

# PULSE 1608 Chip Antenna Measurement For Holder-Smart Ring Project

Wireless Components  
LTCC R&D

September 1, 2022



- **Customer :Holder**
- **Project Name :Ring**
- **Application :Ring**
- **Antenna size :**  
**1.6 x 0.8 x 0.4 (mm) 2.4GHz chip antenna (ANT1608LL14R2400A)**
- **PCB size : 40 \* 7 mm**
- **Report date : 2022/09/01**
- **Version : 1**

# Pulse Chip Antenna\_1608 2.4 GHz Chip Antenna

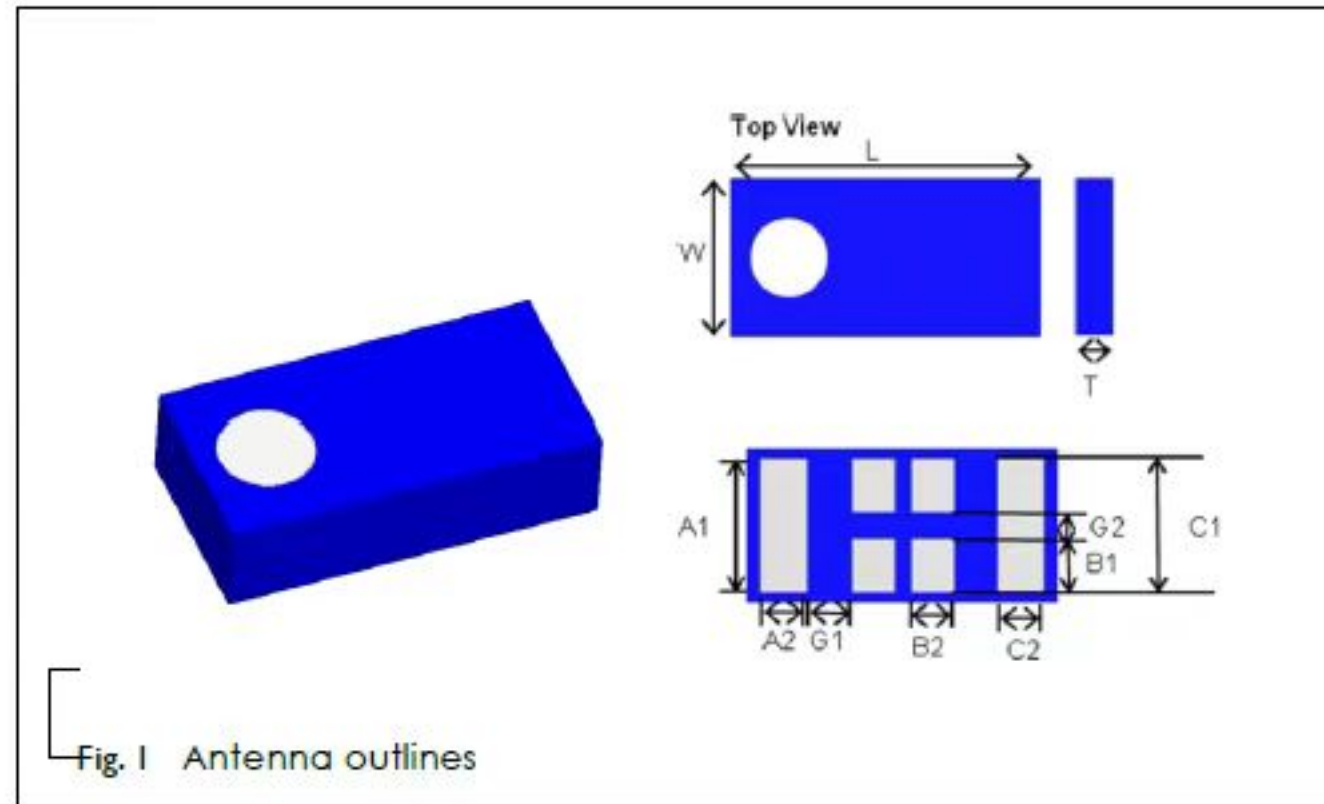
## Customer PCB

|         | DIMENSION       |
|---------|-----------------|
| L (mm)  | $1.6 \pm 0.15$  |
| W (mm)  | $0.8 \pm 0.15$  |
| T (mm)  | 0.4(max)        |
| A1 (mm) | $0.70 \pm 0.15$ |
| A2 (mm) | $0.25 \pm 0.15$ |
| B1 (mm) | $0.30 \pm 0.15$ |
| B2 (mm) | $0.25 \pm 0.15$ |
| C1 (mm) | $0.70 \pm 0.15$ |
| C2 (mm) | $0.25 \pm 0.15$ |
| G1 (mm) | $0.20 \pm 0.05$ |
| G2 (mm) | $0.10 \pm 0.05$ |

Table 3 Termination configuration

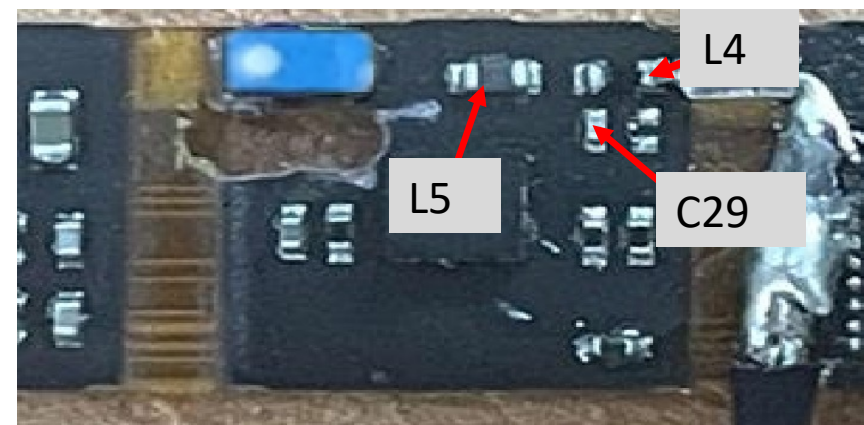
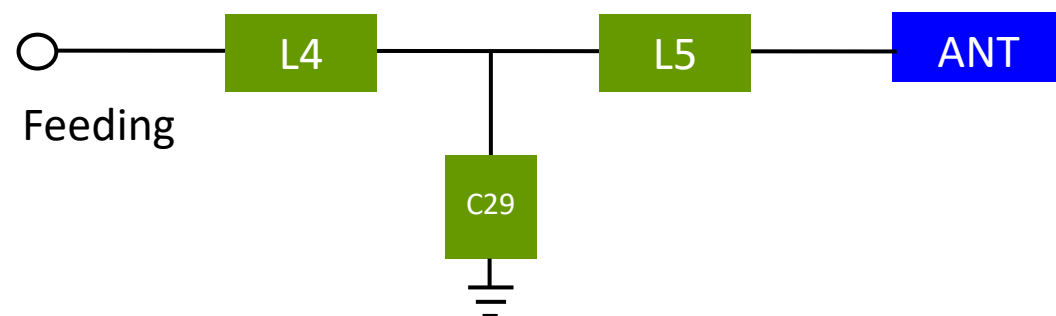
| TERMINAL NAME | FUNCTION      |
|---------------|---------------|
| A1, A2        | Soldering Pad |
| C1, C2        | Feeding Pad   |

## OUTLINES



## Matching Circuit

|                               | Matching Value |       |       |
|-------------------------------|----------------|-------|-------|
|                               | L4             | L5    | C29   |
| Plastic ring matching circuit | 0ohm           | 5.1nH | 1.8pF |
| Metal ring matching circuit   | 0ohm           | 3.9nH | 1.8pF |



Plastic ring

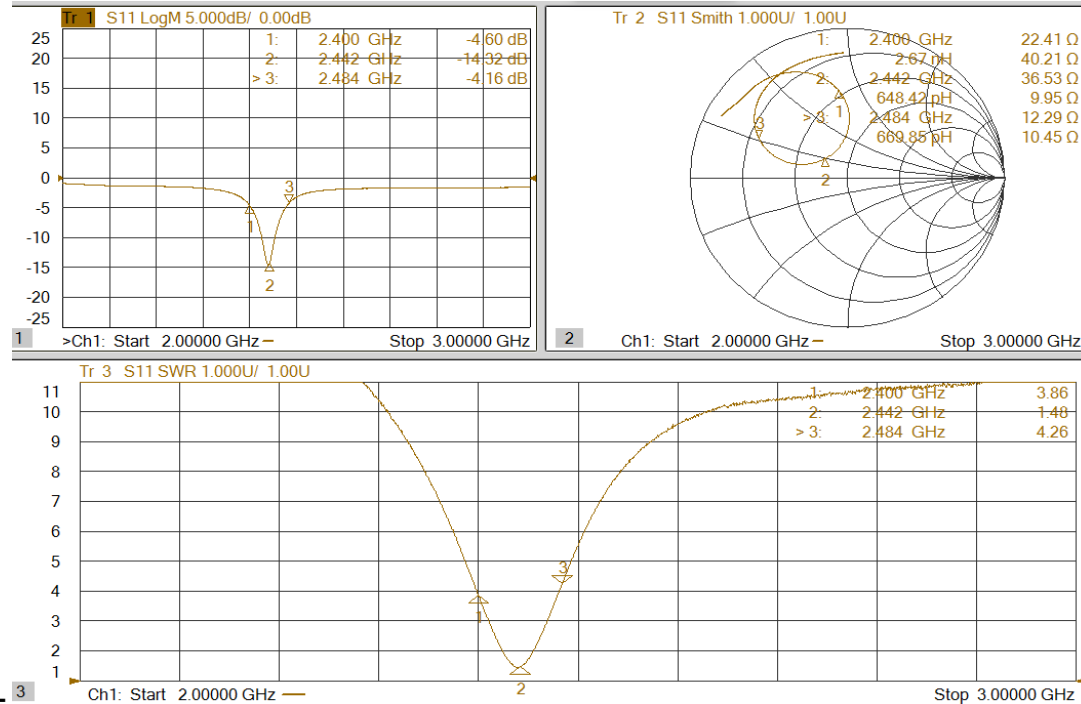


Metal ring

# Measurement Data

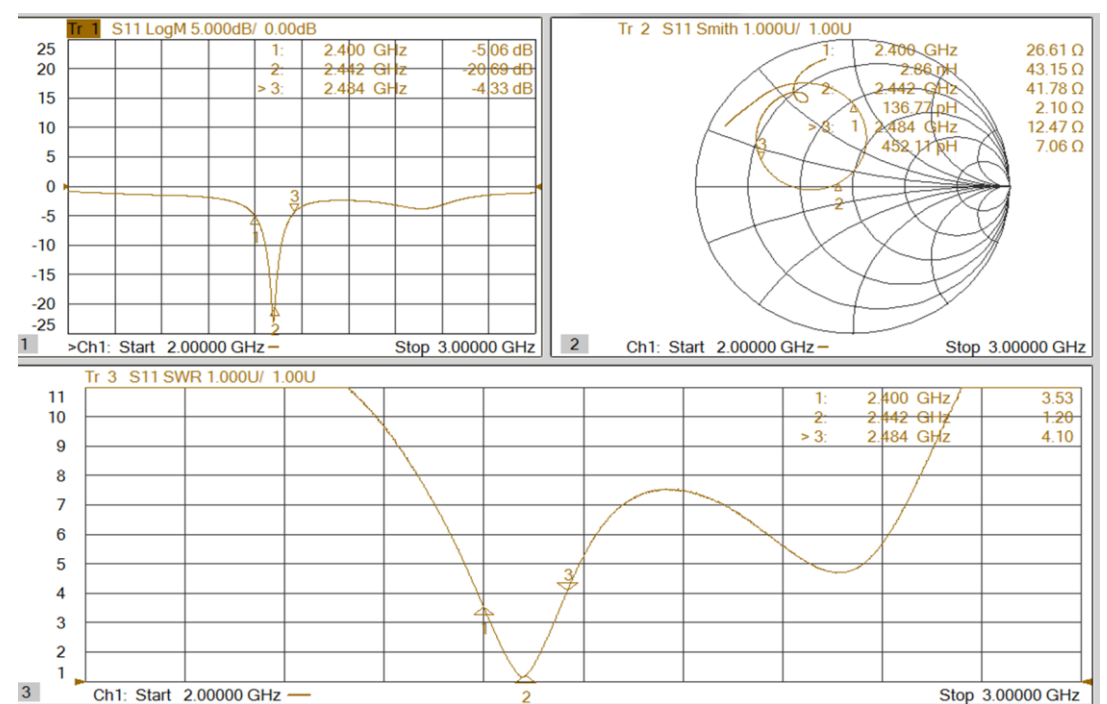
## Plastic ring Data

| Antenna         | ANT1608LL14R2400A |        |        |
|-----------------|-------------------|--------|--------|
| Frequency (MHz) | 2400              | 2442   | 2484   |
| R.L. (dB)       | -4.60             | -14.32 | -4.16  |
| Max. Gain (dBi) | -13.96            | -12.42 | -14.2  |
| Avg. Gain (dB)  | -16.00            | -15.10 | -16.20 |
| Efficiency (%)  | 2.5               | 3.1    | 2.4    |



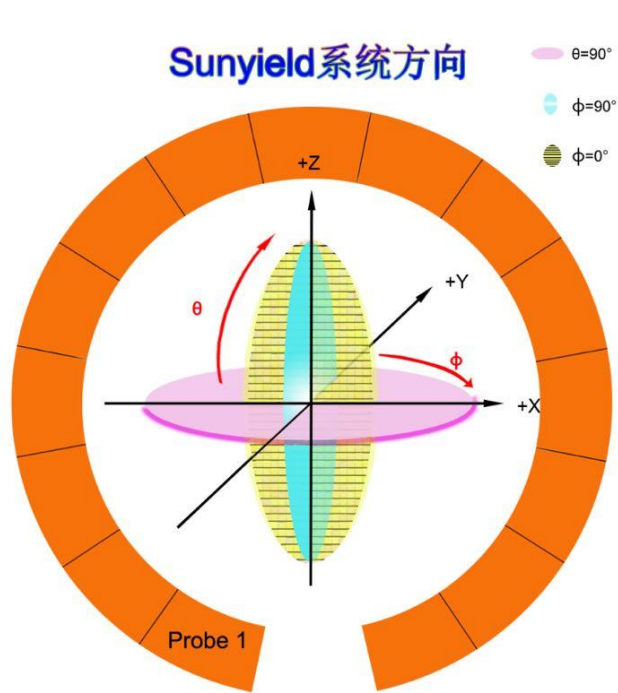
## Metal ring Data

| Antenna         | ANT1608LL14R2400A |        |        |
|-----------------|-------------------|--------|--------|
| Frequency (MHz) | 2400              | 2442   | 2484   |
| R.L. (dB)       | -5.06             | -20.69 | -4.33  |
| Max. Gain (dBi) | -15.53            | -14.31 | -16.36 |
| Avg. Gain (dB)  | -20.41            | -18.26 | -21.40 |
| Efficiency (%)  | 0.90              | 1.50   | 0.7    |



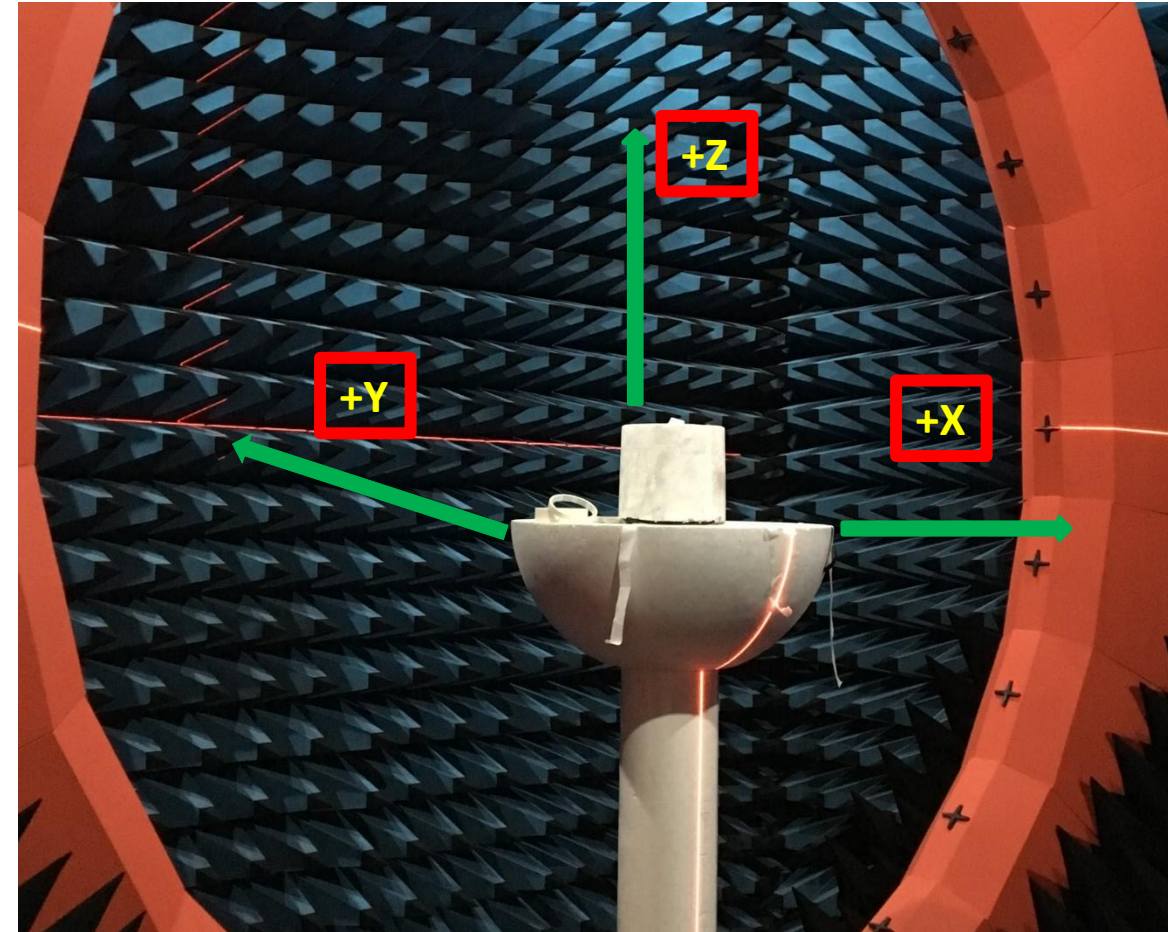
# Measurement Configuration

## [ Direction Definition ]



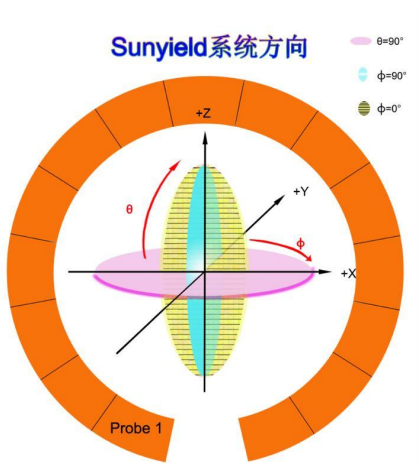
Pulse ANT1 6 0 8 LL1 4 R2400A

## [ Testing Environment ]

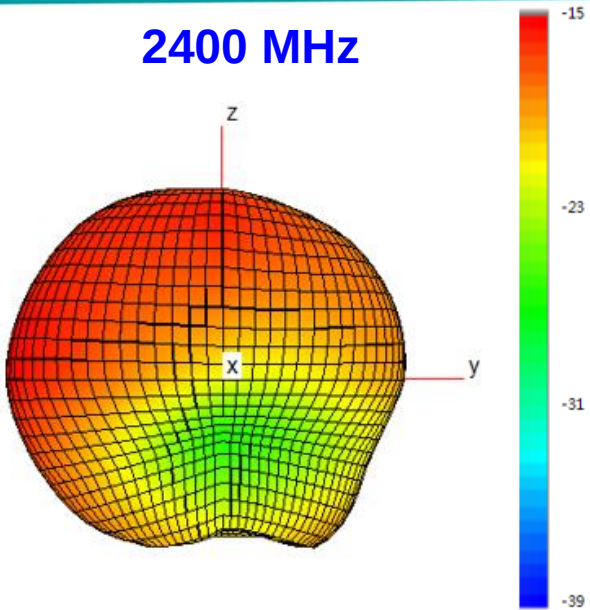


# Radiation Pattern (3D)

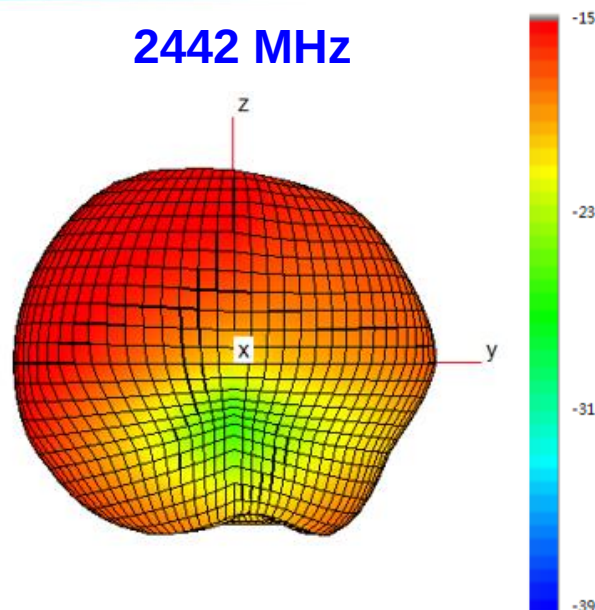
## Plastic ring



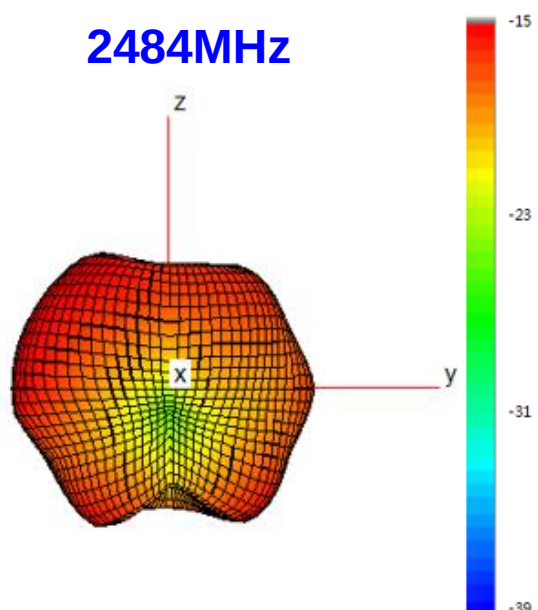
2400 MHz



2442 MHz

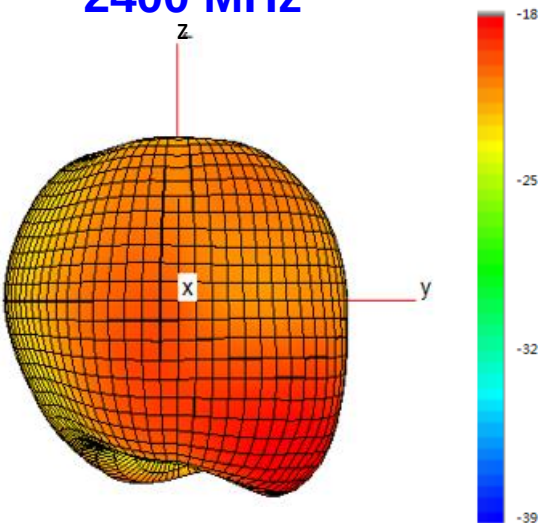


2484 MHz

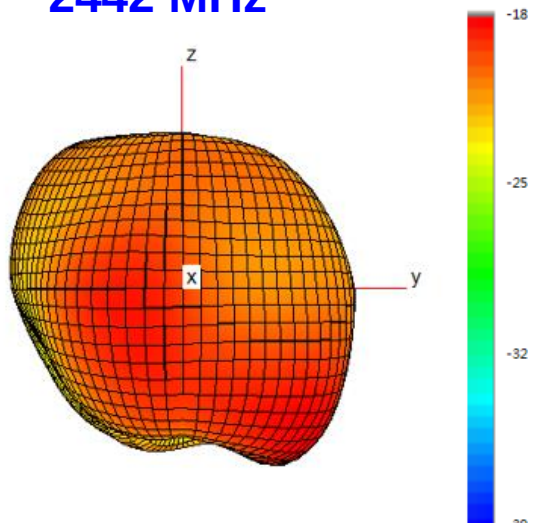


## Metal ring

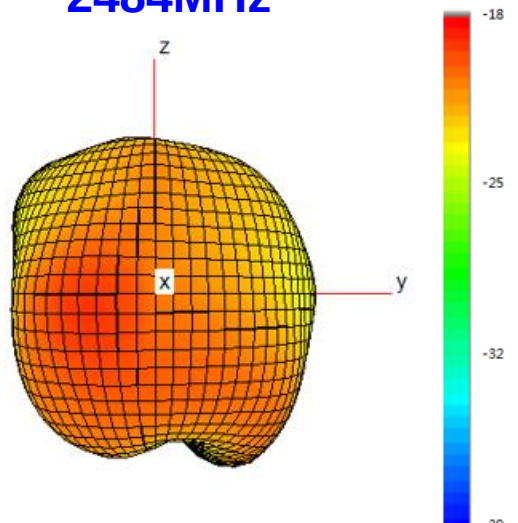
2400 MHz



2442 MHz



2484 MHz



Even though it matches the intermediate frequency, But there may be some damage due to some Rework on the board, And the original matching circuit planning will affect the efficiency of the antenna in the clearance area.



# Thank You

