

# Antenna

# YCGS024AA Datasheet

## Antenna Services

Version:1.0

Date: 2022-05-27

Status: Released



At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

**Quectel Wireless Solutions Co., Ltd.**

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China

Tel: +86 21 5108 6236

Email: [info@quectel.com](mailto:info@quectel.com)

**Or our local offices. For more information, please visit:**

<http://www.quectel.com/support/sales.htm>.

**For technical support, or to report documentation errors, please visit:**

<http://www.quectel.com/support/technical.htm>.

Or email us at: [support@quectel.com](mailto:support@quectel.com).

## Legal Notices

We offer information as a service to you. The provided information is based on your requirements and we make every effort to ensure its quality. You agree that you are responsible for using independent analysis and evaluation in designing intended products, and we provide reference designs for illustrative purposes only. Before using any hardware, software or service guided by this document, please read this notice carefully. Even though we employ commercially reasonable efforts to provide the best possible experience, you hereby acknowledge and agree that this document and related services hereunder are provided to you on an “as available” basis. We may revise or restate this document from time to time at our sole discretion without any prior notice to you.

## Use and Disclosure Restrictions

### License Agreements

Documents and information provided by us shall be kept confidential, unless specific permission is granted. They shall not be accessed or used for any purpose except as expressly provided herein.

### Copyright

Our and third-party products hereunder may contain copyrighted material. Such copyrighted material shall not be copied, reproduced, distributed, merged, published, translated, or modified without prior written consent. We and the third party have exclusive rights over copyrighted material. No license shall be granted or conveyed under any patents, copyrights, trademarks, or service mark rights. To avoid ambiguities, purchasing in any form cannot be deemed as granting a license other than the normal non-exclusive, royalty-free license to use the material. We reserve the right to take legal action for noncompliance with abovementioned requirements, unauthorized use, or other illegal or malicious use of the material.

## Trademarks

Except as otherwise set forth herein, nothing in this document shall be construed as conferring any rights to use any trademark, trade name or name, abbreviation, or counterfeit product thereof owned by Quectel or any third party in advertising, publicity, or other aspects.

## Third-Party Rights

This document may refer to hardware, software and/or documentation owned by one or more third parties (“third-party materials”). Use of such third-party materials shall be governed by all restrictions and obligations applicable thereto.

We make no warranty or representation, either express or implied, regarding the third-party materials, including but not limited to any implied or statutory, warranties of merchantability or fitness for a particular purpose, quiet enjoyment, system integration, information accuracy, and non-infringement of any third-party intellectual property rights with regard to the licensed technology or use thereof. Nothing herein constitutes a representation or warranty by us to either develop, enhance, modify, distribute, market, sell, offer for sale, or otherwise maintain production of any our products or any other hardware, software, device, tool, information, or product. We moreover disclaim any and all warranties arising from the course of dealing or usage of trade.

## Privacy Policy

To implement module functionality, certain device data are uploaded to Quectel’s or third-party’s servers, including carriers, chipset suppliers or customer-designated servers. Quectel, strictly abiding by the relevant laws and regulations, shall retain, use, disclose or otherwise process relevant data for the purpose of performing the service only or as permitted by applicable laws. Before data interaction with third parties, please be informed of their privacy and data security policy.

## Disclaimer

- a) We acknowledge no liability for any injury or damage arising from the reliance upon the information.
- b) We shall bear no liability resulting from any inaccuracies or omissions, or from the use of the information contained herein.
- c) While we have made every effort to ensure that the functions and features under development are free from errors, it is possible that they could contain errors, inaccuracies, and omissions. Unless otherwise provided by valid agreement, we make no warranties of any kind, either implied or express, and exclude all liability for any loss or damage suffered in connection with the use of features and functions under development, to the maximum extent permitted by law, regardless of whether such loss or damage may have been foreseeable.
- d) We are not responsible for the accessibility, safety, accuracy, availability, legality, or completeness of information, advertising, commercial offers, products, services, and materials on third-party websites and third-party resources.

**Copyright © Quectel Wireless Solutions Co., Ltd. 2022. All rights reserved.**

# About the Document

## Revision History

Version	Date	Author	Note
-	2022-05-27	Junsen LI/ Joye WANG	Creation of the document
1.0	2022-05-27	Junsen LI/ Joye WANG	First official release

## Contents

About the Document .....	3
Contents.....	4
<b>1 Product Description .....</b>	<b>5</b>
<b>2 Product Features.....</b>	<b>5</b>
<b>3 Product Specifications .....</b>	<b>6</b>
<b>4 Overall Performance .....</b>	<b>7</b>
4.1. Test Environment.....	7
4.2. VSWR GPS Band.....	8
4.3. Efficiency & Peak Gain GPS Band .....	9
4.4. VSWR Wi-Fi Band.....	10
4.5. Efficiency & Peak Gain Wi-Fi Band .....	11
4.6. Isolation .....	12
4.7. Radiation Pattern.....	13
4.8. Radiation Pattern GPS Band.....	14
4.9. Radiation Pattern Wi-Fi Band .....	15
4.10. PCB Footprint Recommendation .....	18
<b>5 Product Size .....</b>	<b>19</b>
<b>6 Packing Details.....</b>	<b>20</b>
6.1. Reel Drawing.....	20
6.2. Drawing of Small Size Carton in Developed View .....	21
6.3. Drawing of Middle Size Carton in Developed View.....	21
6.4. Drawing of Large Size Carton in Developed View .....	22
6.5. Picture of Reel Label .....	22
6.6. Labeled Reel .....	23
6.7. Small Size Carton Label .....	23
6.8. Middle Size Carton Label .....	23
6.9. Process of Packing.....	24
<b>7 Soldering Conditions.....</b>	<b>26</b>

## 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

- Combo chip antenna covering GPS bands and Wi-Fi (Bluetooth)
- High efficiency
- AEC-Q200 compliant
- Low profile, compact size
- Good isolation between GPS bands and Wi-Fi (Bluetooth) bands



### 3 Product Specifications

#### Passive Electrical Specifications

Frequency Range	1575.42 MHz; 2400–2500 MHz
Input Impedence	50 $\Omega$
VSWR	$\leq 2.0$
Gain	$\leq 1.8$ dBi
Polarization Type	Linear

#### Mechanical Specifications

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

## 4 Overall Performance

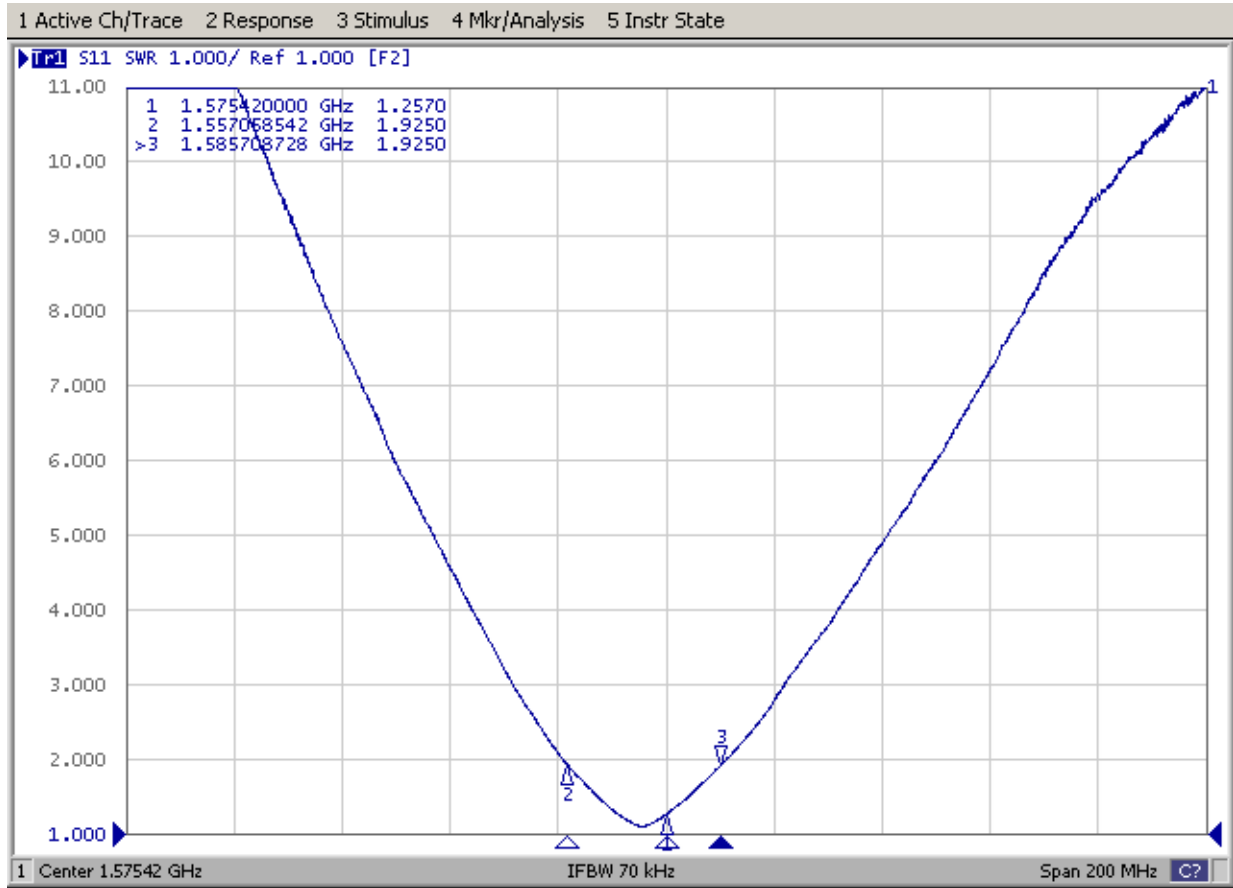
### 4.1. Test Environment

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



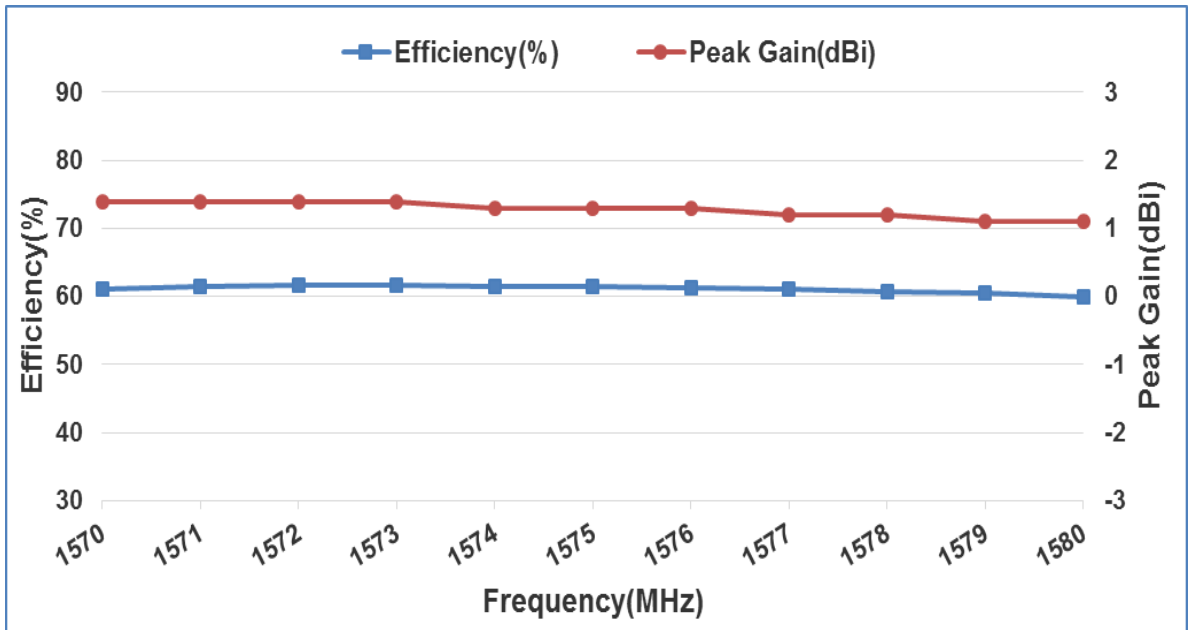


## 4.2. VSWR GPS Band



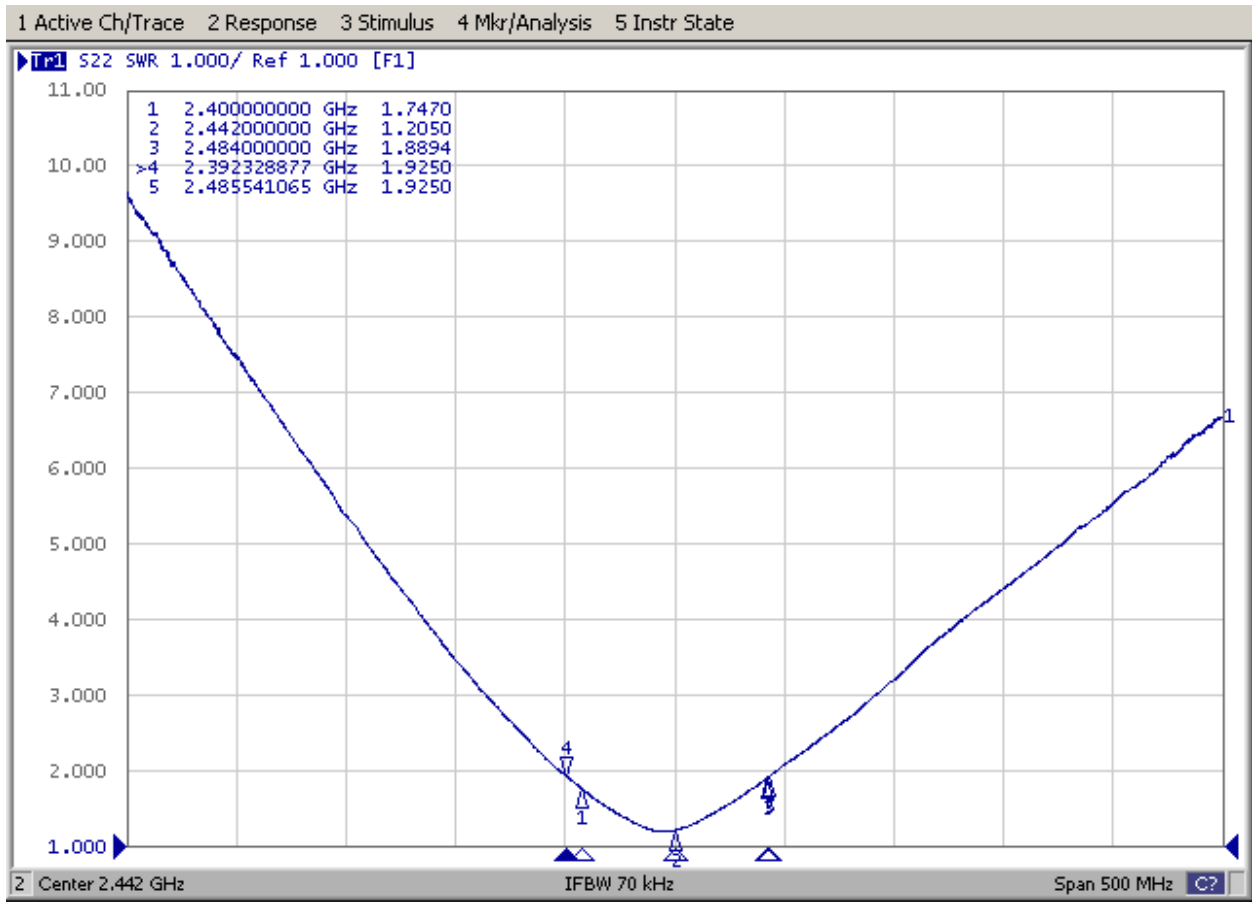
Frequency (MHz)	1575
VSWR	1.25

### 4.3. Efficiency & Peak Gain GPS Band



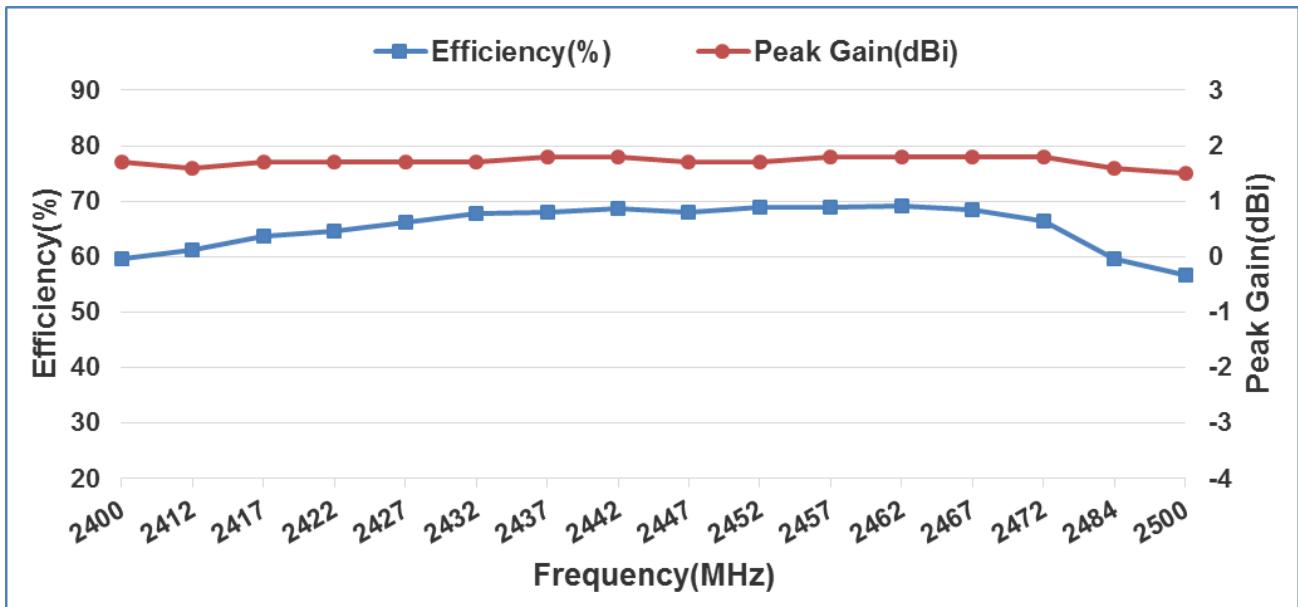
Frequency (MHz)	1575
Efficiency (%)	61.4
Peak Gain (dBi)	1.3

### 4.4. VSWR Wi-Fi Band



Frequency (MHz)	2.40	2.44	2.48
VSWR	1.7	1.2	1.9

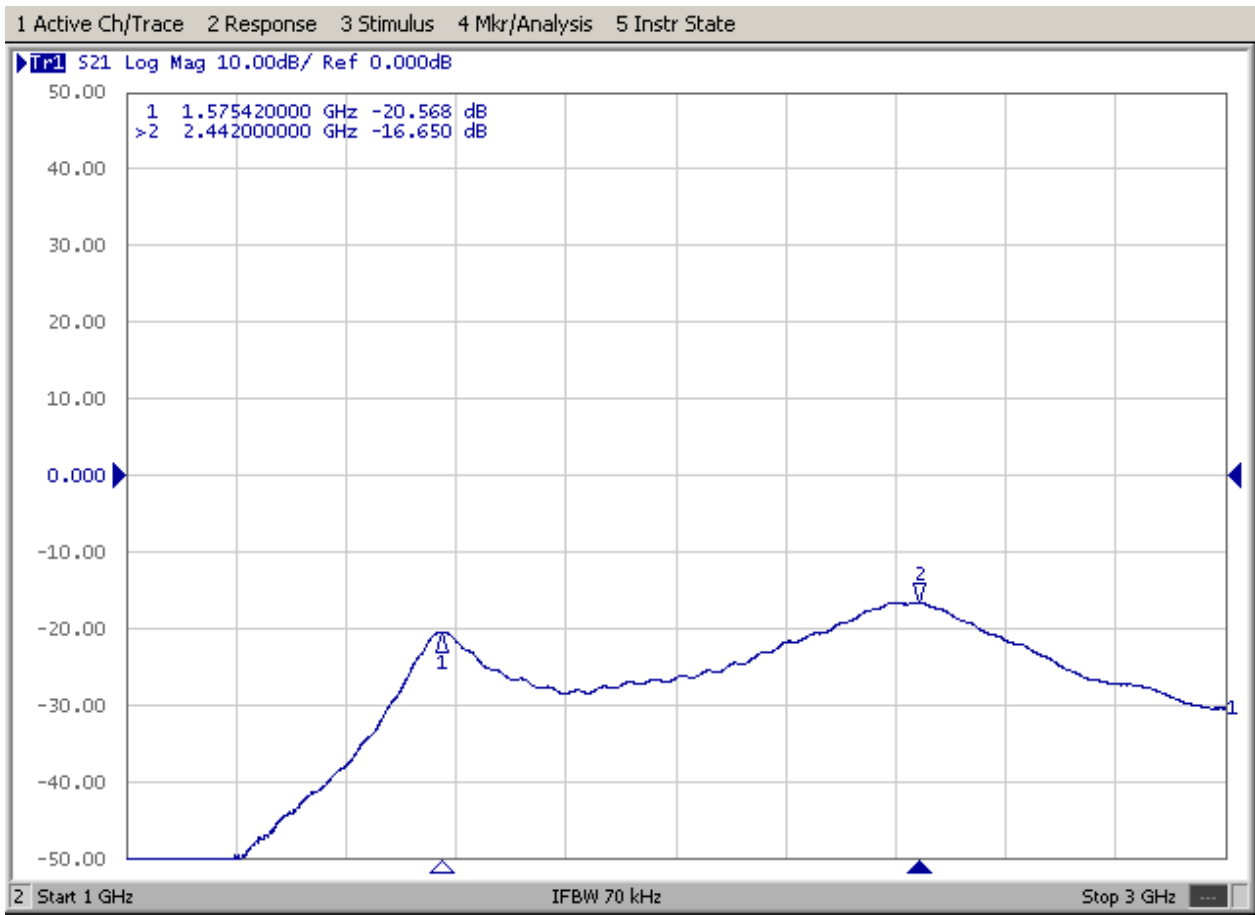
### 4.5. Efficiency & Peak Gain Wi-Fi Band



<b>Frequency (MHz)</b>	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452
<b>Efficiency (%)</b>	59.6	61.1	63.8	64.7	66.1	67.7	68.1	68.7	68.1	68.9
<b>Peak Gain (dB)</b>	1.7	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.7	1.7

<b>Frequency (MHz)</b>	2457	2462	2467	2472	2484	2500
<b>Efficiency (%)</b>	69.0	69.2	68.5	66.4	59.7	56.6
<b>Peak Gain (dB)</b>	1.8	1.8	1.8	1.8	1.6	1.5

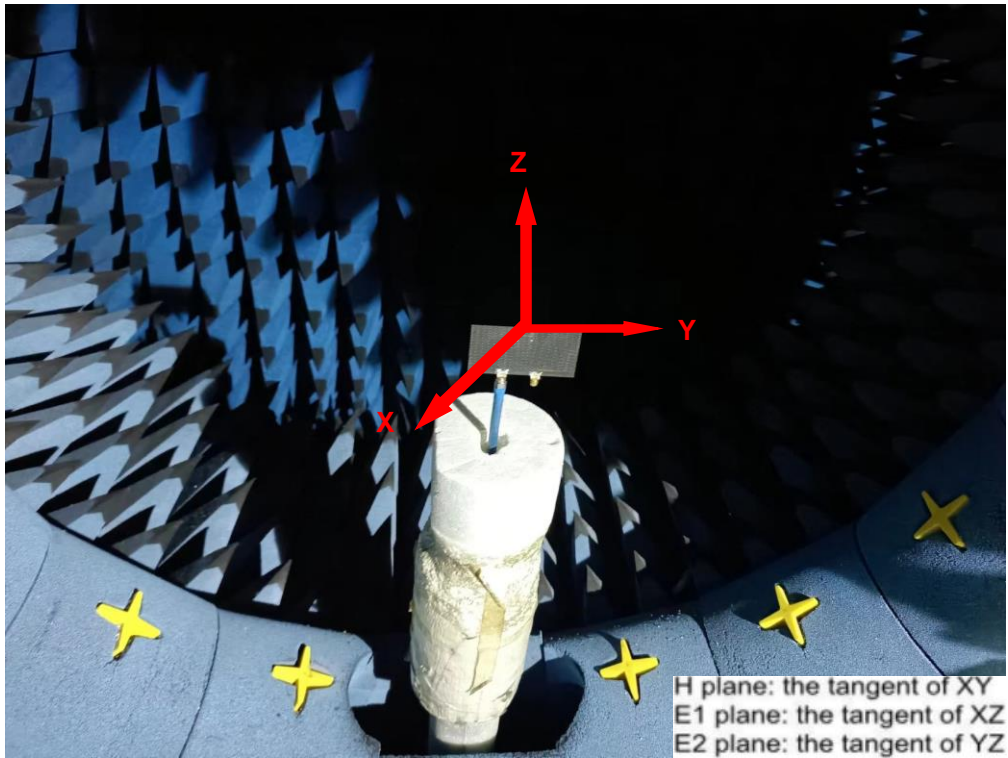
### 4.6. Isolation



Frequency (MHz)	1575.42	2442
Isolation (dB)	-20	-16

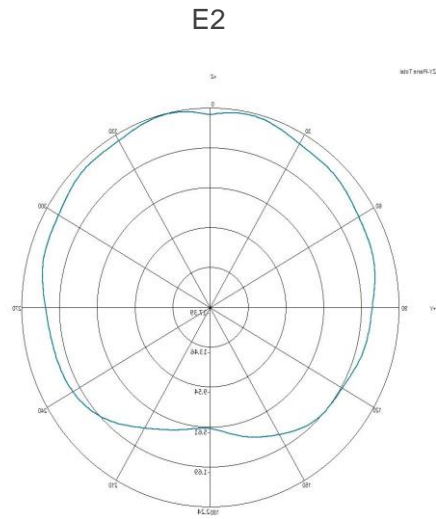
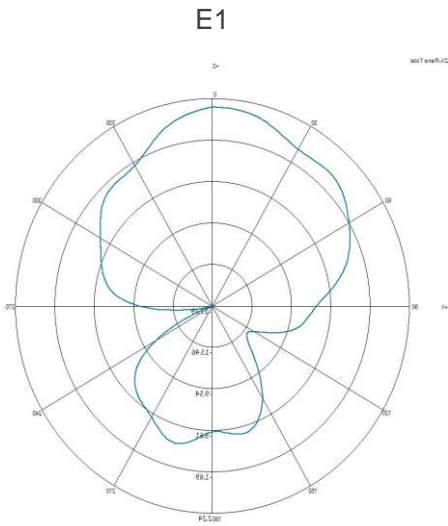
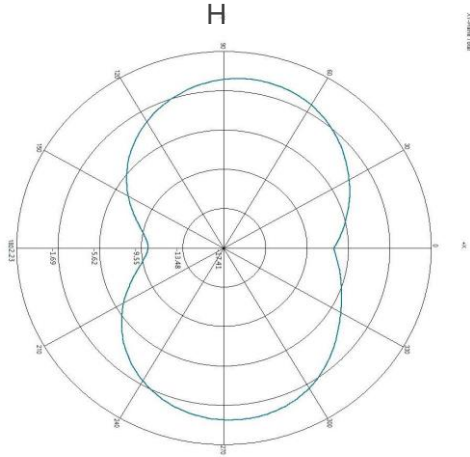
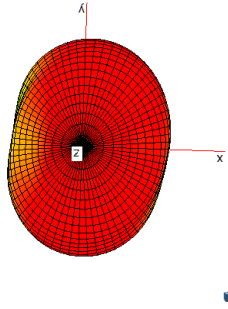
## 4.7. Radiation Pattern

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



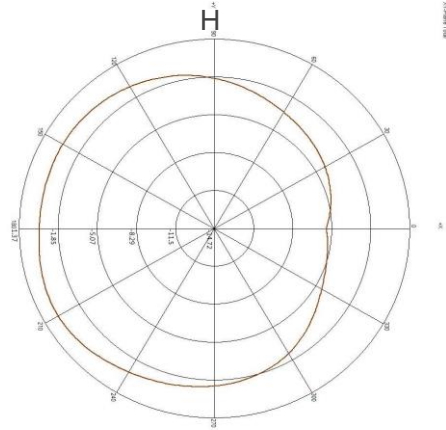
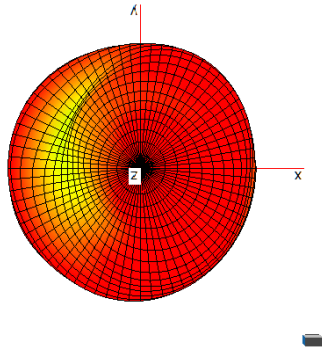
### 4.8. Radiation Pattern GPS Band

- 1575 MHz

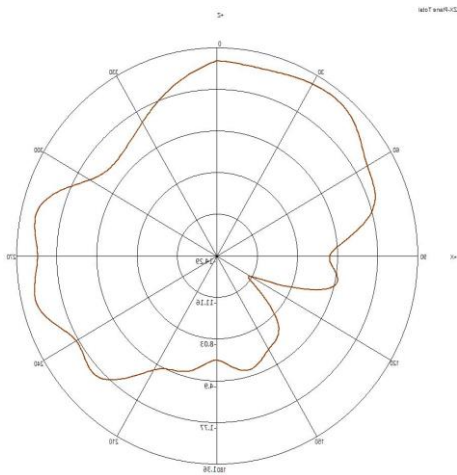


### 4.9. Radiation Pattern Wi-Fi Band

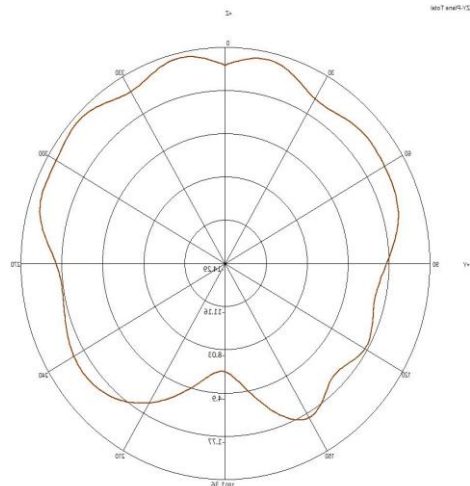
- 2400 MHz



E1

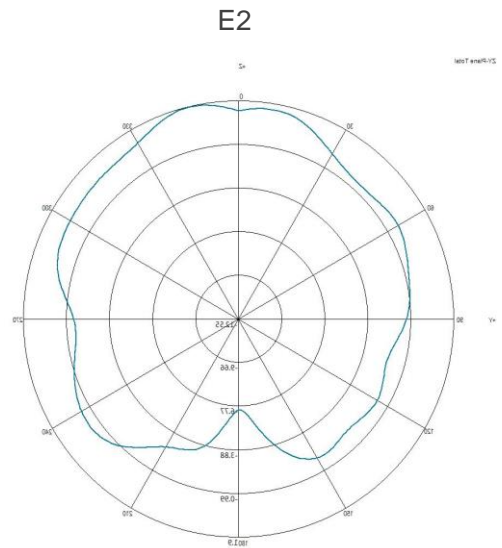
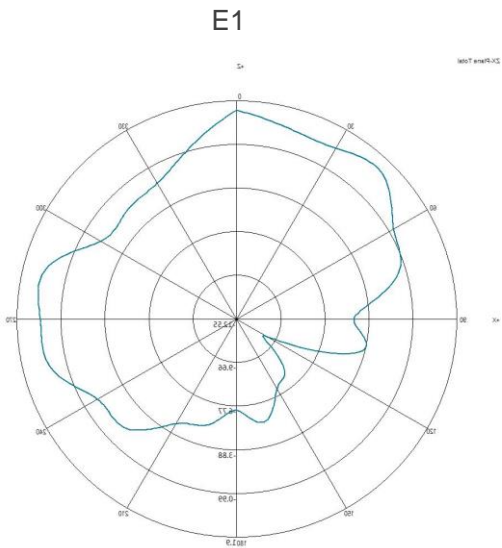
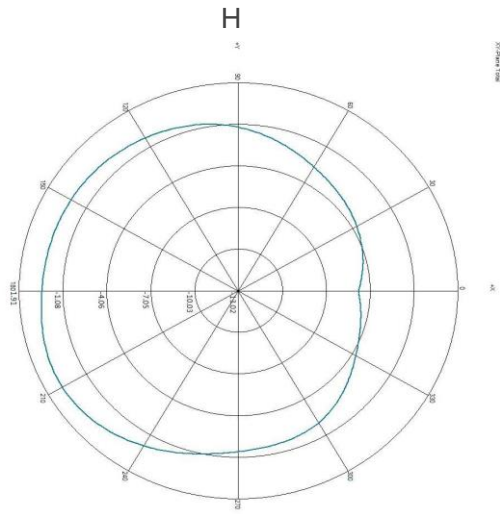
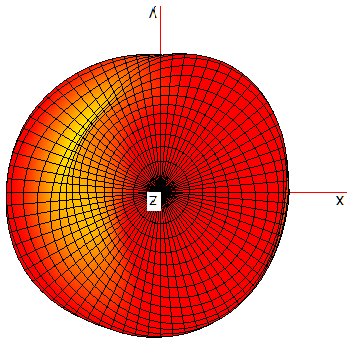


E2

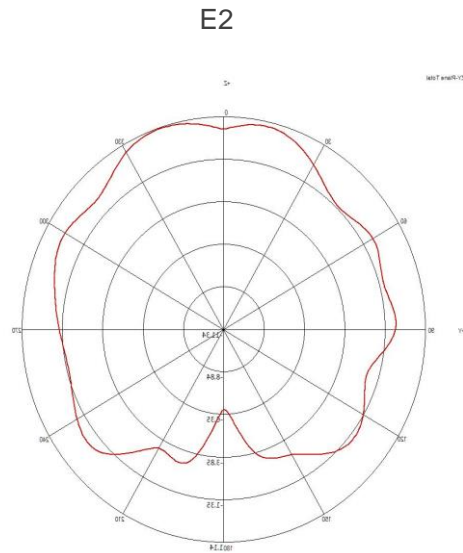
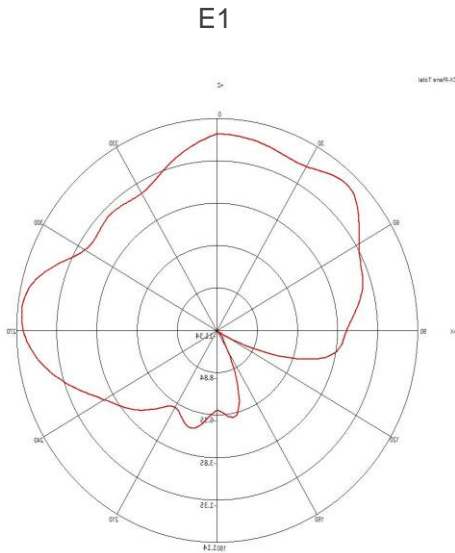
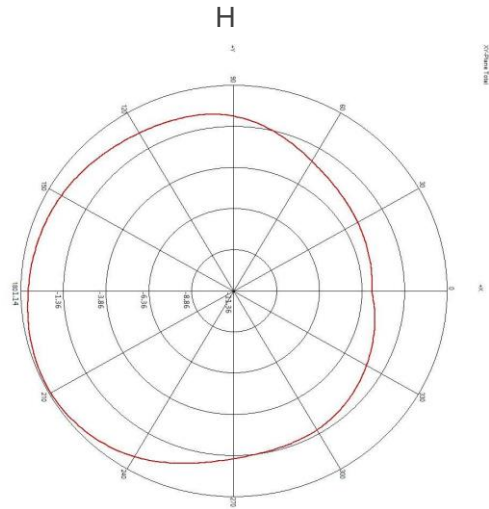
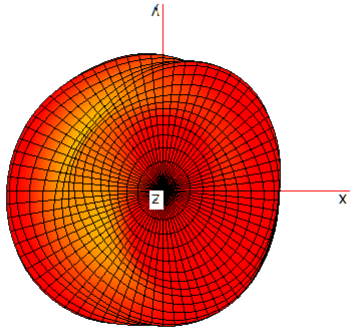




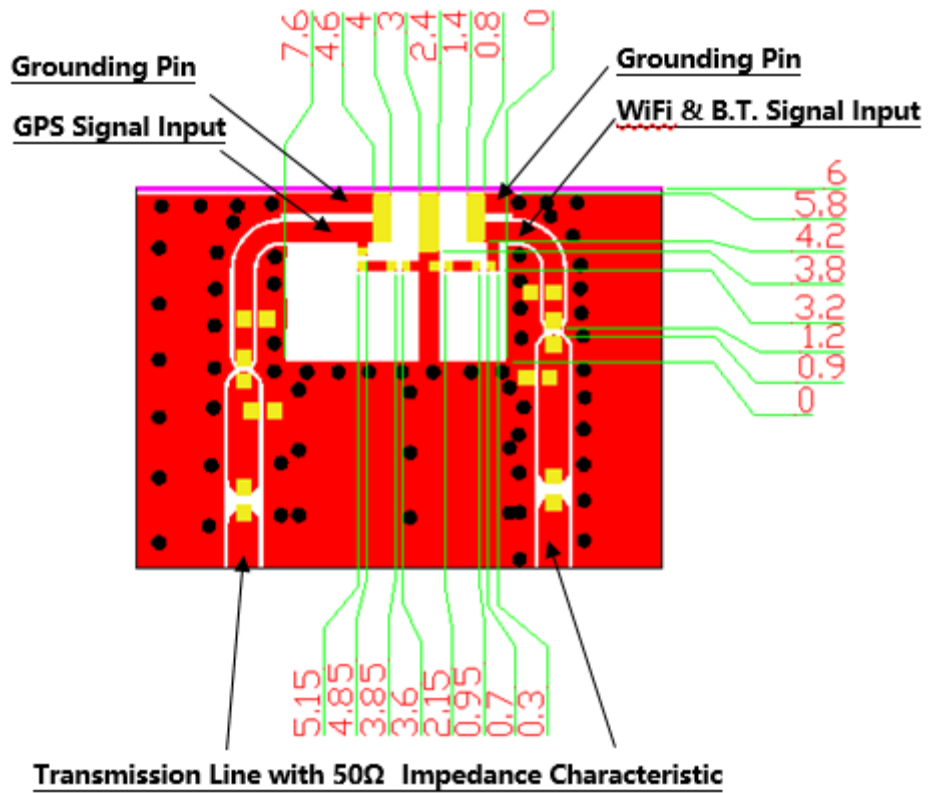
- 2450 MHz



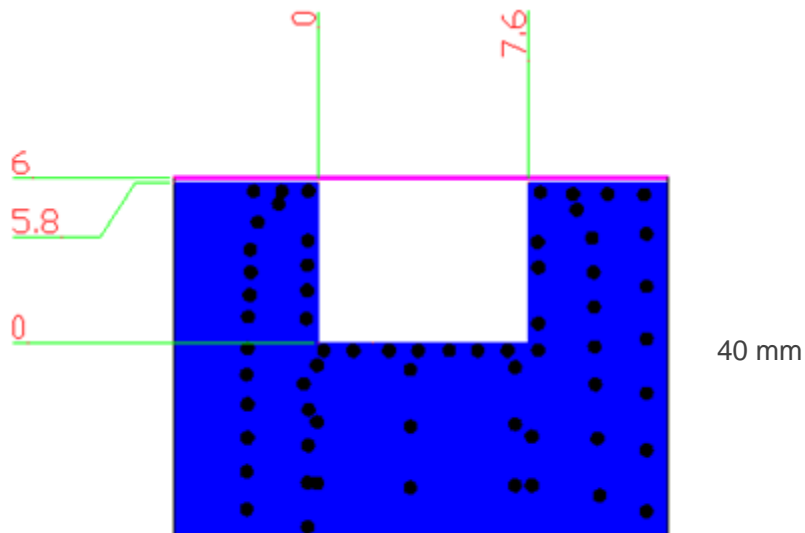
- 2500 MHz



### 4.10. PCB Footprint Recommendation



Top View

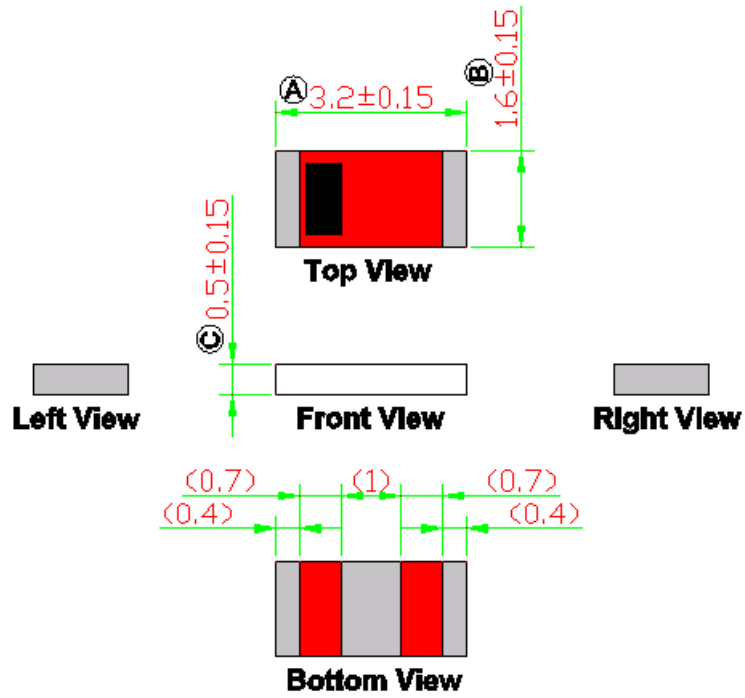


Bottom View

80 mm

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

## 5 Product Size



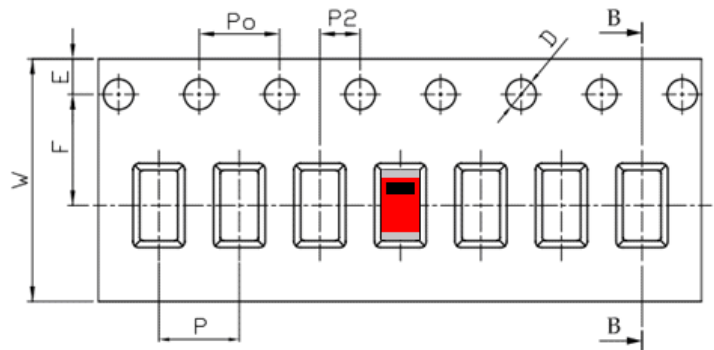
## 6 Packing Details

### Quantity/Reel

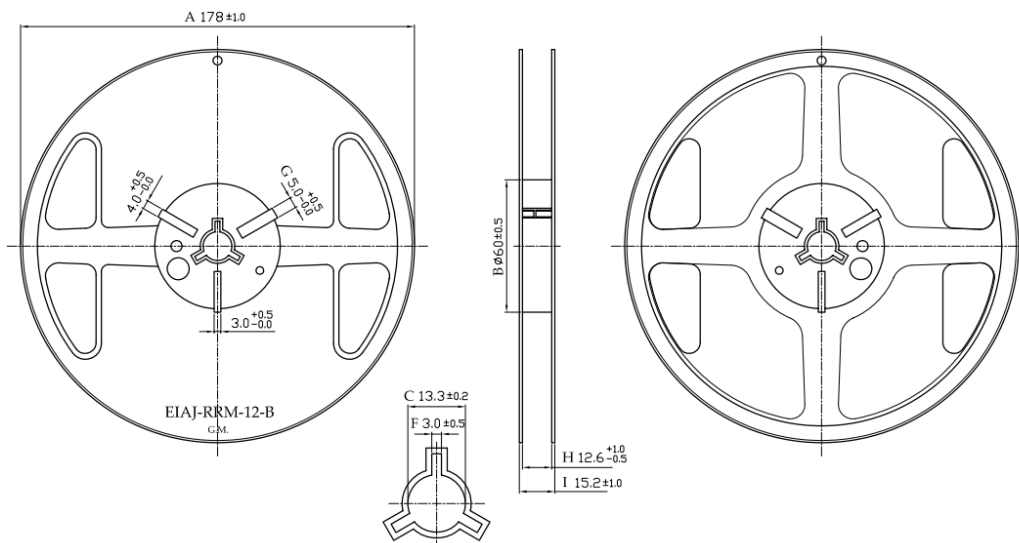
5000 PCS/Reel

### Tape Dimensions (Unit: mm)

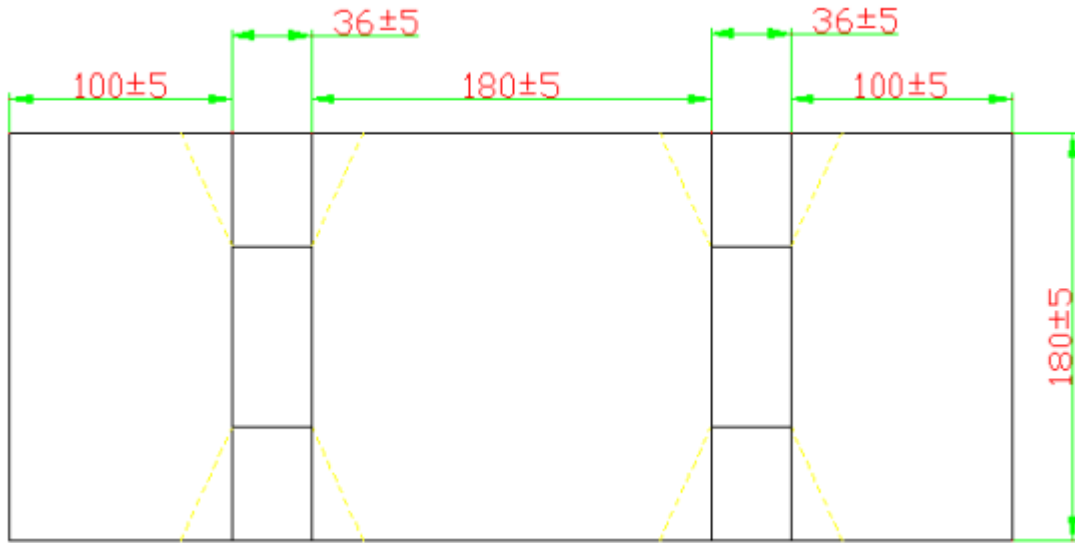
Feature	Specification	Tolerances
W	12.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
Po	4.00	±0.10
10Po	40.00	±0.20



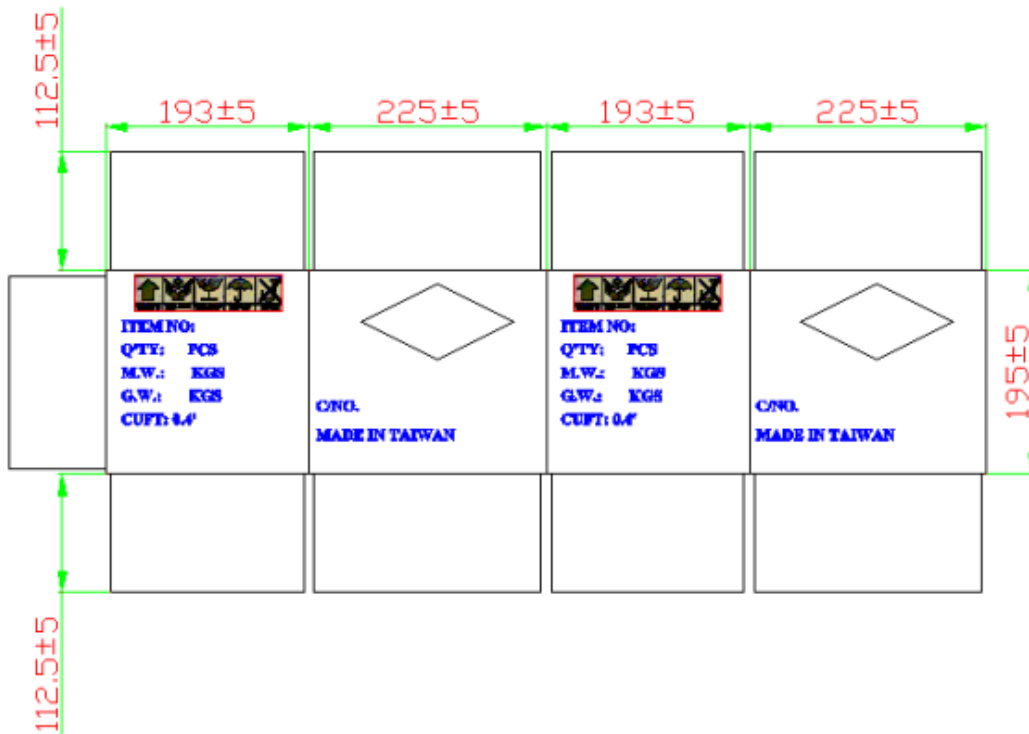
### 6.1. Reel Drawing



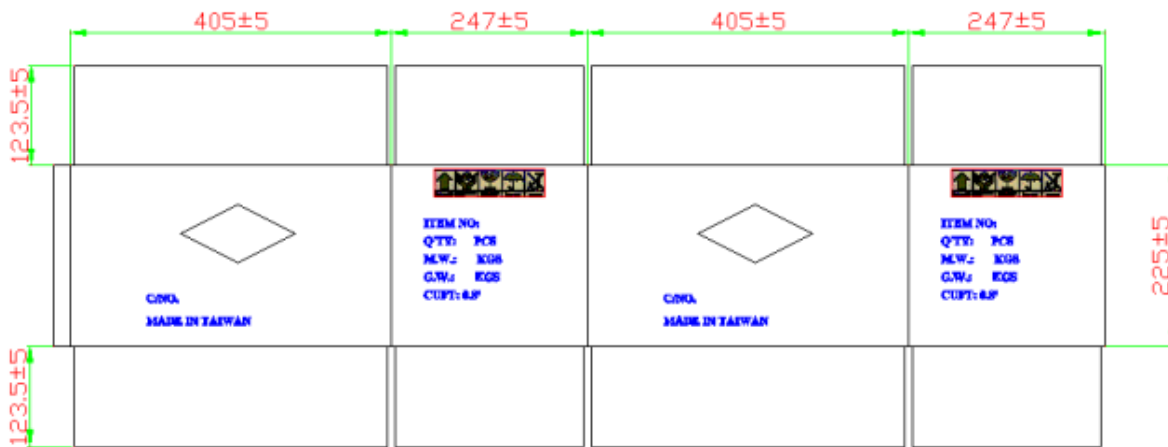
**6.2. Drawing of Small Size Carton in Developed View**



**6.3. Drawing of Middle Size Carton in Developed View**



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



### 6.5. Picture of Reel Label

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

### 6.6. Labeled Reel



### 6.7. Small Size Carton Label

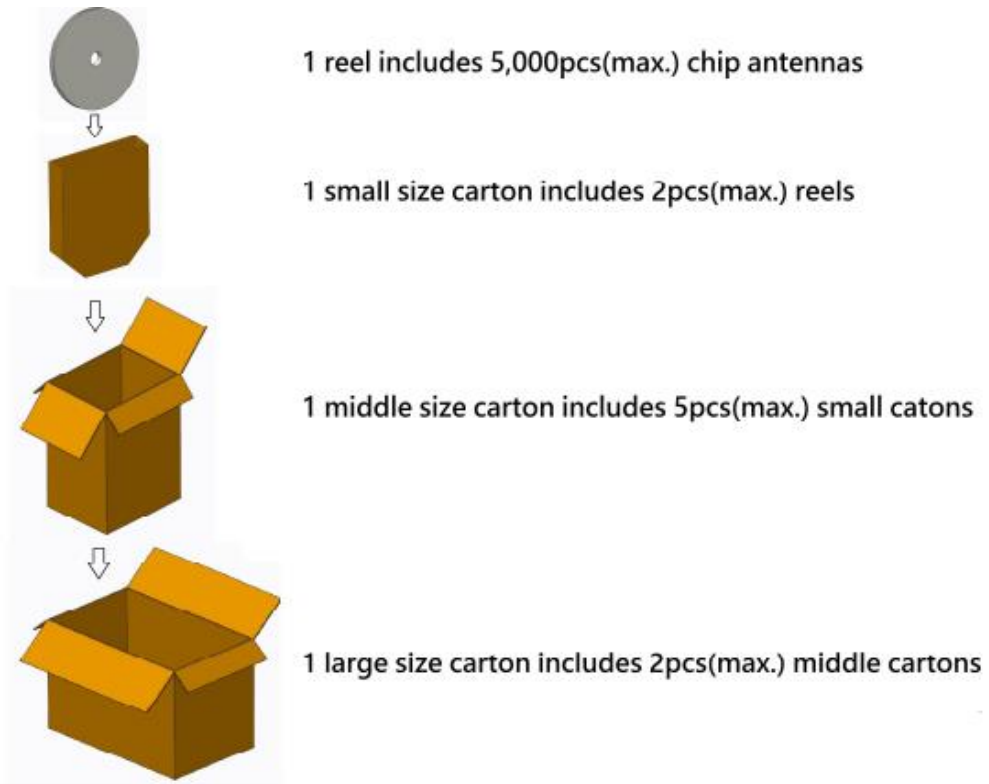


### 6.8. Middle Size Carton Label





### 6.9. Process of Packing



1. Sealing the carton and attach the label.



2. Pictures of carton labels.

- Label 1

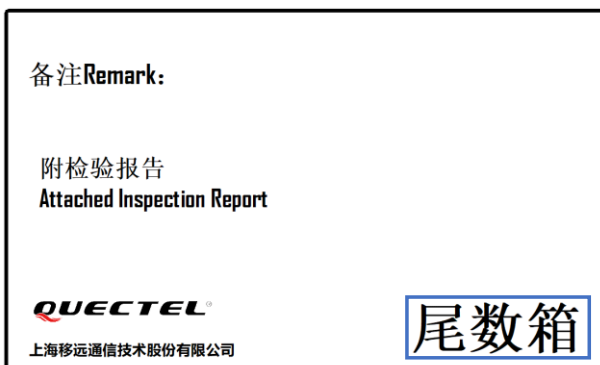


- Label 2



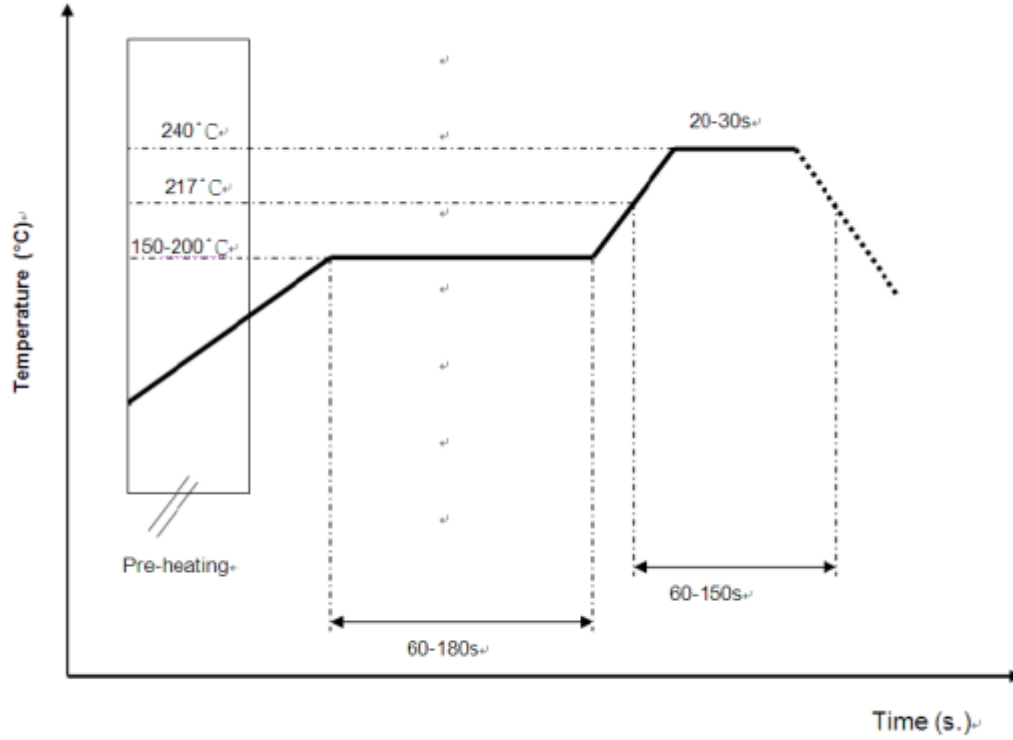
- Label 3

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



## 7 Soldering Conditions

Typical Soldering Profile for Lead-free Process



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