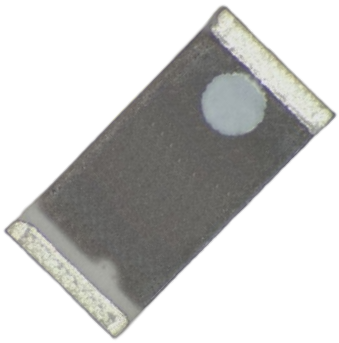
# Wi-Fi / Bluetooth

ST0147-00-011-A

Amphenol

**Datasheet**

## 2.4-2.5GHz
Chip antenna



3.05 X 1.6 X 0.55 mm

**Chip Antenna**

## Features:

High performing Wi-Fi & Bluetooth antenna with SMT mounting on PCB.

## Applications:

- CPE - Router, Set-top boxes & Gateway
- IoT devices
- Bluetooth Mesh
- Smart Metering
- Robotics

RoHS

## Electrical Specifications

### Antenna Characteristics

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

| **Frequency (GHz)** | **2.4~2.5** |
|---|---|
| Return Loss (dB) | < -7 |
| Peak Gain (dBi) | 3.7 |
| Average Gain (dB) | -1.0 |
| Average Efficiency (%) | 80 |

Antenna testing includes evaluation board.

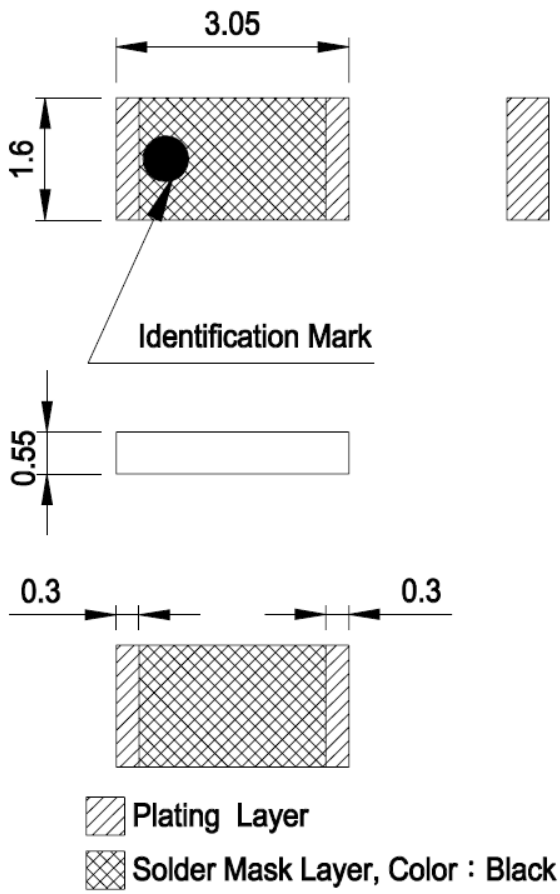
## Mechanical Specifications

| Environmental | |
|---|---|
| Temperature Range (˚C) | -40 to 85 |
| Humidity | Non-condensing 65°C 95% RH |
| RoHS Compliant | |

| Part Number | Dimension (mm) | Weight (g) | Material |
|---|---|---|---|
| ST0147-00-011-A | 3.05 X 1.6 X 0.55 | 0.01 | Ceramic |

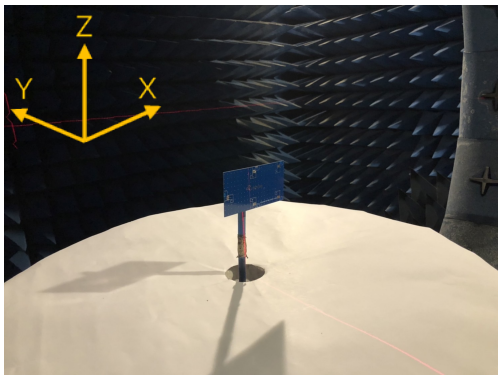
## Mechanical Drawing

Unit : mm

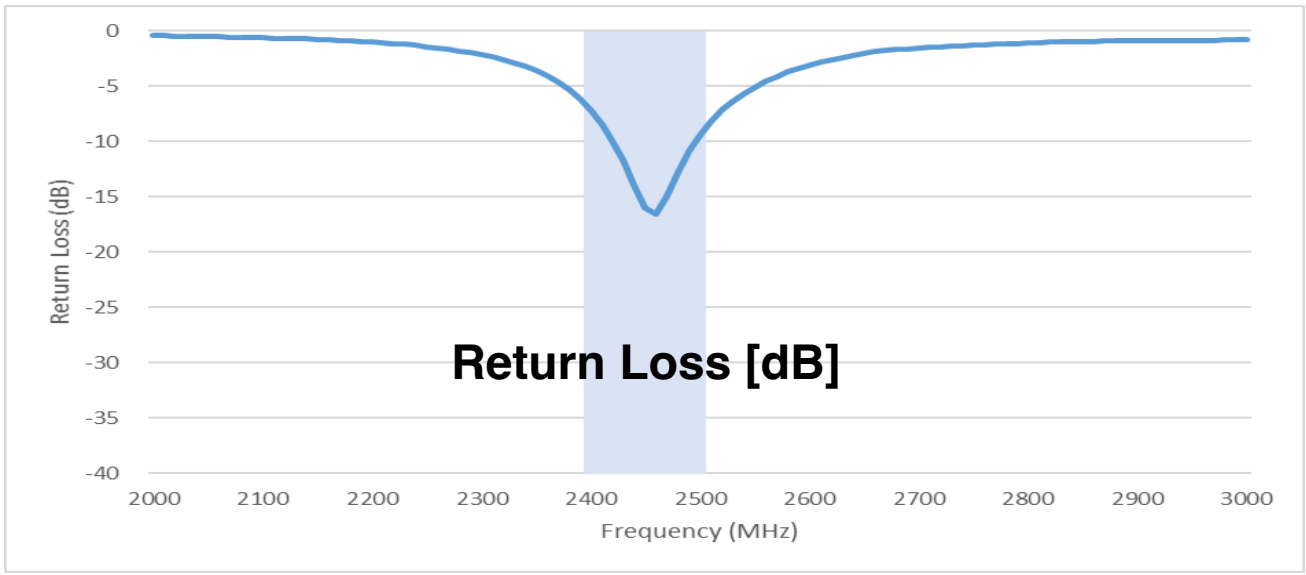



ST0147-00-011-A

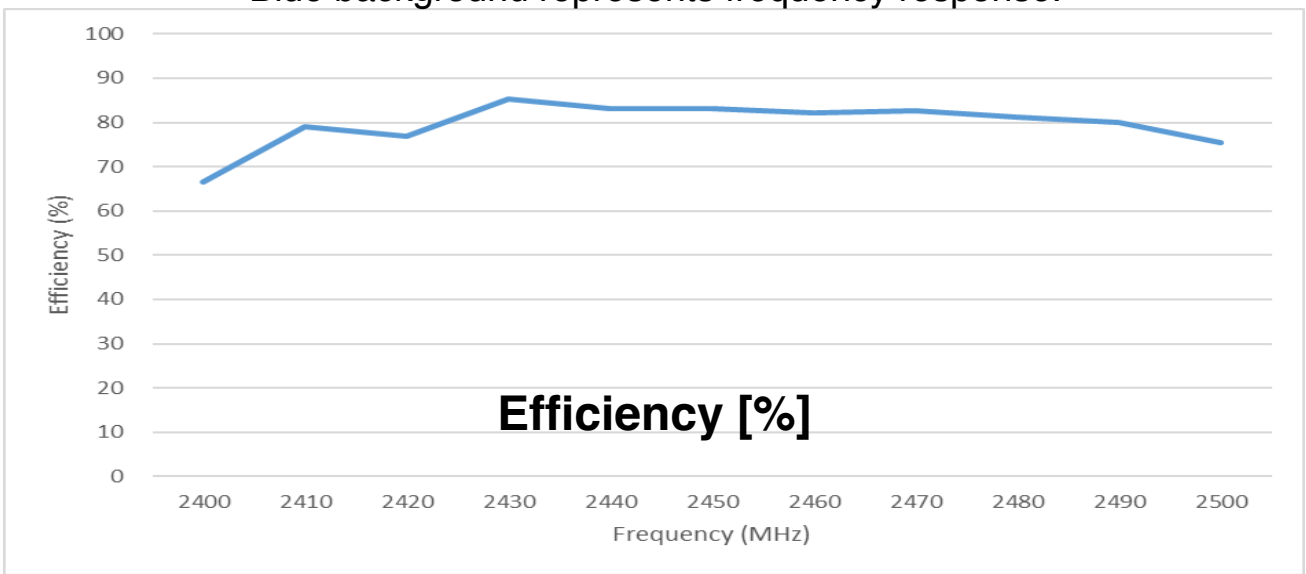
# Antenna Testing Includes Evaluation Board




Test setup, measurement performed in 3D anechoic chamber.

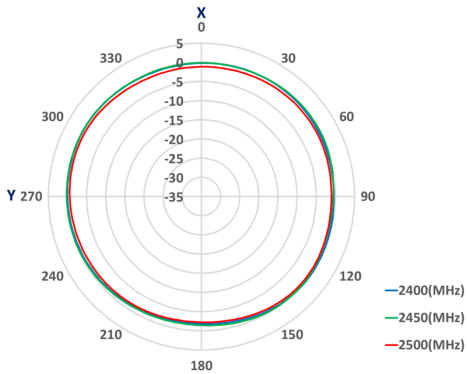



Blue background represents frequency response.

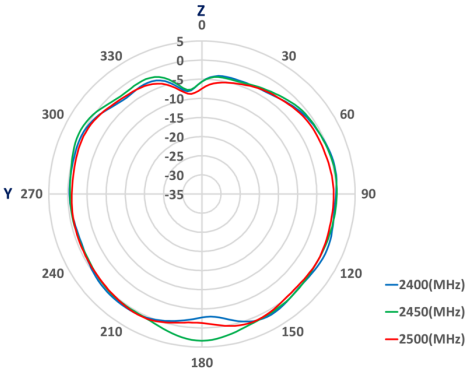


# Radiation Pattern - Includes Evaluation Board

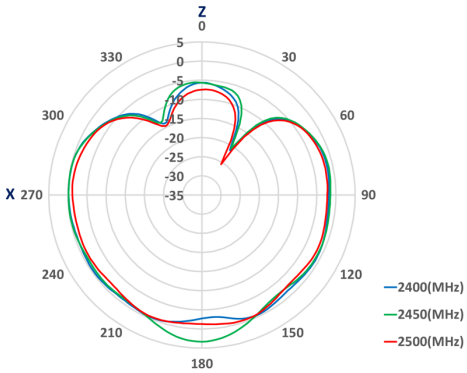
## XY - Plane



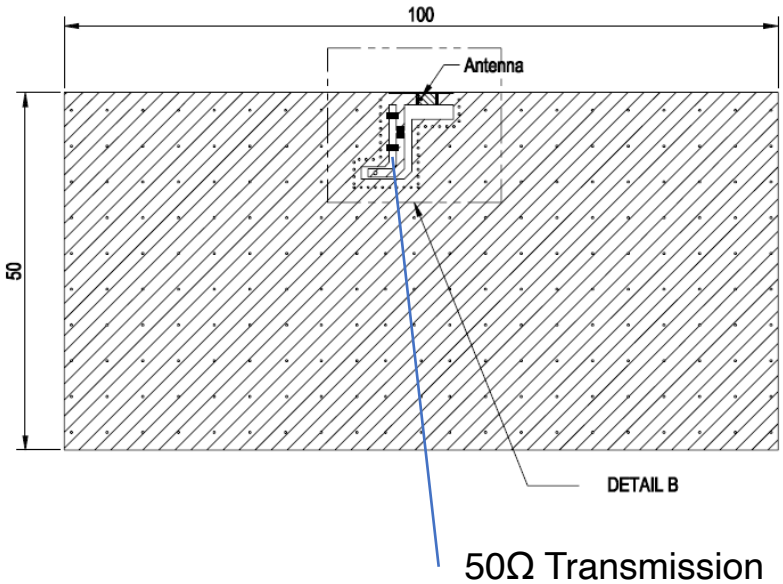

## YZ - Plane



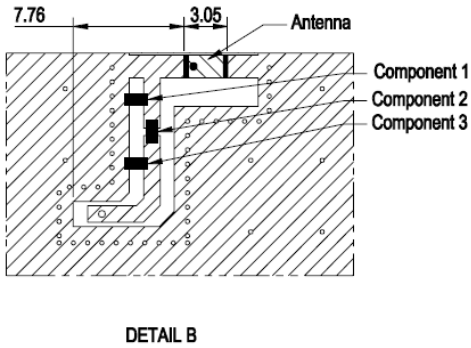

## XZ - Plane



# Matching Circuit Design




50Ω Transmission

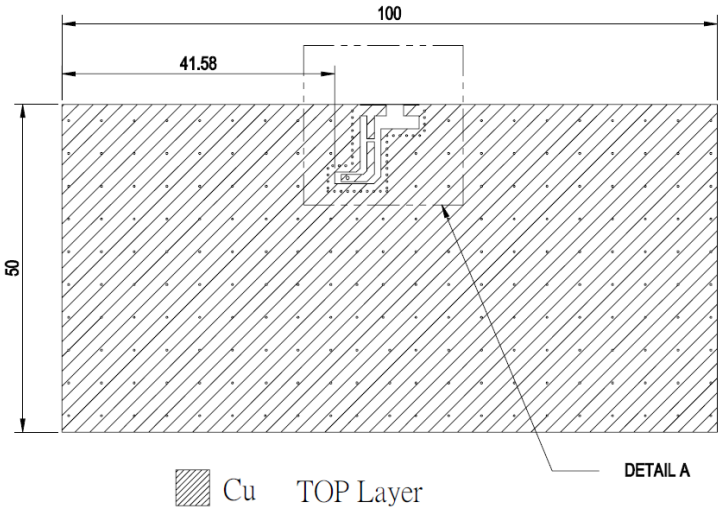


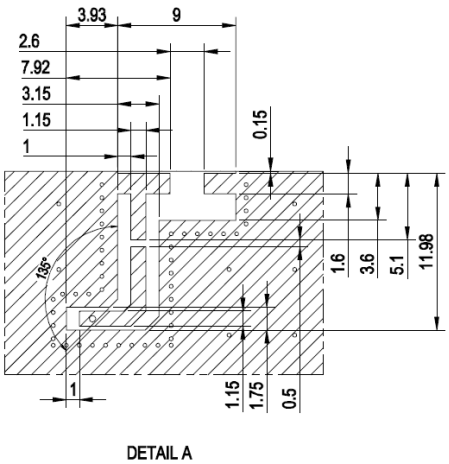

* To make the antenna have this resonance, must be matched with matching circuit.
* The matching component may be slightly different than that show depending ondistance to ground plane, dielectric constant of PCB, and PCB material thickness.

**Circuit Matching Components**

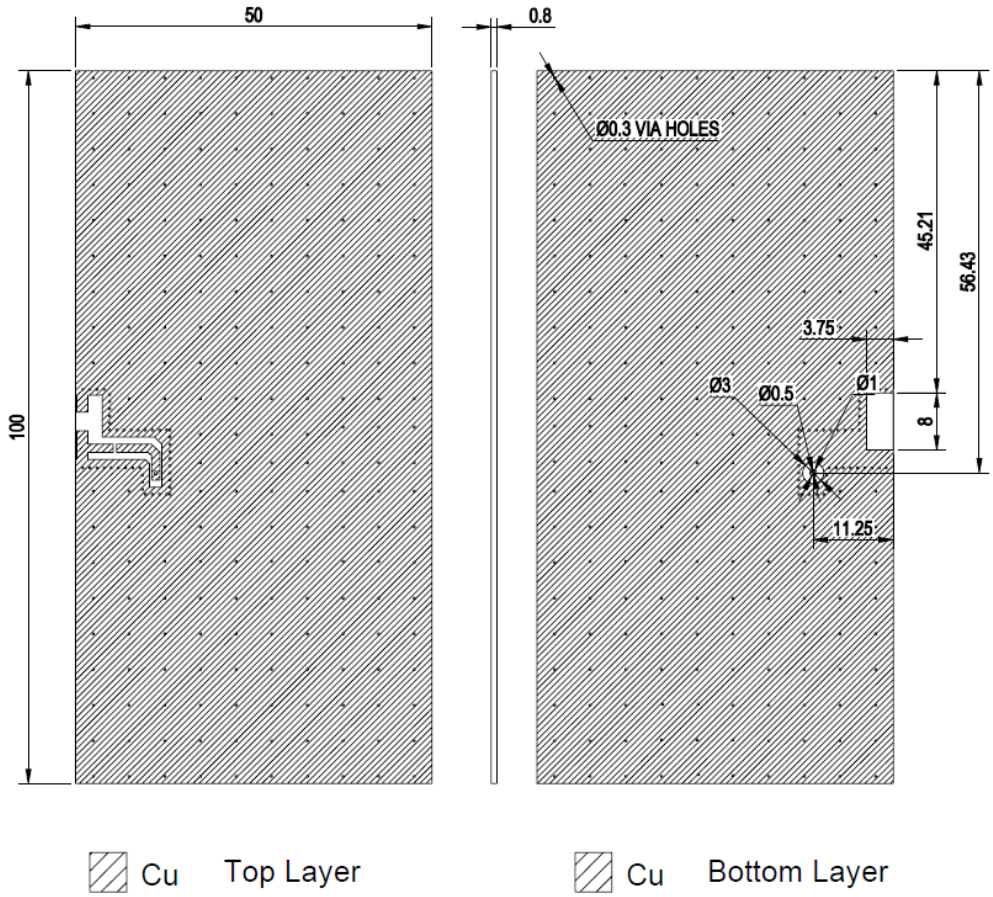
| Circuit Symbol | Size | Description |
|---|---|---|
| Component 1 | 0402 | None |
| Component 2 | 0402 | 0 ohm Resistance |
| Component 3 | 0402 | None |

## Clearance Area Design




## Evaluation Board



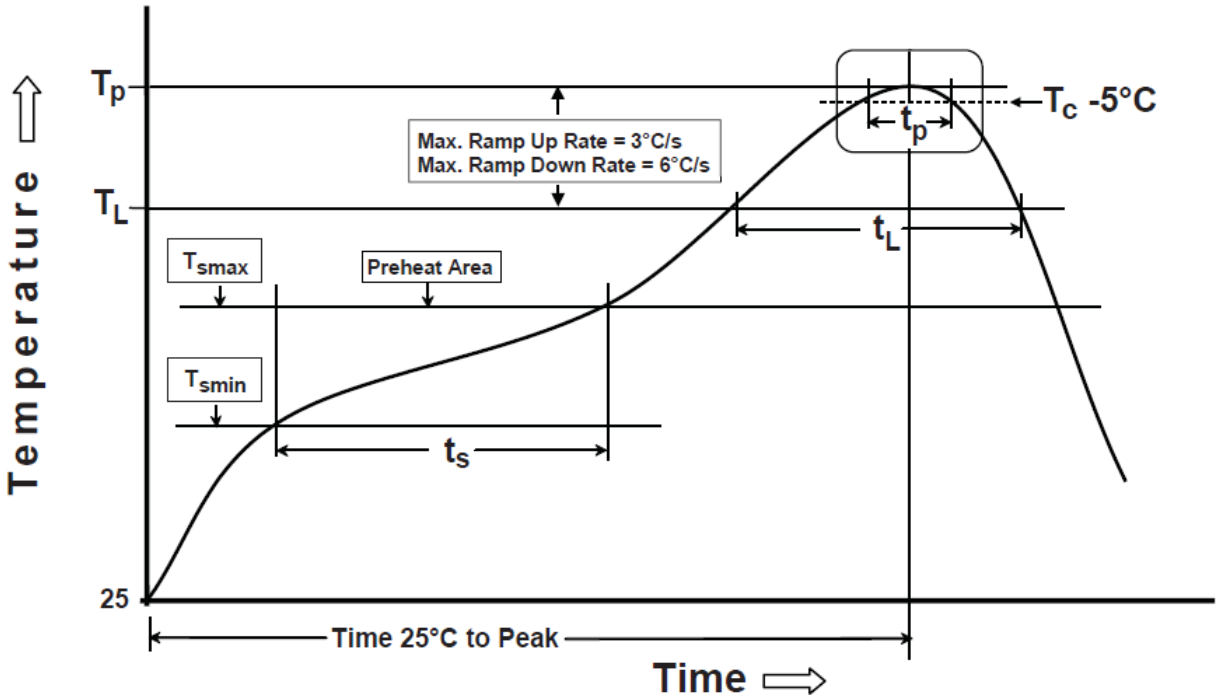

Base Material : FR-4

# Recommended Reflow Temperature Profile

This products can be assembled following Pb-free assembly. According to the Standard **IPC/JEDEC J-STD-020C**, the temperature profile suggested is as follow :

| Reflow Setting | | |
|---|---|---|
| **Phase** | **Profile Features** | **Pb-Free Assembly (Sn Ag Cu)** |
| **PREHEAT** | -Temperature min (Ts min.)<br>-Temperature max (Ts max.)<br>-Time (ts) form (Ts min. to Ts max.) | 150°C<br>200°C<br>60~120 seconds |
| **RAMP-UP** | Avg. ramp-up rate (Ts max. to TP) | 3°C / second (max) |
| **REFLOW** | -Temperature (TL)<br>-Total time above TL (t L) | 217°C<br>30~100 seconds |
| **PEAK** | -Temperature (TP)<br>-Time (tp) | 260°C<br>10~20 second |
| **RAMP-DOWN** | Rate | 6°C / second max. |
| Time from 25°C to peak temperature | | 8 minutes max. |
| Composition of solder paste | | 96.5Sn / 3Ag / 0.5Cu |
| Solder paste model | | SHENMAO PF606-P26 |

*Note：All the temperature measure point is on top surface of the component, if temperature over recommend, it will make component surface peeling or damage.




The graphic shows temperature profile component assembly process in reflow ovens.

## Soldering With Iron

**Soldering condition :**

Soldering iron temperature 270± 10˚C. Apply preheating at 120˚C for 2~3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron over temperature 270± 10˚C or 3 seconds, it will make component surface peeling or damage. Soldering iron can not leakage of electricity.

| Revisions | | | | |
|---|---|---|---|---|
| Rev | Description | Date | ECN | Approval |
| A | Initial Release | 2022-10-25 | ST0147-00-011-A-RA00 | ATC |
| B | RF Performance Update | 2023-01-02 | ST0147-00-011-A-RB00 | ATC |