

# Antenna

# YCGS010AA Datasheet

## Antenna Services

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# 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
1.1	2022-09-20	Junsen LI	Added Chapter 7.

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## 1 Product Description

This Quectel GNSS antenna adopts a diversity of forms to guarantee the most suitable polarization type. Quectel's positioning products support single-band or multi-band operation modes to meet various high-precision positioning requirements of customers' products. Quectel provides both passive and active antennas to satisfy the customer demand for high gain. Such antenna supports different installation or connection methods such as pin mount, surface mount, magnetic mount, internal cable, and external SMA. Customized connector type and cable length are provided according to requirements.

## 2 Product Features

- High Precision GNSS, L1/L2/L5, E6, B3
- AEC-Q200 compliant
- Low profile, compact size
- Stable and reliable in performances



## 3 GNSS Frequency Band Checklist

GNSS Frequency Bands (MHz)					
GPS	<b>L1</b> Centre 1575.42 (1565–1586)	<b>L2</b> Centre 1227.6 (1217–1238)	<b>L5</b> Centre 1176.45 (1164–1189)		
	•	•	•		
GLONASS	<b>G1/L1OC/L1OF</b> Centre 1601 (1595–1606)	<b>G2/L2OC/L2OF</b> Centre 1248.06 (1241–1255)	<b>G3/L3OC</b> Centre 1202.025 (1189–1213)		
	•	-	-		
GALILEO	<b>E1</b> Centre 1575.42 (1563–1588)	<b>E5a</b> Centre 1176.45 (1166–1187)	<b>E5b</b> Centre 1207.14 (1197–1218)	<b>E6</b> Centre 1278.75 (1258–1300)	
	•	•	-	•	
BEIDOU	<b>B1I</b> Centre 1561.098 (1559–1564)	<b>B1C (BeiDou-3)</b> Centre 1575.42 (1559–1592)	<b>B2a/B2I</b> Centre 1176.45 (1166–1187)	<b>B2b</b> Centre 1207.14 (1197–1217)	<b>B3</b> Centre 1268.52 (1258–1279)
	-	•	•	-	•
QZSS	<b>L1</b> Centre 1575.42 (1573–1578)	<b>L2C</b> Centre 1227.6 (1226–1229)	<b>L5</b> Centre 1176.45 (1166–1187)	<b>L6</b> Centre 1278.75 (1257–1300)	
	•	•	•	•	
IRNSS	<b>L5</b> Centre 1176.45 (1164–1189)				
	•				

## 4 Product Specifications

### Passive Electrical Specifications

Frequency Range	1176.45–1278.75 MHz; 1575.42 MHz
Input Impedence	50 $\Omega$
VSWR	$\leq 5.0$ @ 1278.75 MHz $\leq 3.0$ @ 1176–1227 MHz $\leq 2.0$ @ 1575.42 MHz
Gain	$\leq 2.1$ @ 1278.75 MHz $\leq 3.0$ @ 1176–1227 MHz $\leq 3.3$ @ 1575.42 MHz
Polarization Type	Linear

### Mechanical Specifications

Antenna Size (mm)	5 × 3 × 0.5
Materia	Ceramic
Cable Type	NA
Connector	NA
Antenna Color	White
Weight	Typ. 0.025 g
Working Temperature	-40 °C to +85 °C
Mounting Type	SMD



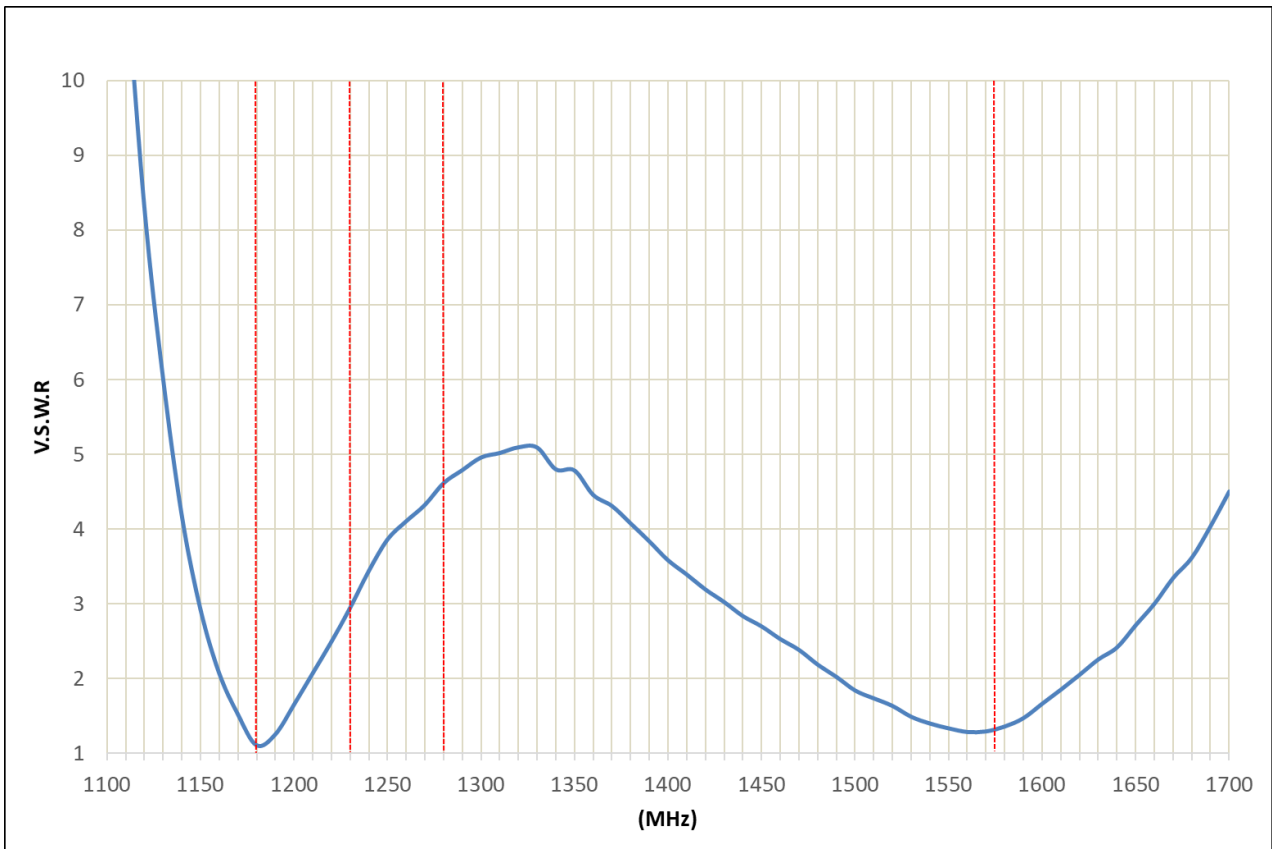
## 5 Overall Performance

### 5.1. Test Environment

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

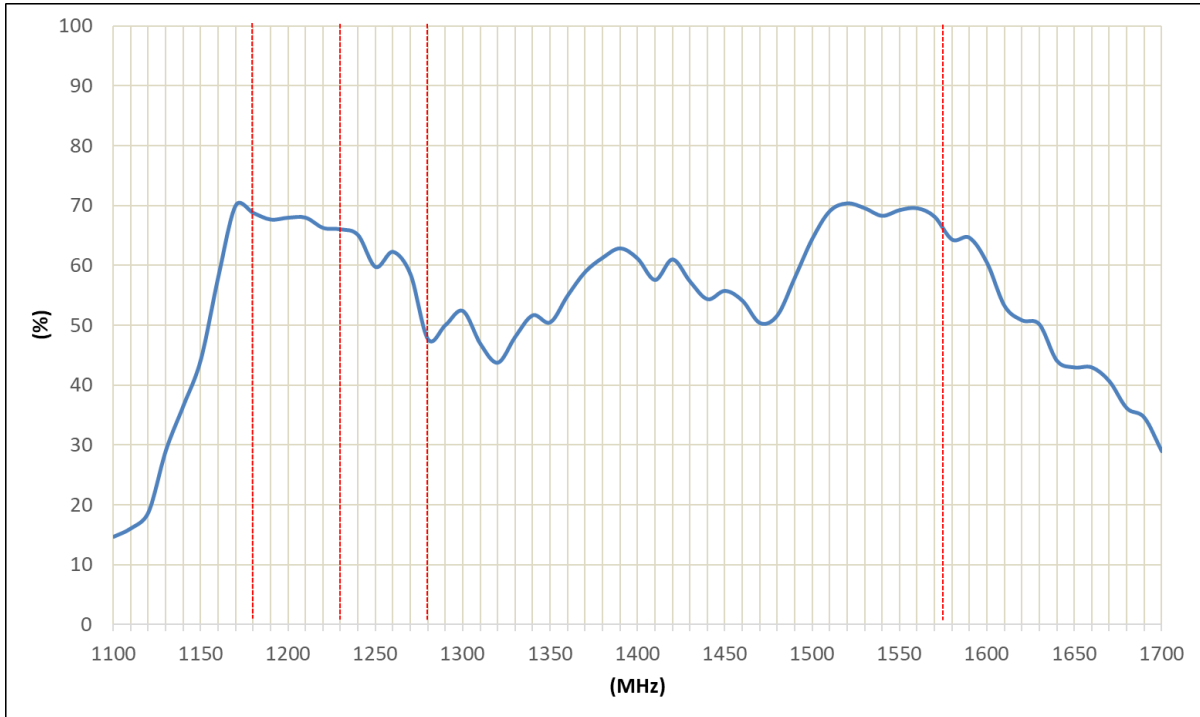


## 5.2. VSWR



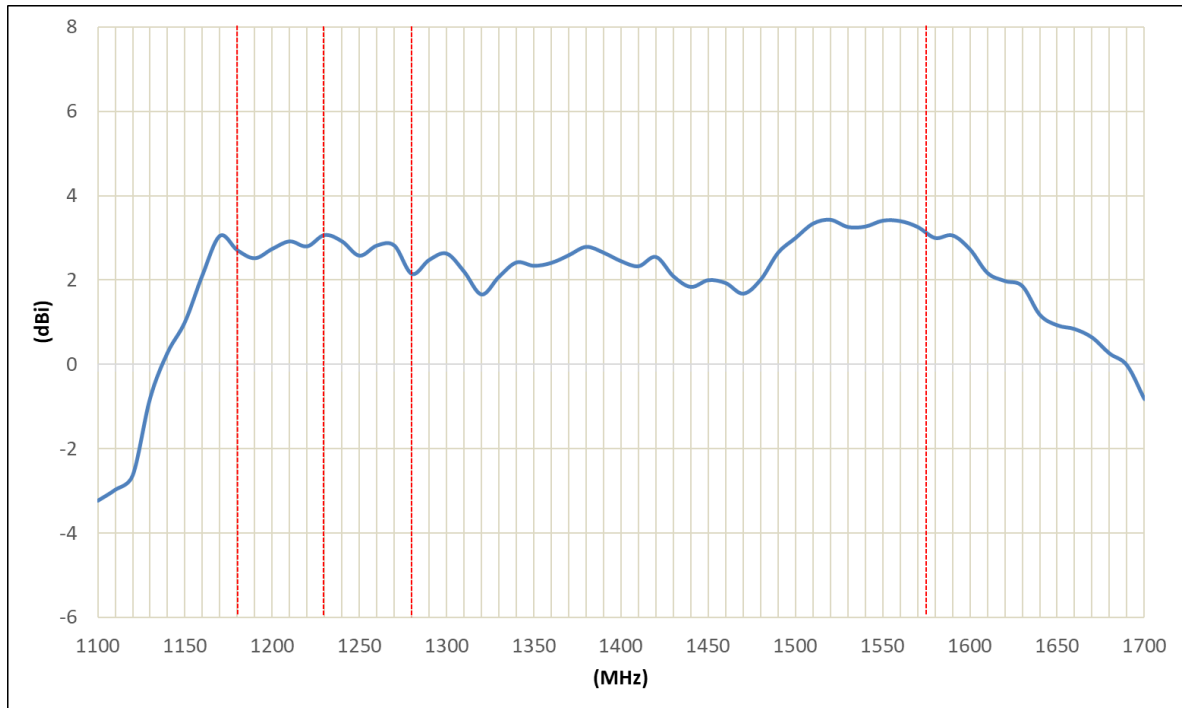
<b>Frequency (MHz)</b>	1176	1227	1268	1278	1561	1575	1602
<b>VSWR</b>	1.8	2.2	3.7	4.2	1.2	1.2	1.5

### 5.3. Efficiency



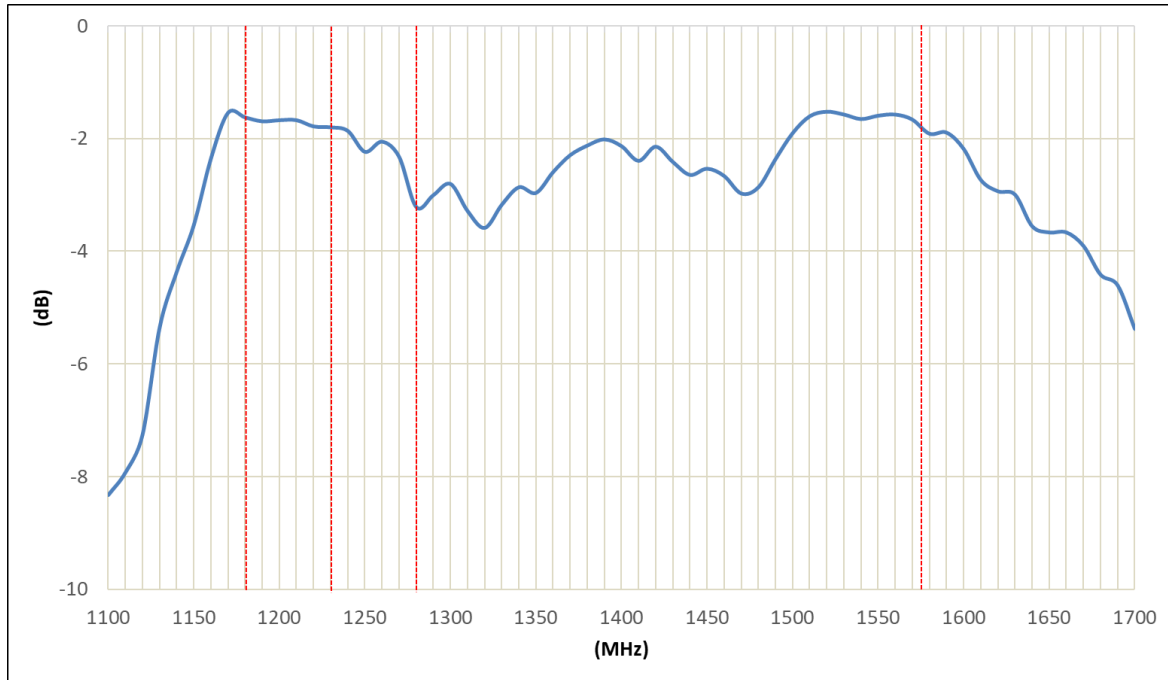
<b>Frequency (MHz)</b>	1176	1227	1268	1278	1561	1575	1602
<b>Efficiency (%)</b>	59	68	62	62	68	70	65

### 5.4. Peak Gain



<b>Frequency (MHz)</b>	1176	1227	1268	1278	1561	1575	1602
<b>Peak Gain (dBi)</b>	2.5	2.5	2.0	2.0	2.7	2.8	2.7

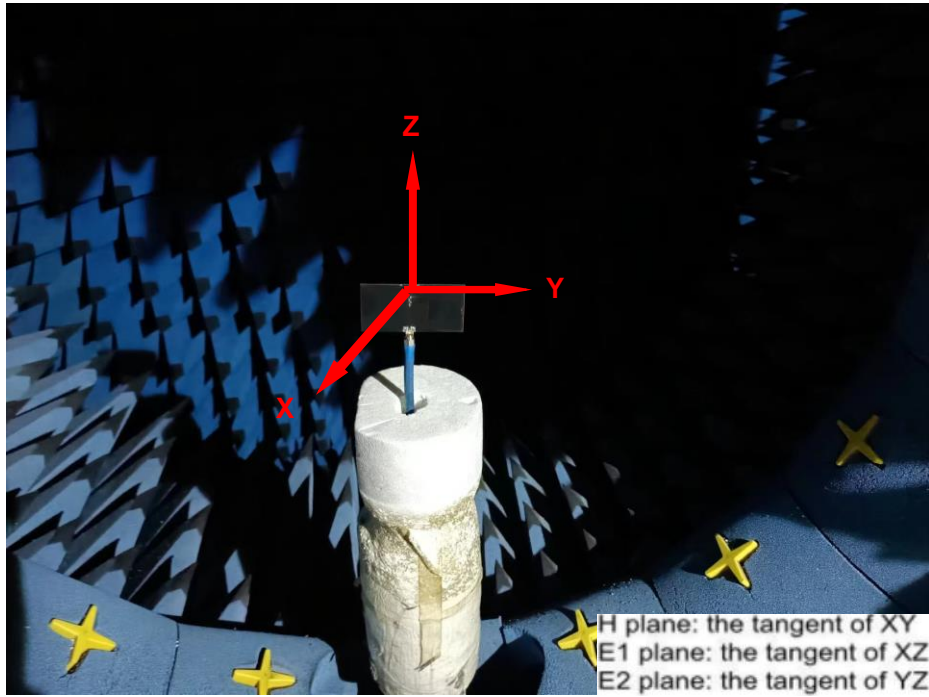
### 5.5. Average Gain



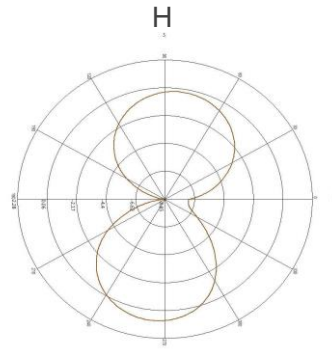
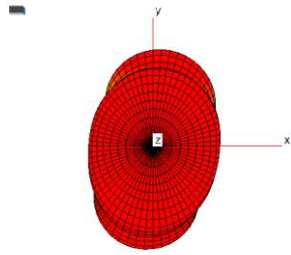
<b>Frequency (MHz)</b>	1176	1227	1268	1278	1561	1575	1602
<b>Average Gain (dBi)</b>	-1.6	-1.8	-2.2	-2.2	-1.6	-1.6	-1.9

## 5.6. Radiation Pattern

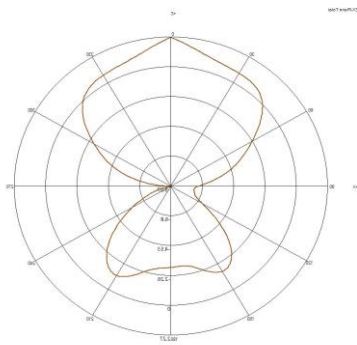
- Test condition: with ground plane (80 mm × 40 mm).



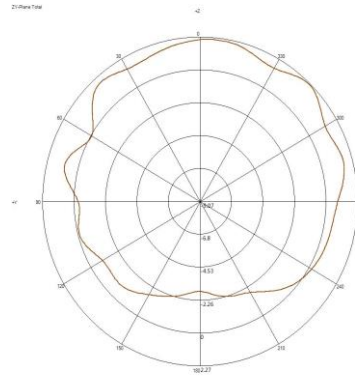
● 1176.45 MHz



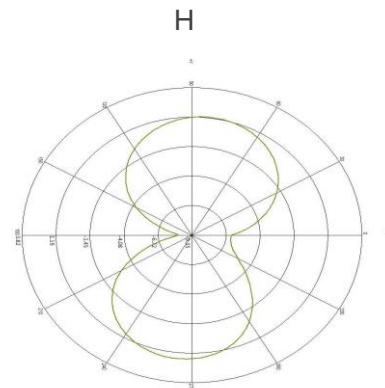
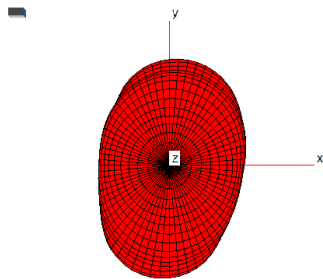
**E1**



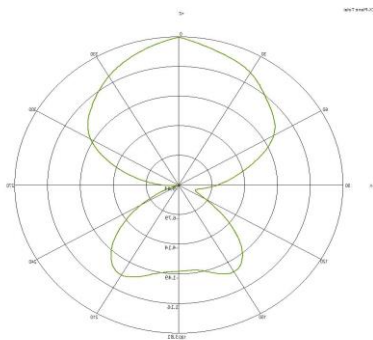
**E2**



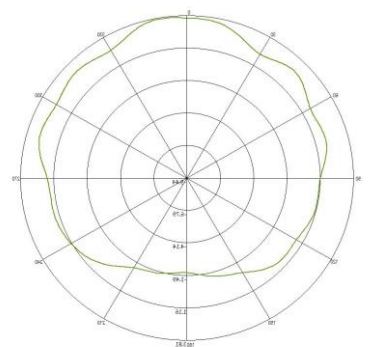
● 1227.6 MHz



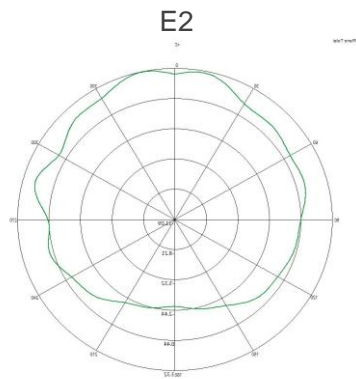
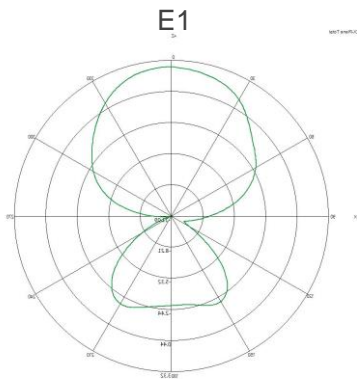
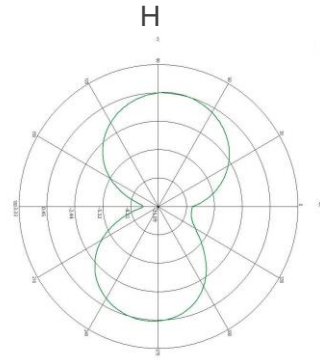
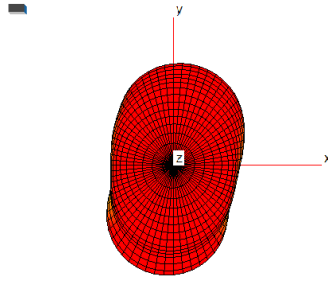
**E1**



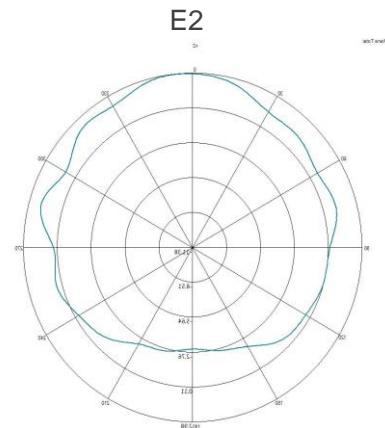
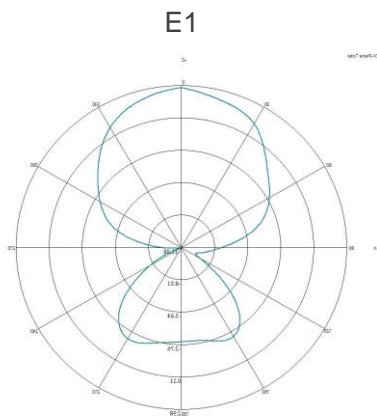
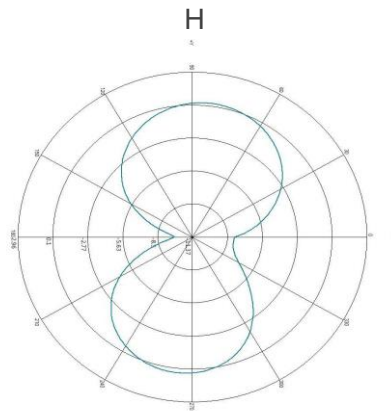
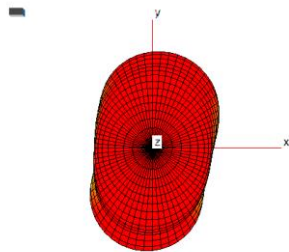
**E2**



● **1268 MHz**

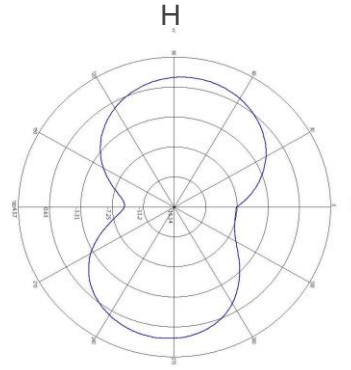
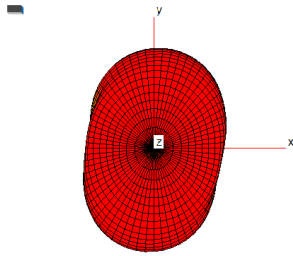


● **1278.45 MHz**

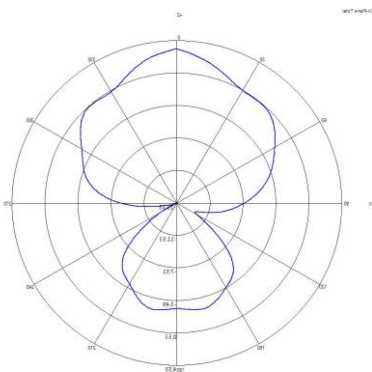




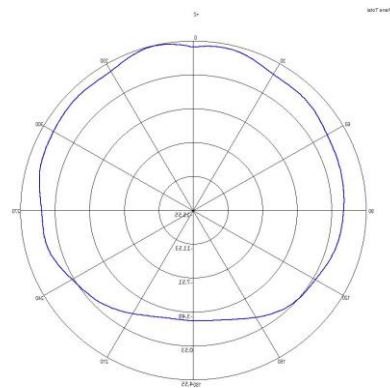
● 1561 MHz



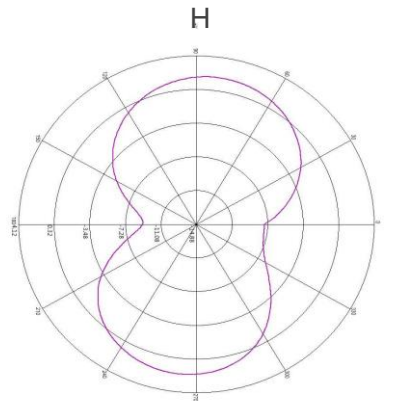
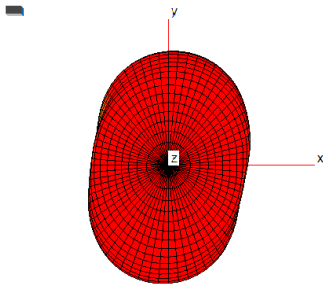
**E1**



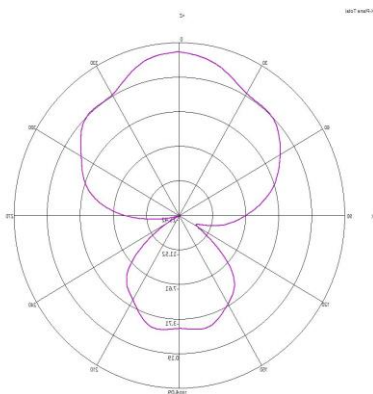
**E2**



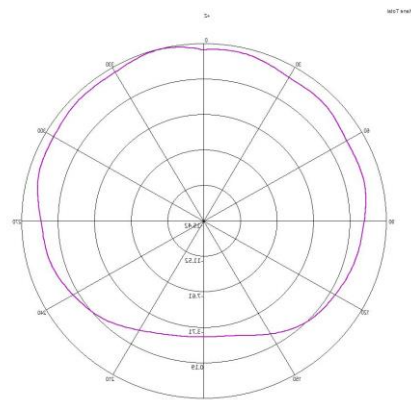
● 1575.42 MHz



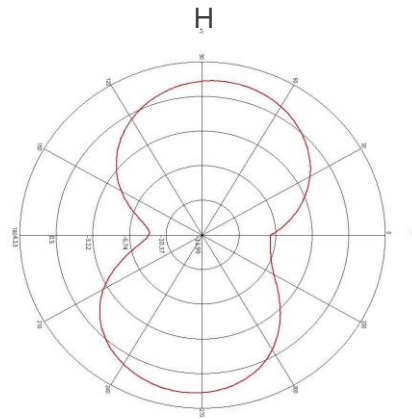
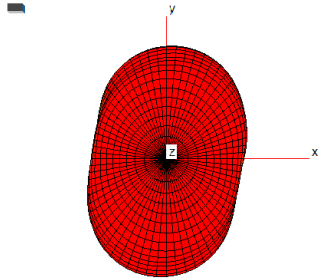
**E1**



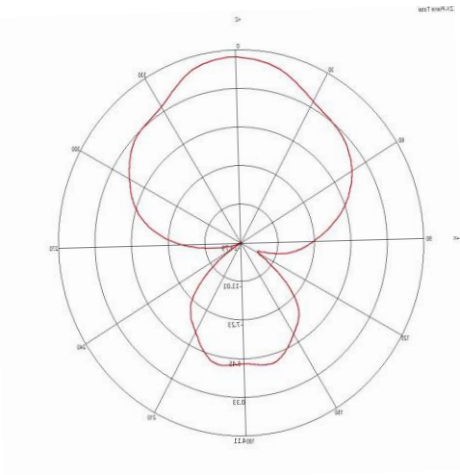
**E2**



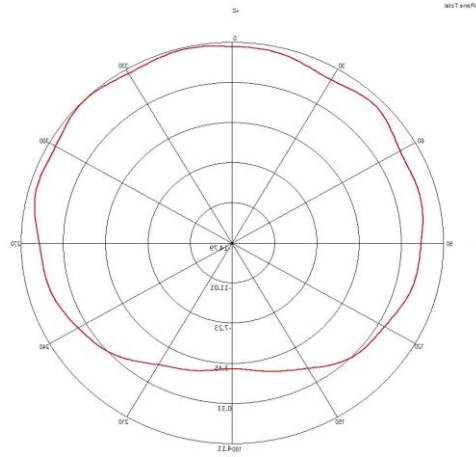
1602 MHz



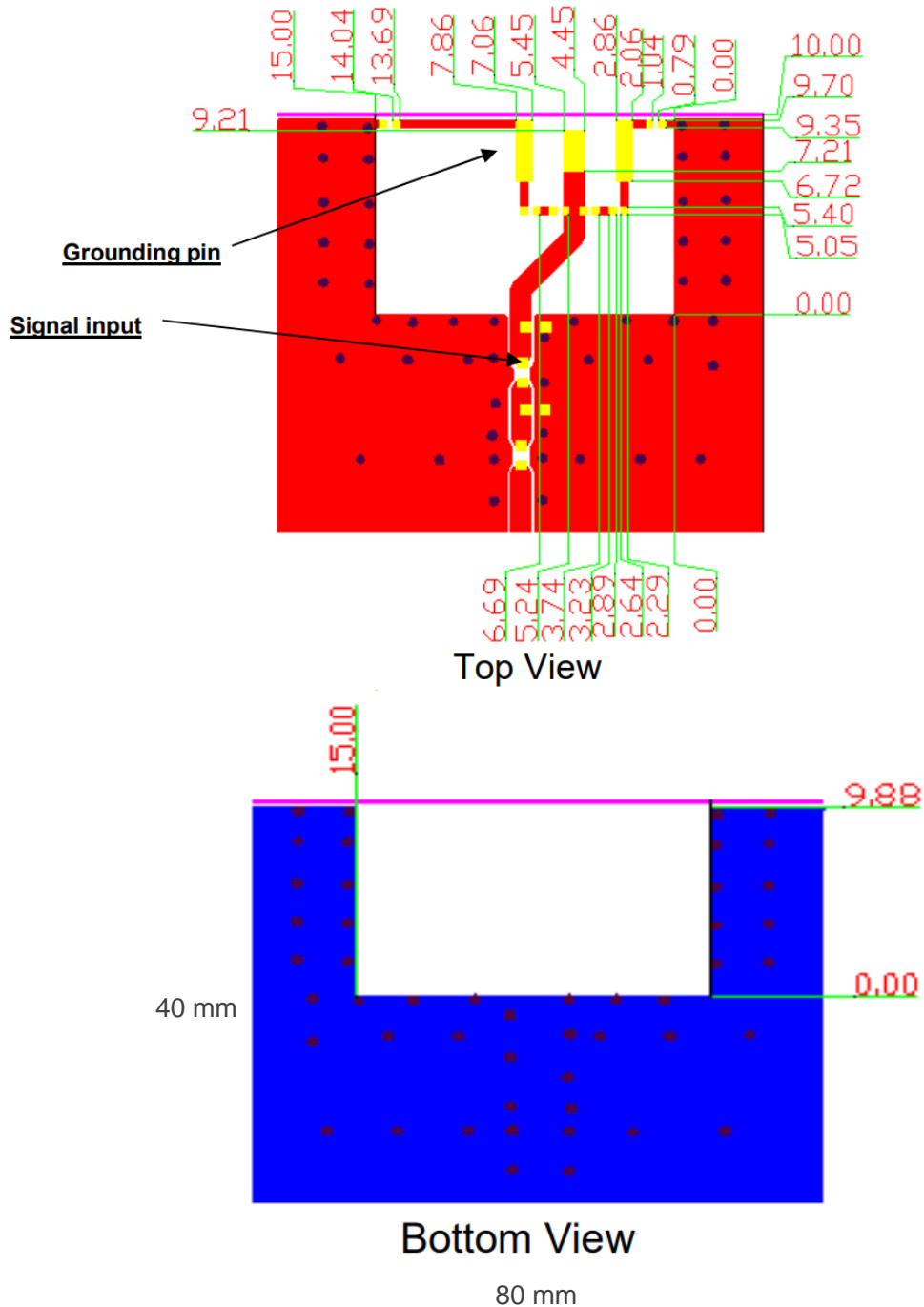
E1



E2

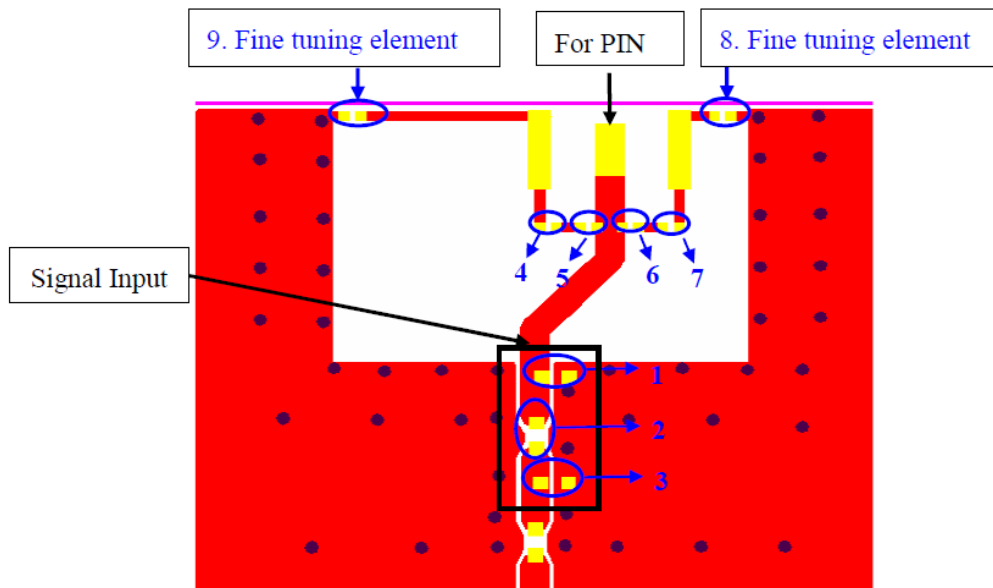


## 6 PCB Footprint Recommendation

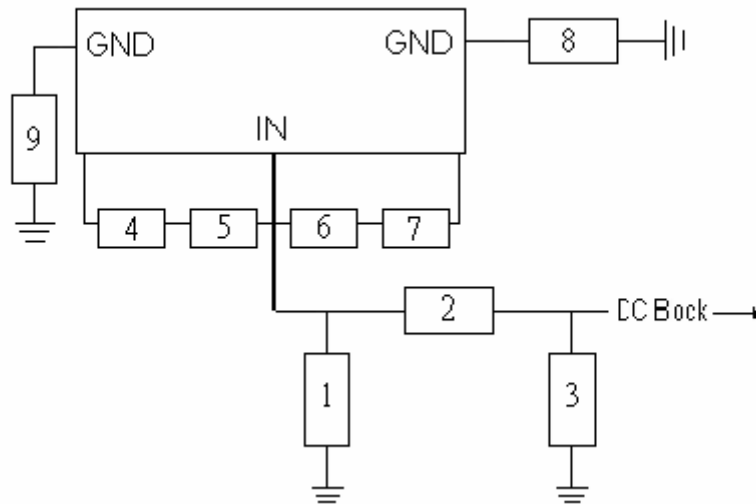


- **Note: The minimum PCB size is recommended to be 30 mm × 50 mm.**

## 7 Frequency Tuning and Matching Circuit

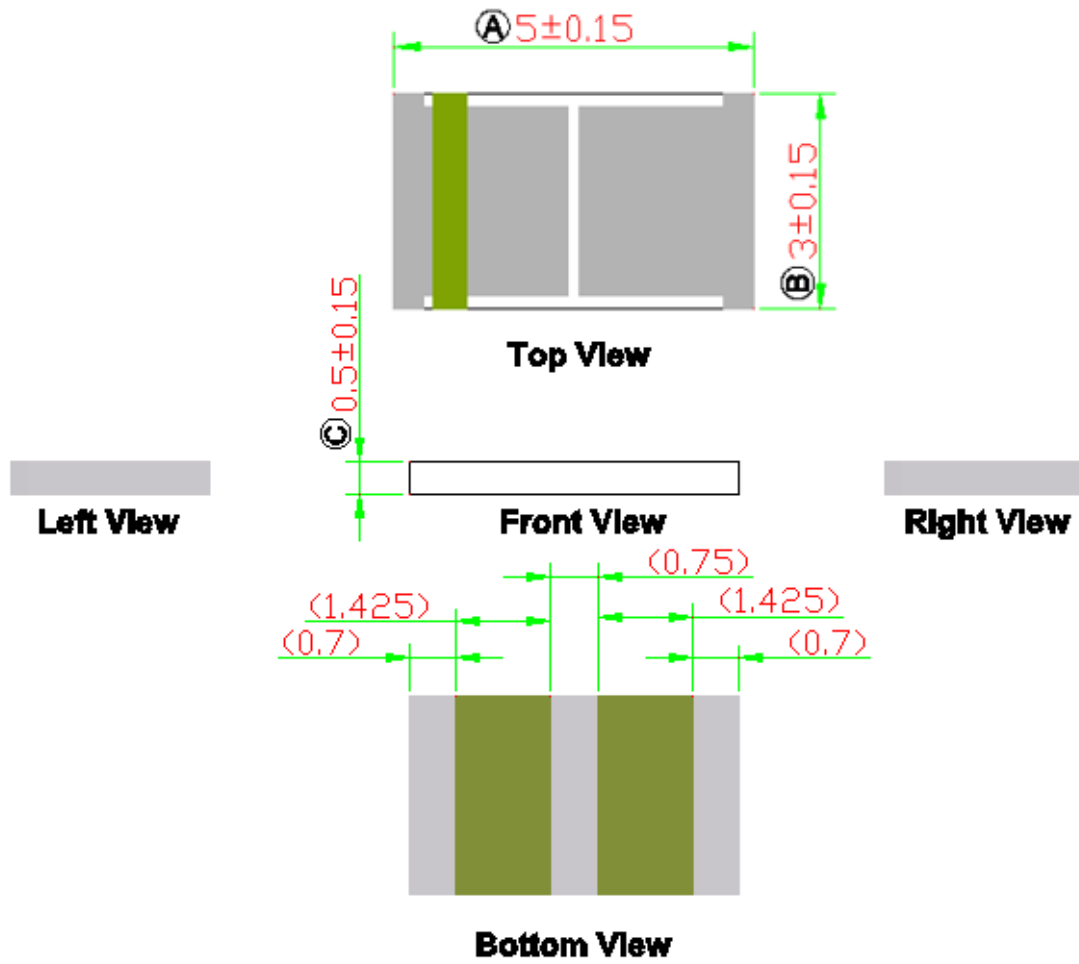


**Matching circuit:** (the center frequencies will be about 1176.45–1278.75 MHz & 1575.42 MHz on GPS band at @ 80 x 40 mm<sup>2</sup> Evaluation Board).



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	1.5pF, (0402)	Murata	±0.05pF
2	3.6pF, (0402)	Murata	±0.1pF
3	N/A	-	-
4-7 Fine tuning element	N/A	-	-
8 Fine tuning element	2.7pF,(0201)	Murata	±0.1pF
9 Fine tuning element	6.8pF,(0201)	Murata	±0.1pF

## 8 Product Size



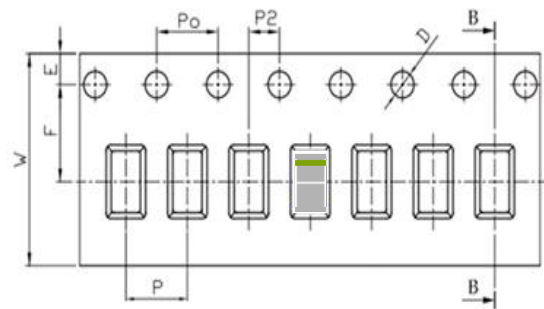
## 9 Packing Details

### Quantity/Reel

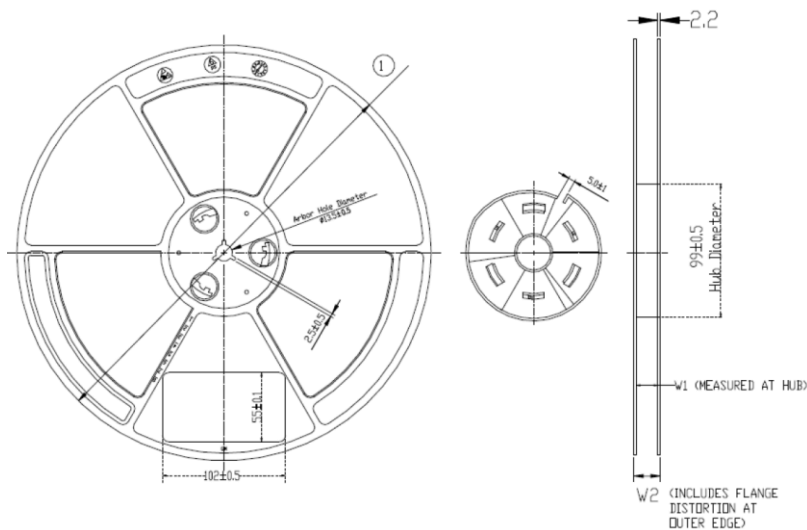
6000 PCS/Reel

### Tape Dimensions (Unit: mm)

Feature	Specification	Tolerances
W	12.00	±0.30
P	8.00	±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

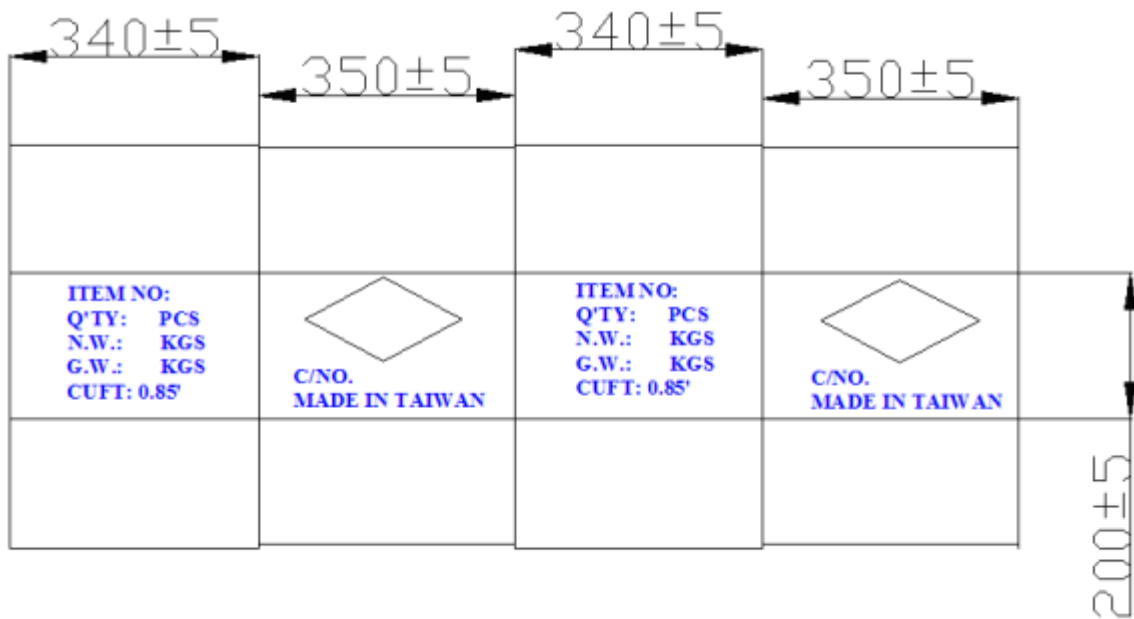


### 9.1. Reel Drawing (Unit: mm)

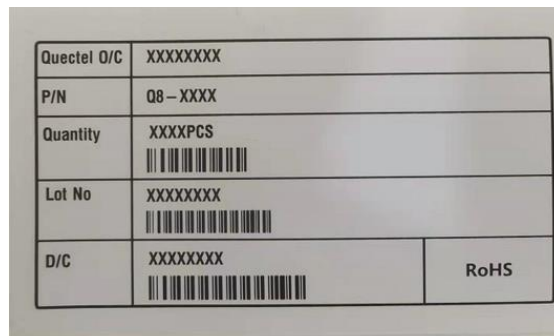


	D	ID	OD
	①	W1	W2
13"12MMCSBY(12.6)	330±1	13.4±1	17.8±1

**9.2. Carton Size (Unit: mm)**



**9.3. Picture of Reel Label**





## 9.4. Process of Packing

1. Attach the reel label on the reel.



2. Seal the labeled reel in a vacuum and dry package.



3. Put ten reels into a carton. After sealing the carton, attach the labels.



4. Pictures of carton labels.

- Label 1

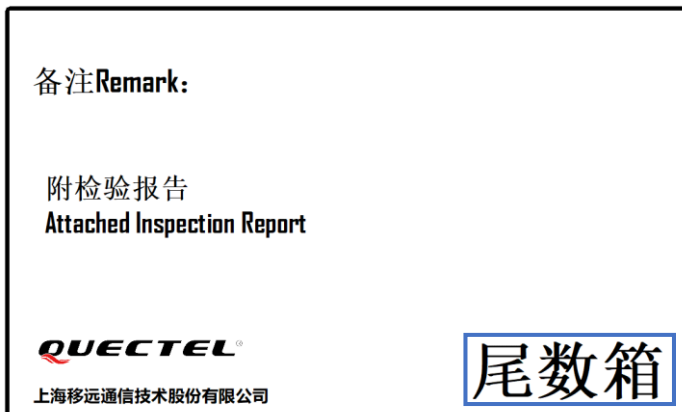


- Label 2



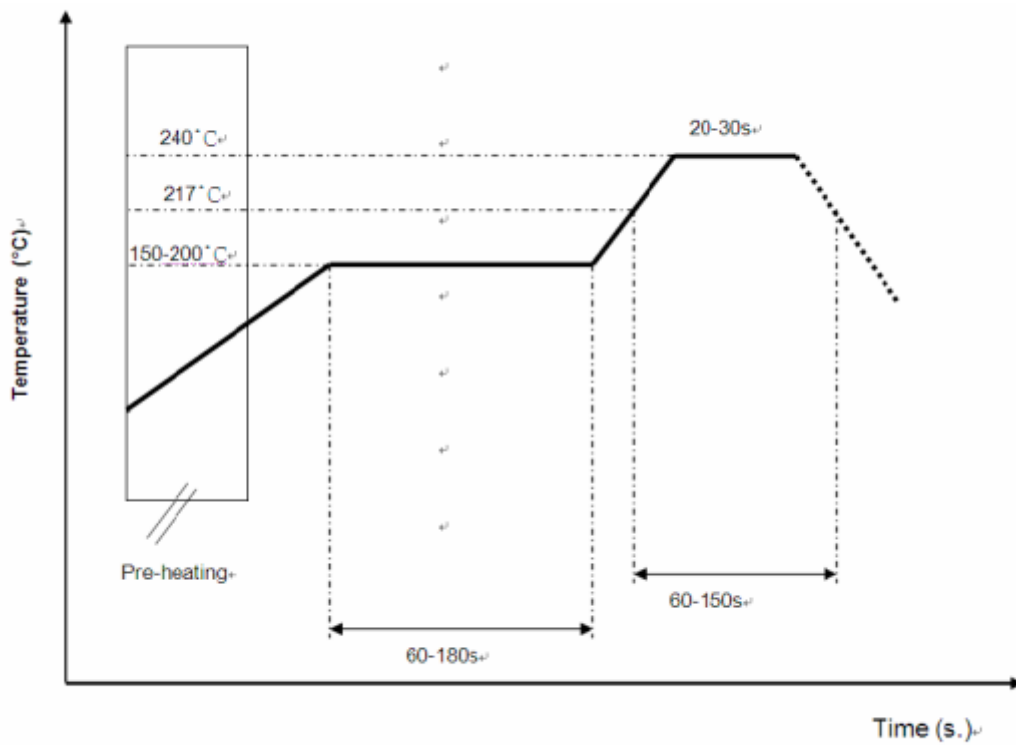
- Label 3

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



## 10 Soldering Conditions

Typical Soldering Profile for Lead-free Process



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