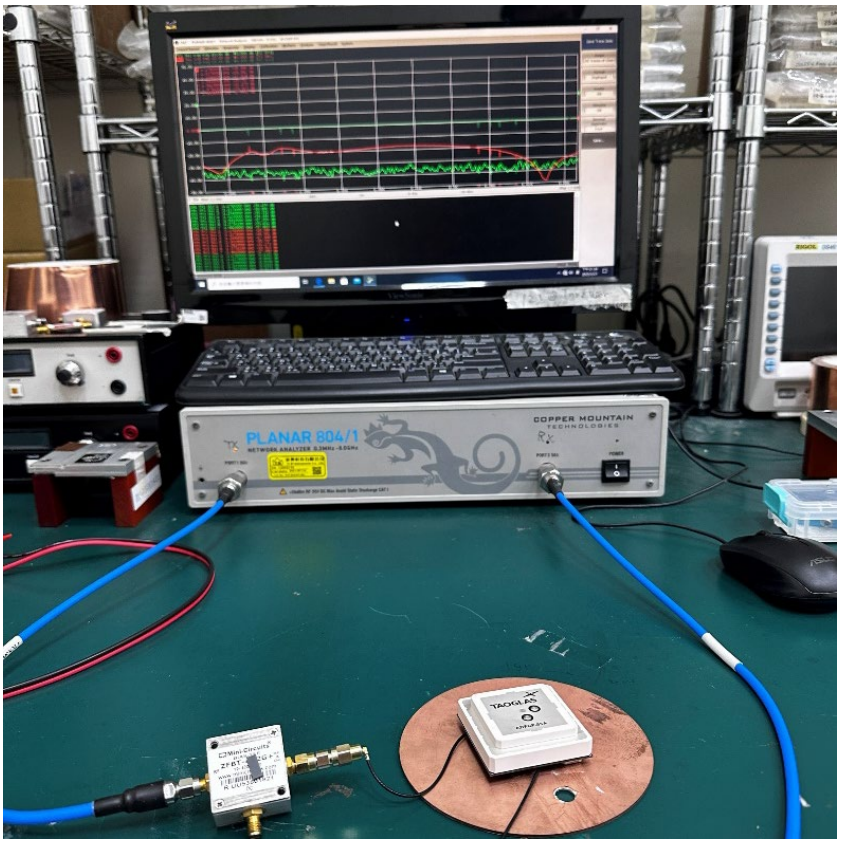


96 PCS / Carton
Carton(mm): 370 x 370 x 300
Carton Label
Weight (Kg): 10.8 ±3%

6. Antenna Characteristics

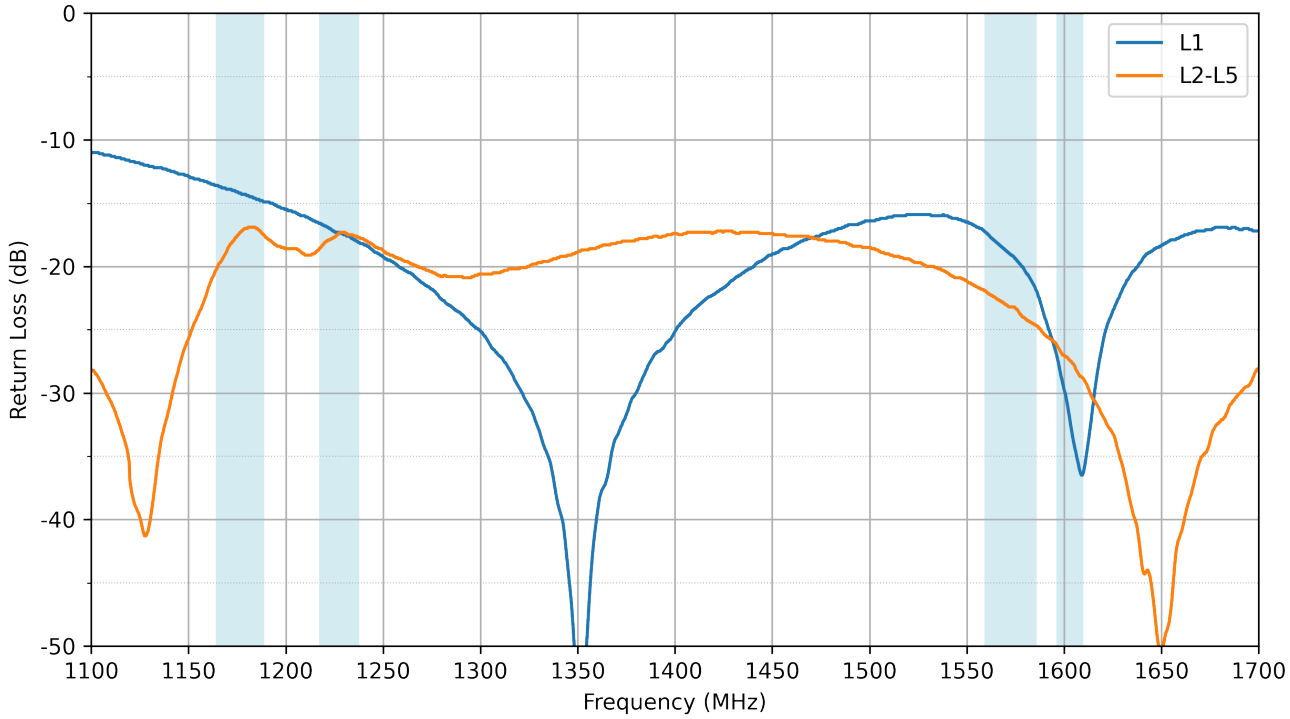
6.1 Test Setup



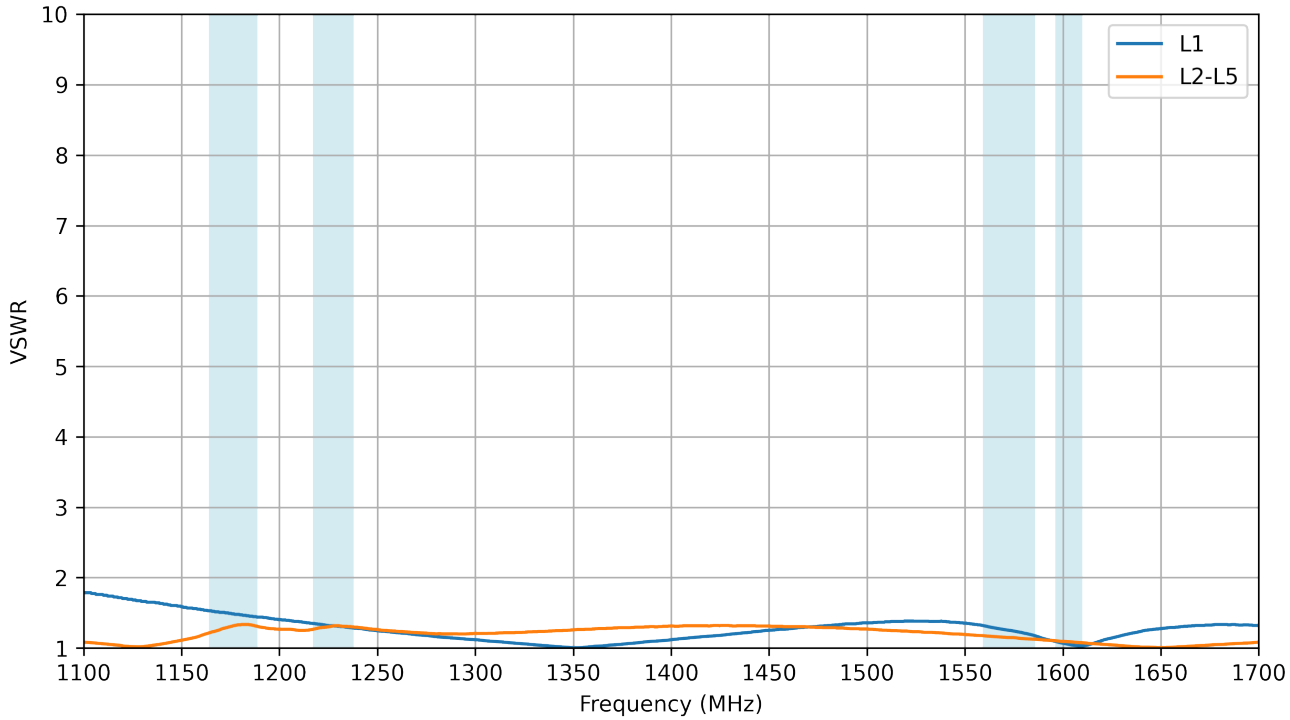


VNA Test Set-up

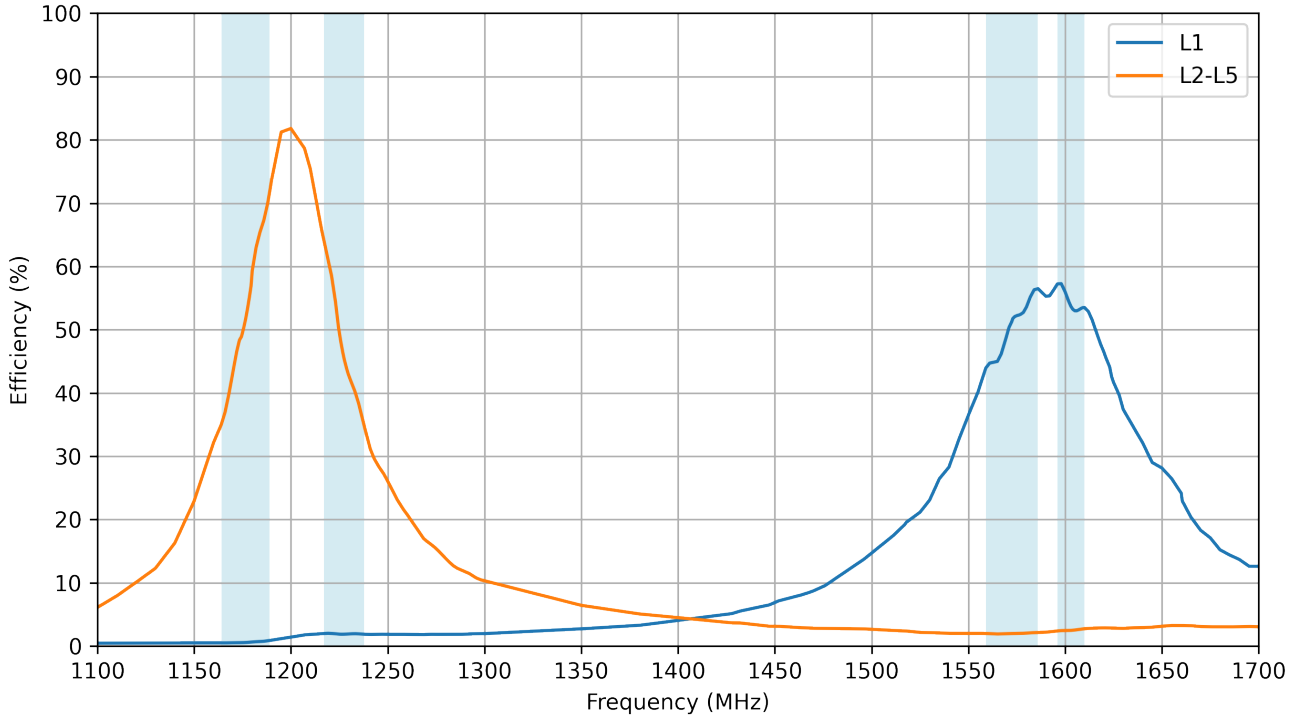
6.2 Return Loss



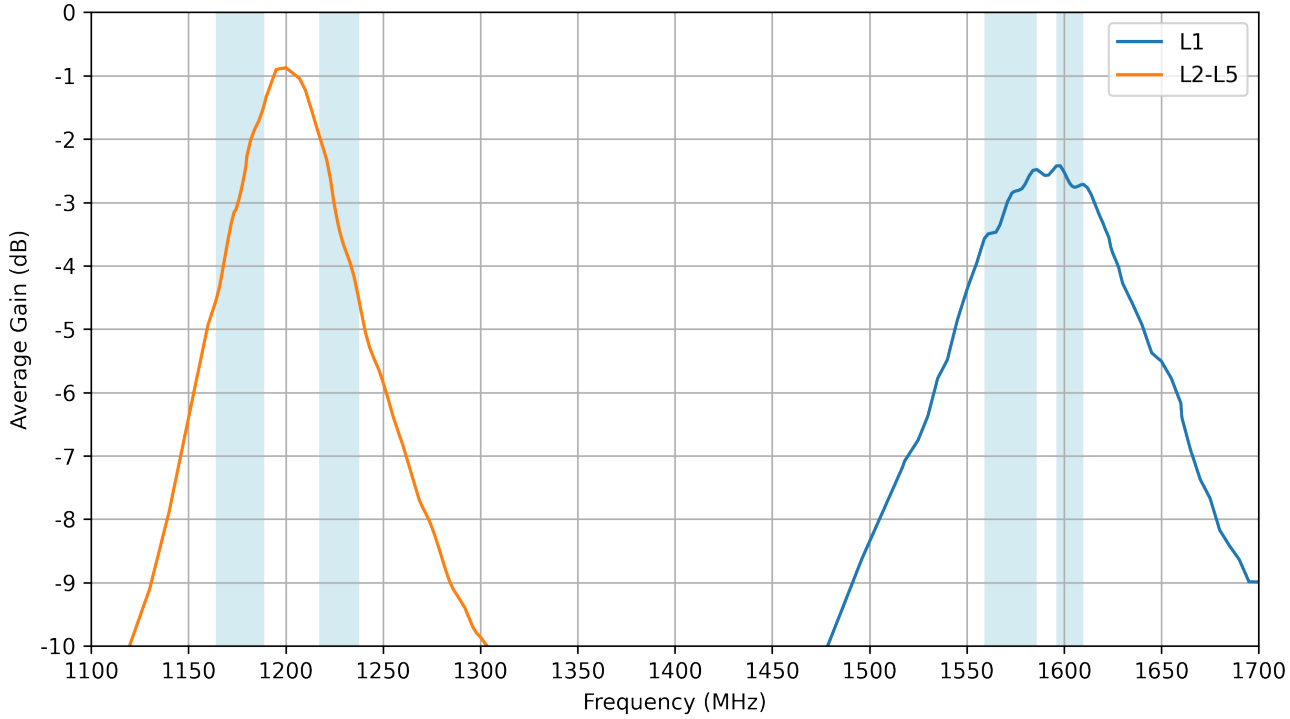
6.3 VSWR



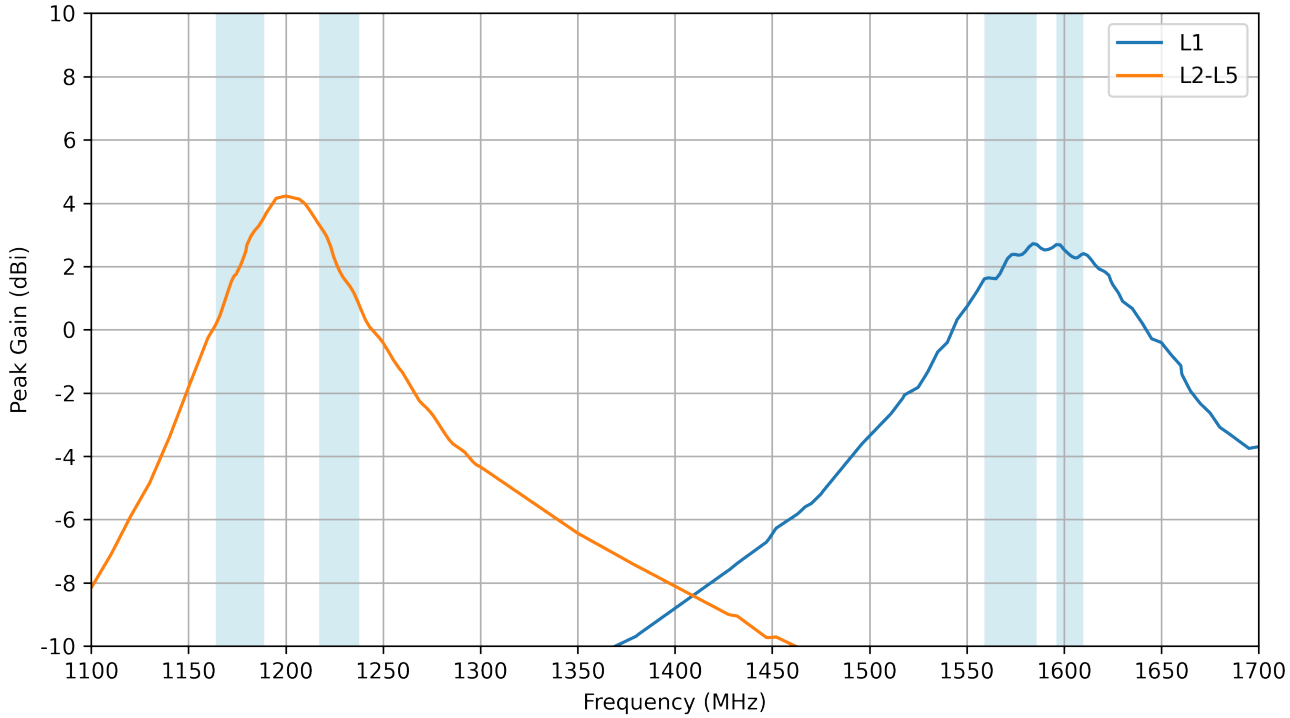
6.4 Efficiency



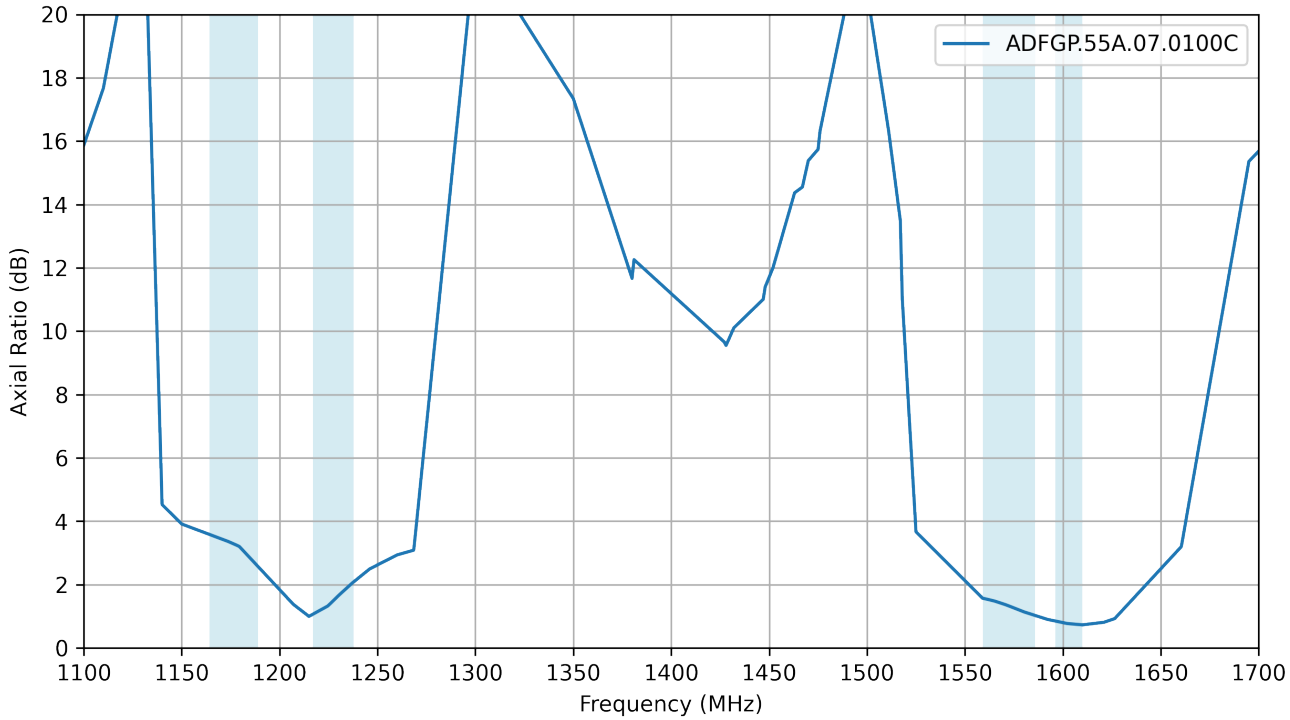
6.5 Average Gain



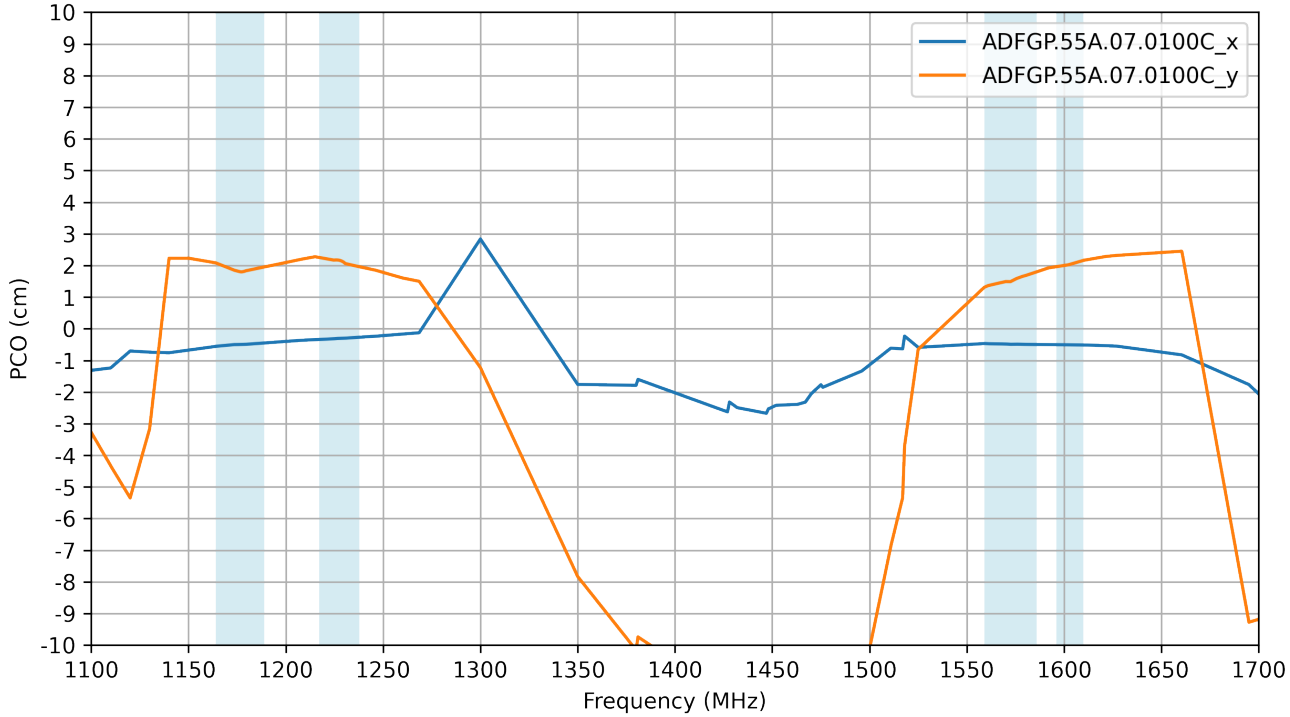
6.6 Peak Gain



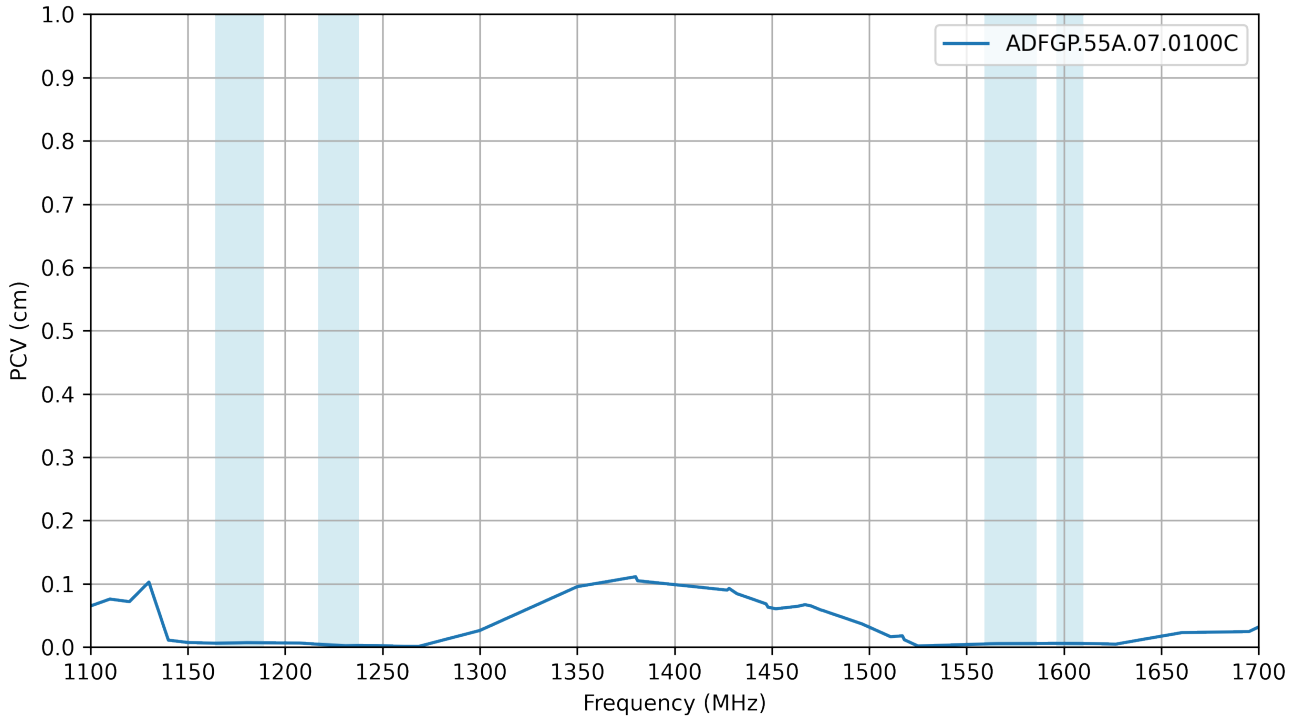
6.7 Axial Ratio



6.8 PCO

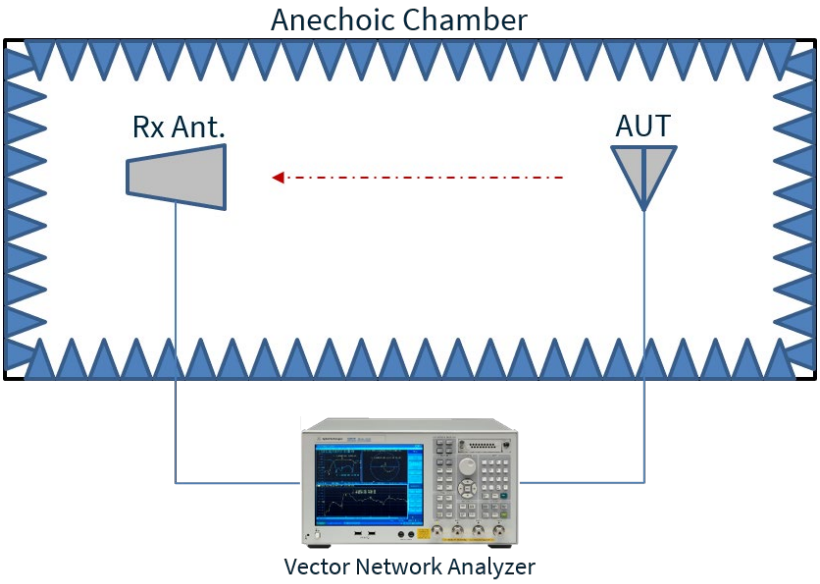

ADFGP.55A.07.0100C_x
ADFGP.55A.07.0100C_y
PCO (cm)
Frequency (MHz)

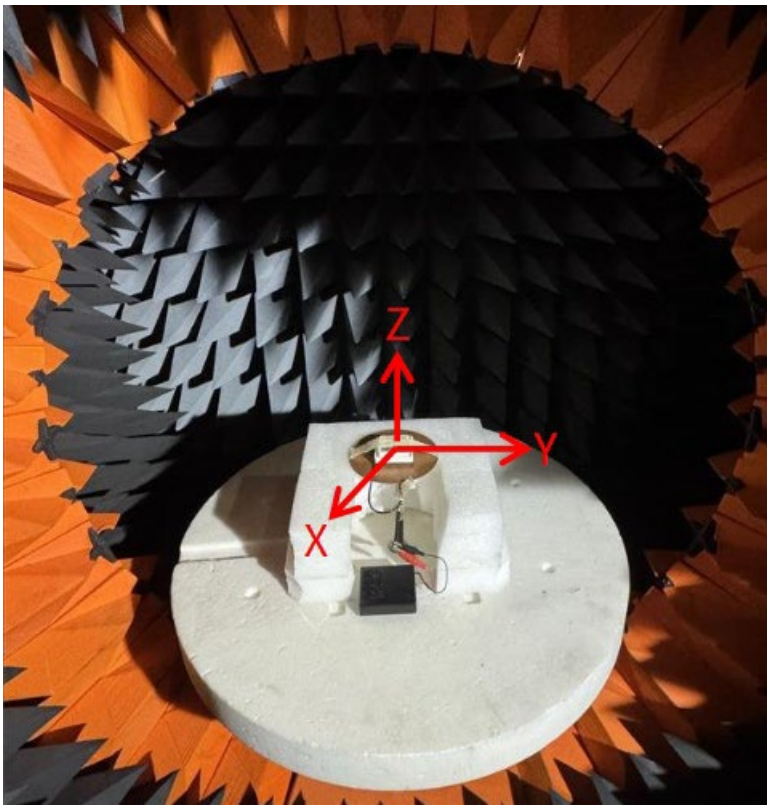
6.9 PCV


ADFGP.55A.07.0100C
PCV (cm)
Frequency (MHz)

7. Radiation Patterns

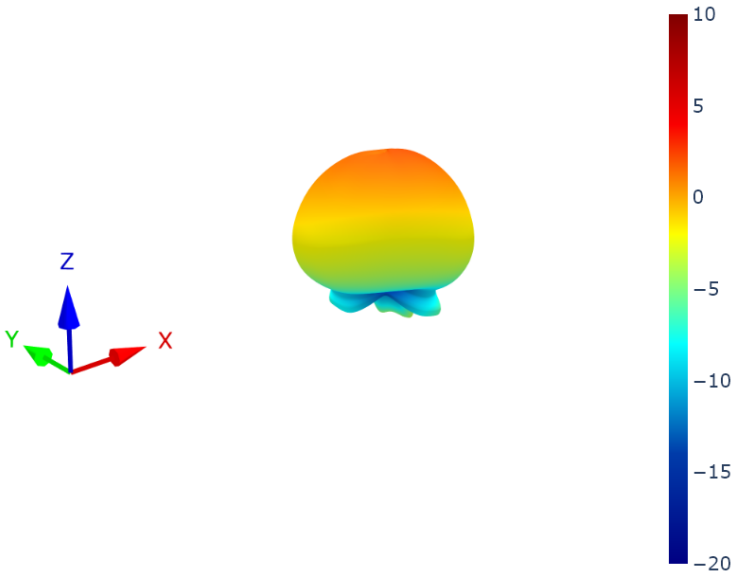
7.1 Test Setup



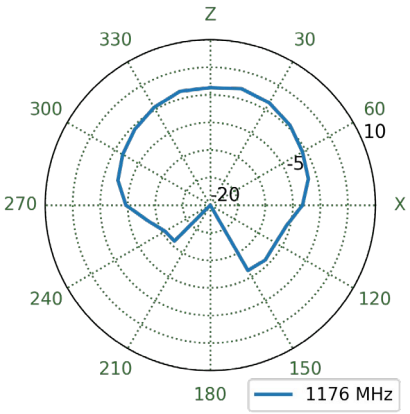


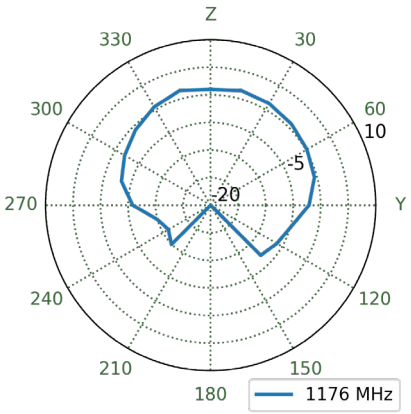
Chamber Test Set-up

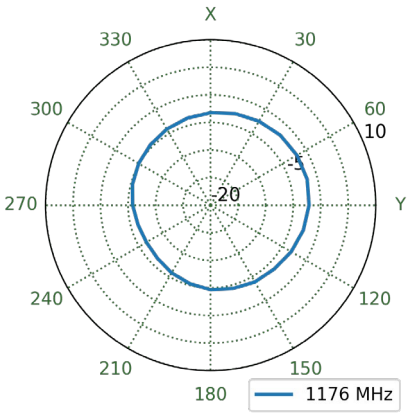
7.2 L2-L5 Patterns at 1176 MHz



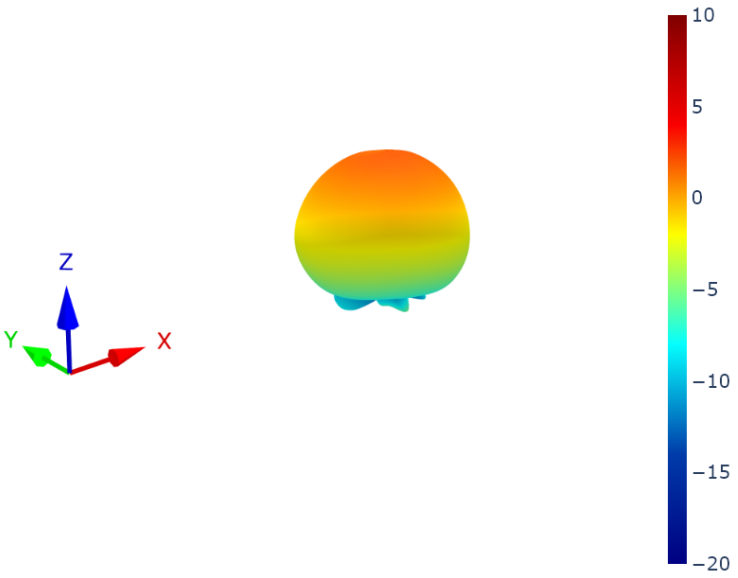
XZ Plane	YZ Plane	XY Plane



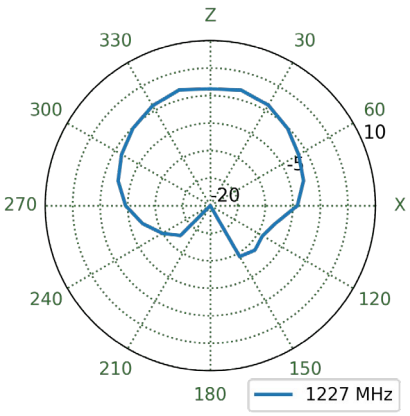


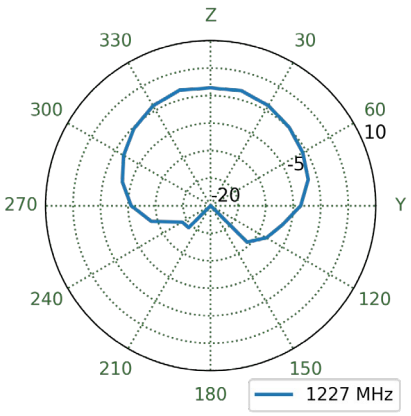


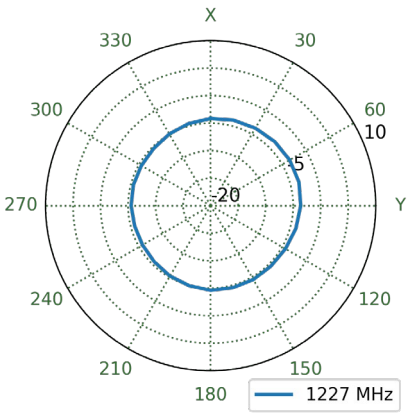
7.3 L2-L5 Patterns at 1227 MHz



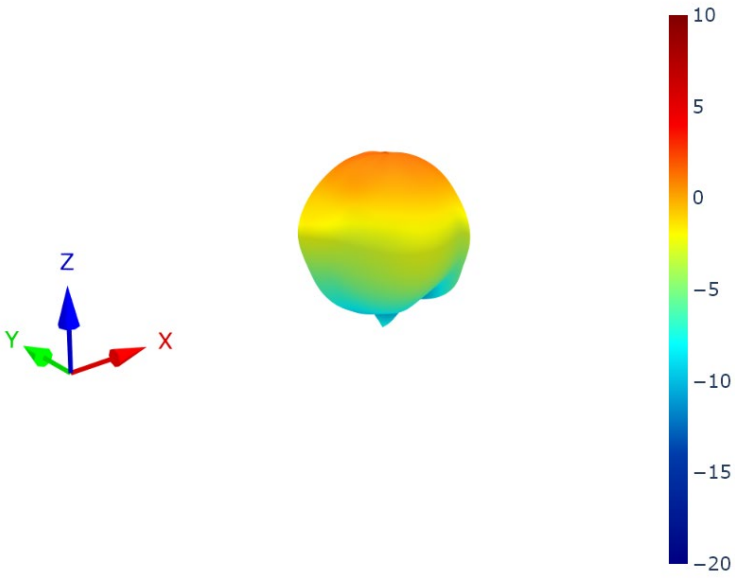
XZ Plane	YZ Plane	XY Plane

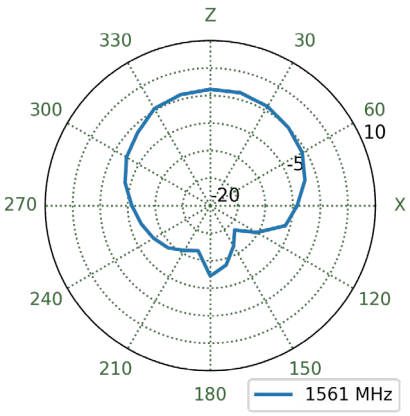
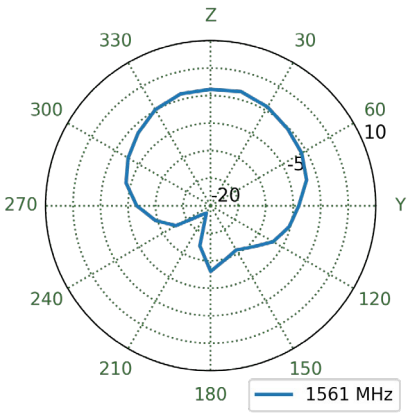
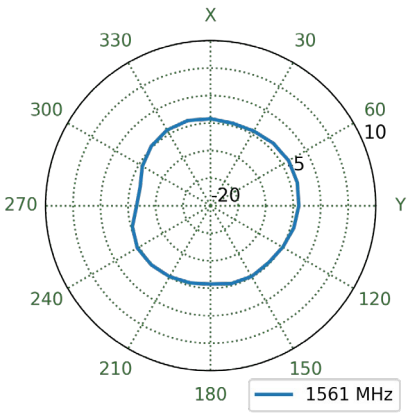




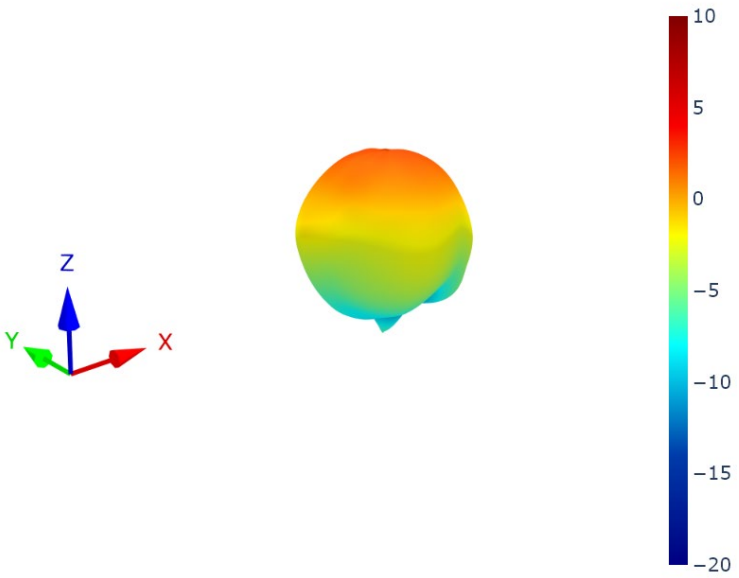


7.4 L1 Patterns at 1561 MHz

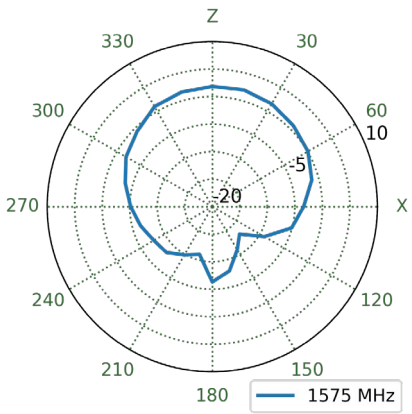


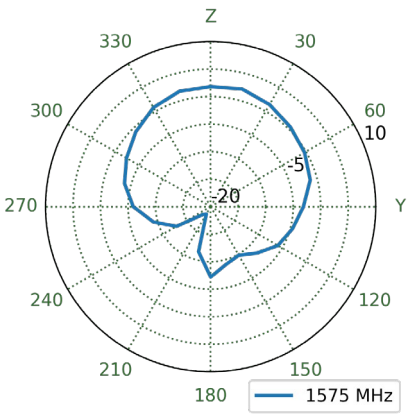
XZ Plane	YZ Plane	XY Plane
		

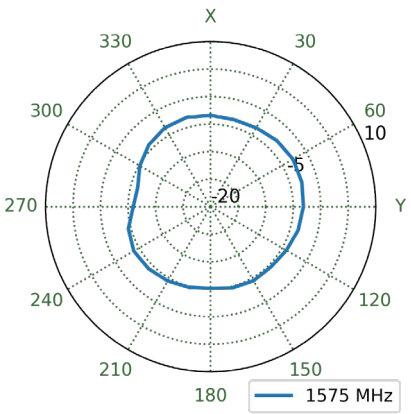
7.5 L1 Patterns at 1575 MHz



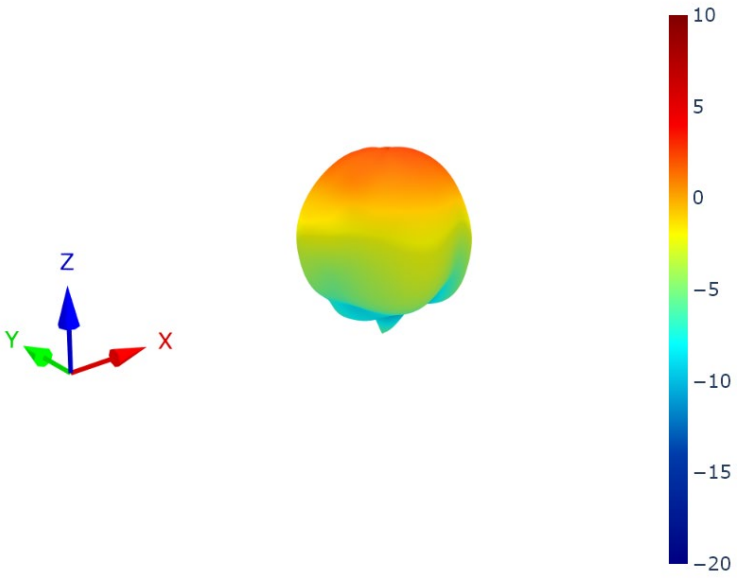
XZ Plane	YZ Plane	XY Plane



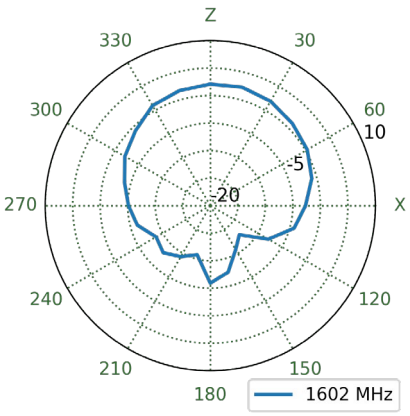


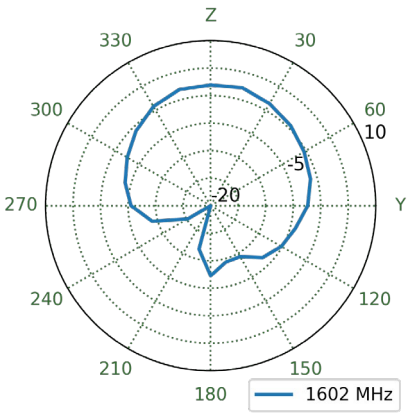


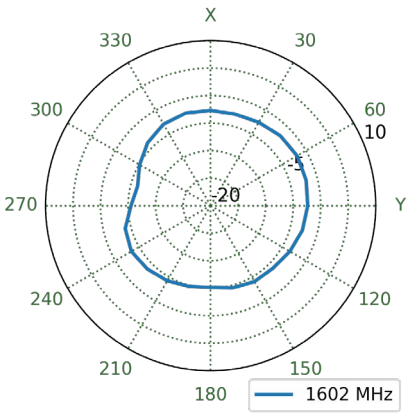
7.6 L1 Patterns at 1602 MHz



XZ Plane	YZ Plane	XY Plane

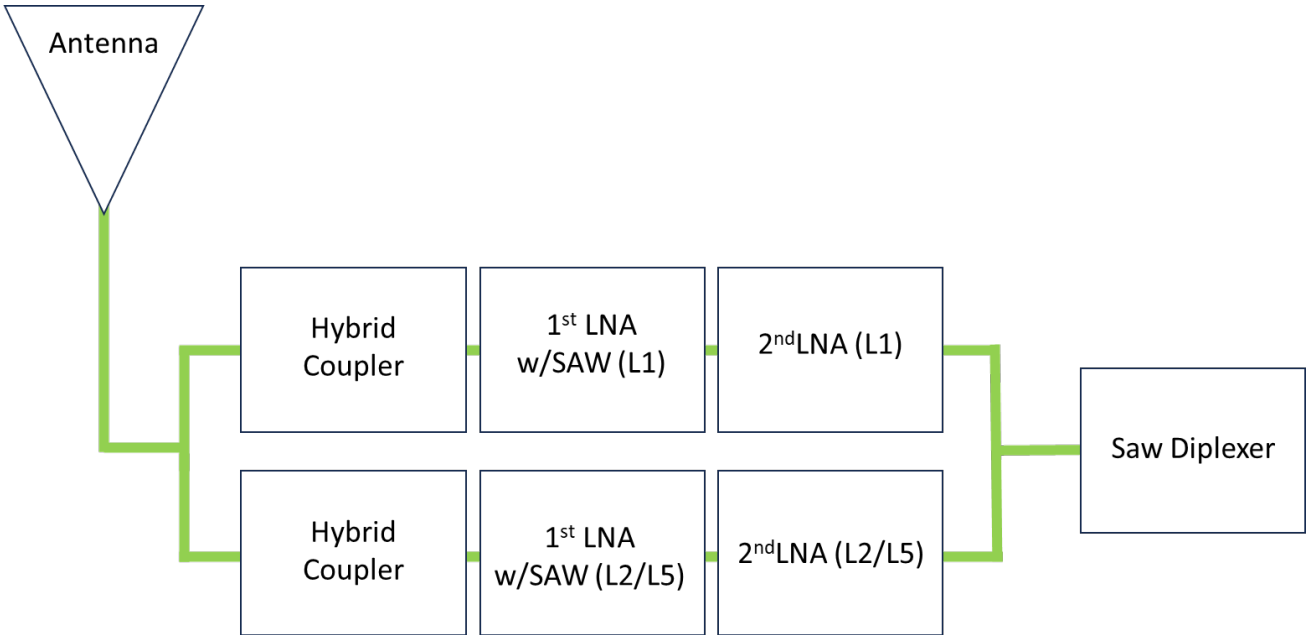




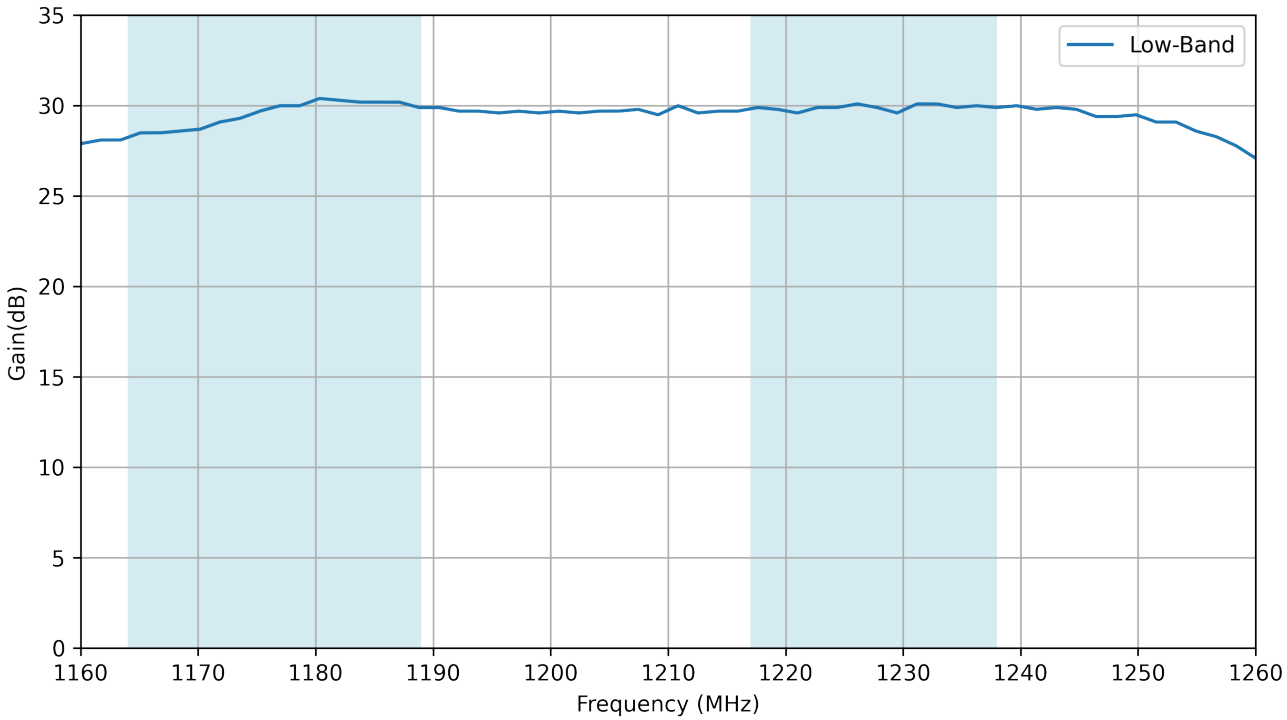


8. LNA Characteristics

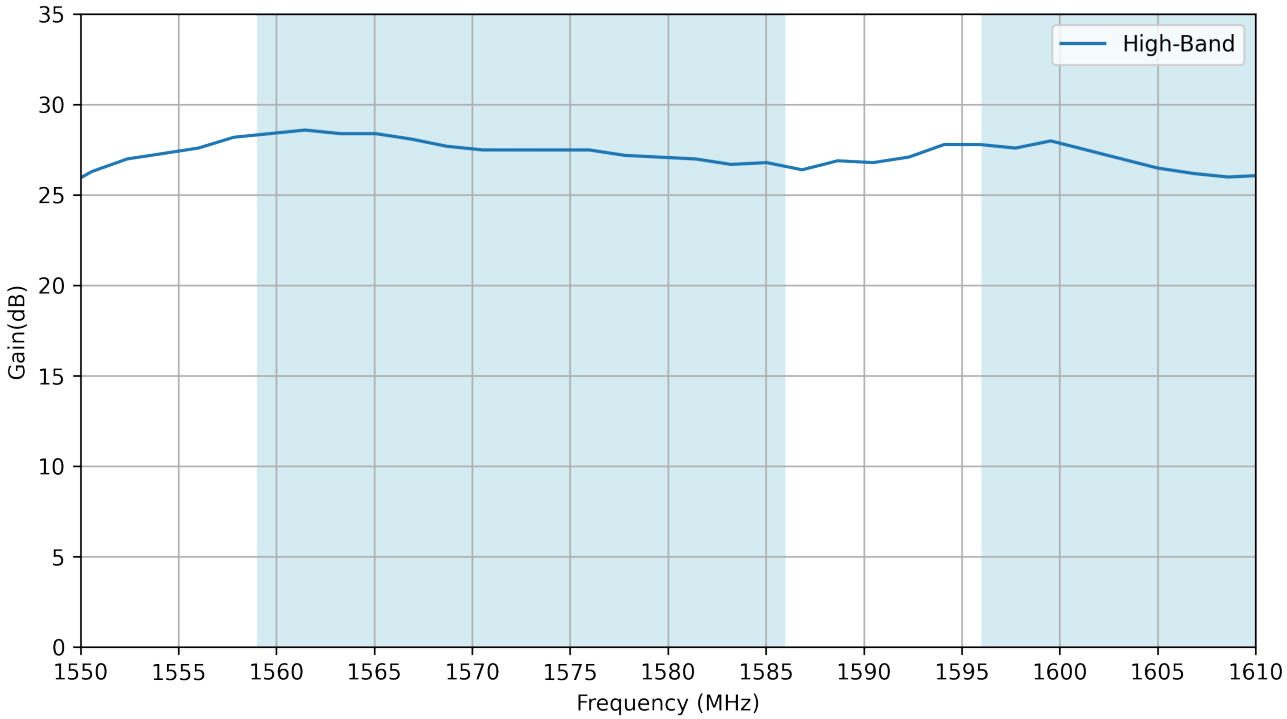
8.1 Block Diagram



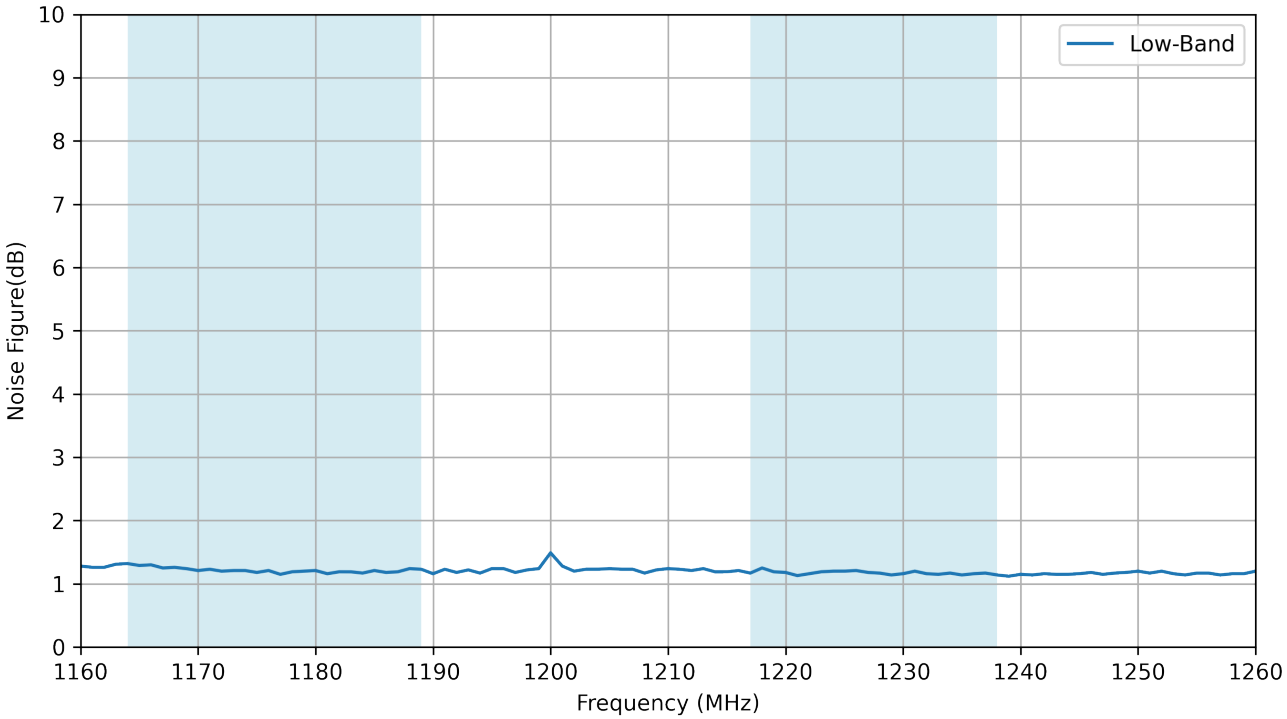
8.2 Gain – Low-Band



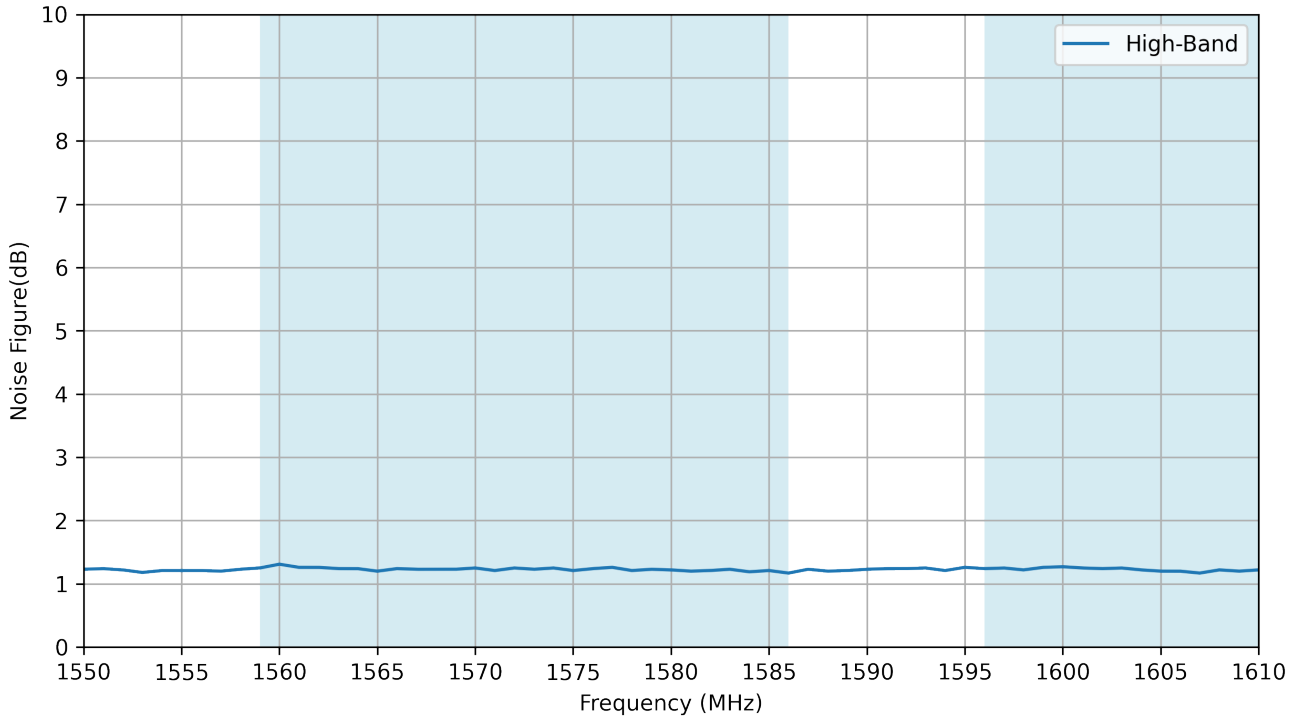
8.3 Gain – High-Band



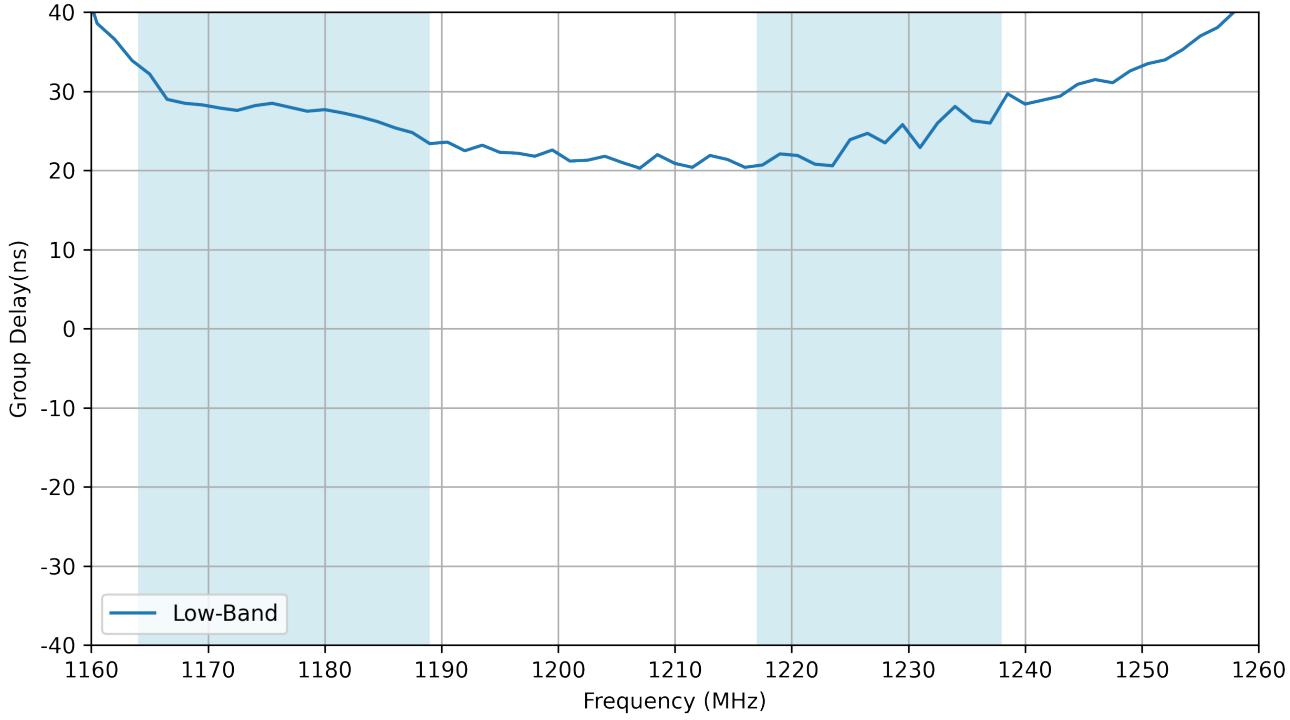
8.4 Noise Figure – Low-Band



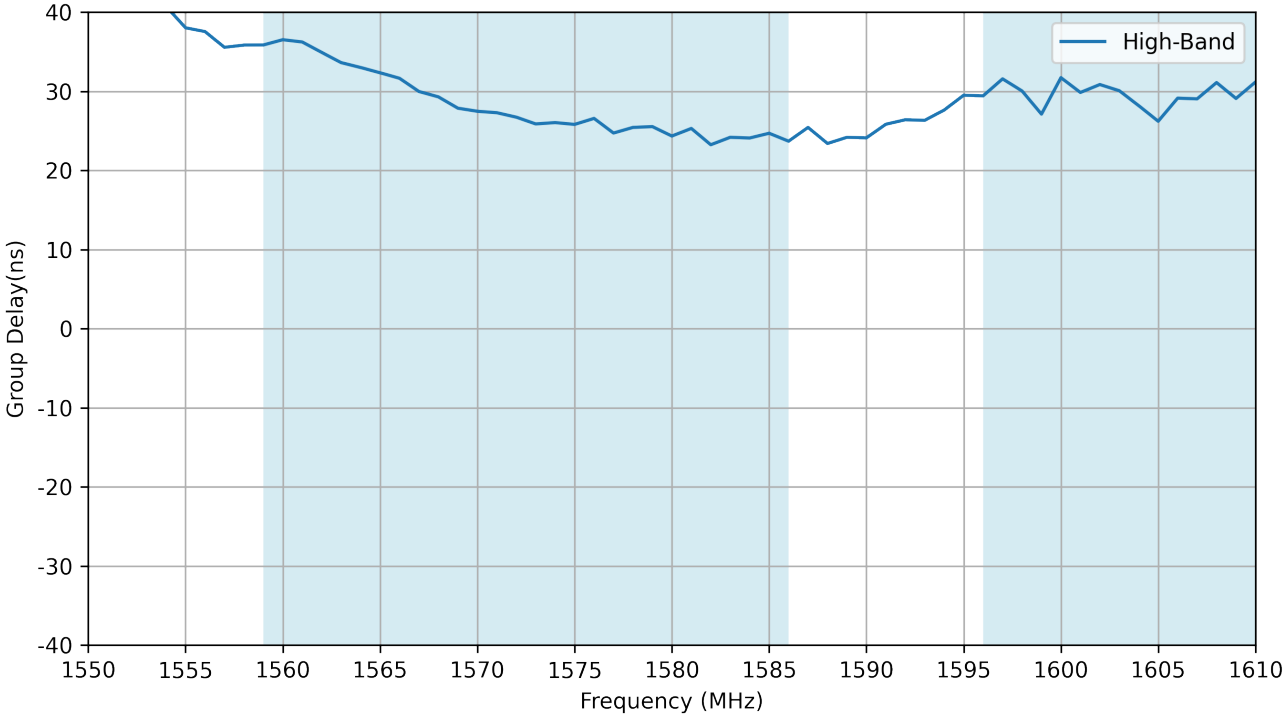
8.5 Noise Figure – High-Band



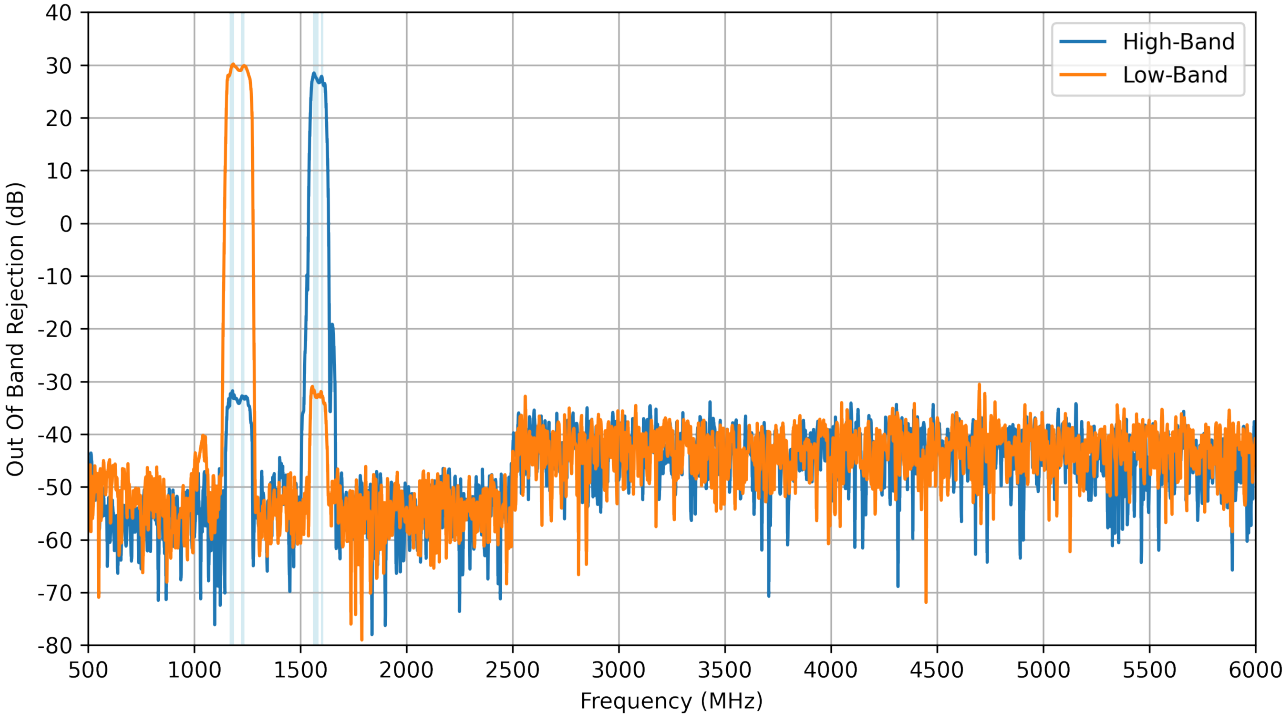
8.6 Group Delay – Low-Band



8.7 Group Delay - High-Band



8.8 Out Of Band Rejection



Changelog for the datasheet

SPE-25-8-090 – ADFGP.55A.07.0100C

Revision: B (Current Version)	
Date:	2026-01-14
Notes:	Added Installation Suggestion to datasheet
Author:	Conor McGrath

Previous Revisions

Revision: A (Original First Release)	
Date:	2025-03-25
Notes:	Initial Release
Author:	Gary West

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