Antenna

YCGO014AA Datasheet

Antenna Services

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About the Document

Revision History

Version	Date	Author	Note
-	2021-09-01	Xiaodong YANG/ Kenny YIN	Creation of the document
1.0	2021-09-29	Xiaodong YANG/ Kenny YIN	First official release
1.1	2021-12-05	Xiaodong YANG/ Kenny YIN	Updated the product description in Chapter 1.

Contents

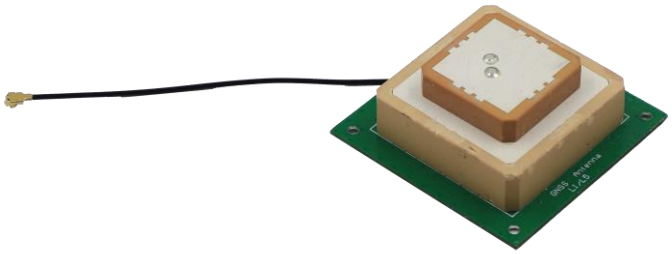
1 Product Description

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 also 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.

We provide comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

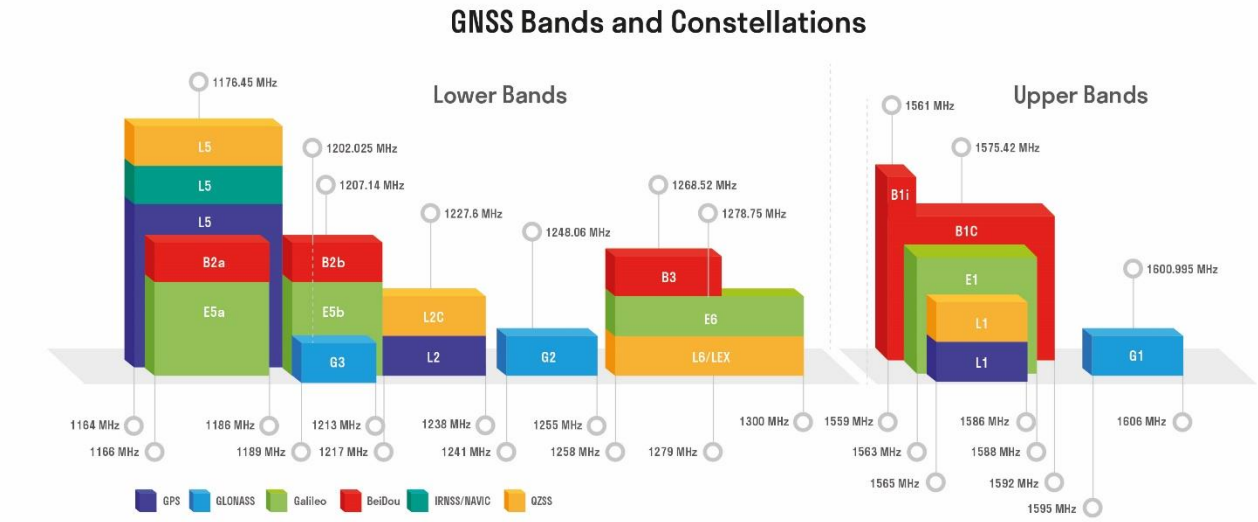
2 Product Features

- GNSS L1/L5
- Compact Dual Feed Patch Element
- Excellent performance



3 GNSS Frequency Band Checklist

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)	
	●	●	-	-	
BEIDOU	**B1I** Centre 1561.098 (1559–1564)	**B1C (BeiDou-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
B3
1227.6 MHz
L2C
L2
1248.06 MHz
G2
1268.52 MHz
1278.75 MHz
E6
L6/LEX
1561 MHz
1575.42 MHz
B1i
B1C
E1
L1
L1
1600.995 MHz
G1
1164 MHz
1166 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

4 Product Specifications

- The antenna is tested on a 50 mm × 50 mm × 0.8 mm PCB.

Passive Electrical Specifications	
Frequency Range	L5: 1166–1186 MHz L1: 1559–1606 MHz
Input Impedance	50 Ω
VSWR	< 2.0
Peak Gain	L5 = 1.35 dBi, L1= 2.24 dBi
Polarization Type	RHCP
AR	< 2 dB
Mechanical Specifications	
Antenna Size	38 mm × 38 mm × 10 mm + 25 mm × 25 mm × 6 mm (Ground Plane: 50 mm × 50 mm × 0.8 mm)
Casing	Ceramics
Weight	Approx. 72 g
Connector Type	IPEX-1
Working Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
Radome Color	-
IP Rating	-

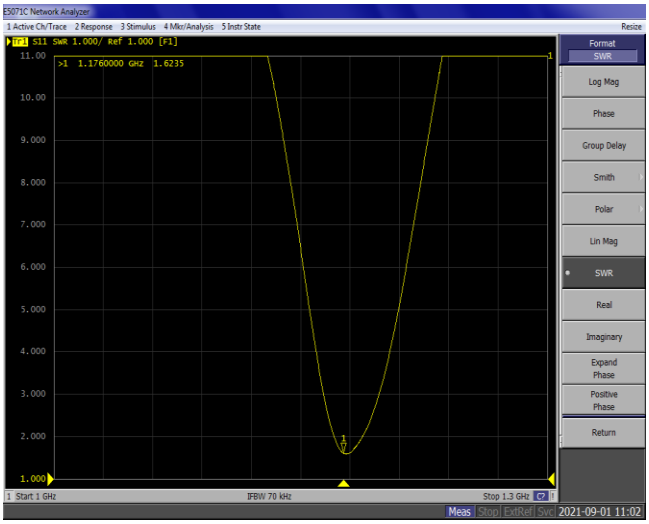
5 Overall Performance

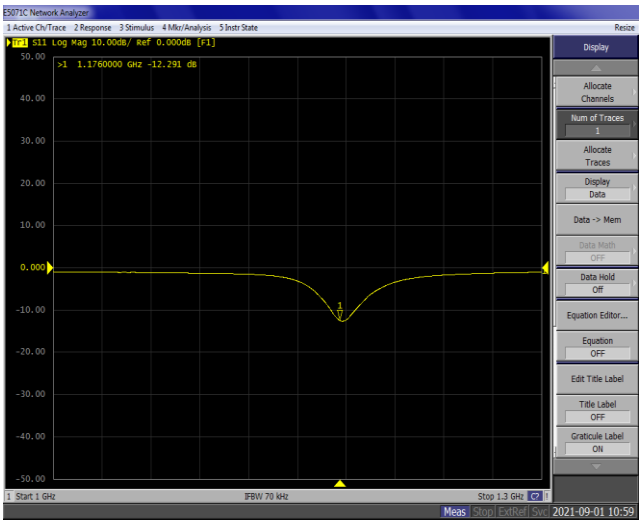
5.1. Test Environment

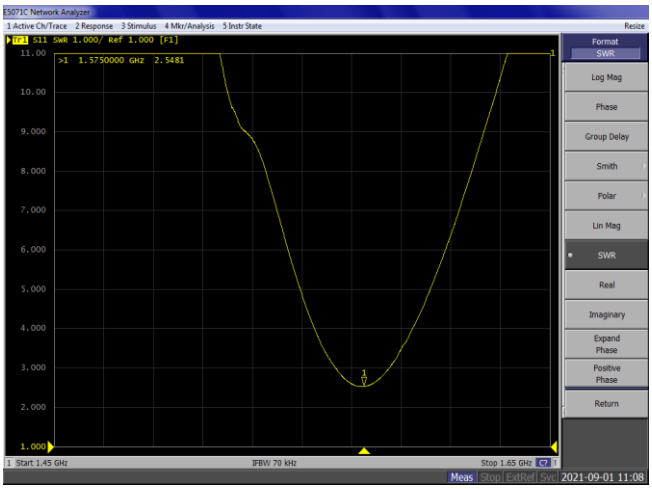
- KEYSIGHT VNA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone® 2800 Chamber 5G (FR1) SISO/MIMO, 400 MHz – 8.0 GHz

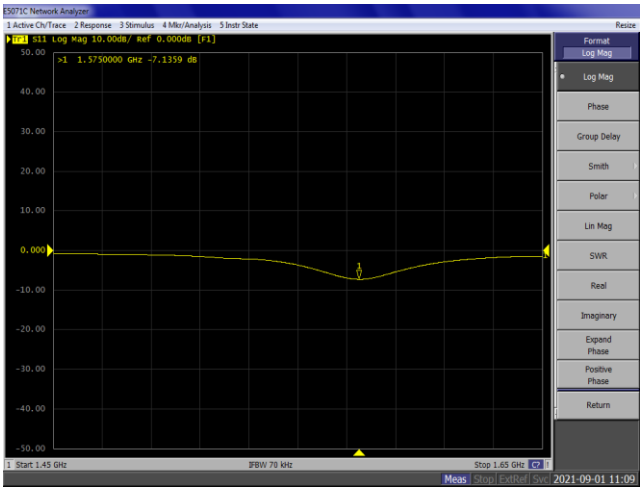
5.2. VSWR

- VSWR before hybrid coupler.



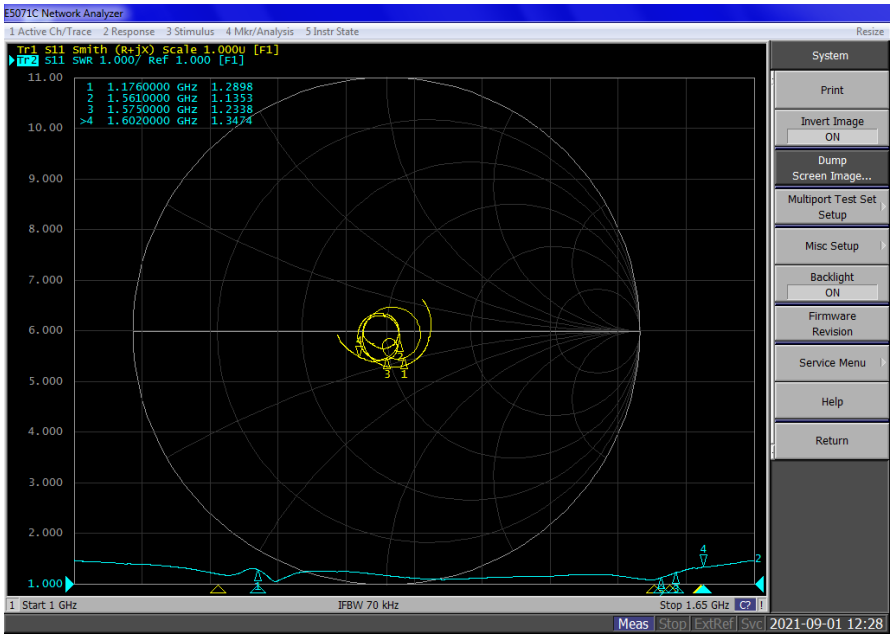






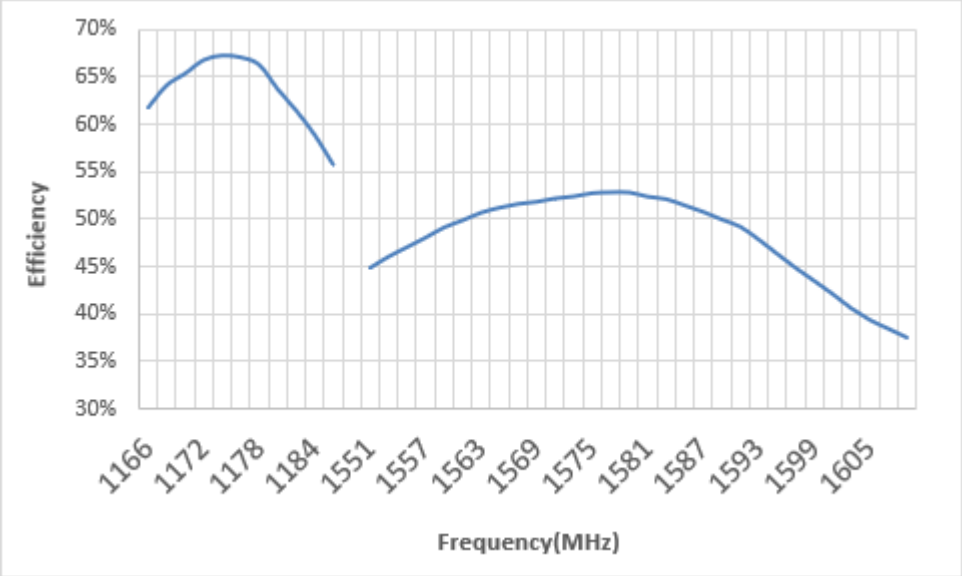
Frequency (MHz)	1176	1575
VSWR	1.62	2.54

- VSWR after hybrid coupler.



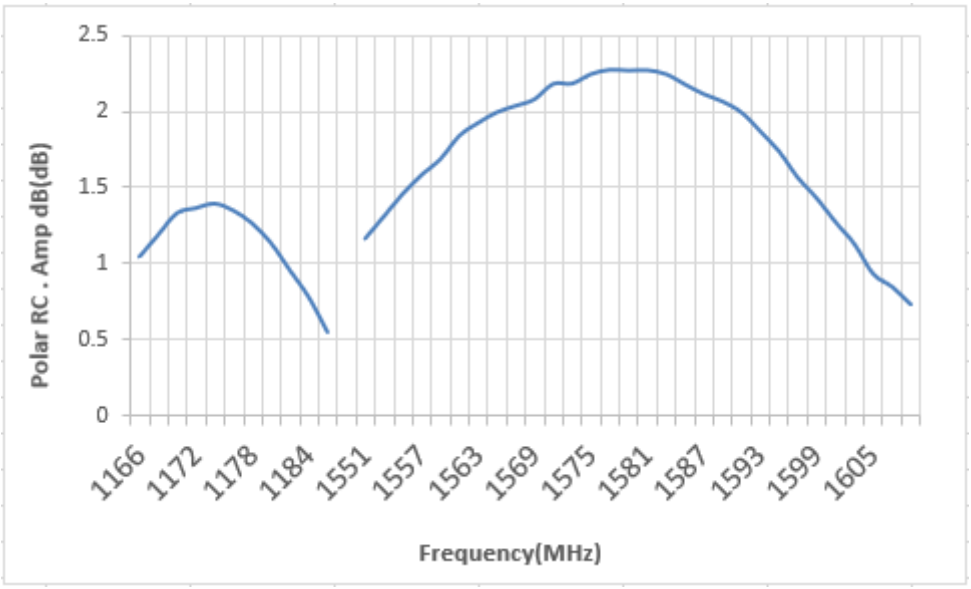
Frequency (MHz)	1176	1561	1575	1602
VSWR	1.29	1.13	1.23	1.34

5.3. Efficiency



Frequency (MHz)	1176	1561	1575	1602
Efficiency (%)	67	50	53	42

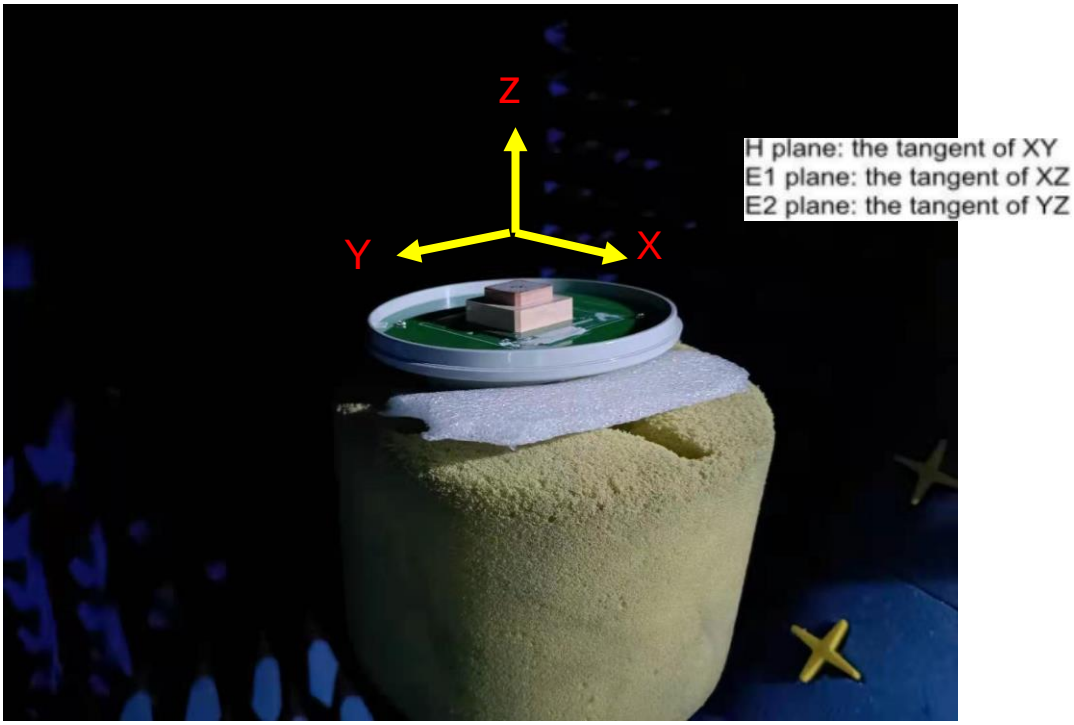
5.4. Gain



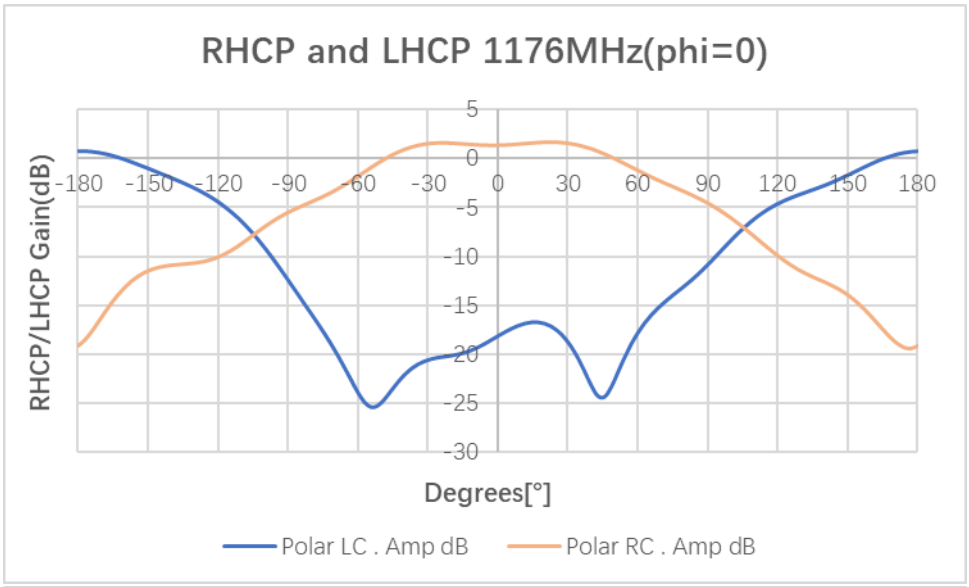
Frequency (MHz)	1176	1561	1575	1602
Gain (dBi)	1.35	1.84	2.24	1.27

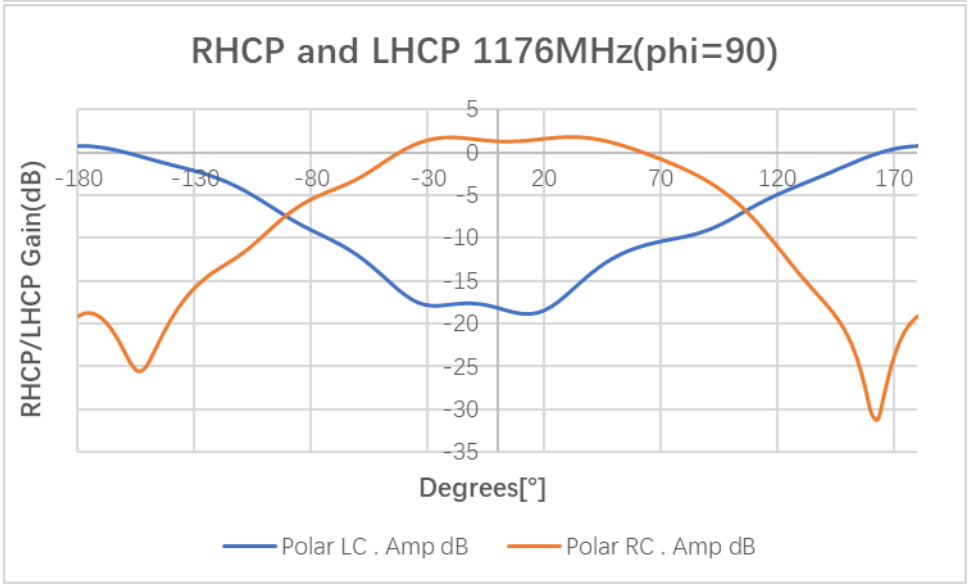
5.5. Radiation Pattern

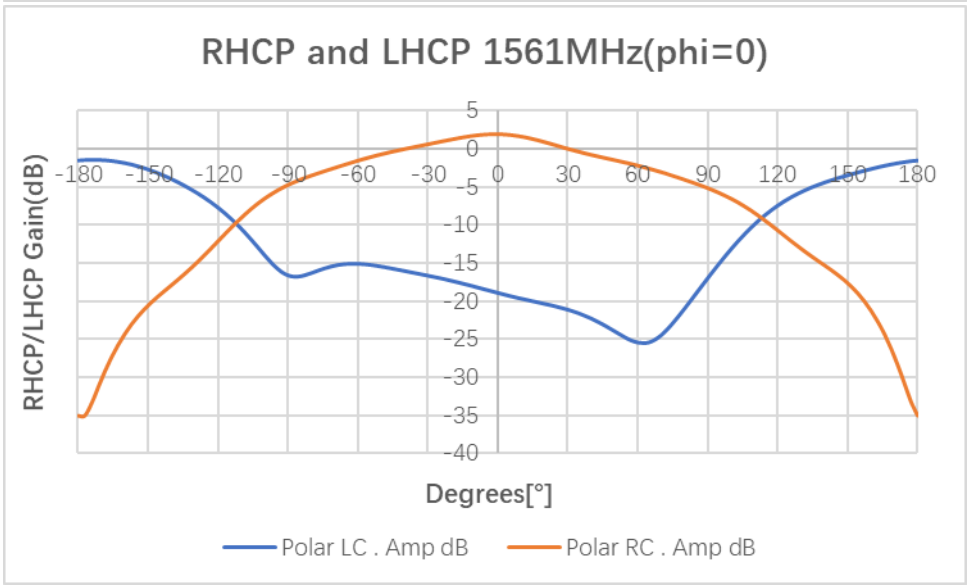
- Test condition: free space.

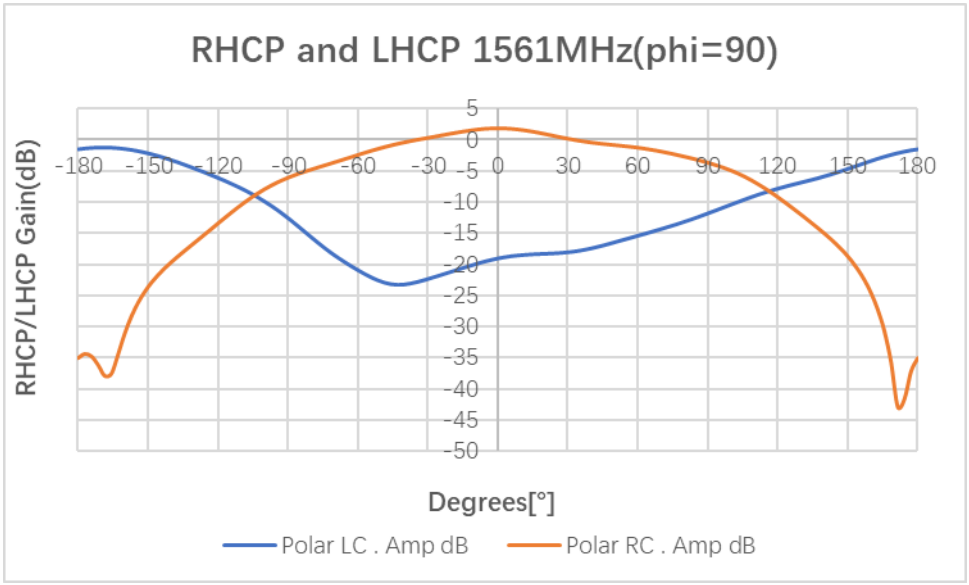


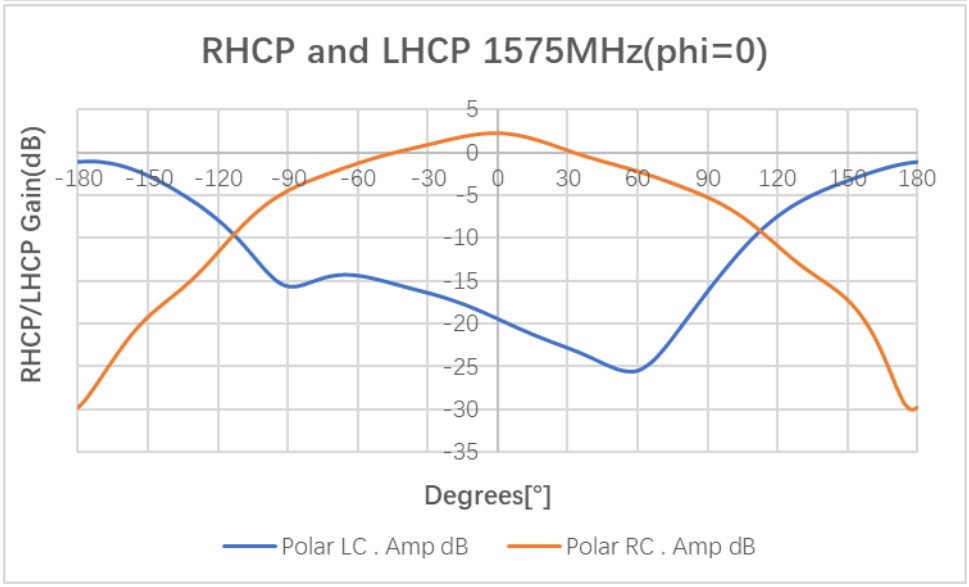
5.6. 2D RHCP and LHCP Gain

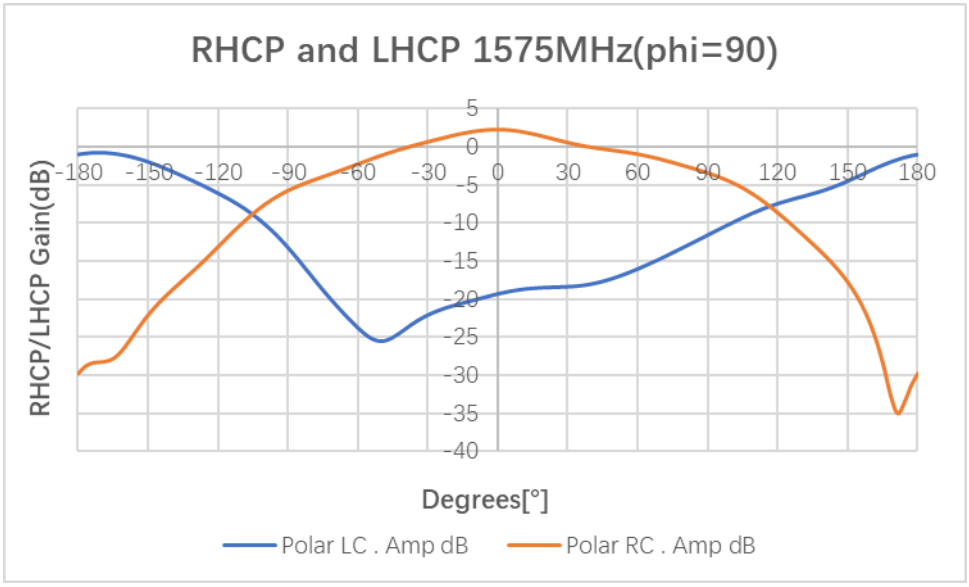


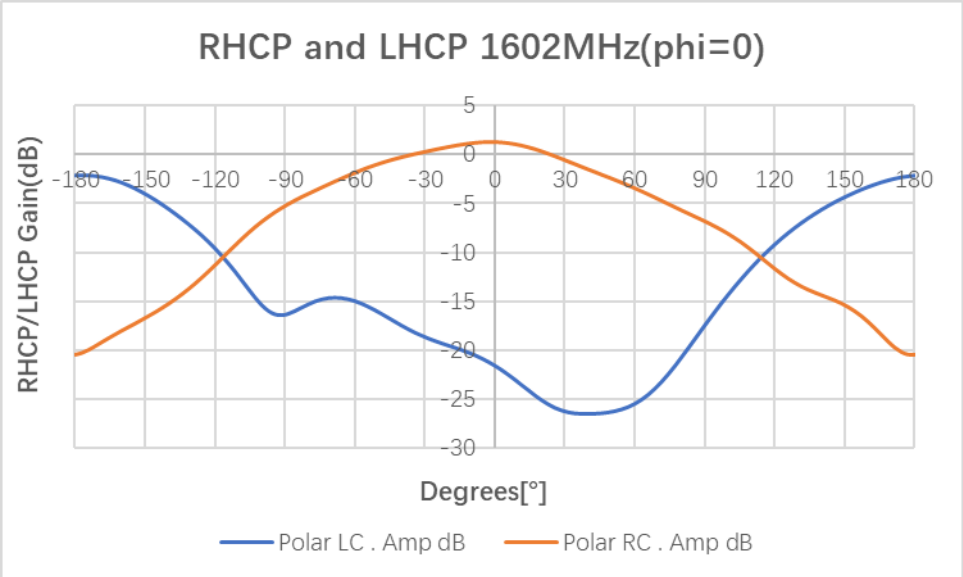


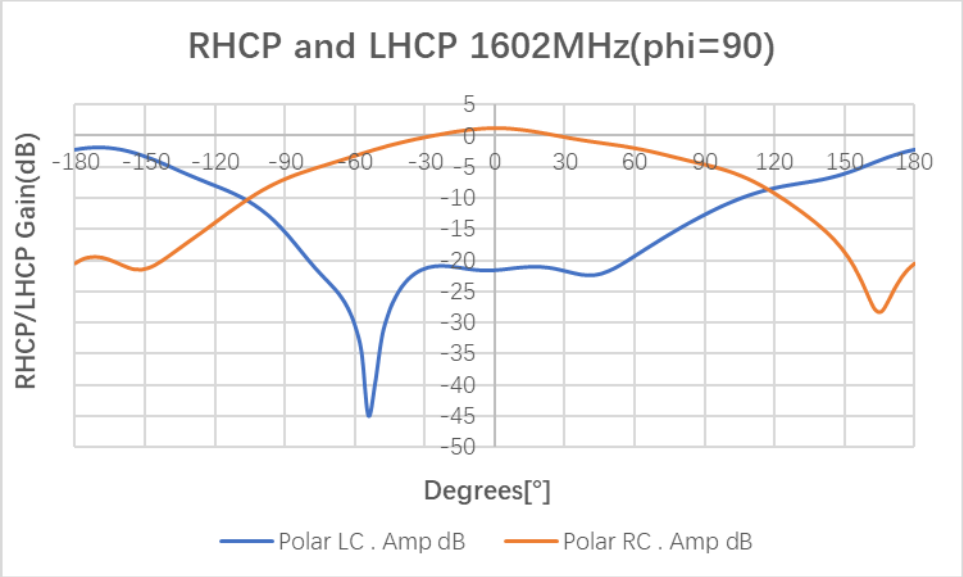



RHCP and LHCP 1561MHz(phi=90)
RHCP/LHCP Gain(dB)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB


RHCP and LHCP 1575MHz(phi=0)
RHCP/LHCP Gain(dB)
5
0
-5
-10
-15
-20
-25
-30
-35
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

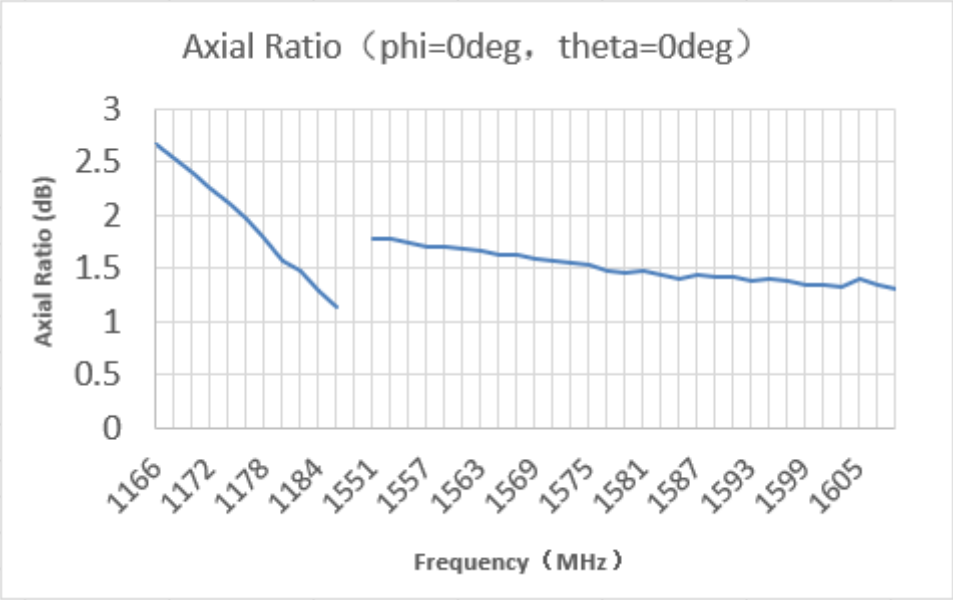

RHCP and LHCP 1575MHz(phi=90)
RHCP/LHCP Gain(dB)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB



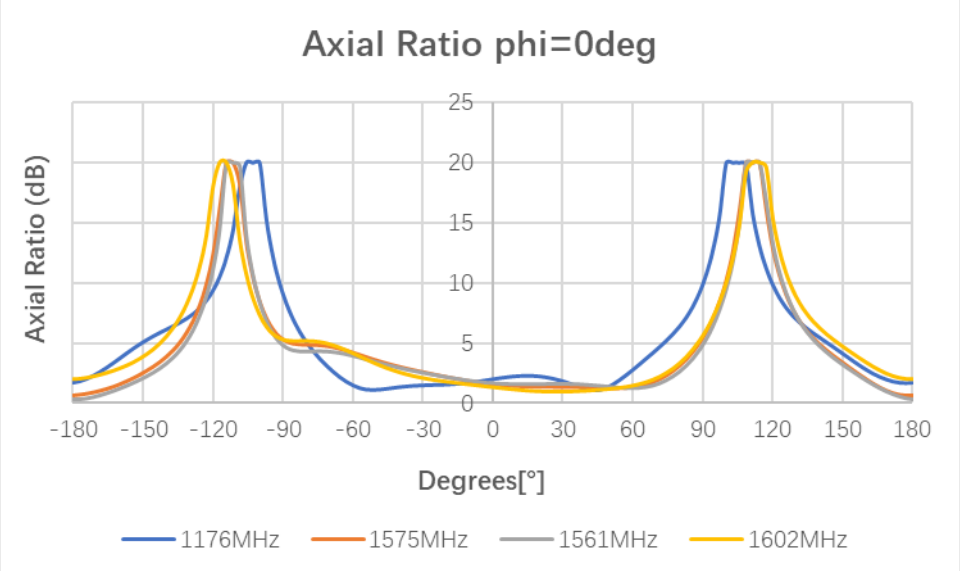


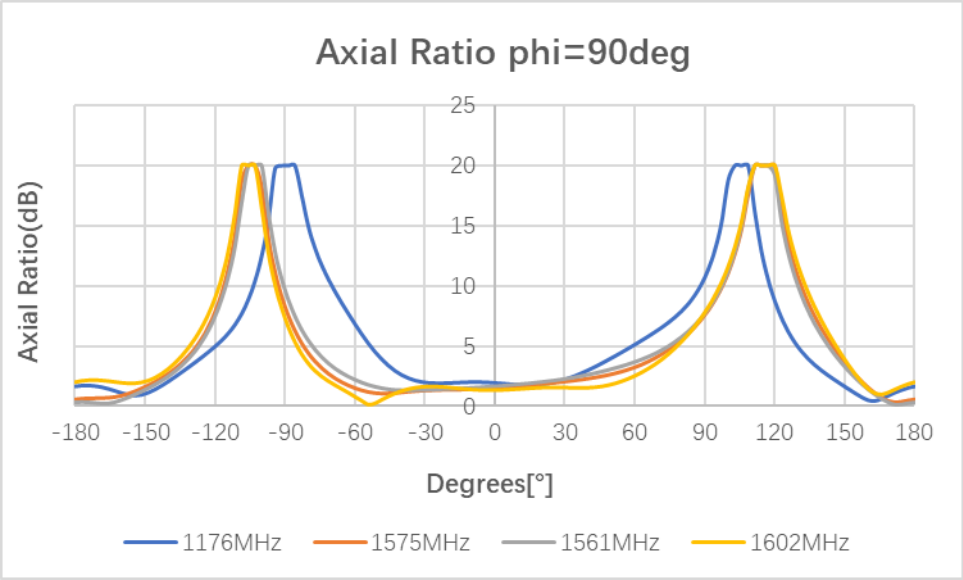
Frequency (MHz)	1176	1561	1575	1602
RC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	1.35	1.84	2.24	1.27
RC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	1.35	1.84	2.24	1.27
LC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	-18.15	-18.97	-19.38	-21.54
LC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	-18.15	-18.97	-19.38	-21.54

5.7. Axial Ratio



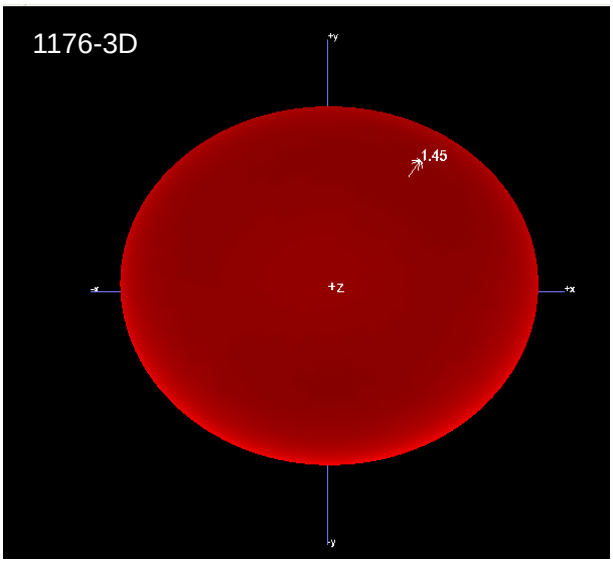
5.8. Axial Ratio in XOZ/YOZ

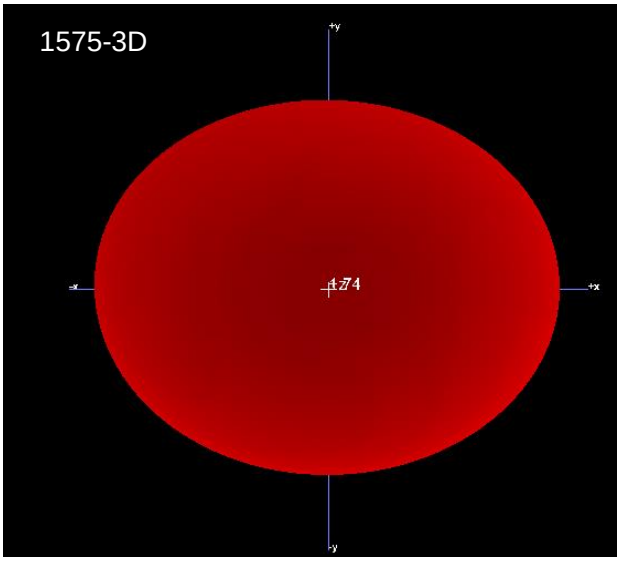


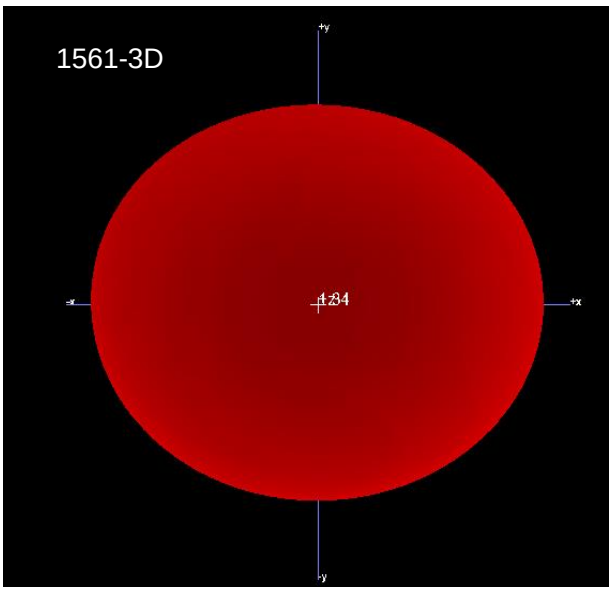


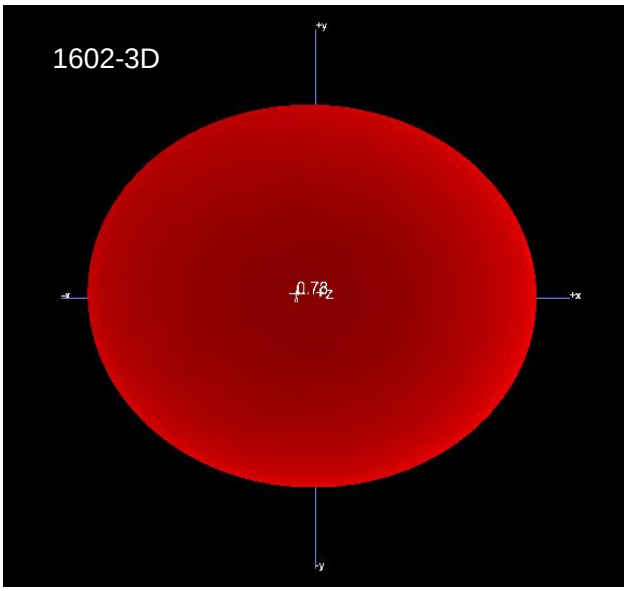
Frequency (MHz)	1176	1561	1575	1602
AR (dB) Phi = 0 (deg) Theta = 0 (deg)	1.95	1.53	1.68	1.33
AR (dB) Phi = 90 (deg) Theta = 0 (deg)	1.95	1.53	1.68	1.33

5.9. 3D Radiation

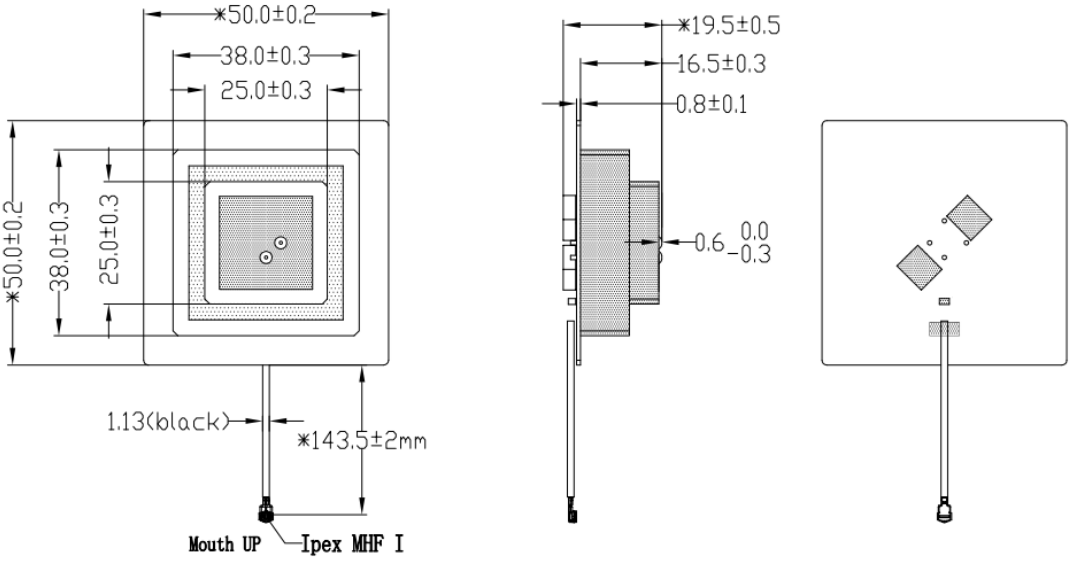








6 Product Size



Unit:mm
General tolerances:±0.2

7 PCB Footprint Recommendation