



TAOGLAS®



Datasheet

Part No:
CGGP.25.4.E.02

Description

GPS/GLONASS/Galileo Patch Antenna 25 x 25 x 4mm

Features:

GPS/Galileo L1 and GLONASS G1 Operation
1575.42MHz and 1602MHz Resonance
Dimensions: 25 x 25 x 4mm
Pin type Ceramic Patch Antenna
Automotive TS16949 Production and Quality Approved
RoHS & REACH Compliant

1.	Introduction	3
2.	Specification	4
3.	Mechanical Drawing	6
4.	Antenna Integration Guide	7
5.	Packaging	13
6.	Antenna Characteristics	14
7.	Radiation Patterns	18
	Changelog	21

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1. Introduction

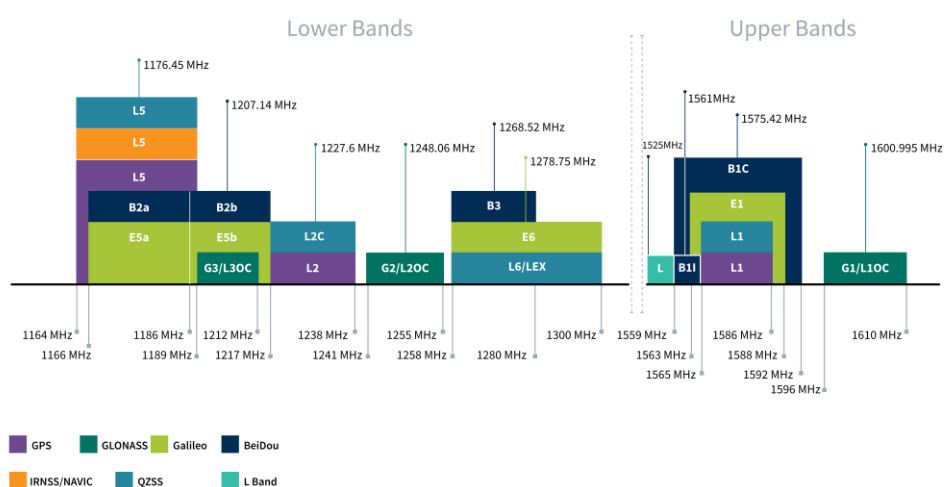


The CGGP.25.4.E.02 is a 25 x 25 x 4 mm embedded ceramic GPS/GLONASS/Galileo Patch antenna. It features a double resonance design at GPS/Galileo and GLONASS bands, 1575.42 MHz and 1602MHz respectively. This antenna has been tuned for a center position on a 70mm x 70mm ground plane. Return loss is -28dB at 1575.42MHz and -22dB at GLONASS. Overall, the antenna has greater than 60% efficiency.

For further optimization to customer specific device environments where positioning is off center or a different ground-plane size, custom tuned patch antennas can be supplied. For more 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
	■	□	■	□	□



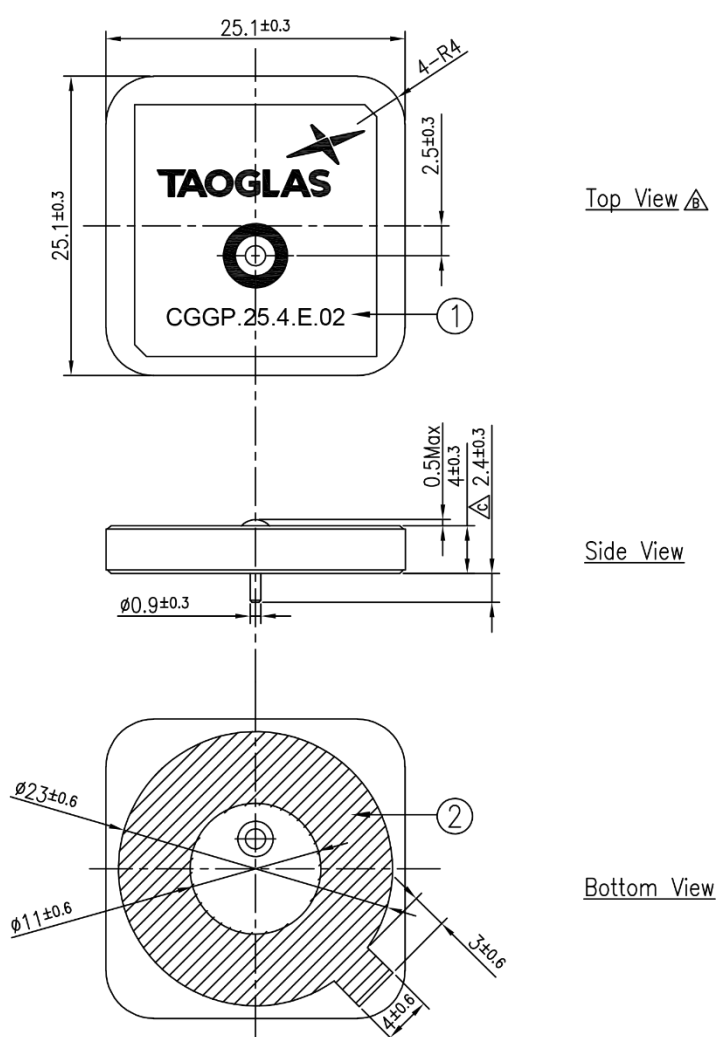
GNSS Bands and Constellations

GNSS Electrical		
Frequency (MHz)	1575.42	1602
VSWR (max.)	1.5:1	1.5:1
Passive Antenna Efficiency (%)	85.50	89.04
Passive Antenna Gain (dBi)	4.64	4.97
Axial Ratio (dB)	9.04	9.91
Polarization	Linear	
Impedance	50 Ω	
* Antenna properties were measured with the antenna mounted on 70 x 70mm Ground Plane		

Mechanical	
Ceramic Dimension	25 x 25 x 4 mm
Pin Diameter	$\varnothing$ 0.9 mm
Pin Length	2.4 mm
Weight	9.5g

Environmental	
Operation Temperature	-40°C to 105°C
Storage Temperature	-40°C to 105°C

3. Mechanical Drawing



	Name	P/N	Material	Finish	QTY
1	Patch	001518H180000A	Ceramic	Clear	1
2	Double sided Adhesive	001518H180000A	NIITO 5015	White Linter	1

4. Antenna Integration Guide

The following is an example on how to integrate the CGGP.25.4.E.02 into a design. The CGGP.25.4.E.02 has one pin which is used for the RF Feed. Taoglas recommends using a minimum of 70x70mm ground plane to ensure optimal performance.



Top view of an example 70x70mm PCB Reference Design.

Please find the Integration files in Altium, 2D formats and the 3D model for the CGGP.25.4.E.02 here: <https://www.taoglas.com/product/cggp-25-4-a-02-gpsglonass-dual-band-patch-antenna-25254mm-2/>

4.1 Schematic Symbol and Pin Definitions

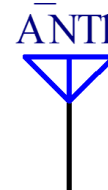


Top view of an example 70x70mm PCB Reference Design.

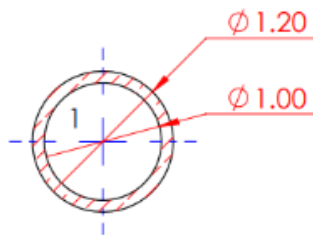
The circuit symbol for a CGGP.25.4.E.02 is shown below. The antenna has 1 pin as indicated below.

Pin	Description
1	RF Feed

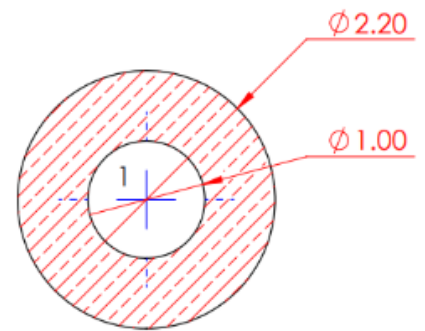
TAOGLAS_CGGP25.4.E.02



4.2 Antenna Footprint



TOP

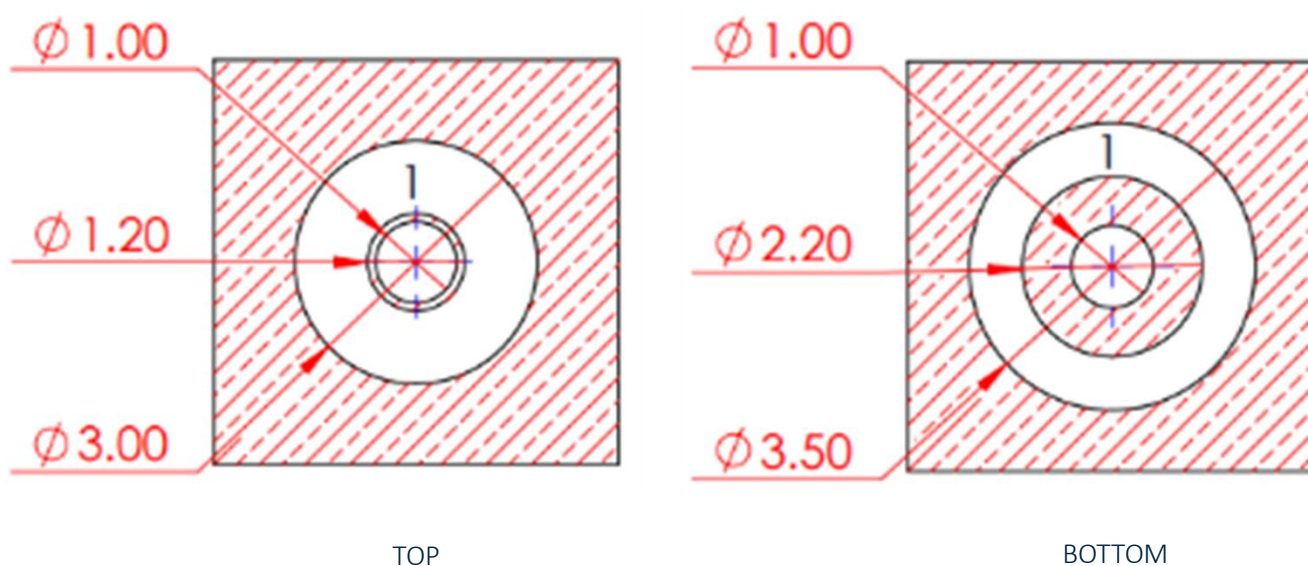


BOTTOM

4.3 Copper Clearance

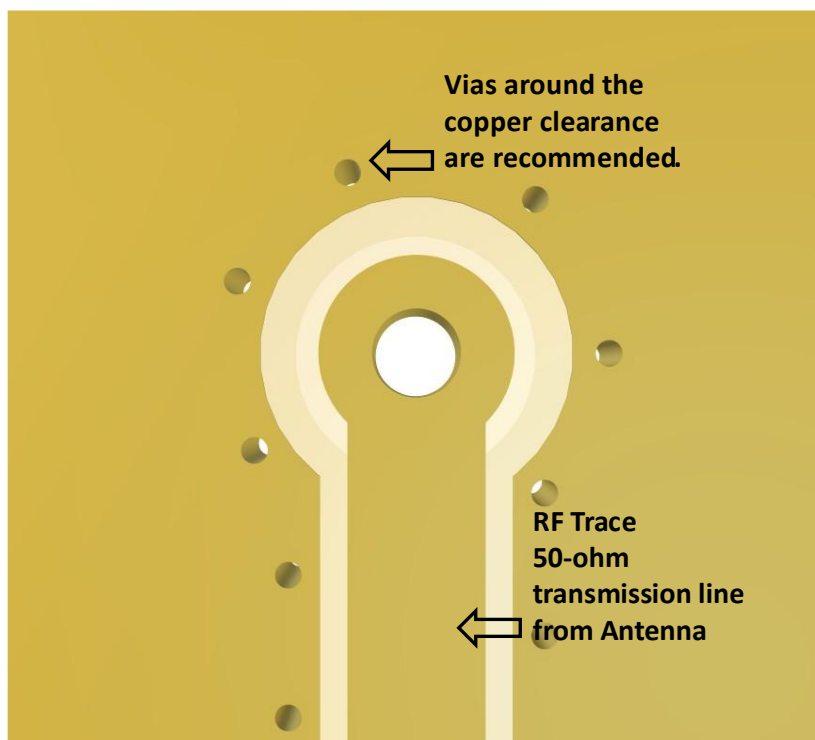
The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the CGGP.25.4.E.02 clearance area for Pin 1 (RF Feed Pad). The bottom copper keep out area only applies to the bottom layer and the top copper keep out area applies to all other layers.

There should be a $\varnothing 3\text{mm}$ copper clearance around the antenna pins on the top side of the PCB with a $\varnothing 3.5\text{mm}$ copper clearance around the antenna pins on the bottom side..



4.4 Antenna Integration

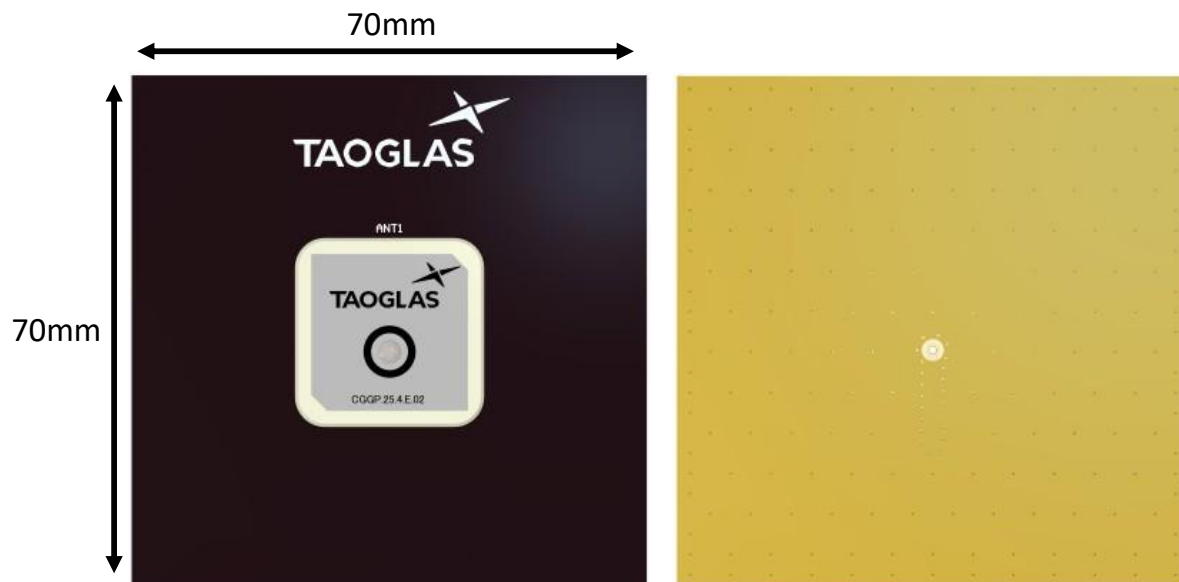
The CGGP.25.4.E.02 should be placed in the centre of the PCB to take advantage of the ground plane. The RF trace must maintain a 50 Ohm transmission line. Ground vias should be placed around the copper clearance area and the transmission line. Note that depending on the design application, tuning may be required for optimal performance. This may be achieved using a 'pi' matching network or custom tuning of the patch antenna.



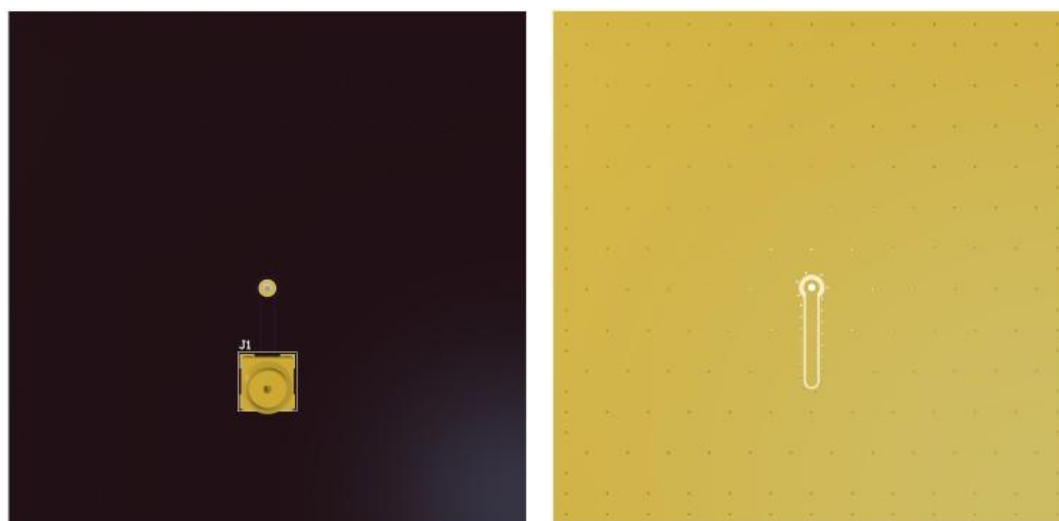
Bottom view of the PCB Reference Design, showing transmission lines and integration notes.

4.5 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.



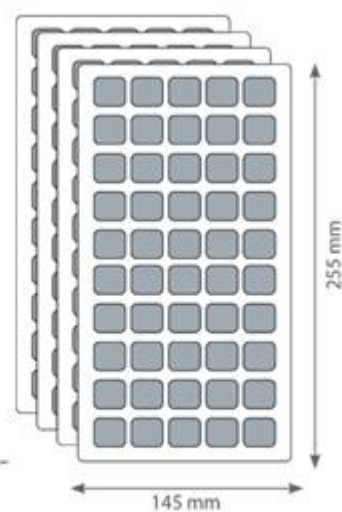
Top Side (70x70mm example PCB Reference Design)



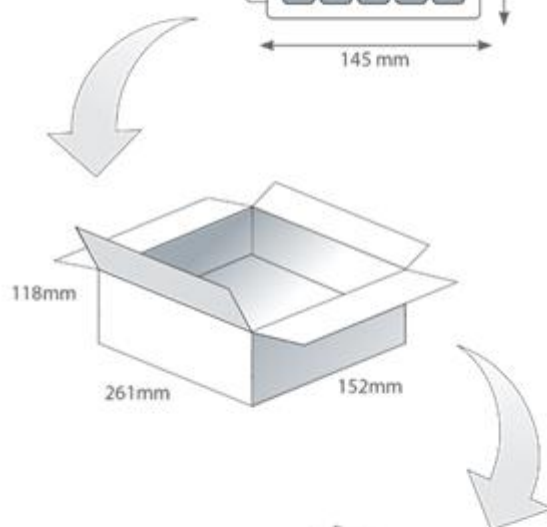
Bottom Side

5. Packaging

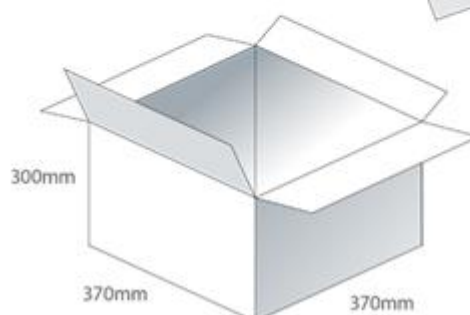
50 pcs CGGP.25.4.E.02 per tray
Tray Dimensions - 255*145*32mm
Weight - 519g



200 pcs CGGP.25.4.E.02 per Inner Carton
Inner Carton Dimensions - 261*152*118mm
Weight - 2.2kg



800 pcs CGGP.25.4.E.02 per Carton
Carton Dimensions - 370*370*300mm
Weight - 9.3kg



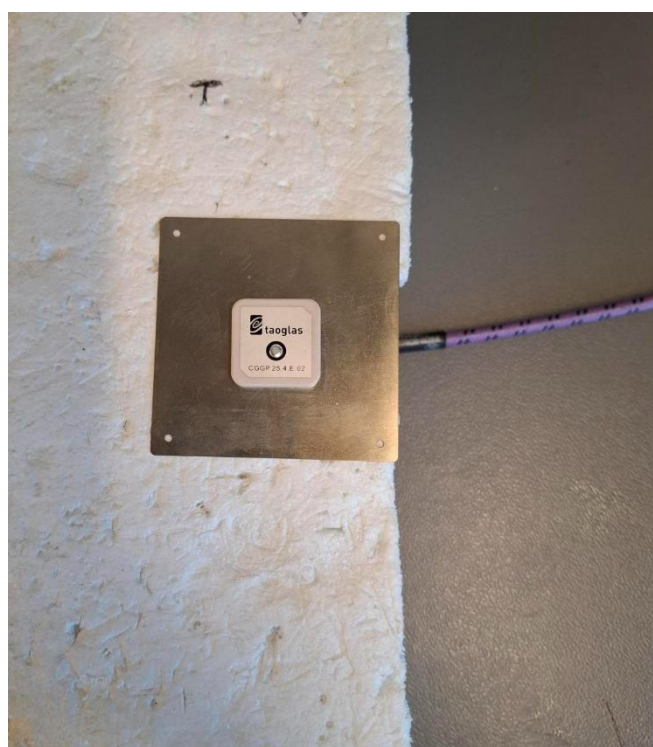
6. Antenna Characteristics

6.1 Test Setup

AUT

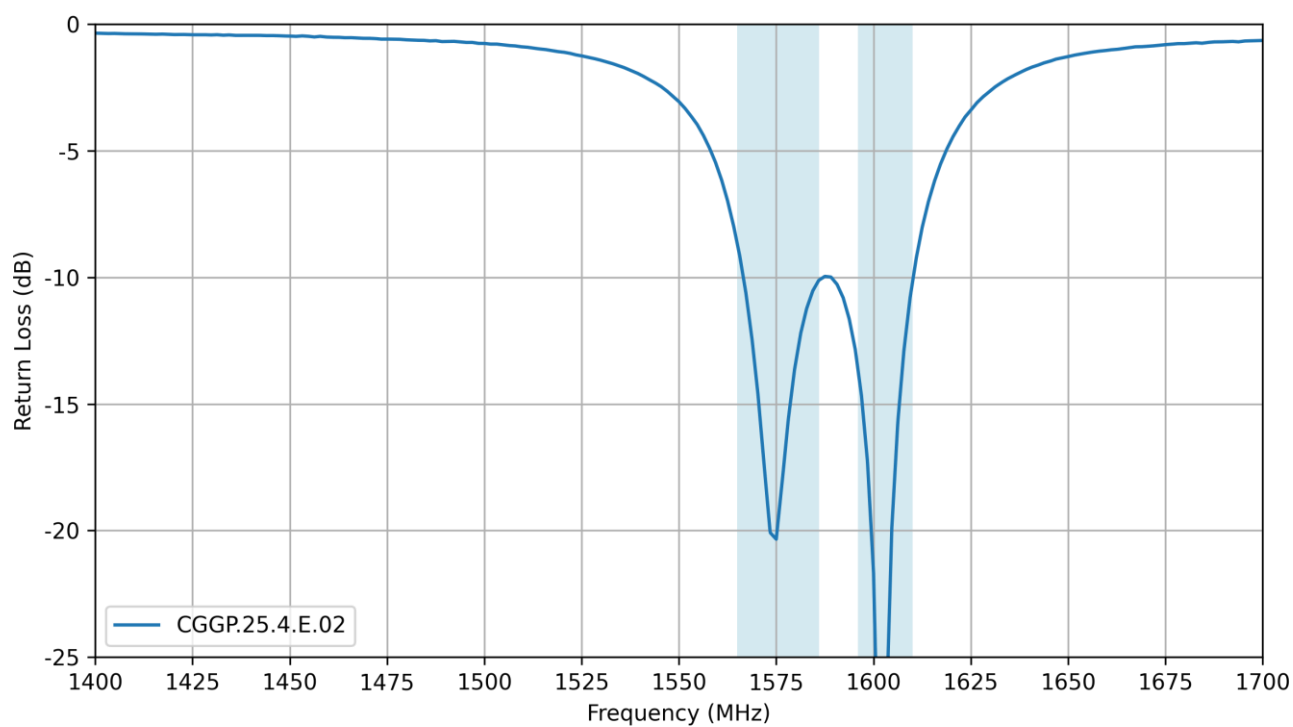


Vector Network Analyzer

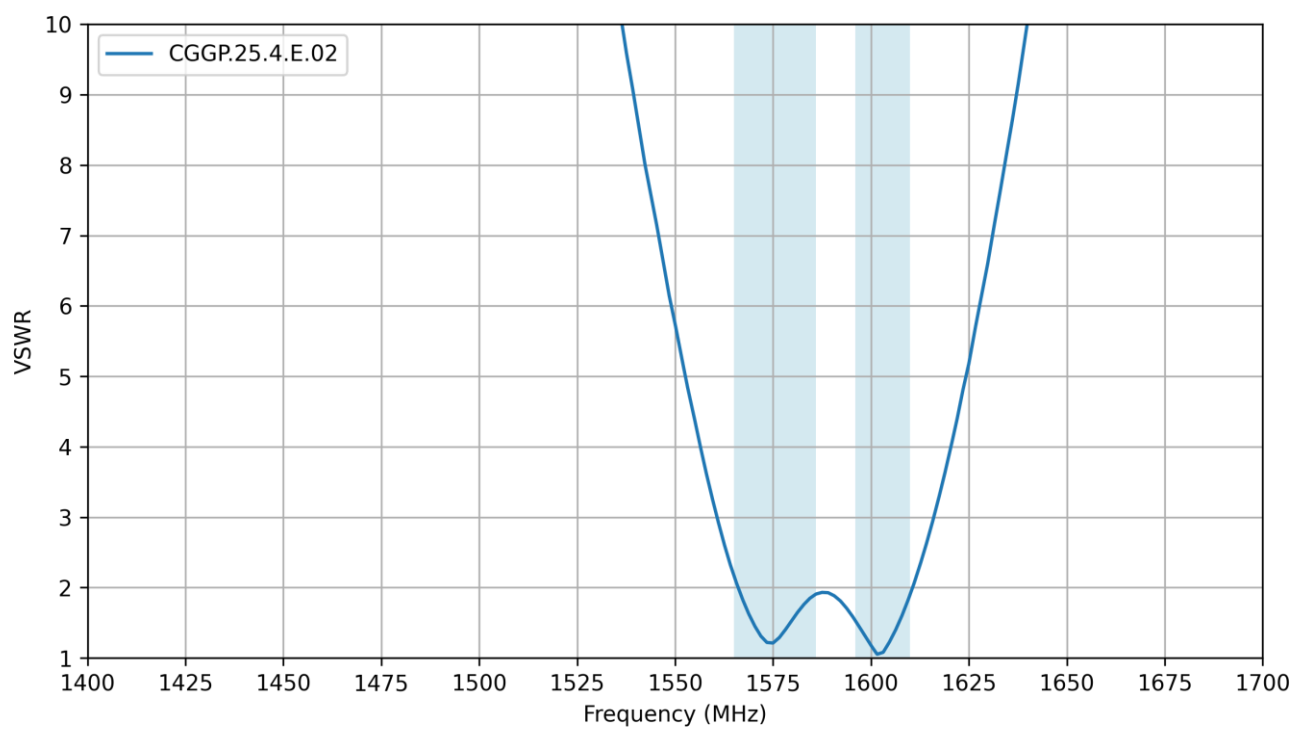


VNA Test Set-up

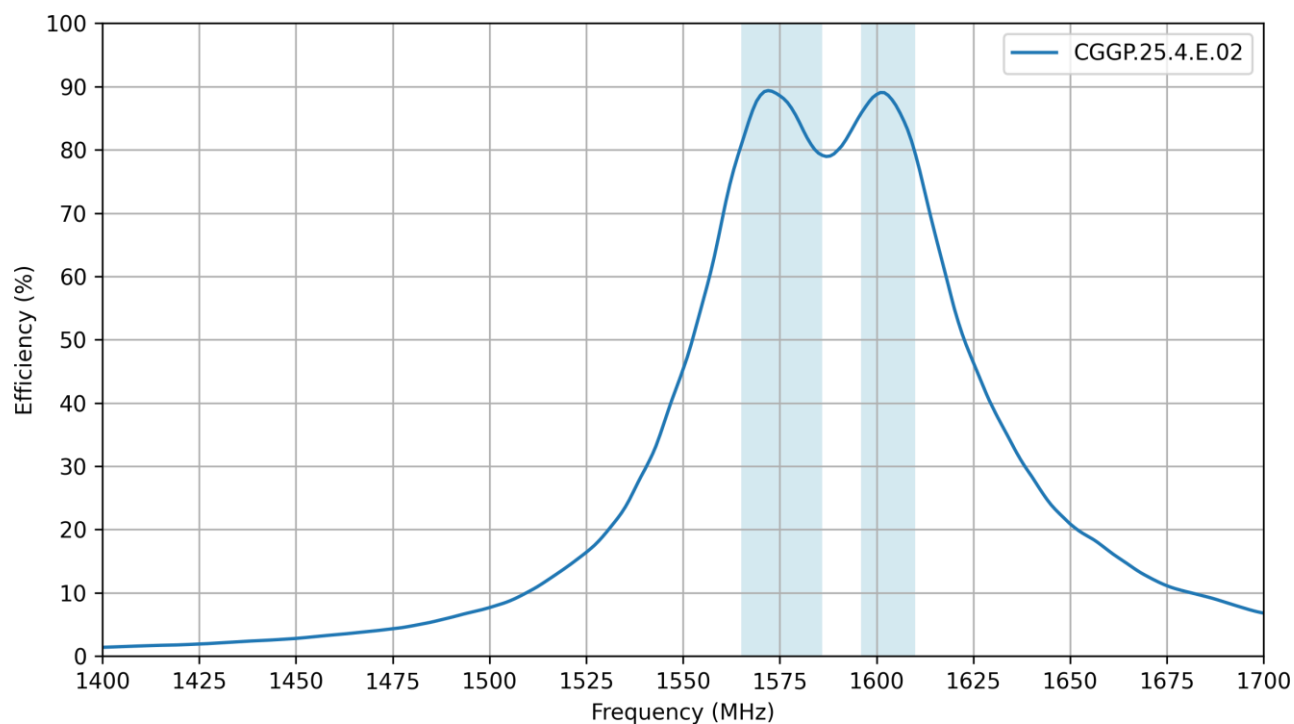
6.2 Return Loss



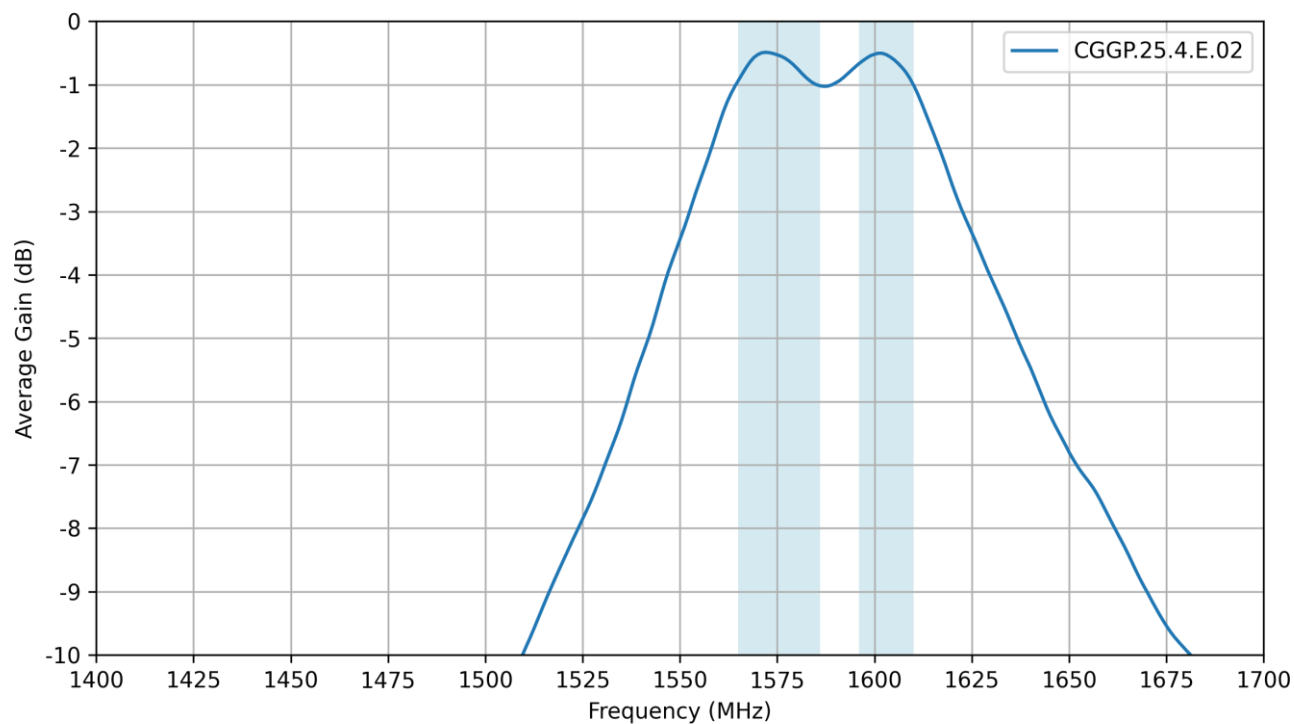
6.3 VSWR



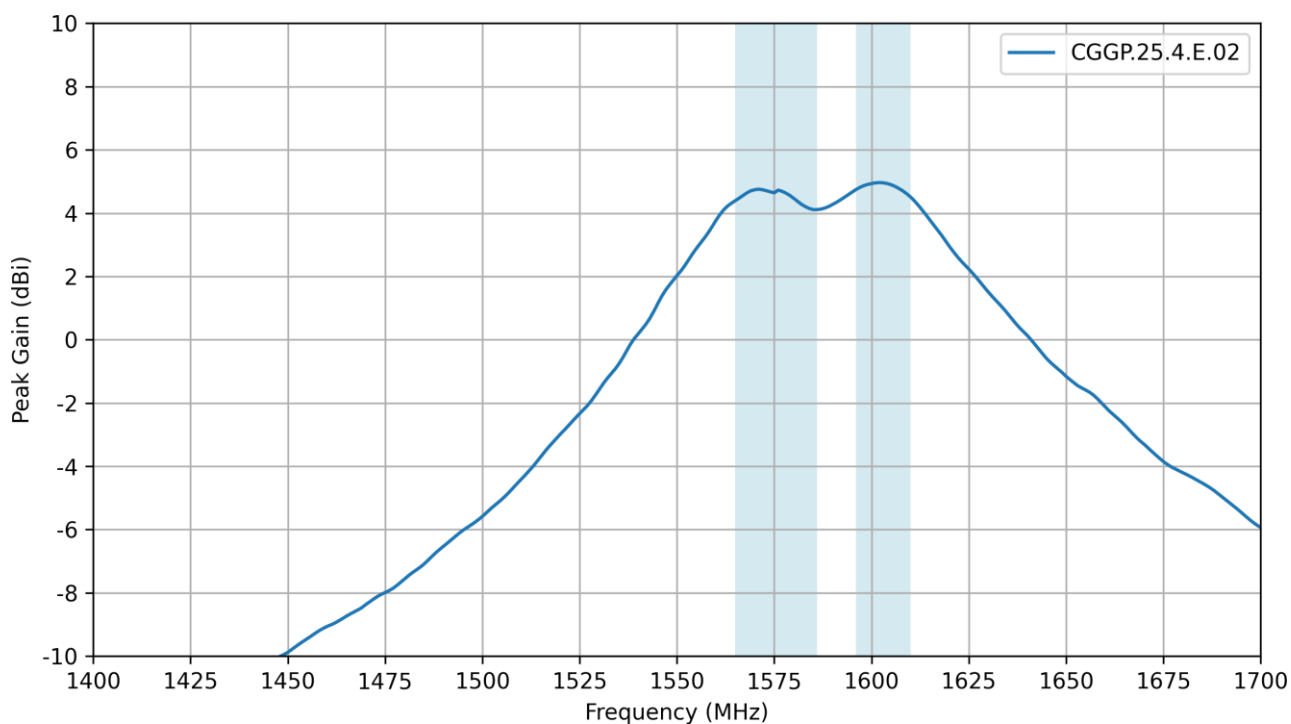
6.4 Efficiency



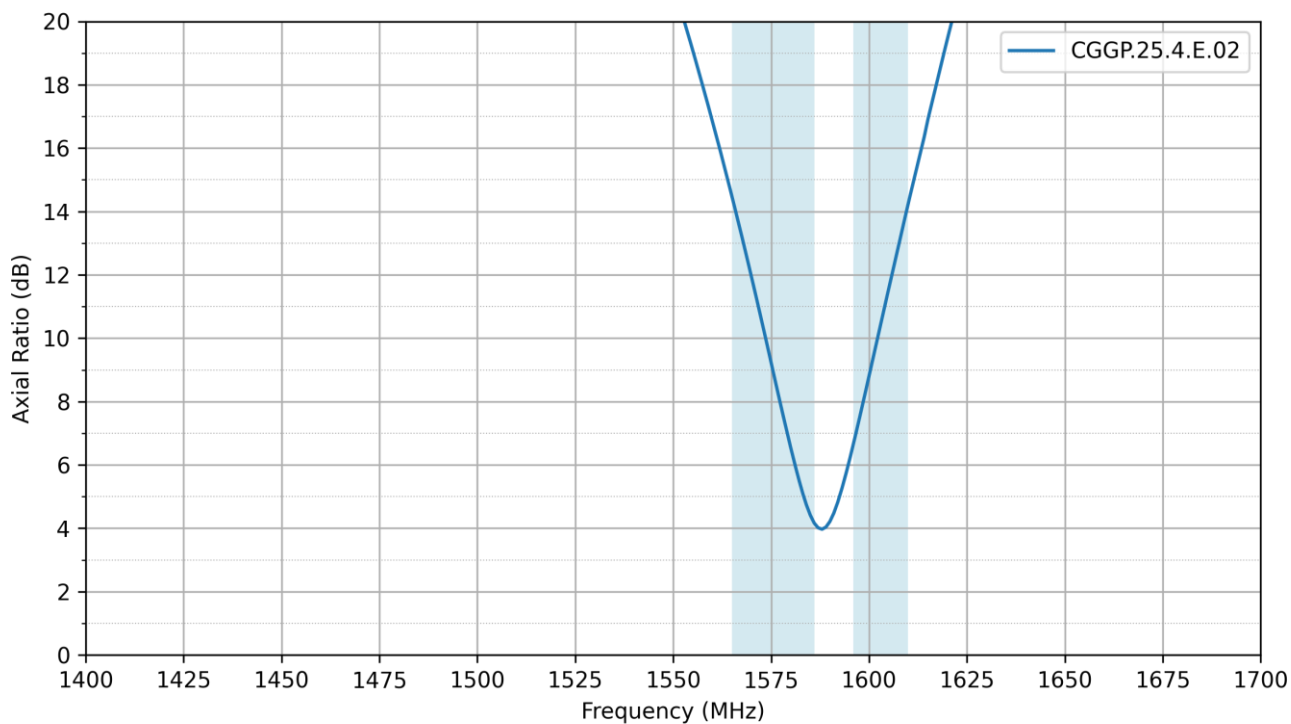
6.5 Average Gain



6.6 Peak Gain

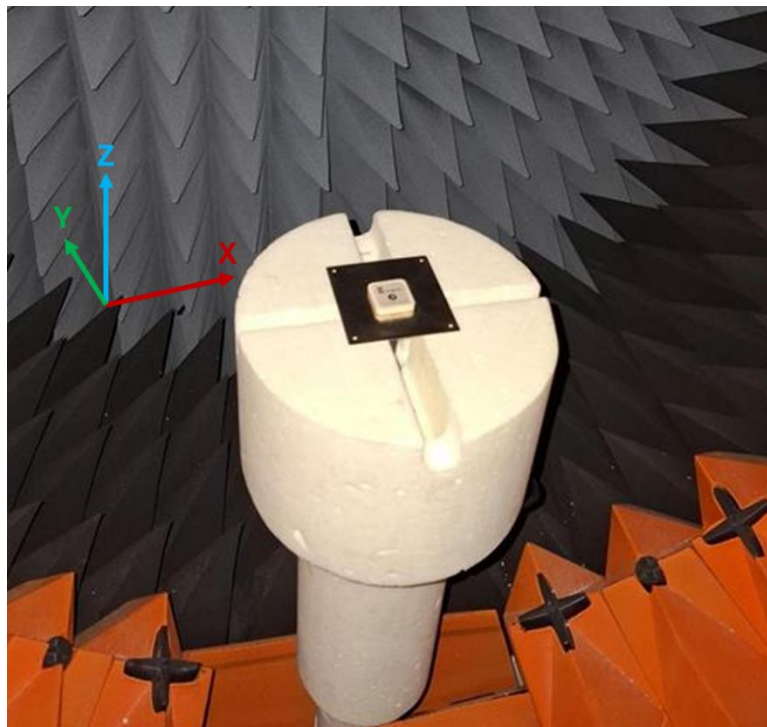
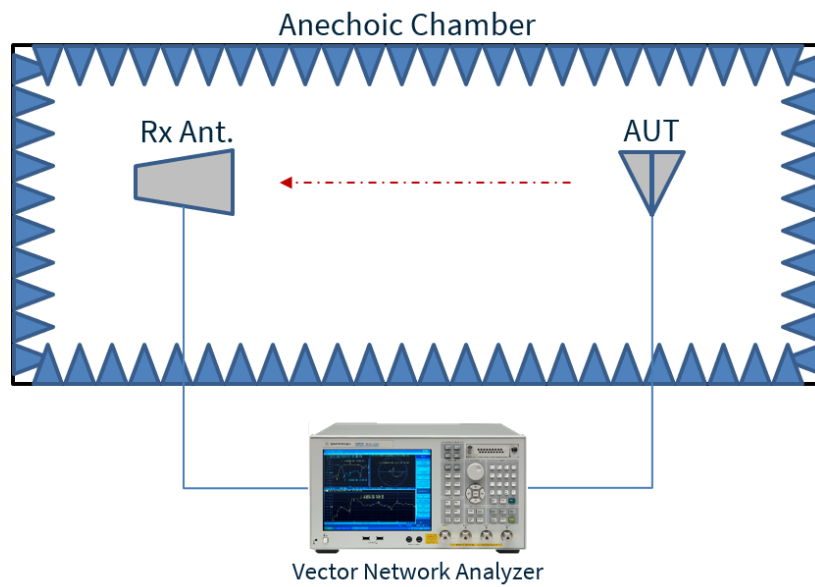


6.7 Axial Ratio



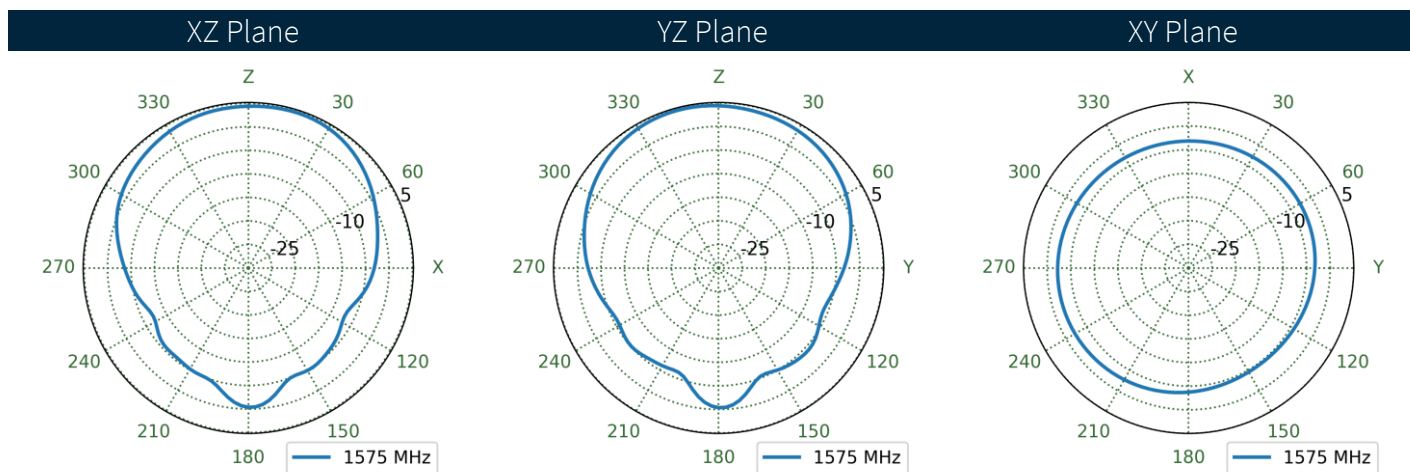
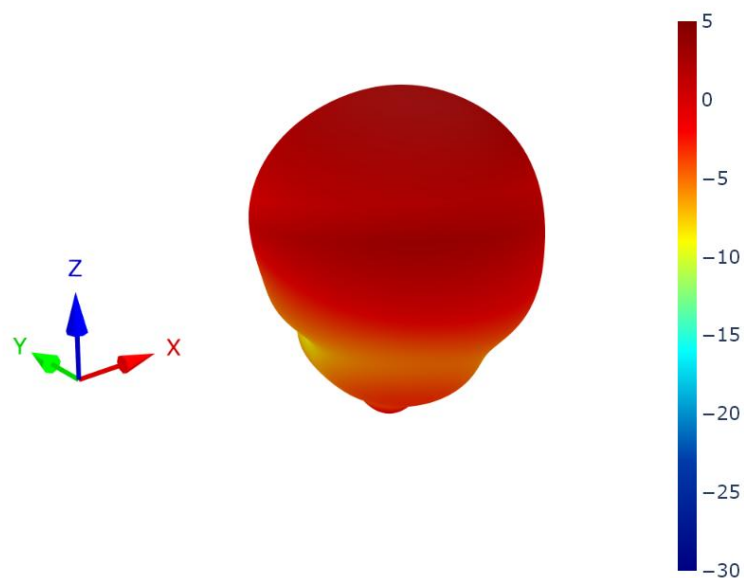
7. Radiation Patterns

7.1 Test Setup

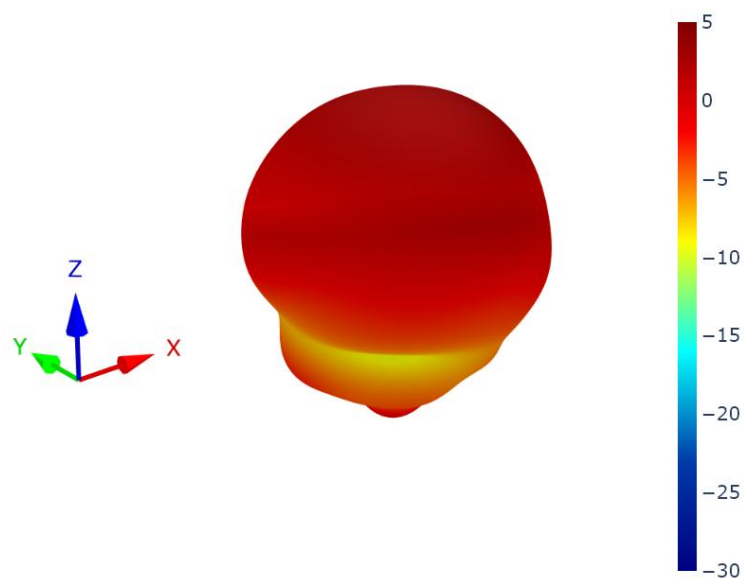


Chamber Test Set-up

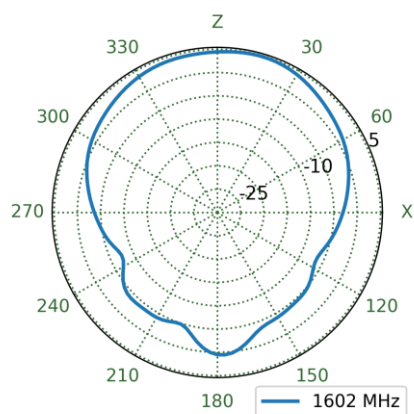
7.2 Patterns at 1575 MHz



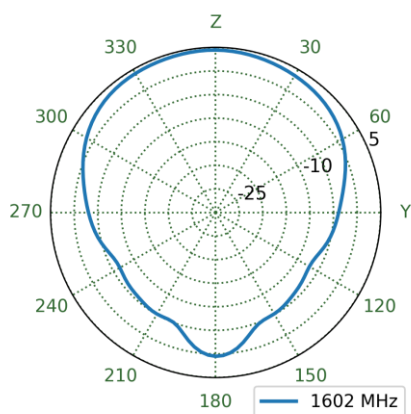
7.3 Patterns at 1602 MHz



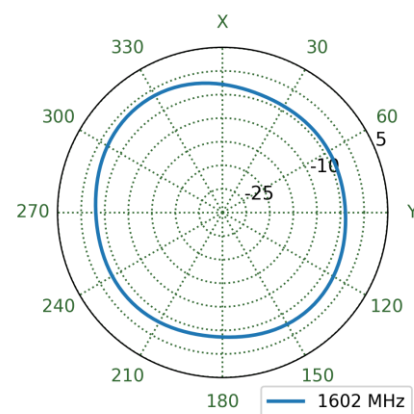
XZ Plane



YZ Plane



XY Plane



Changelog for the datasheet

SPE-16-8-018 – CGGP.25.E.02

Revision: H (Current Version)

Date:	2025-07-02
Changes:	Full datasheet update
Changes Made by:	Gary West

Previous Revisions

Revision: G

Date:	2024-05-24
Changes:	Removed moisture sensitivity level information from datasheet
Changes Made by:	Conor McGrath

Revision: B

Date:	2019-11-15
Changes:	Updated Images Reference ECR-18-8-259
Changes Made by:	Russell Meyler

Revision: F

Date:	2023-02-27
Changes:	Integration Guide Added
Changes Made by:	Cesar Sousa

Revision: A (Original First Release)

Date:	2016-09-03
Notes:	
Author:	Jack Conroy

Revision: E

Date:	2022-02-17
Changes:	Updated Packaging Graphic
Changes Made by:	Paul Doyle

Revision: D

Date:	2021-06-12
Changes:	Updated Pin Length to 2.4mm Updated Drawing
Changes Made by:	Dan Cantwell

Revision: C

Date:	2020-11-19
Changes:	Updated to new format Added Moisture Sensitivity Level 3 to Environmental Specifications
Changes Made by:	Dan Cantwell



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