



# TAOGLAS®



# Datasheet

**Part No:**  
**CGGBP.35.3.A.02**

**Description:**

35mm\*35mm\*3mm 4dBi+ GPS/GLONASS/Galileo/BeiDou/QZSS  
Ceramic Patch Antenna

**Features:**

Stable gain across most major GNSS applications  
Excellent radiation pattern coverage  
Dielectric Ceramic  
Pin (Through hole) Mount  
RoHS & Reach Compliant

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## 1. Introduction



This CGGBP.35 35mm\*35mm embedded ceramic GPS/GLONASS/Galileo/ BeiDou patch antenna has a wide band of operation, leading to excellent gain and radiation pattern stability on all three GNSS system bands. The CGGBP.35.3 is ideal for devices where height may be at a premium, at just 3mm this low profile patch antenna can be placed in areas where thicker antennas may not fit.

Typical Applications Include:

- Wearables
- Navigation
- Transportation
- RTK

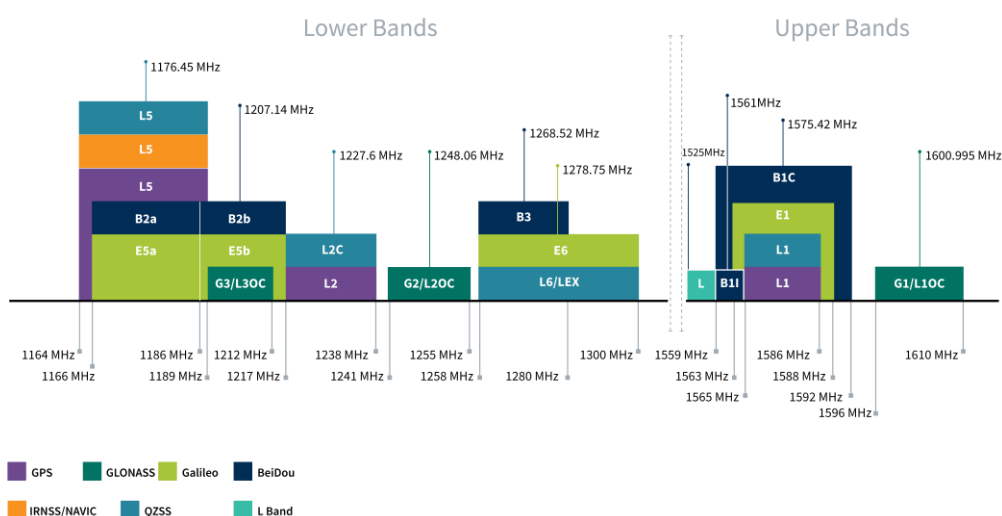
Compared to using a smaller antenna, this will translate into the GNSS system having much higher location accuracy, improved reliability of lock in urban areas, better signal reception, with more satellites acquired and a quicker time to first fix.

The patch is mounted via pin and double-sided adhesive. This antenna has been manufactured in an IATF16969 approved facility.

While the antenna will operate well in most device environments (Note cannot be covered with metal enclosure), tuning and further optimization of this antenna to different ground-planes and enclosures can be done if required, also including a pin length change. These changes would be subject to possible NRE and a minimum order quantity. For further information contact your regional Taoglas customer support team

## 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
	■	□	■	□	□



Bands and Constellations Table

GNSS Electrical			
Frequency (MHz)	1561	1575.42	1602
Return Loss (dB)	-30	-18	-13
Efficiency (%)	63	65.6	67
Average Gain (dB)	-2.01	-1.83	-1.74
Peak Gain at Zenith (dBi)	4.05	3.82	3.97
Polarization	RHCP		
Impedance( $\Omega$ )	50		

## Field Test Result with 70\*70mm ground plane

Frequency	GPS L1	Galileo E1	GLONASS G1	BeiDou B1I
	1563-1587	1559-1591	1598-1605	1559-1563
Carrier-to-Noise Values(dB-Hz)	41.7	38.2	40.1	40.2
2*DRMS Positioning Accuracy (cm) <b>without RTK</b>	83	83	83	83
2*DRMS Positioning Accuracy (cm) <b>with RTK</b>	1.4	1.4	1.4	1.4
TTFF(s)	25.4	25.4	25.4	25.4
Group Delay @ Zenith Variation Across Single Constellation(ns)	3.2	3.2	3.2	3.2
Phase Centre Offset PCO (cm)	3.5	3.5	3.5	3.5
Phase Centre Variation PCV (mm)	35	35	35	35
Axial Ratio (dB)	2	2	2	2

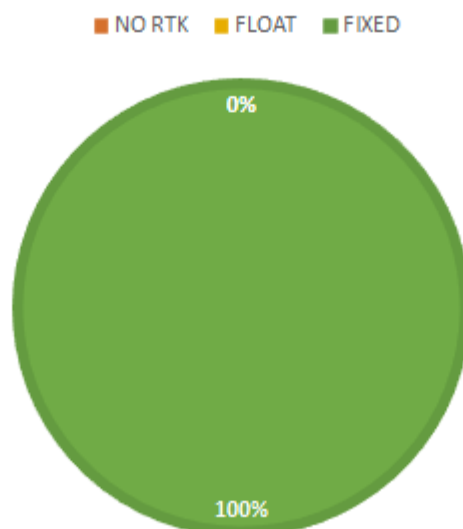
\*All outdoor measurements performed on the roof top of the Taoglas R&D Labs facility in Dublin Ireland.

\*\* Recommended Minimum C/No for Standard Precision Acquisition/ Tracking (dB-Hz): 26-30/ 12-15.

\*\*\*Data Measured Free Space.

\*\*\*\*Group Delay, PCO, PCV and Axial Ratio values includes Active Circuitry.

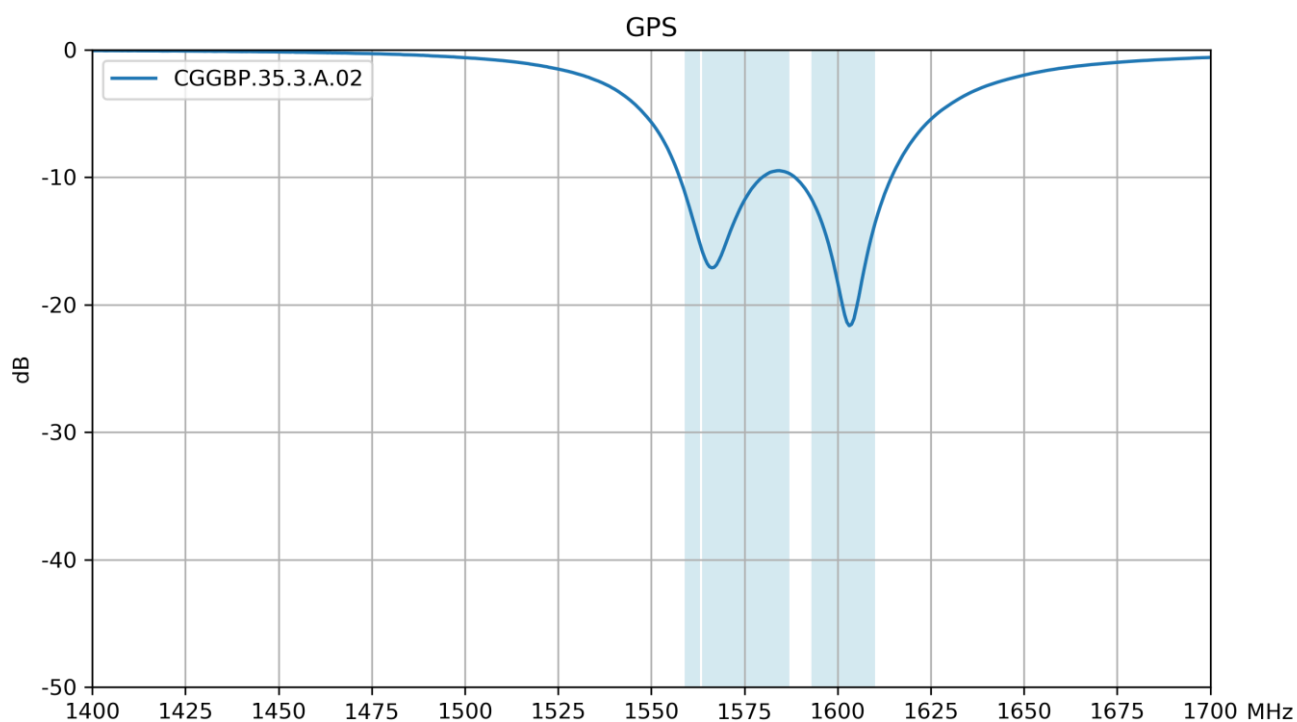
\*\*\*\*\*Ublox C099-F9P application board is used for Field test Measurements.



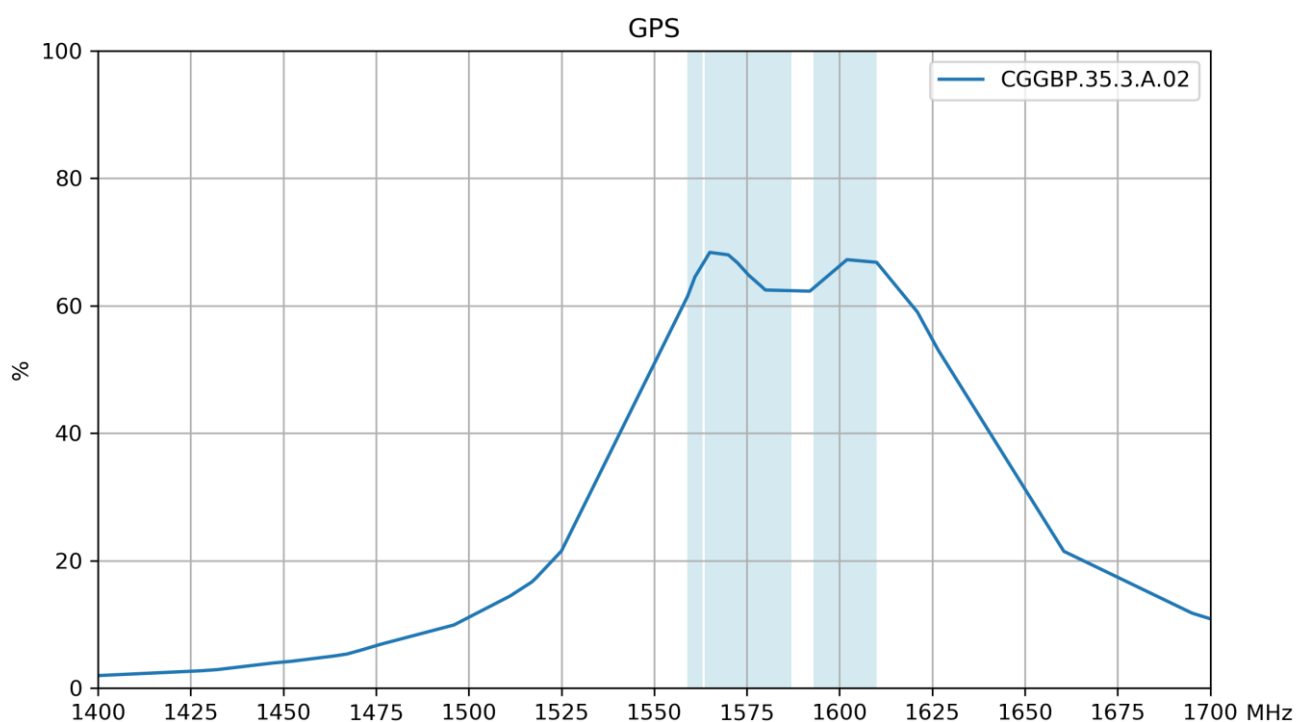
Mechanical	
Dimensions	35 x 35 x 3mm
Material	Ceramic
Pin Diameter	0.9mm
Pin Length	2.4mm
Weight	13.5g
Environmental	
Temperature Range	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

## 3. Antenna Characteristics

### 3.1 Return Loss

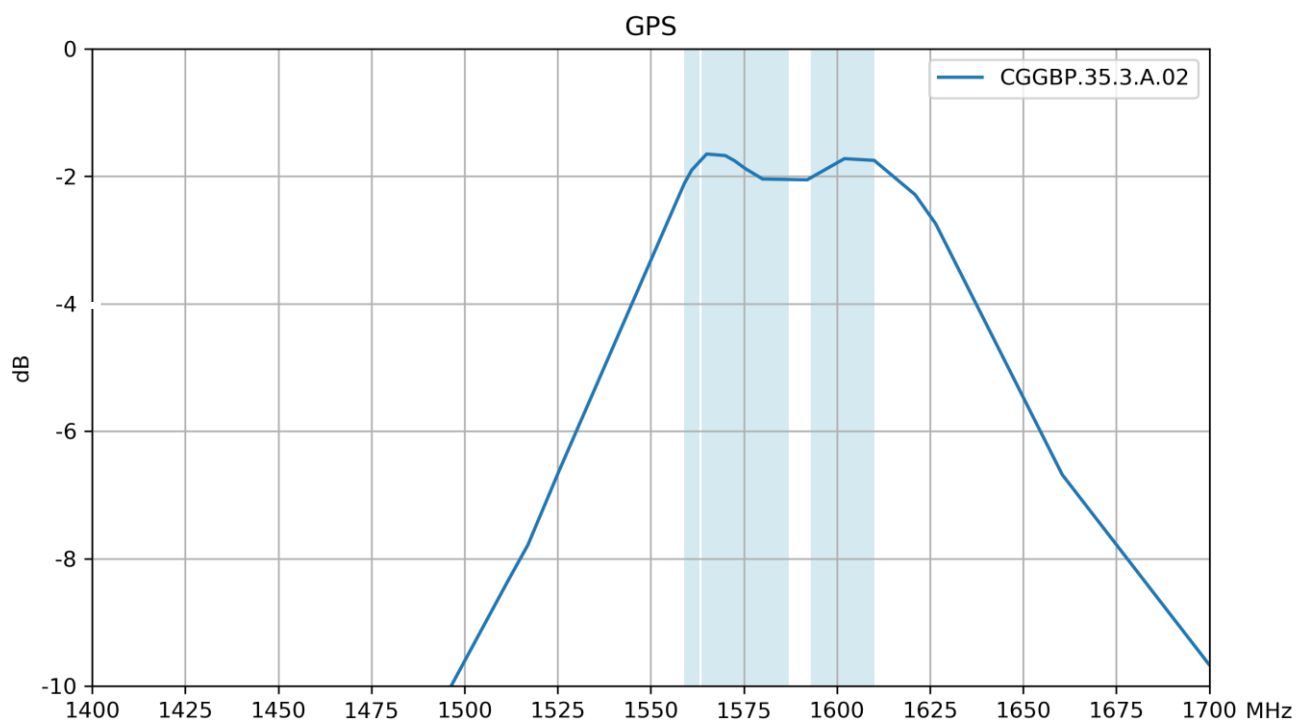


### 3.2 Efficiency

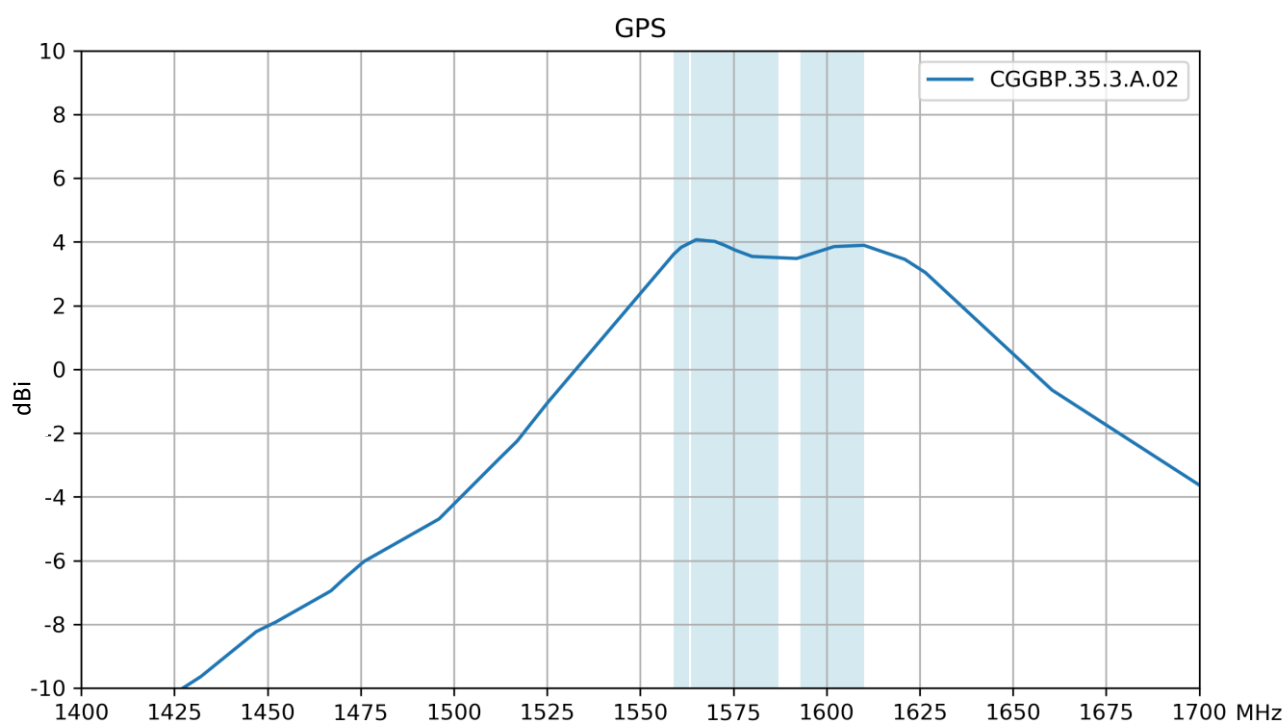




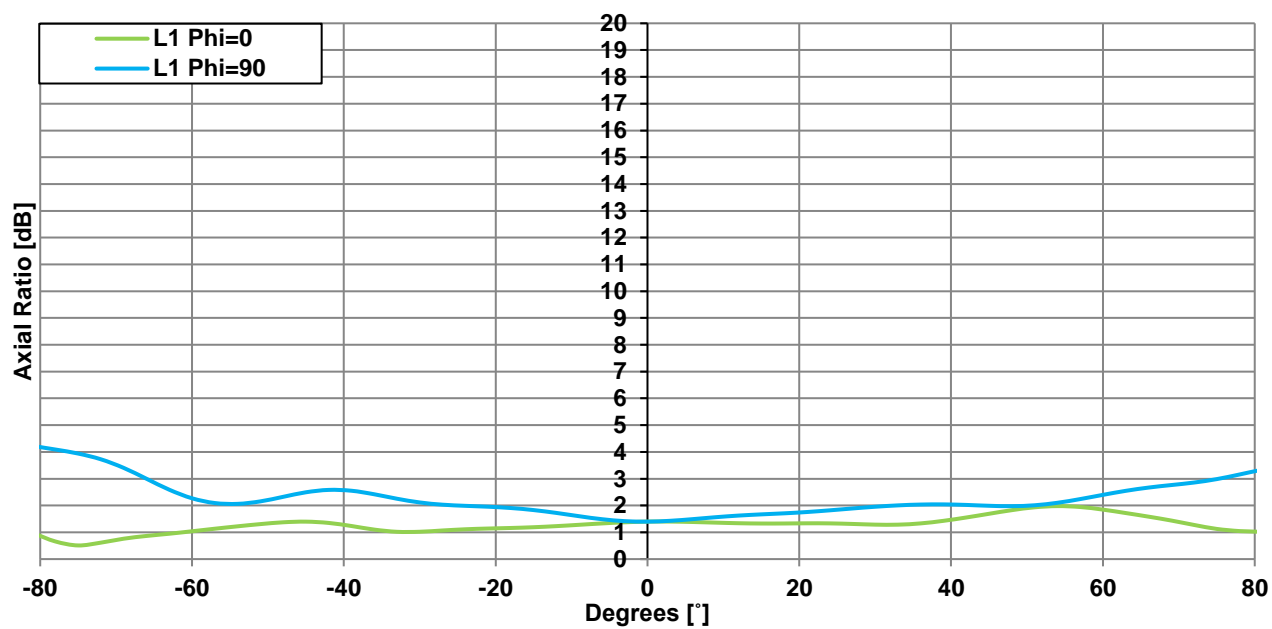
### 3.3 Average Gain



### 3.4 Peak Gain

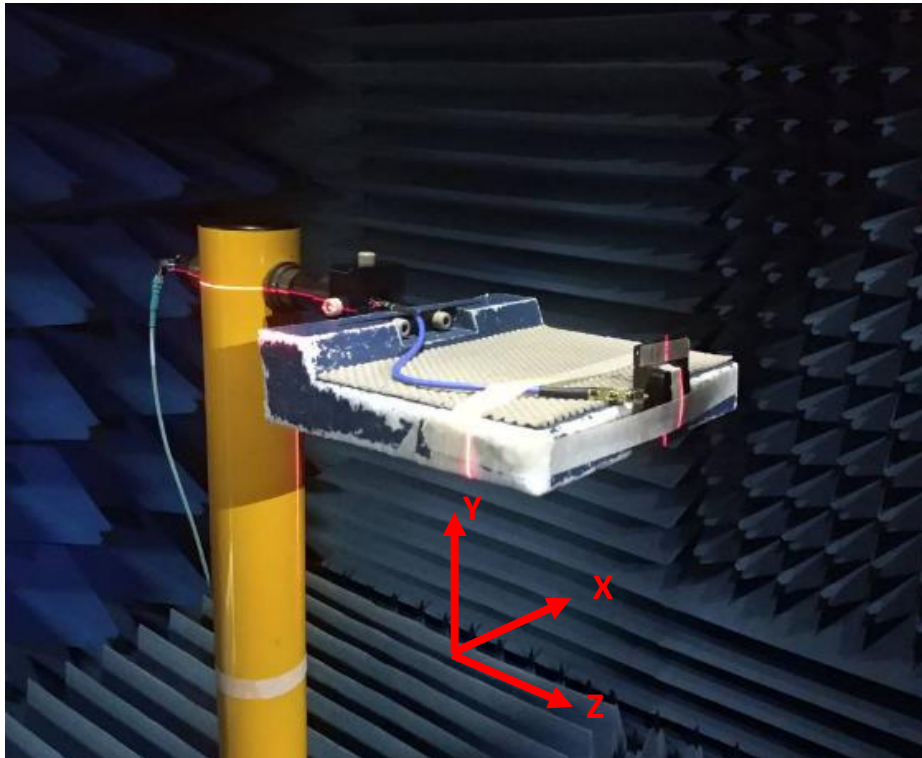


### 3.5 Axial Ratio @ L1

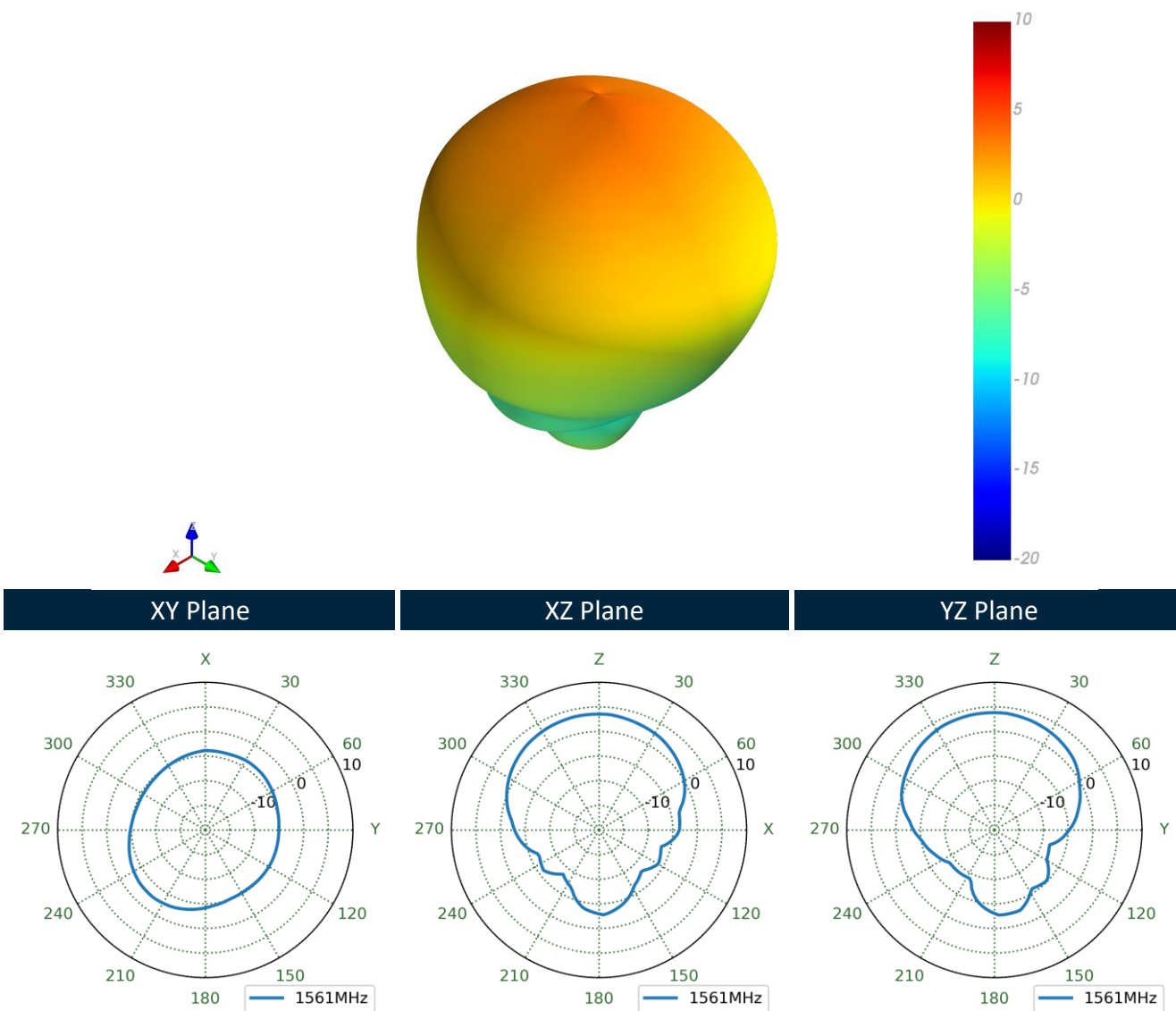


## 4. Radiation Patterns

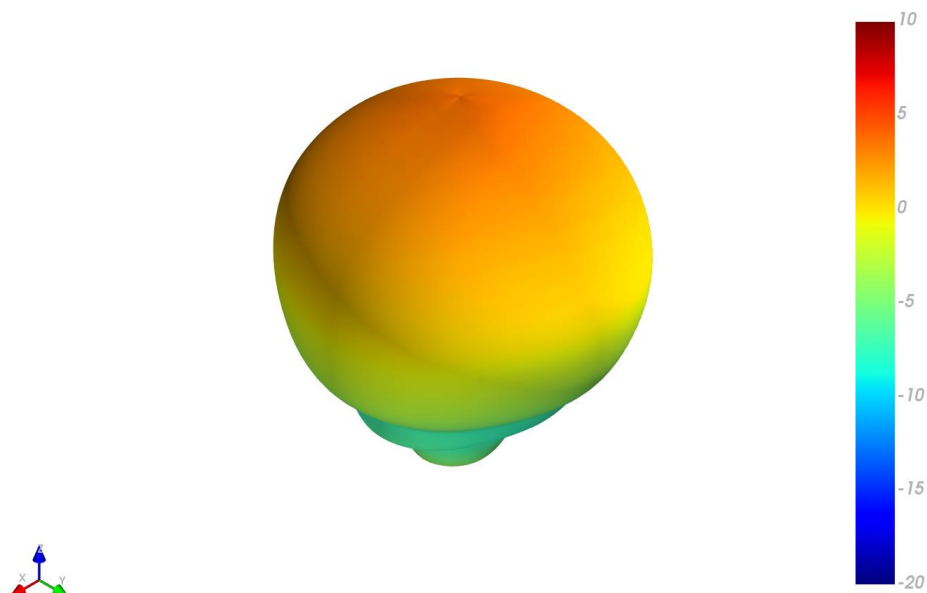
### 4.1 Test Setup – on 70\*70mm Ground Plane



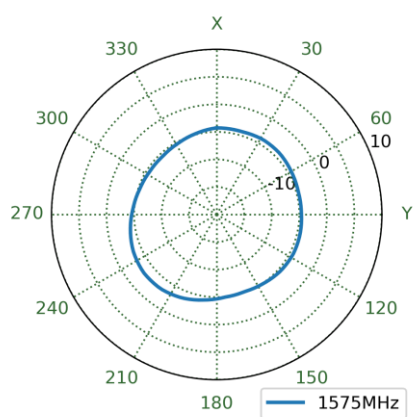
## 4.2 1561MHz 3D and 2D Radiation Patterns



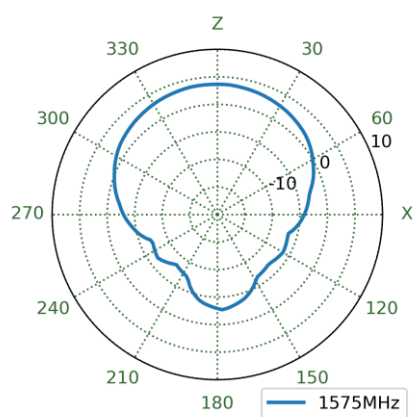
### 4.3 1575.42MHz 3D and 2D Radiation Patterns



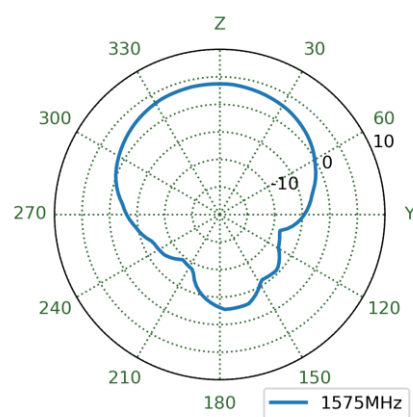
XY Plane



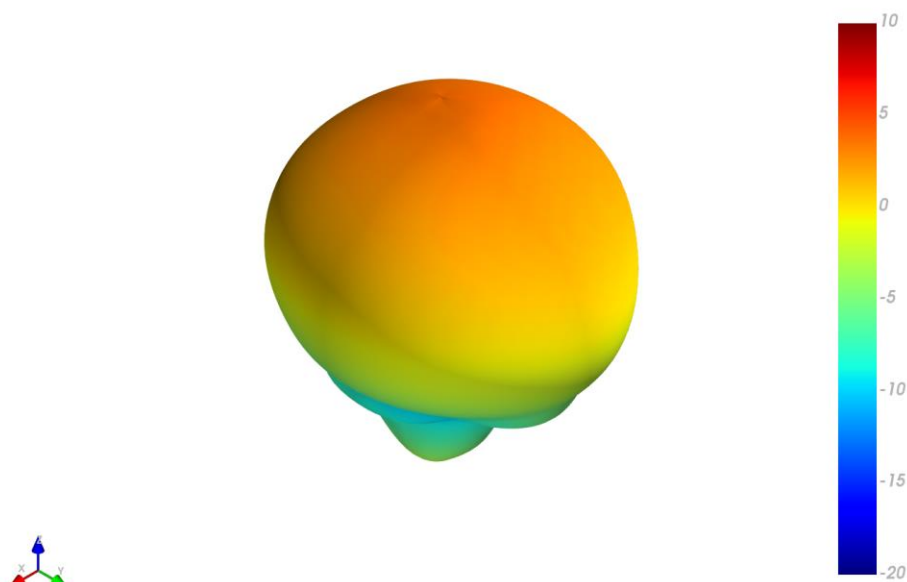
XZ Plane



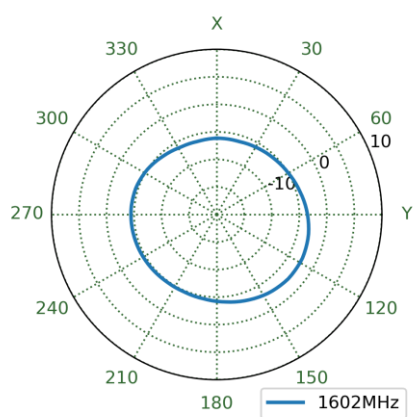
YZ Plane



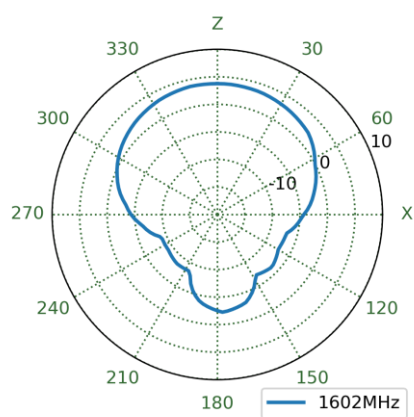
## 4.4 1602MHz 3D and 2D Radiation Patterns



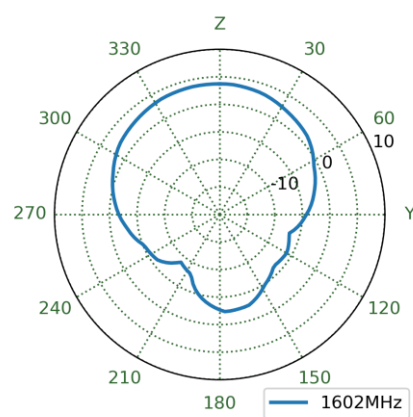
XY Plane



XZ Plane

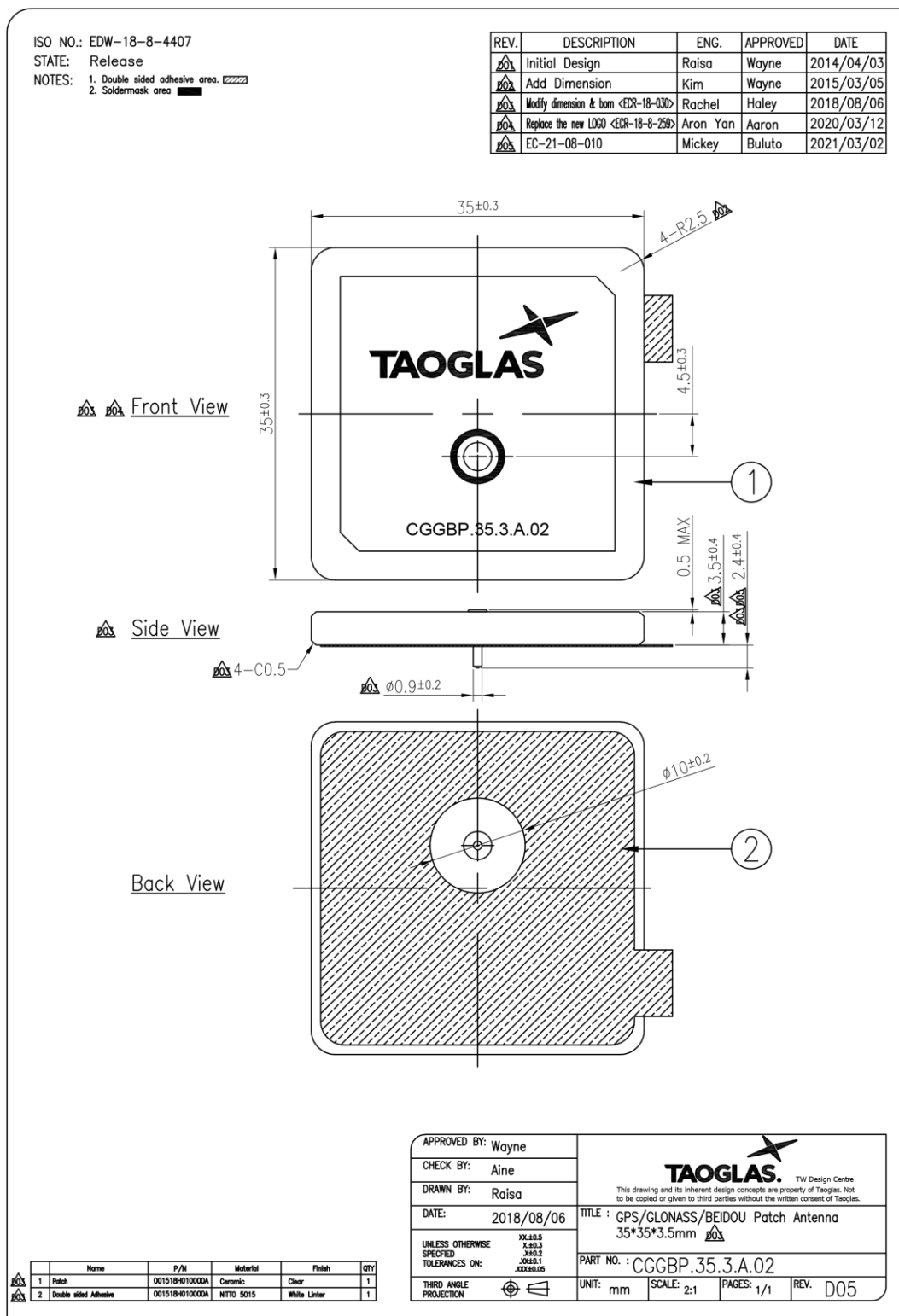


YZ Plane

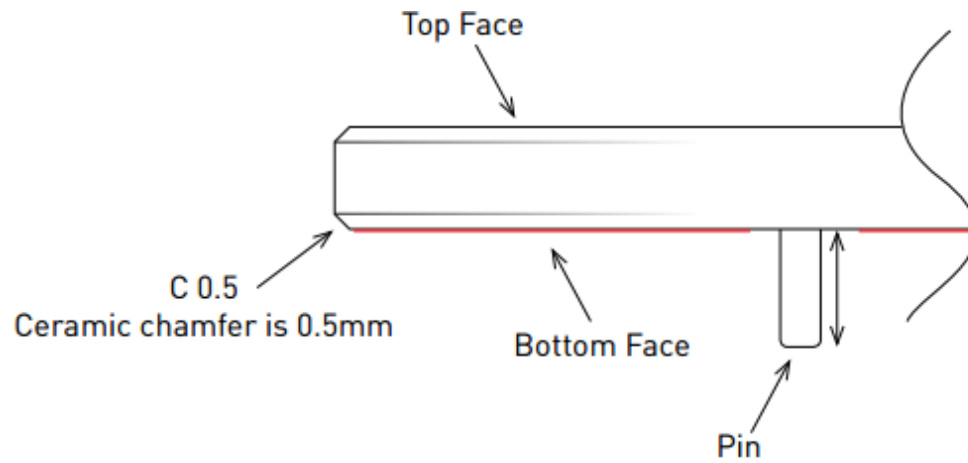


## 5. Mechanical Drawing (Units:mm)

### 5.1 Mechanical Drawing



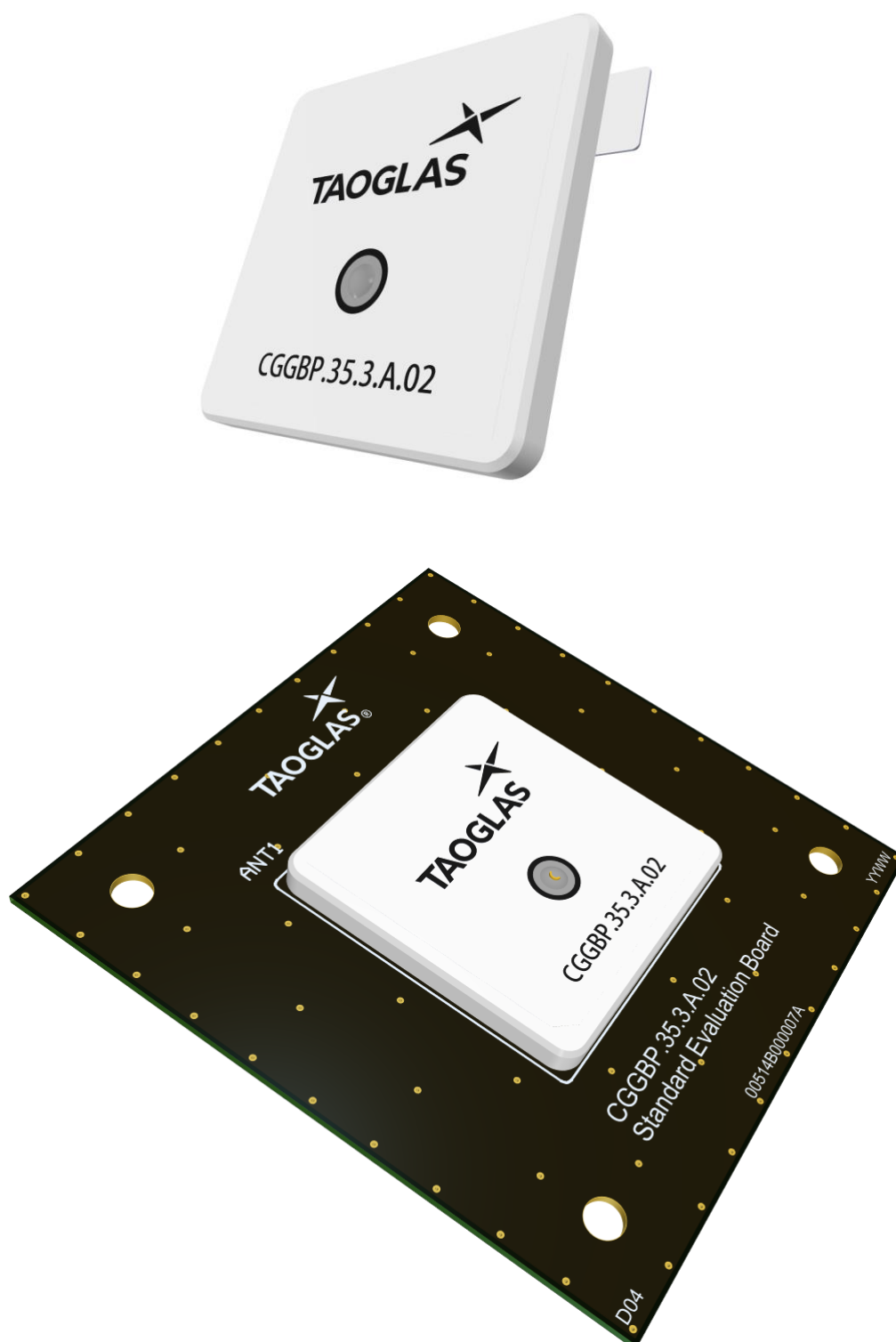
## 5.2 Adhesive Thickness



**Red Line** shows the adhesive without Liner – thickness 0.08~0.1mm



## 6. Antenna Integration Guide

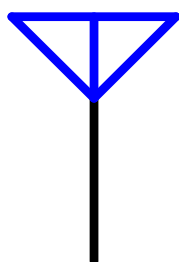


## 6.1 Schematic Symbol and Pin Definition

The circuit symbol for the antenna is shown below. The antenna has 1 pin as indicated below.

Pin	Description
1	RF Feed

TAOGLAS\_CGGBP353A.02  
ANTI



## 6.2 Antenna Integration

The antenna should be placed at the center of the ground plane with a length and width of 70mm. Maintaining a square symmetric ground plane shape and symmetric environment around the antenna is critical to maintaining the excellent axial ratio and phase center performance shown in this datasheet.



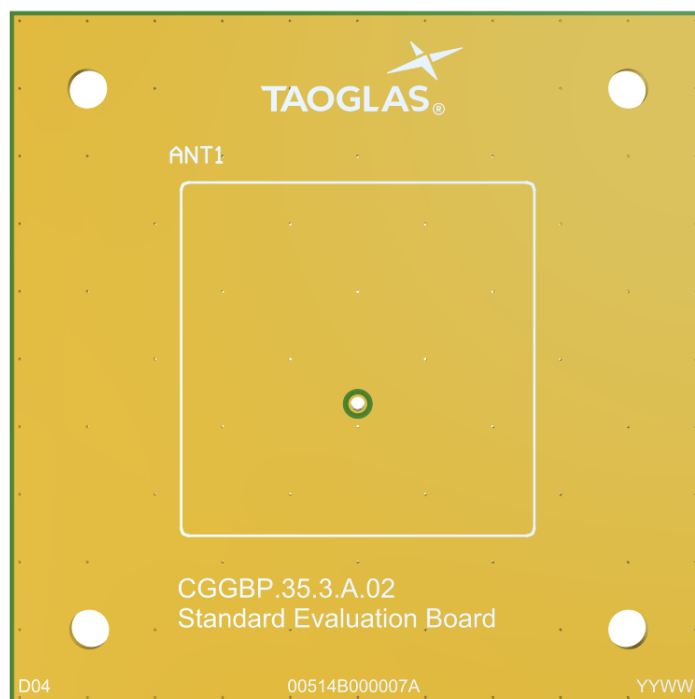
Top Side w/ Solder Mask



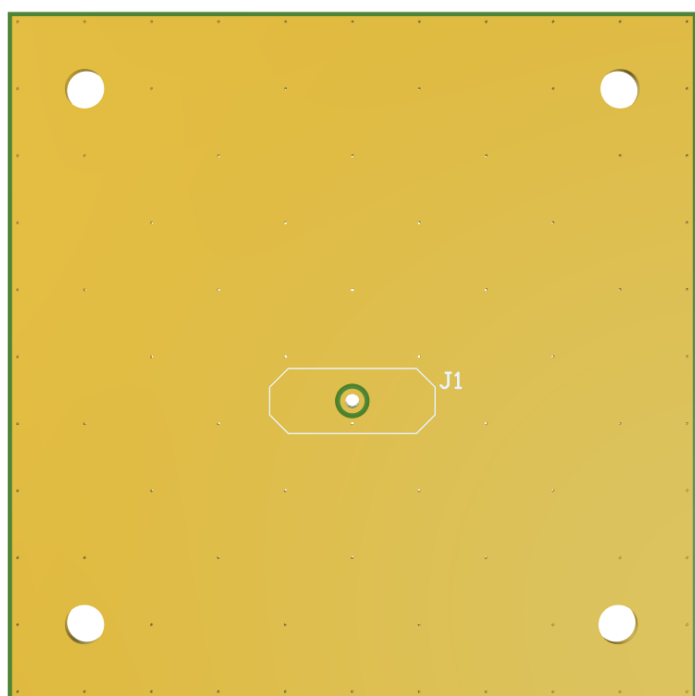
Top Side w/o Solder Mask

## 6.3 PCB Layout

The footprint and clearance on the PCB must comply with the antenna specification. The PCB layout shown in the diagram below demonstrates the antenna footprint.

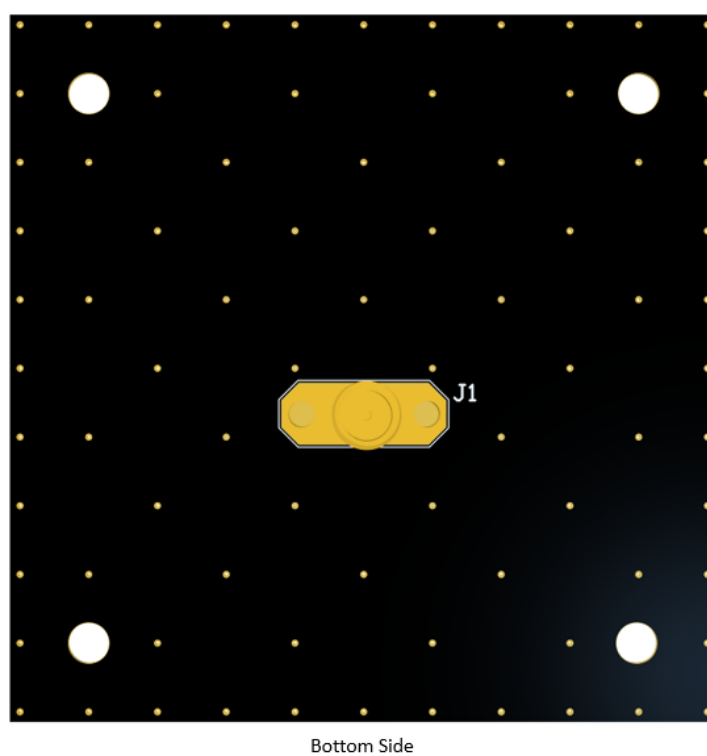
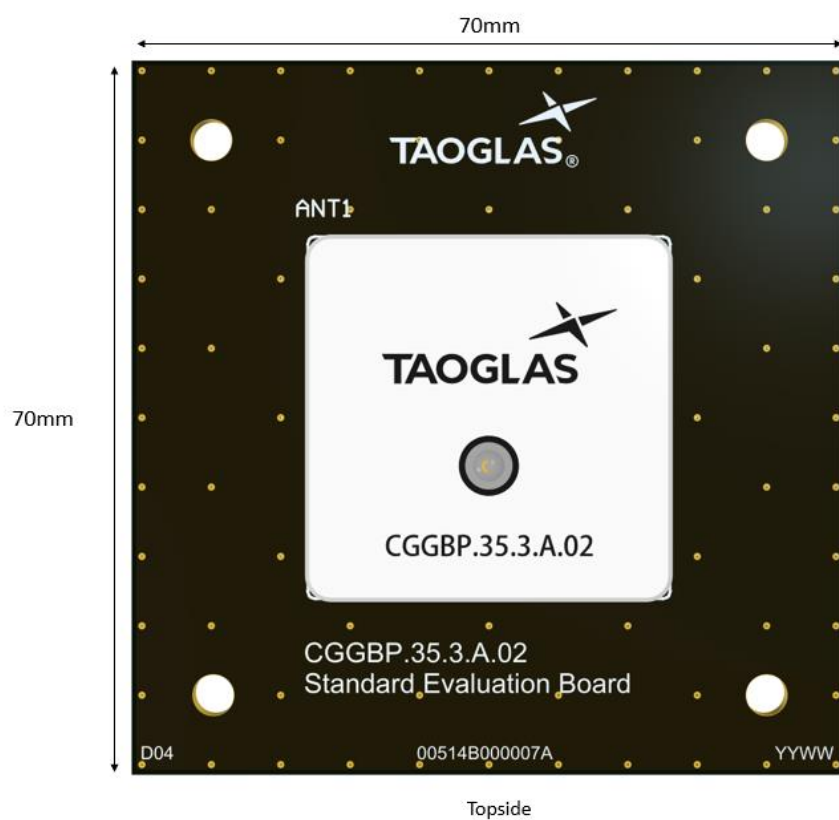


Topside



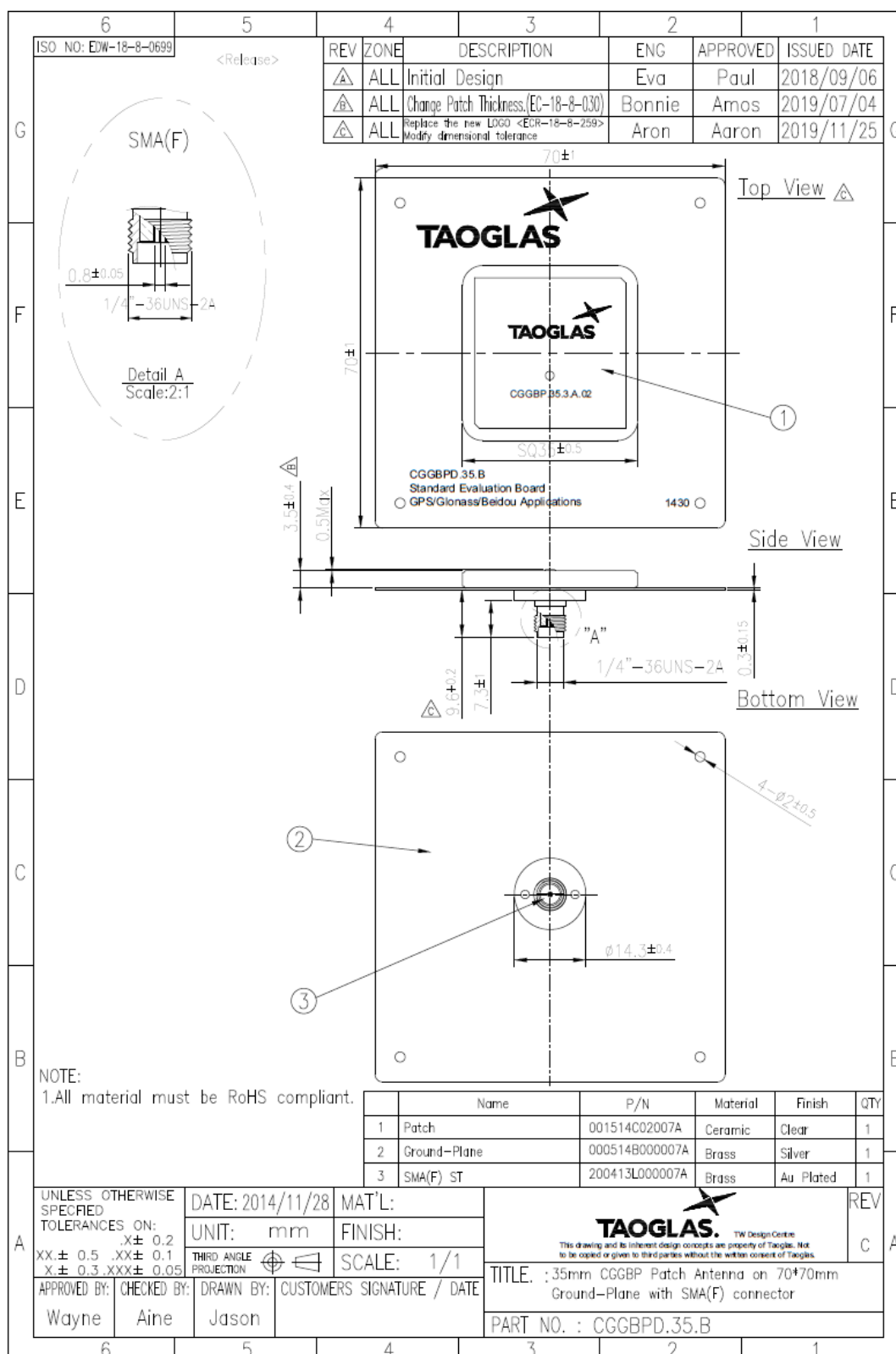
Bottom Side

## 6.5 Evaluation Board

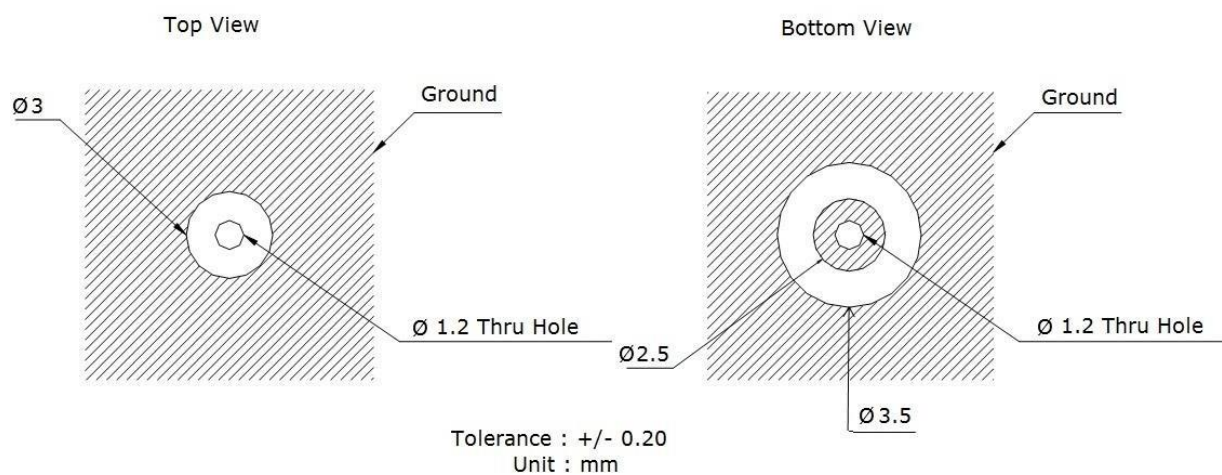


## 7. Evaluation Board Mechanical Drawing (unit: mm)

### 7.1 Evaluation Board Drawing

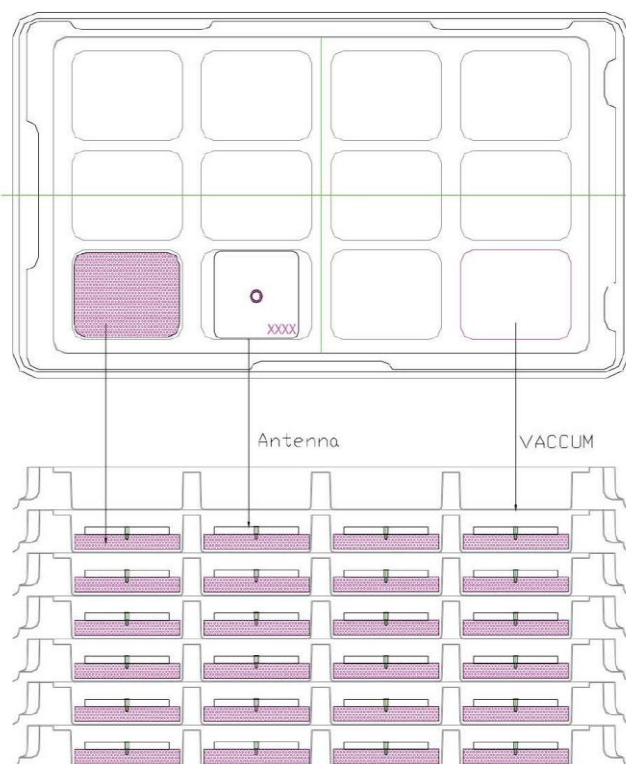


## 8. PCB Footprint Recommendation

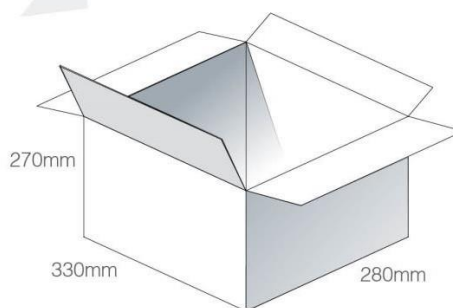
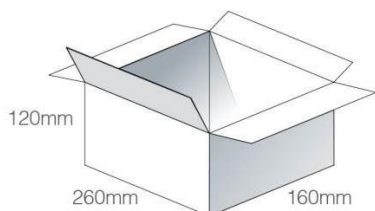


## 9. Packaging

12 Pieces CGGBP.35 per tray  
Dimensions - Diameter 250\*150\*20mm  
Weight - 220g

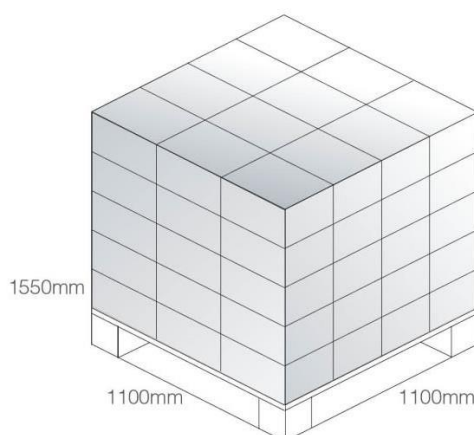


6 Trays per Small Carton  
72 Pieces CGGBP.35 Carton  
Dimensions - 260\*160\*120  
Weight - 1.37Kg



4 Small Cartons per 1 Large Carton  
288 Pieces CGGBP.35 per Large Carton  
Carton Dimensions - 330\*280\*270  
Weight - 6Kg

Pallet Dimensions 1100\*1100\*1550mm  
60 Cartons per Pallet  
12 Cartons per layer  
5 Layers





## Changelog for the datasheet

### SPE-15-8-010 – CGGBP.35.3.A.02

#### Revision: E (Current Version)

Date:	2024-05-10
Changes:	Updated GNSS Frequency Bands table
Changes Made by:	Cesar Sousa

#### Previous Revisions

##### Revision: D

Date:	2022-02-24
Changes:	Integration Guide Added
Changes Made by:	Cesar Sousa

##### Revision: C

Date:	2021-06-09
Changes:	Updated pin length to 2.4mm Updated mechanical drawing
Changes Made by:	Dan Cantwell

##### Revision: B

Date:	2020-03-18
Changes:	Updated Data
Changes Made by:	Jack Conroy

##### Revision: A (Original First Release)

Date:	2017-10-11
Notes:	Initial Datasheet Release
Author:	Jack Conroy



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