Antenna Datasheet

Product OC: YFGC018WWCM
Version: 1.0
Date: 2025-11-28
Status: Released

Product Name: GPS L1&GLONASS G1 Adhesive & Soldering Mount Ceramic Patch Passive Embedded Antenna

Key Features:

Frequency Band: 1565–1606 MHz
Dimensions: 18 mm × 18 mm × 2 mm
Peak Gain: 0.67dBi (MAX)
RoHS and REACH Compliant

Overview

The Quectel YFGC018WWCM is a compact, passive ceramic patch antenna designed for embedded GNSS applications. It supports GPS L1 and GLONASS G1 frequency bands, operating within the 1565–1606 MHz range. With dimensions of 18 mm × 18 mm × 2 mm, the antenna offers a directional radiation pattern and right-hand circular polarization (RHCP).

- **Key features include:**

✓ High efficiency of up to 44.1 %

✓ VSWR as low as 1.47 at 1575 MHz

✓ Peak gain of 0.43 dBi (GPS L1) and 0.67 dBi (GLONASS G1)

✓ Supports adhesive and soldering mounting methods

✓ Compliant with RoHS and REACH standards

✓ Operating temperature range: -40 °C to +85 °C

Ideal for high-precision positioning in consumer and industrial devices, this antenna is part of Quectel 's diverse portfolio of GNSS solutions, offering reliable performance in a small form factor.

Quectel provides comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs. We have regional R & D centers to offer quick response to meet your requirements. Please contact our sales & FAEs if you have any requests.

Contents

1 Specification

Test Condition: on 70 mm × 70 mm PCB

1.1. Electrical

Electrical	
Frequency Range	1565–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

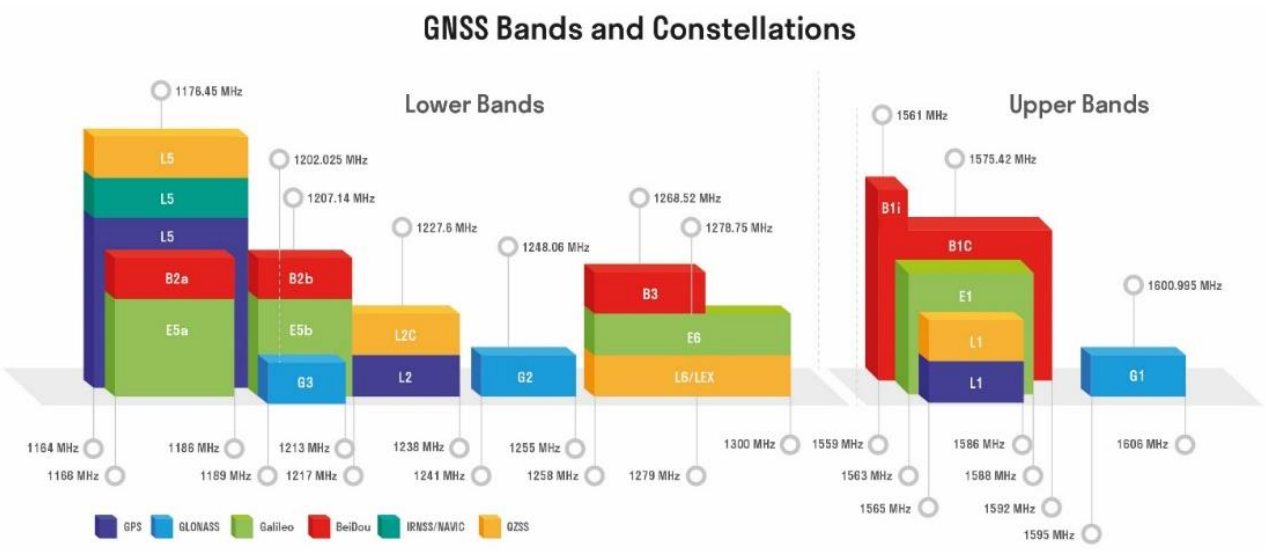
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	-	1.47	1.58
Return Loss (dB)	-	-	-	-	-	-	-13.8	-12.4
Efficiency (%)	-	-	-	-	-	-	41.8	44.1
Peak Gain (dBi)	-	-	-	-	-	-	0.43	0.67

1.2. Mechanical & Environmental

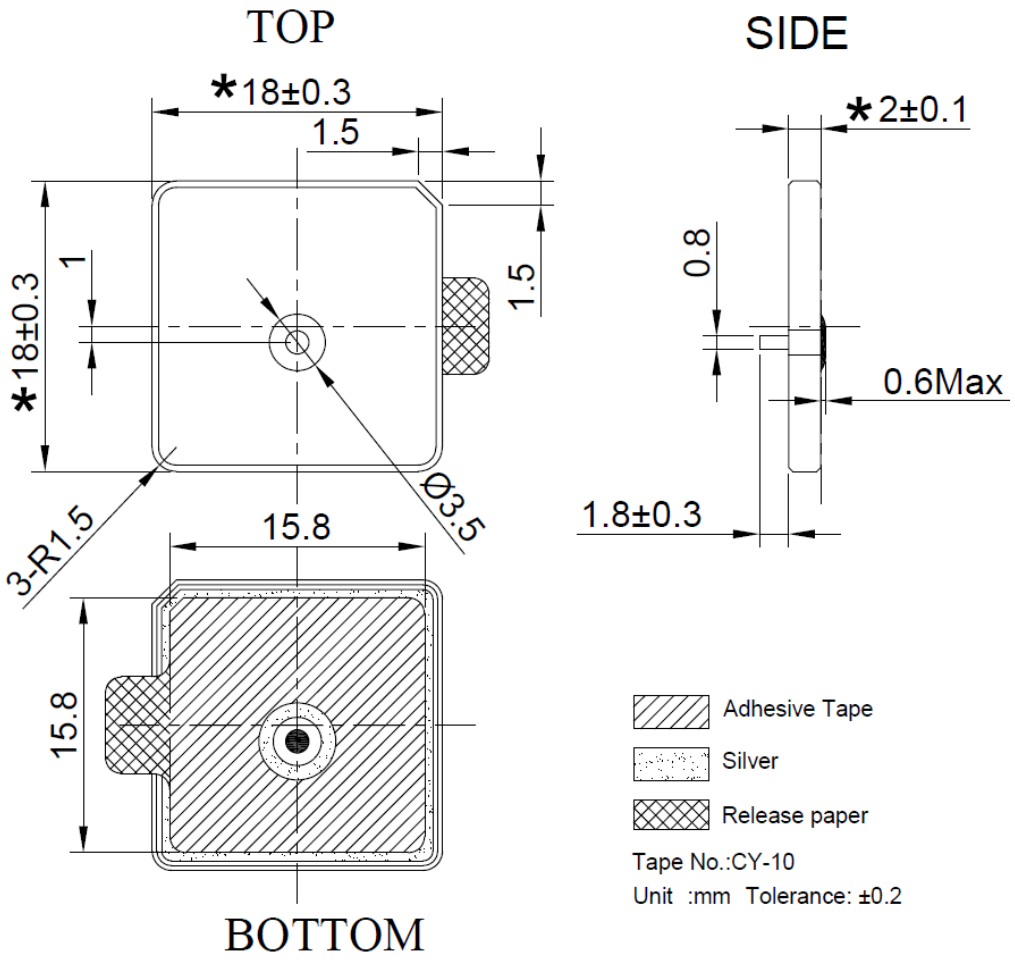
Mechanical	
Antenna Dimensions	18 mm × 18 mm × 2 mm
Material	Ceramic
Mounting Type	Adhesive & Soldering
Weight	Typ. - g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Recommended Reflow Temperature and Time	260 °C & 5 s
RoHS & REACH Compliant	Yes

1.3. Supported GNSS Frequency Bands

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


GNSS Bands and Constellations
Lower Bands
Upper Bands
1176.45 MHz
L5
L5
L5
B2a
E5a
1202.025 MHz
1207.14 MHz
B2b
E5b
G3
1227.6 MHz
L2C
L2
1248.06 MHz
G2
1268.52 MHz
1278.75 MHz
B3
E6
L6/LEX
1561 MHz
1575.42 MHz
B1i
B1C
E1
L1
L1
1600.995 MHz
G1
1164 MHz
1168 MHz
1186 MHz
1189 MHz
1213 MHz
1217 MHz
1238 MHz
1241 MHz
1255 MHz
1258 MHz
1279 MHz
1300 MHz
1559 MHz
1563 MHz
1565 MHz
1586 MHz
1588 MHz
1592 MHz
1595 MHz
1606 MHz
GPS
GLONASS
Galileo
BeiDou
IRNSS/NAVIC
QZSS

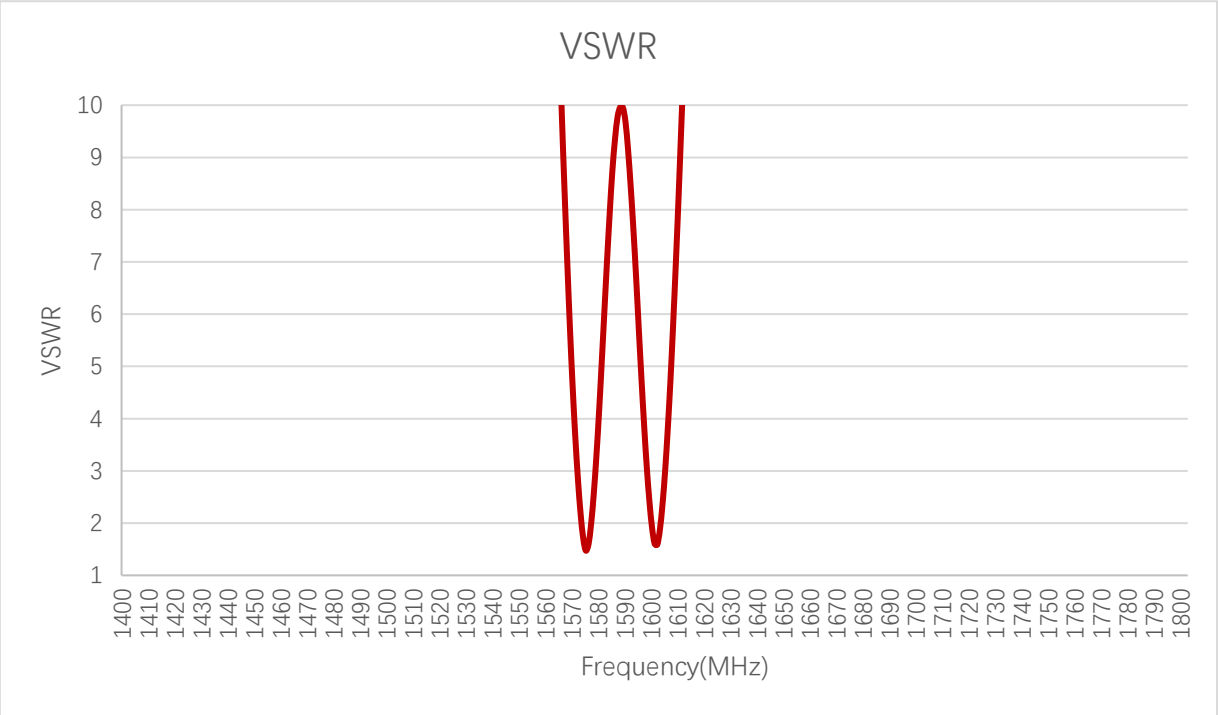
2 Drawing


TOP
SIDE
*18±0.3
1.5
*18±0.3
1
1.5
*2±0.1
0.8
0.6Max
1.8±0.3
3-R1.5
Ø3.5
15.8
15.8
BOTTOM
Adhesive Tape
Silver
Release paper
Tape No.:CY-10
Unit :mm Tolerance: ±0.2

3 Detailed Performance

3.1. S-Parameter Test

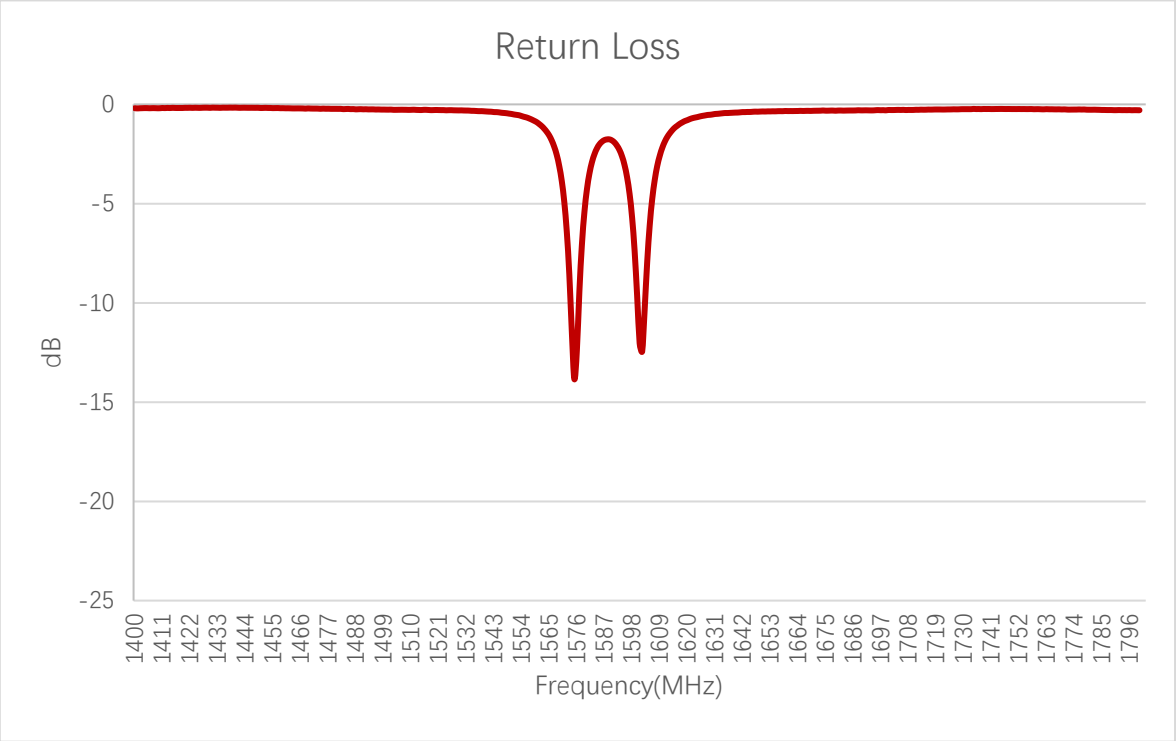
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	-	1.47	1.58

3.1.2. Return Loss

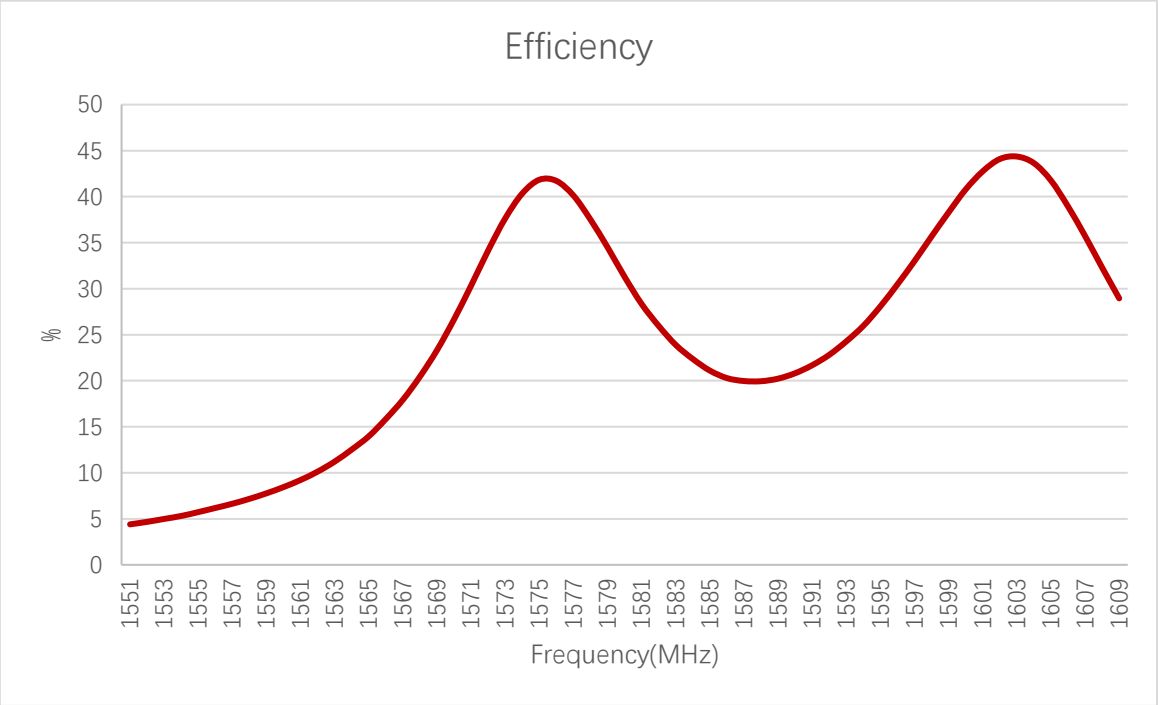


Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-	-13.8	-12.4

3.2. Radiation Performance Test

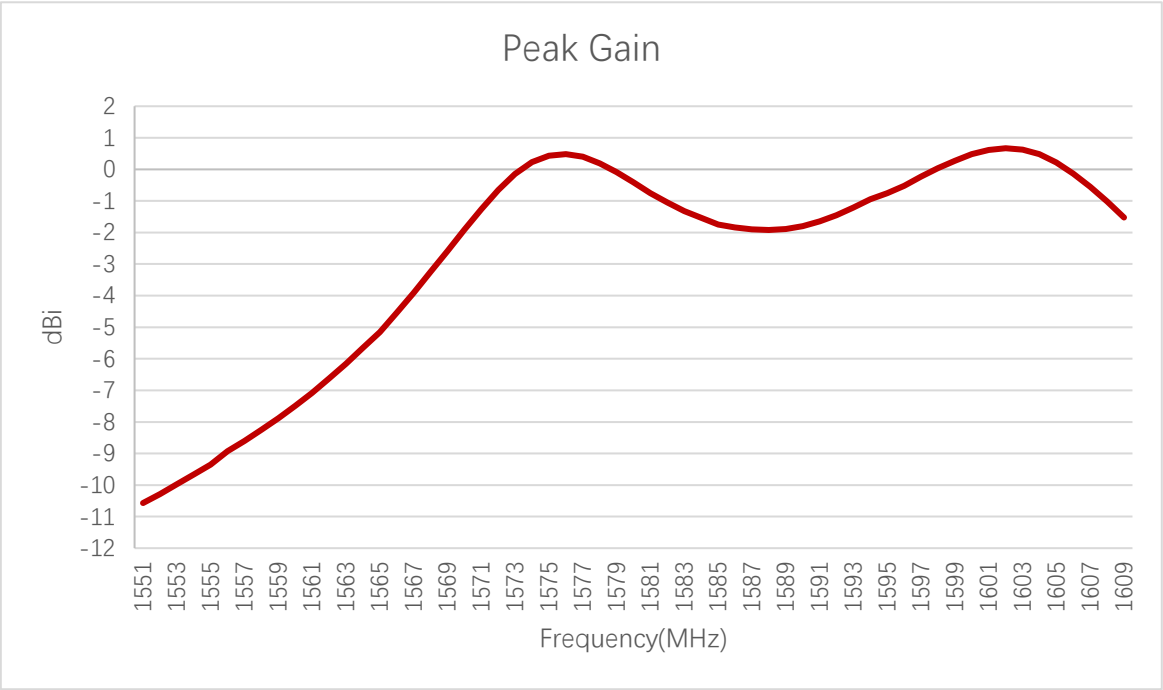
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	-	41.8	44.1

3.2.2. Peak Gain

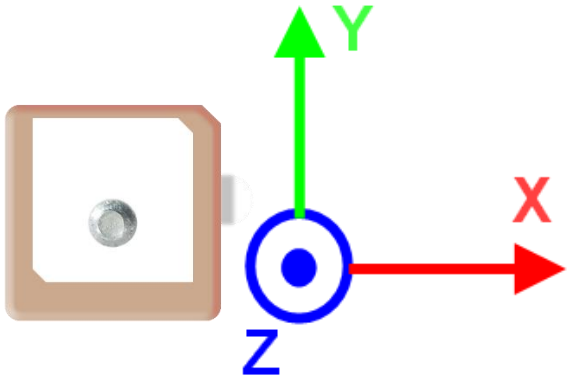


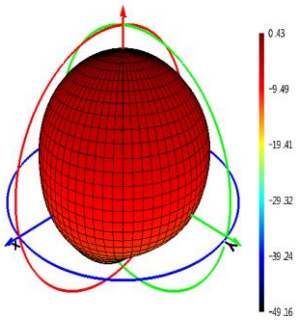
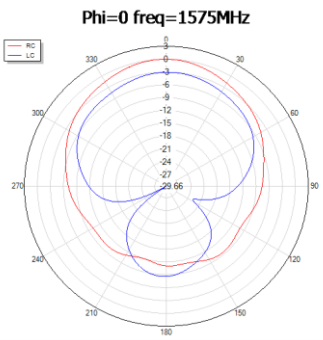
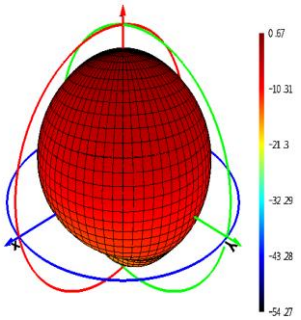
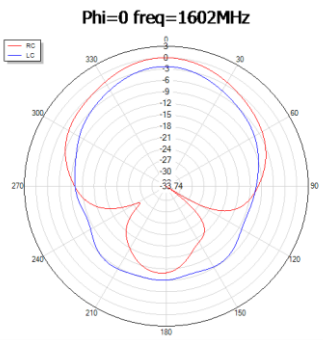
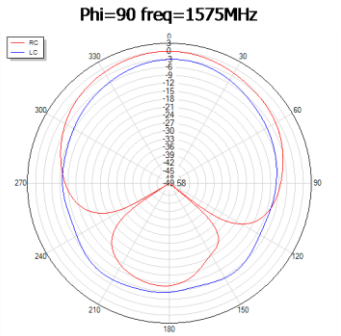
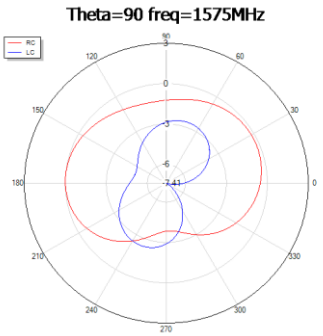
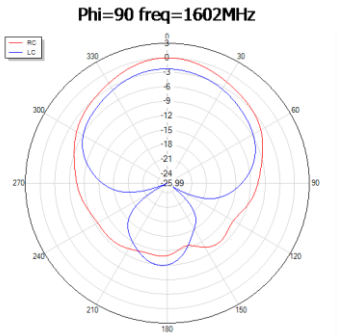
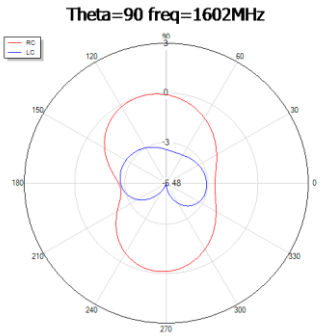
Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	-	0.43	0.67

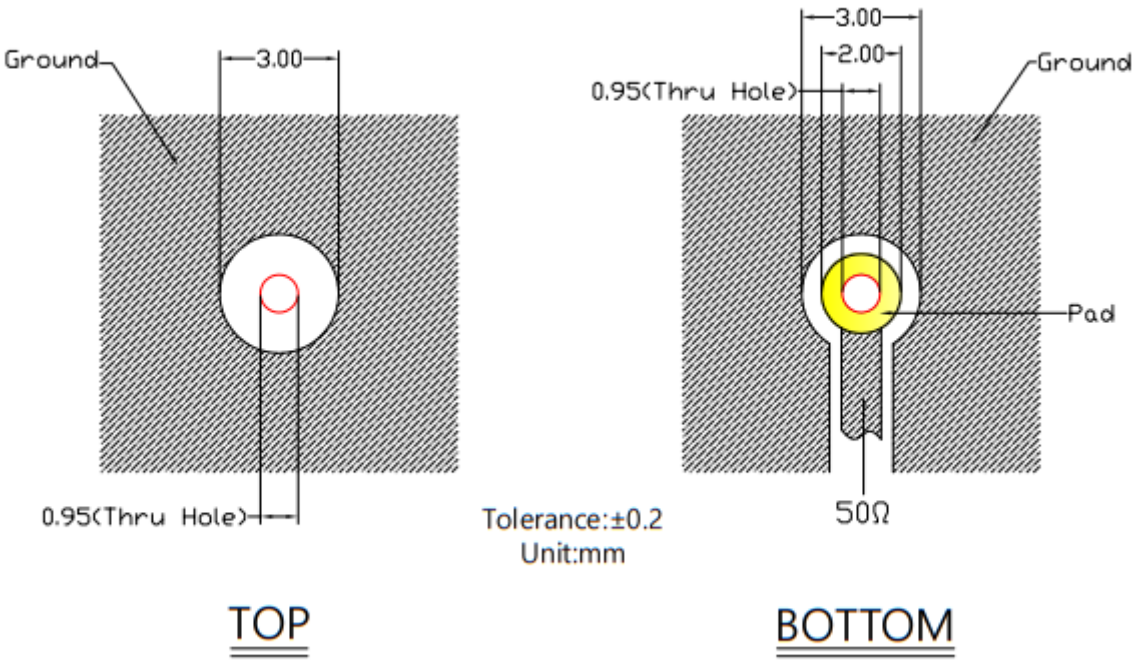
3.2.3. 3D & 2D Radiation Pattern

- Test Condition: on 70 mm × 70 mm PCB
- Test Chamber: HF-S-1



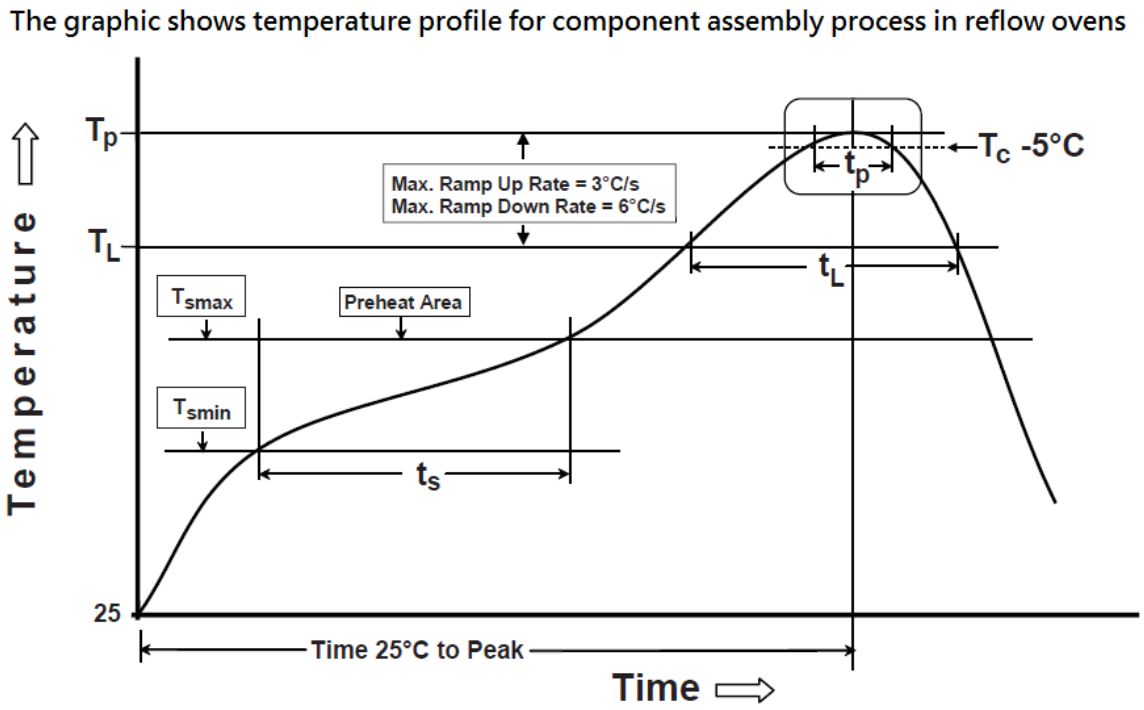
1575 MHz		1602 MHz	
			
			

4 PCB Footprint Recommendation



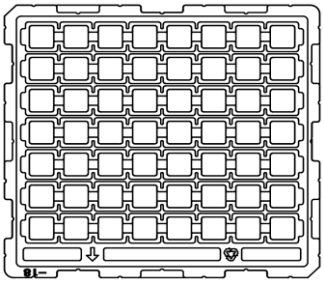
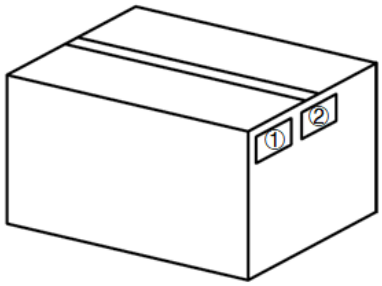
5 Recommended Reflow Soldering Profile

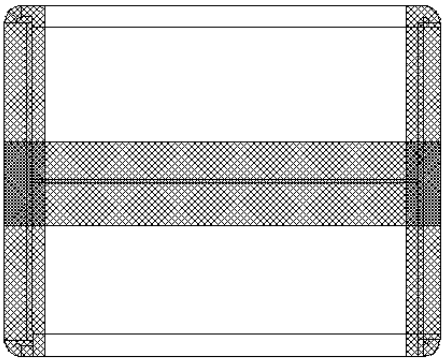
- SOLDER PASTE: Sn/Ag/Cu: 96.5/3.0/0.5
- Recommended reflow condition:



Phase	Profile Features	Pb-Free Assembly (SnAgCu)
PREHEAT	-Temperature Min (Tsmin) -Temperature Max (Tsmax) -Time(ts) form (Tsmin to Tsmax)	150 °C 200 °C 60–120 seconds
RAMP-UP	Avg. Ramp-up Rate (Tsmax to TP)	3 °C / second (max)
REFLOW	-Temperature (TL) -Total Time above TL (t L)	217 °C 30–100 seconds
PEAK	-Temperature (TP) -Time (tp)	260 °C 3 seconds
RAMP-DOWN	Rate	6 °C / second max.
Time from 25 °C to Peak Temperature		8 minutes max.

6 Packaging

Step	Packaging Picture / 2D Picture	Description
1		56 antenna products in a blister tray. (56 Antennas / Blister Tray)
2		500 antenna products in a vacuum bag. (500 Antennas / Vacuum Bag)
3		(2 Vacuum Bags / Carton Box) (1000 Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. Carton Size: L × W × H = 275 × 275 × 185 mm
4		**Position for Attaching Labels** ① Carton Label ② Quality Label

5		**Sealing Cartons** H-shaped sealing cartons
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

Contact Us

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

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Revision History

Version	Date	Author	Note
-	2025-11-28	Junsen Li/ Mike Guo/ Strong Qiang/ Rainey Liao	Creation of the document
1.0	2025-11-28	Junsen Li/ Mike Guo/ Strong Qiang/ Rainey Liao	First official release

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