TAOGLAS

Datasheet

GPS/GLONASS/BeiDou Patch

Part No:
CGGBP.35.6.A.02

Description

GPS/GLONASS/Galileo/BeiDou Embedded Patch Antenna

Features:

Dielectric Ceramic
BeiDou 1561MHz / GPS-Galileo 1575MHz / GLONASS 1602MHz
Pin Mount
Dimensions: 35mm*35mm*6.5mm
RoHS & Reach Compliant

1. Introduction

The Taoglas **CGGBP.35.6.A.02** is a Circularly Polarized embedded GNSS patch designed for use across the full single band GNSS spectrum.

This 35mm square ceramic GPS/GLONASS/Galileo/BeiDou patch antenna's wide band of operation leads to excellent gain and radiation pattern stability on all GNSS system bands.

Typical applications include:

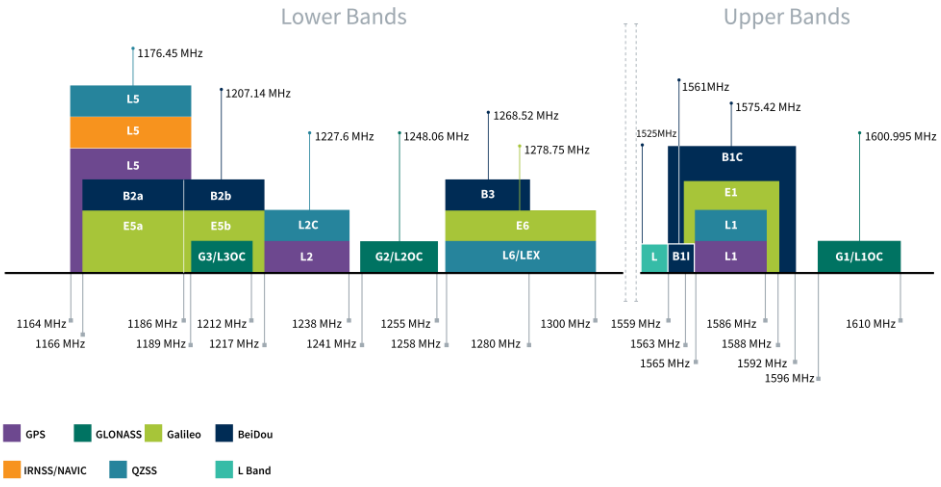
- Agriculture
- Asset tracking systems
- Navigation

Compared to using a smaller antenna, this will translate into the GNSS system having much higher location accuracy, improved reliability of lock in urban areas, better signal reception, with more satellites acquired and a quicker time to first fix.

The patch is mounted via pin and double-sided adhesive and can be custom tuned to a device subject to NRE, for further information please contact your regional Taoglas customer support team.

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

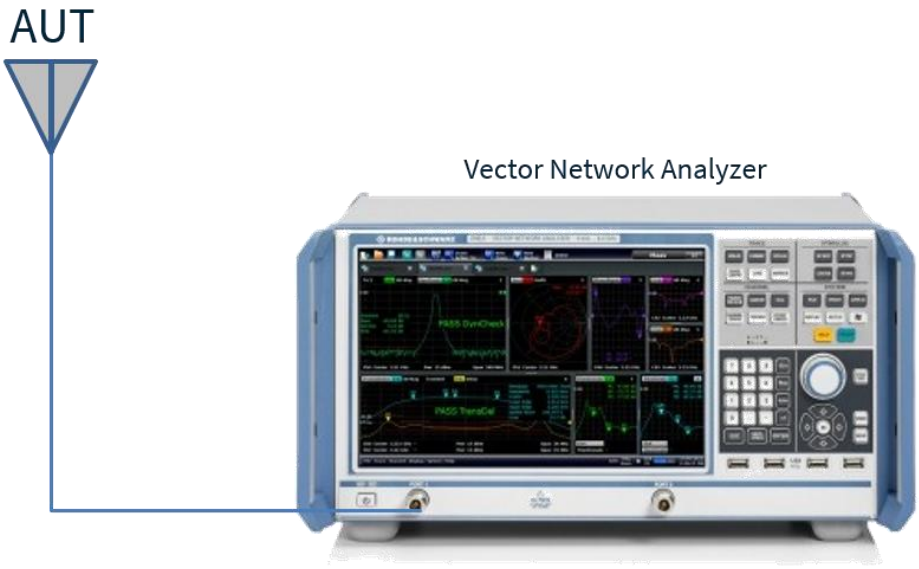
GNSS Electrical			
Frequency (MHz)	**1561**	**1575.42**	**1603**
VSWR (max.)	1.5:1	1.5:1	1.5:1
Passive Antenna Efficiency (%) (Without cable loss)	93.24	94.24	94.22
Passive Antenna Gain at Zenith (dBic) (Without cable loss)	5.13	5.18	5.24
Axial Ratio (dB)	8.6	4.5	4.0
PCO_x (cm)	0.17	0.19	0.19
PCO_y (cm)	0.33	0.29	0.29
PCV (cm)	0.07	0.06	0.06
Polarization	RHCP		
Impedance	50 Ω		

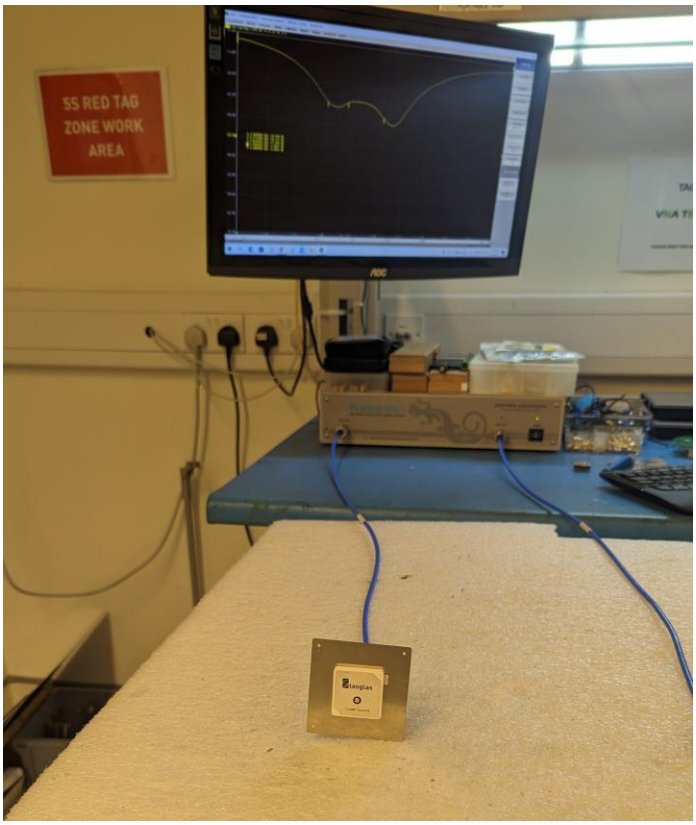
Mechanical	
Dimensions	35 x 35 x 6.5mm
Weight	29g
Material	Ceramic

Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C

3. Antenna Characteristics

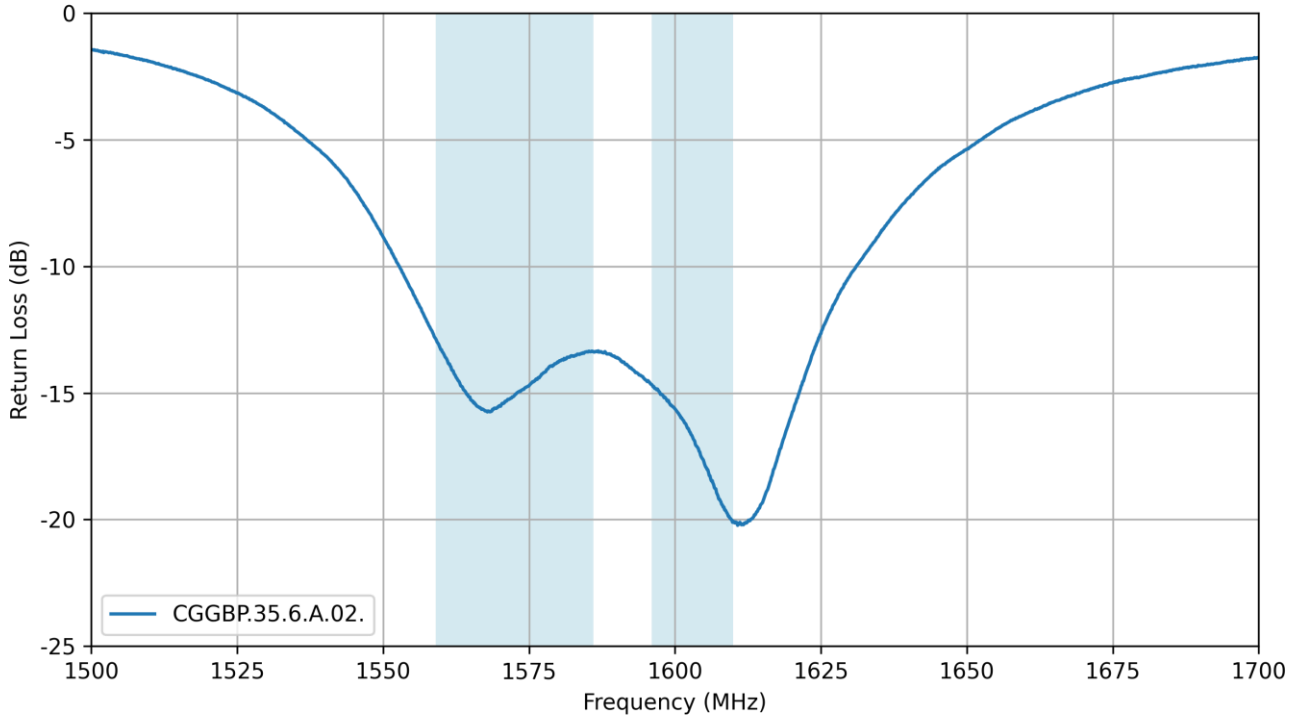
3.1 Test Setup



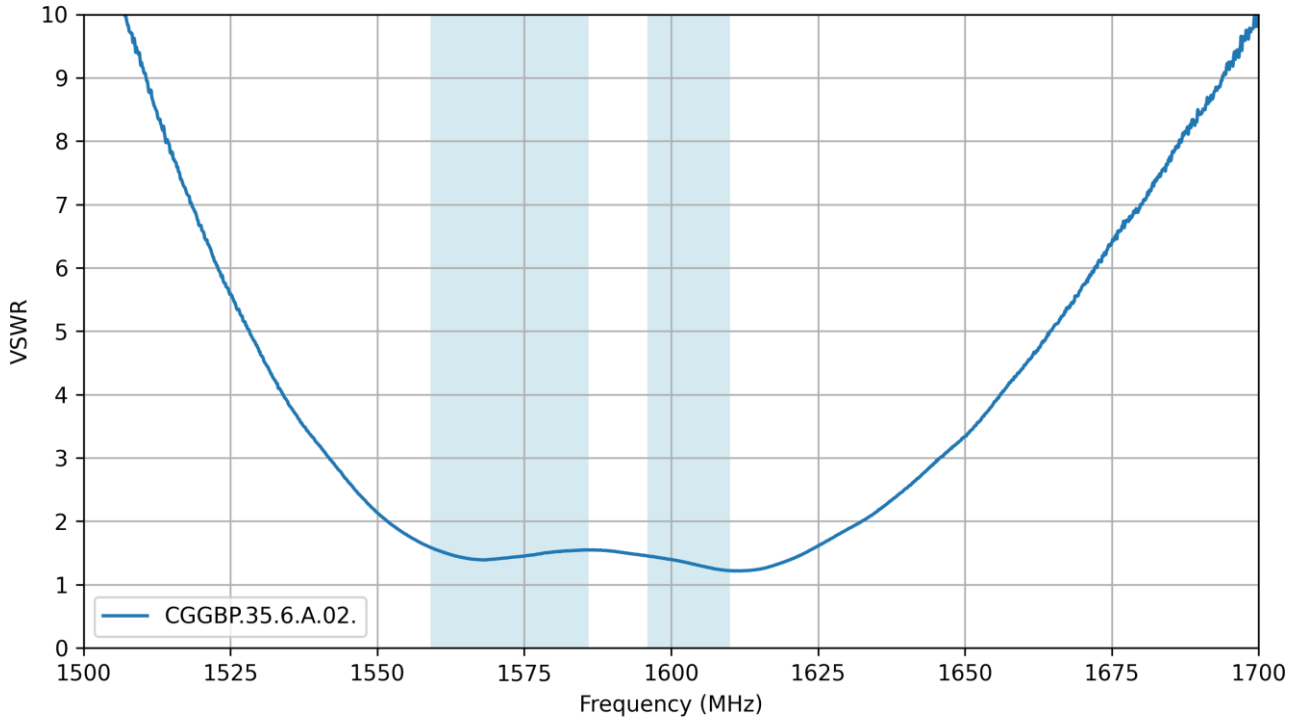


On 70mmx70mm Ground Plane

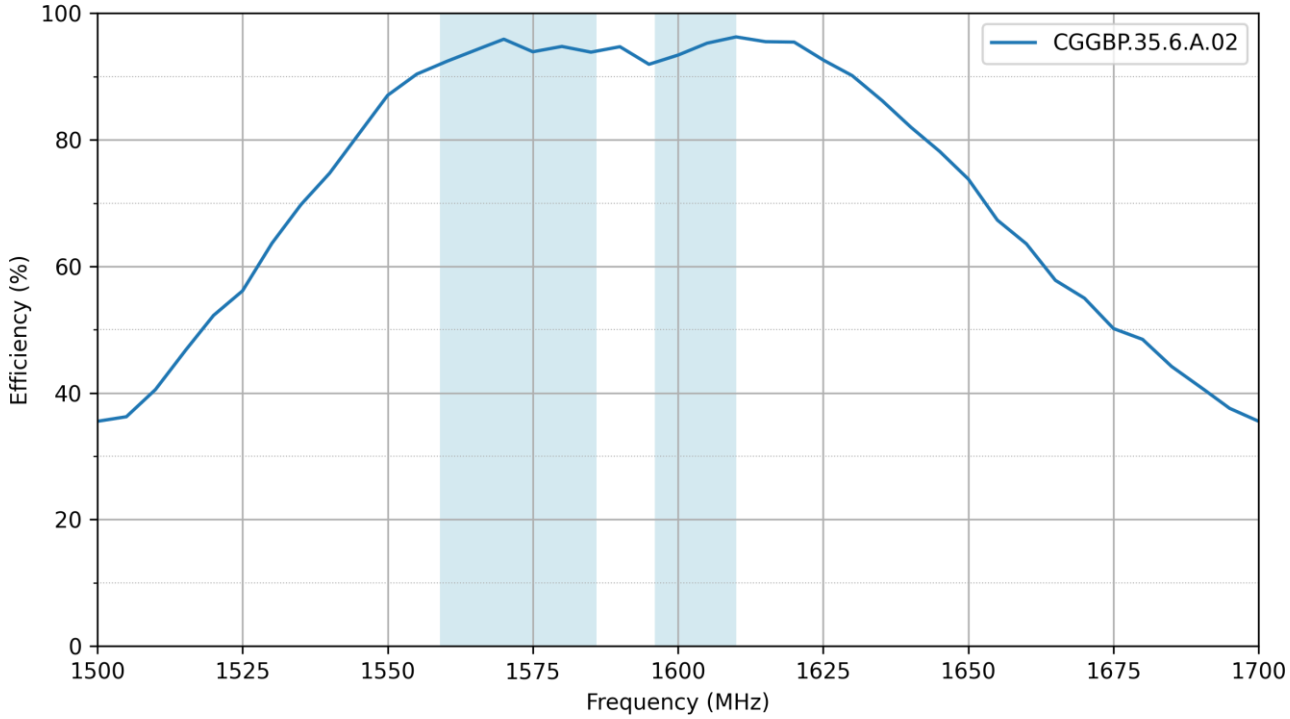
3.2 Return Loss



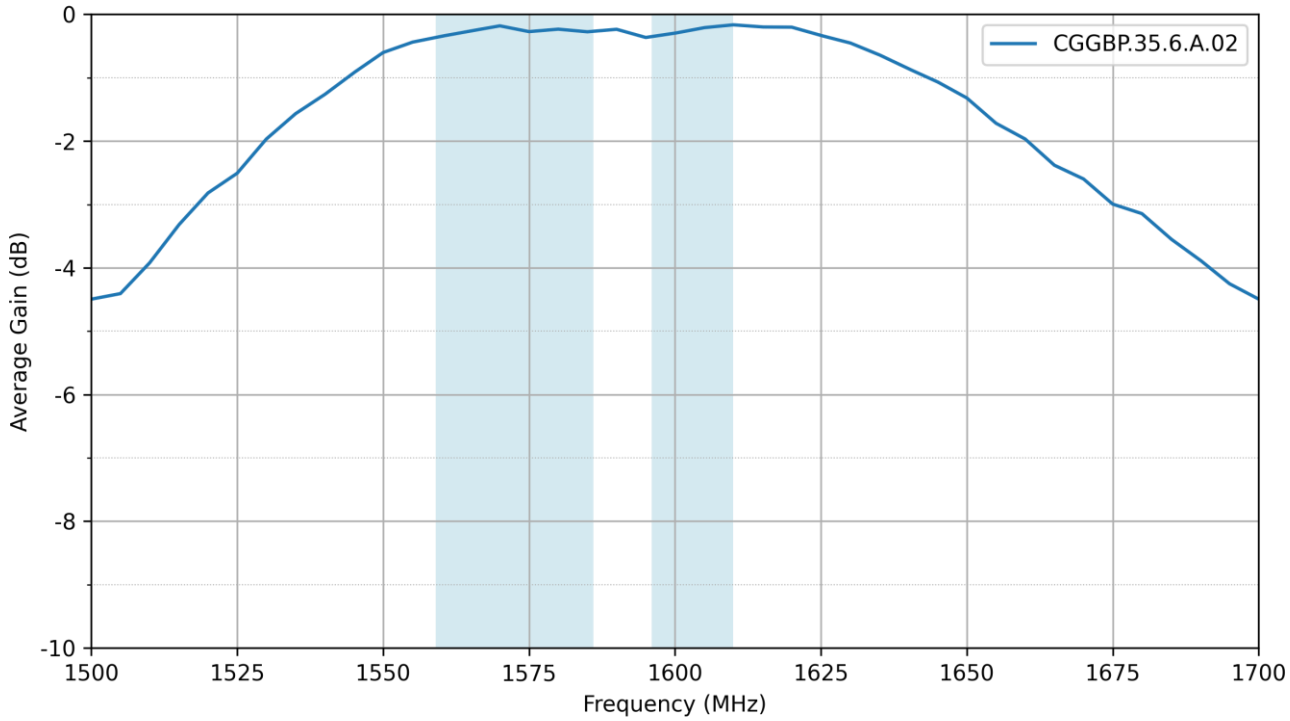
3.3 VSWR



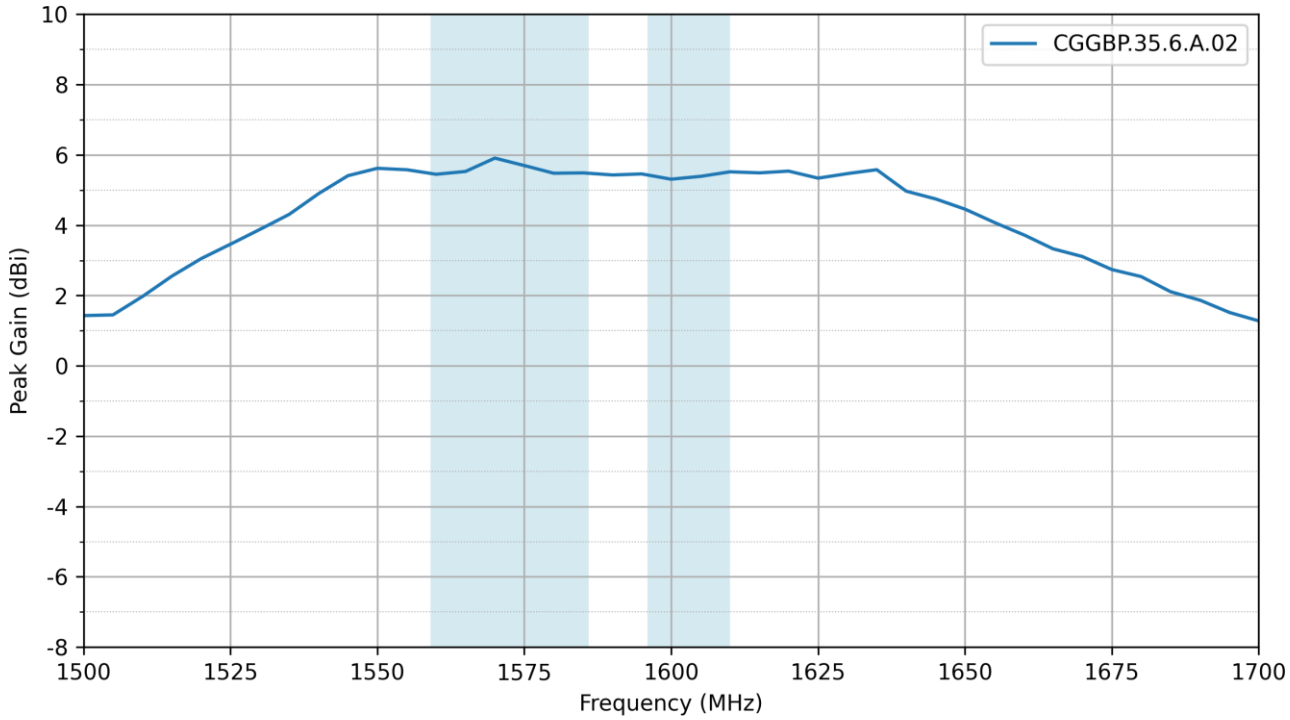
3.4 Efficiency



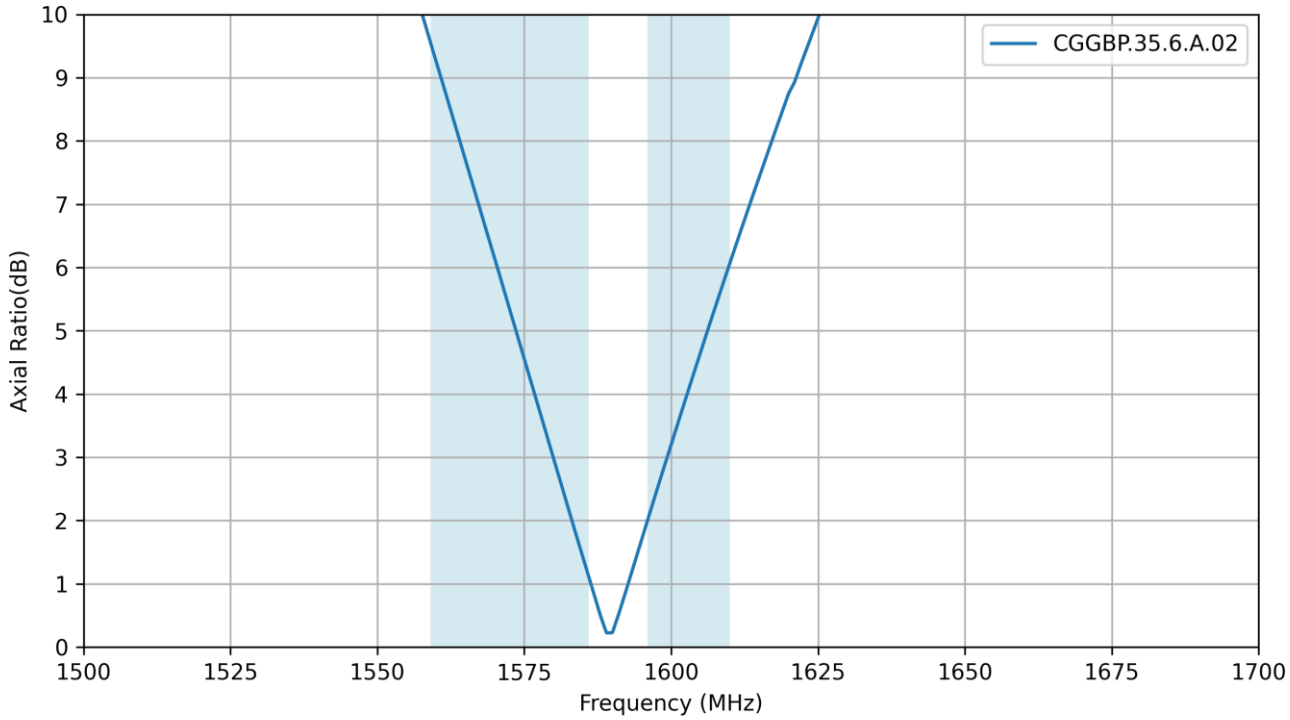
3.5 Average Gain



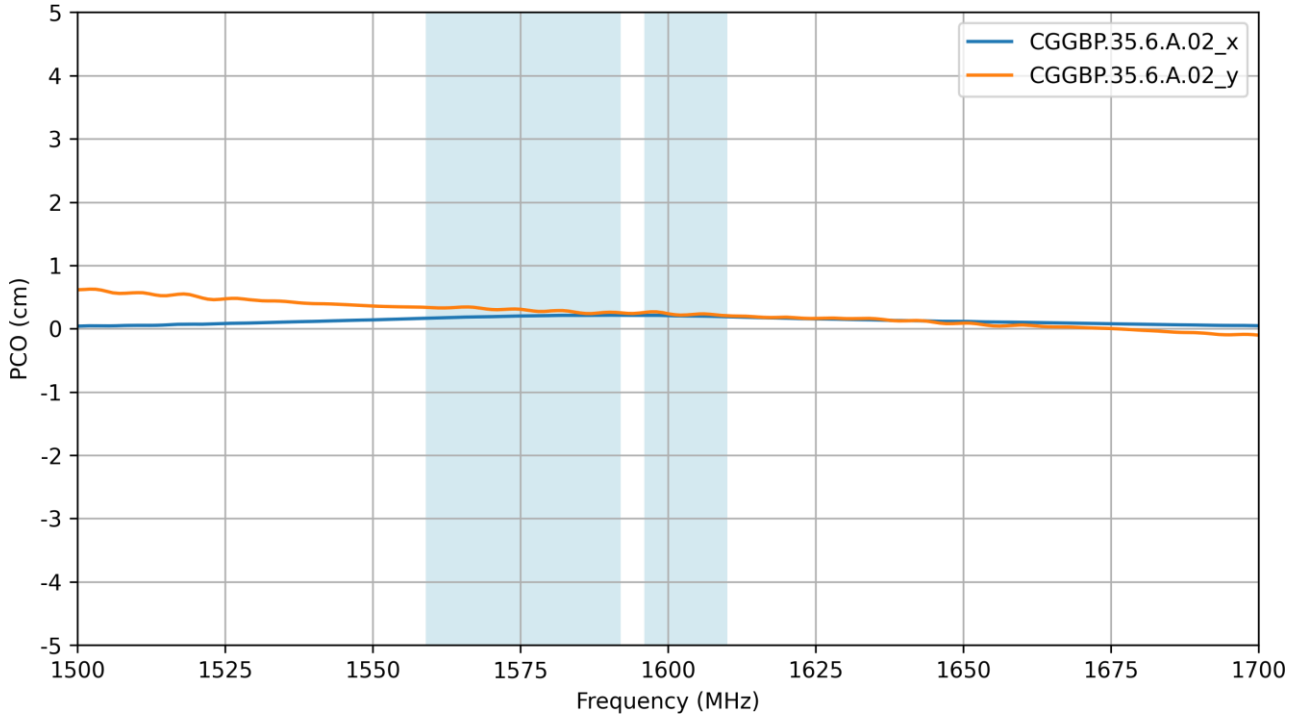
3.6 Peak Gain



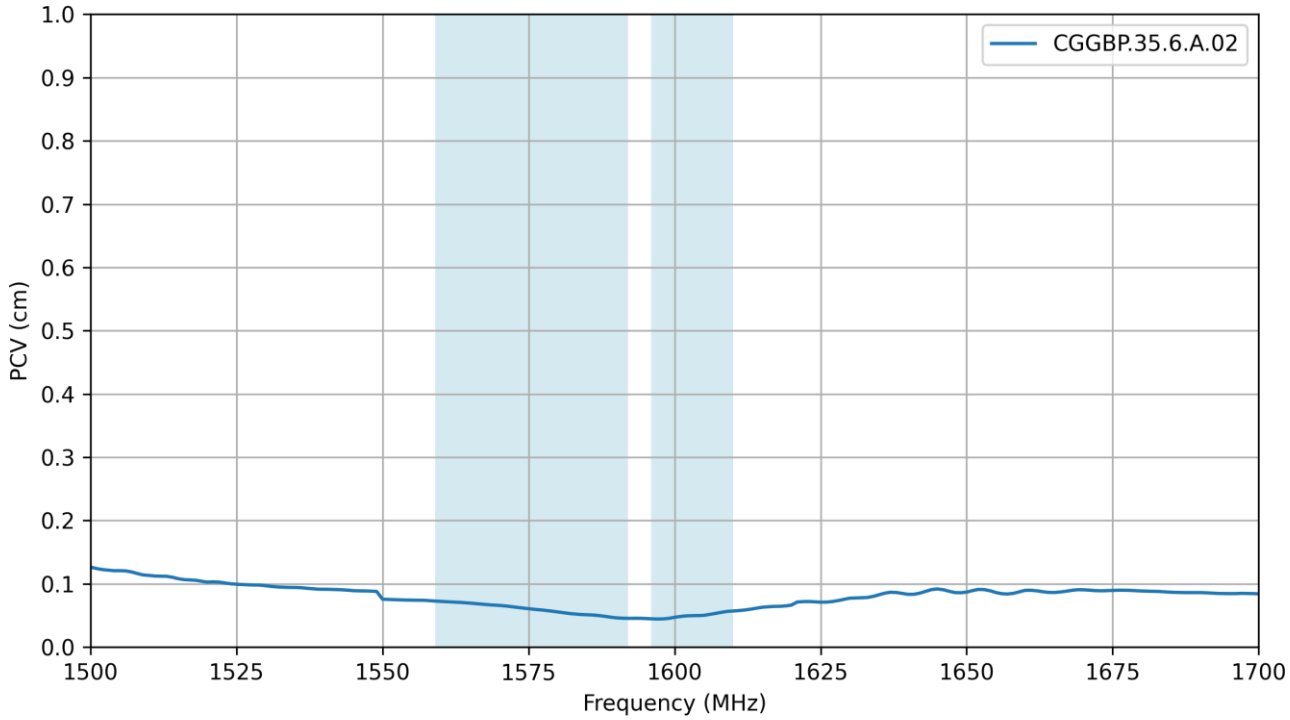
3.7 Axial Ratio



3.8 PCO

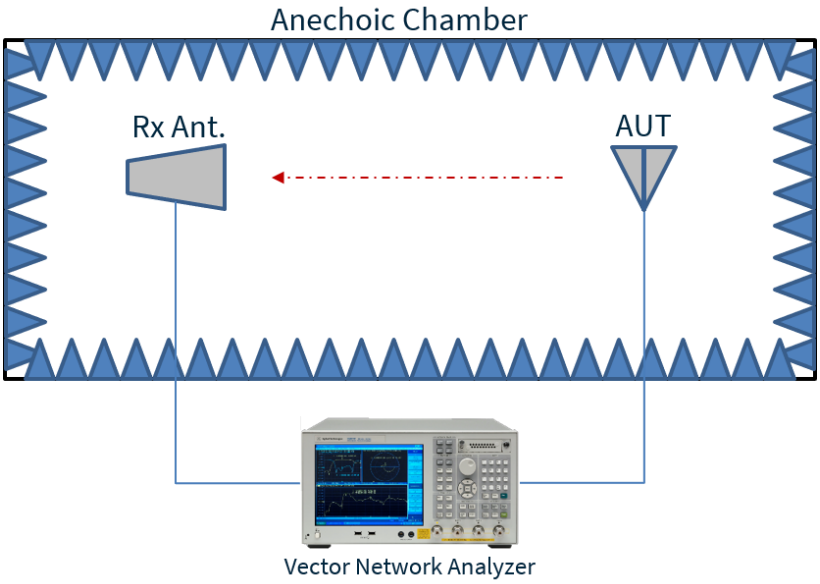

CGGBP.35.6.A.02_x
CGGBP.35.6.A.02_y
PCO (cm)
Frequency (MHz)
5
4
3
2
1
0
-1
-2
-3
-4
-5
1500
1525
1550
1575
1600
1625
1650
1675
1700

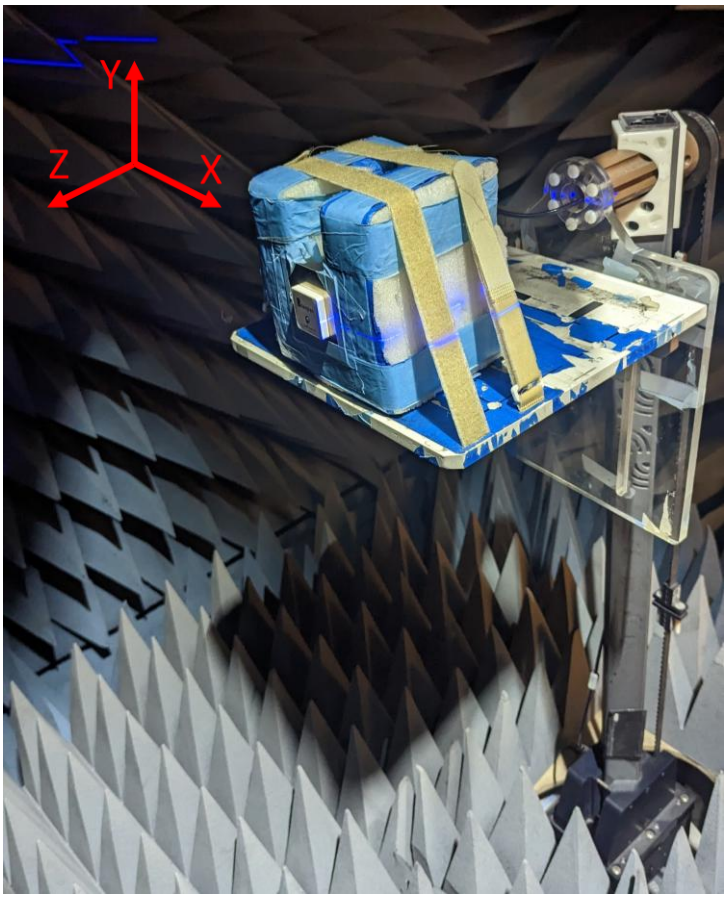
3.9 PCV


CGGBP.35.6.A.02
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
1500
1525
1550
1575
1600
1625
1650
1675
1700

4. Radiation Patterns

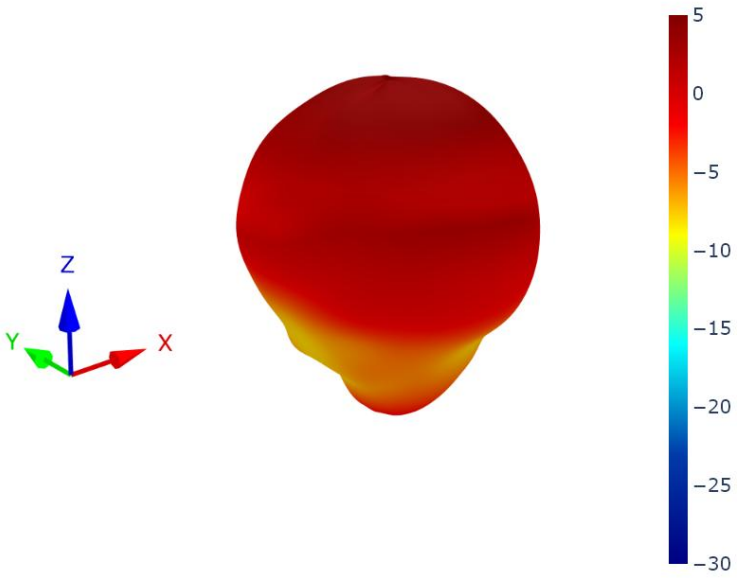
4.1 Test Setup

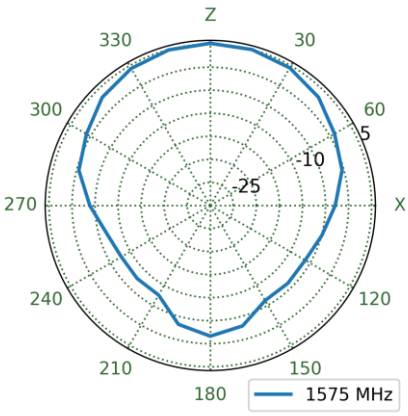
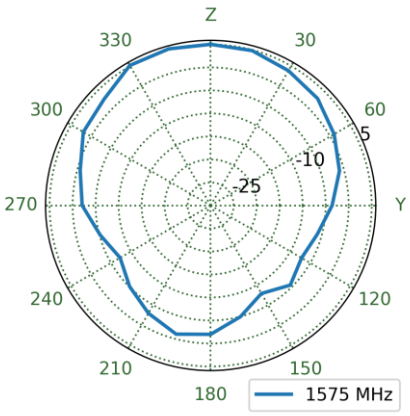
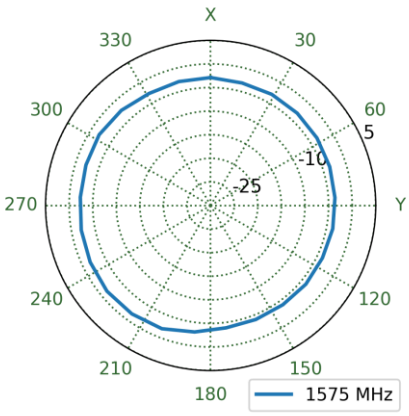




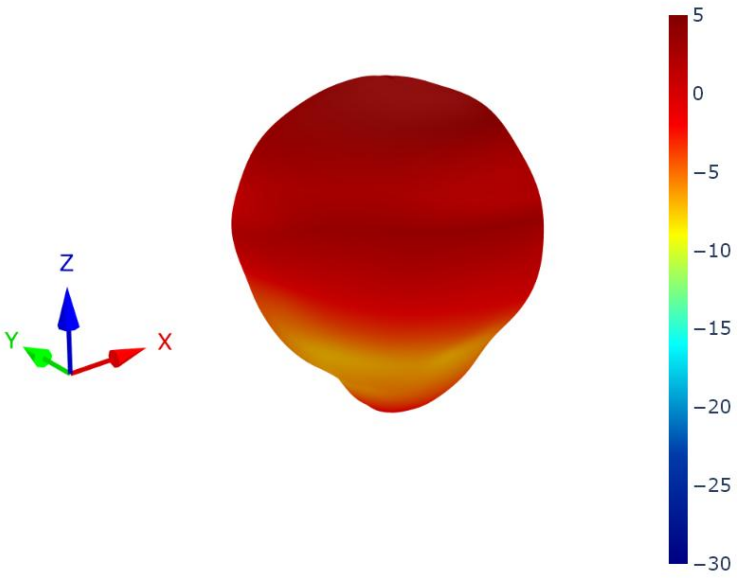
On 70mmx70mm Ground Plane

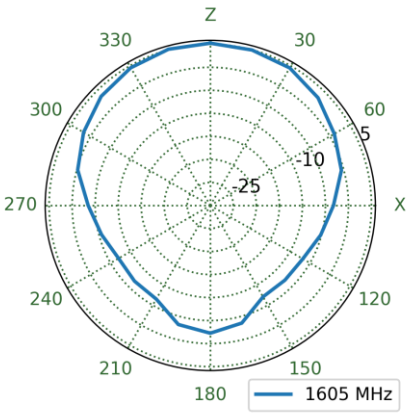
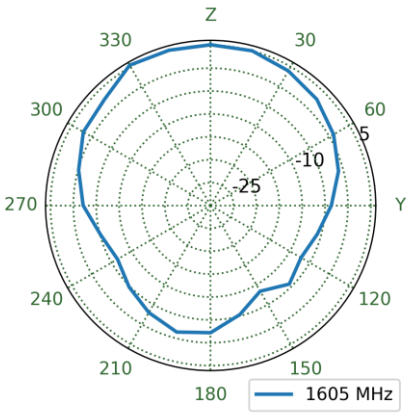
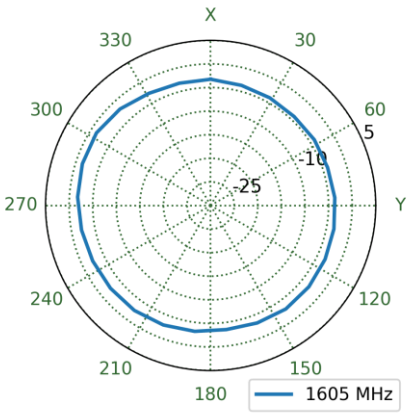
4.2 Patterns at 1575 MHz



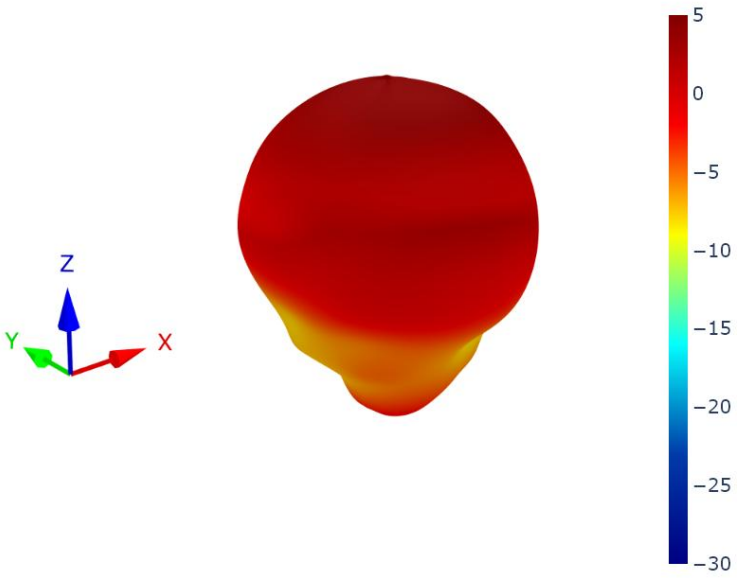
XZ Plane	YZ Plane	XY Plane
		

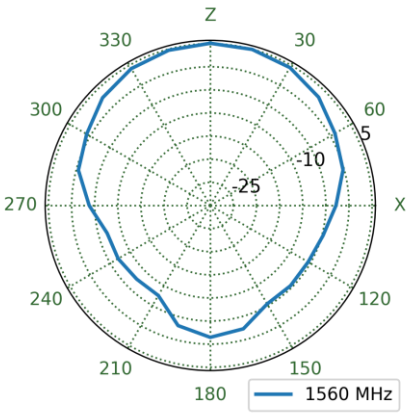
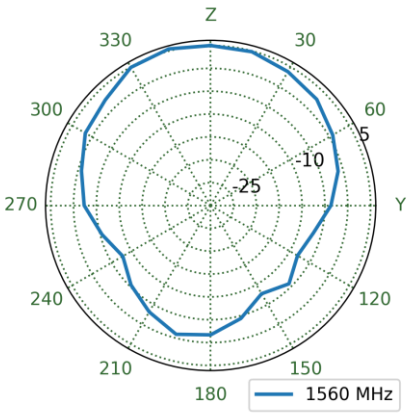
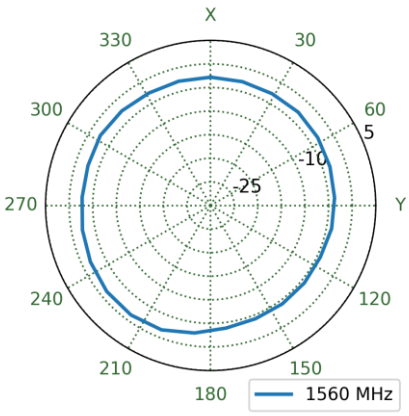
4.3 Patterns at 1605 MHz



XZ Plane	YZ Plane	XY Plane
		

4.4 Patterns at 1560 MHz



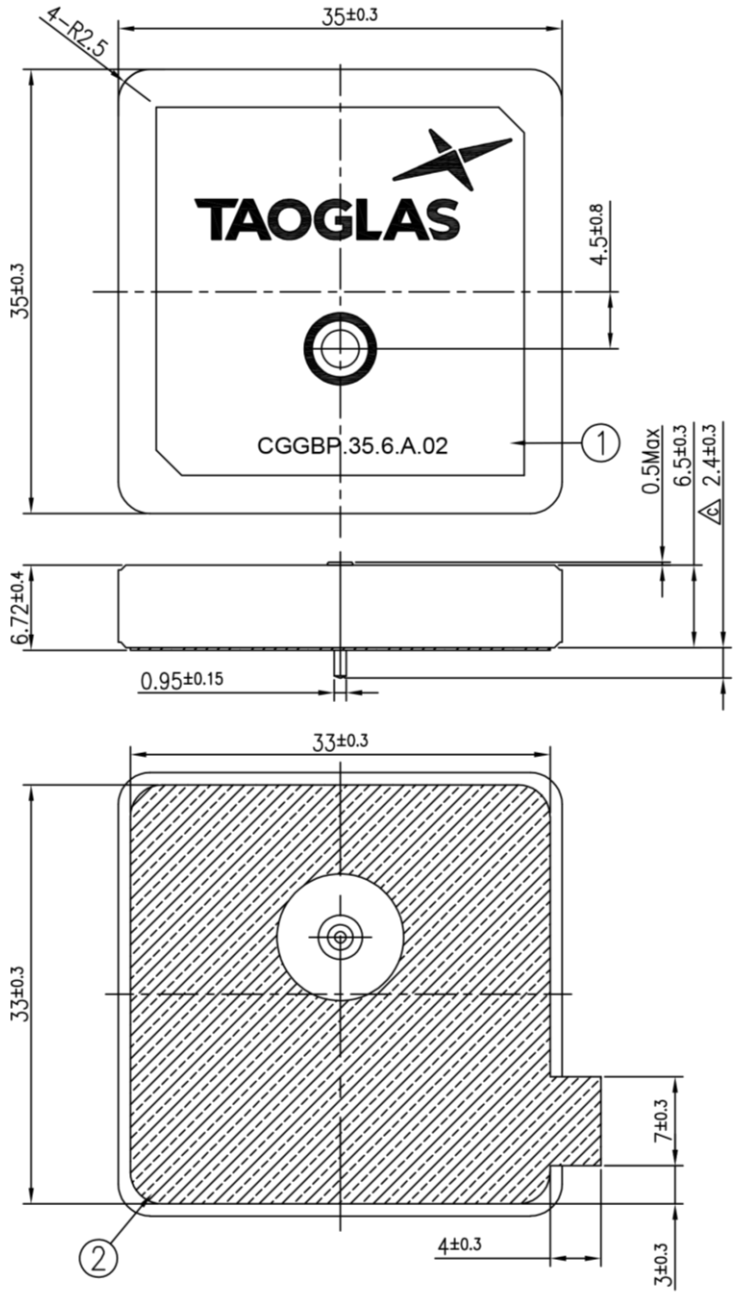
XZ Plane	YZ Plane	XY Plane
		

5. Mechanical Drawing

Top View

Side View

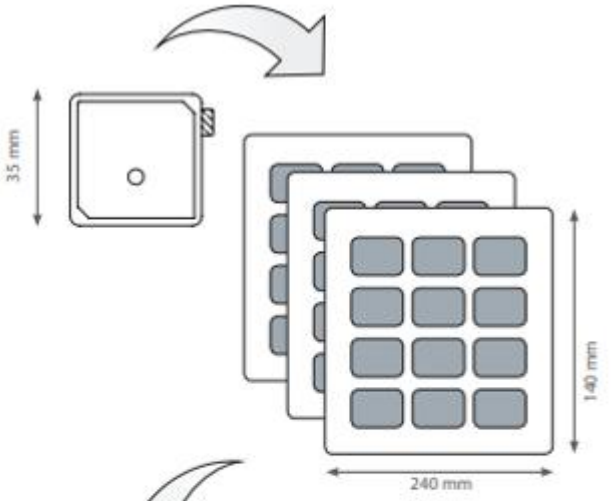
Bottom View



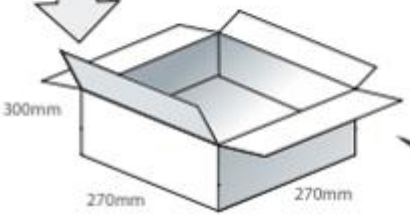
	Name	P/N	Material	Finish	QTY
1	Patch	0015166040007A	Ceramic	Clear	1
2	Double sided Adhesive	0015166040007A	NITTO 5015	White Linter	1

6. Packaging

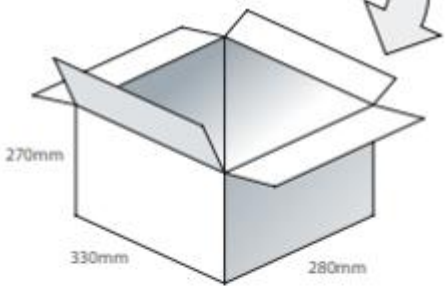
12 pcs CGGP.35.6.A.02
Tray Dimensions – 240*140*20mm
Weight – 280g



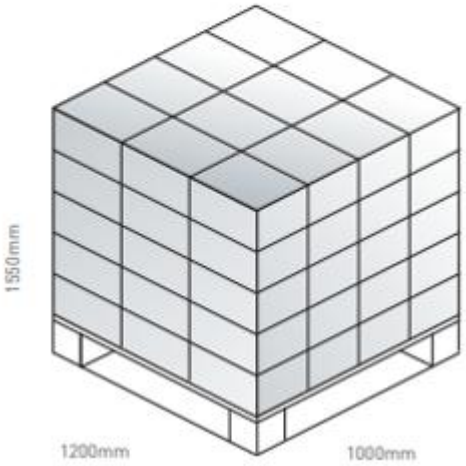
72 pcs CGGP.35.6.A.02 per inner carton
Inner carton dimensions – 261*152*118mm
Weight – 1.675Kg



288 pcs CGGP.35.6.A.02 per carton
Carton dimensions – 330*280*270mm
Weight – 6.7Kg



Pallet dimensions – 1200*1000*1550mm
60 Cartons per pallet
12 Cartons per layer
5 Layers



7. Antenna Integration Guide

The following is an example on how to integrate the CGGBP.35.6.A.02 into a design. This antenna has one pin, which is used for the RF Feed. Taoglas recommends using a minimum of 70x70mm ground plane (PCB) to ensure optimal performance.

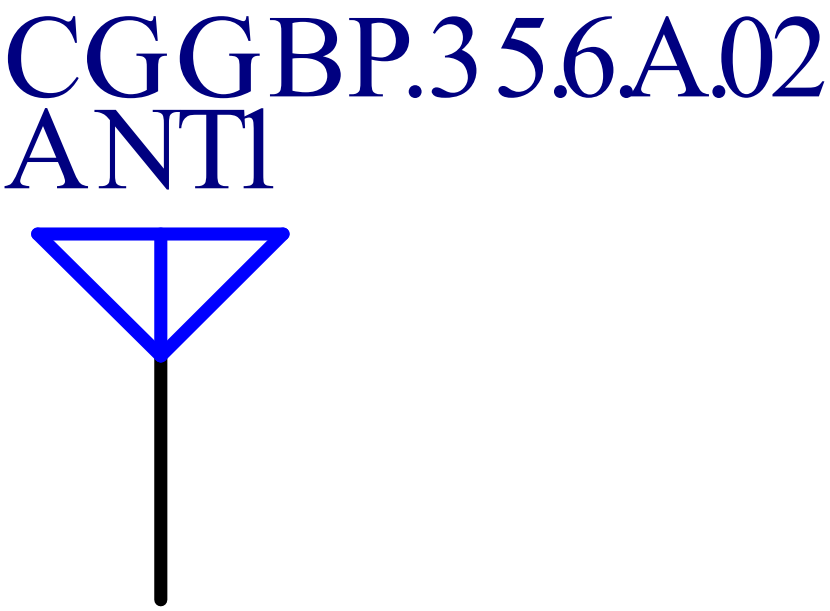
Top view of PCB reference design

Please find the Integration files in Altium, 2D formats and the 3D model for the CGGBP.35.6.A.02 here: https://www.taoglas.com/product/cggbp-35-6-a-02-gpsglonassbeidou-patch-antenna-356-5mm-2/

7.1 Schematic and Symbol Definition

The circuit symbol for the CGGBP.35.6.A.02 is shown below. The antenna has 1 pin as indicated below.

Pin	Description
1	RF Feed



Above is a schematic symbol of CGGBP.35.6.A.02 and a table of the pin definitions.

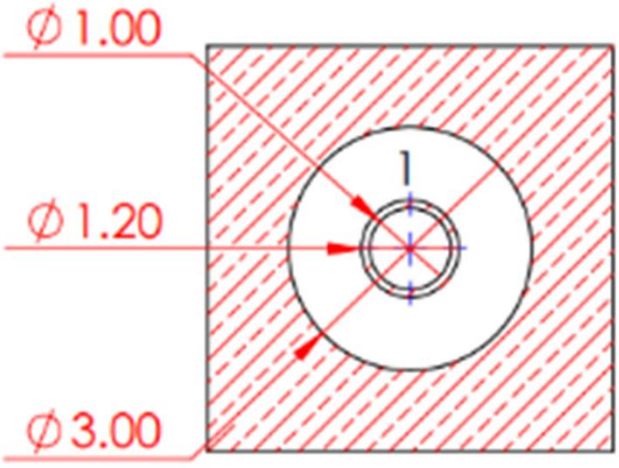
7.2 Antenna Footprint

Pin	Description
1	RF Feed

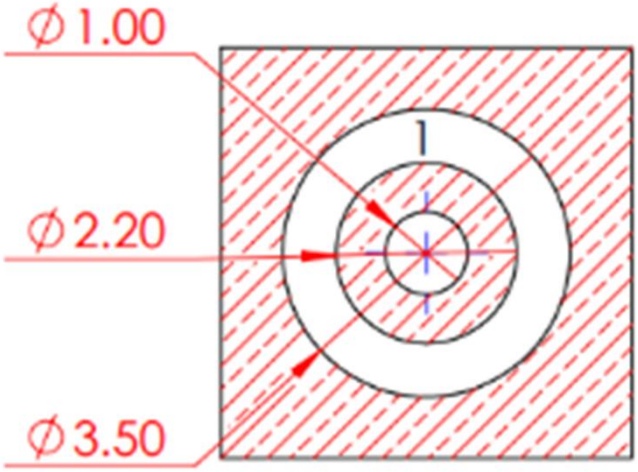
7.3 Copper Clearance

The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the CGGBP.35.6.A.02 clearance area for Pin 1 (RF Feed Pad). The bottom copper keep out area only applies to the bottom layer and the top copper keep out area applies to all other layers.

There should be a Ø3mm copper clearance around the antenna pins on the top side of the PCB with a Ø3.5mm copper clearance around the antenna pins on the bottom side.



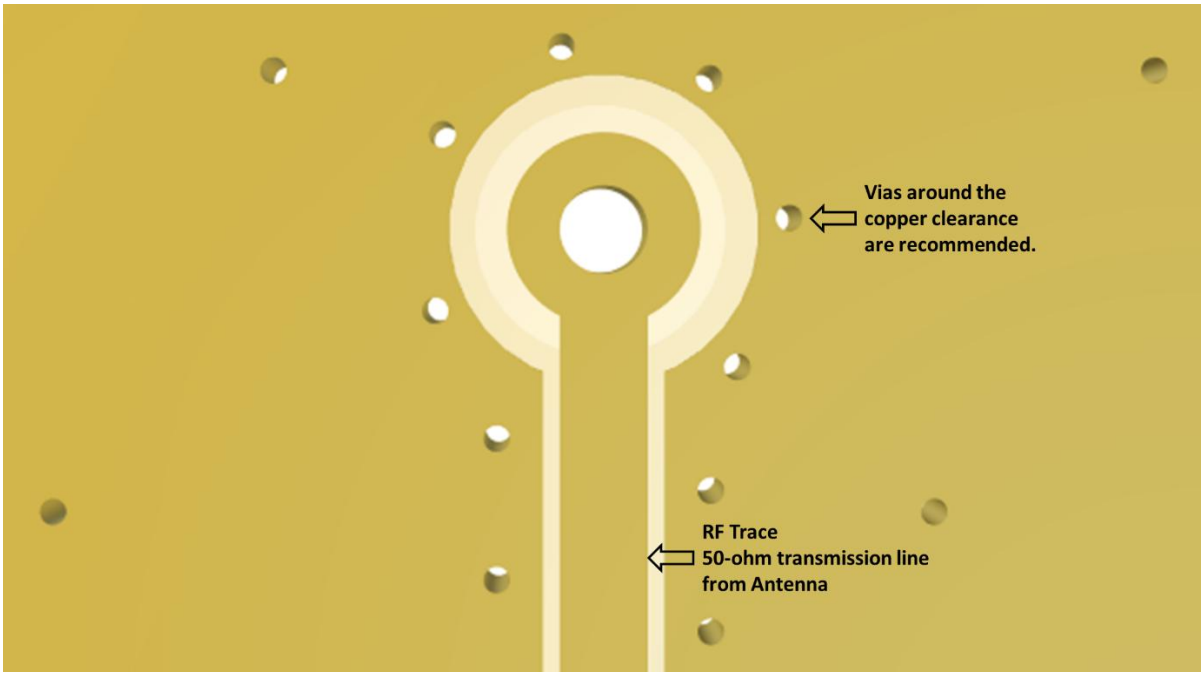
Top Side



Bottom Side

7.4 Antenna Integration

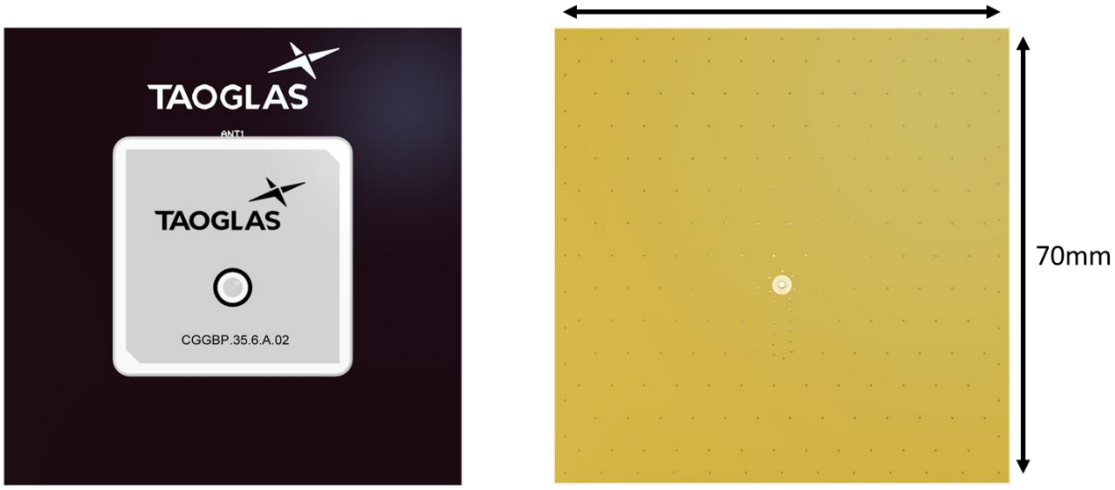
The CGGBP.35.6.A.02 should be placed in the centre of the PCB to take advantage of the ground plane. The RF traces must maintain a 50 Ohm transmission line. Ground vias should be placed around the copper clearance area and the transmission line. Note that depending on the design application, tuning may be required for optimal performance. This may be achieved using a 'pi' matching network or custom tuning of the patch antenna.



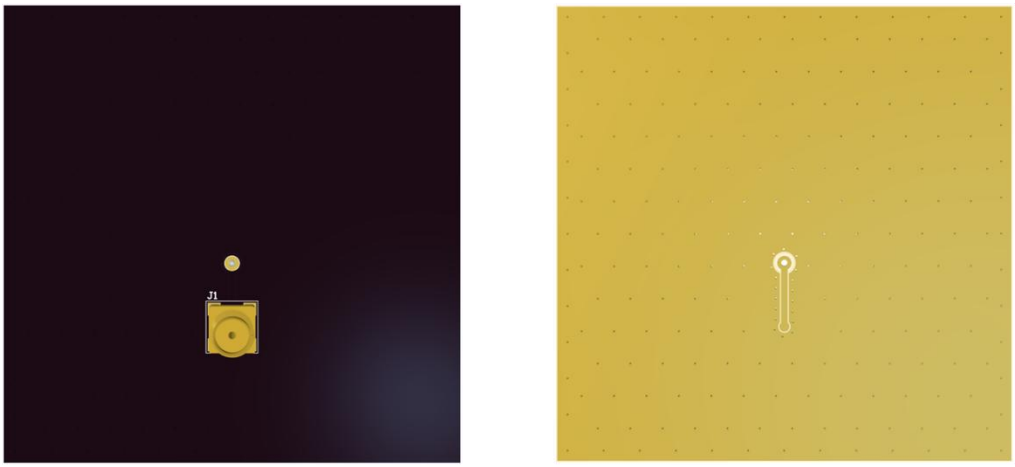
Bottom view of the PCB Reference Design, showing transmission lines and integration notes.

7.5 Final Integration

The bottom side image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 70x70mm ground plane to ensure optimal performance.



Top Side (70x70mm PCB Reference Design)



Bottom Side

Changelog for the datasheet

SPE-14-8-018 – CGGBP.35.6.A.02

Revision: M (Current Version)	
Date:	2025-12-10
Changes:	Updated antenna integration guide.
Changes Made by:	Gary West

Previous Revisions

Revision: L	
Date:	2025-04-29
Changes:	Added PCO/PCV data and graphs.
Changes Made by:	Gary West

Revision: G	
Date:	2021-06-08
Changes:	Pin Length changed to 2.4mm Drawing updated
Changes Made by:	Dan Cantwell

Revision: K	
Date:	2025-04-14
Changes:	Added axial ratio graph
Changes Made by:	Gary West

Revision: F	
Date:	2020-01-27
Changes:	Installation Guide Amended
Changes Made by:	Jack Conroy

Revision: J	
Date:	2023-06-08
Changes:	Updated Graphs Updated PCB Footprint
Changes Made by:	Aswin Biju

Revision: E	
Date:	2018-03-27
Changes:	Installation Guide Amended
Changes Made by:	Jack Conroy

Revision: I	
Date:	2023-05-12
Changes:	Updated Axial Ratio Graph.
Changes Made by:	Gary West

Revision: D	
Date:	2017-06-27
Changes:	
Changes Made by:	David Connolly

Revision: H	
Date:	2022-02-24
Changes:	Integration guide added
Changes Made by:	Cesar Sousa

Revision: C	
Date:	2015-01-06
Changes:	PCB Footprint
Changes Made by:	Made by Andy Mahoney

Previous Revisions

Revision: B	
Date:	2014-11-17
Changes:	Evaluation Board Added
Changes Made by:	Aine Doyle

Revision: A (Original First Release)	
Date:	2014-03-04
Notes:	
Author:	Aine Doyle

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