



TAOGLAS®



Datasheet

Part No:
CGGBP.35.3.A.02

Description

35mm x 35mm x 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



The Taoglas **CGGBP.35** is a compact, 35 mm × 35 mm embedded ceramic patch antenna supporting GPS, GLONASS, Galileo, and BeiDou systems. With its wide operational bandwidth, the CGGBP.35 delivers excellent gain and stable radiation patterns across all GNSS frequency bands, ensuring reliable satellite reception even in challenging environments.

At just 3 mm in height, this low-profile antenna is ideal for applications where space is limited, allowing integration in devices where thicker antennas cannot fit.

Typical Applications:

- Wearables
- Navigation
- Transportation
- RTK (Real-Time Kinematic)

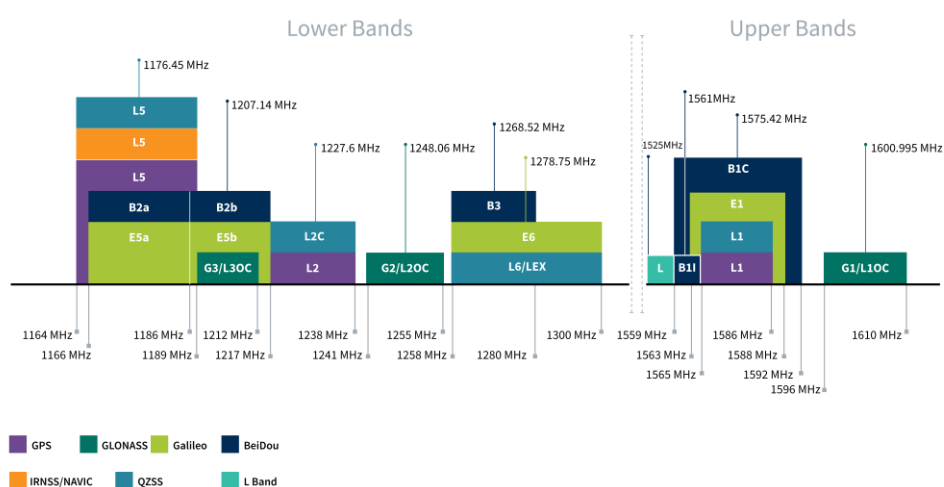
Compared to smaller antennas, the CGGBP.35 provides higher location accuracy, improved lock reliability in urban areas, better signal reception, more satellites acquired, and a faster time-to-first-fix (TTFF).

The antenna is mounted via pins and double-sided adhesive and is manufactured in an IATF16949-certified facility, ensuring consistent quality and performance. While the antenna performs well in most device environments (note: cannot be covered by a metal enclosure), tuning and further optimization for specific ground planes, enclosures, or pin length adjustments are available. Such customizations may be subject to NRE and minimum order quantities.

For further information regarding customization or installation, 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
	■	□	■	□	□



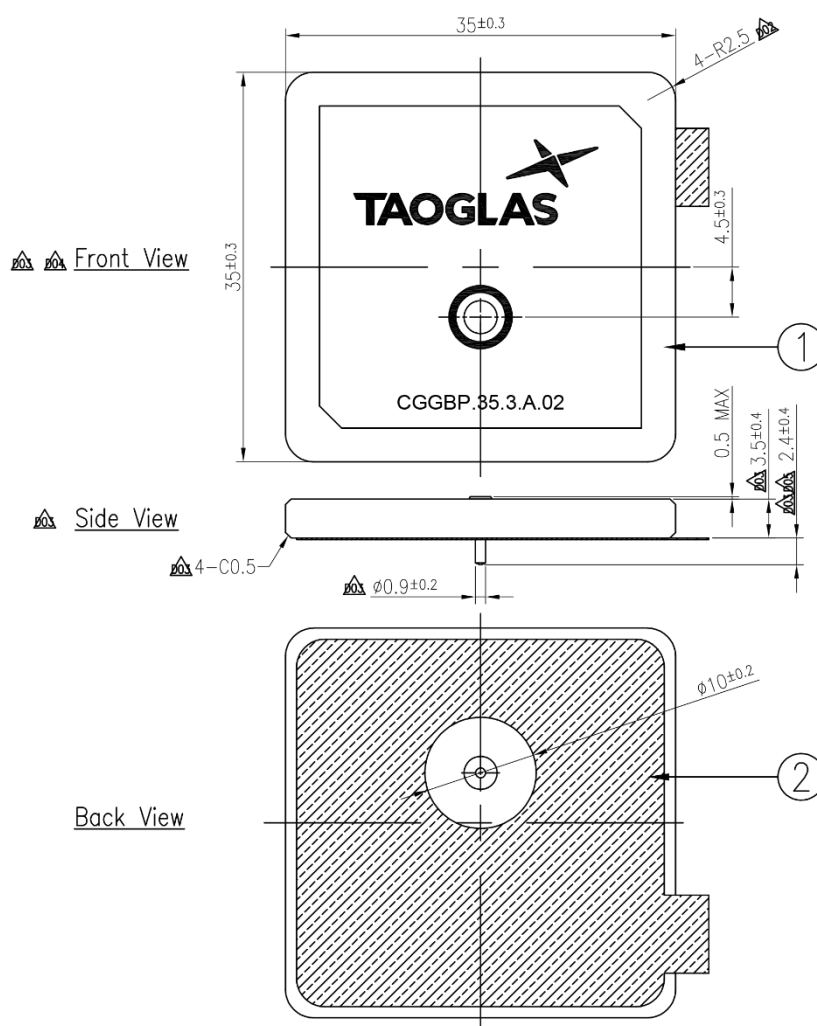
GNSS Bands and Constellations

GNSS Electrical			
Frequency (MHz)	1561	1575.42	1602
VSWR (max.)	2:1	1.5:1	1.5:1
Efficiency (%)	78.9	79.7	82.6
Average Gain (dB)	-1.03	-1.00	-0.83
Peak Gain (dBi)	5.06	5.06	5.06
Axial Ratio (dB)	6.28	6.09	9.33
PCO_x (cm)	0.51	0.51	0.52
PCO_y (cm)	0.24	0.24	0.22
PCV (cm)	0.07	0.07	0.05
Polarization	RHCP		
Impedance	50 Ω		

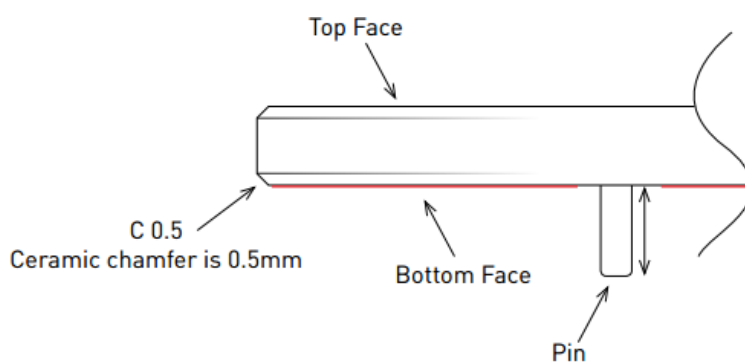
Mechanical	
Dimensions	35 x 35 x 3mm
Material	Ceramic
Pin Diameter	0.9mm
Pin Length	2.4mm
Weight	13.5g

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

3. Mechanical Drawing



	Name	P/N	Material	Finish	QTY
1	Patch	001518H010000A	Ceramic	Clear	1
2	Double sided Adhesive	001518H010000A	NITTO 5015	White Linter	1



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

4. Antenna Integration Guide

The following is an example on how to integrate the CGGBP.35.3.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.

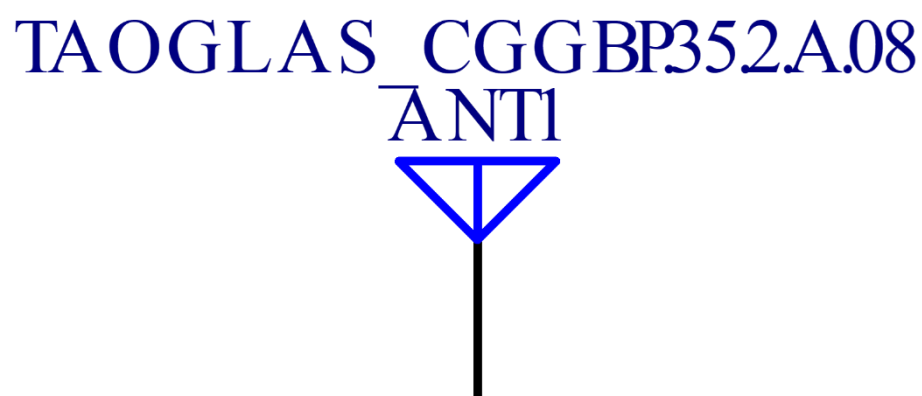


Top view of PCB reference design

Please find the Integration files in Altium, 2D formats and the 3D model for the CGGBP.35.3.A.02 here:
<https://www.taoglas.com/product/cggbp-35-3-a-02-gpsglonassbeidou-patch-antenna-353mm-2/>

4.1 Schematic Symbol and Pin Definitions

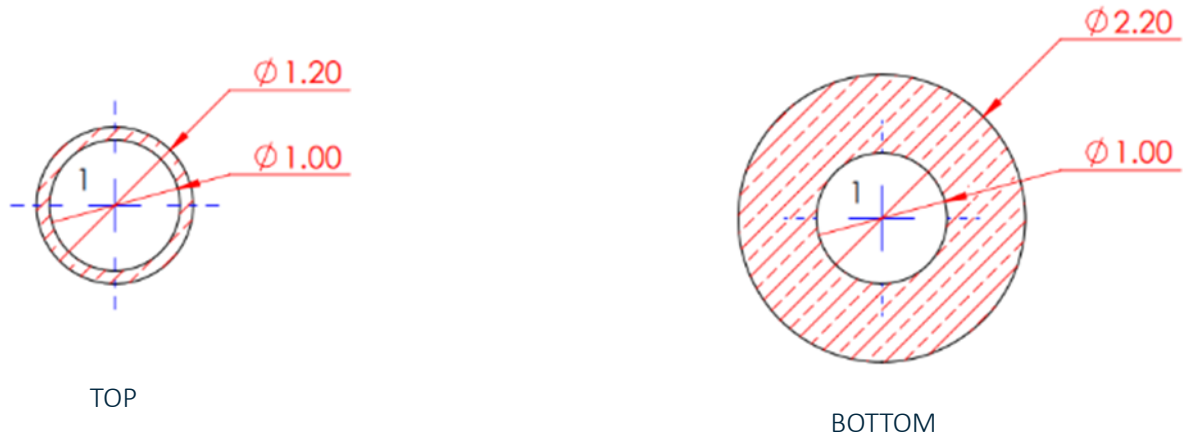
The circuit symbol for the CGGBP.35.3.A.02 is shown below. The antenna has 1 pin as indicated below.



Above is a schematic symbol of CGGBP.35.3.A.02 and a table of the pin definitions.

Pin	Description
1	RF Feed

4.2 Antenna Footprint

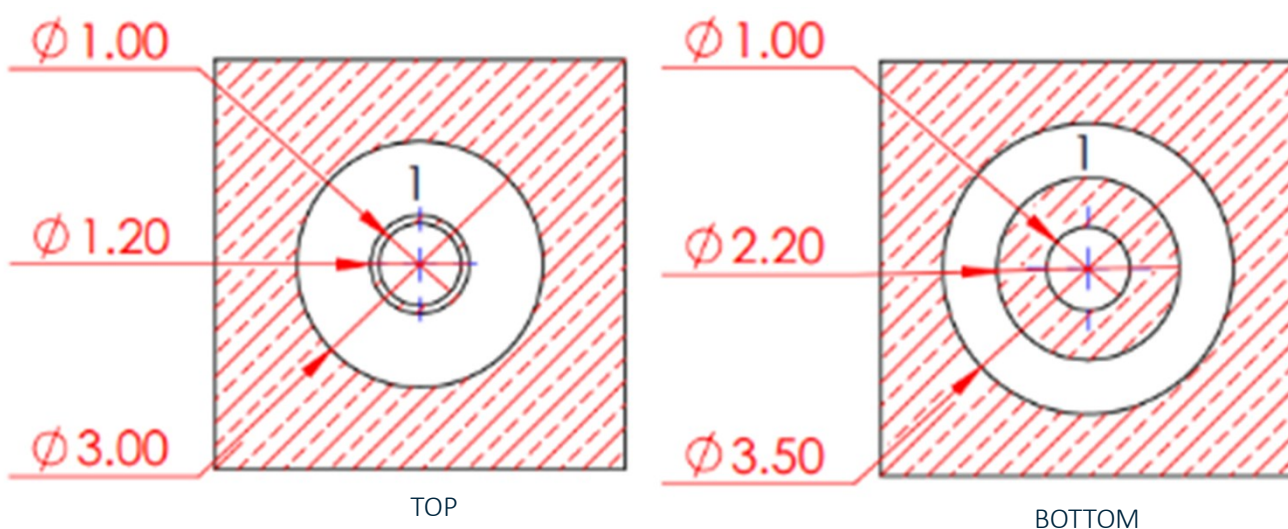


Pin	Description
1	RF Feed

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 CGGBP.35.3.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.

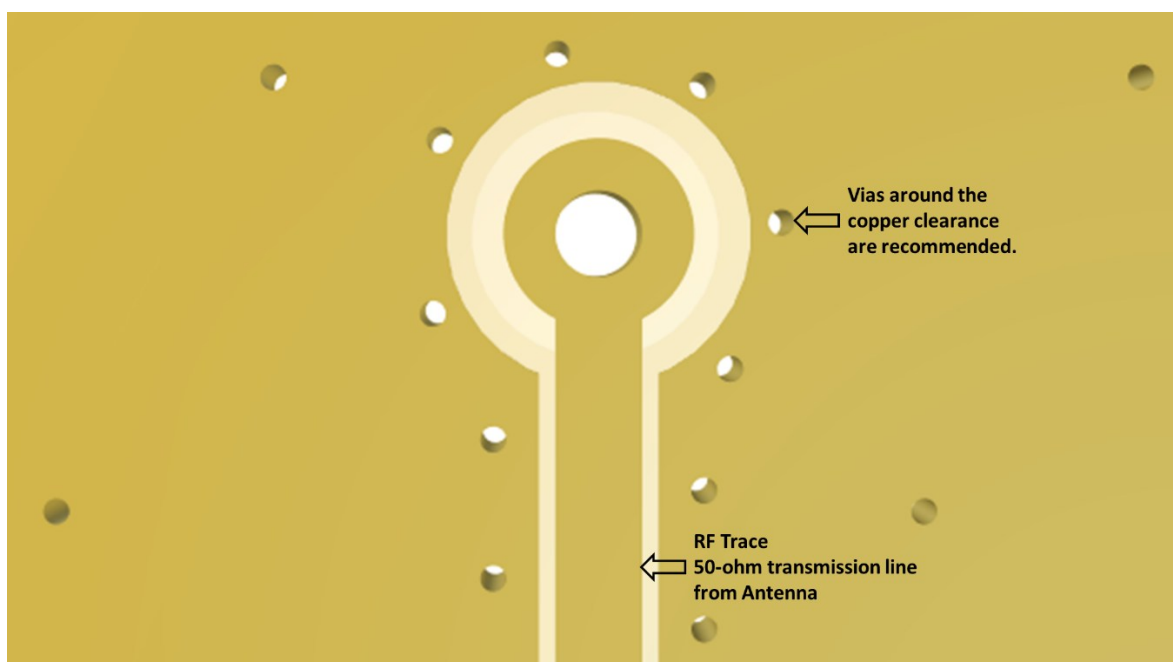
There should be a $\varnothing 3\text{mm}$ copper clearance around the antenna pins on the top side of the PCB with a $\varnothing 3.5\text{mm}$ copper clearance around the antenna pins on the bottom side.



2D Images of Copper Clearances

4.4 Antenna Integration

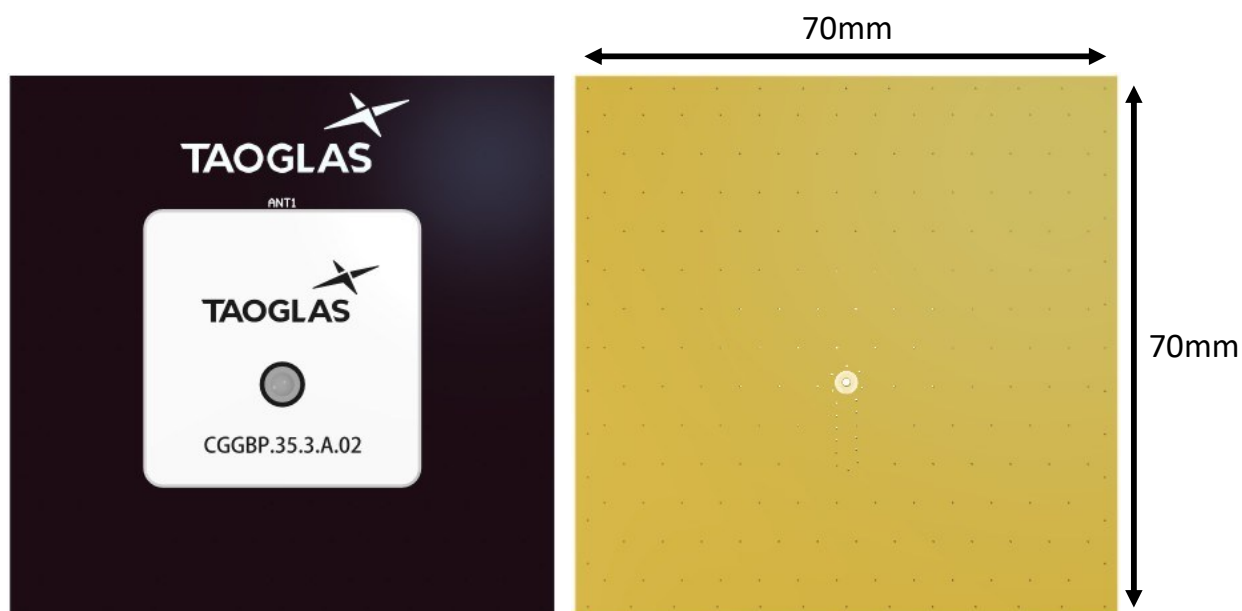
The CGGBP.35.3.A.02 should be placed in the centre of the PCB to take advantage of the ground plane. The RF traces must maintain a 50 Ohm transmission line. Ground vias should be placed around the copper clearance area and the transmission line. Note that depending on the design application, tuning may be required for optimal performance. This may be achieved using a 'pi' matching network or custom tuning of the patch antenna.



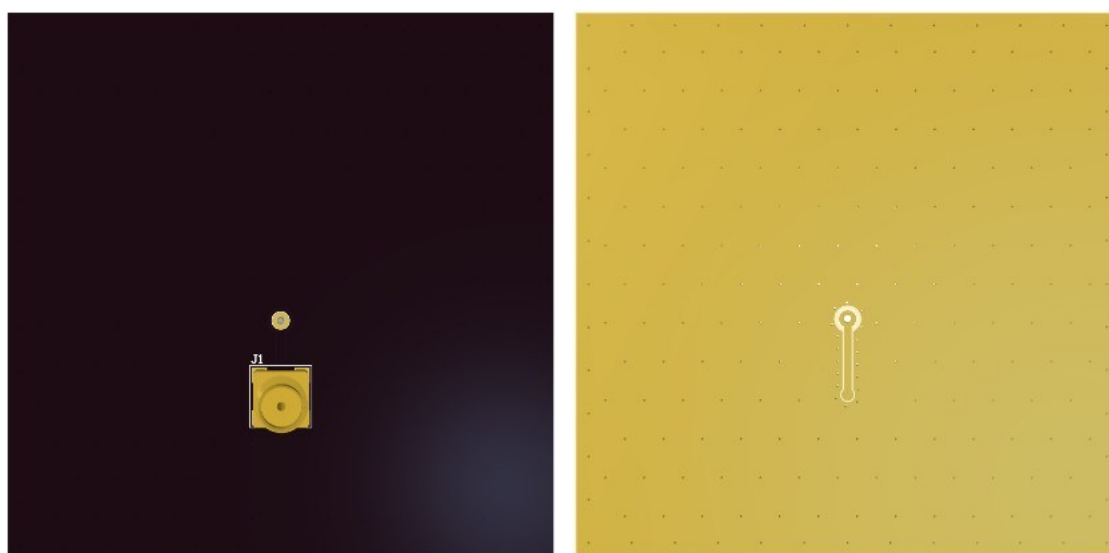
Bottom view of the PCB Reference Design, showing transmission lines and integration notes.

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.

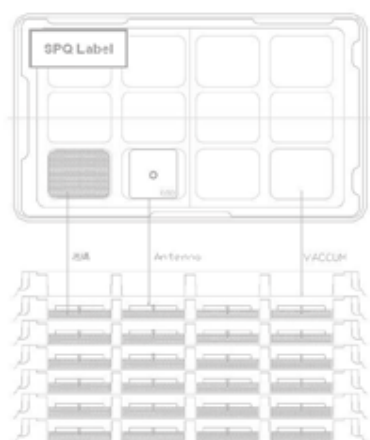


Top Side (70x70mm PCB Reference Design)



Bottom Side

5. Packaging



- ✓ 12 PCS / Tray
- ✓ 6 Piece / Vacuum package
- ✓ 2 PCS / 3g Desiccant
- ✓ SPQ Label I



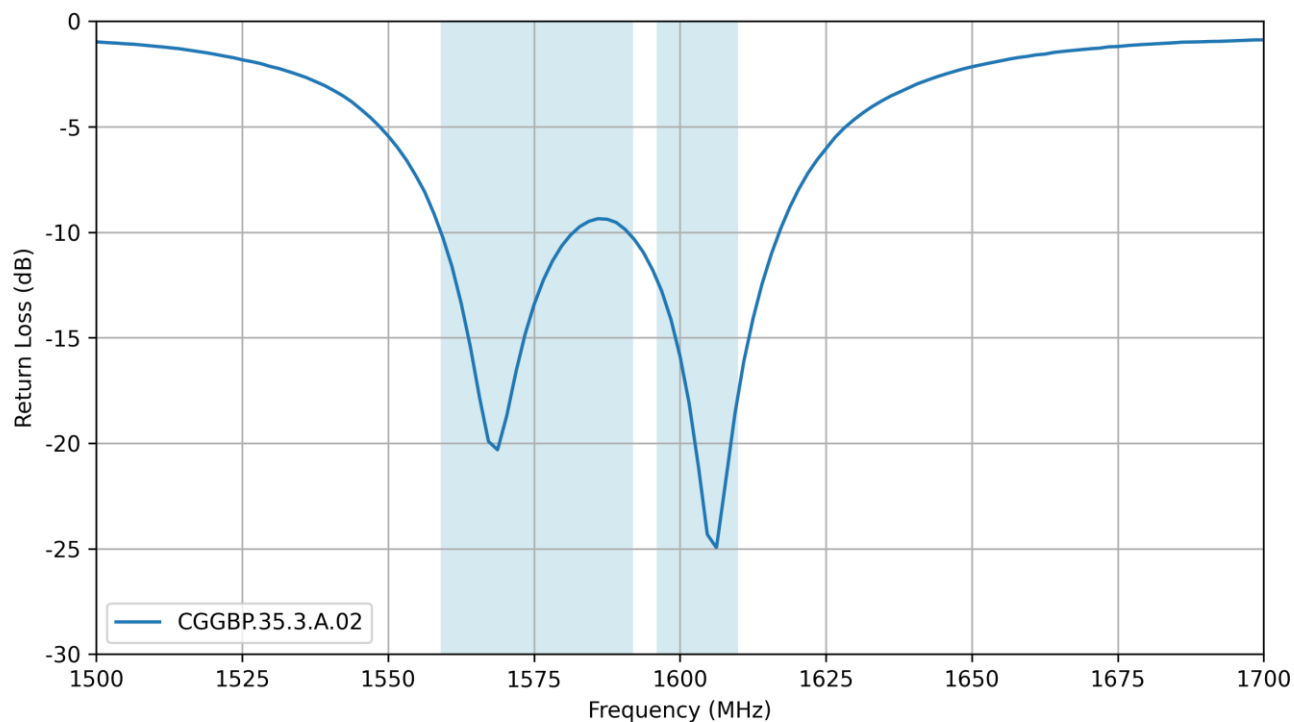
- ✓ 72 PCS / Small box
- ✓ Small box (mm) : 261x152x118
- ✓ SPQ Label



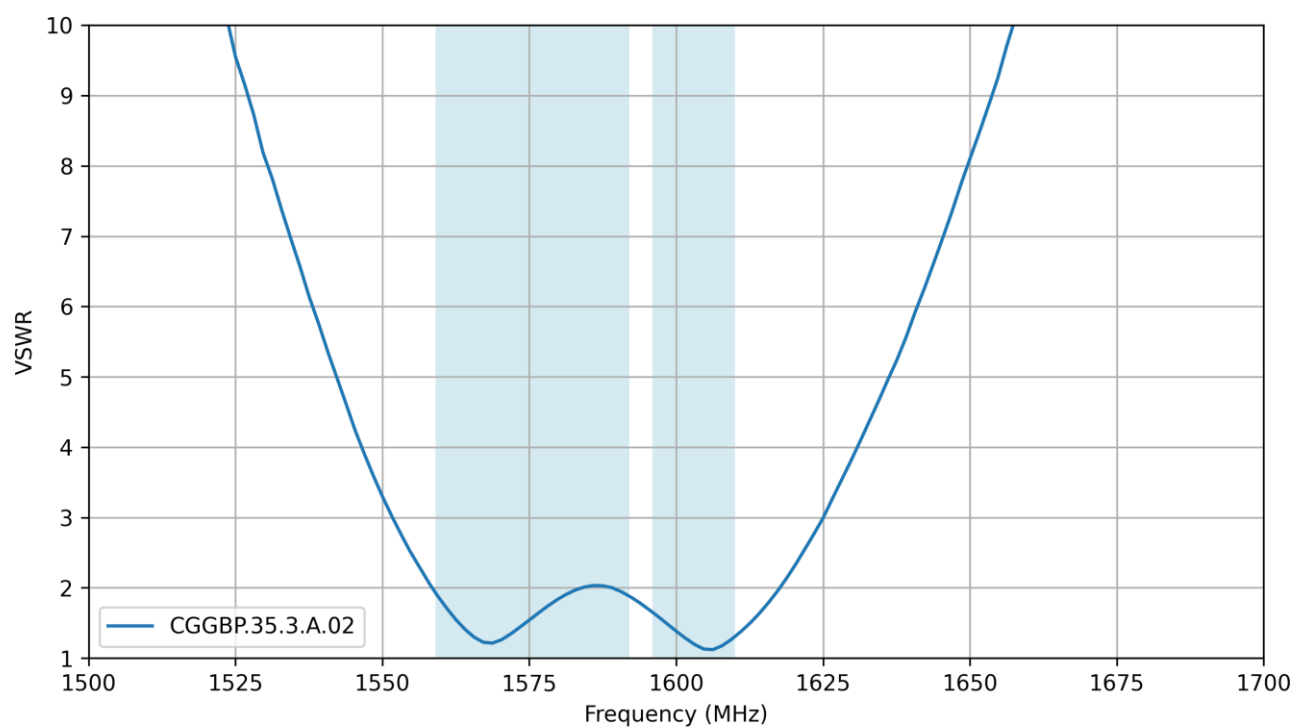
- ✓ 288 PCS / Carton
- ✓ Carton(mm) : 330x280x270
- ✓ Carton Label

6. Antenna Characteristics

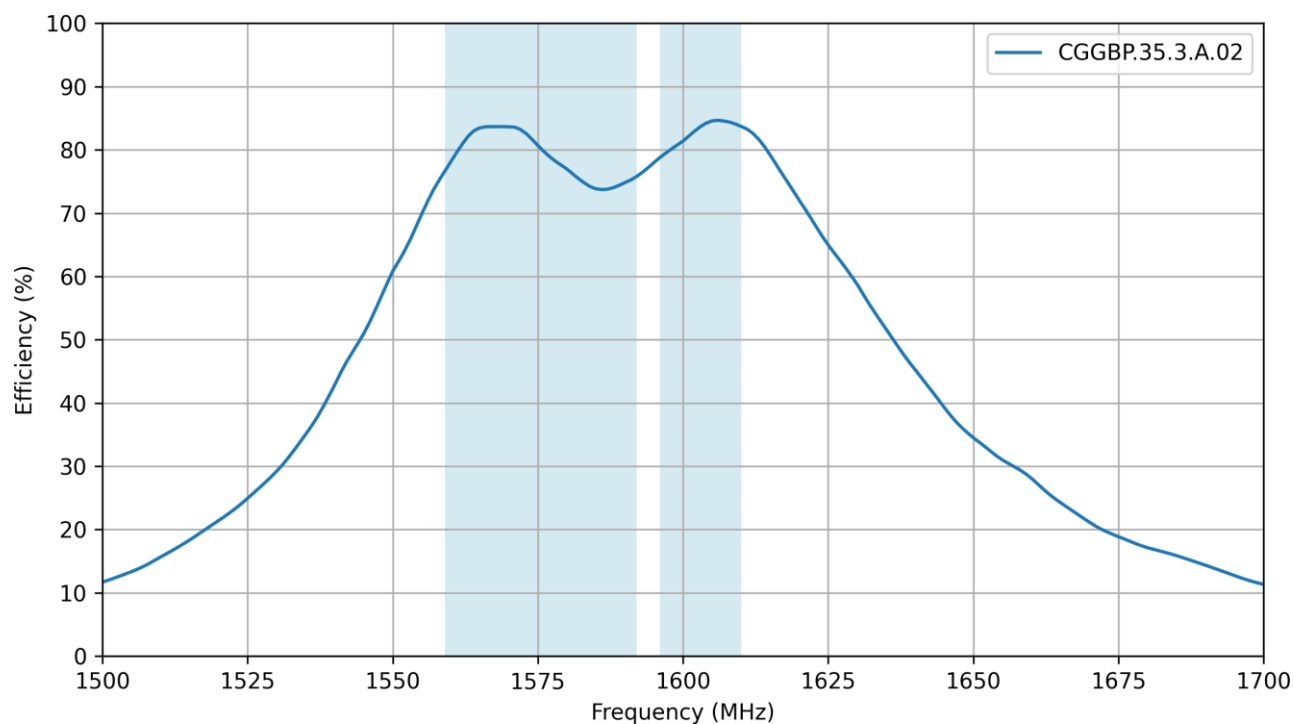
6.1 Return Loss



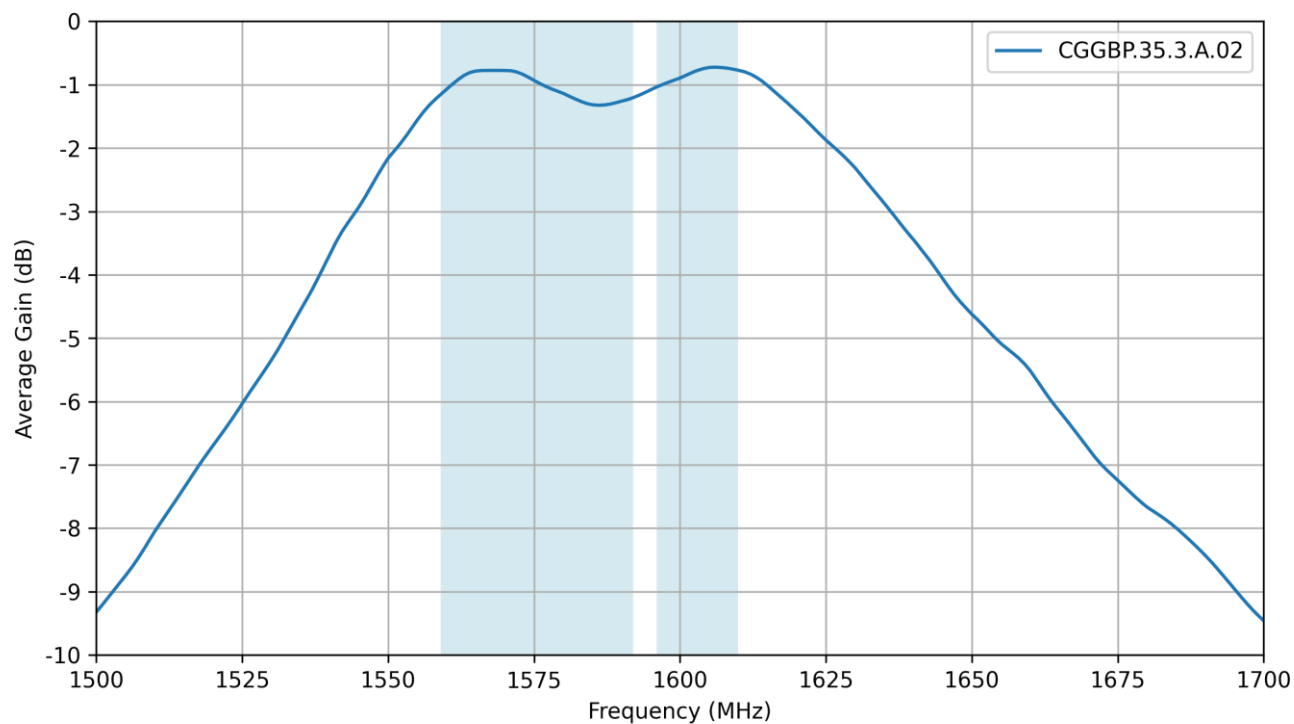
6.2 VSWR



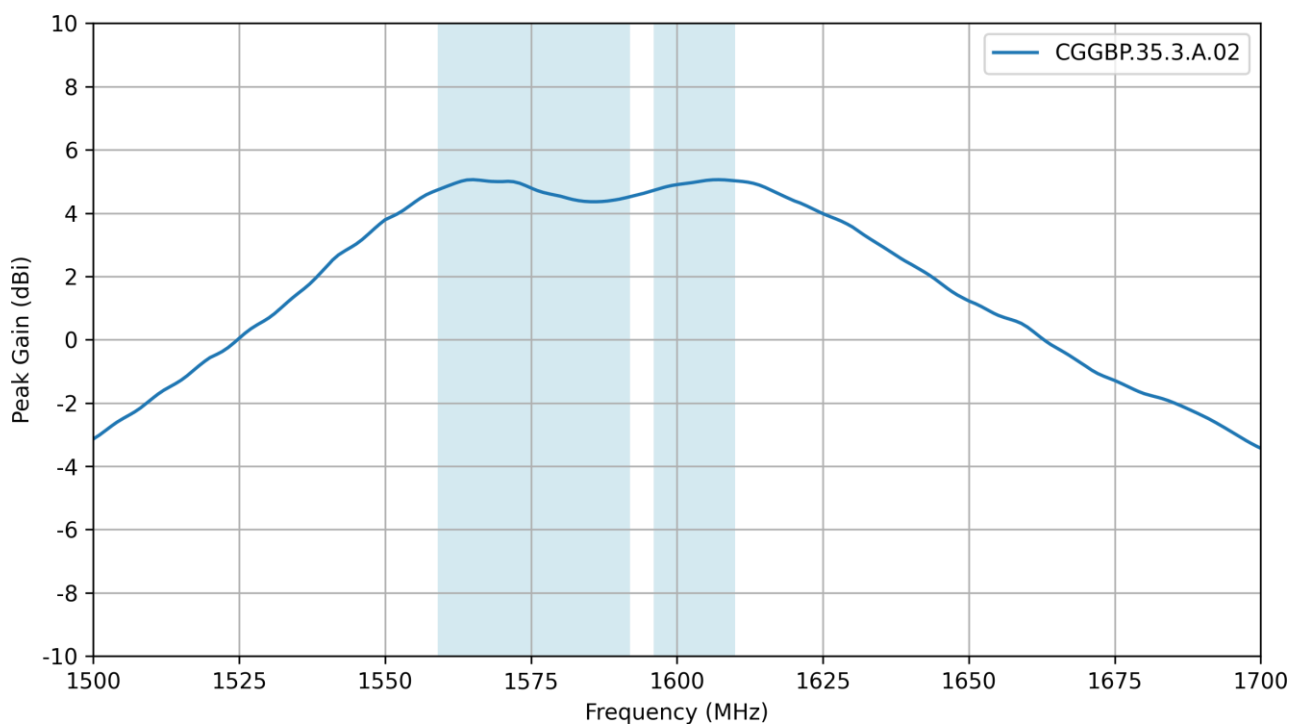
6.3 Efficiency



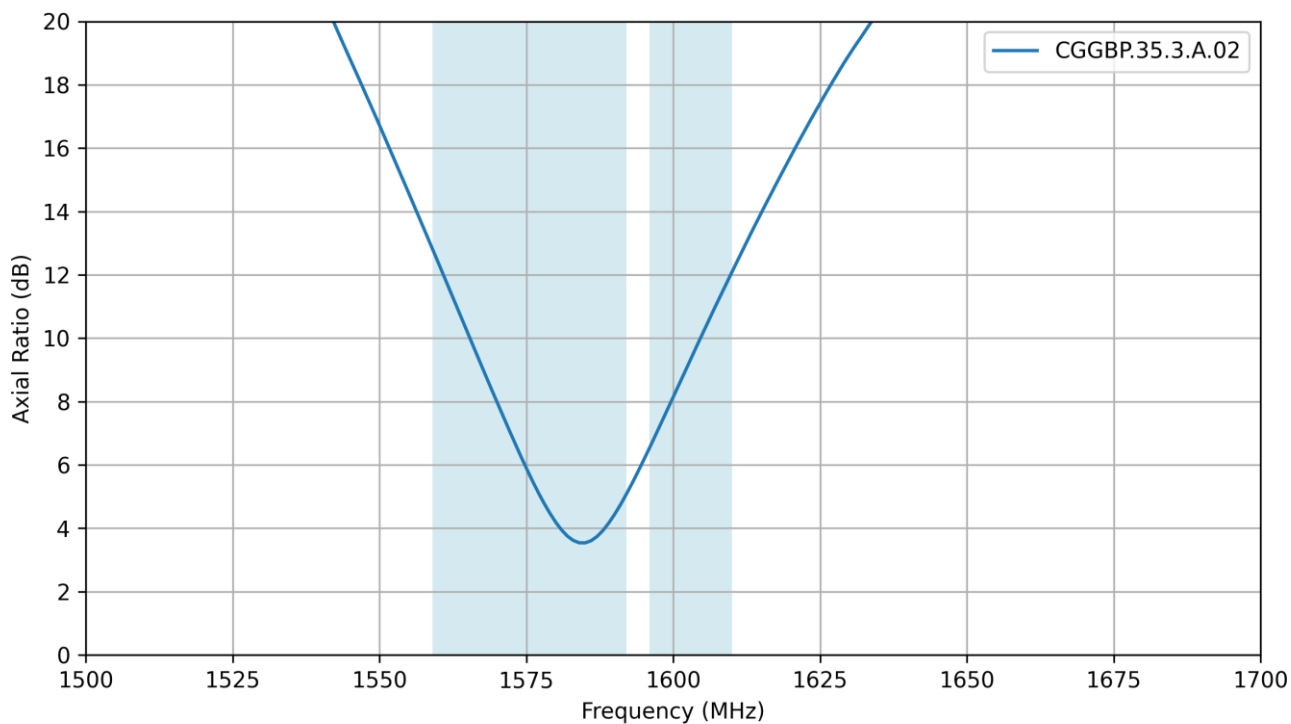
6.4 Average Gain



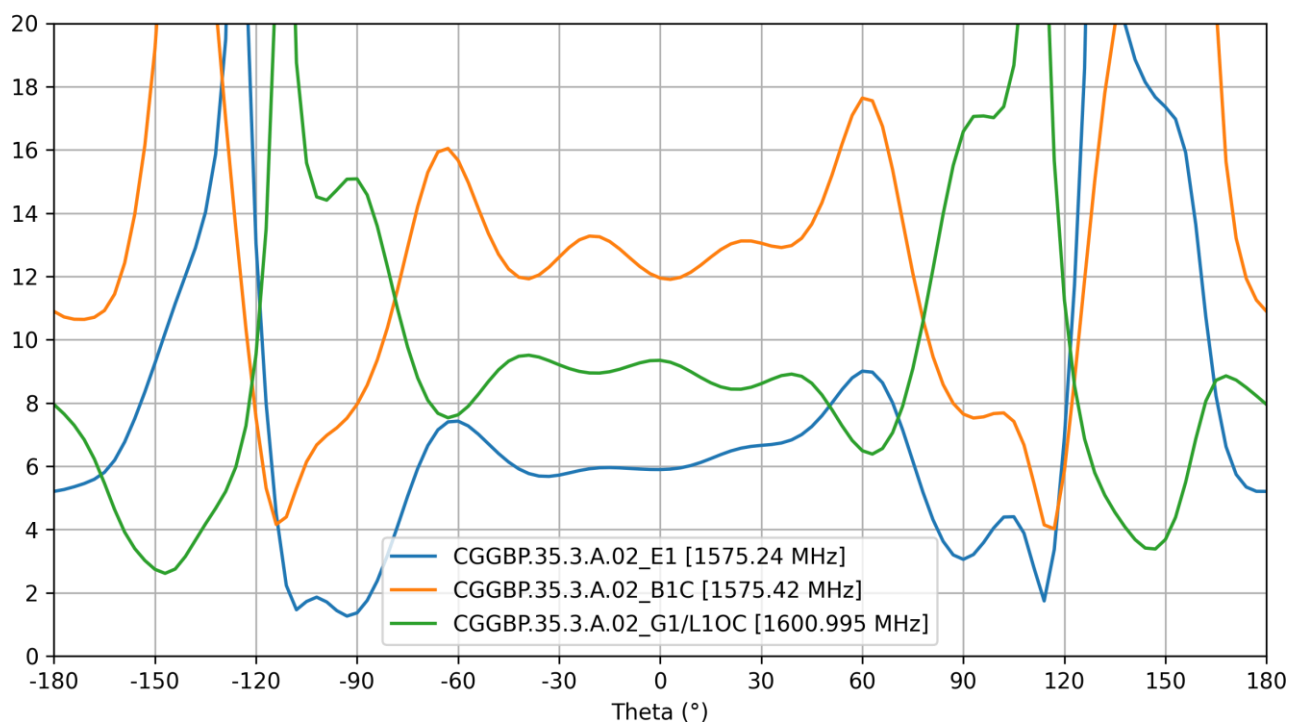
6.5 Peak Gain



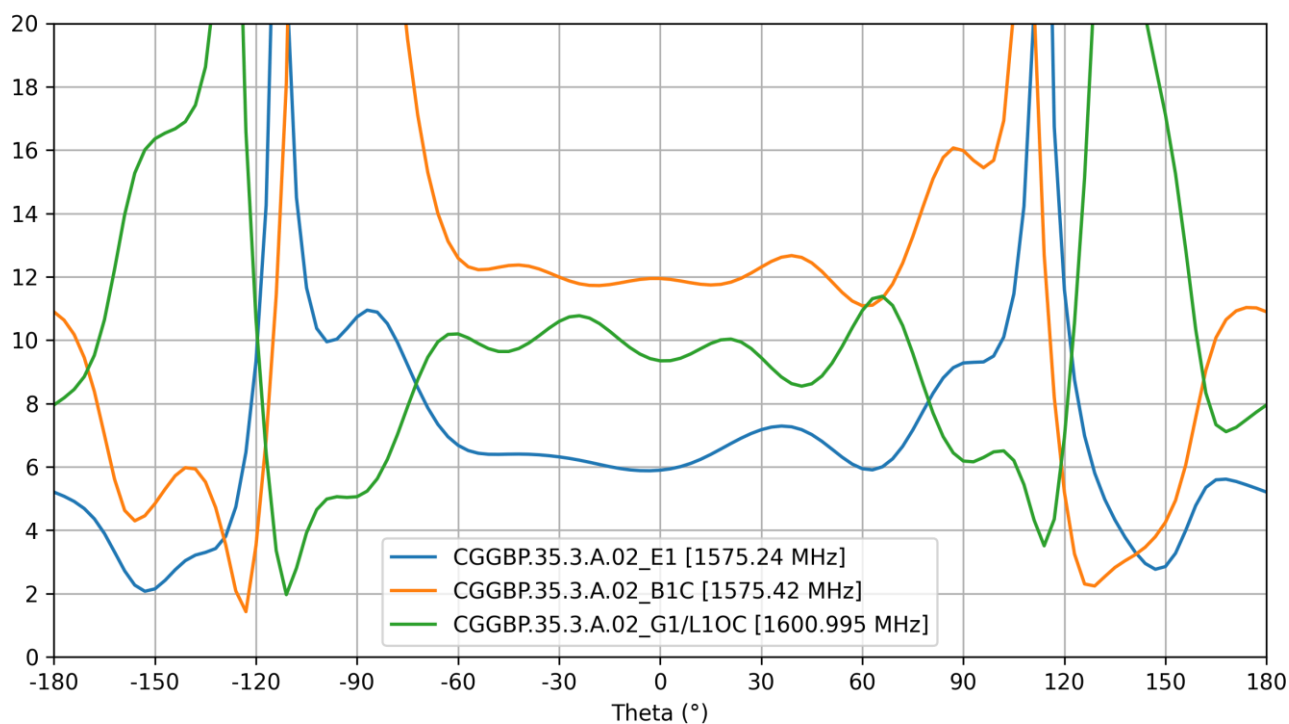
6.6 Axial Ratio



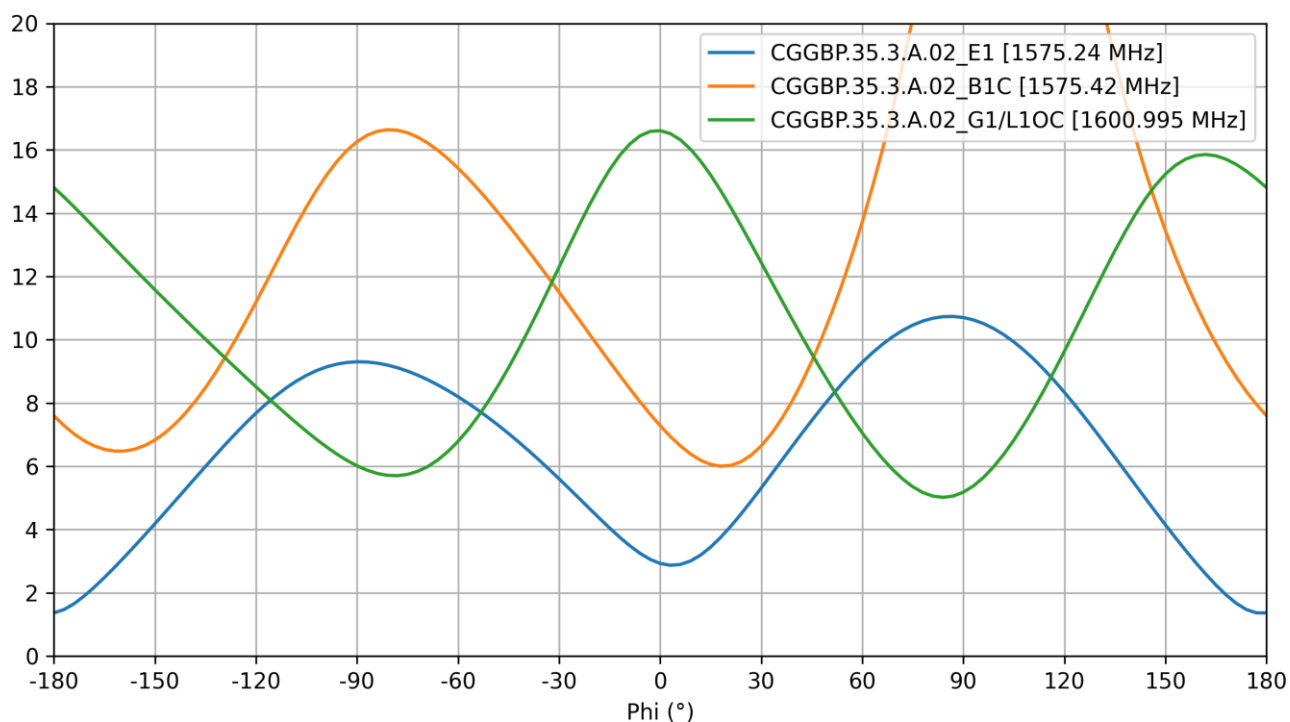
6.7 AR vs Angle for Phi=0



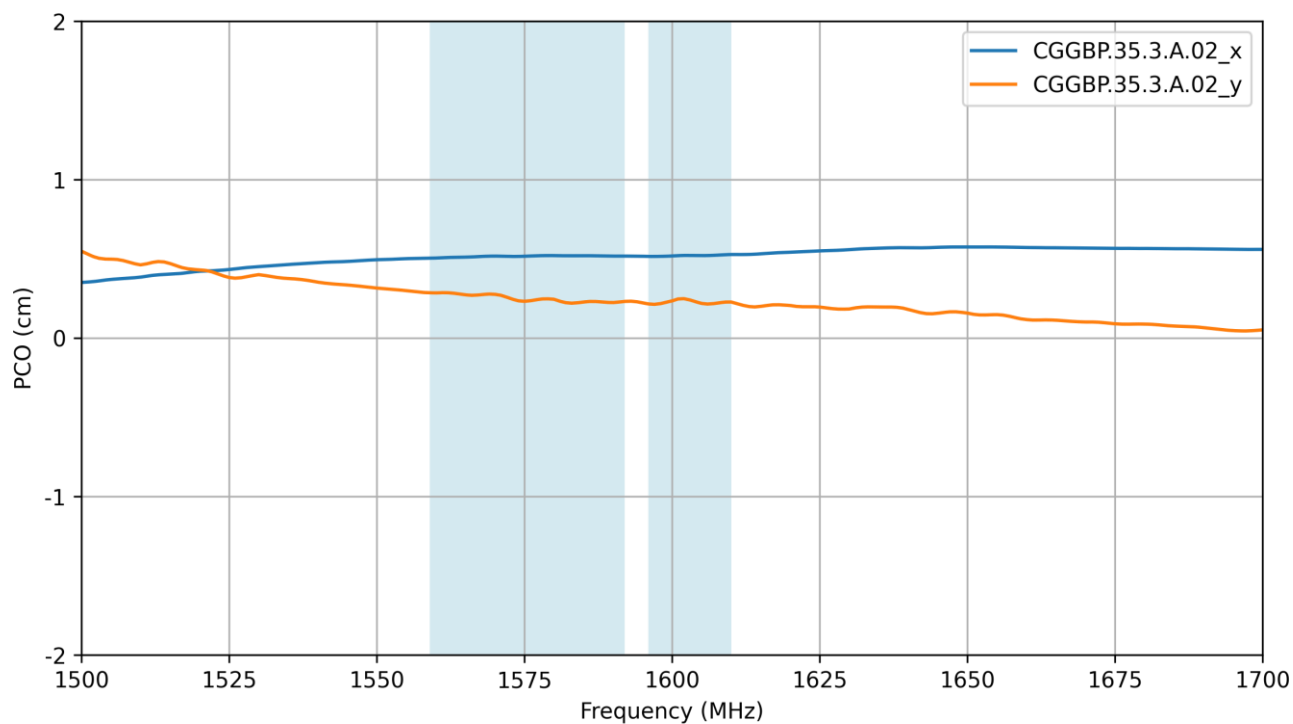
6.8 AR vs Angle for Phi=90



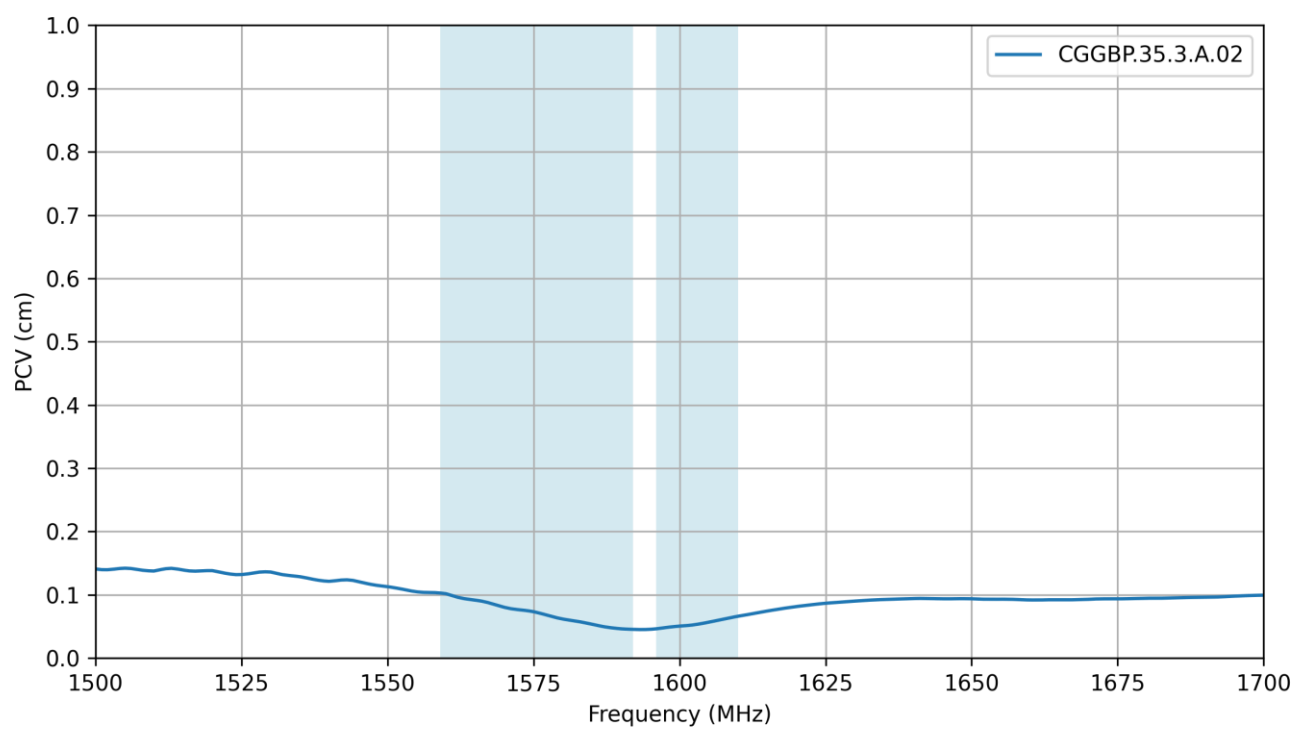
6.9 AR vs Angle for Theta=90



6.10 PCO



6.11 PCV



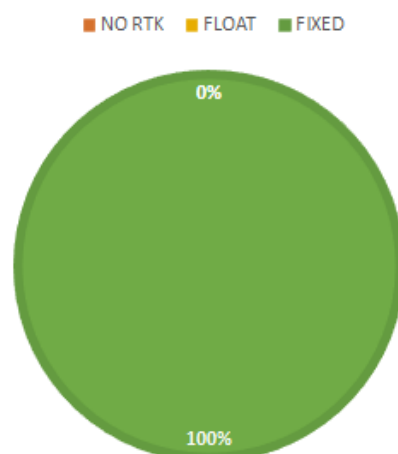
7. Field Test Results

7.1 Ublox ZED-F9P

Receiver features:

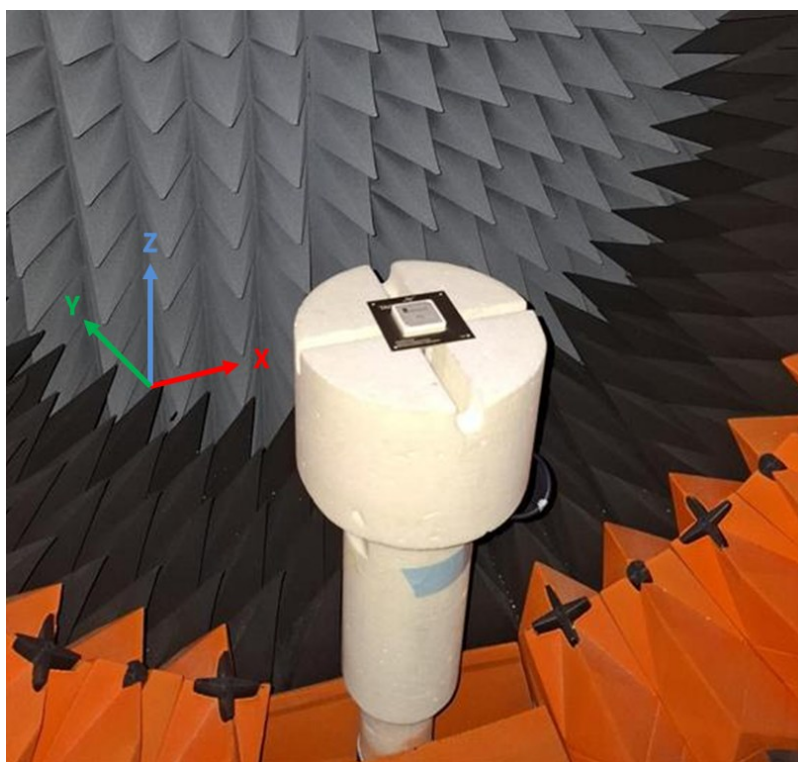
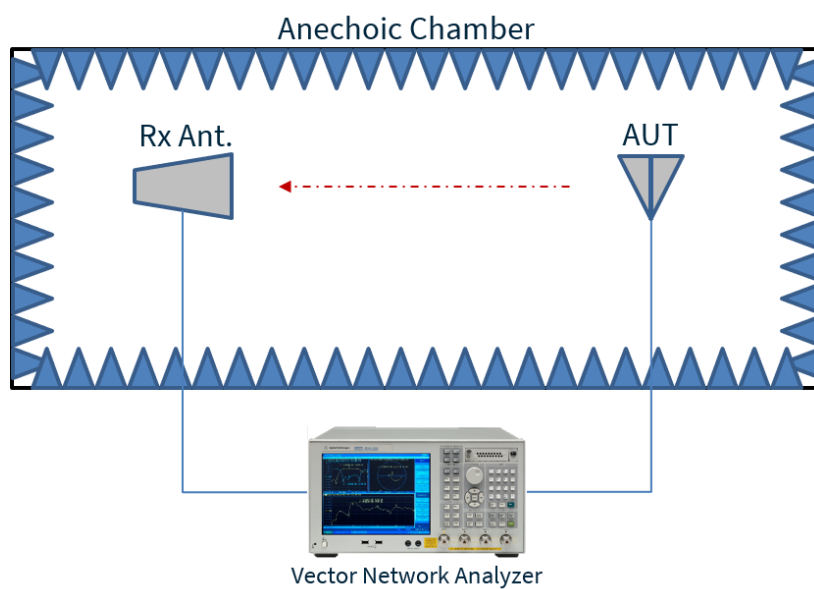
- Multi-band GNSS: 184-channel GPS L1C/A L2C, GLONASS: L1OF L2OF, Galileo: E1B/C E5b, BeiDou: B1I
- B2I, QZSS: L1C/A L2C L1S , SBAS L1C/A
- Multi-band RTK with fast convergence times and reliable performance
- Nav. update rate RTK up to 20 Hz
- Position accuracy = RTK 0.01 m + 1 ppm CEP

Positioning Accuracy Table (2D Accuracy)			
Test Condition	Correction Service	2DRMS (95%)	TTFF (sec)
70x70mm Ground Plane	PPP-RTK DISABLED	83	25.4
	PPP-RTK ENABLED	1.4	



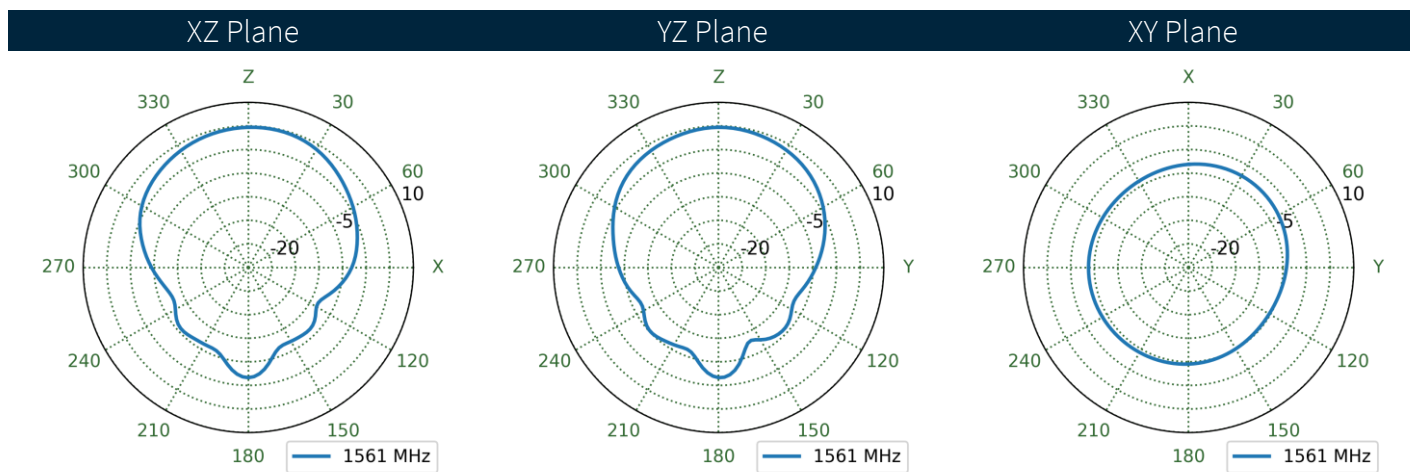
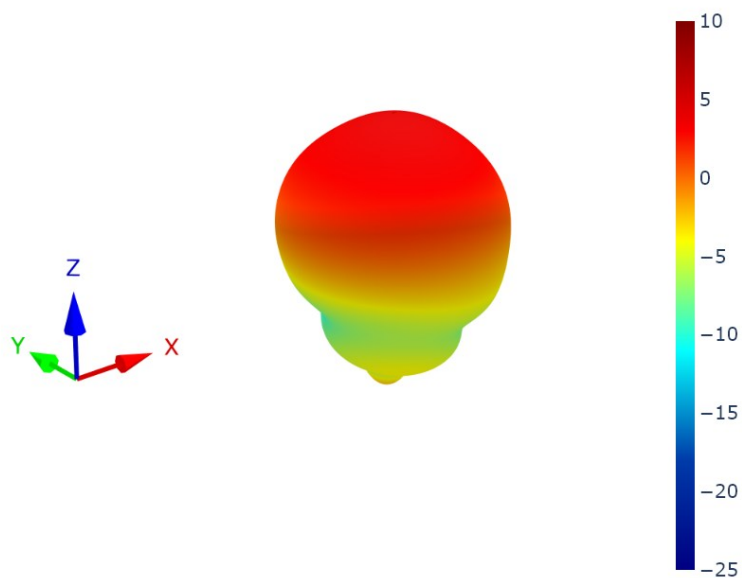
8. Radiation Patterns

8.1 Test Setup

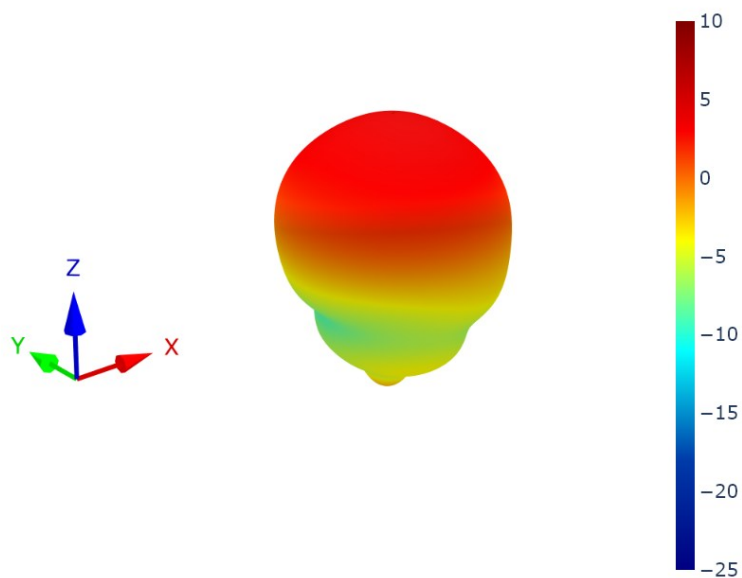


Chamber Test Setup on 70x70mm Ground Plane

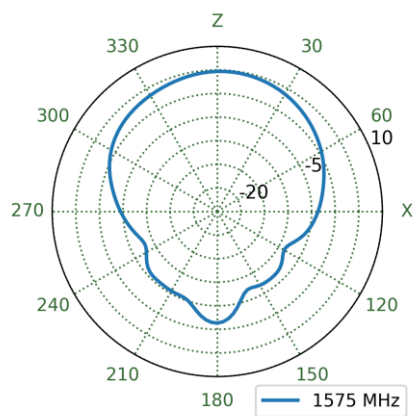
8.2 Patterns at 1561 MHz



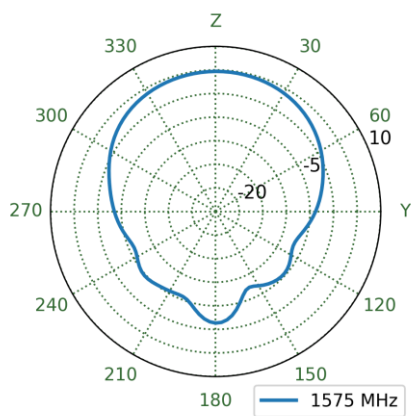
8.3 Patterns at 1575 MHz



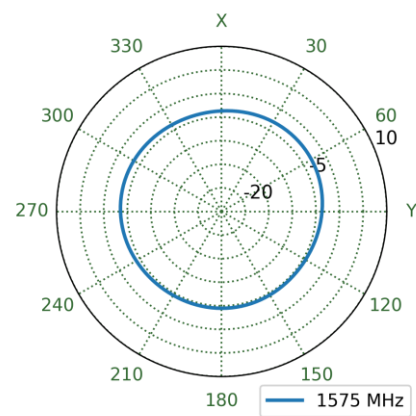
XZ Plane



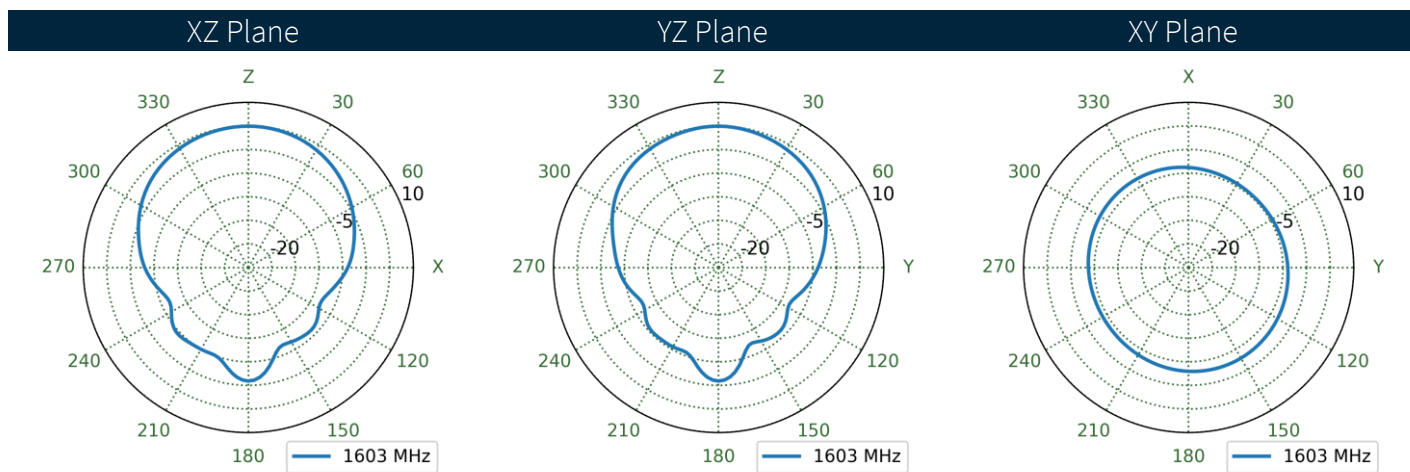
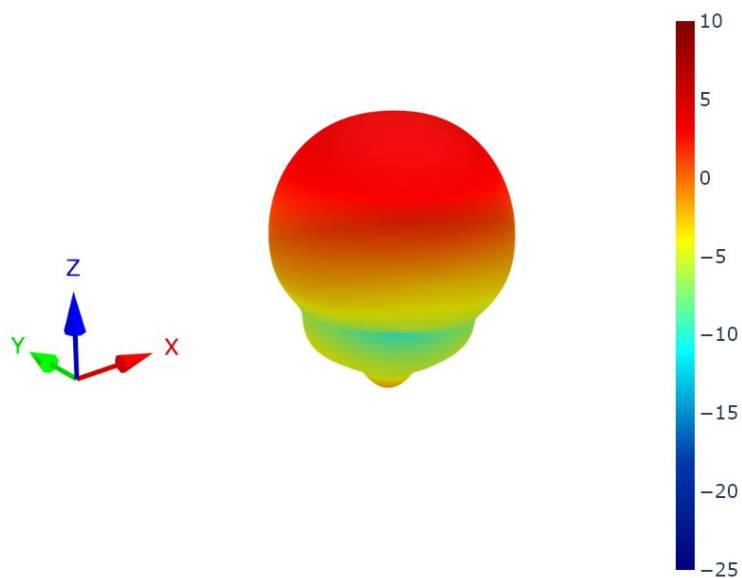
YZ Plane



XY Plane



8.4 Patterns at 1603 MHz



Changelog for the datasheet

SPE-15-8-010 – CGGBP.35.3.A.02

Revision: F (Current Version)

Date:	2025-10-15
Changes:	Updated datasheet template, flow and antenna integration guide.
Changes Made by:	Gary West

Previous Revisions

Revision: E

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

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

