TAOGLAS

Datasheet

Part No:
SGGP.25.4.A.02

Description

GPS/GLONASS/GALILEO SMD Patch Antenna

Features:

Dimensions: 25mm*25mm*4mm

Single Feed SMD Mount

GPS/GALILEO: 1575MHz

GLONASS: 1602MHz

RoHS & REACH Compliant

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1. Introduction

The Taoglas SGGP.25 is a ceramic GPS/GLONASS/Galileo passive patch antenna designed for optimal performance on GPS L1/Galileo E1 band (1575.42 MHz) and GLONASS L1 band (1602 MHz). With a low-profile thickness of just 4mm and convenient mounting via standard SMD process, it is ideal for high-volume, low-cost assembly applications.

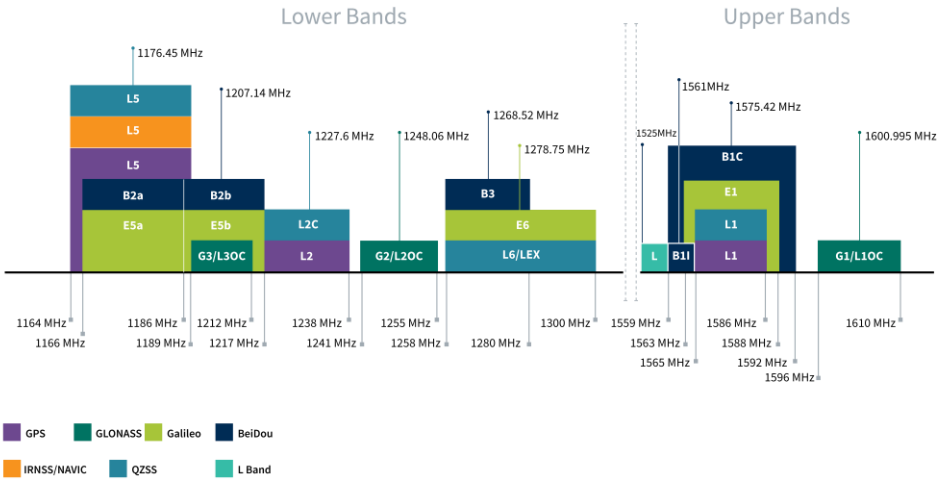
SGGP.25 is designed for applications in navigation devices, vehicle tracking/fleet management systems, and telematics devices. It is an excellent choice for applications in transportation, defense, marine, agriculture, and navigation industries.

The SGGP.25 is manufactured and tested in an IATF16949 first tier automotive approved facility. For further optimization to customer-specific device environments, custom tuned patch antennas can be supplied, subject to NRE and MOQ.

For further information or support with integrating this antenna into your device, 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 1575.42 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

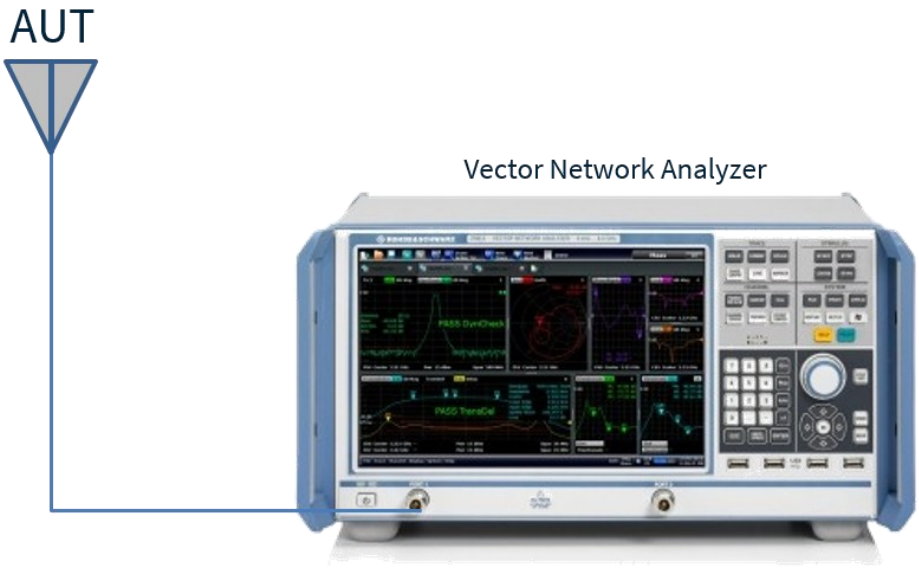
GNSS Electrical			
Frequency (MHz)	**1561**	**1575.42**	**1603**
VSWR (max.)	3:1	3:1	5:1
Passive Antenna Efficiency (%)	78.49	78.41	73.49
Passive Antenna Gain at Zenith (dBic)	3.66	3.66	3.04
Polarization	RHCP		
Impedance	50 Ω		

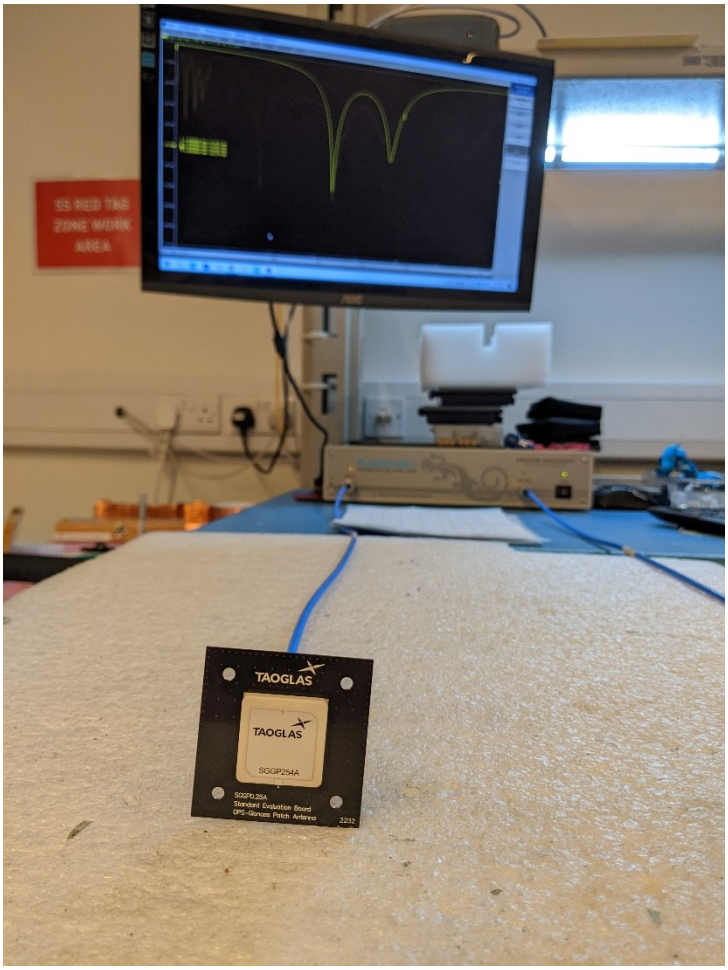
Mechanical	
Dimensions	25*25*4mm
Weight	7g
Material	Ceramic

Environmental	
Operating Temperature	-40ºC to +85ºC
Storage Temperature	-40ºC to +85ºC
Moisture Sensitivity Level (MSL)	3 (168 Hours)

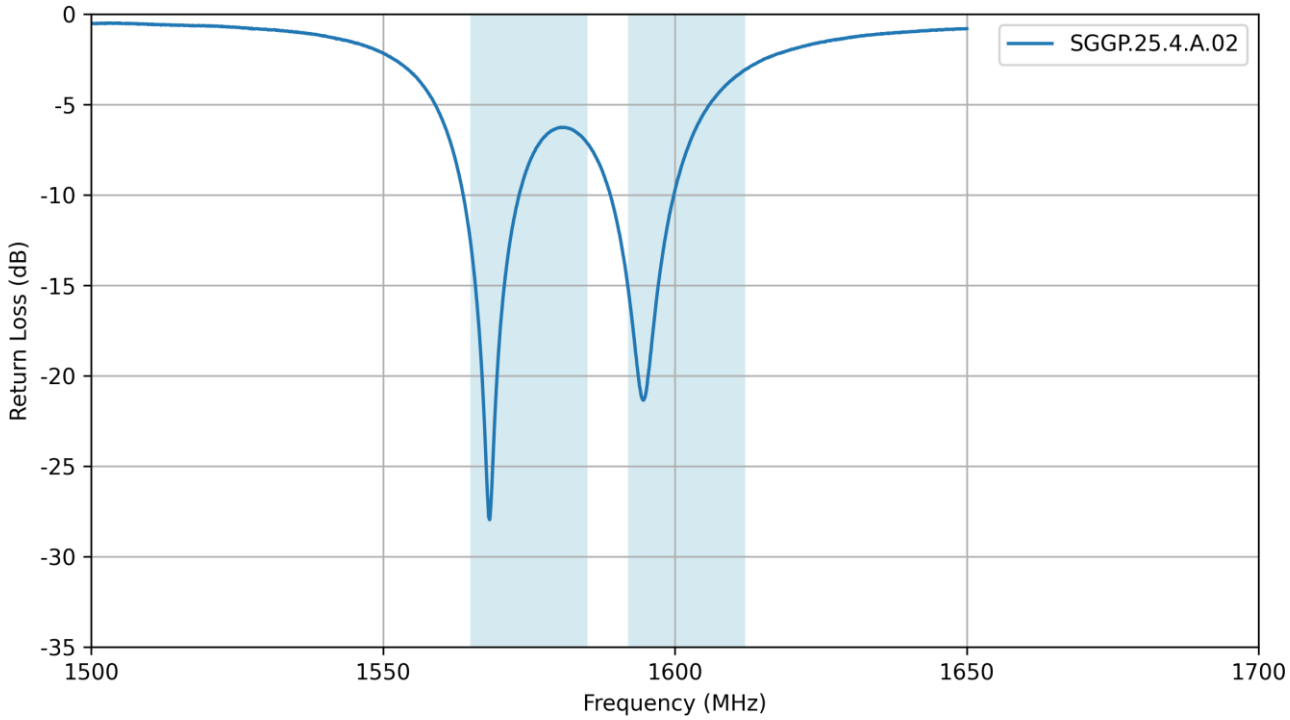
3. Antenna Characteristics

3.1 Test Setup

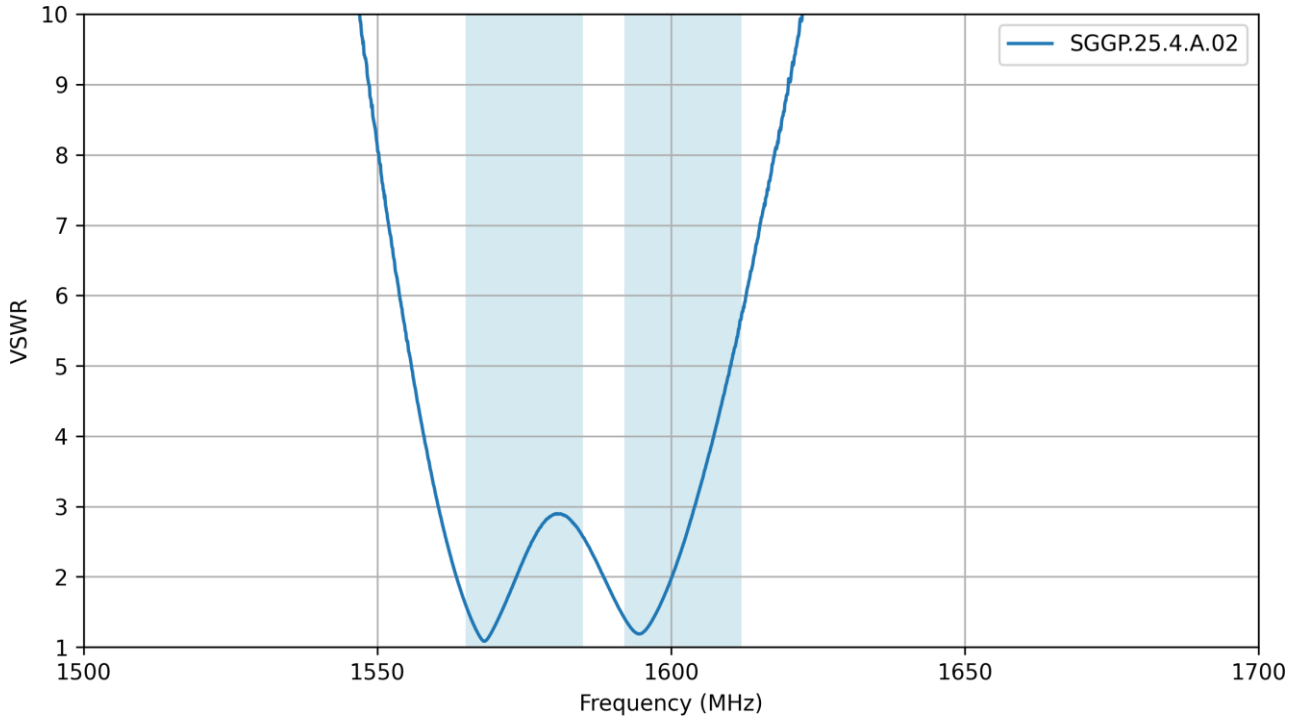




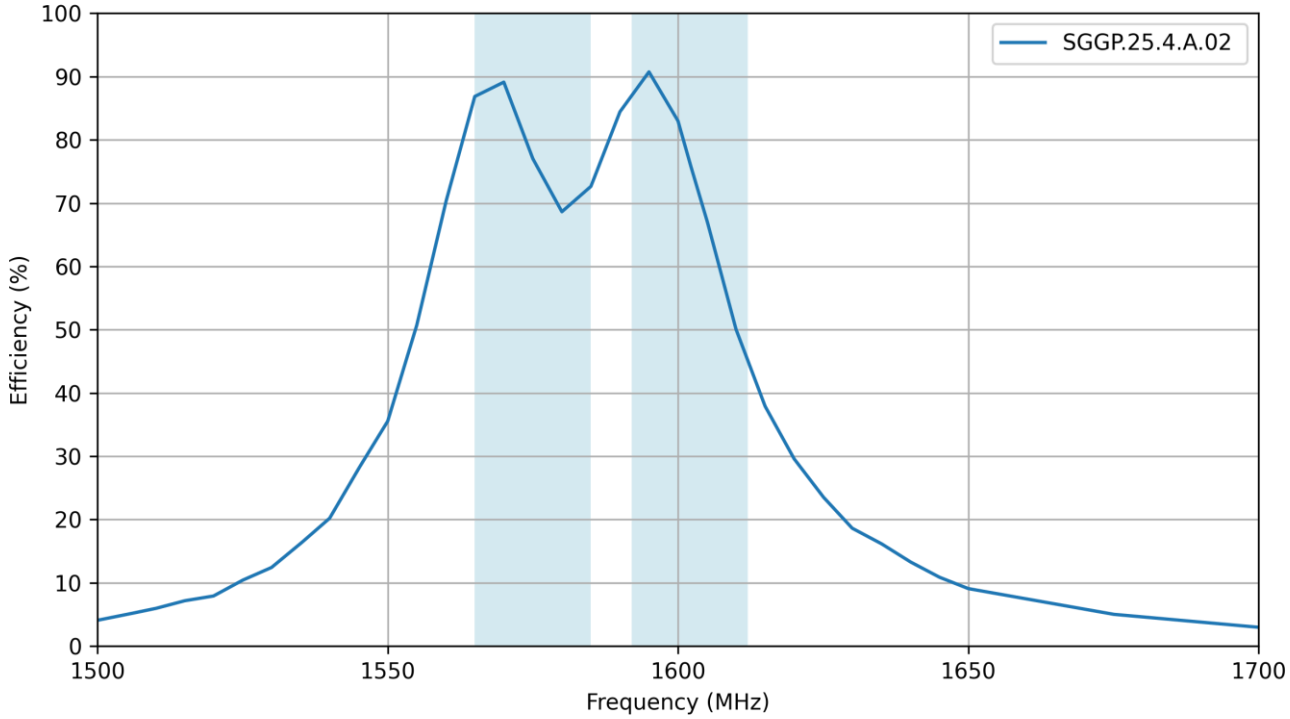
3.2 Return Loss



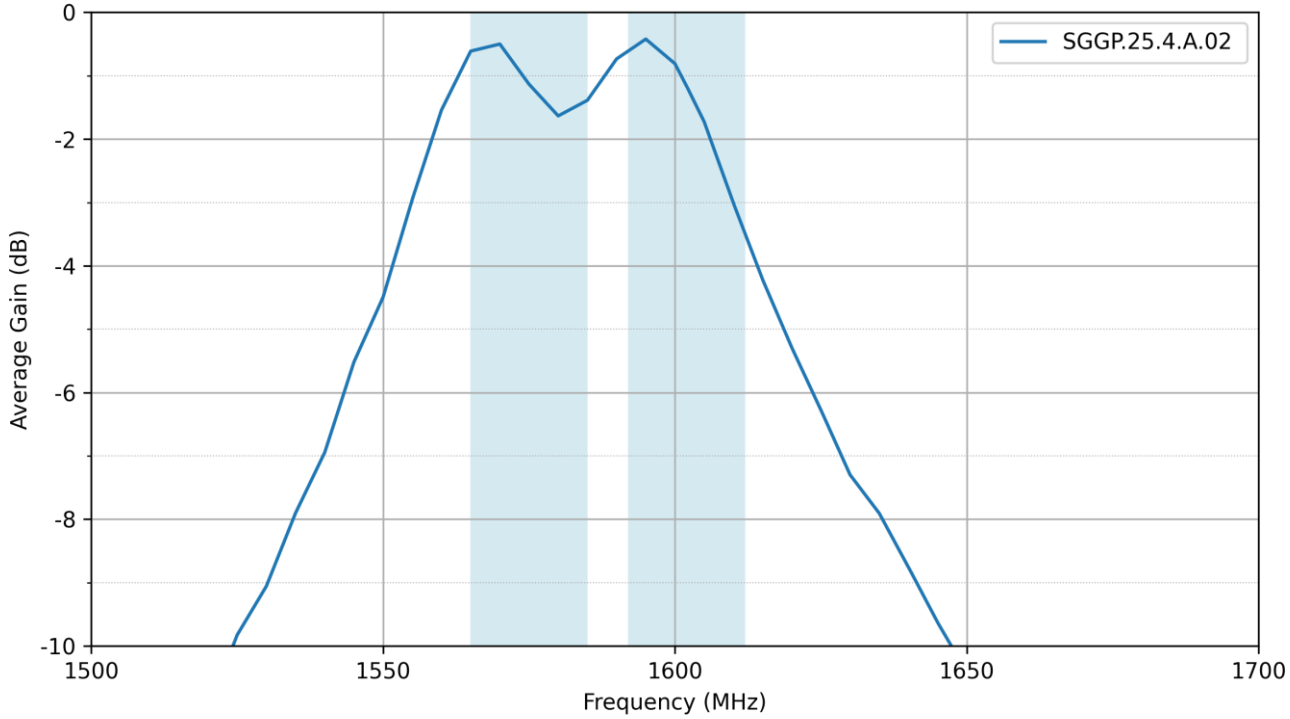
3.3 VSWR



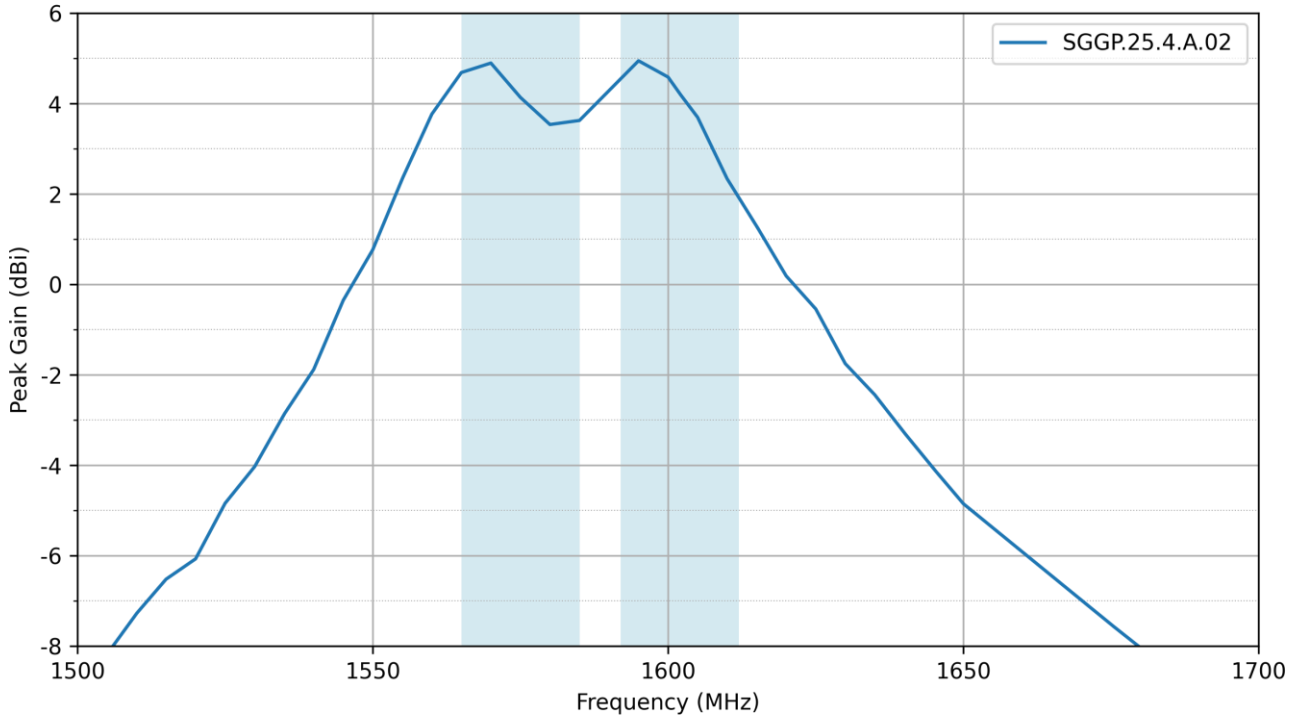
3.4 Efficiency



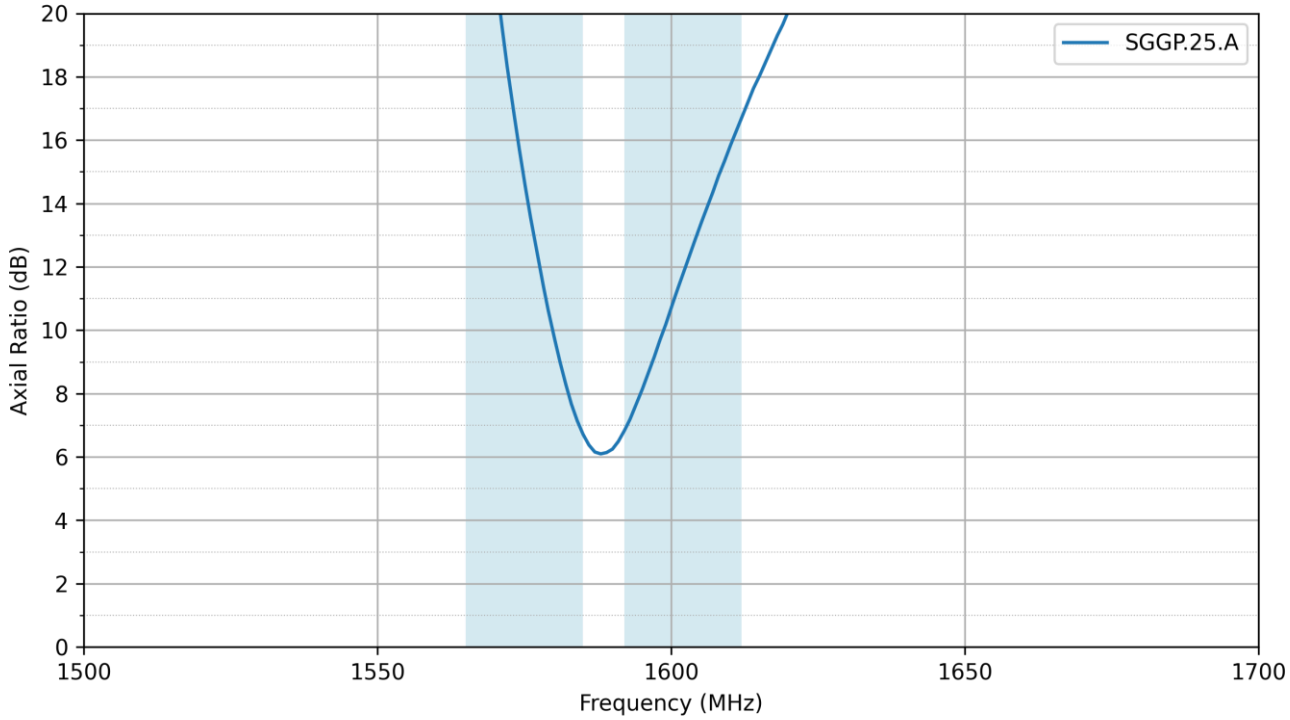
3.5 Average Gain



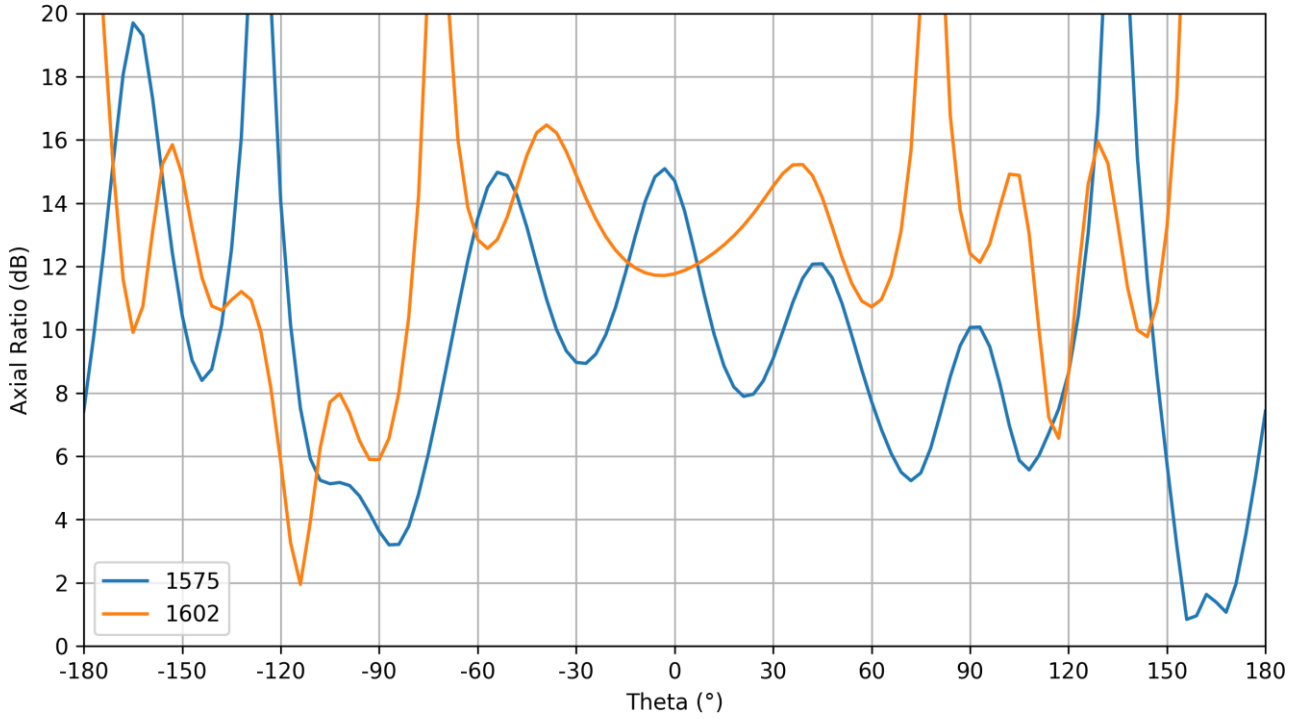
3.6 Peak Gain



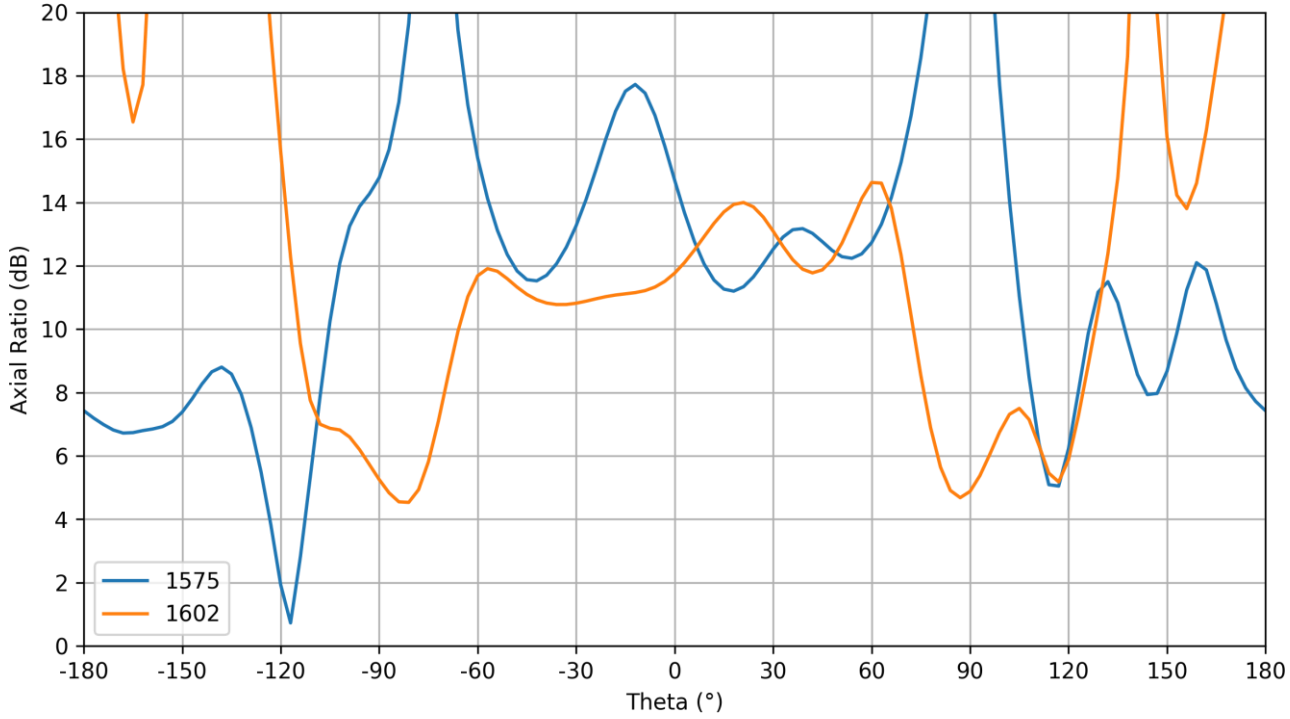
3.7 Axial Ratio



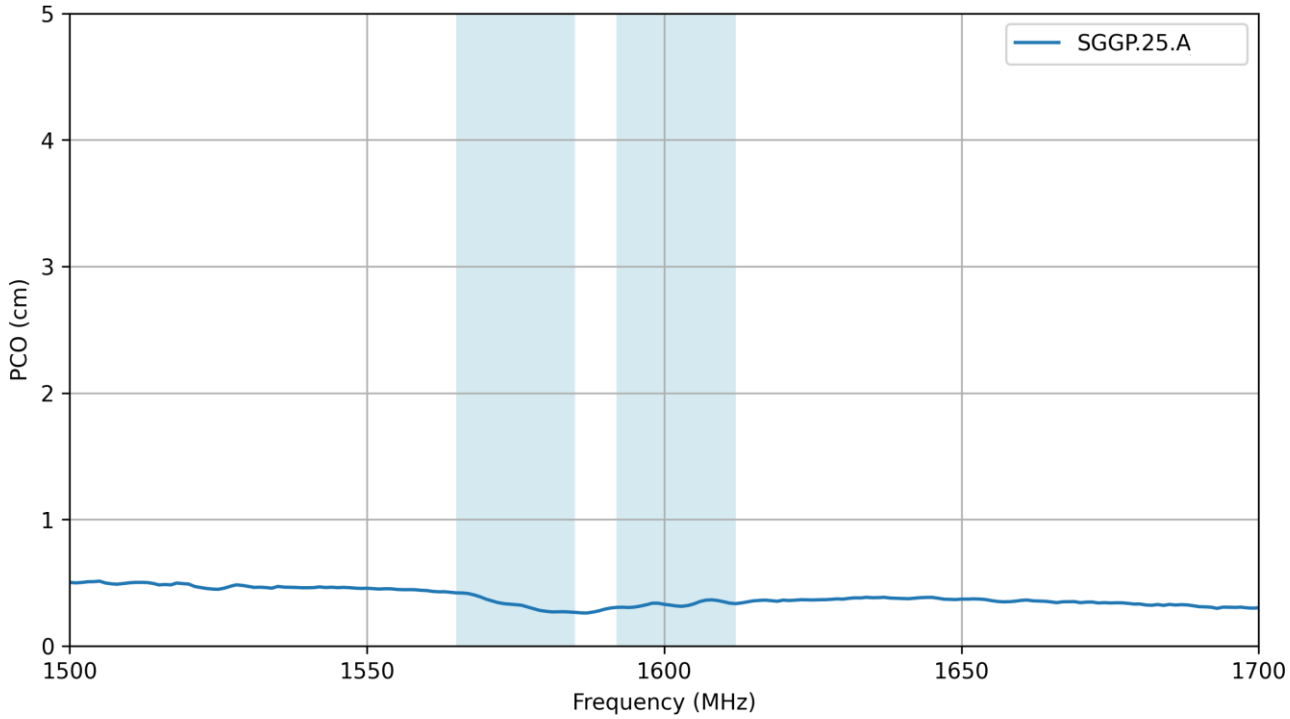
3.8 Axial Ratio vs Angle for Phi=0



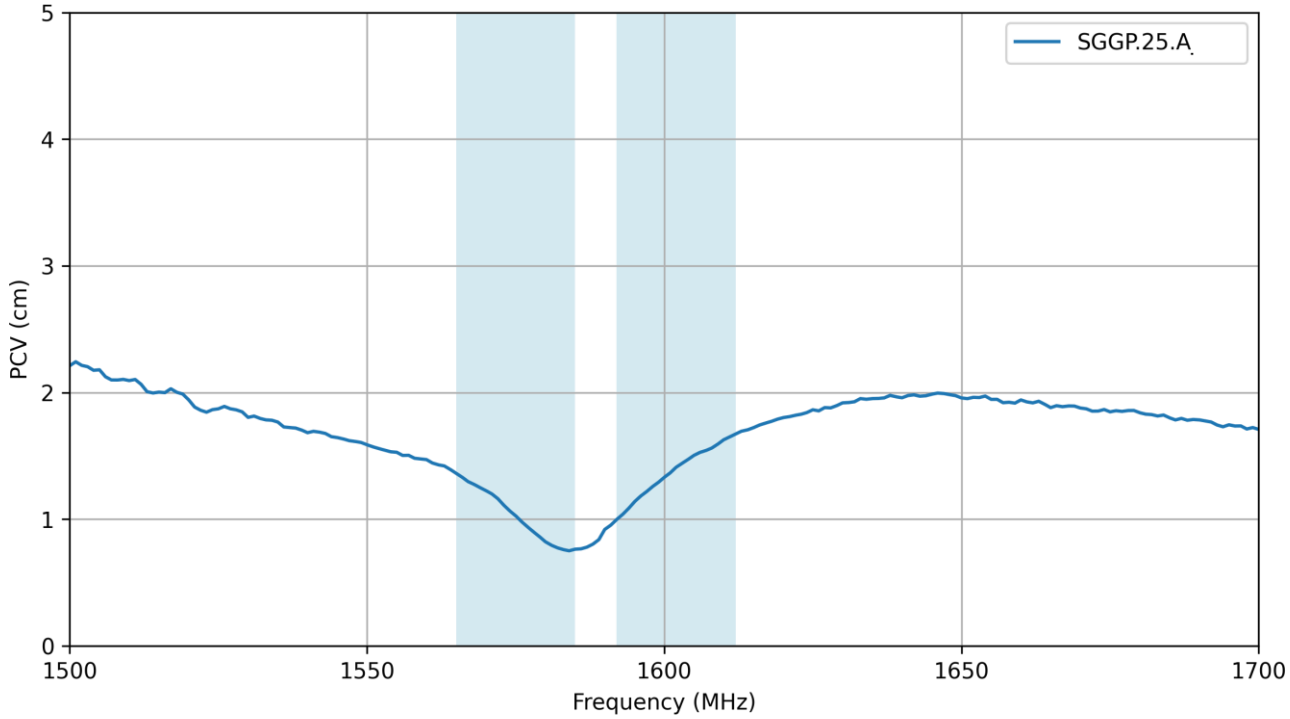
3.9 Axial Ratio vs Angle for Phi=90



3.10 PCO

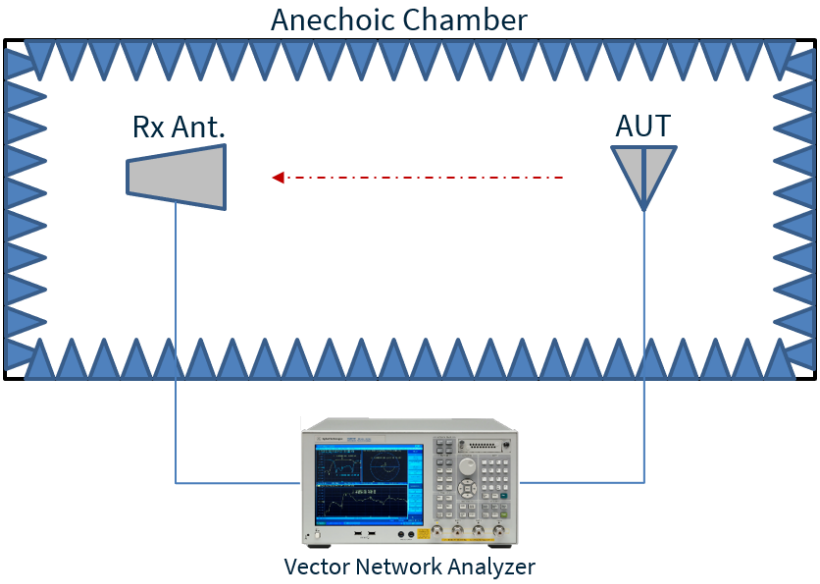


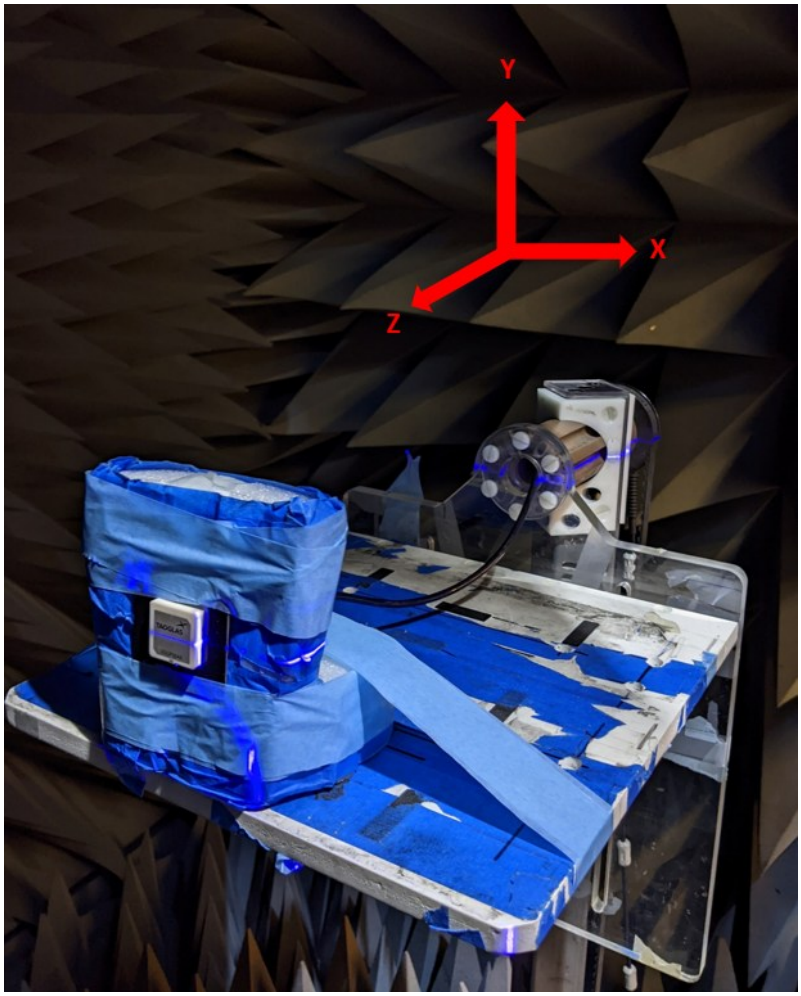
3.11 PCV



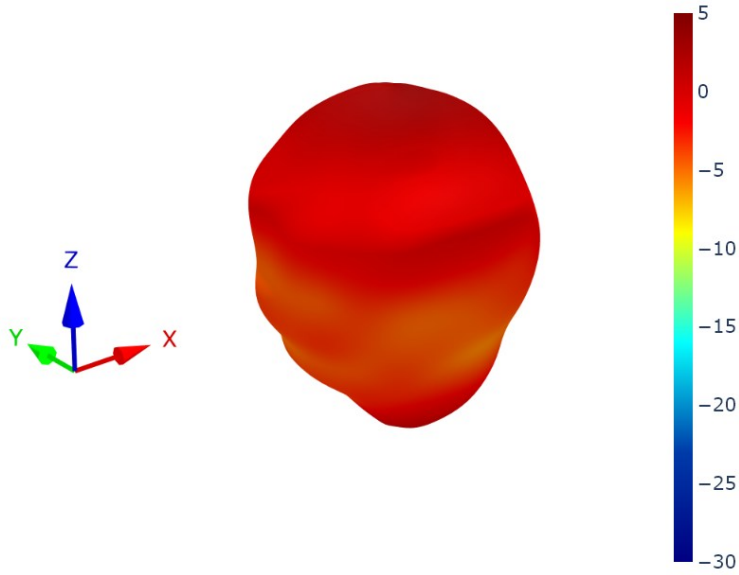
4. Radiation Patterns

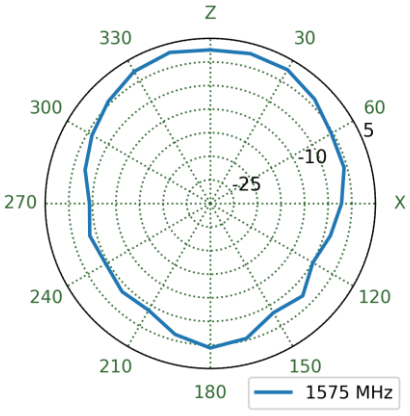
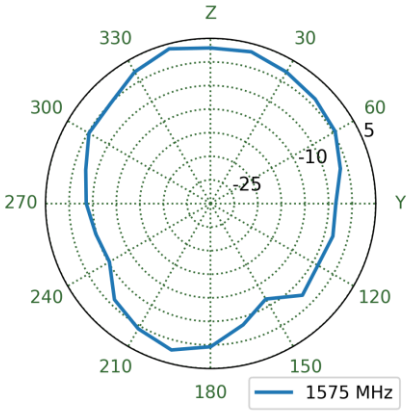
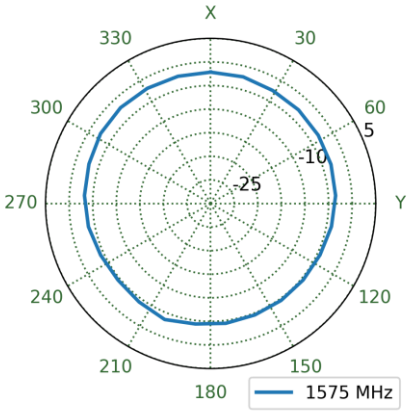
4.1 Test Setup



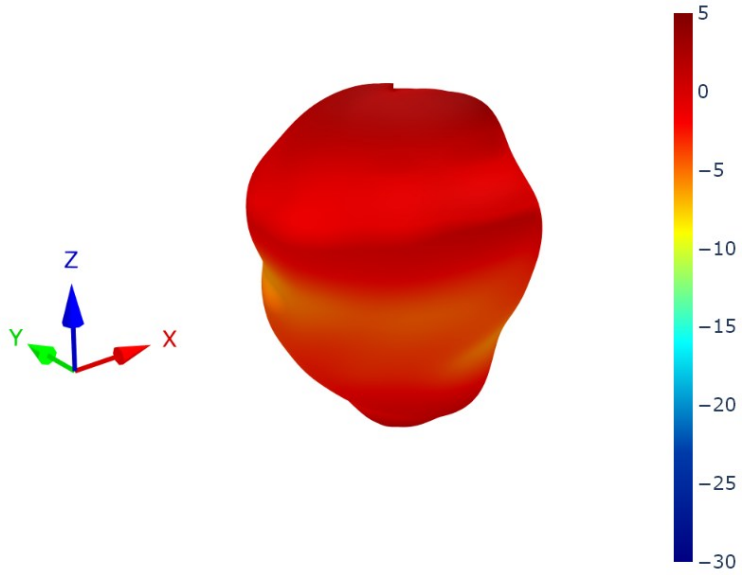


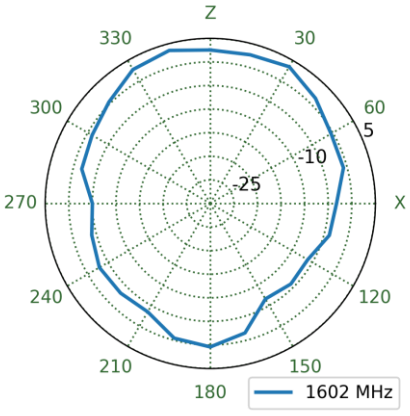
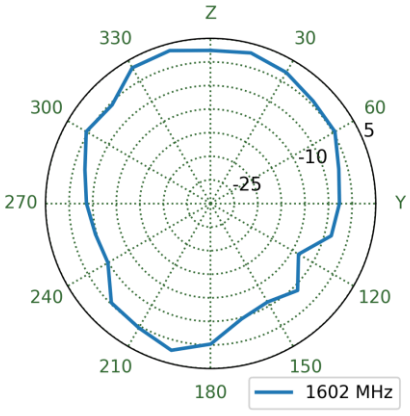
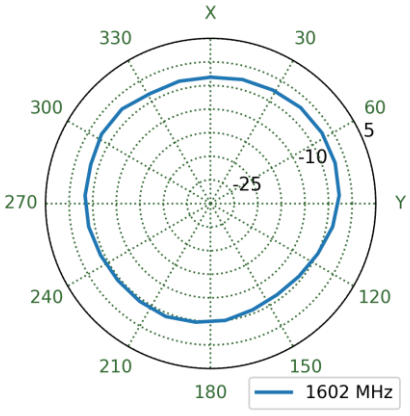
4.2 SGGP.25.4.A.02 - Patterns at 1575 MHz



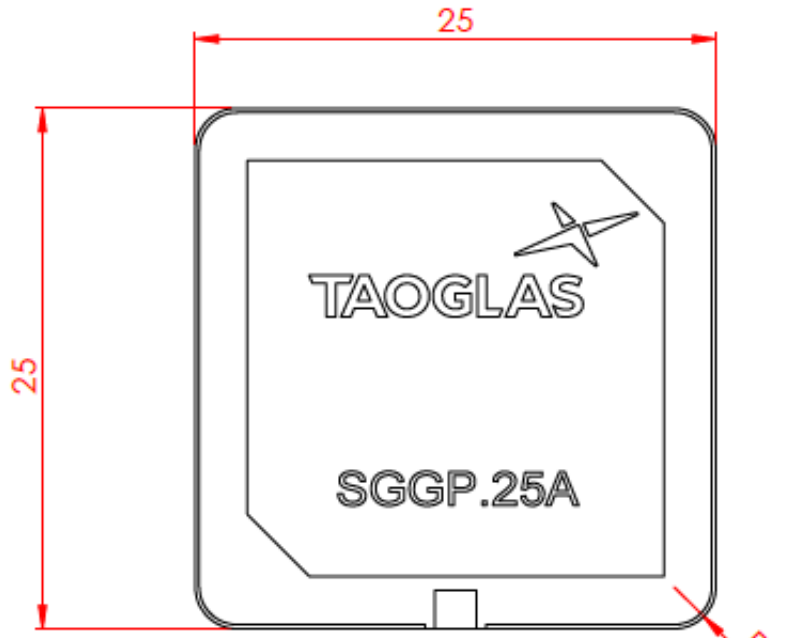
XZ Plane	YZ Plane	XY Plane
		

4.3 SGGP.25.4.A.02 - Patterns at 1602 MHz

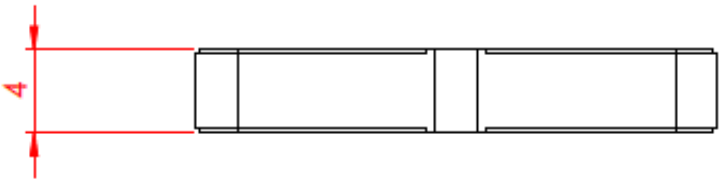


XZ Plane	YZ Plane	XY Plane
		

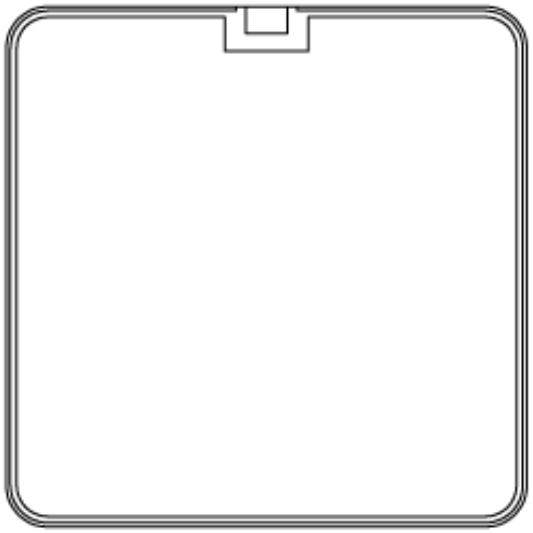
5. Mechanical Drawing



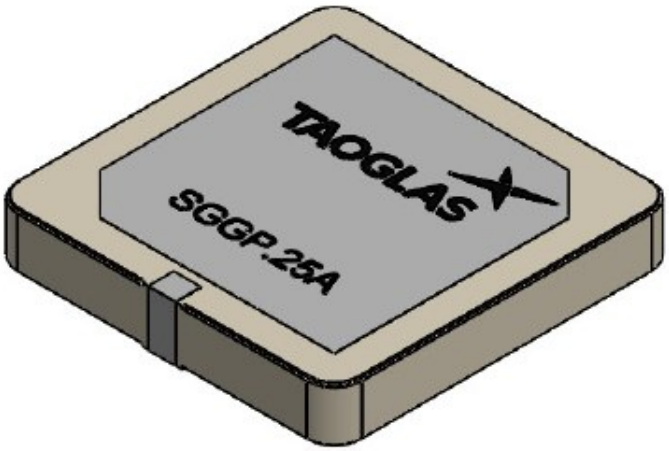
TOP VIEW



FRONT VIEW

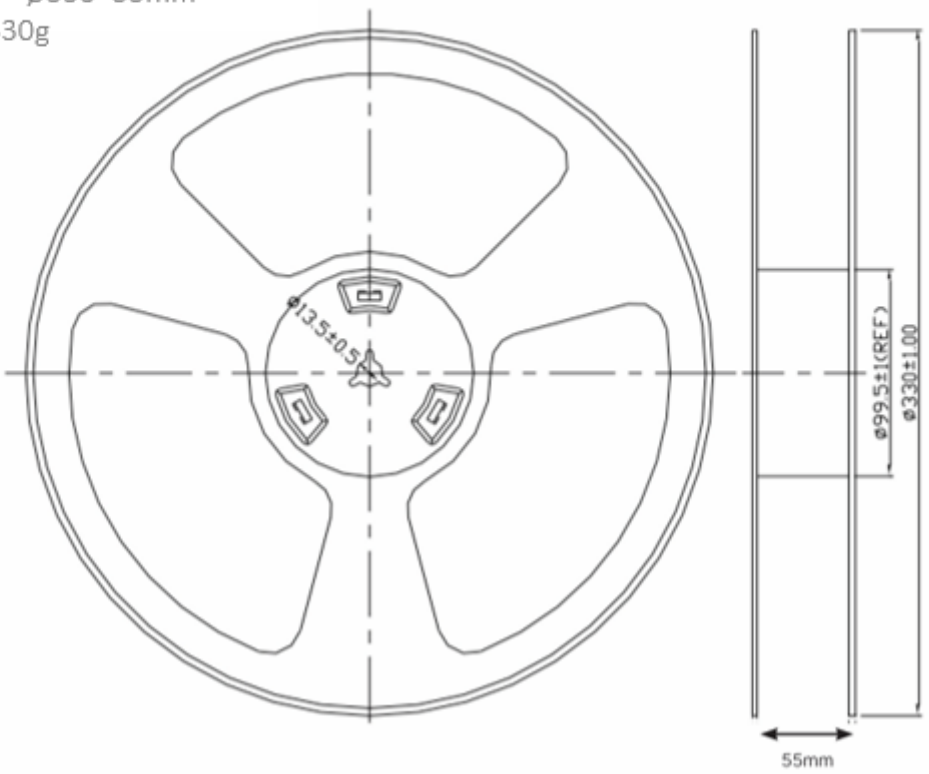


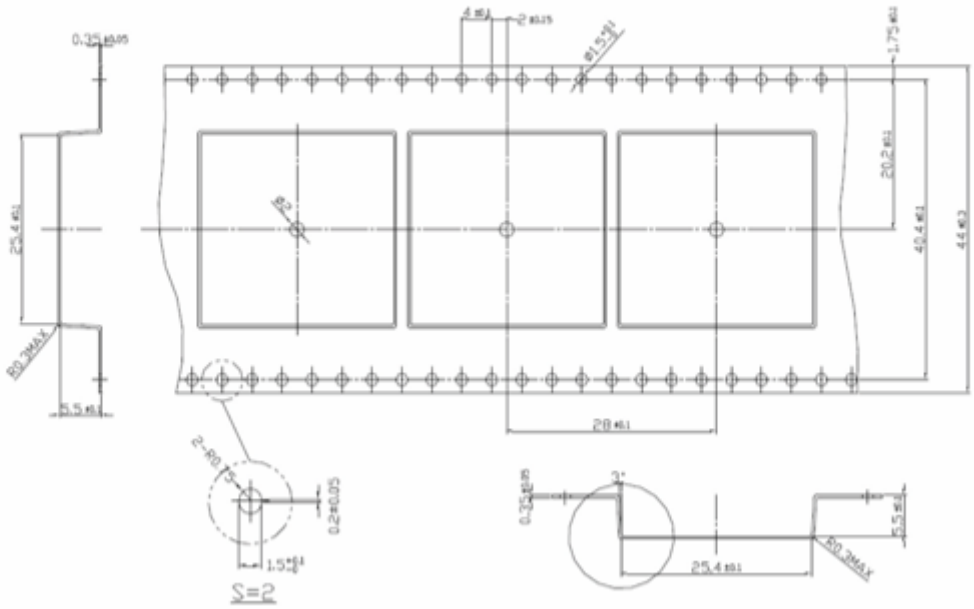
BOTTOM VIEW



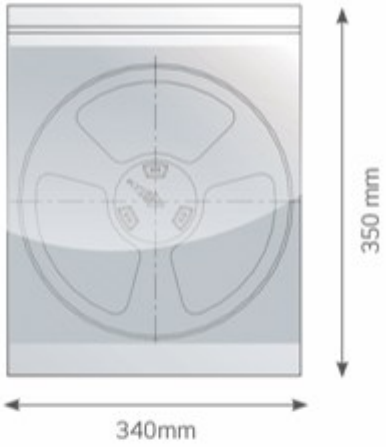
6. Packaging

200 pc SGGP.25.4.A.02 per reel
Dimensions – Ø330*55mm
Weight – 2330g

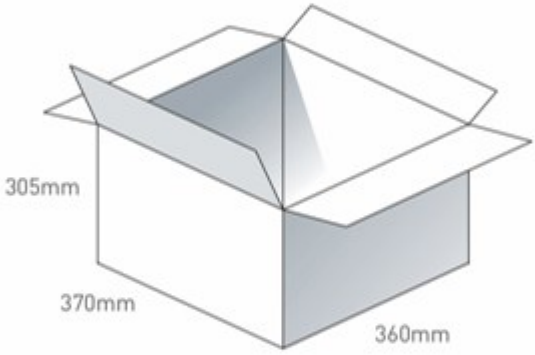




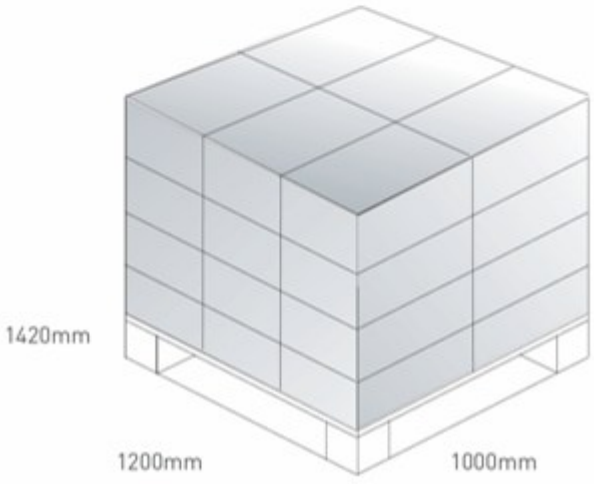
1 pc reel in small anti-static bag
Dimensions – 340*350*70mm
Weight – 2.63Kg



4 reels / 800 pcs in one carton
Carton Dimensions – 370*360*305mm
Weight – 11.3Kg

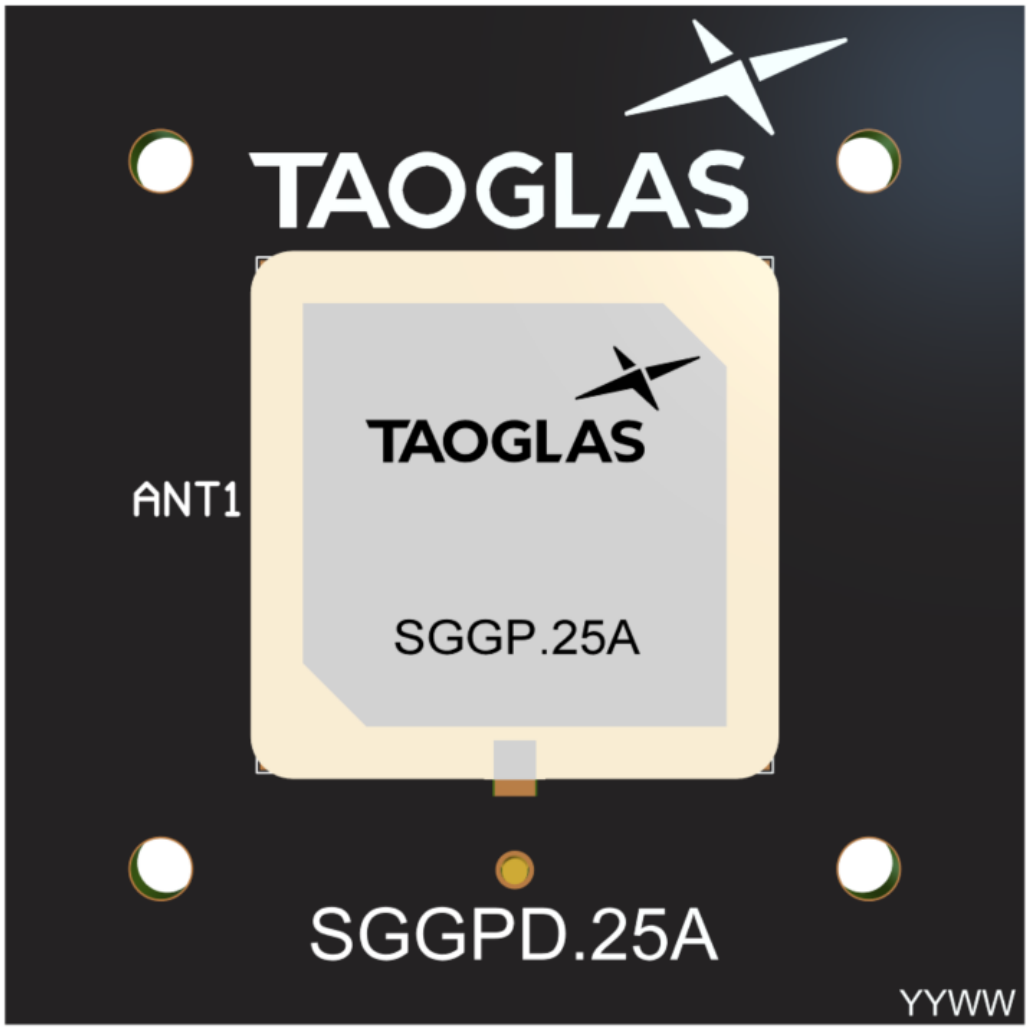


Pallet Dimensions – 1200*1000*1420mm
24 Cartons per pallet
6 Cartons per layer
4 Layers



7. Antenna Integration Guide

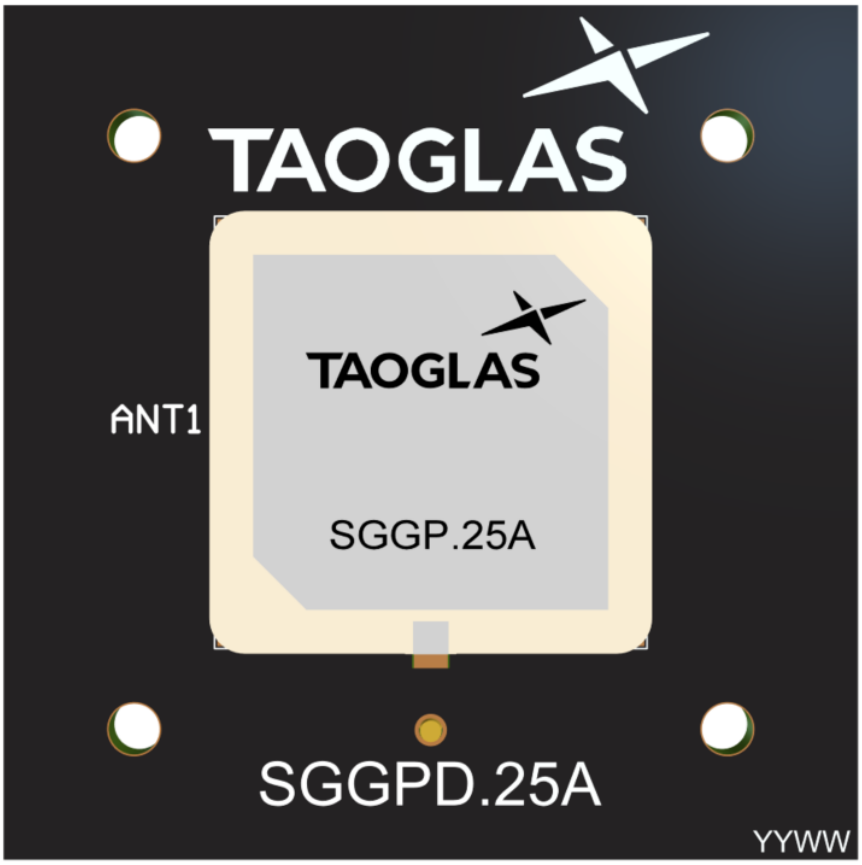
The following is an example on how to integrate the SGGP.25.4.A.02 antenna into a design. The SGGP.25.4.A.02 has one pin which is used for the RF Feed. Taoglas recommends using a minimum of 50x50mm ground plane to ensure optimal performance.



Top view of PCB.

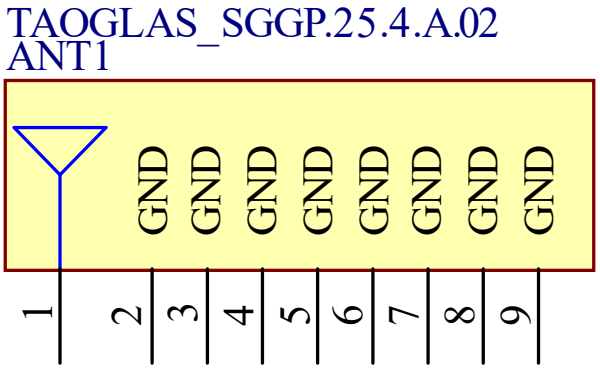
Please find the Integration files in Altium, 2D formats and the 3D model for the SGGP.25.4.A.02 here: https://www.taoglas.com/product/sggp-12-4-a-02-gpsglonass-smd-mount-patch-12mm-2/

7.1 Schematic and Symbol Definition



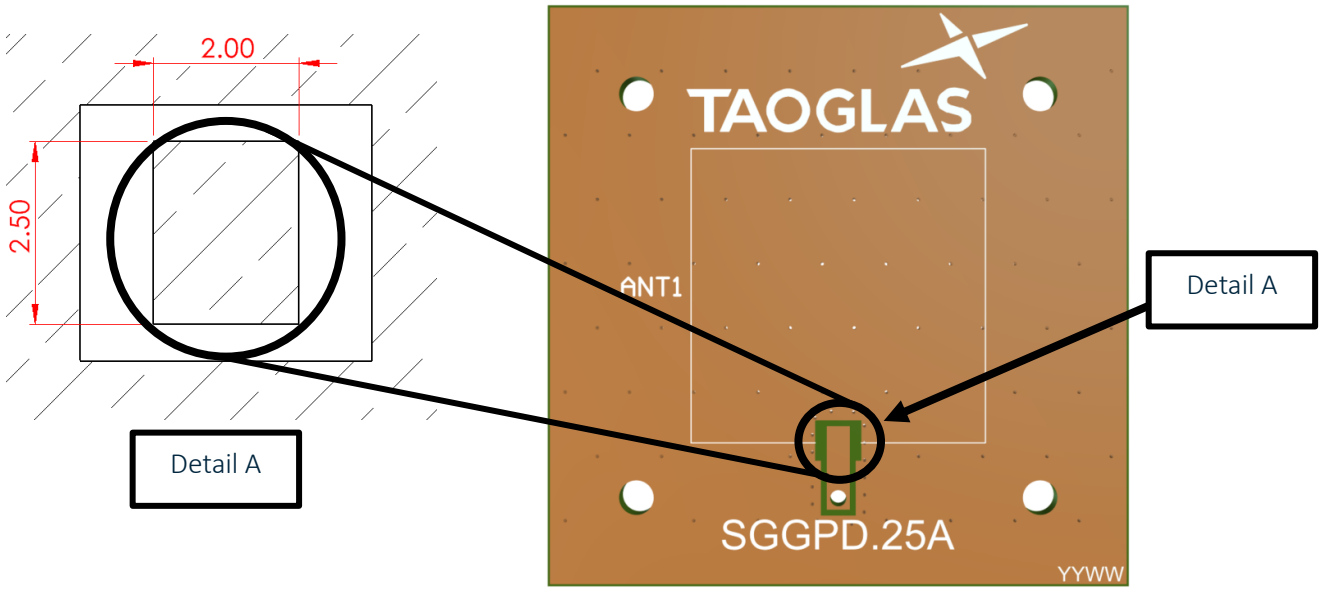
Above is the 3D model of the SGGP.25.4.A.02 on the PCB.

Pin	Description
1	RF Feed
2-9	Ground



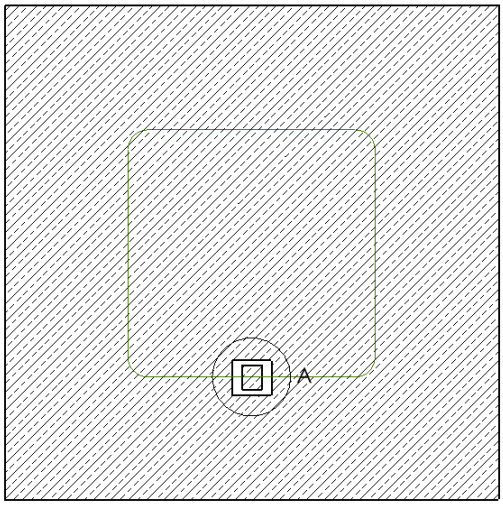
Above is a schematic symbol of SGGP.25.4.A.02 and a table of the pin definitions.

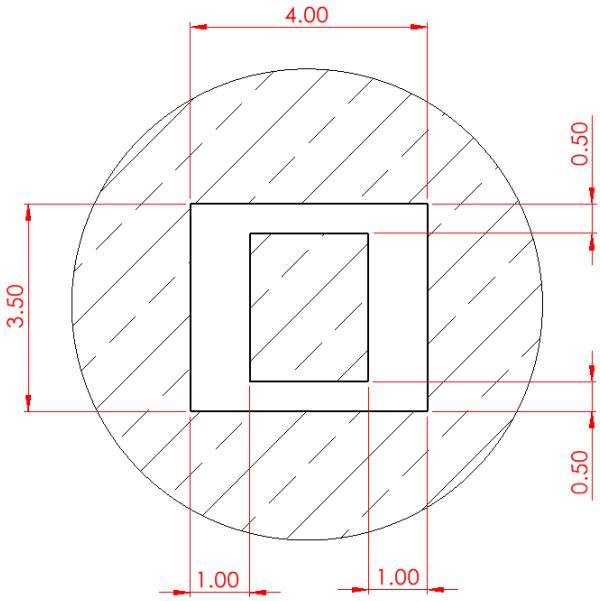
7.2 Footprint



*Hatched area is copper

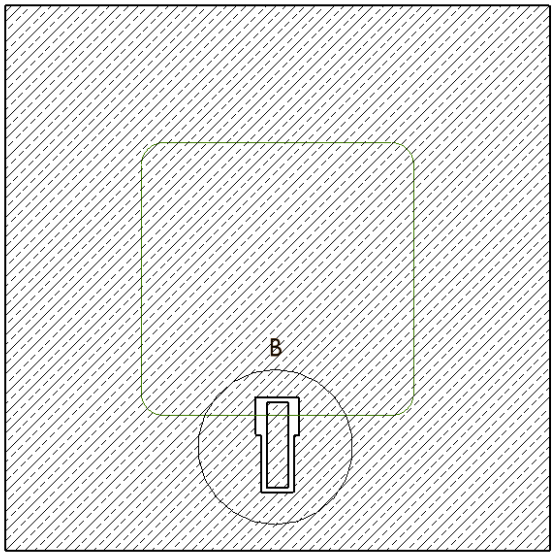
7.3 Copper Keep-Out

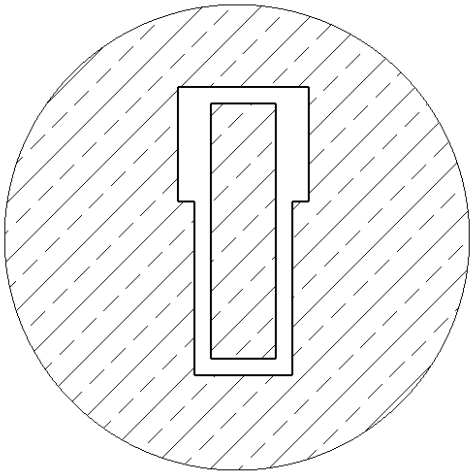




DETAIL A
SCALE 12 : 1

*Hatched area is copper

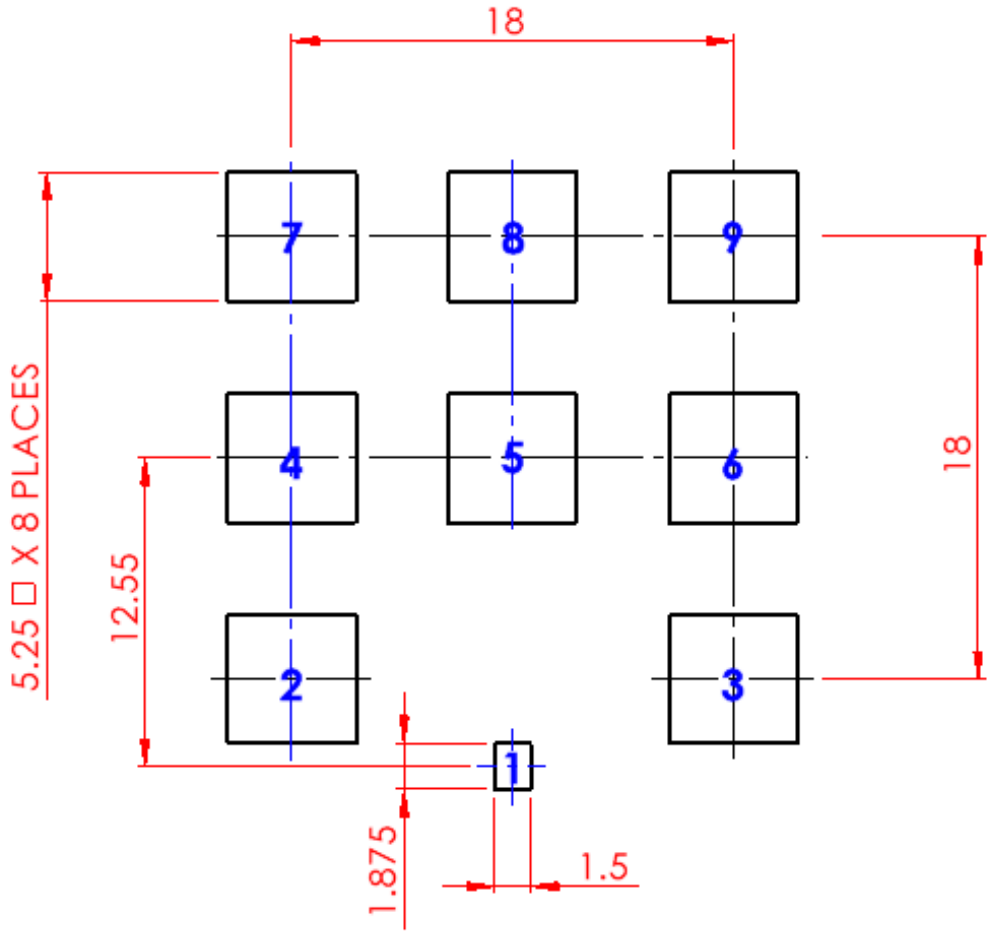




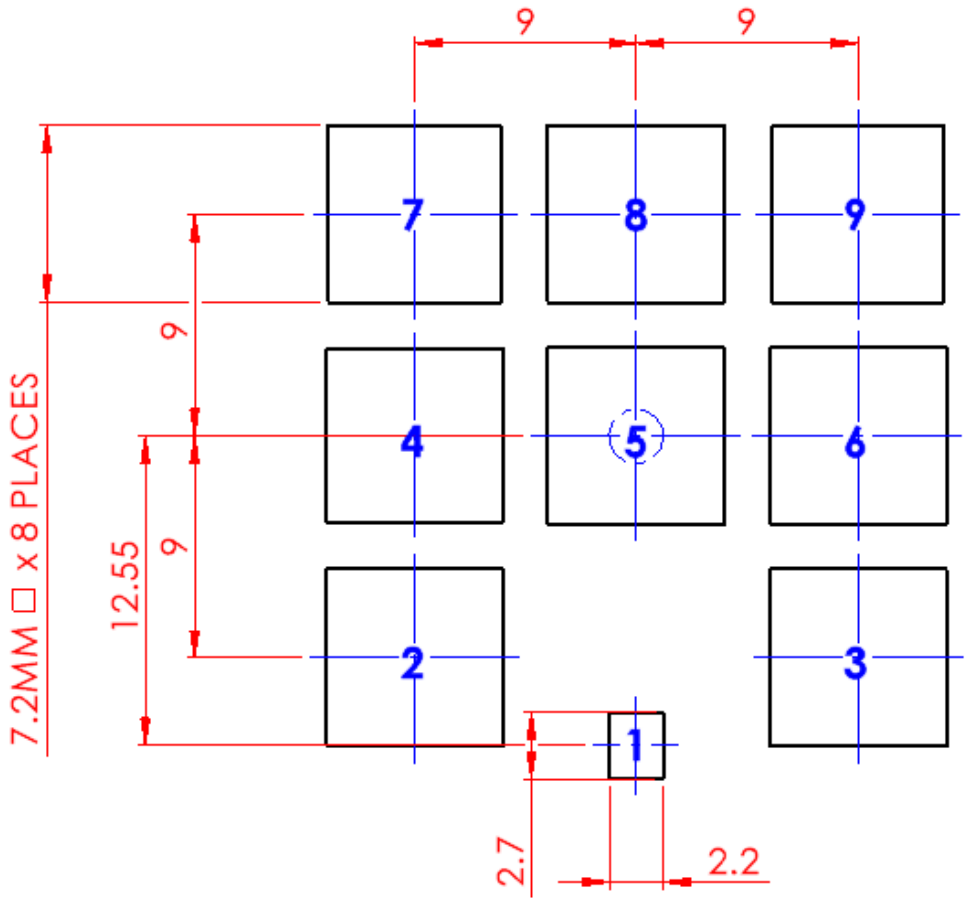
DETAIL B
SCALE 6 : 1

*Transmission line example

7.4 Top Solder Paste

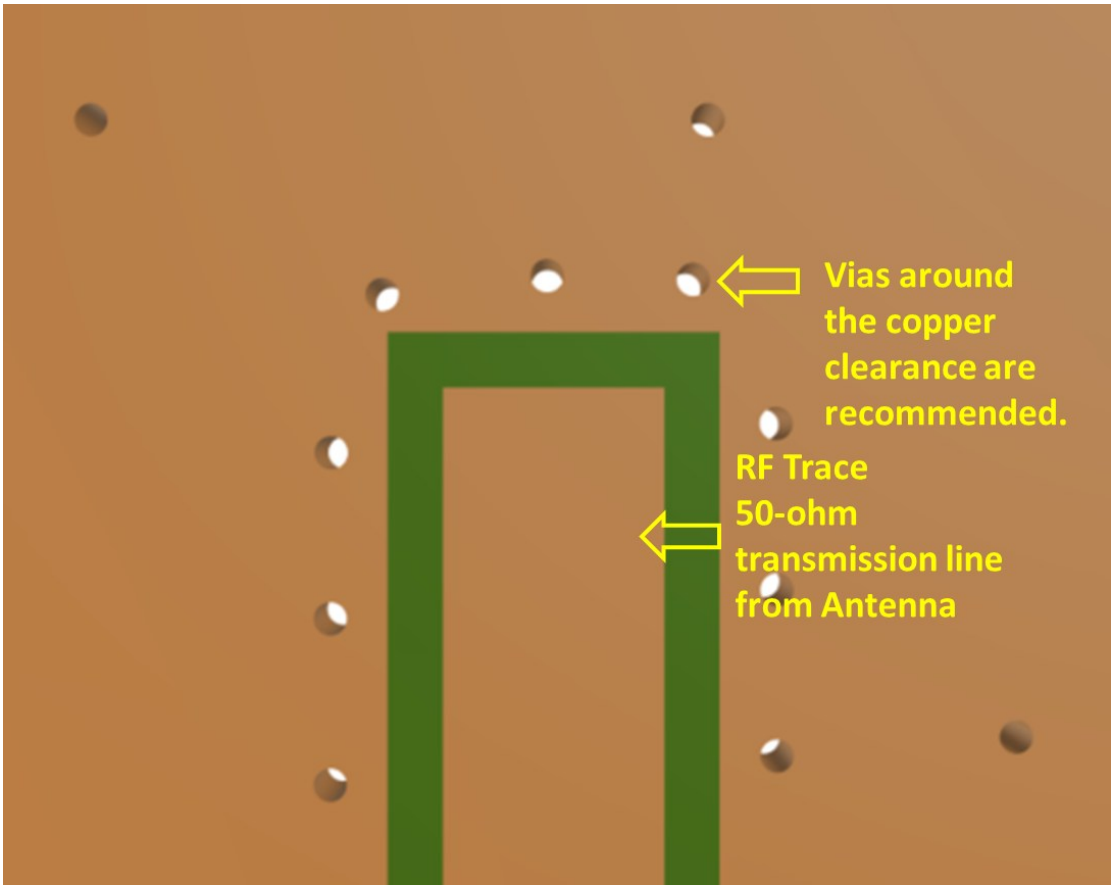


7.5 Top Solder Mask



7.6 Antenna Integration

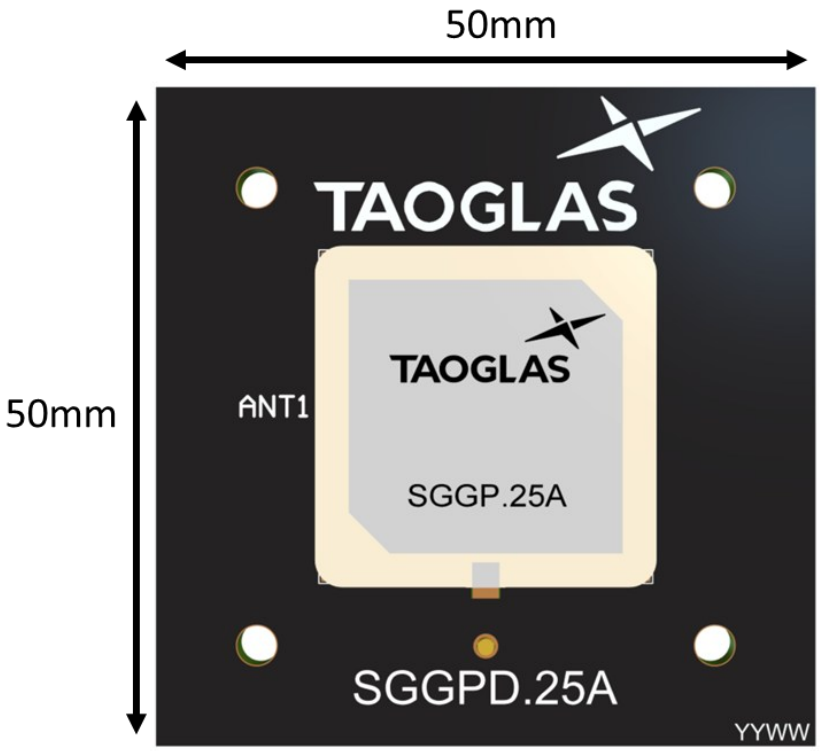
The SGGP.25.4.A.02 should be placed in the centre of the PCB to take advantage of the ground plane. The RF traces must maintain a 50 Ohm transmission line. Ground vias should be placed around the copper clearance area and the transmission line.



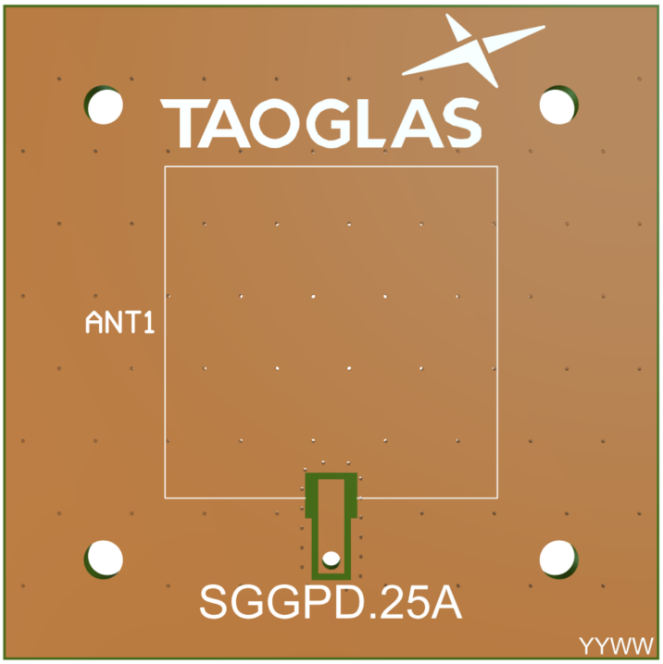
Top view of the PCB, showing transmission lines and integration notes.

7.7 Final Integration

The image shown below highlights the antenna transmission line. Taoglas recommends using a minimum of 50x50mm ground plane to ensure optimal performance.



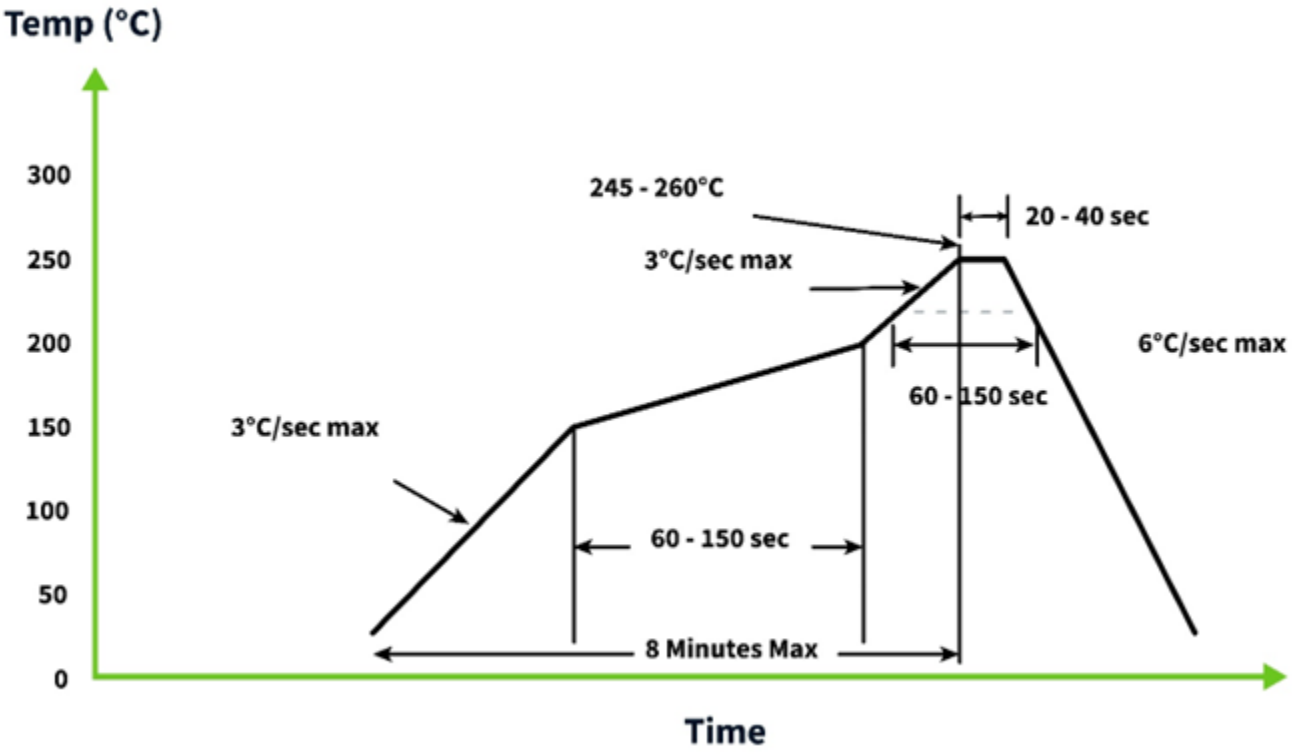
Top Side (SGGP.25.4.A.02 placement on 50x50mm ground plane)



Top Side with antenna and silk screen

8. Solder Reflow Profile

The SGGP.25.4.A.02 can be assembled by following the recommended soldering temperatures are as follows:



*Temperatures listed within a tolerance of +/- 10º C

Smaller components are typically mounted on the first pass, however, we do advise mounting the SGGP.25.4.A.02 when placing larger components on the board during subsequent reflows.

Changelog for the datasheet

SPE-13-8-031 – SGGP.25.4.A.02

Revision: K (Current Version)	
Date:	2024-09-20
Changes:	Antenna integration guide updated
Changes Made by:	Gary West

Previous Revisions

Revision: J	
Date:	2023-08-16
Changes:	Full datasheet update
Changes Made by:	Gary West

Revision: E	
Date:	2013-12-03
Changes:	Amended op temp
Changes Made by:	Aine Doyle

Revision: I	
Date:	2021-10-15
Changes:	Updated spec table.
Changes Made by:	Gary West

Revision: D	
Date:	2013-10-23
Changes:	Amended dimensions
Changes Made by:	Aine Doyle

Revision: H	
Date:	2018-06-25
Changes:	Adding plots and updating footprints
Changes Made by:	Jack Conroy

Revision: C	
Date:	2013-05-21
Changes:	Removed footprint drawing for now
Changes Made by:	Aine Doyle

Revision: G	
Date:	2014-05-21
Changes:	Added updated reflow
Changes Made by:	Aine Doyle

Revision: B	
Date:	2013-05-15
Changes:	Amended Drawing
Changes Made by:	Aine Doyle

Revision: F	
Date:	2014-03-27
Changes:	Added Footprint from Jon
Changes Made by:	Aine Doyle

Revision: A (Original First Release)	
Date:	2013-04-16
Notes:	
Author:	SS

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