Antenna Datasheet

Product OC: YFGC018WWDM
Version: 1.0
Date: 2026-04-30
Status: Released

Product Name: GNSS SMT Mount Ceramic Patch Passive Embedded Antenna
Key Features:
Frequency Band: 1559–1606 MHz
Dimensions: 18 mm × 18 mm × 2 mm
Efficiency: Up to 43.2 %
RoHS and REACH Compliant

Overview

The Quectel YFGC018WWDM is a high-performance, passive embedded GNSS antenna designed for SMT (surface mount) assembly. Housed in a compact ceramic package measuring 18 mm × 18 mm × 2 mm, this antenna supports the L1 frequency band (1559–1606 MHz), covering GPS L1, GLONASS G1, Galileo E1, BDS B1I/B1C, QZSS L1, and other compatible GNSS signals.

- **Key electrical characteristics (tested on a 50 mm × 50 mm reference PCB at 1575 MHz):**

✓ VSWR: 1.26

✓ Return loss: -18.8 dB

✓ Efficiency: up to 43.2 %

✓ Peak gain: 0.11 dBi

✓ Axial ratio: 0.97 dB (circular polarization, RHCP)

The antenna features a directional radiation pattern with right-hand circular polarization (RHCP). It is RoHS and REACH compliant, operates from -40 °C to +85 °C, and withstands peak reflow temperatures of 260 °C for 5 seconds. The datasheet provides detailed S-parameters, radiation performance (efficiency, gain, axial ratio, 2D/3D patterns), PCB footprint recommendation, and a reflow soldering profile

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 50 mm × 50 mm PCB

1.1. Electrical

Electrical	
Frequency Range	1559–1606 MHz
Impedance	50 Ω
Polarization	RHCP
Radiation Pattern	Directional

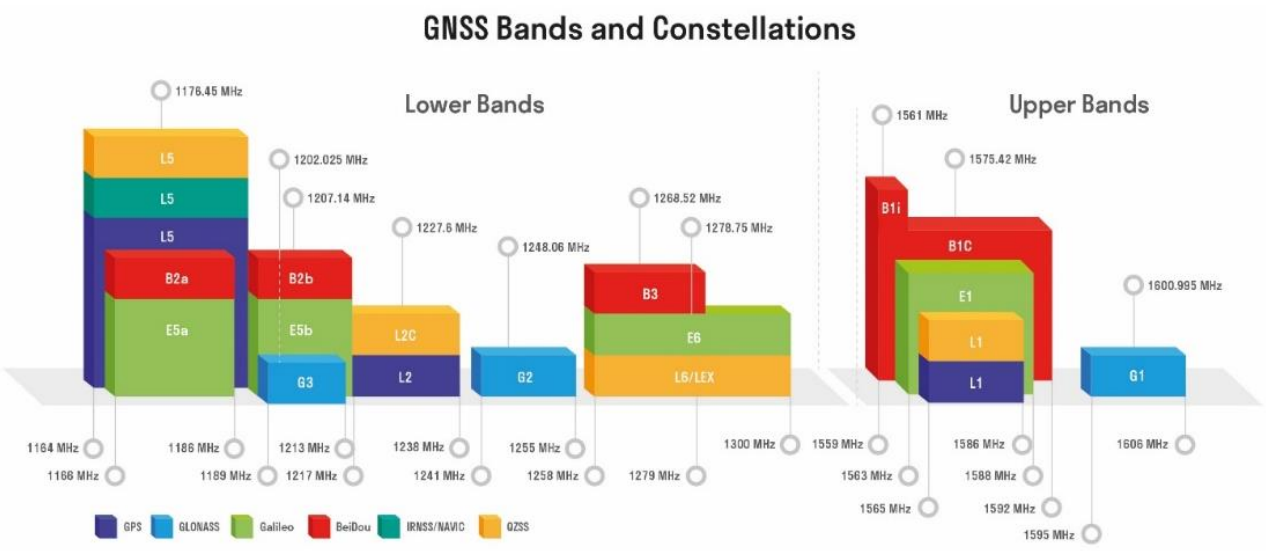
Band / Frequency (MHz)	GPS L5 GALILEO E5a BDS B2a-B2I QZSS L5 IRNSS L5	GALILEO E5b BDS B2b	GPS L2 QZSS L2C	GLONASS G2	BDS B3	BDS B1I	GPS L1 GALILEO E1 BDS B1C QZSS L1	GLONASS G1
	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-		1.26	
Return Loss (dB)	-	-	-	-	-		-18.8	
Efficiency (%)	-	-	-	-	-		43.2	
Peak Gain (dBi)	-	-	-	-	-		0.11	
Axial Ratio (dB)	-	-	-	-	-		0.97	

1.2. Mechanical & Environmental

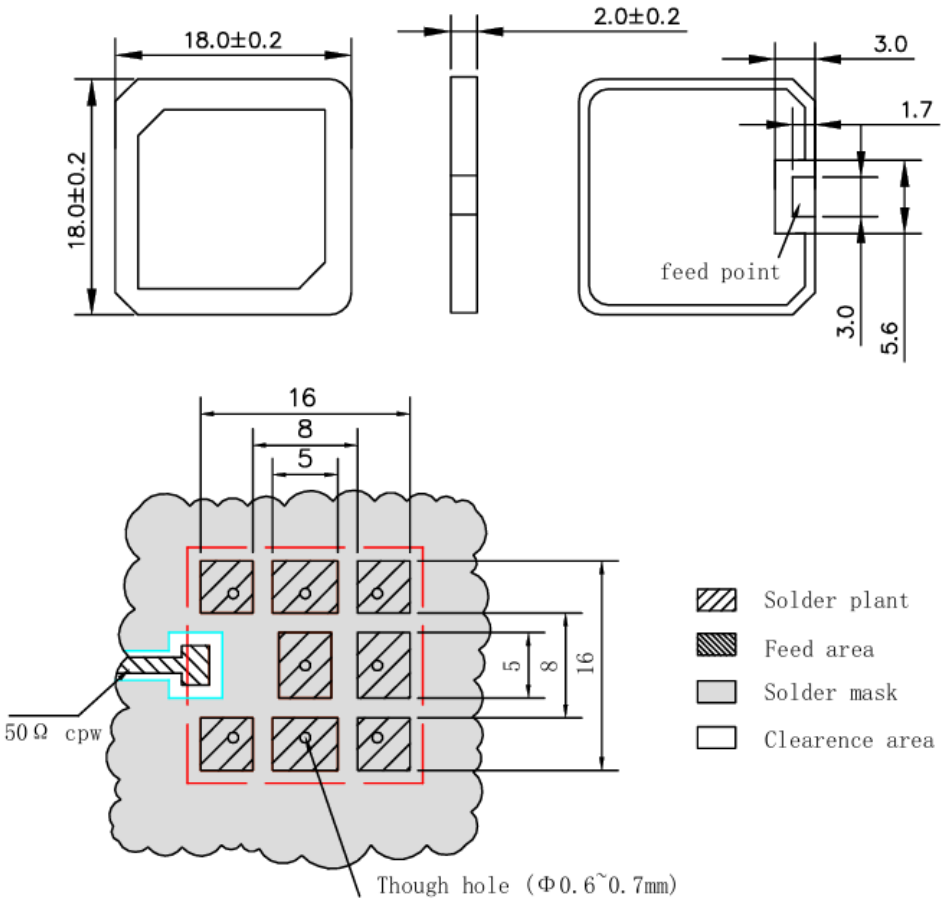
Mechanical	
Antenna Dimensions	18 mm × 18 mm × 2 mm
Material	Ceramic
Mounting Type	SMD
Weight	Typ. 3.2 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Recommended Reflow Temperature and Time	260 °C & 5 s
RoHS & REACH Compliant	Yes

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

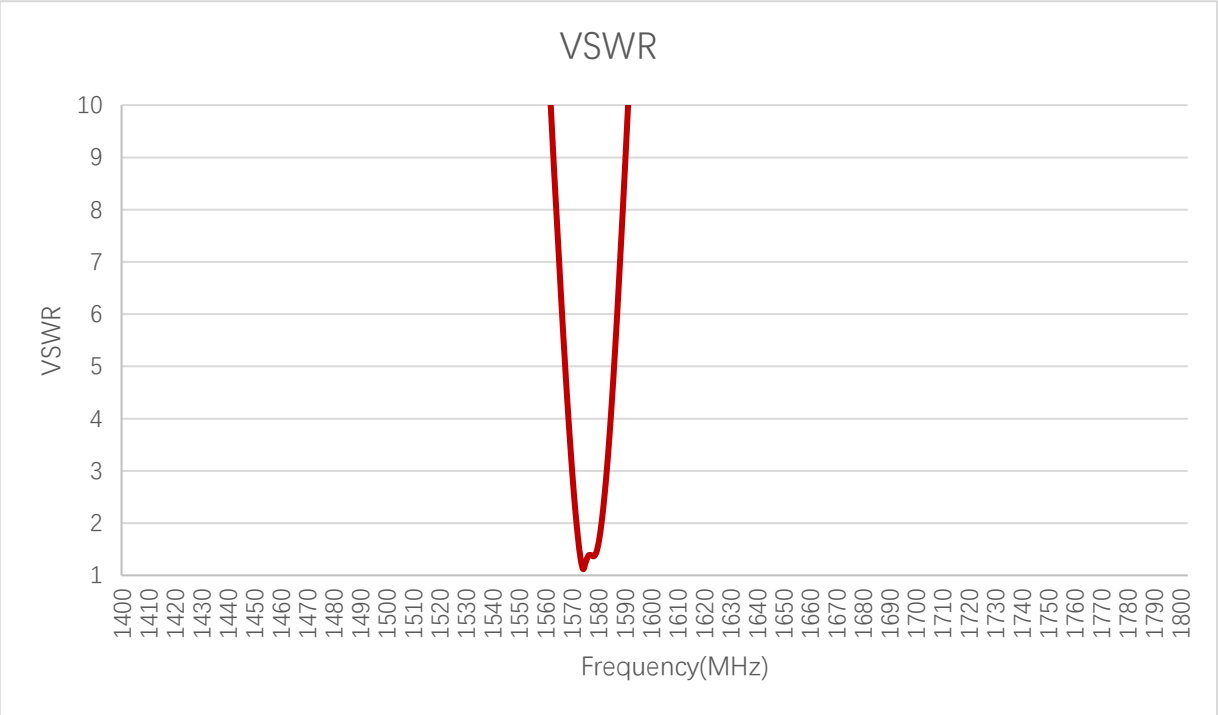
2 Drawing


18.0±0.2
18.0±0.2
2.0±0.2
3.0
1.7
feed point
3.0
5.6
16
8
5
5
8
16
50Ω cpw
Though hole (Φ0.6~0.7mm)
Solder plant
Feed area
Solder mask
Clearence area

3 Detailed Performance

3.1. S-Parameter Test

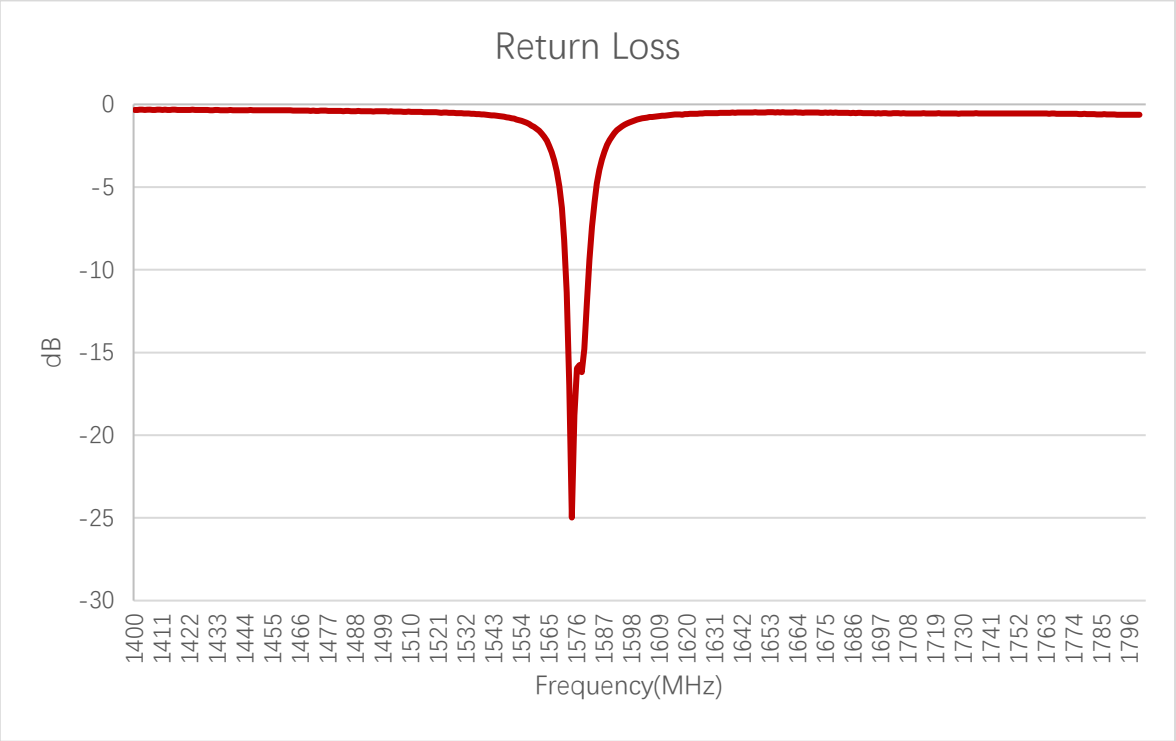
3.1.1. VSWR



VSWR

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
VSWR	-	-	-	-	-	-	1.26	-

3.1.2. Return Loss

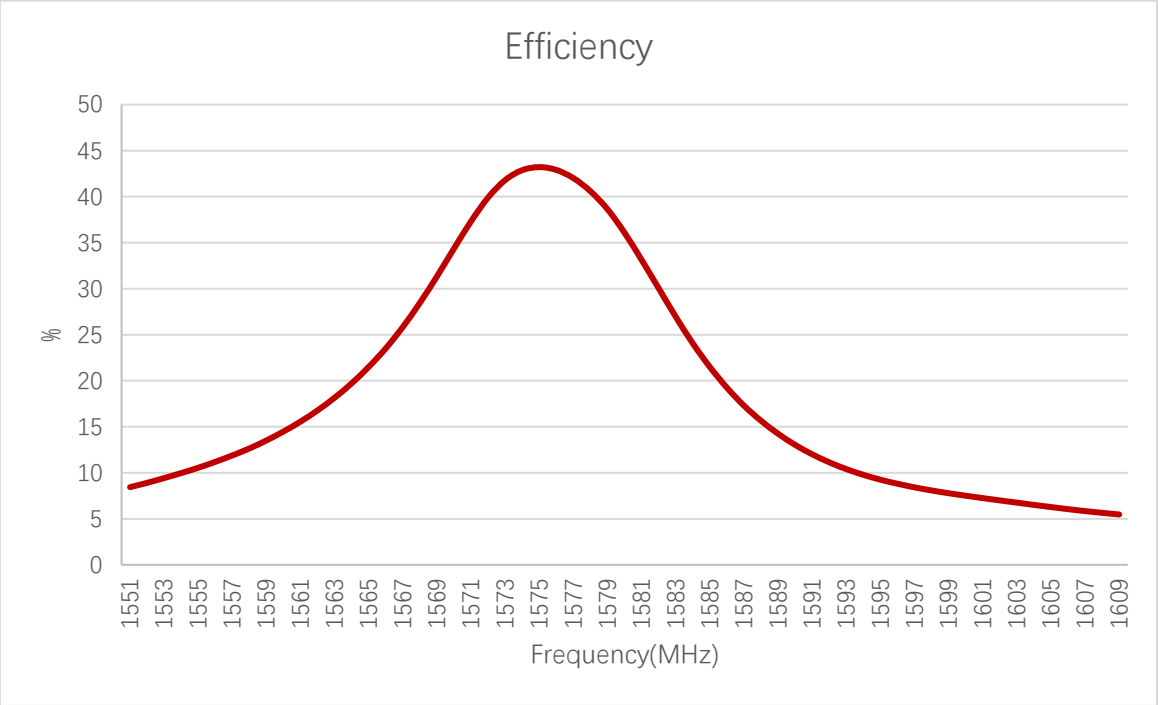


Return Loss (dB)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Return Loss (dB)	-	-	-	-	-	-	-18.8	-

3.2. Radiation Performance Test

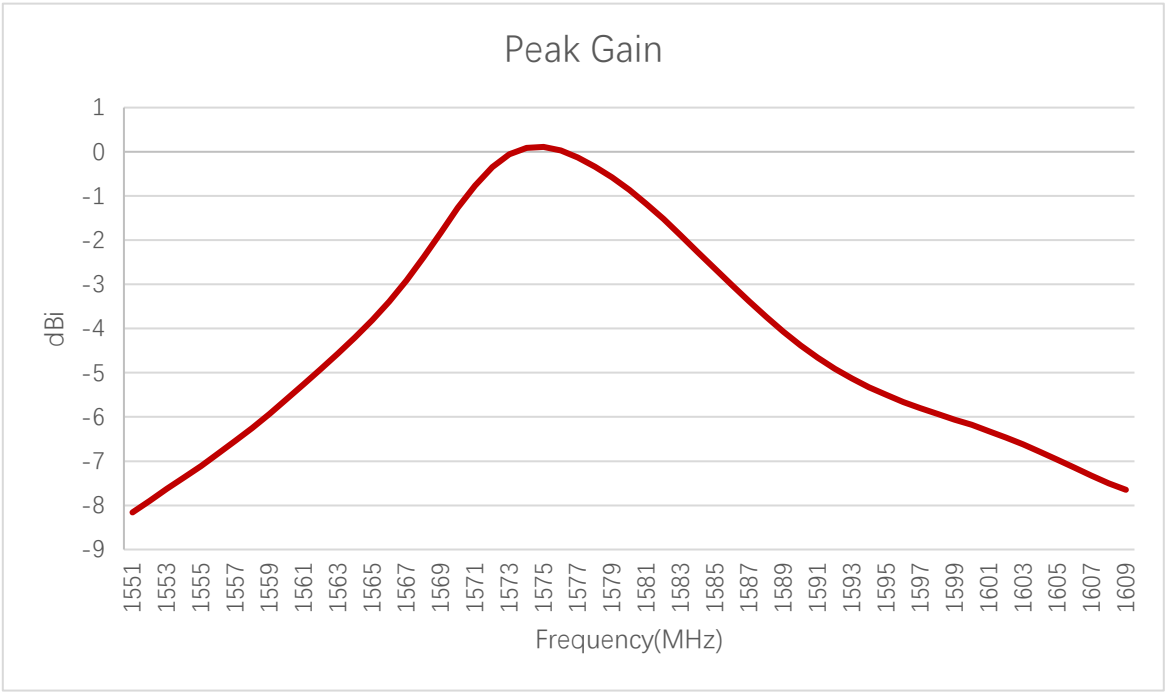
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Efficiency (%)	-	-	-	-	-	-	43.2	-

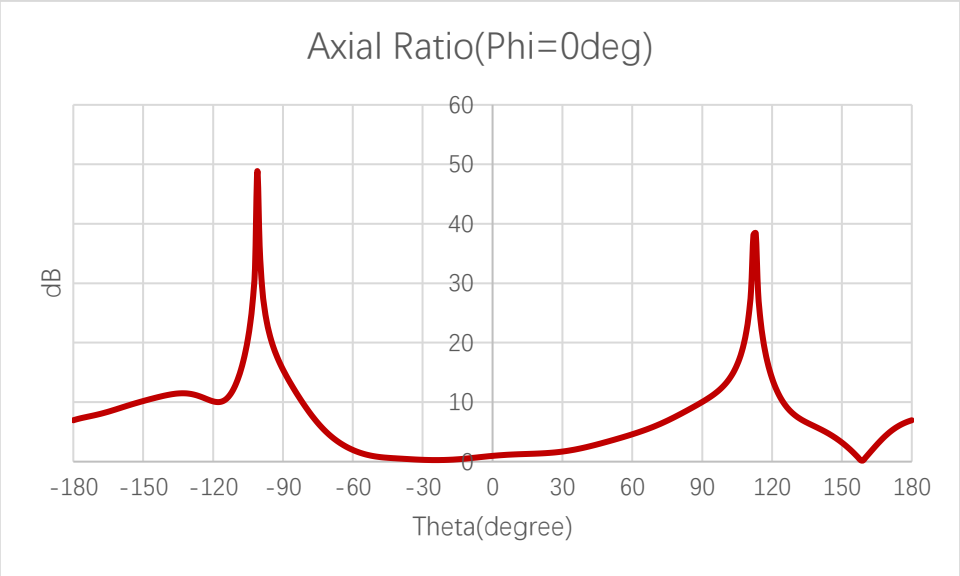
3.2.2. Peak Gain

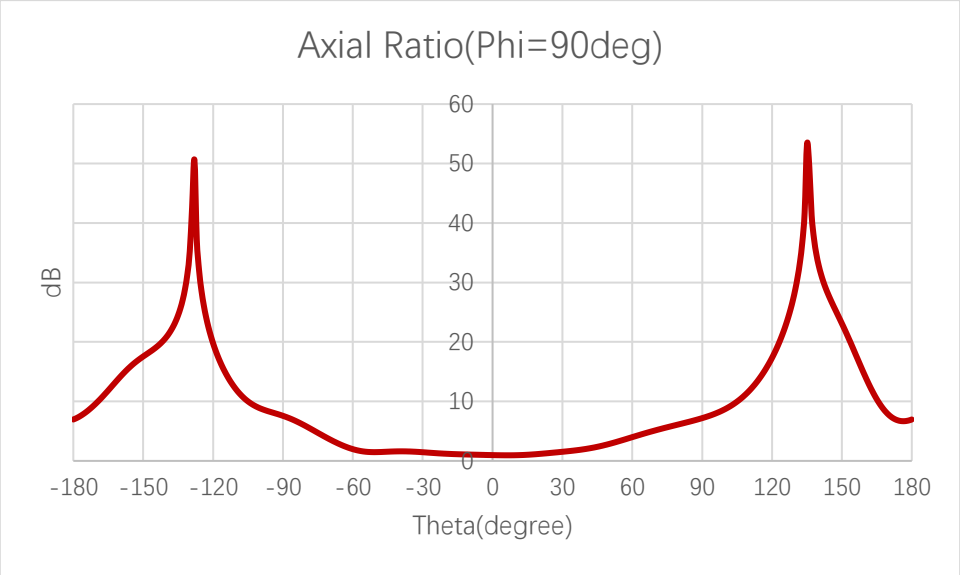


Peak Gain (dBi)

Frequency (MHz)	1176	1207	1227	1248	1268	1561	1575	1602
Peak Gain (dBi)	-	-	-	-	-	-	0.11	-

3.2.3. Axial Ratio

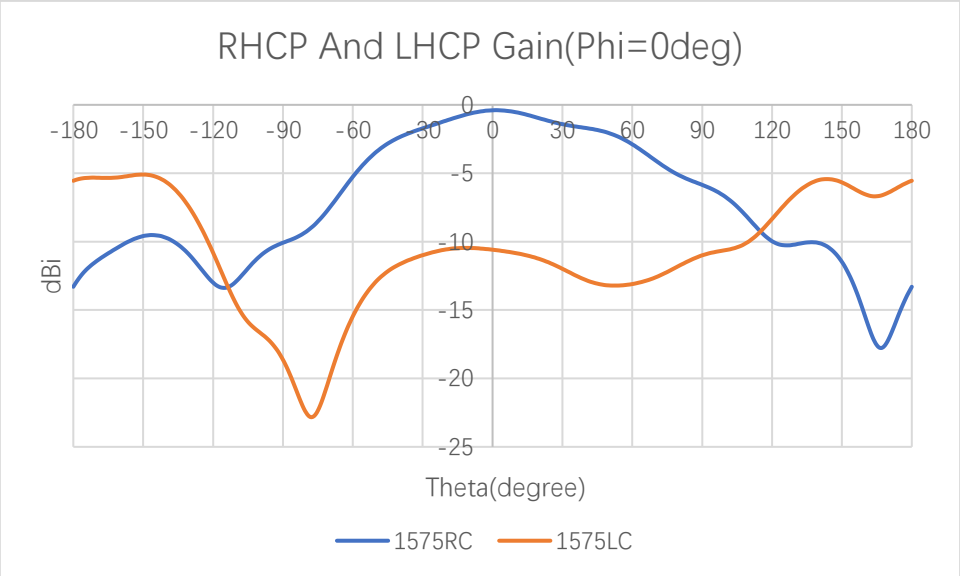


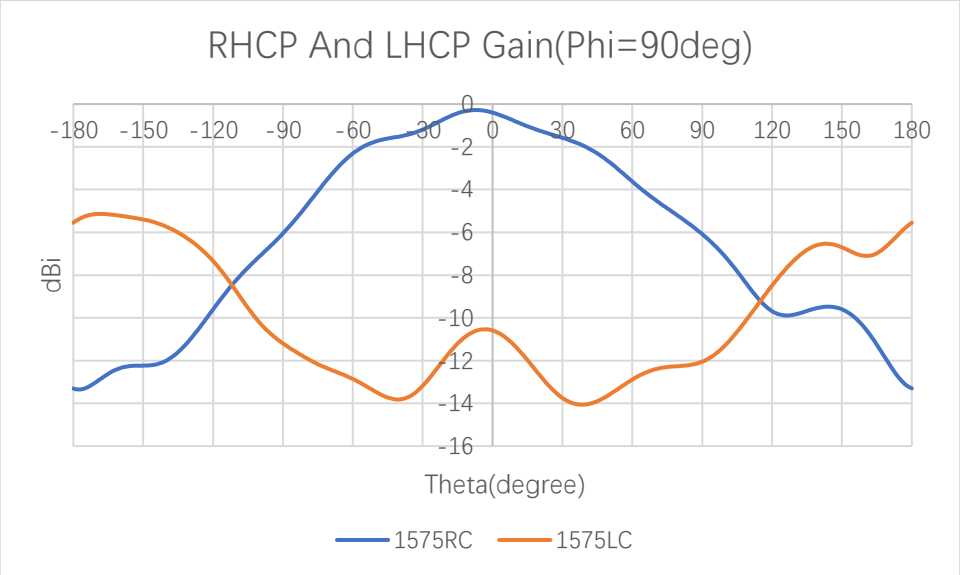


Axial Ratio (dB)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
Axial Ratio (dB)	Phi = 0 (deg) Theta = 0 (deg)	-	-	-	-	-	-	0.97	-
	Phi = 90 (deg) Theta = 0 (deg)	-	-	-	-	-	-	0.97	-

3.2.4. 2D RHCP and LHCP Gain



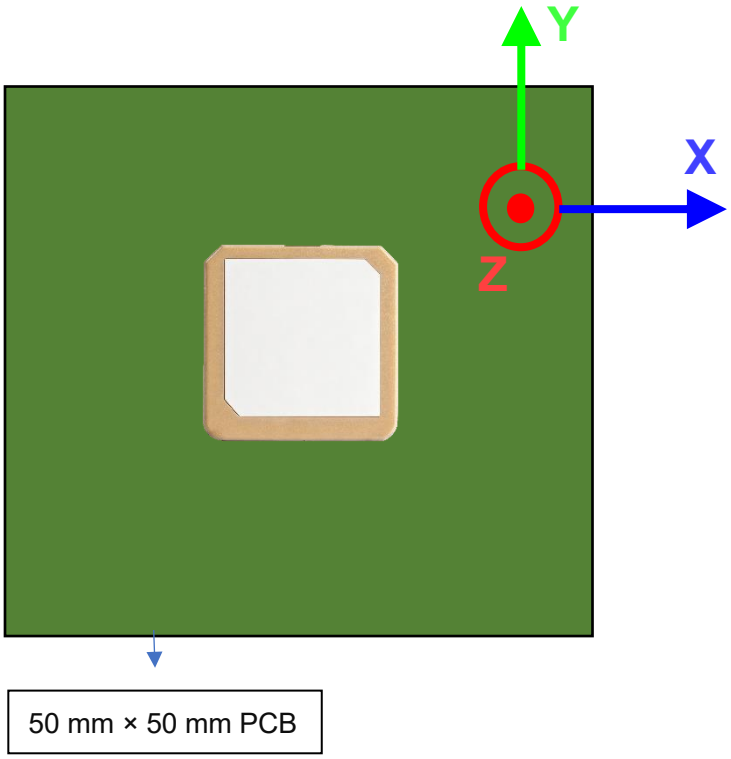


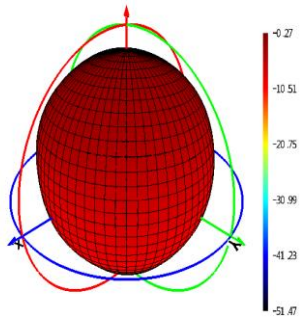
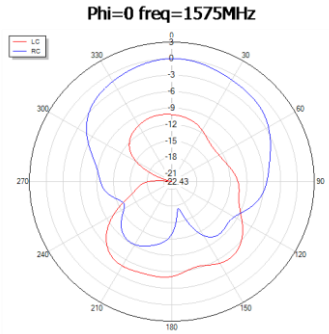
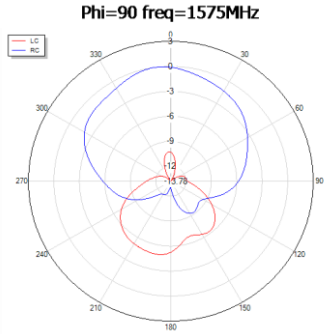
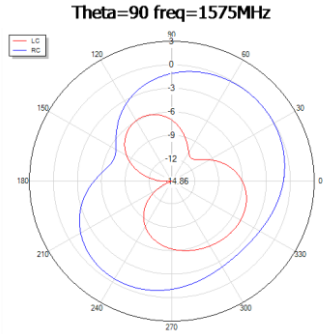
2D RHCP and LHCP Gain (dBi)

Frequency (MHz)		1176	1207	1227	1248	1268	1561	1575	1602
RHCP Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-	-	-	-	-	-0.4	-	-
	Phi = 90 (deg) Theta = 0 (deg)	-	-	-	-	-	-0.4	-	-
LHCP Gain (dBi)	Phi = 0 (deg) Theta = 0 (deg)	-	-	-	-	-	-10.6	-	-
	Phi = 90 (deg) Theta = 0 (deg)	-	-	-	-	-	-10.6	-	-

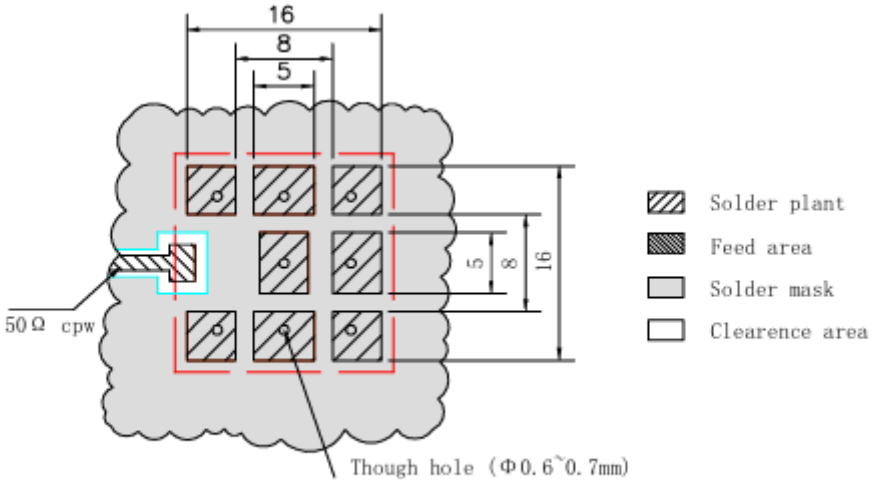
3.2.5. 3D & 2D Radiation Pattern

- Test Condition: on 50 mm × 50 mm PCB
- Test Chamber: SH-SY-1



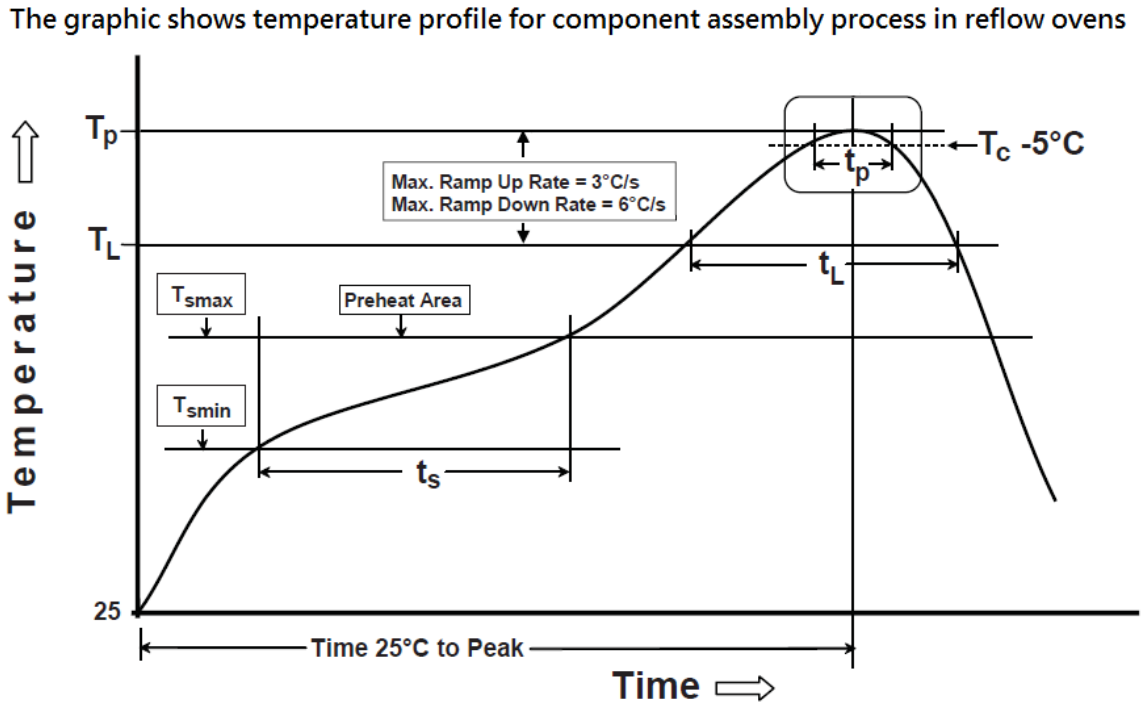
1575 MHz	
 -0.27 -10.51 -20.75 -30.99 -41.23 -51.47	 Phi=0 freq=1575MHz LC RC -22.43
 Phi=90 freq=1575MHz LC RC	 Theta=90 freq=1575MHz LC RC -14.86

4 PCB Footprint Recommendation



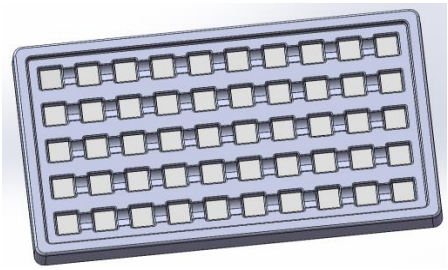
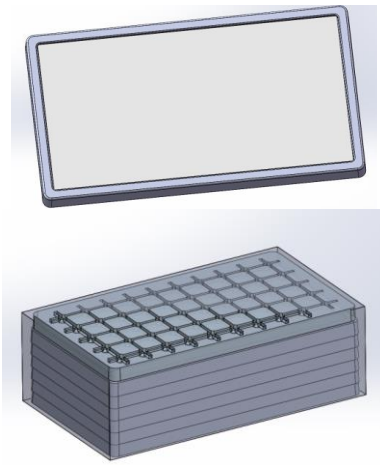
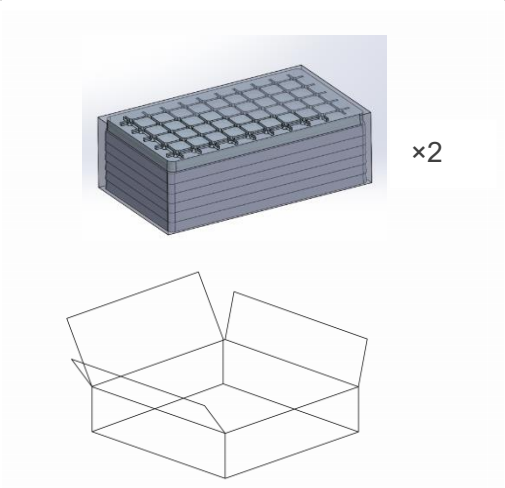
5 Recommended Reflow Soldering Profile

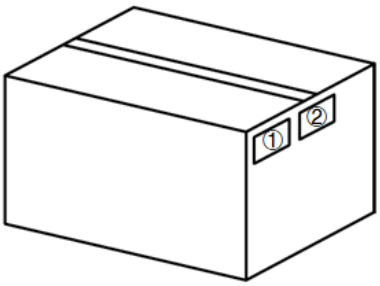
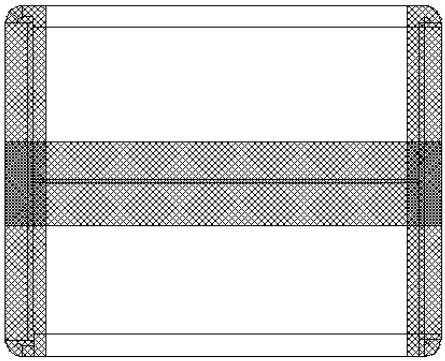
- SOLDER PASTE: Sn/Ag/Cu: 96.5/3.0/0.5
- Recommended reflow condition:



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		50 products packed in a Blister tray.
2		Stack the six pallets in the same direction, place an empty pallet on top, insert the vacuum bag to remove the air, then put in an inner box. (300 Antennas / Inner Box)
3		(2 Inner Boxes / Carton Box) (600 Antennas / Carton Box) Estimated quantity Carton Size: L × W × H = 345 × 255 × 210 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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Or our local offices. For more information, please visit:
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Revision History

Version	Date	Author	Note
-	2026-04-30	Junsen Li/ Mike Guo/ Kessie Geng/ Rainey Liao	Creation of the document
1.0	2026-04-30	Junsen Li/ Mike Guo/ Kessie Geng/ Rainey Liao	First official release

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