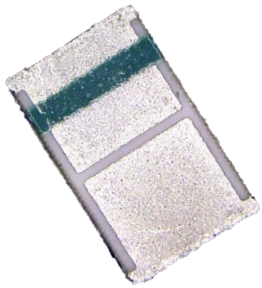
Amphenol

Datasheet

# GNSS
Chip Antenna



5.0 × 3.0 × 0.5 mm

**Chip Antenna**

## Features:

This antenna is designed to cover GPS/ GLONASS/QZSS/BDS/Galileo frequency band. High performing and compact size with low profile.

## Applications:

- Public Safety, Search and Rescue
- IoT tracker
- GPS Navigator
- Asset tracking
- Navigation devices
- Location based services
- Drones, Robotics and Vehicles

RoHS

## Electrical Specifications

### Antenna Characteristics

| Antenna Type | Radiation Pattern | Polarization | Max. Input Power | Impedance |
|---|---|---|---|---|
| Chip Antenna | Omni | Linear | 2W | 50Ω |

| **Frequency (GHz)** | **1.176** | **1.227** | **1.278** | **1.575** |
|---|---|---|---|---|
| Return Loss (dB) at 80mm x 40 mm ground | < -9.5 | < -6 | < -3.5 | < -9.5 |
| Peak Gain (dBi) | 1.8 | 1.9 | 0.5 | 2.1 |
| Average Gain (dB) | -3.7 | -3.5 | -3.6 | -2.3 |
| Efficiency (%) at 80mm x 40 mm ground | 43 | 45 | 44 | 59 |

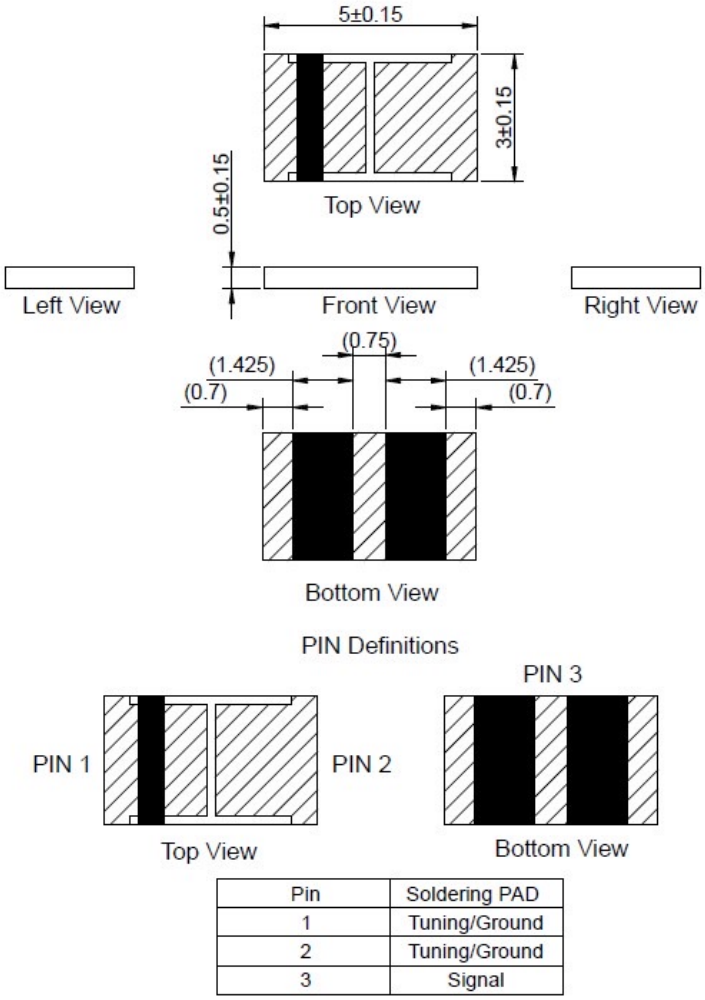
## Mechanical Specifications

| Mechanical | |
|---|---|
| **Dimension (mm)** | 5.0 x 3.0 x 0.5 |
| **Material** | Ceramic |
| **Weight (g)** | 0.01 |

| Environmental | |
|---|---|
| **Temperature Range (˚C)** | -40 to 85 |
| **Humidity** | 10% to 70% RH |
| RoHS Compliant | |

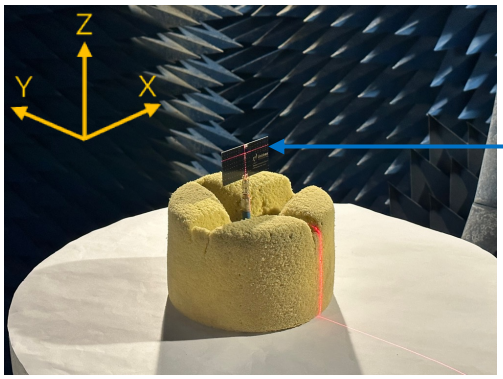
## Mechanical Drawing

Unit : mm

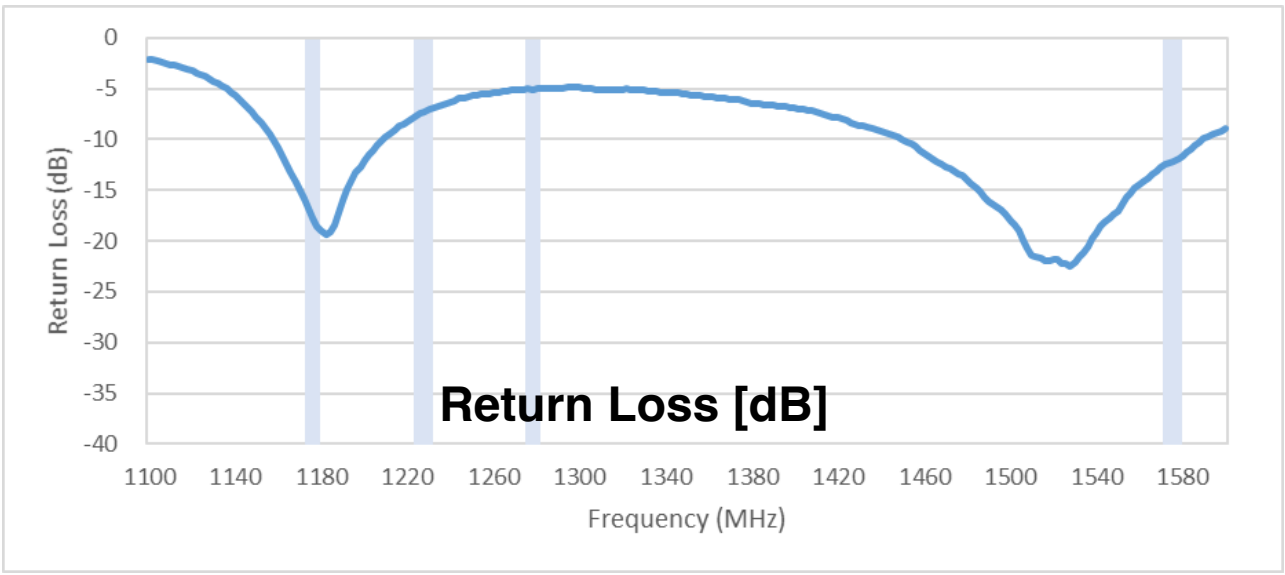



| Pin | Soldering PAD |
|---|---|
| 1 | Tuning/Ground |
| 2 | Tuning/Ground |
| 3 | Signal |

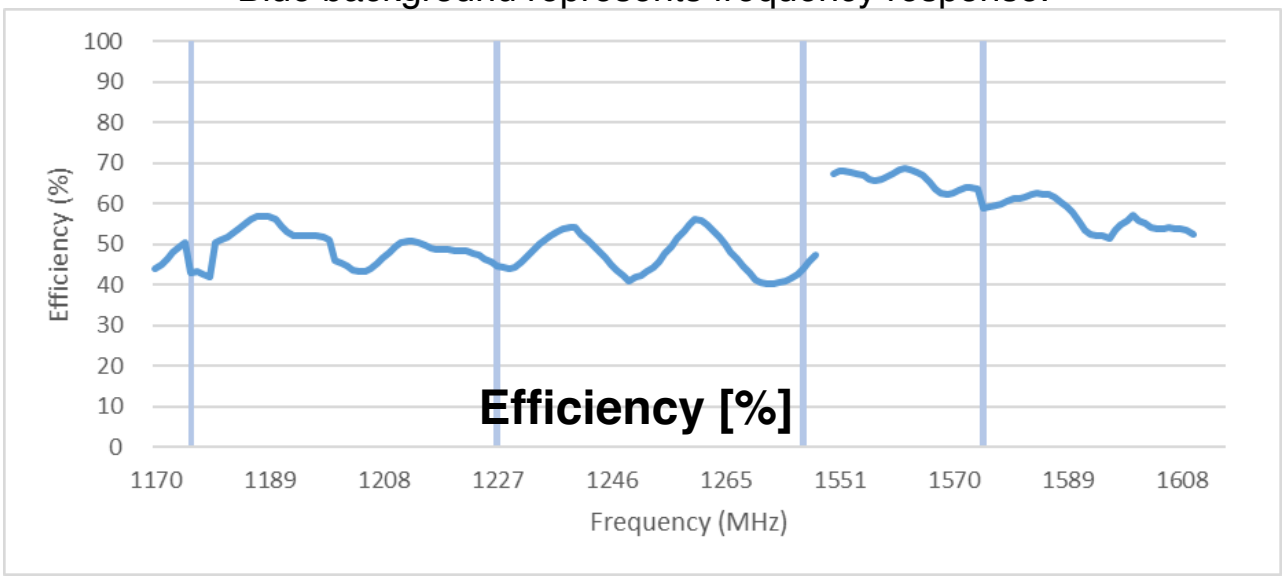
# Antenna Testing Includes Evaluation Board




Test setup, measurement performed in 3D anechoic chamber.

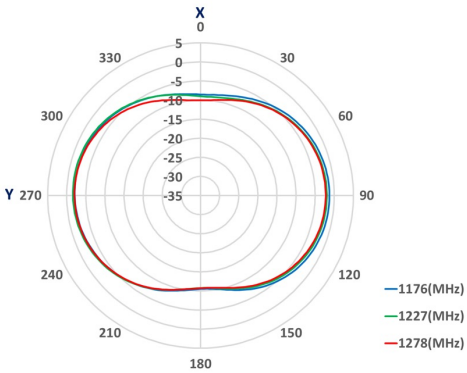


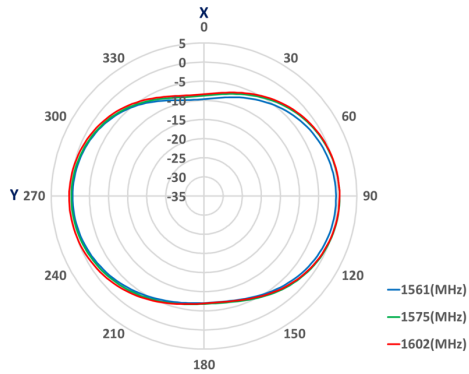

Blue background represents frequency response.



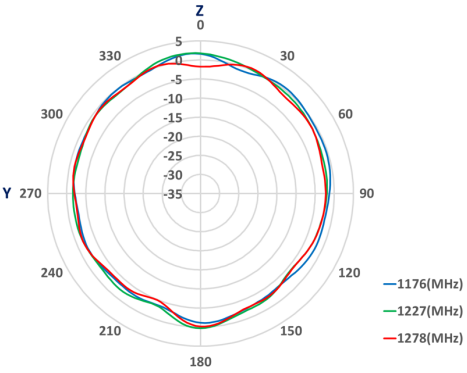
# Radiation Pattern - Free Space

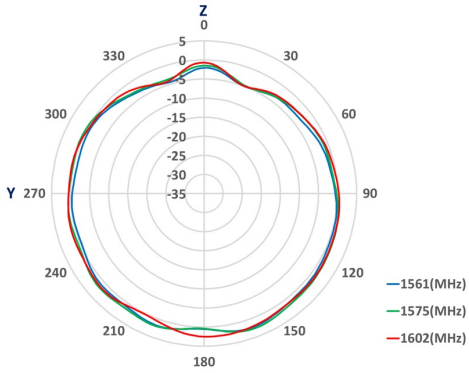
## XY - Plane



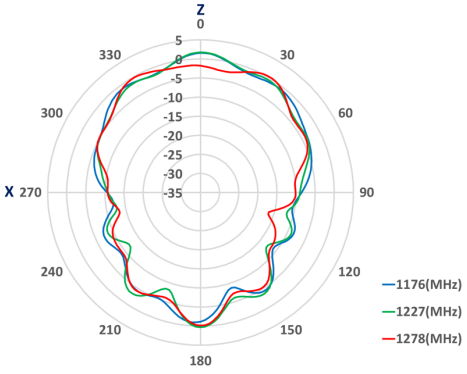



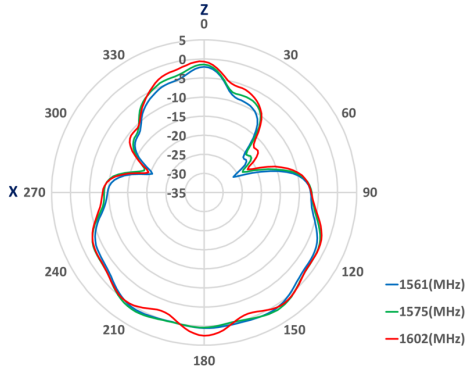

## YZ - Plane



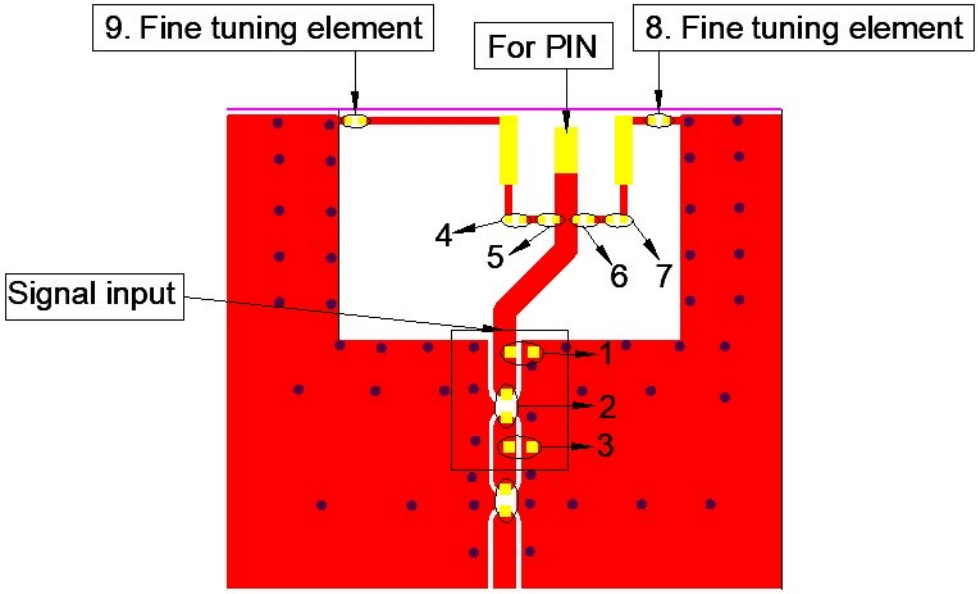




## XZ - Plane



# Matching Circuit Design



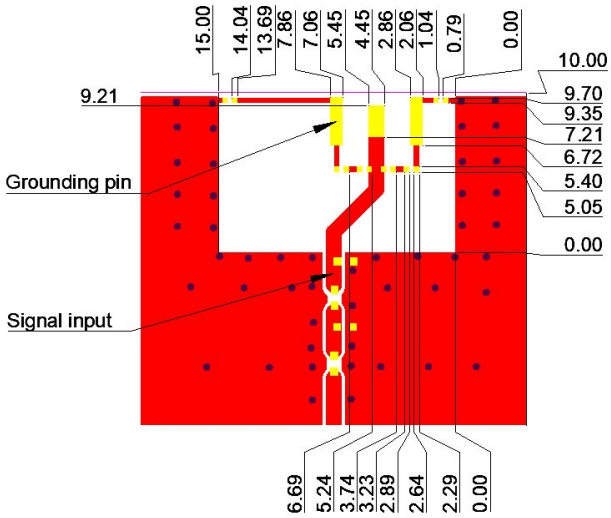

* To make the antenna have this resonance must be matched with the matching circuit.
* The matching component may be slightly different than that shown depending on the distance to the ground plane, the dielectric constant of the PCB, and PCB material thickness.

**Circuit Matching Components**

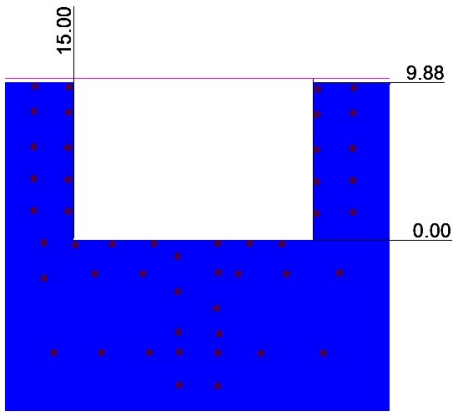
| Circuit Symbol | Size | Description |
|---|---|---|
| 1 | 0402 | 1.5 pF Capacitor |
| 2 | 0402 | 3.6 pF Capacitor |
| 3 | N/A | N/A |
| 4~7 Fine tuning element | N/A | N/A |
| 8 Fine tuning element | 0201 | 2.7 pF Capacitor |
| 9 Fine tuning element | 0201 | 6.8 pF Capacitor |

## Clearance Area Design

Unit : mm



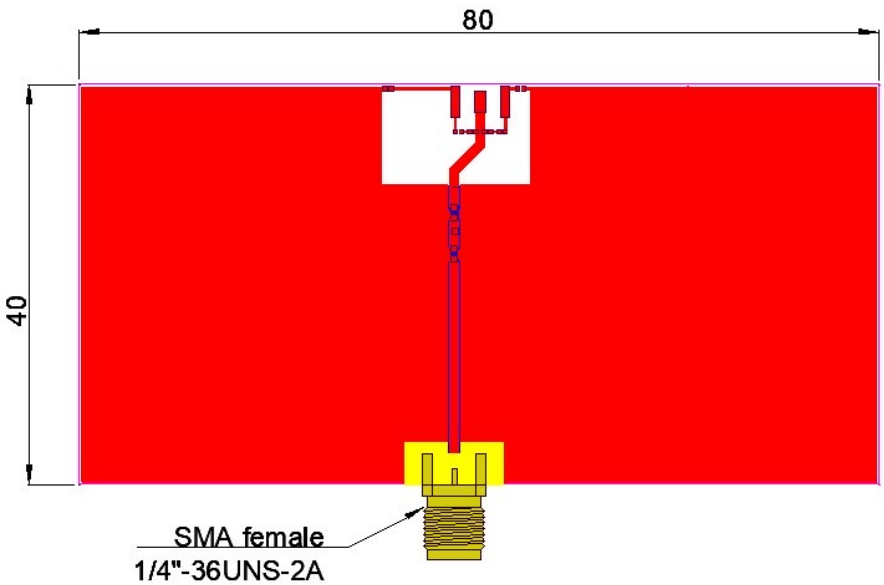

Top View




Bottom View

## Evaluation Board

Unit : mm

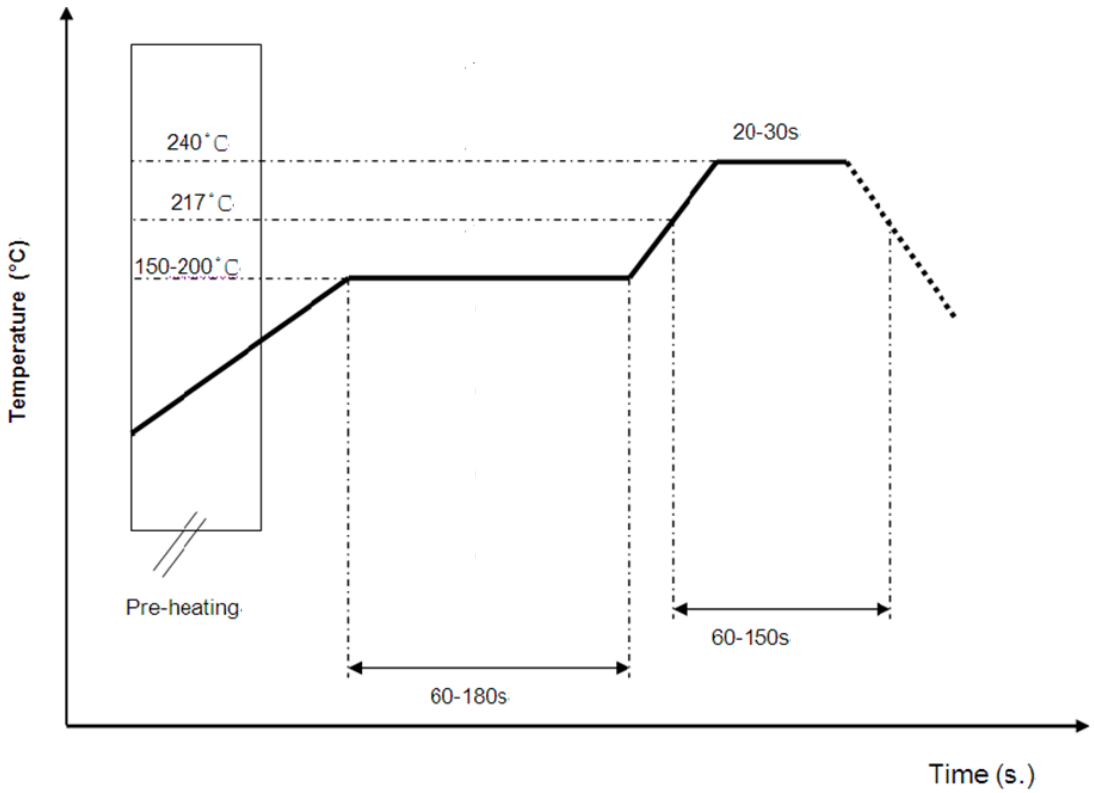



Base Material : FR-4, T=1.0

# Recommended Reflow Temperature Profile

Recommended solder paste alloy:

SAC305 (Sn96.5 /Ag3 /Cu0.5) Lead Free solder paste



| Revisions | | | | |
|---|---|---|---|---|
| Rev. | Description | Date | ECN | Approval |
| A | Initial Release | 2023-05-30 | ST0543-00-N01-B-RA00 | ATC |