



# TAOGLAS®



# Datasheet

**Part No:**  
**SGGP184B**

**Description**

GPS/GLONASS/GALILEO/BEIDOU Ceramic SMD Patch Antenna

**Features:**

SMD Mount Ceramic Patch Antenna

GPS/GLONASS/GALILEO/BEIDOU

Coverage:

- B1I: 1561 MHz
- L1: 1575.42 MHz
- G1: 1602 MHz

Dimension: 18 x 18 x 4mm

Includes Additional Solder Mask

RoHS & Reach Compliant

|           |                                  |           |
|-----------|----------------------------------|-----------|
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# 1. Introduction



The SGGP184B is a compact ceramic GPS/GLONASS/GALILEO/BEIDOU passive patch antenna, measuring just 18mm x 18mm with a low-profile height of 4mm. Its small form factor makes it ideal for space-constrained applications such as compact telematics devices, vehicle tracking and fleet management systems, wearables, and navigation devices.

The antenna is optimized for a 50mm x 50mm ground plane, operating at 1575.42MHz, 1602MHz and 1561MHz with a peak gain of 1.22dBi gain, 1.99dBi gain and -0.09dBi gain. Designed for SMT mounting, the ceramic patch includes an additional solder mask to enhance durability and prevent cracking due to heat expansion during high-volume, cost-sensitive assembly processes.

Typical applications include:

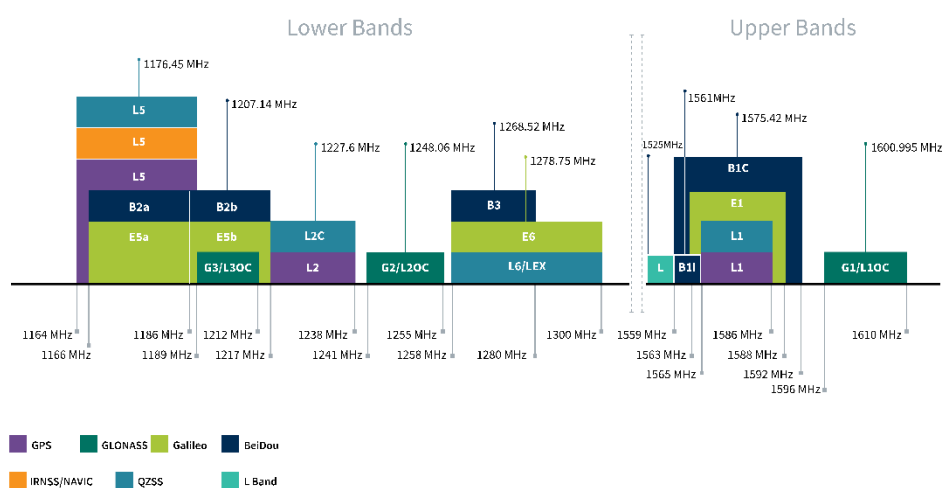
- Vehicle Tracking and Fleet Management Systems
- Wearables
- Navigation Devices

The SSGP Series can be manufactured in a TS16949 first-tier automotive-approved facility and tested to AEC-Q200 certification if required. Further to this, full PPAP and IMDS documentation can be provided upon request. Please discuss your quality and reliability requirements with our team prior to ordering.

Taoglas also offers custom tuning services based on minimum order quantities, contact your regional Taoglas customer support team for further information.

## 2. Specification

| GNSS Frequency Bands |                         |                           |                    |                    |                   |
|----------------------|-------------------------|---------------------------|--------------------|--------------------|-------------------|
| GPS                  | L1<br>1575.42 MHz       | L2<br>1227.6 MHz          | L5<br>1176.45 MHz  |                    |                   |
|                      | ■                       | □                         | □                  |                    |                   |
| GLONASS              | G1<br>1602 MHz          | G2<br>1248 MHz            | G3<br>1207 MHz     |                    |                   |
|                      | ■                       | □                         | □                  |                    |                   |
| Galileo              | E1<br>1575.24 MHz       | E5a<br>1176.45 MHz        | E5b<br>1201.5 MHz  | E6<br>1278.75 MHz  |                   |
|                      | ■                       | □                         | □                  | □                  |                   |
| BeiDou               | B1C<br>1575.42 MHz      | B1I<br>1561 MHz           | B2a<br>1176.45 MHz | B2b<br>1207.14 MHz | B3<br>1268.52 MHz |
|                      | ■                       | ■                         | □                  | □                  | □                 |
| L-Band               | L-Band<br>1542 MHz      |                           |                    |                    |                   |
|                      | □                       |                           |                    |                    |                   |
| QZSS (Regional)      | L1<br>1575.42 MHz       | L2C<br>1227.6 MHz         | L5<br>1176.45 MHz  | L6<br>1278.75e6    |                   |
|                      | ■                       | □                         | □                  | □                  |                   |
| IRNSS (Regional)     | L5<br>1176.45 MHz       |                           |                    |                    |                   |
|                      | □                       |                           |                    |                    |                   |
| SBAS                 | L1/E1/B1<br>1575.42 MHz | L5/B2a/E5a<br>1176.45 MHz | G1<br>1602 MHz     | G2<br>1248 MHz     | G3<br>1207 MHz    |
|                      | ■                       | □                         | ■                  | □                  | □                 |



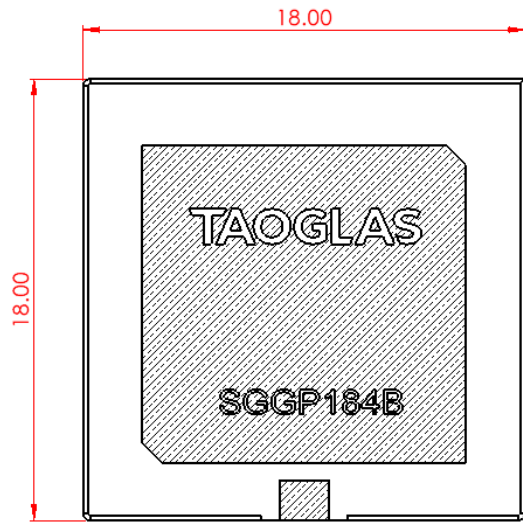
GNSS Bands and Constellations

| GNSS Electrical                   |                |                     |               |
|-----------------------------------|----------------|---------------------|---------------|
| Frequency (MHz)                   | B1I – 1561 MHz | L1/E1 - 1575.42 MHz | G1 – 1602 MHz |
|                                   | 1559-1565      | 1565-1586           | 1596-1610     |
| Efficiency (%)                    | 29.6           | 43.2                | 46.4          |
| Average Gain (dB)                 | -5.28          | -3.64               | -3.33         |
| Peak Gain (dBi)                   | -0.09          | 1.22                | 1.99          |
| Polarization                      | RHCP           |                     |               |
| Impedance                         | 50 Ω           |                     |               |
| *Tested on a 50x50mm Ground Plane |                |                     |               |

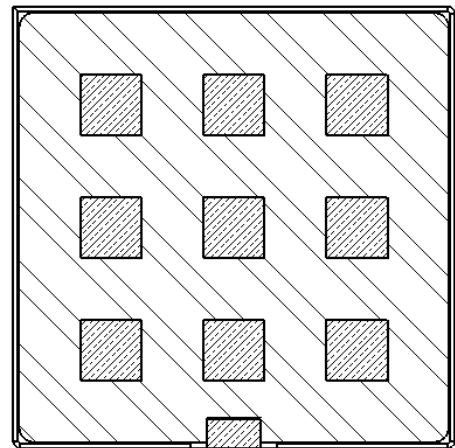
| Mechanical |                   |
|------------|-------------------|
| Dimensions | 18mm x 18mm x 4mm |
| Weight     | 5.18g 3%          |
| Material   | Ceramic           |

| Environmental         |                            |
|-----------------------|----------------------------|
| Operation Temperature | -40°C to 105°C             |
| Storage Temperature   | -40°C to 105°C             |
| Relative Humidity     | Non-condensing 65°C 95% RH |
| Moisture Sensitivity  | 3 (168 Hours)              |

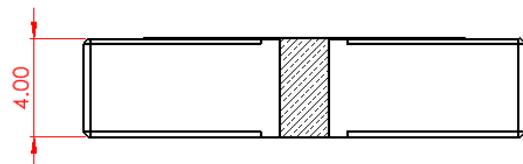
### 3. Mechanical Drawing



TOP



BOTTOM



SIDE

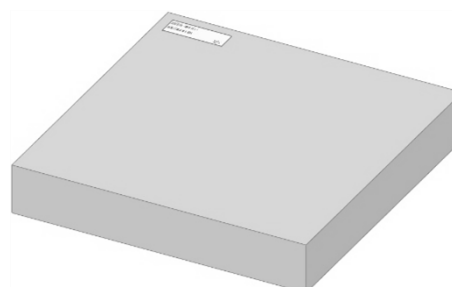
-  SILVER
-  CERAMIC
-  SOLDER MASK

## 4. Packaging

200 pcs/ Vacuum bag



200 pcs / Box  
Box: 350x340x67mm  
Weight: 2.12  $\pm$ 3% Kg

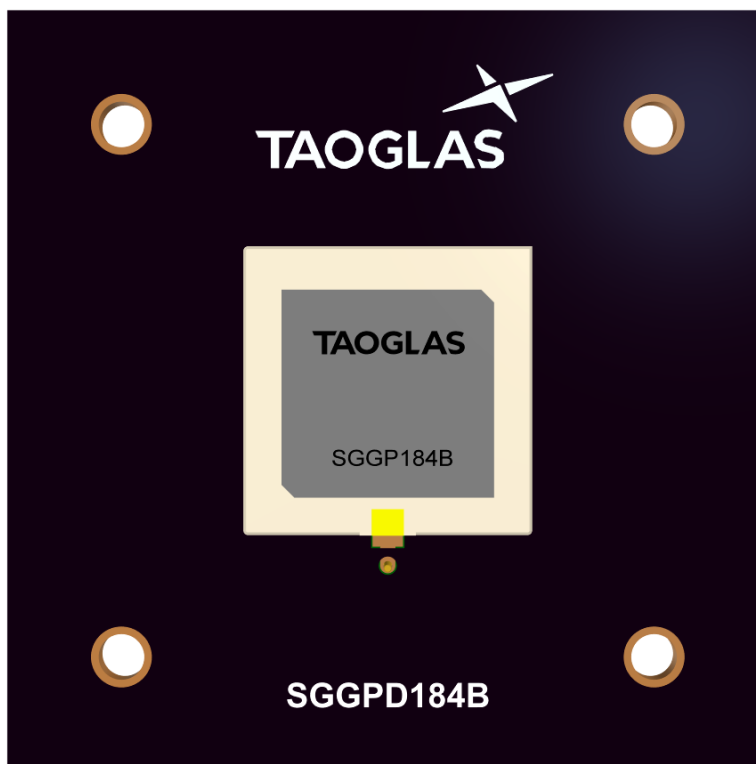


800 pcs / Carton  
Carton: 370x370x300mm  
Weight: 8.5  $\pm$ 3% Kg



## 5. Antenna Integration Guide

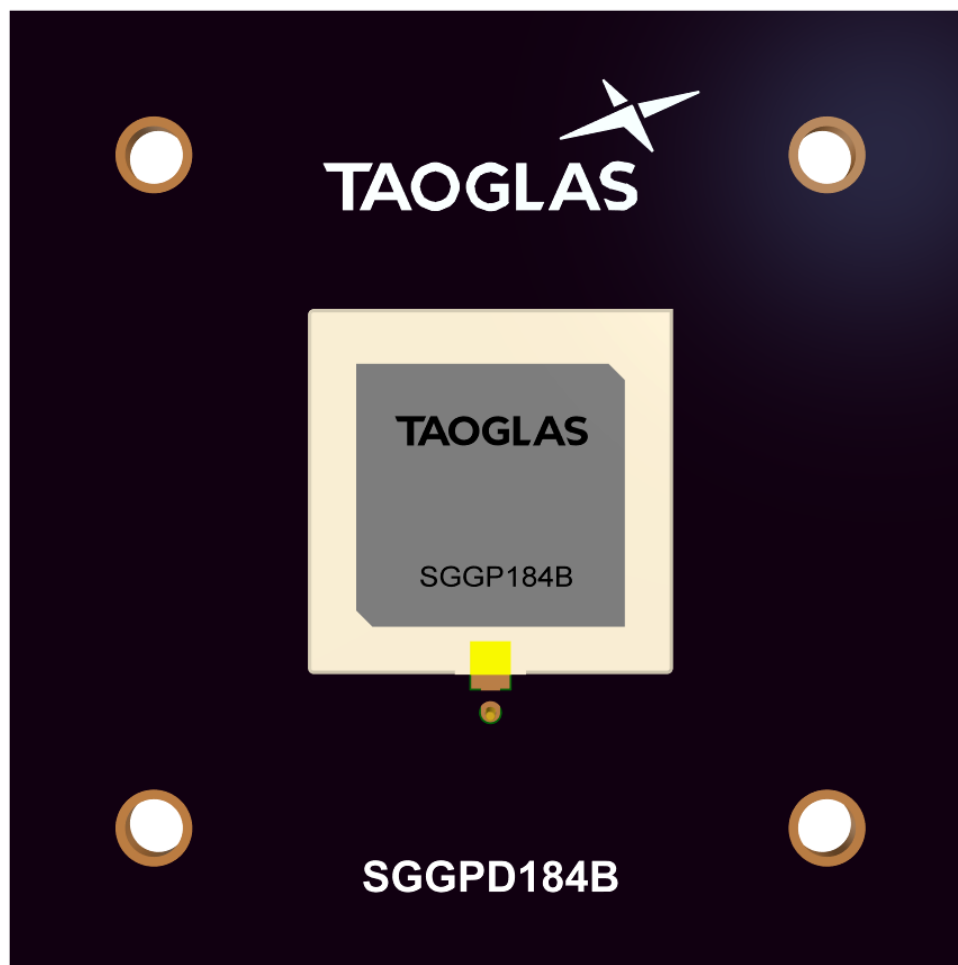
The following is an example on how to integrate the SGGP184B into a design. This antenna has 10 pins, where one pin is used for the RF Feed. Taoglas recommends using a minimum of 50x50mm ground plane (PCB) to ensure optimal performance.



Top view of PCB reference design.

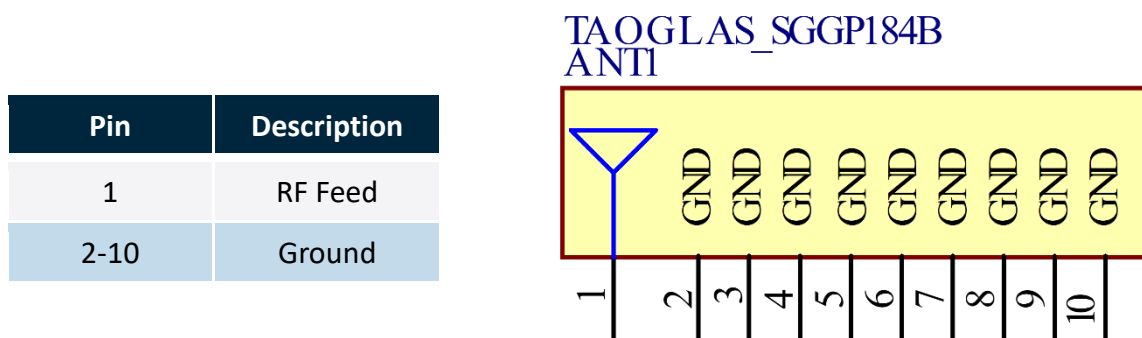


## 5.1 Schematic and Symbol Definition

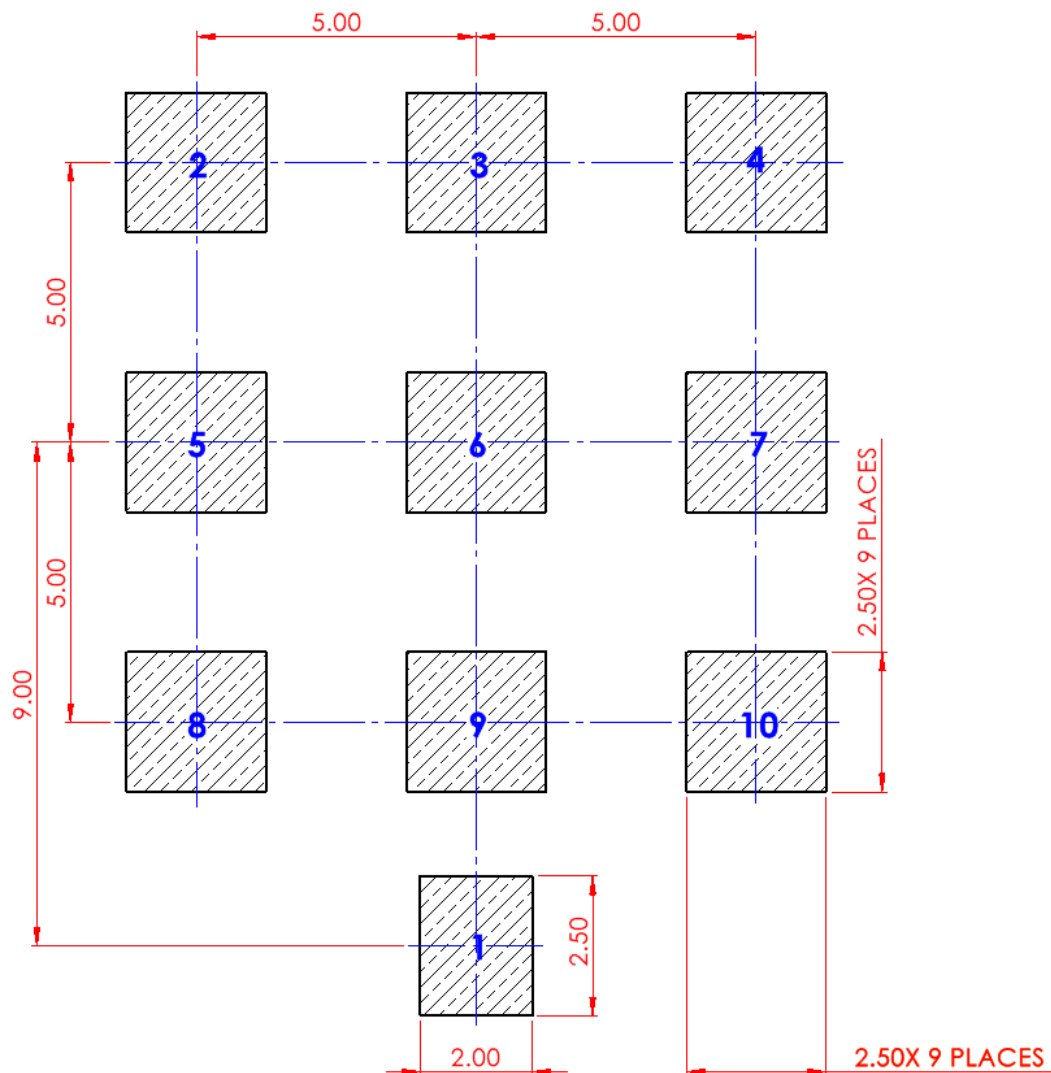


Above is a 3D model of the SGGP184B on a PCB reference design.

The circuit symbol for the SGGP184B is shown below. The antenna has 10 pins as indicated below.

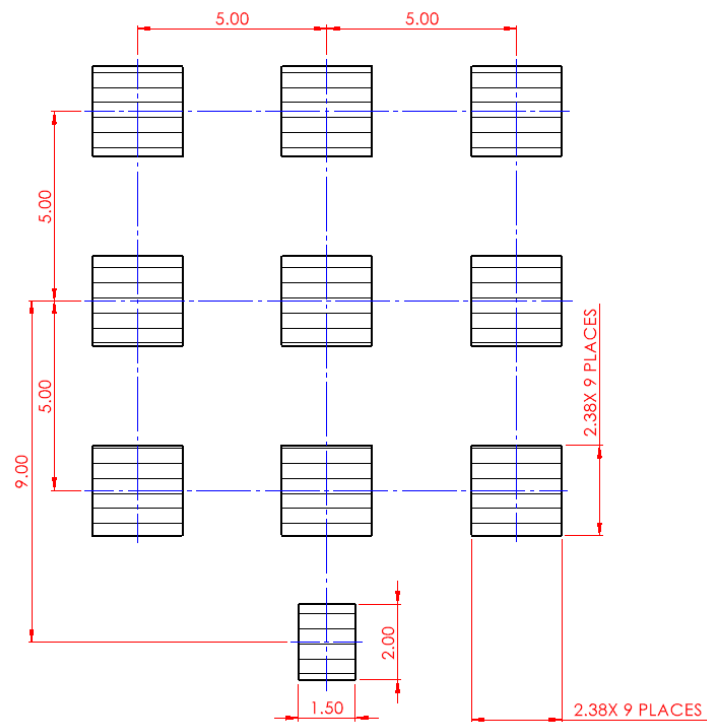


## 5.2 Antenna Footprint

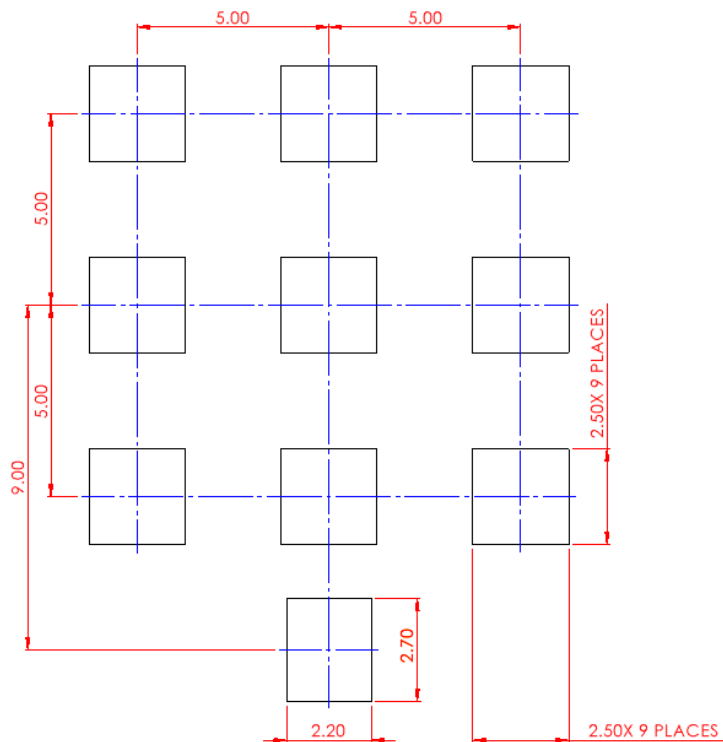


| Pin  | Description |
|------|-------------|
| 1    | RF Feed     |
| 2-10 | Ground      |

### 5.3 Top Solder Paste



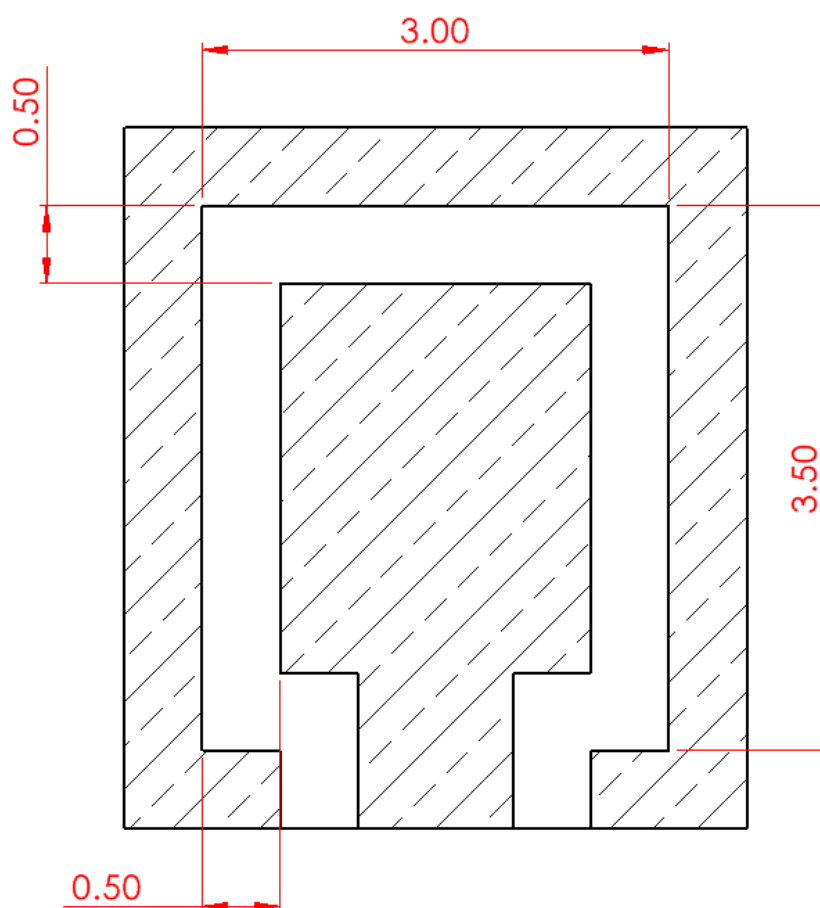
### 5.4 Top Solder Mask



## 5.5 Copper Clearance for SGGP184B

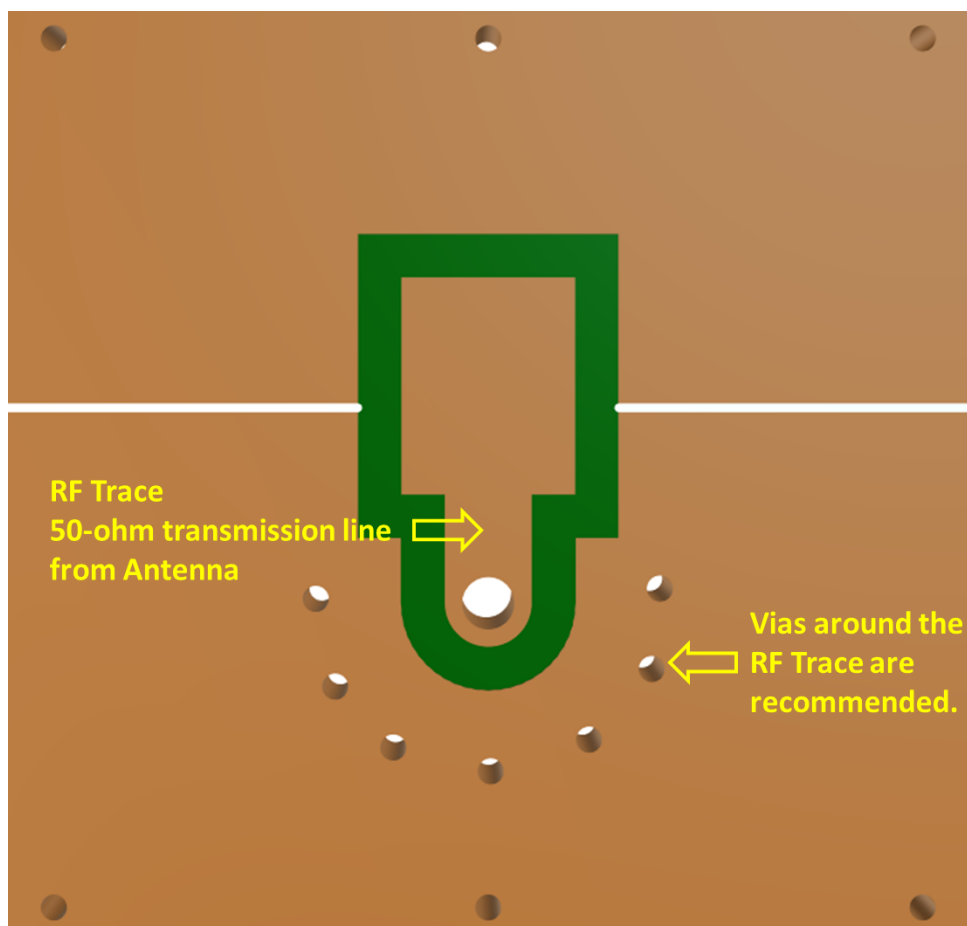
The footprint and clearance on the PCB must comply with the antenna's specification. The PCB layout shown in the diagrams below demonstrates the SGGP184B clearance area. The copper keep out area applies to the top layer and all internal layers.

There should be a 3.5x3mm copper clearance area around RF Feed pad.



## 5.6 Antenna Integration

The SGGP184B should be placed in the centre, as close to the edge on the long side of the PCB as possible, to take advantage of the ground plane. The RF trace must maintain a 50 Ohm transmission line. Ground vias should be placed around the RF trace.



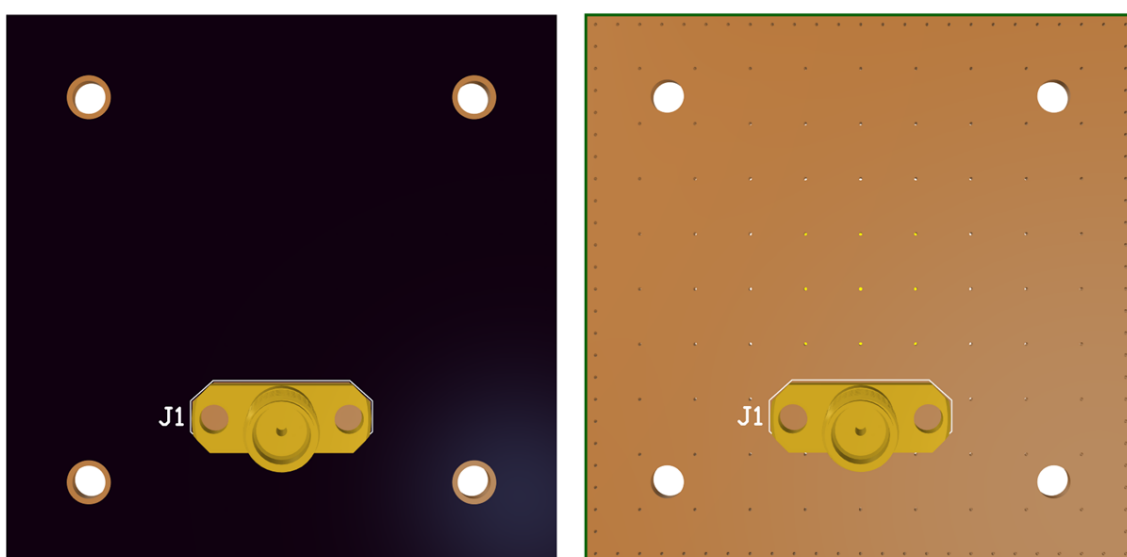
SGGP184B antenna mounted on a PCB reference design, showing transmission lines and integration notes.

## 5.7 Final Integration

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



Top Side (SGGP184B placement on 50x50mm PCB reference design)



Bottom Side

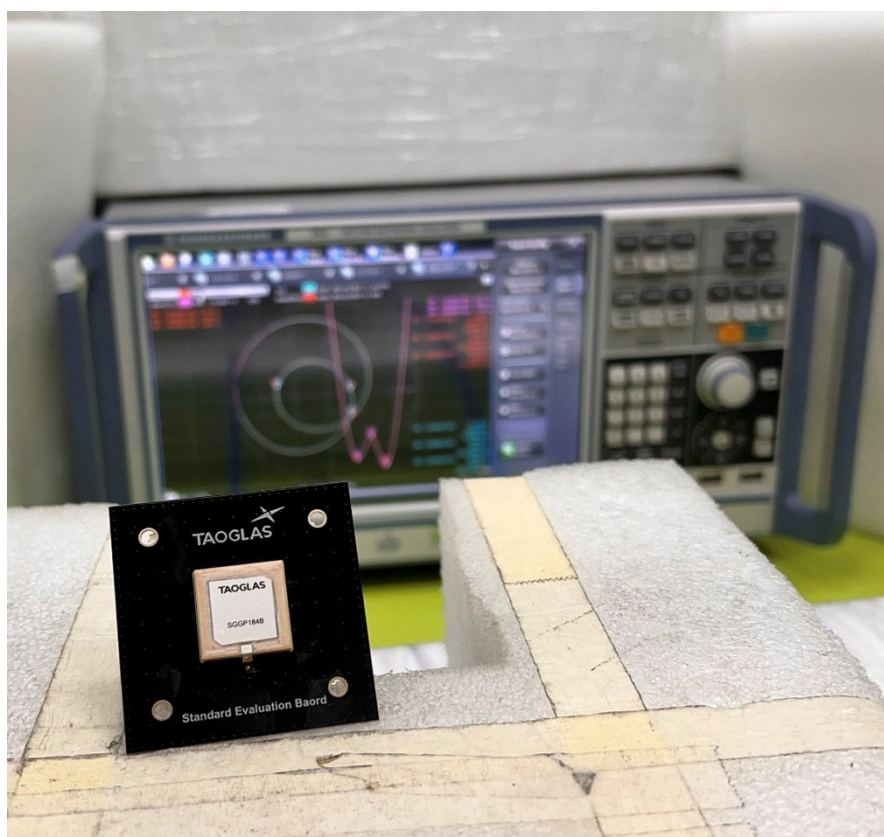
## 6. Antenna Characteristics

### 6.1 Test Setup

AUT

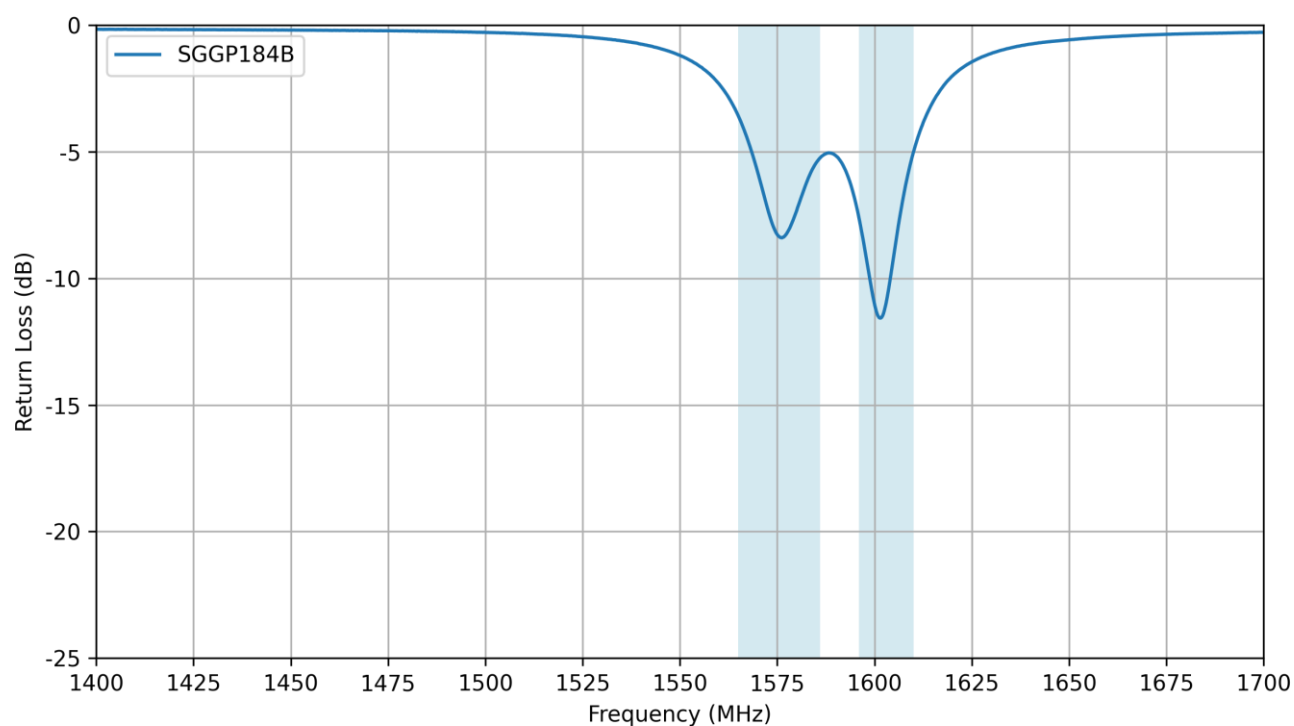


Vector Network Analyzer

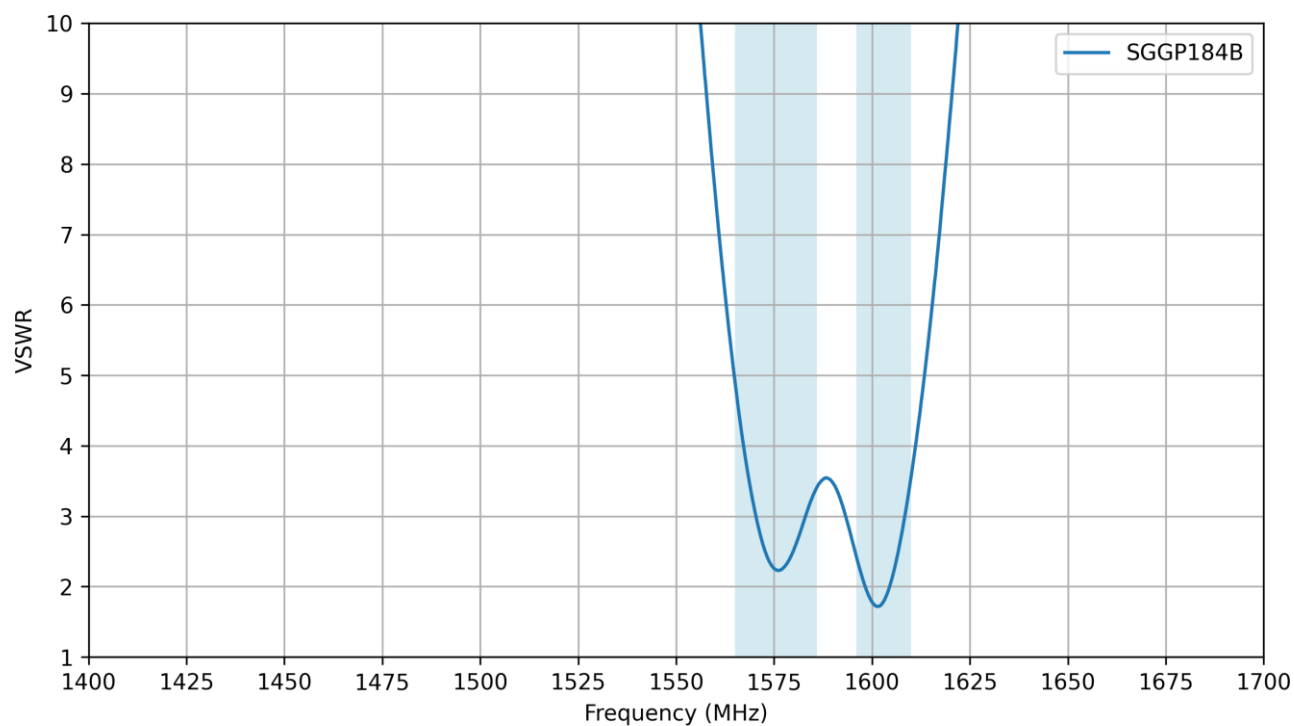


VNA Test Set-up

## 6.2 Return Loss

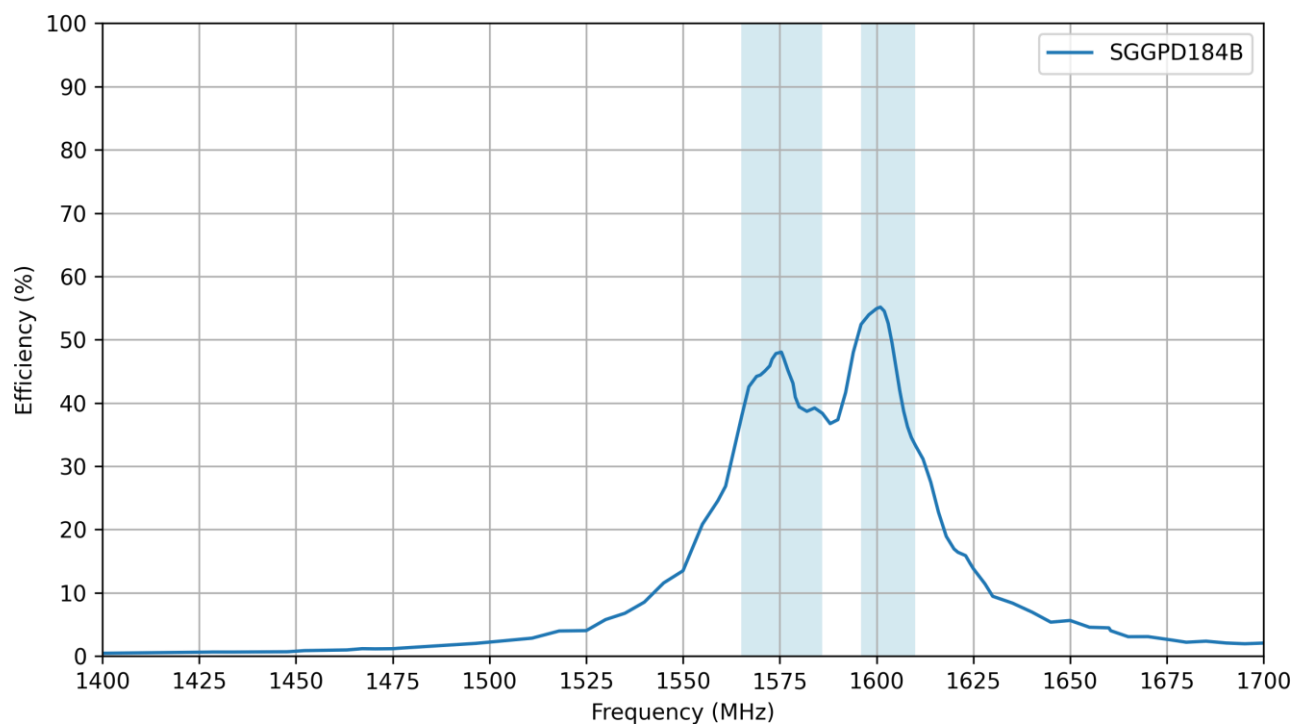


## 6.3 VSWR

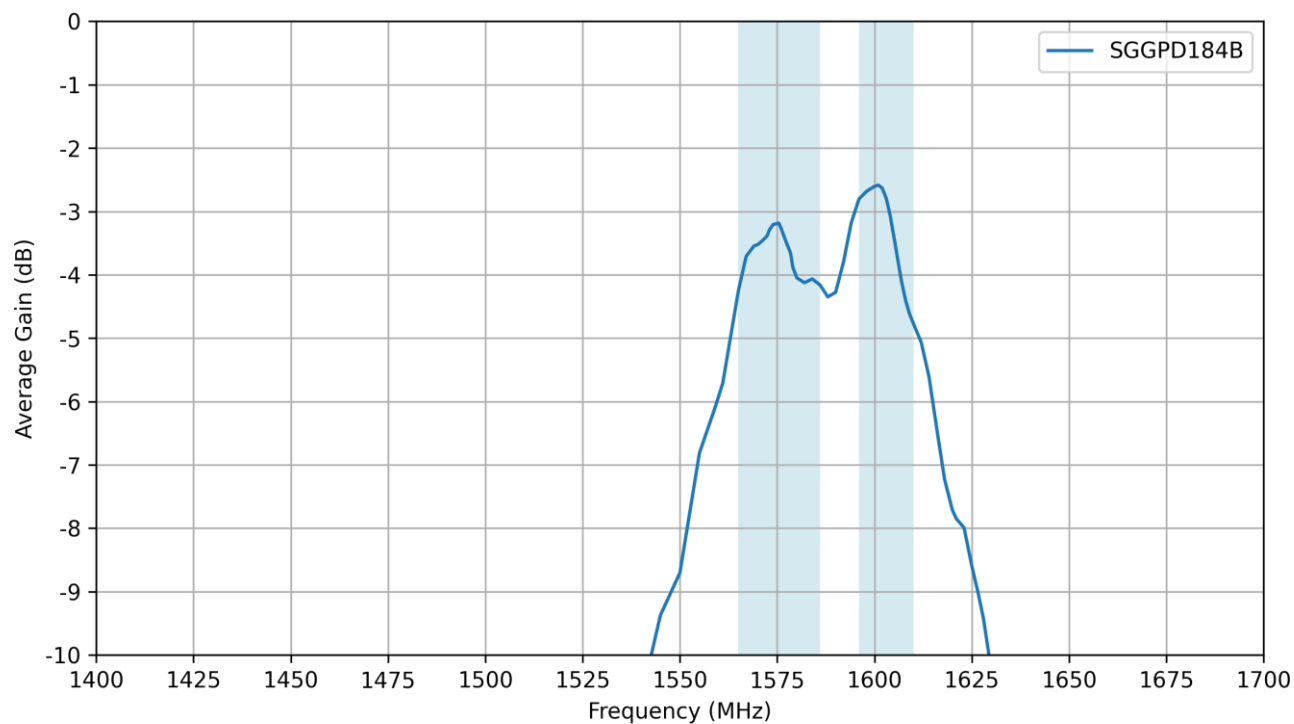




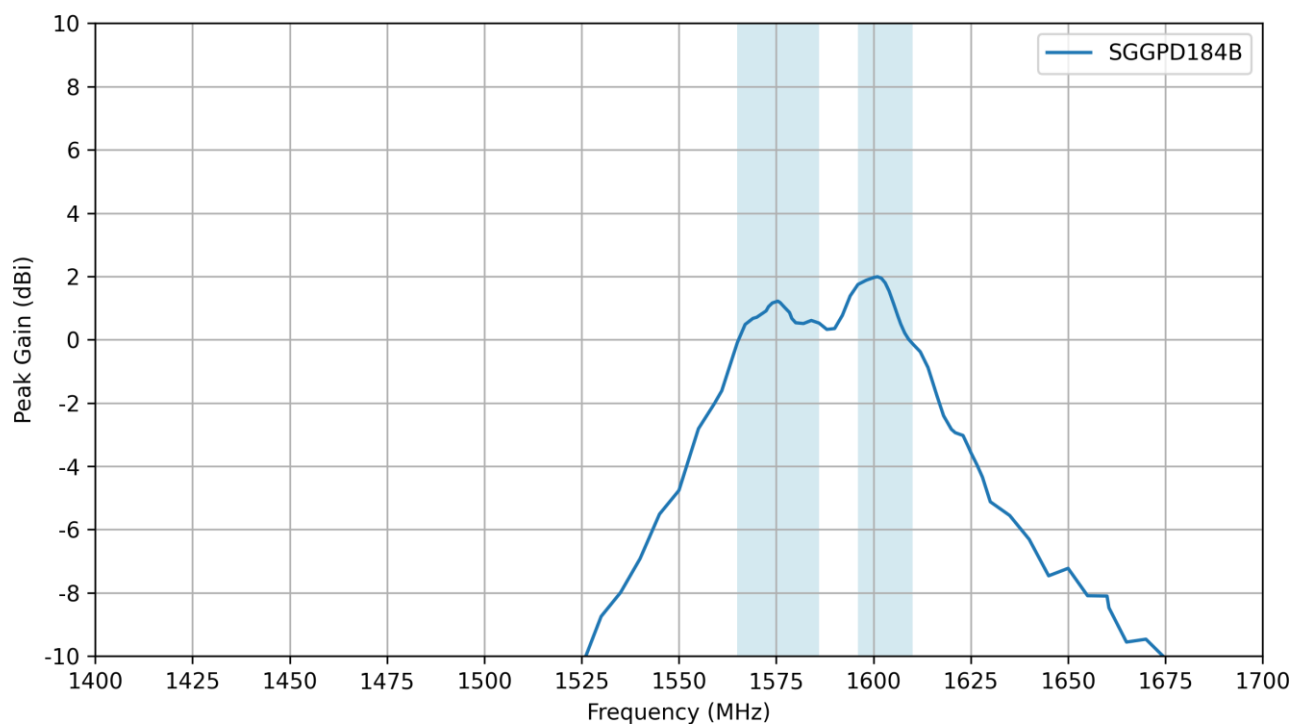
## 6.4 Efficiency



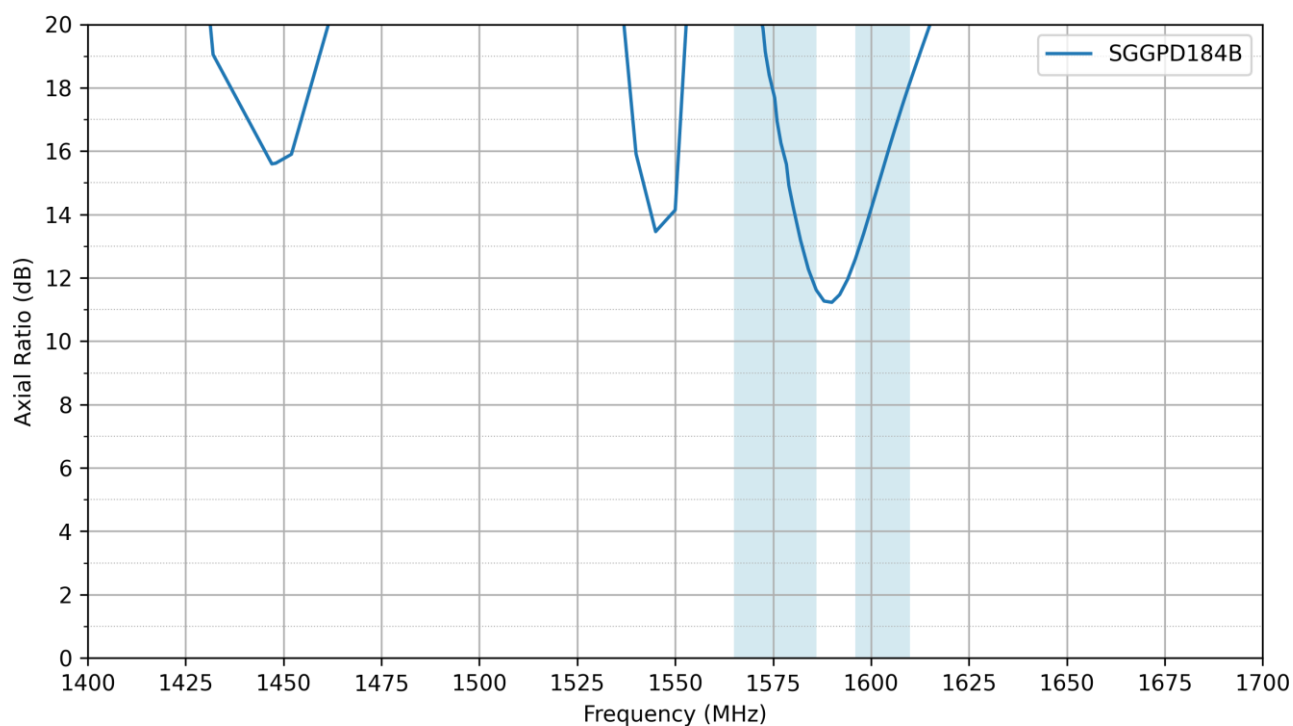
## 6.5 Average Gain



## 6.6 Peak Gain

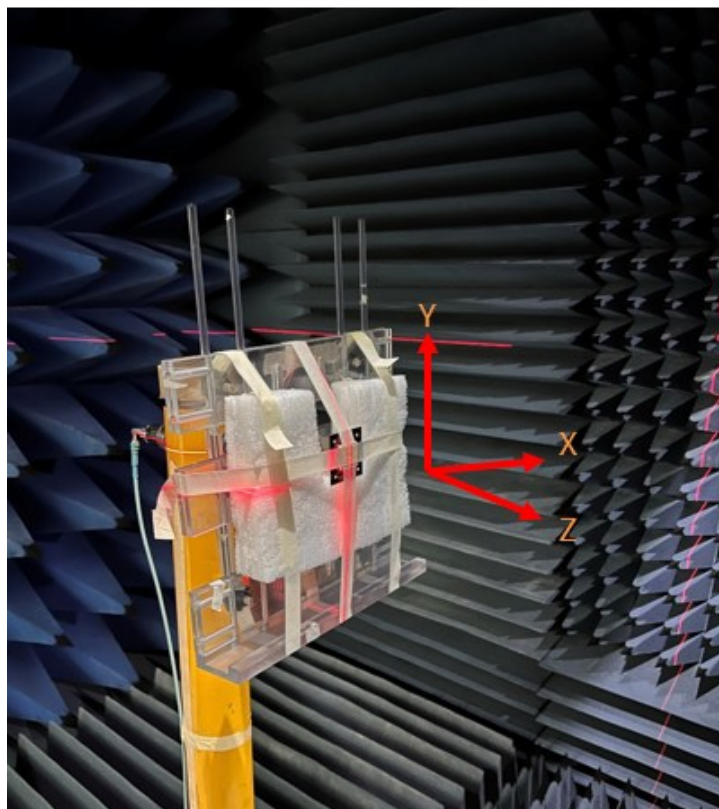
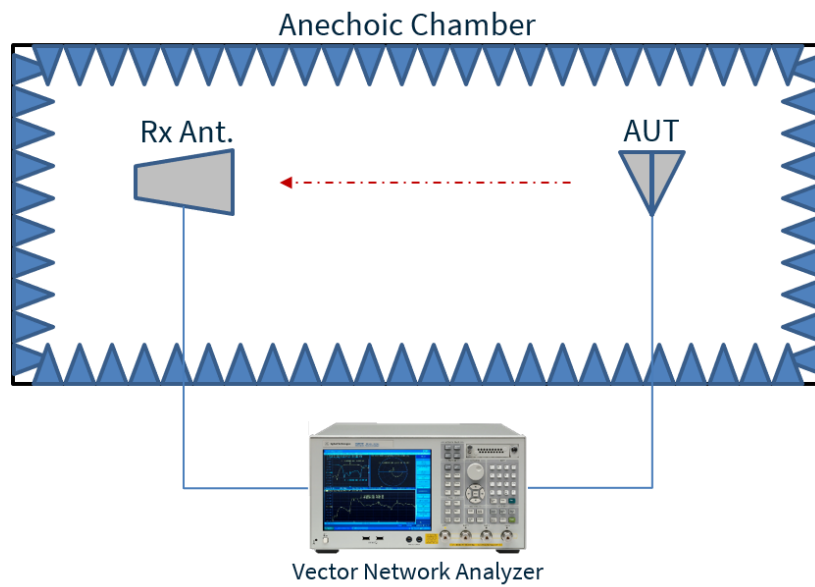


## 6.7 Axial Ratio



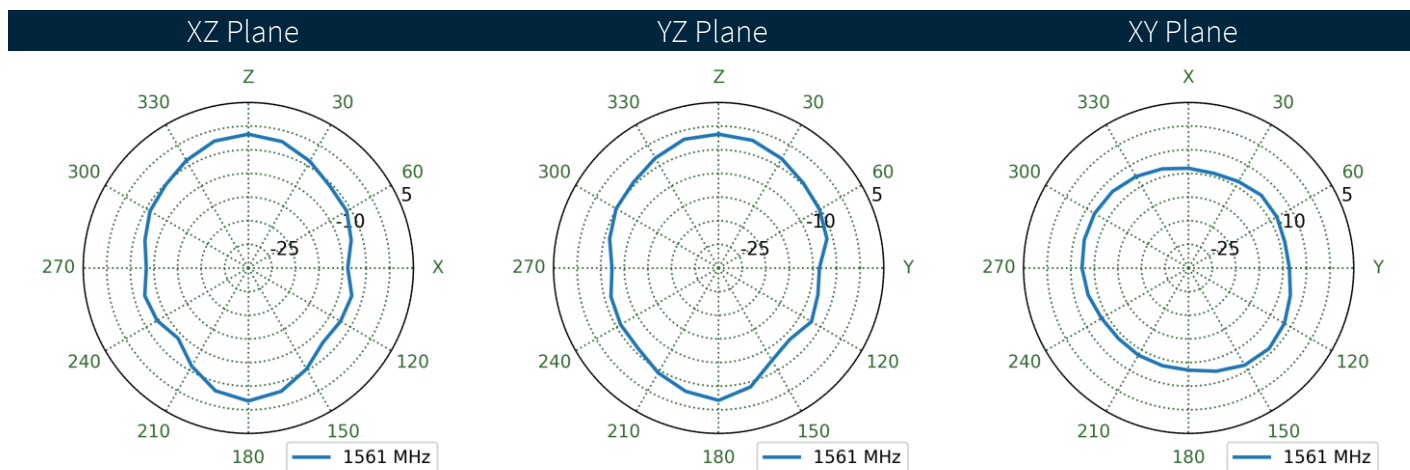
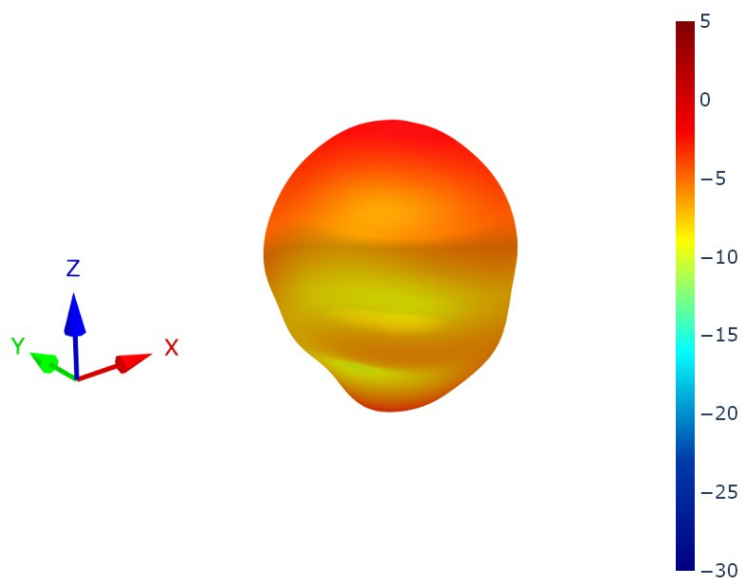
## 7. Radiation Patterns

### 7.1 Test Setup

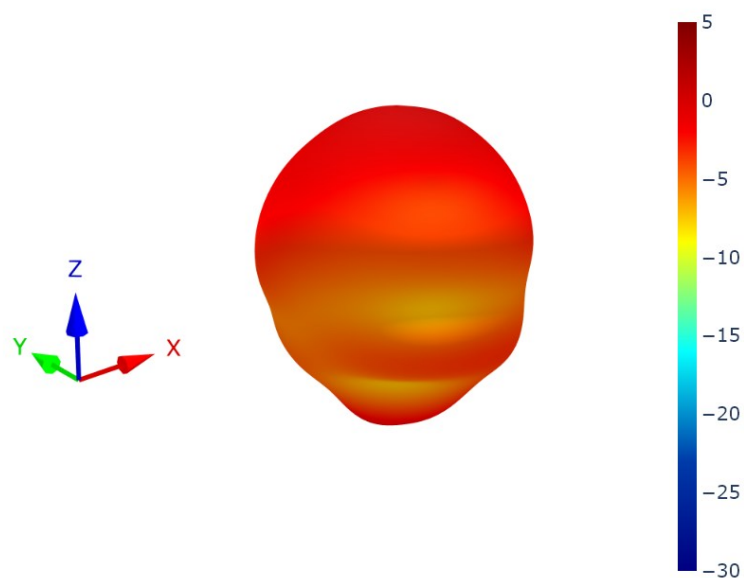


Chamber Test Set-up

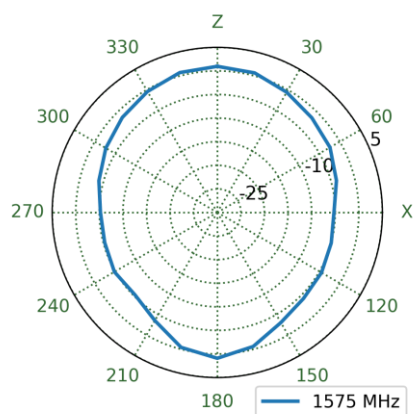
## 7.2 Patterns at 1561 MHz



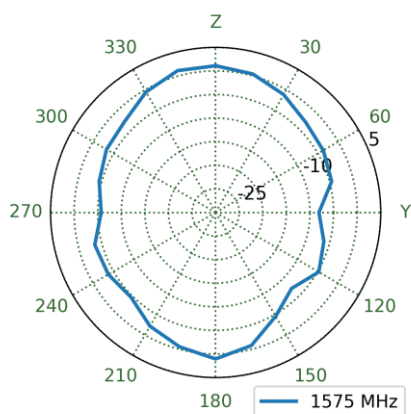
## 7.3 Patterns at 1575 MHz



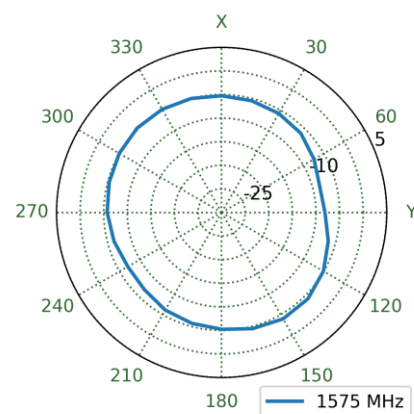
XZ Plane



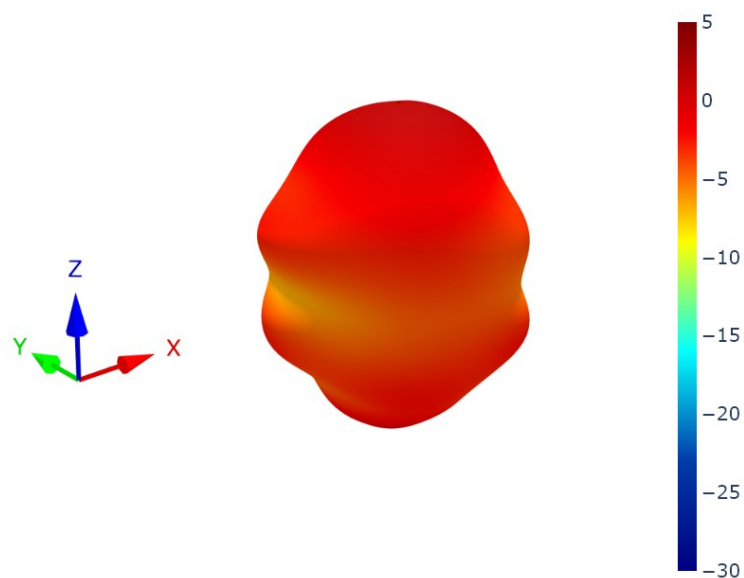
YZ Plane



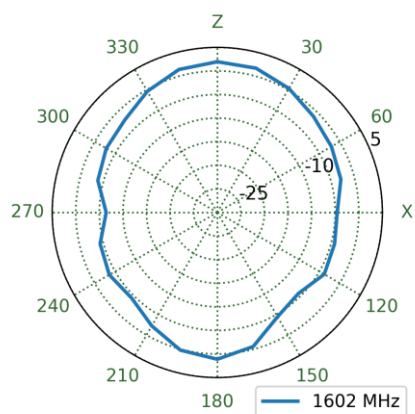
XY Plane



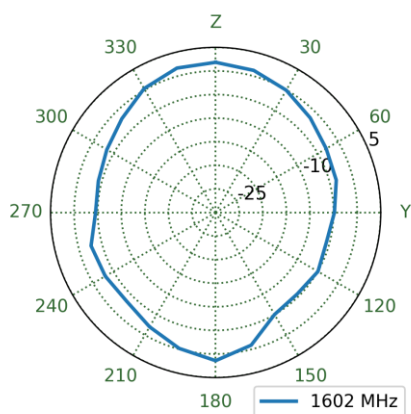
## 7.4 Patterns at 1602 MHz



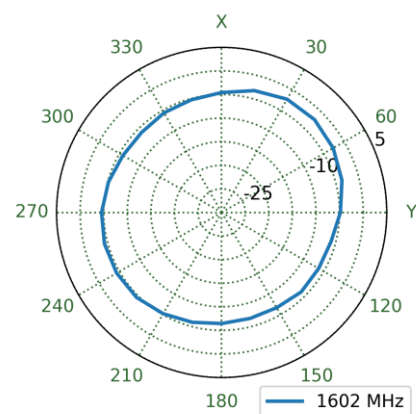
XZ Plane



YZ Plane

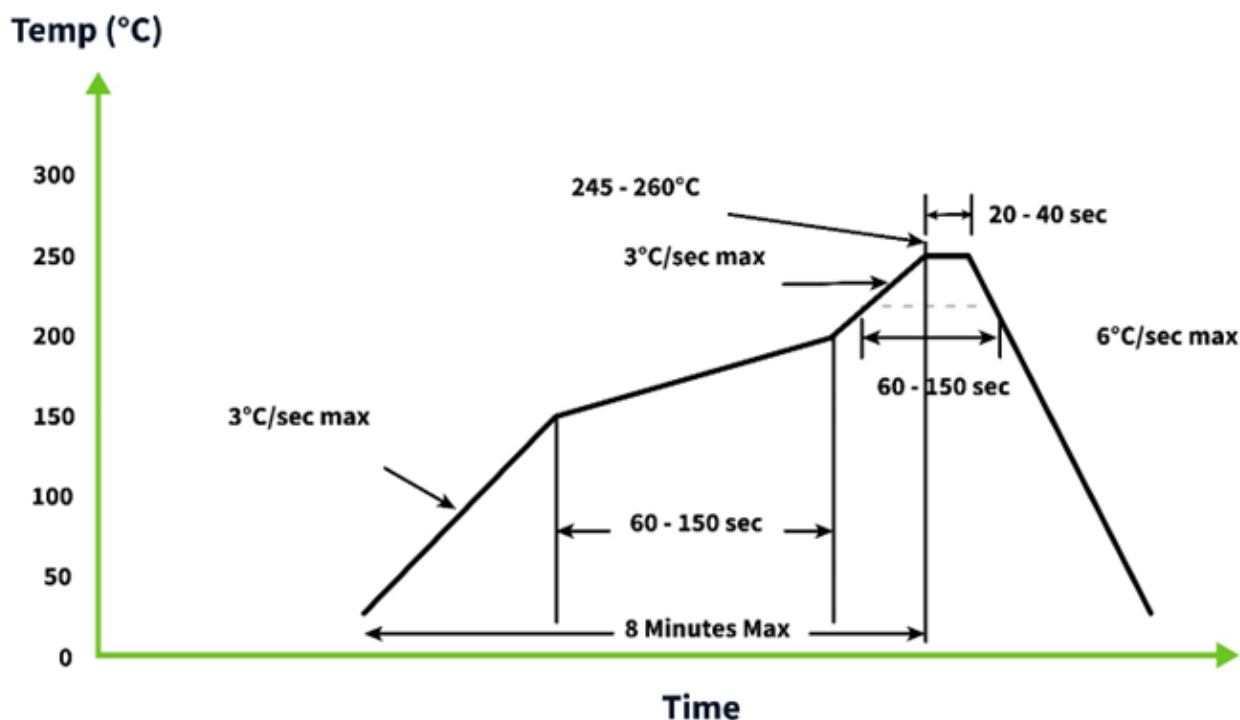


XY Plane



## 8. Solder Reflow Profile

The SGGP184B can be assembled by following the recommended soldering temperatures are as follows:



\*Temperatures listed within a tolerance of  $\pm 10^{\circ}\text{C}$

Smaller components are typically mounted on the first pass, however, we do advise mounting the SGGP184B when placing larger components on the board during subsequent reflows.

Note: Soldering flux classified ROL0 under IPC J-STD-004 is recommended.

Changelog for the datasheet

SPE-25-8-115 – SGGP184B

| Revision: A (Original First Release) |                 |
|--------------------------------------|-----------------|
| Date:                                | 2025-04-07      |
| Notes:                               | Initial Release |
| Author:                              | Gary West       |

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