

# Antenna

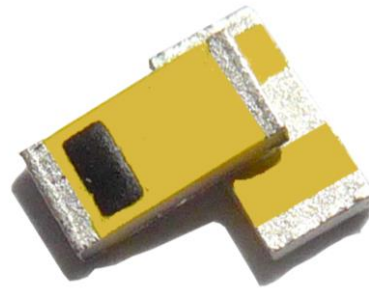
# YCGS025AA Datasheet

## Antenna Services

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Date: 2022-09-20

Status: Released



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# About the Document

## Revision History

Version	Date	Author	Note
-	2022-05-21	Junsen LI/ Joye WANG	Creation of the document
1.0	2022-05-21	Junsen LI/ Joye WANG	First official release
1.1	2022-09-20	Junsen LI	Added Chapter 6.

## Contents

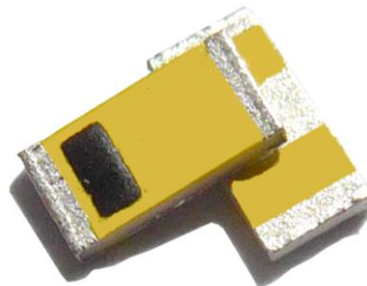
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## 1 Product Description

To meet customers' requirements for the high performance, high integration, and integrated appearance of their products, Quectel provides a combined antenna box series. The antenna box can integrate a variety of antennas, such as 5G, 4G, GNSS, Wi-Fi antennas, to achieve communication functions of 5G MIMO, 4G, GNSS, and Wi-Fi. These antenna boxes can be mounted on the surface of devices via screw, adhesive or other methods, supports multiple connector types and cable lengths. It is a more flexible and reliable high-performance antenna solution for outdoor applications.

## 2 Product Features

- GPS & Dual Band Wi-Fi (2.4 & 5 GHz)
- High efficiency
- AEC-Q200 compliant
- Stable and reliable in performances
- Compact size
- Excellent performance



### 3 Product Specifications

#### Passive Electrical Specifications

Frequency Range	1575.42 MHz; 2400–2500 MHz; 5150–5850 MHz
Input Impedence	50 $\Omega$
VSWR	$\leq 3.0$
Gain	$\leq 2.3$ dBi
Polarization Type	Linear

#### Mechanical Specifications

Antenna Size (mm)	3.2 × 1.6 × 0.5
Materia	Ceramic
Cable Type	NA
Connector	NA
Color	Yellow
Weight	Typ. 0.008 g
Working Temperature	-40 °C to +85 °C
Mounting Type	SMD

## 4 Overall Performance

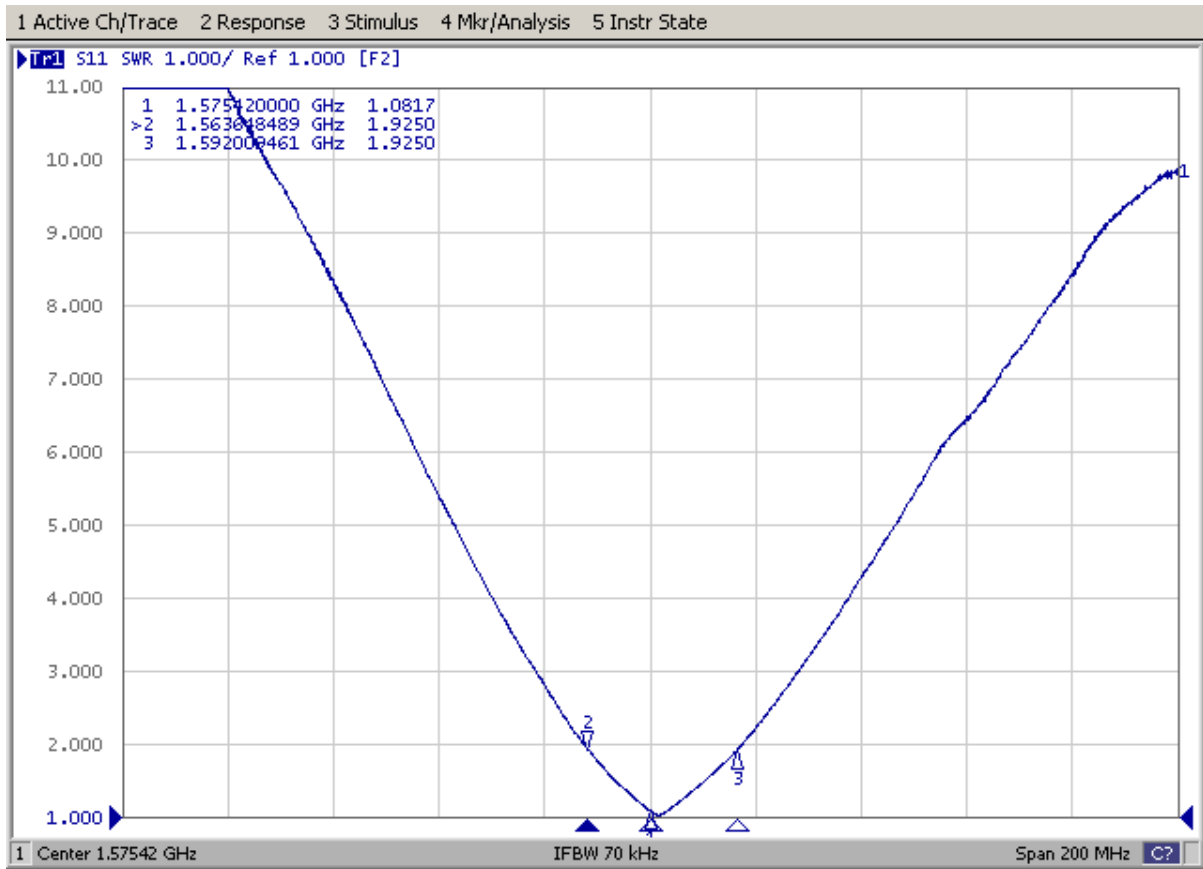
### 4.1. Test Environment

- KEYSIGHT ENA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone® 2800 Chamber 5G (FR1) SISO/MIMO, 600 MHz – 8.5 GHz



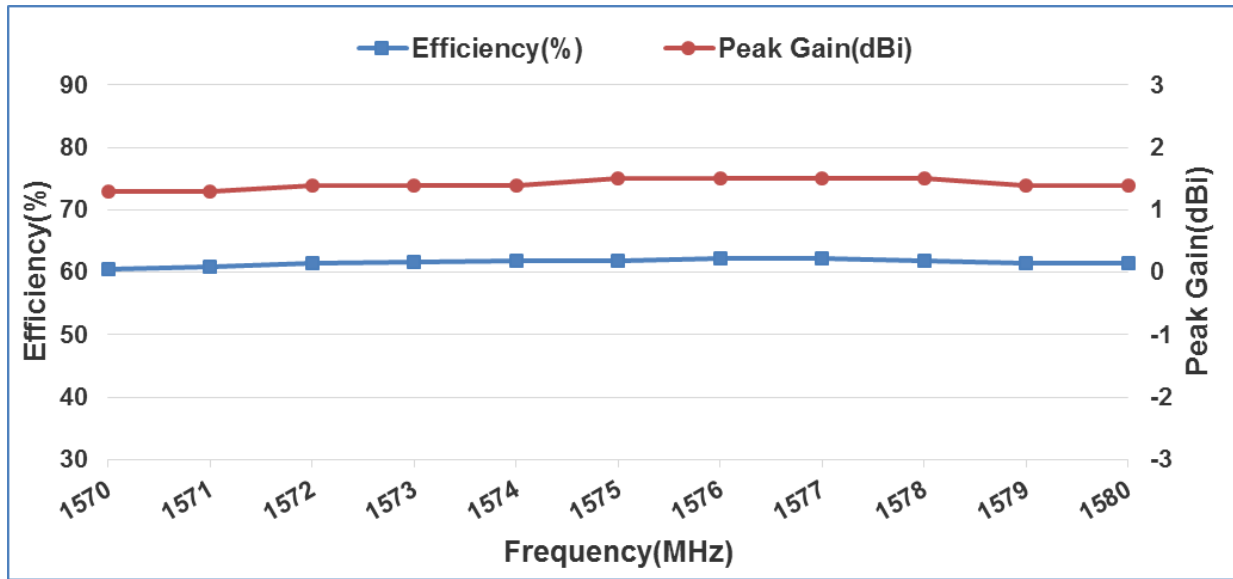


## 4.2. VSWR of GPS Band



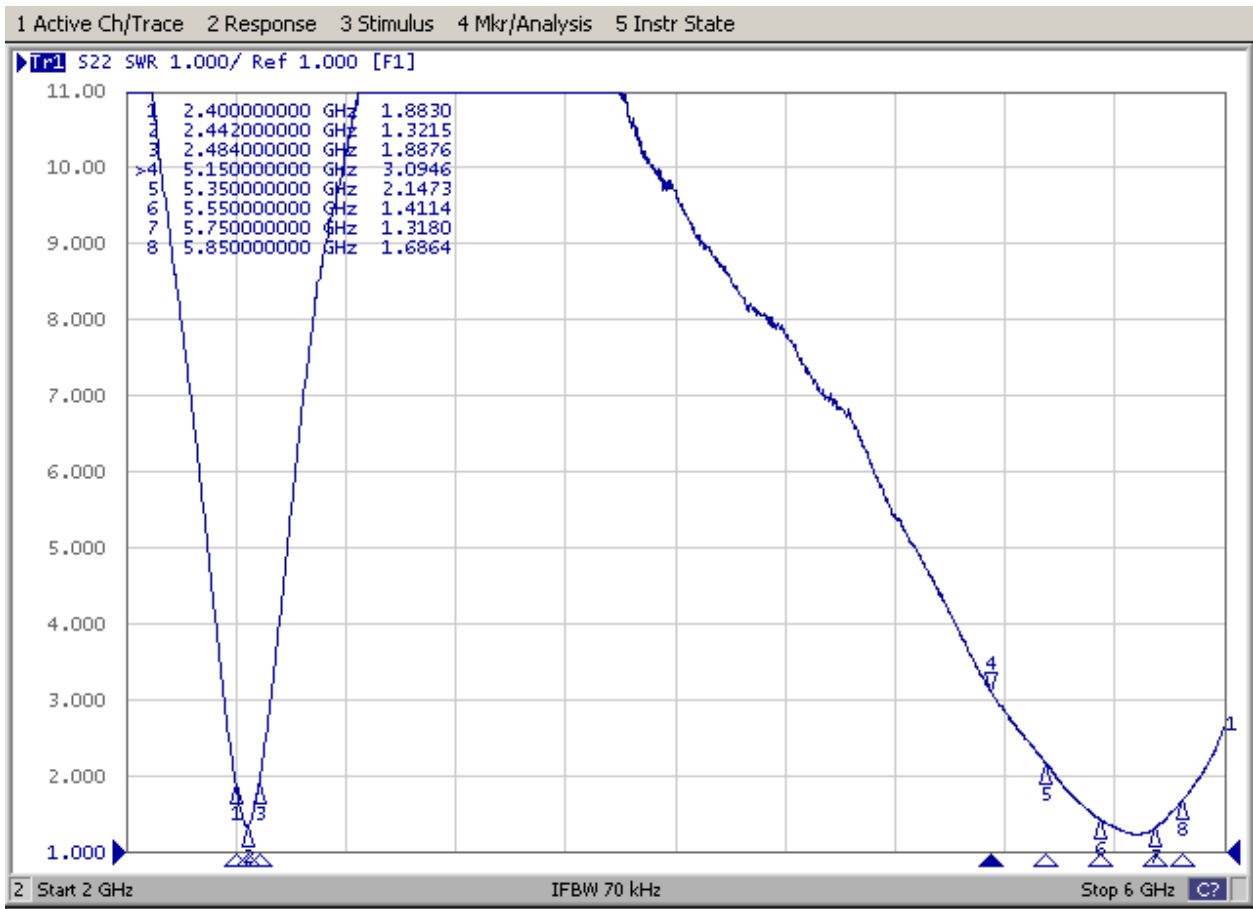
Frequency (MHz)	1575
VSWR	1.08

### 4.3. Efficiency and Peak Gain of GPS Band



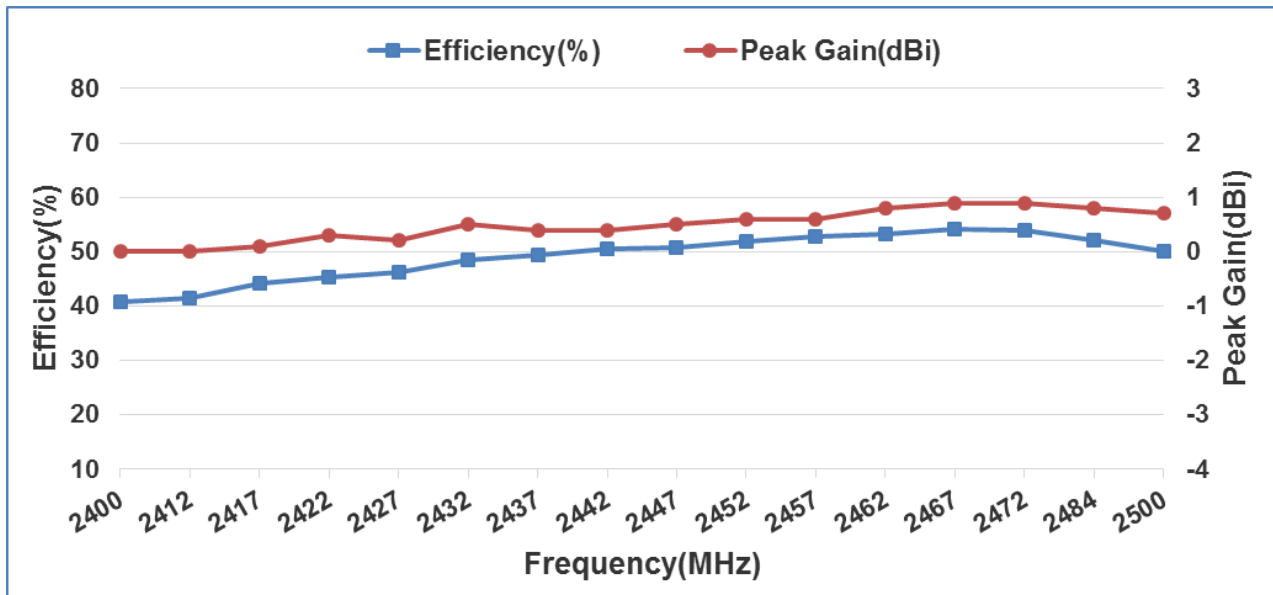
Frequency (MHz)	1575
Efficiency (%)	61.9
Peak Gain (dBi)	1.5

### 4.4. VSWR of Wi-Fi Band



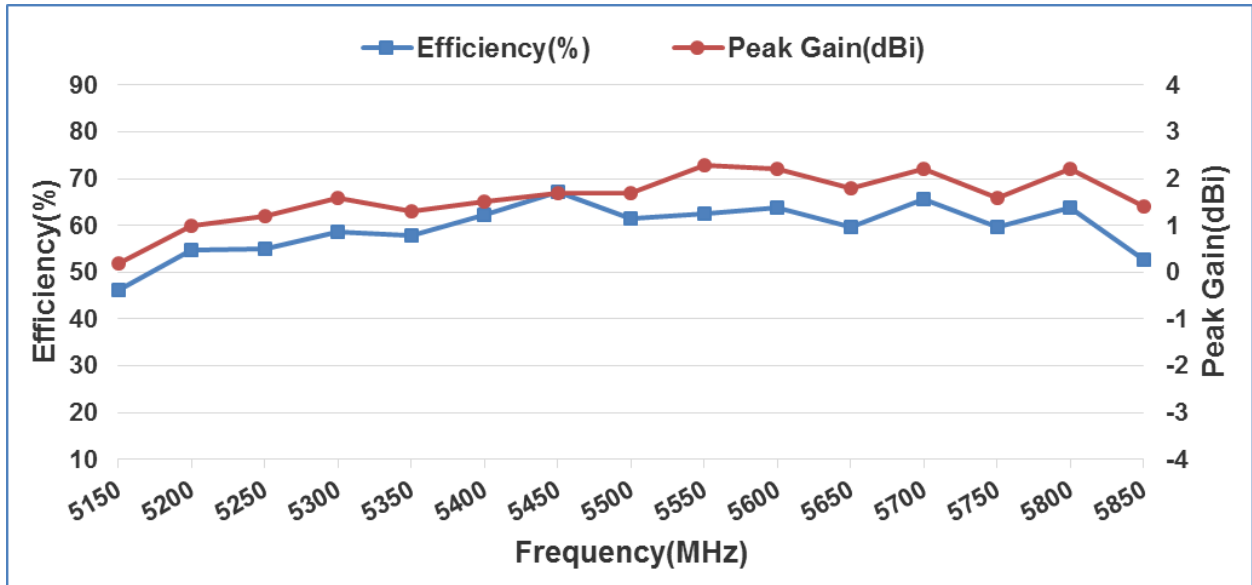
<b>Frequency (MHz)</b>	2400	2442	2484	5150	5350	5550	5750	5850
<b>VSWR</b>	1.88	1.32	1.88	3.09	2.14	1.41	1.31	1.68

### 4.5. Efficiency and Peak Gain of Wi-Fi Band



<b>Frequency (MHz)</b>	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452
<b>Efficiency (%)</b>	40.8	41.5	44.1	45.2	46.2	48.5	49.3	50.5	50.7	51.9
<b>Peak Gain (dBi)</b>	0.0	0.0	0.1	0.3	0.2	0.5	0.4	0.4	0.5	0.6

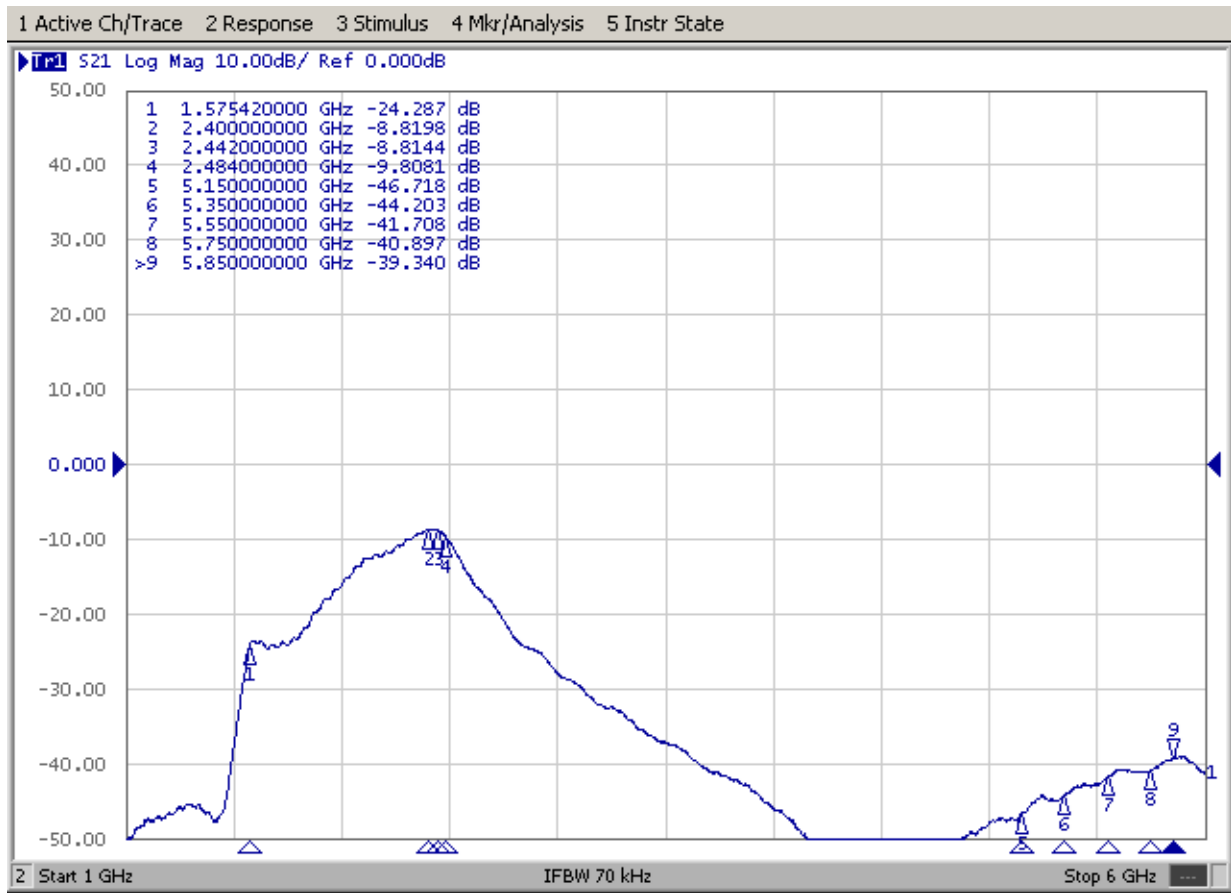
<b>Frequency (MHz)</b>	2457	2462	2467	2472	2484	2500
<b>Efficiency (%)</b>	52.7	53.2	54.2	53.9	52.2	50.1
<b>Peak Gain (dBi)</b>	0.6	0.8	0.9	0.9	0.8	0.7



<b>Frequency (MHz)</b>	5150	5200	5250	5300	5350	5400	5450	5500	5550	5600
<b>Efficiency (%)</b>	46.3	54.8	54.9	58.7	57.9	62.2	67.3	61.6	62.6	63.7
<b>Peak Gain (dBi)</b>	0.2	1.0	1.2	1.6	1.3	1.5	1.7	1.7	2.3	2.2

<b>Frequency (MHz)</b>	5650	5700	5750	5800	5850
<b>Efficiency (%)</b>	59.8	65.6	59.6	63.7	52.7
<b>Peak Gain (dBi)</b>	1.8	2.2	1.6	2.2	1.4

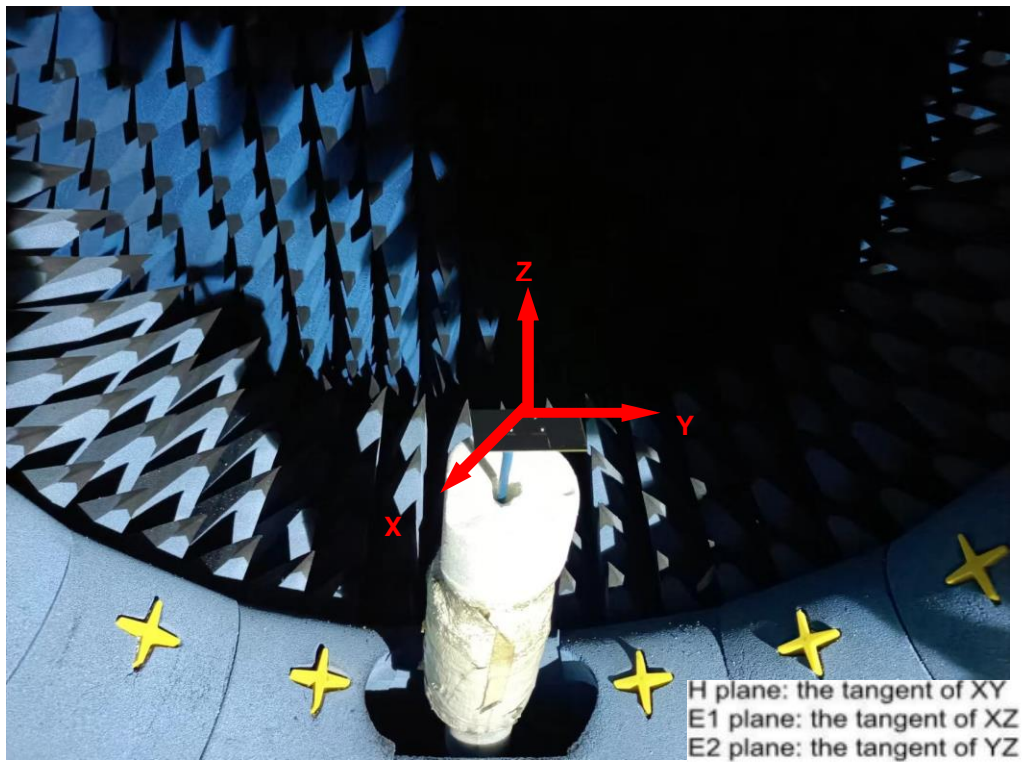
### 4.6. Isolation Between GPS Band & Wi-Fi Band



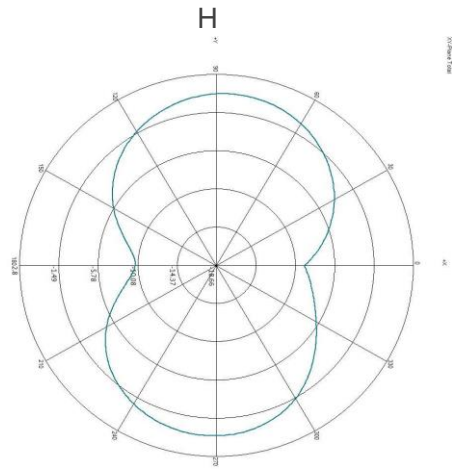
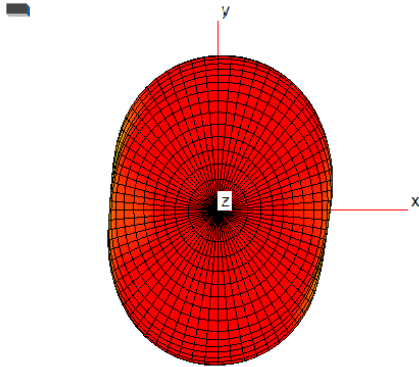
Frequency (MHz)	1575	2400	2442	2484	5150	5350	5550	5750	5850
Isolation(dB)	-24	-8.8	-8.8	-9.8	-46	-44	-41	-40	-39

## 4.7. Radiation Pattern

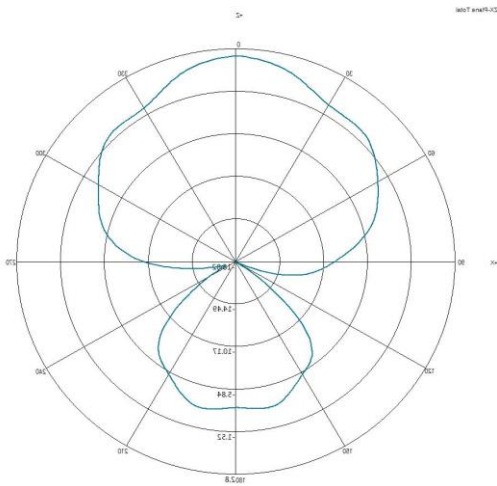
- Test condition: with ground plane (80 mm × 40 mm).



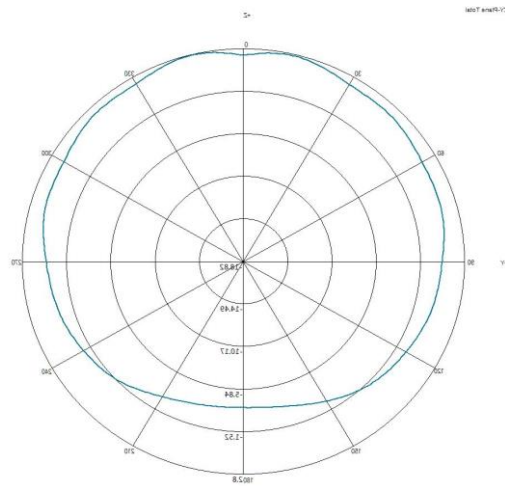
- 1575.42 MHz



E1

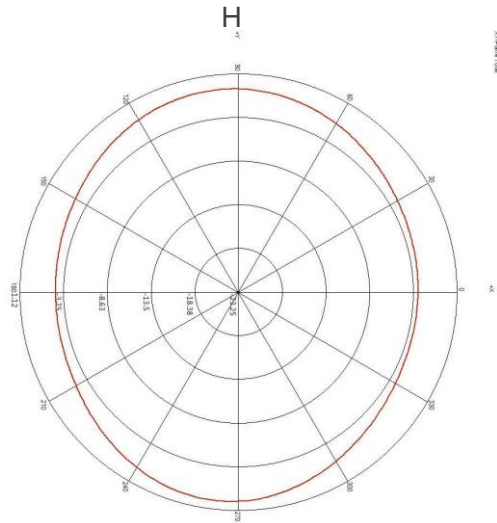
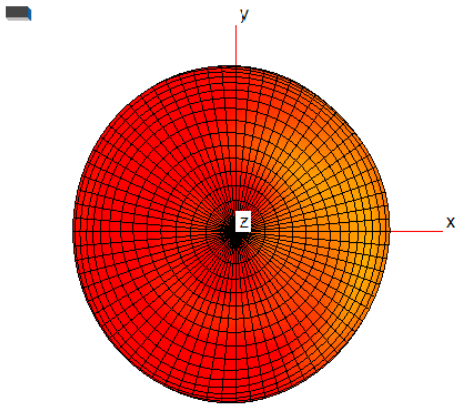


E2

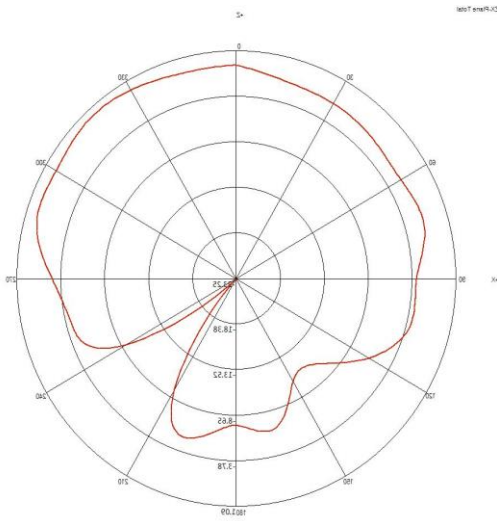




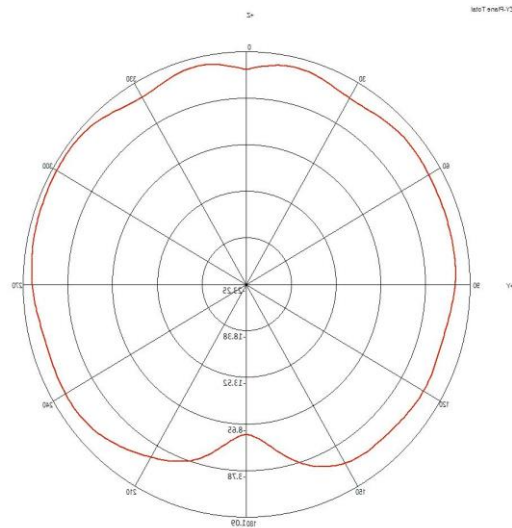
- 2400 MHz



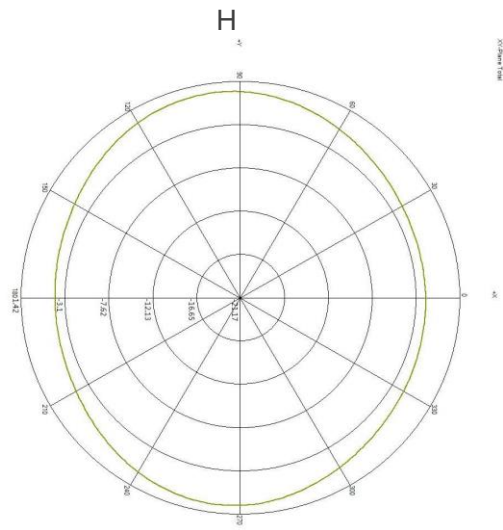
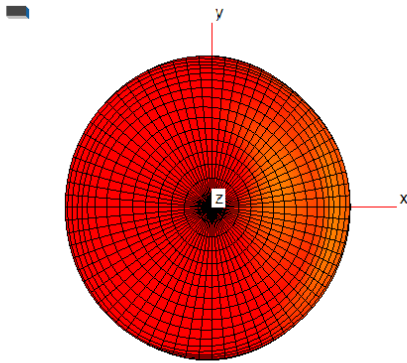
**E1**



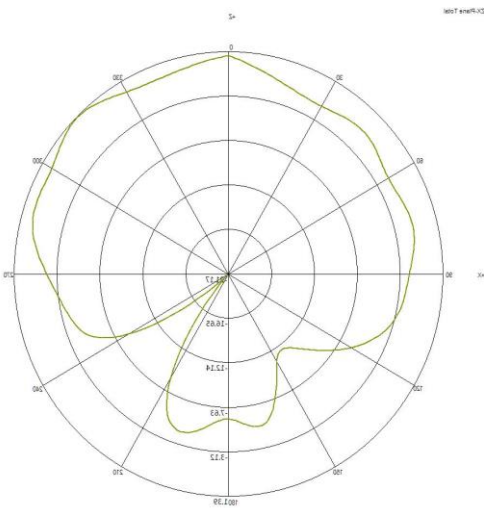
**E2**



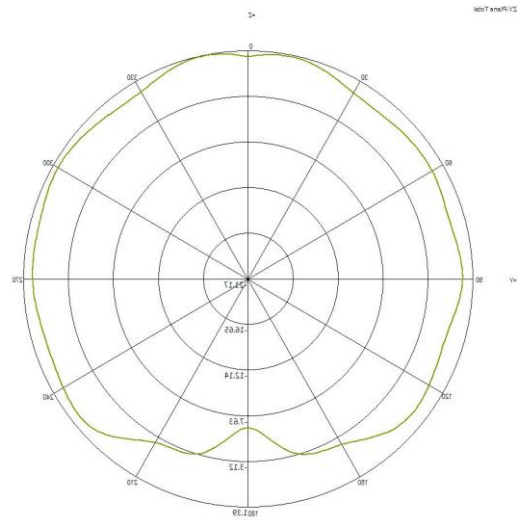
● 2450 MHz



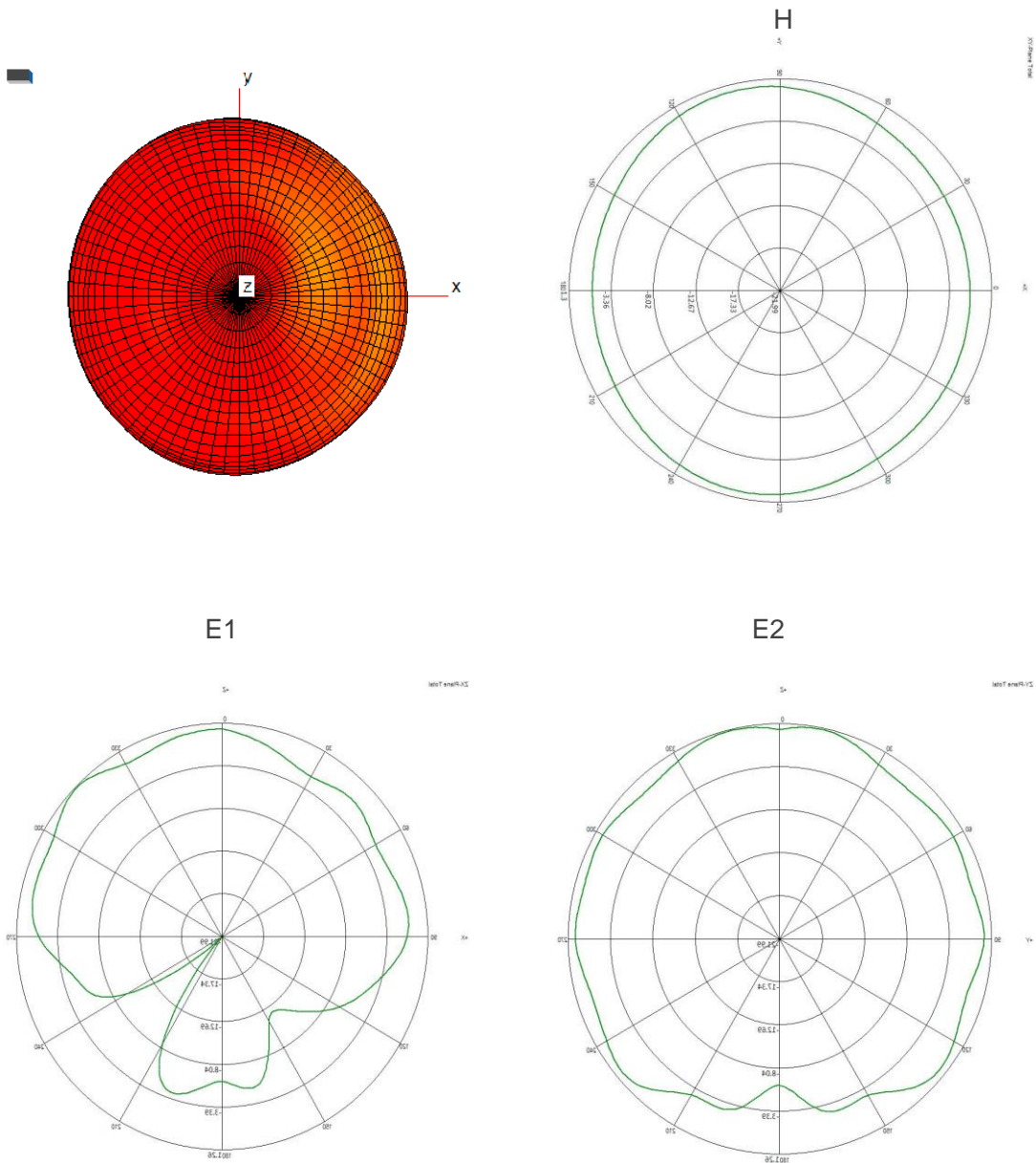
E1



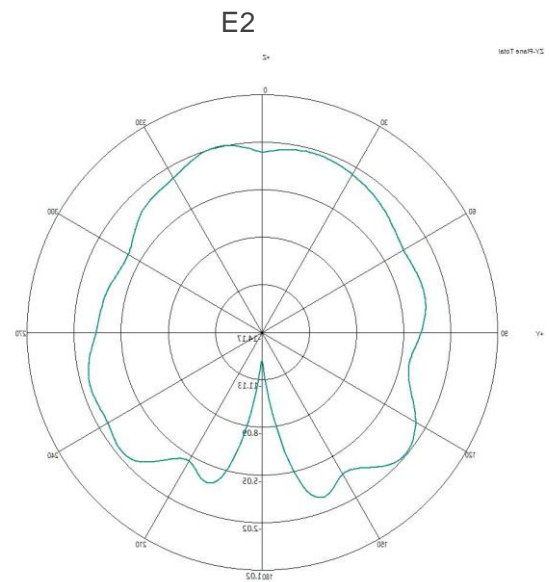
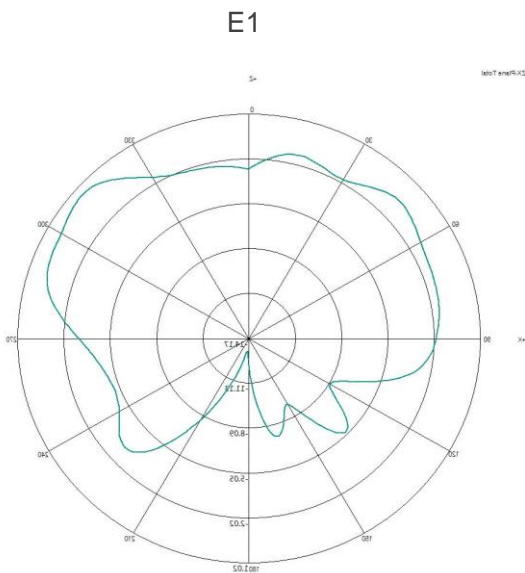
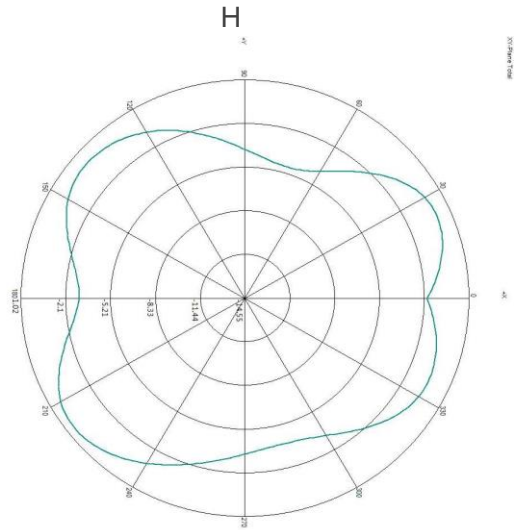
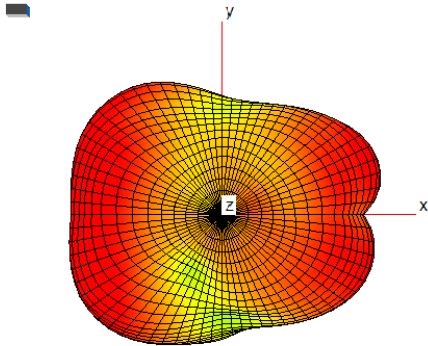
E2



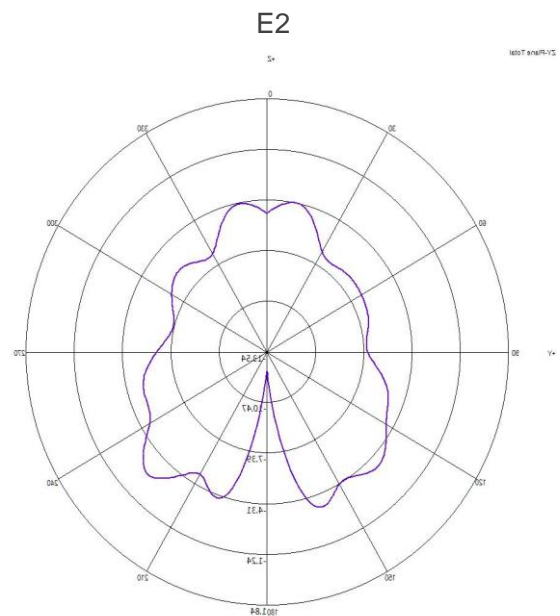
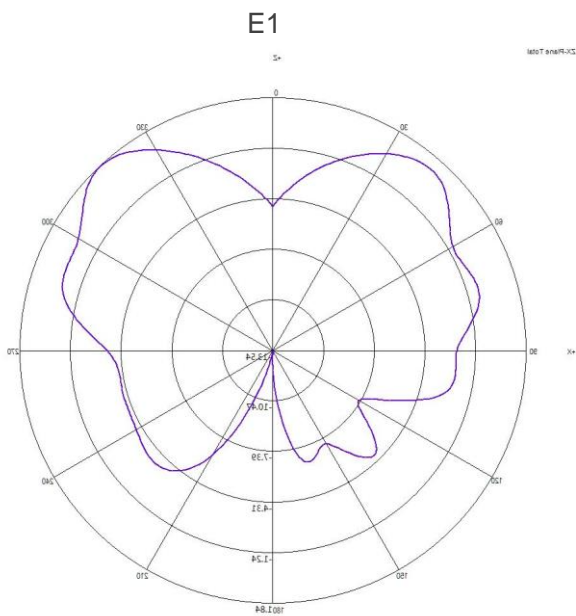
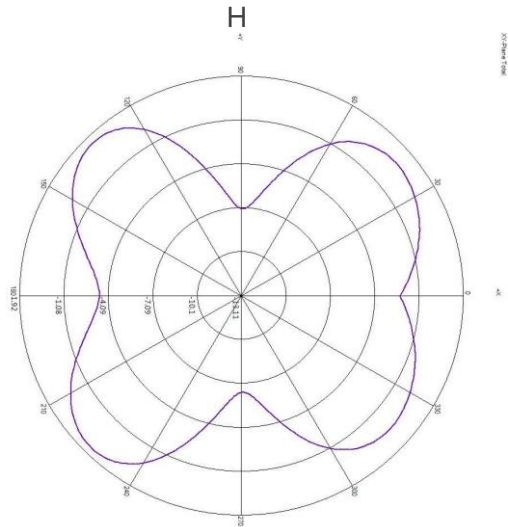
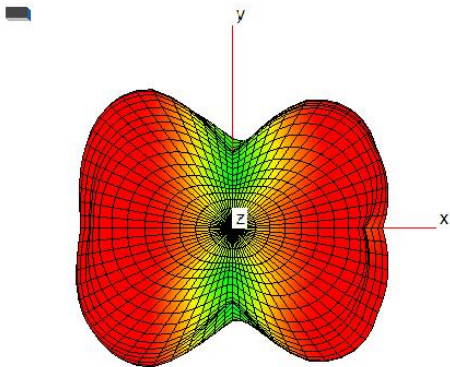
- 2500 MHz



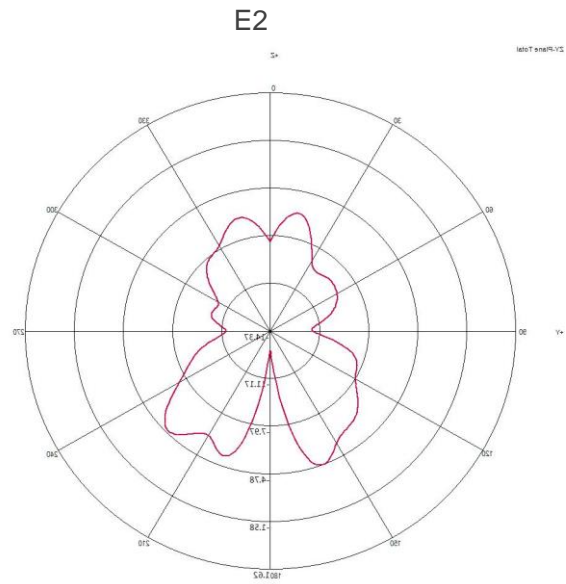
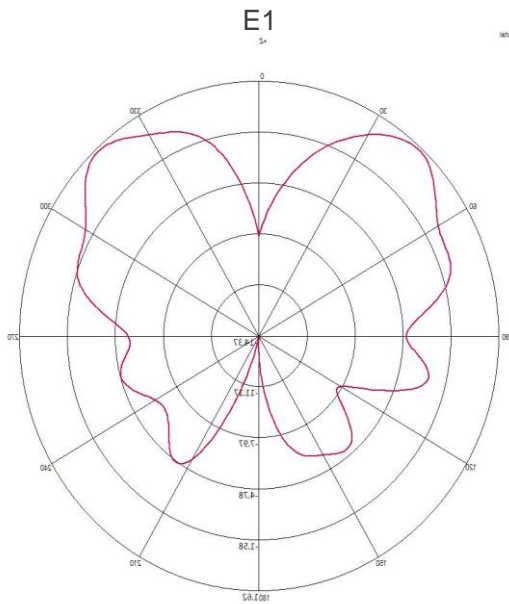
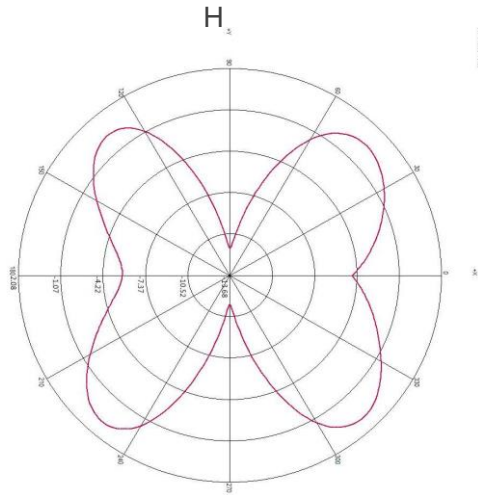
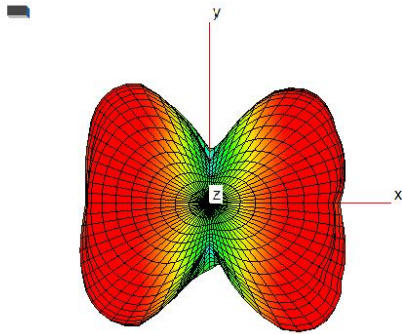
- 5150 MHz



- 5550 MHz

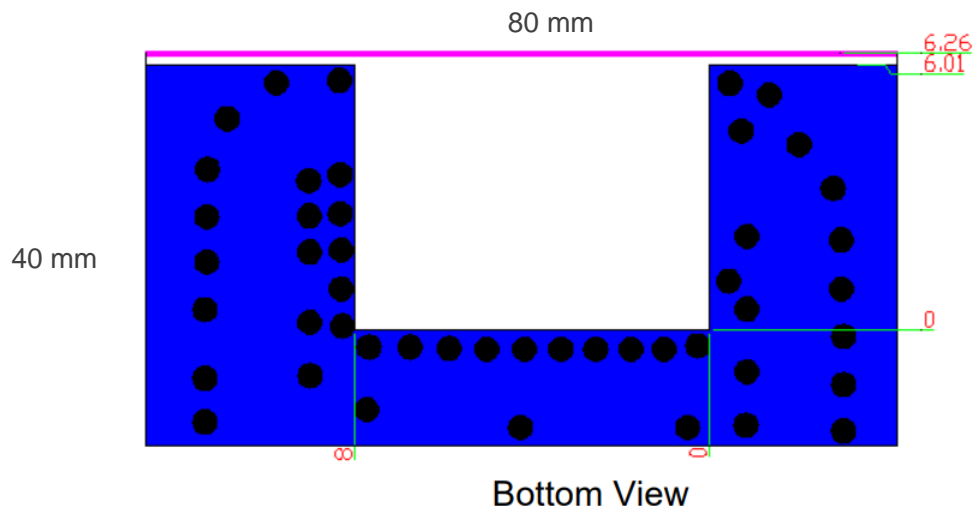
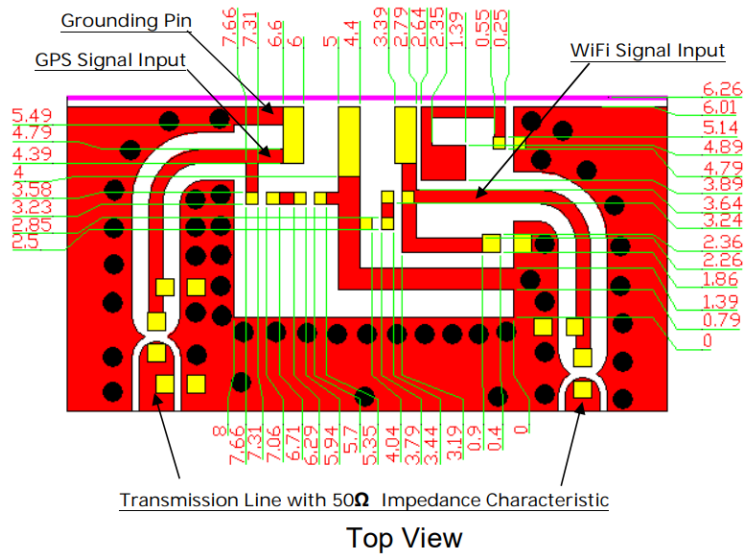


● 5850 MHz



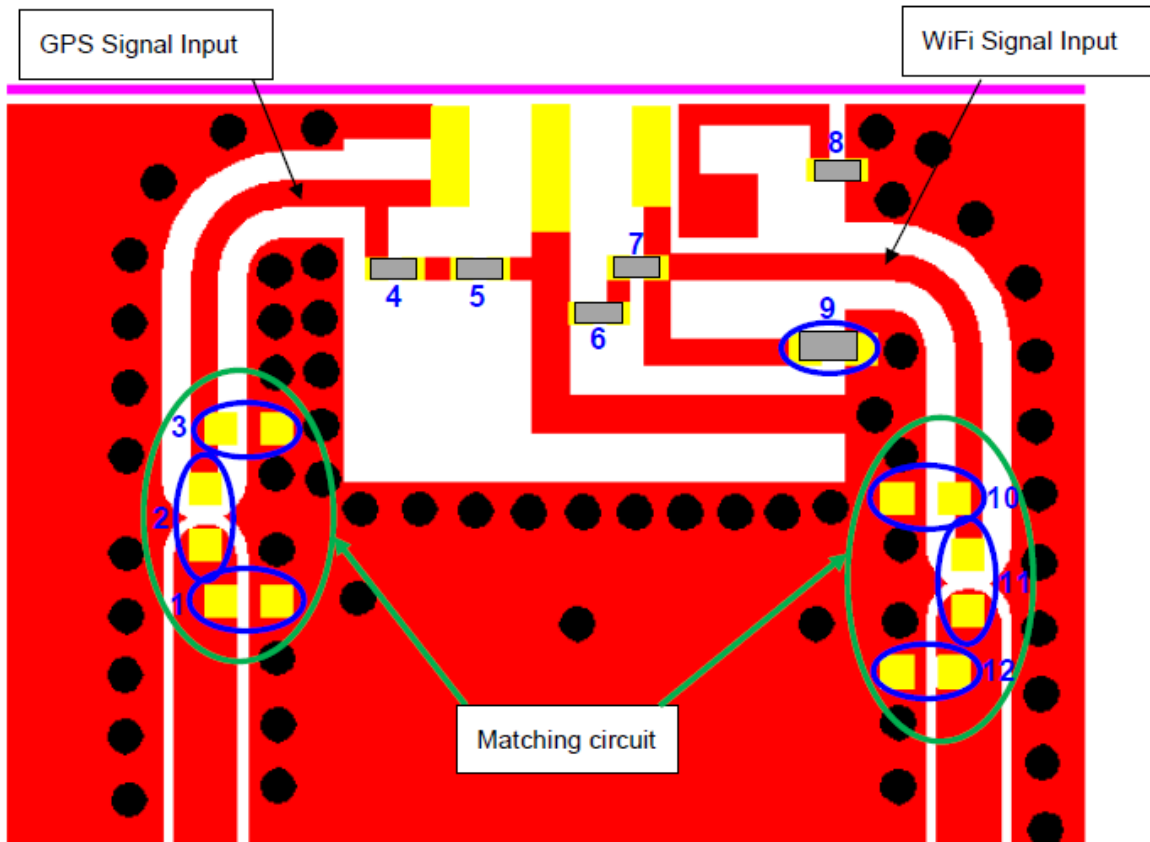


## 5 PCB Footprint Recommendation

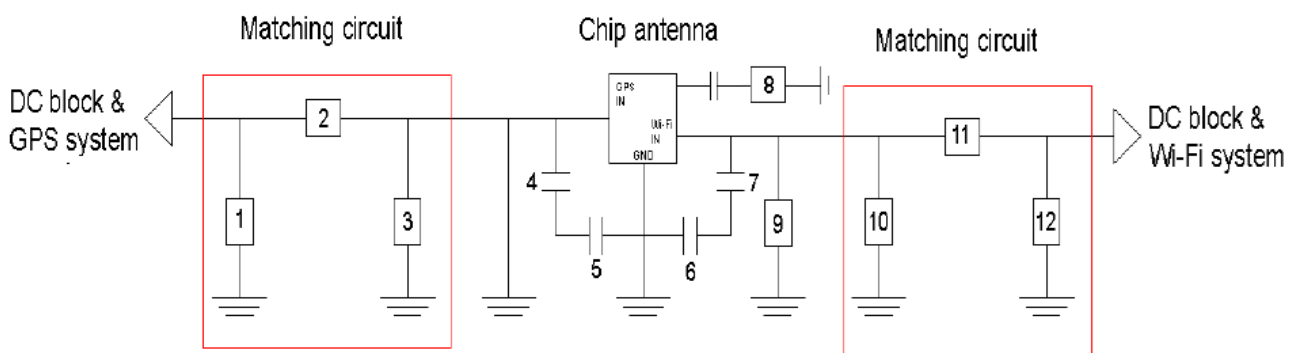


- **Note: The minimum PCB size is recommended to be 30 mm × 50 mm.**

## 6 Frequency Tuning and Matching Circuit



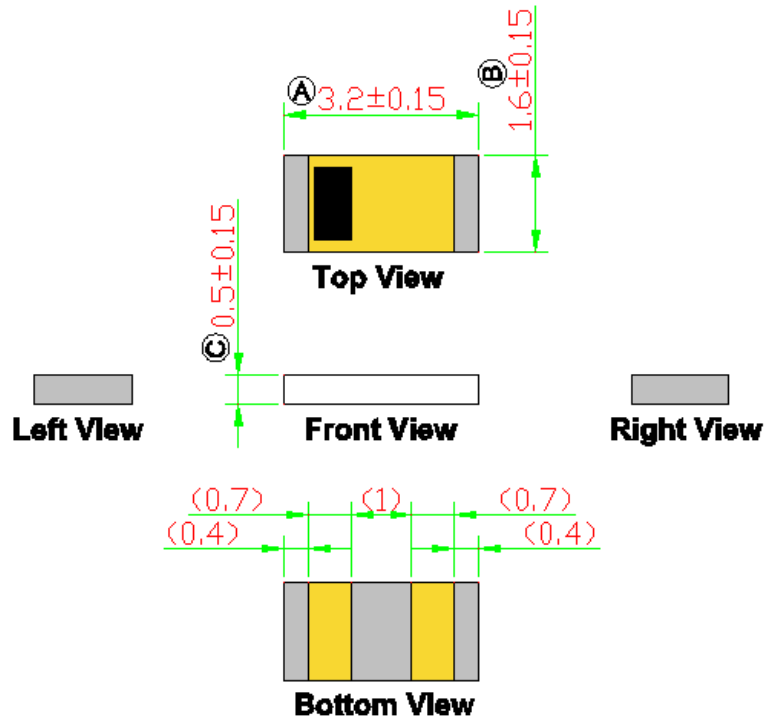
**Matching circuit:** (the center frequencies will be about 1575.42 MHz on GPS and 2442 MHz & 5550 MHz on Wi-F- band at @ 80 x 40 mm<sup>2</sup> Evaluation Board).





System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A*		
2	0 $\Omega$ , (0402)	-	$\pm 5\%$
3	N/A*		
4 Fine tuning element	1.8pF, (0201)	MURATA	$\pm 0.05\text{pF}$
5 Fine tuning element	0.8pF, (0201)	MURATA	$\pm 0.05\text{pF}$
6 Fine tuning element	0.9pF, (0201)	MURATA	$\pm 0.05\text{pF}$
7 Fine tuning element	0.9pF, (0201)	MURATA	$\pm 0.05\text{pF}$
8 Fine tuning element	0.4pF, (0201)	MURATA	$\pm 0.05\text{pF}$
9	0 $\Omega$ , (0402)	-	$\pm 5\%$
10	N/A*		
11	0 $\Omega$ , (0402)	-	$\pm 5\%$
12	N/A*		
DC Block	22pF, (0402)	MURATA	$\pm 5\%$

## 7 Product Size



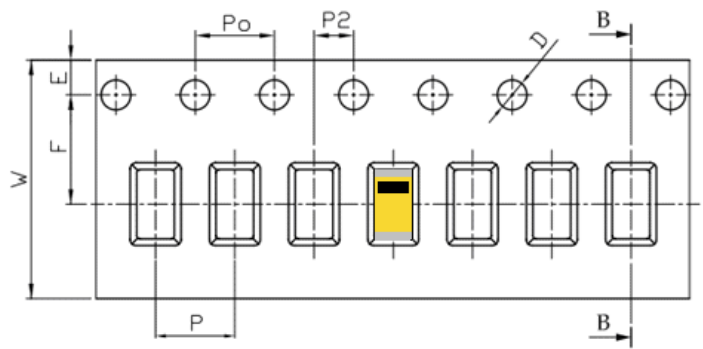
## 8 Packing Details

### Quantity/Reel

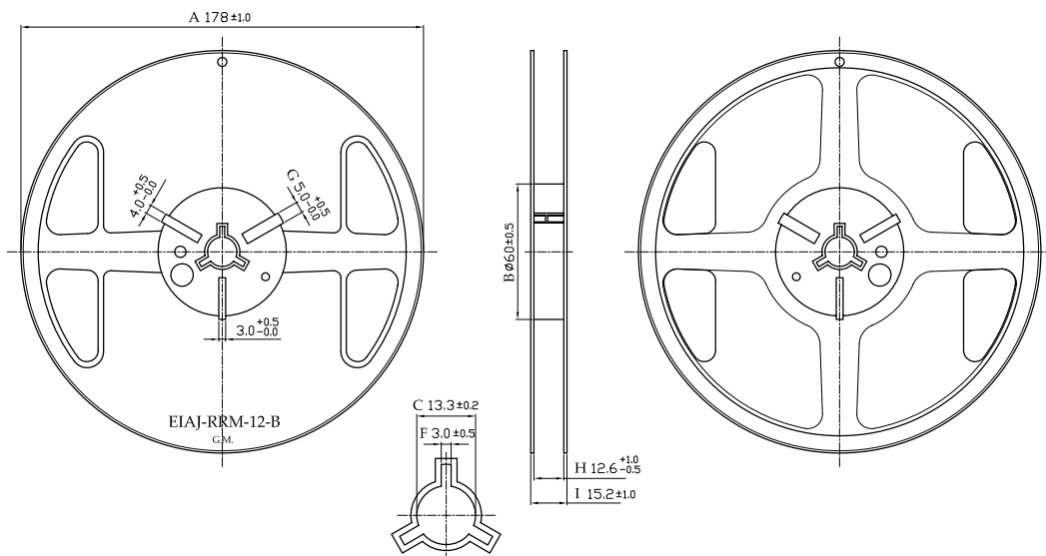
5000 PCS/Reel

### Tape Dimensions (Unit: mm)

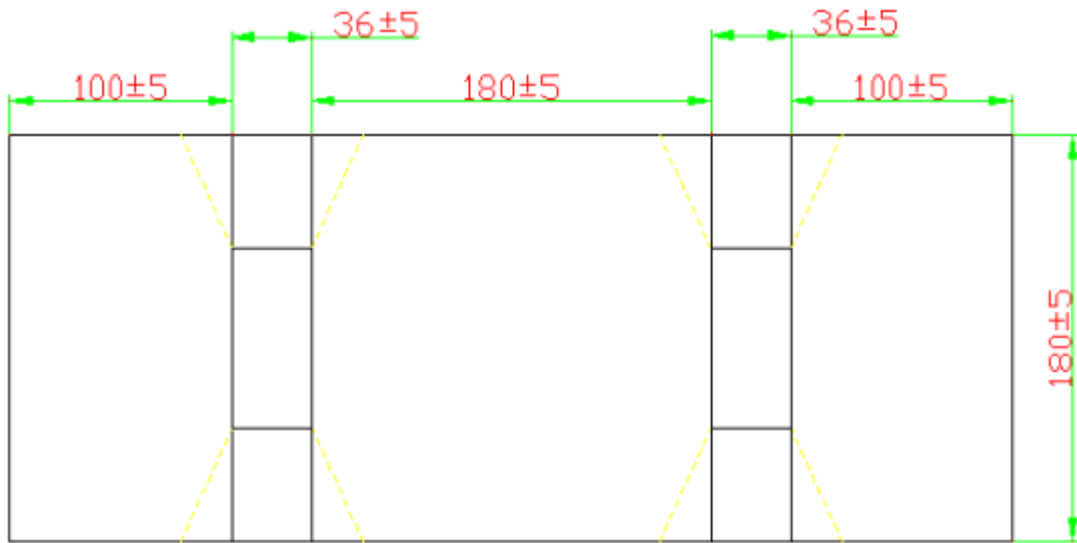
Feature	Specification	Tolerances
W	12.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
Po	4.00	±0.10
10Po	40.00	±0.20



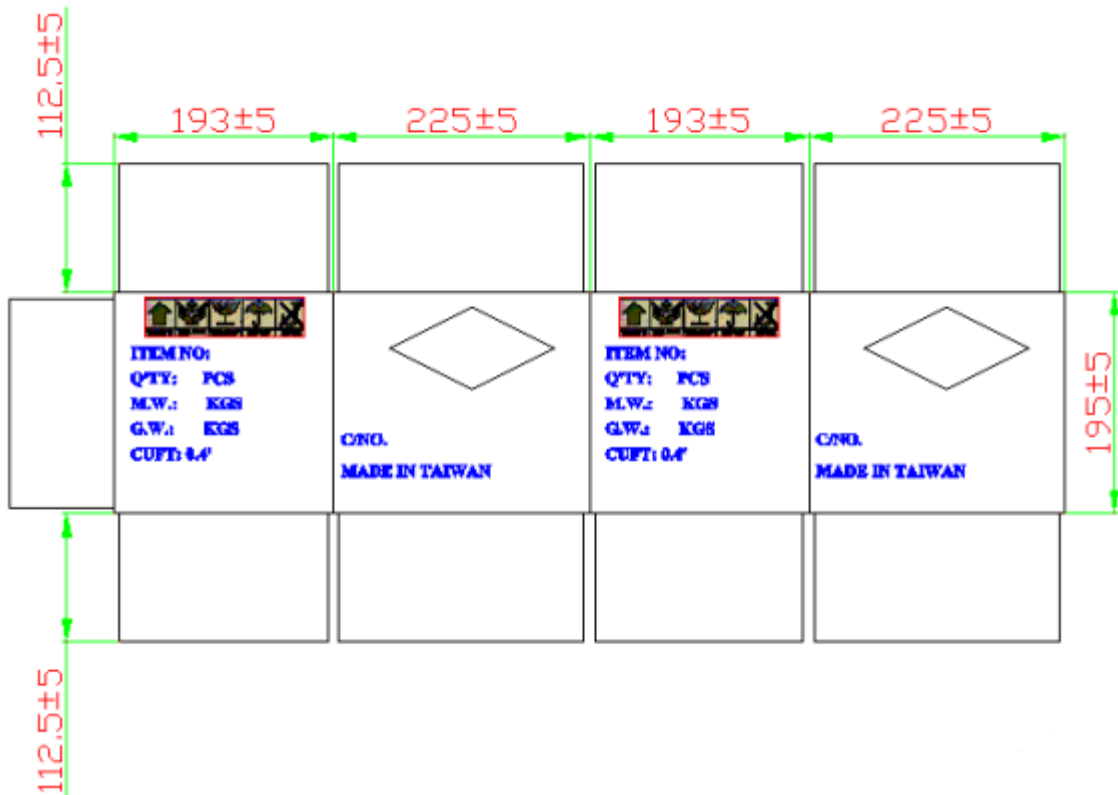
### 8.1. Reel Drawing



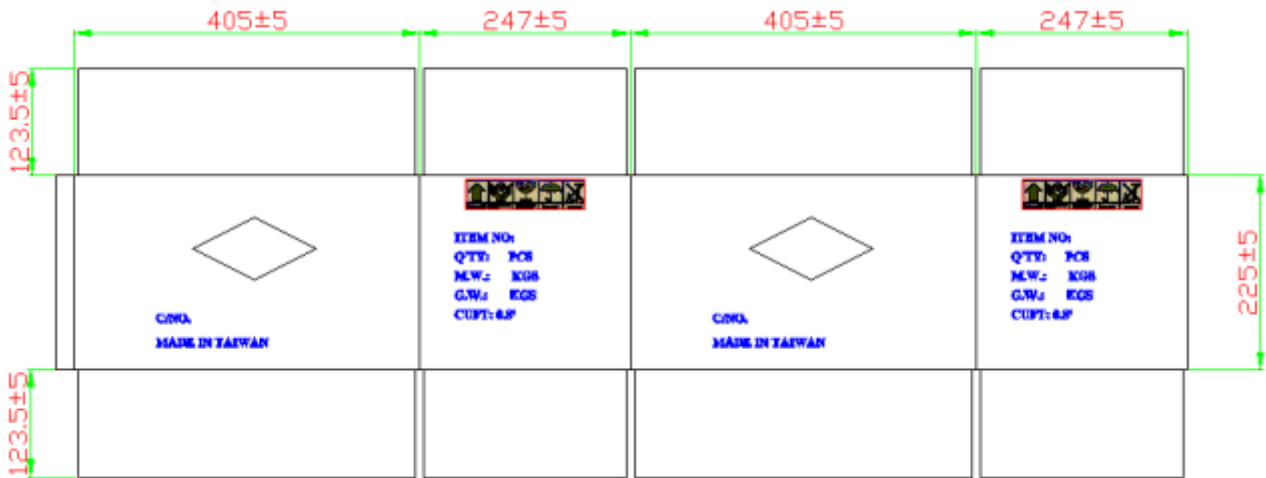
### 8.2. Drawing of Small Size Carton in Developed View



### 8.3. Drawing of Middle Size Carton in Developed View



### 8.4. Drawing of Large Size Carton in Developed View



### 8.5. Picture of Reel Label

Quectel O/C	XXXXXXXX	
P/N	Q8 - XXXX	
Quantity	XXXXPCS [Barcode]	
Lot No	XXXXXXXX [Barcode]	
D/C	XXXXXXXX [Barcode]	RoHS

### 8.6. Labeled Reel



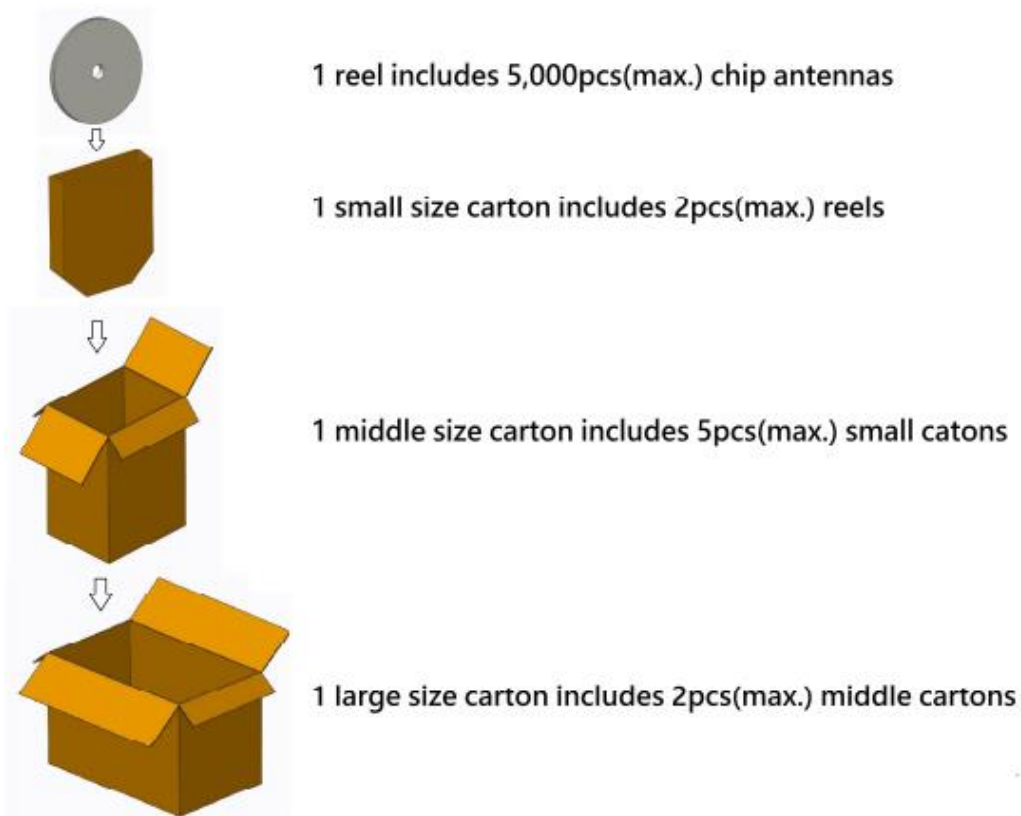
### 8.7. Small Size Carton Label



### 8.8. Middle Size Carton Label



### 8.9. Process of Packing



1. Sealing the carton and attach the label.



(1) Pictures of carton labels.

- Label 1



- Label 2





- Label 3

Paste this label in the carton containing the inspection report, if there are mantissa products.

备注Remark:

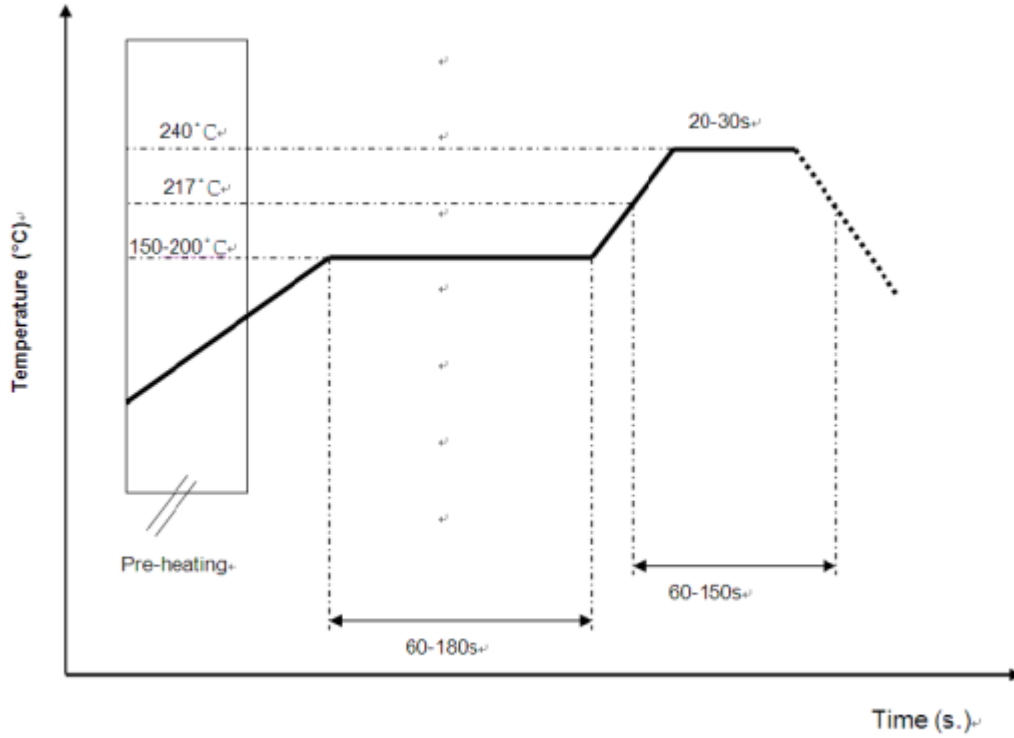
附检验报告  
Attached Inspection Report

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尾数箱

## 9 Soldering Conditions

### 9.1 Typical Soldering Profile for Lead-free Process



\*Recommended solder paste alloy: SAC305 (Sn96.5 /Ag3 /Cu0.5) Lead Free solder paste.