Antenna

YEGM011AA Datasheet

Antenna Services

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About the Document

Revision History

Version	Date	Author	Note
-	2022-01-27	Kenny YIN/ Xiaodong YANG	Creation of the document
1.0	2022-01-27	Kenny YIN/ Xiaodong YANG	First official release
1.1	2022-03-17	Junsen LI	Updated the data (Chapters 2, 4, 6 and 7).
1.2	2022-06-17	Kenny YIN	Updated the coaxial cable drawing (Chapter 4 and 6).

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 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.

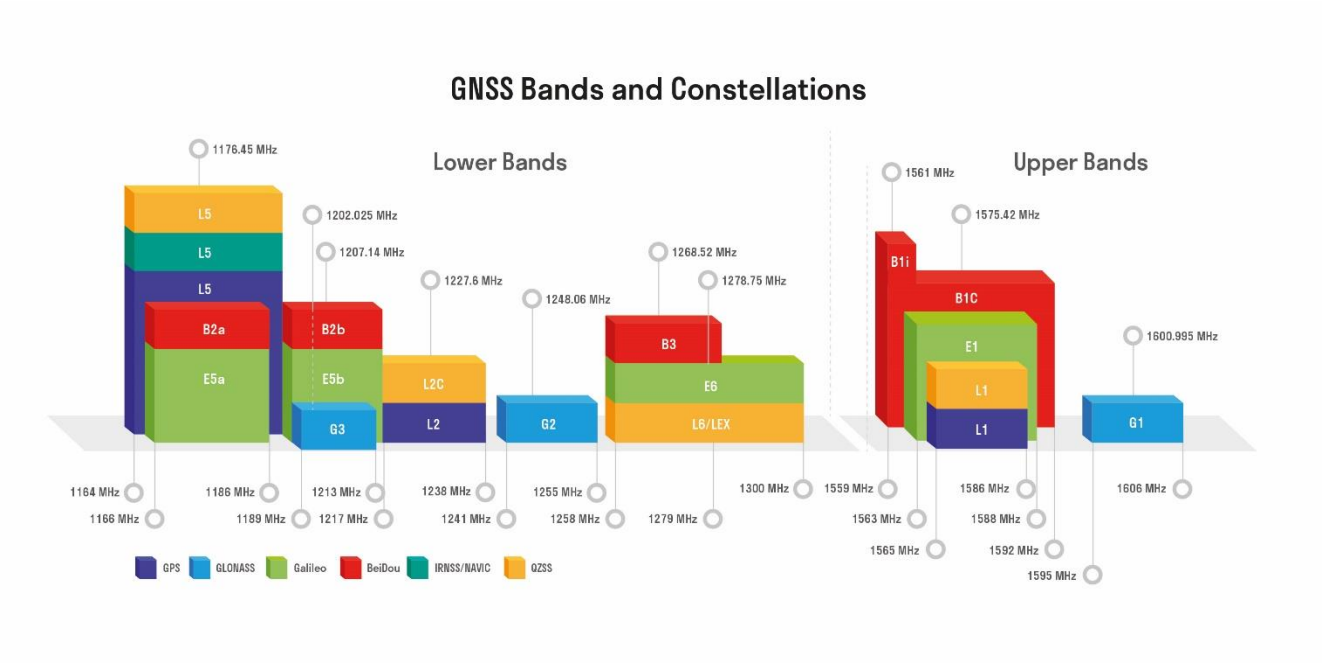
2 Product Features

Geodetic antenna used for GNSS base station EVK that are included in the kit:

- Antenna (GPS L1/L2/L5, BDS B1/B2, GLONASS G1)
- RG58 (SMA to TNC Male) length: 4000 ±50 mm
- Magnetic and suction cup support (bracket length: 75 ±1 mm)

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
B3
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

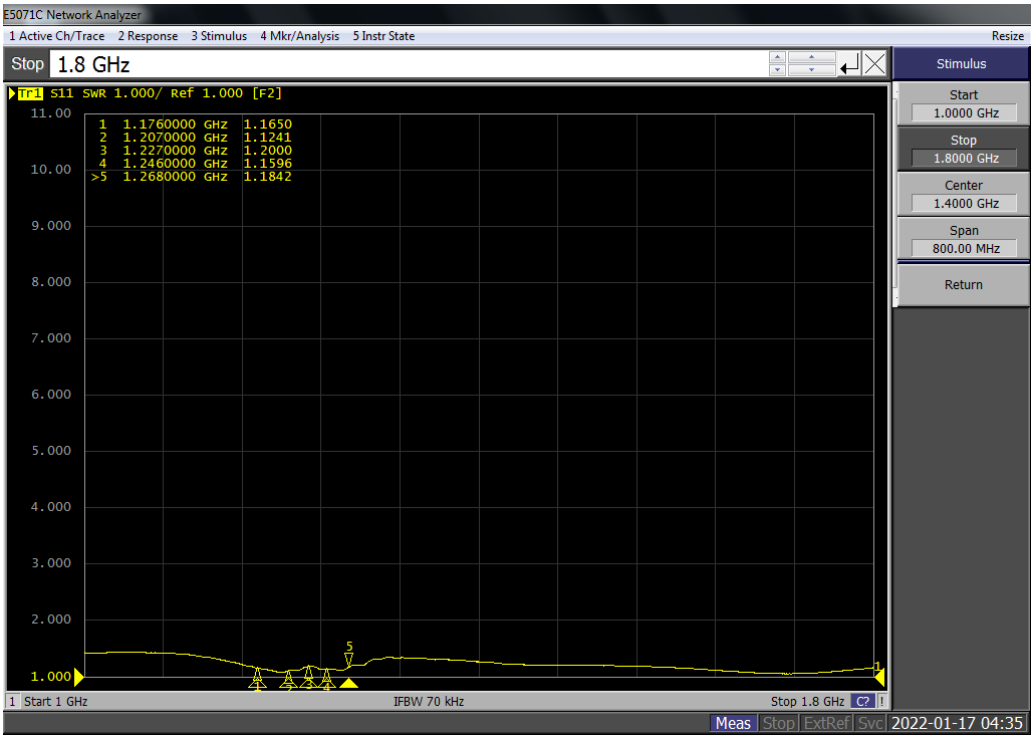
Passive Electrical Specifications	
Frequency Range	1166–1227 MHz, 1559–1606 MHz
Input Impendence	50 Ω
VSWR	≤ 2
Peak Gain	< 6.0 dBi
Axial Ratio	< 3 dB
Polarization Type	RHCP
LNA Electrical Properties	
Gain	17 ±2 dB
Noise Figure	< 1.5 dB
Output VSWR	< 2.0
Input VSWR	< 2.0
Voltage	DC 3–12 V
Current	19 mA
Impedance	50 Ω
Mechanical Specifications	
Antenna Size	Φ 146.4 mm × 65 mm
Cable Type & Length	RG58 Black & 4000mm
Casing	ASA
Connector Type	Antenna: TNC Female Cable: SMA Male to TNC Male
Working Temperature	-40 °C to +85 °C
IP Rating	IP67
Color	White
Weight	Typ. 1258 g
Mounting Type	Thread and Magnet

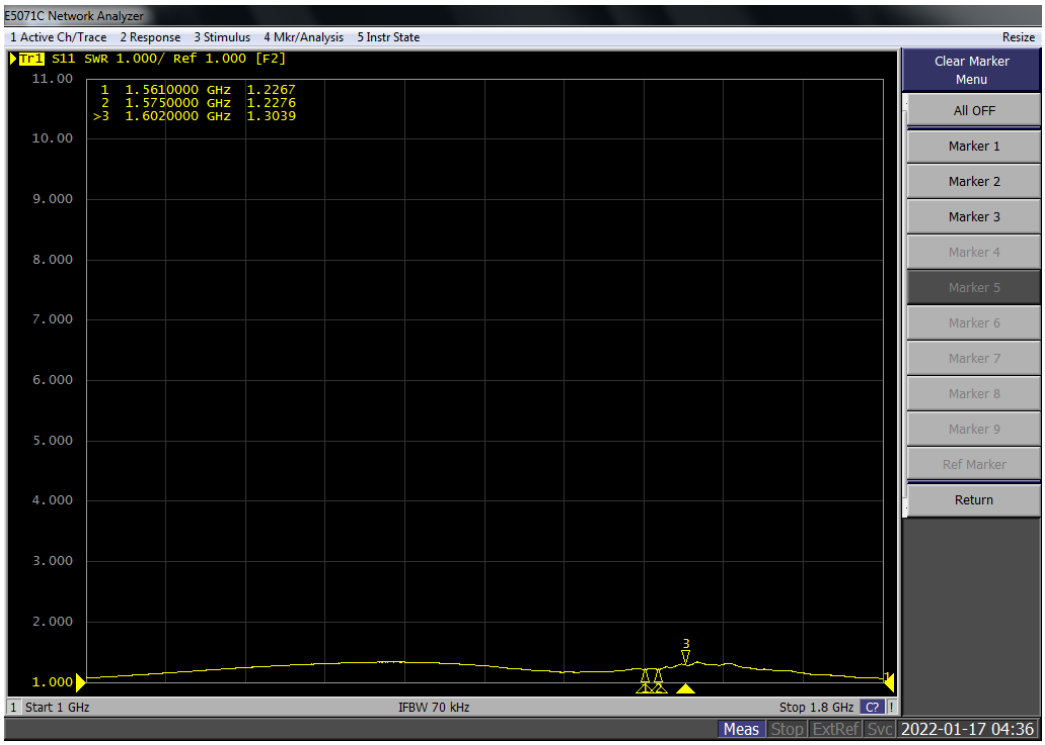
5 Overall Performance

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

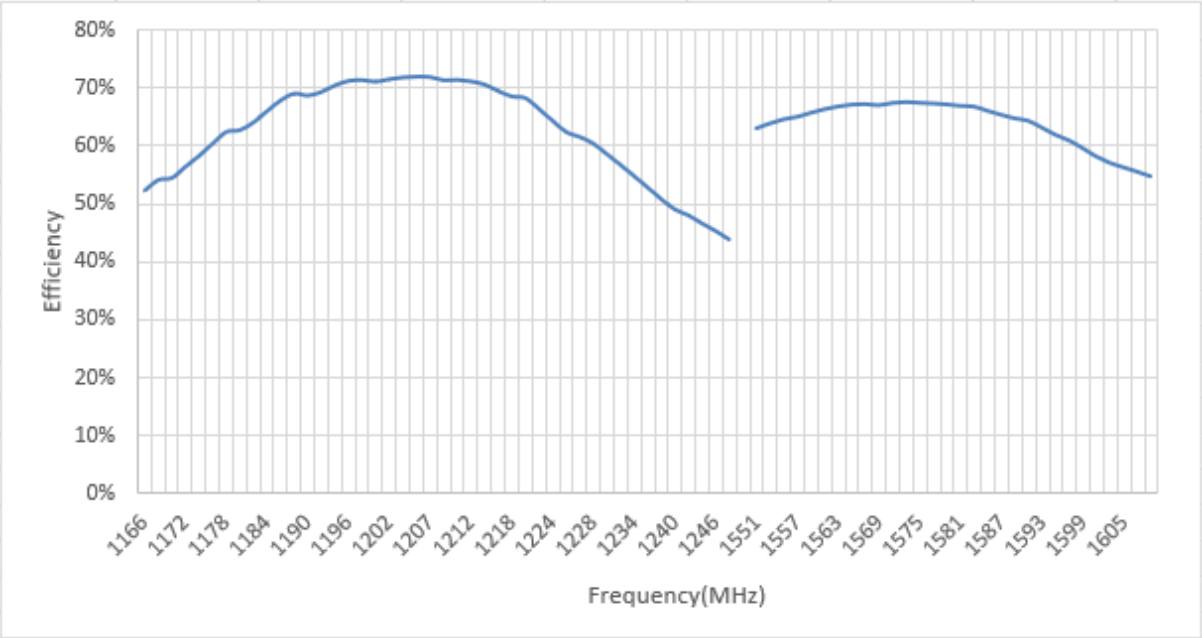
5.2. VSWR





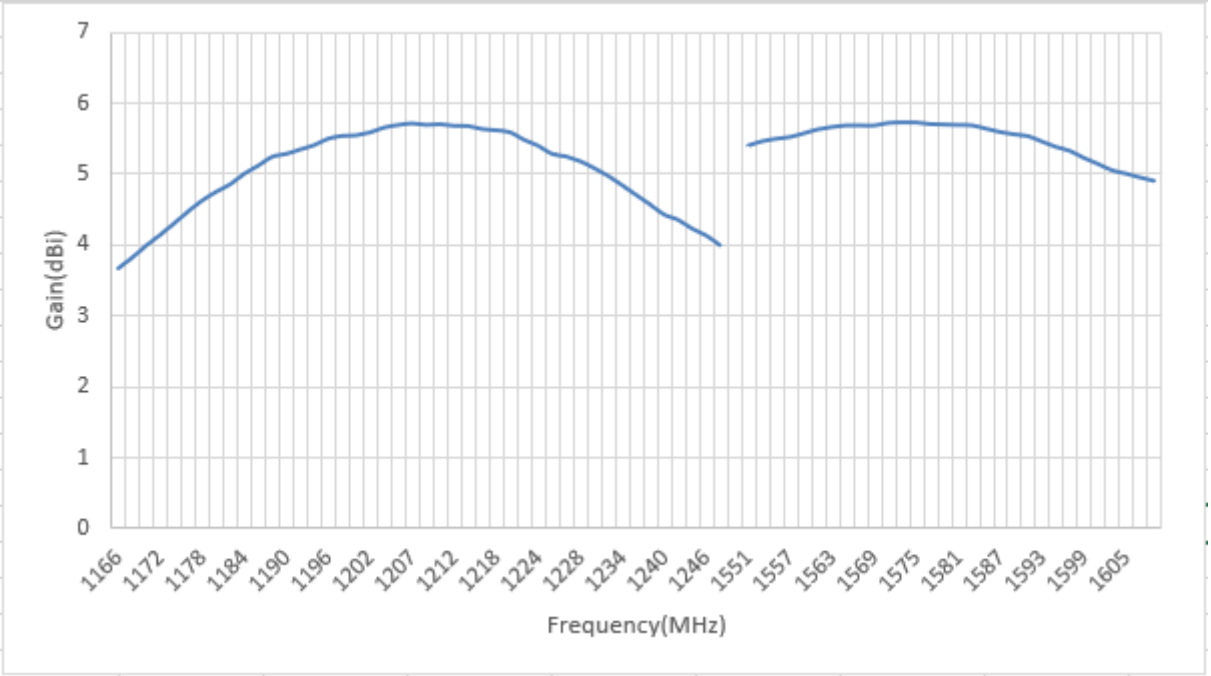
Frequency (MHz)	1176	1207	1227	1561	1575	1601
VSWR	1.16	1.12	1.2	1.22	1.22	1.3

5.3. Efficiency



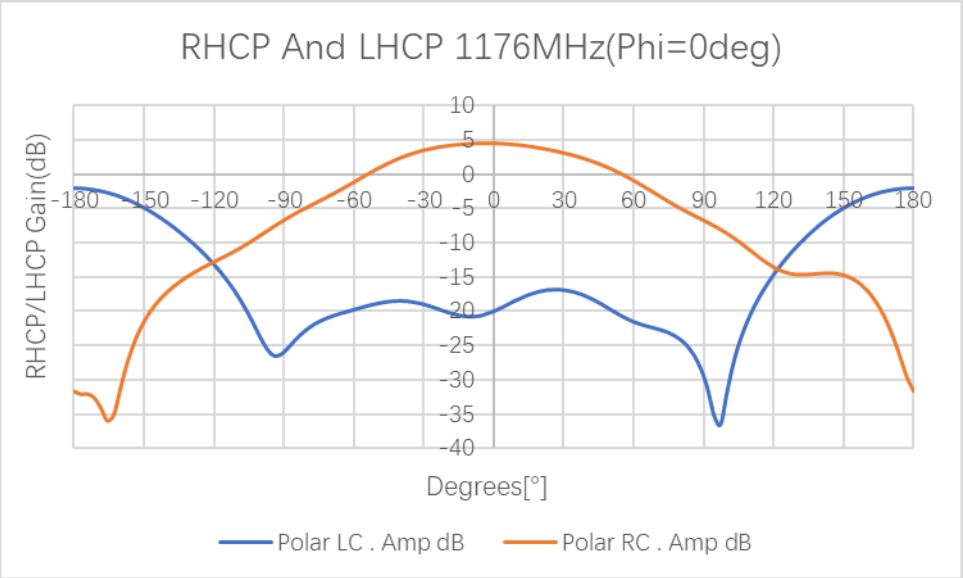
Frequency (MHz)	1176	1207	1227	1561	1575	1602
Efficiency (%)	60	72	62	66	67	58

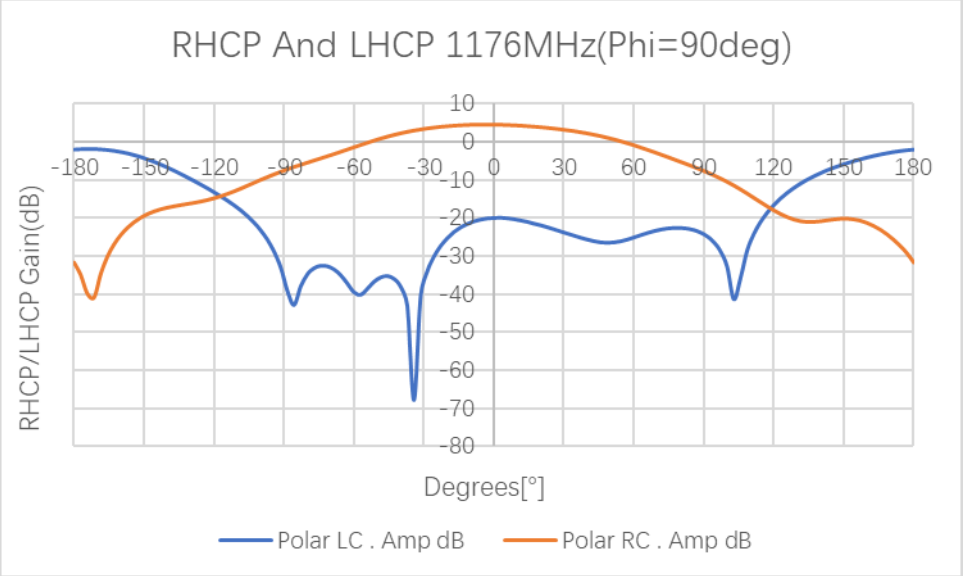
5.4. Gain

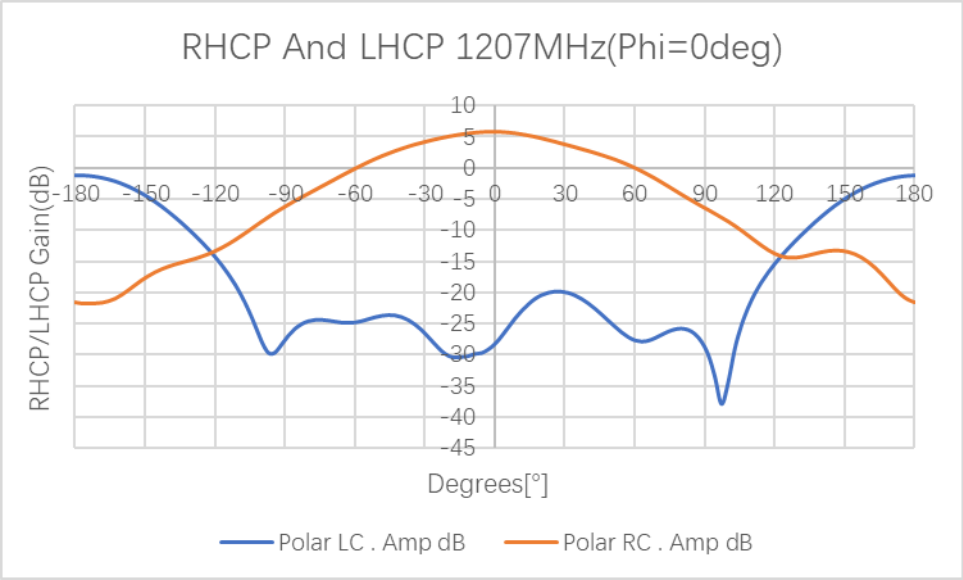


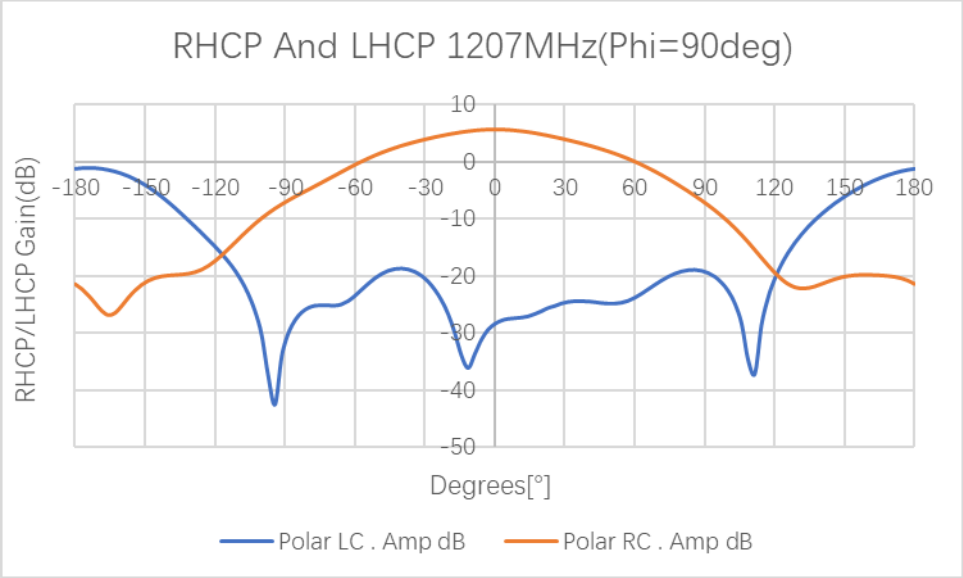
Frequency (MHz)	1176	1207	1227	1561	1575	1602
Gain (dBi)	4.47	5.7	5.25	5.64	5.74	5.14

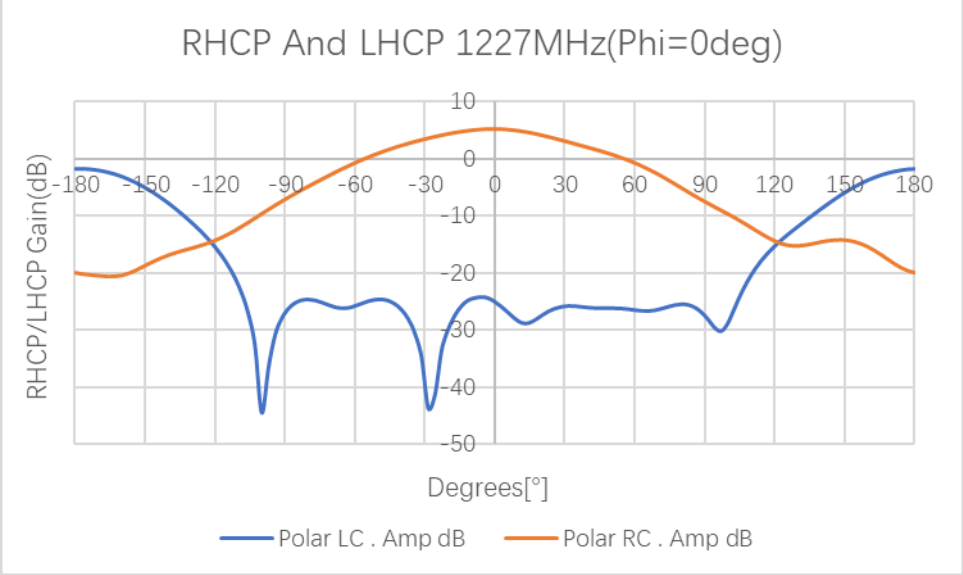
5.5. 2D RHCP and LHCP Gain

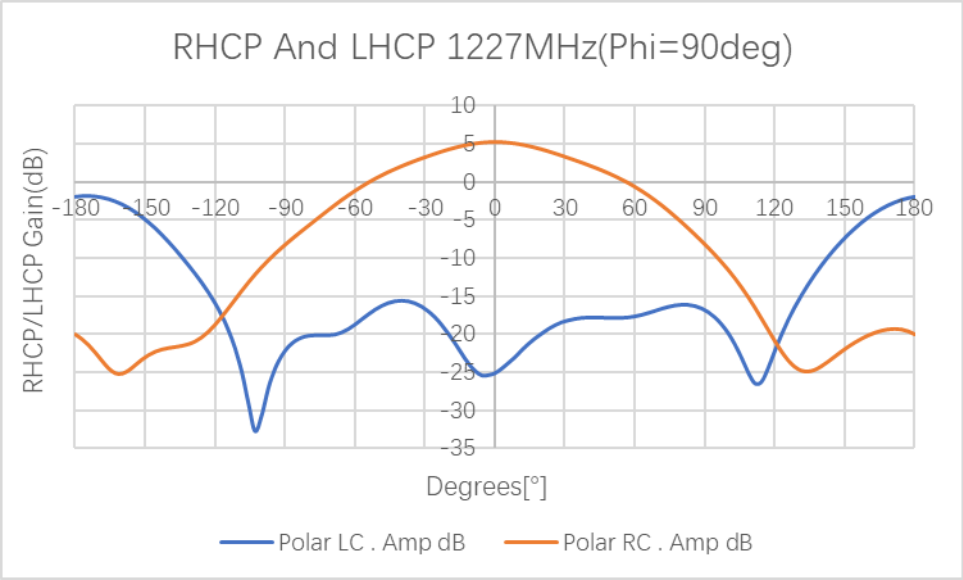


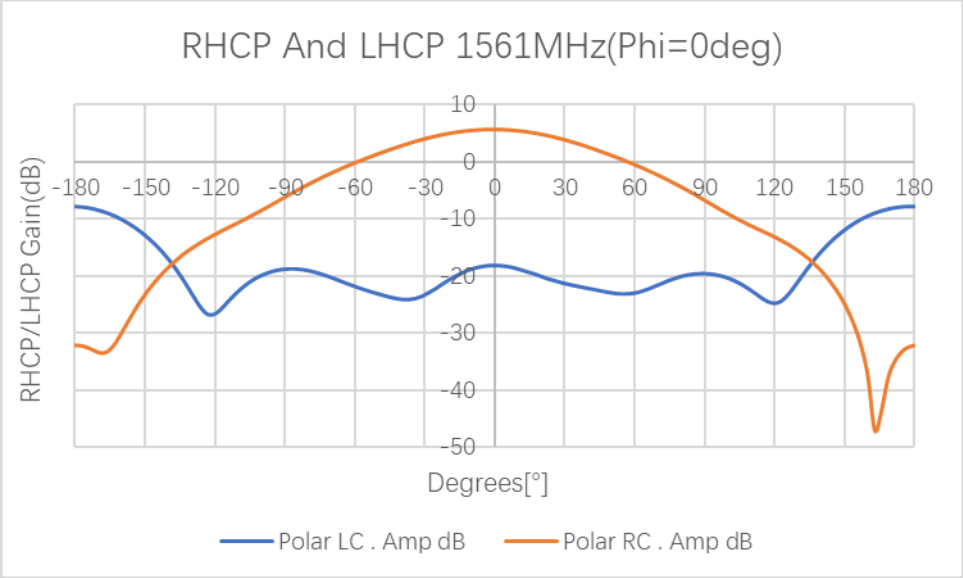


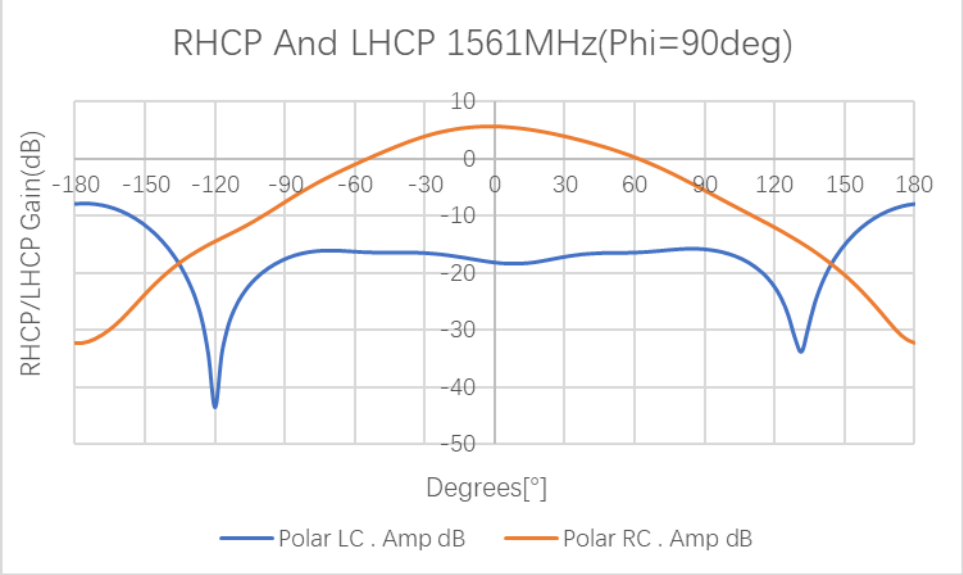

RHCP And LHCP 1207MHz(Phi=0deg)
RHCP/LHCP Gain(dB)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

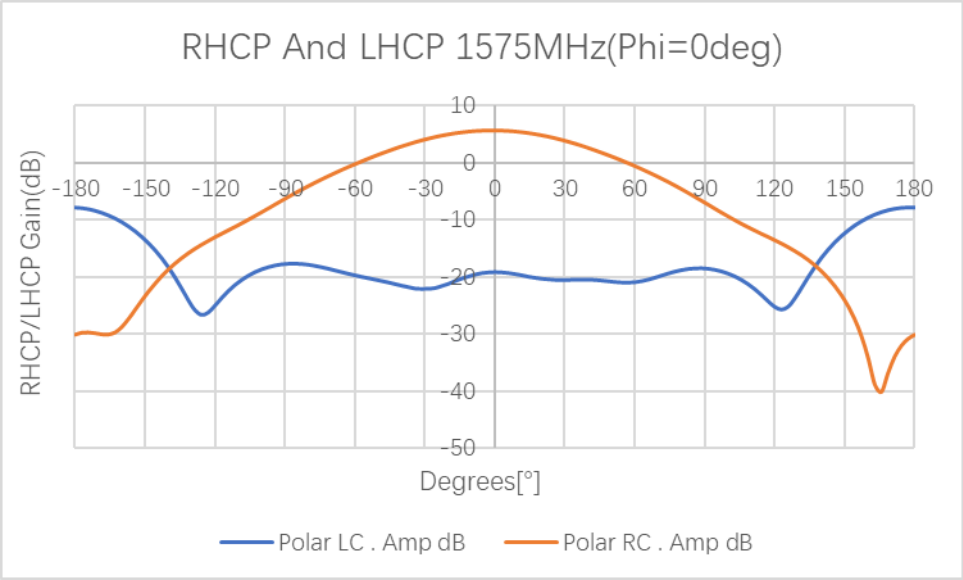

RHCP And LHCP 1207MHz(Phi=90deg)
RHCP/LHCP Gain(dB)
10
0
-10
-20
-30
-40
-50
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

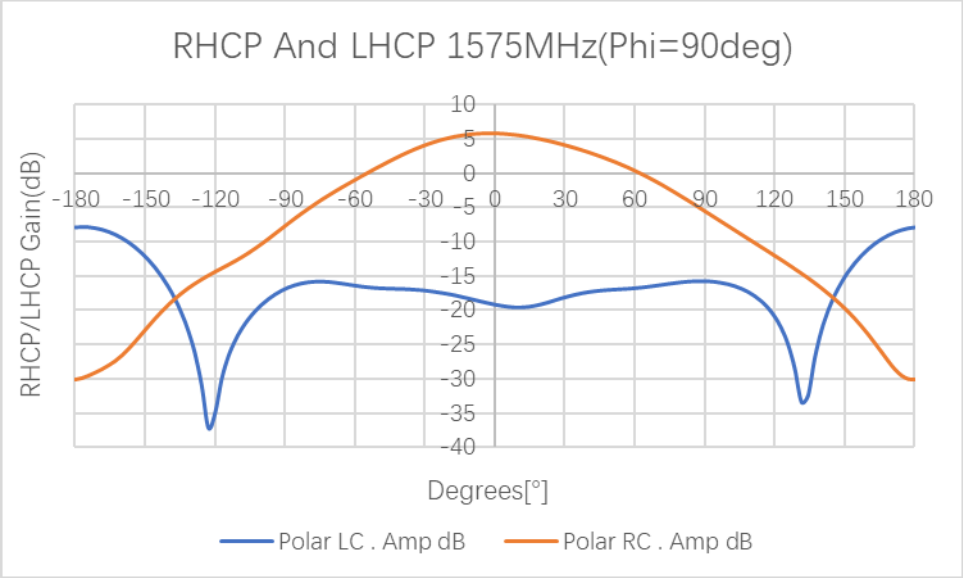

RHCP And LHCP 1227MHz(Phi=0deg)
RHCP/LHCP Gain(dB)
10
0
-10
-20
-30
-40
-50
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

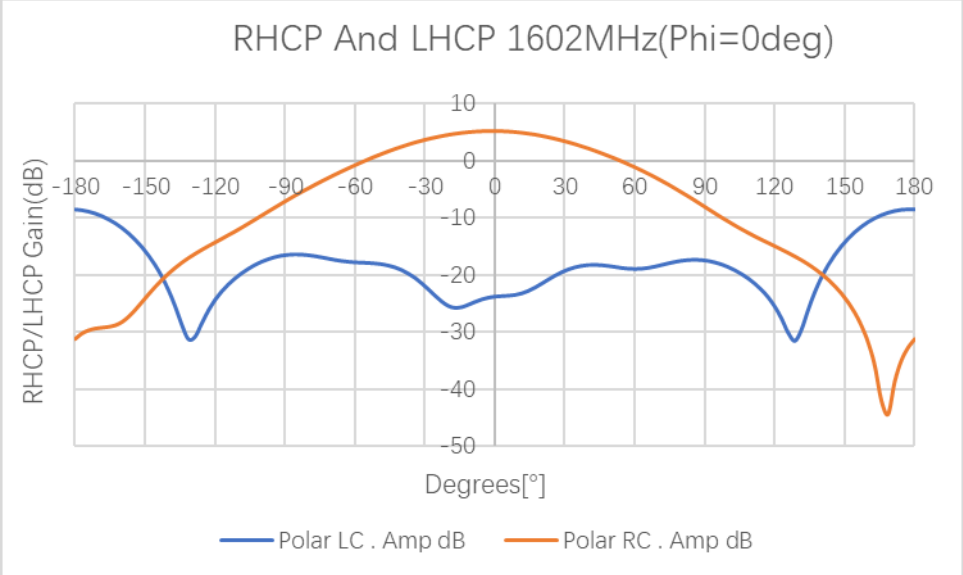

RHCP And LHCP 1227MHz(Phi=90deg)
RHCP/LHCP Gain(dB)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

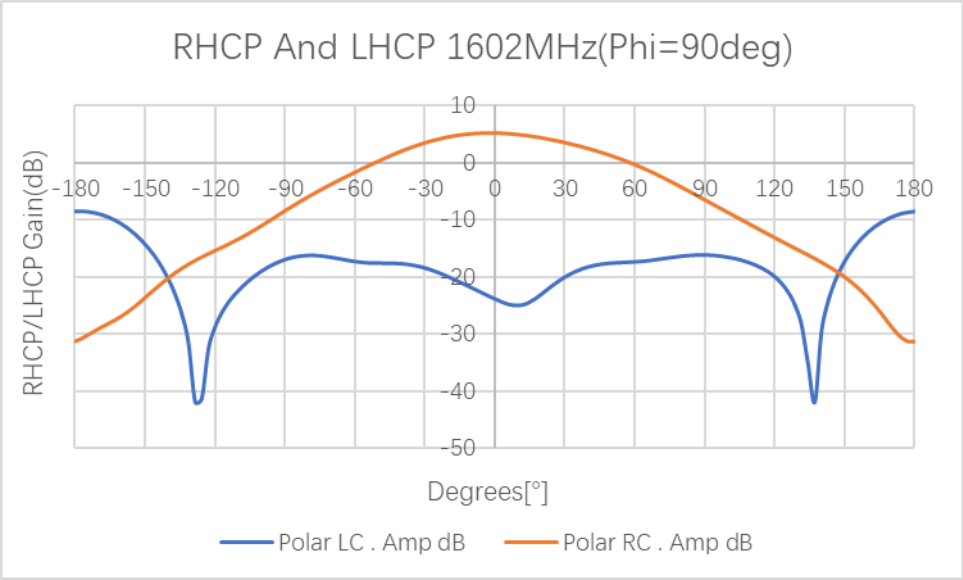

RHCP And LHCP 1561MHz(Phi=0deg)
RHCP/LHCP Gain(dB)
10
0
-10
-20
-30
-40
-50
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB


RHCP And LHCP 1561MHz(Phi=90deg)
RHCP/LHCP Gain(dB)
10
0
-10
-20
-30
-40
-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=0deg)
RHCP/LHCP Gain(dB)
10
0
-10
-20
-30
-40
-50
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

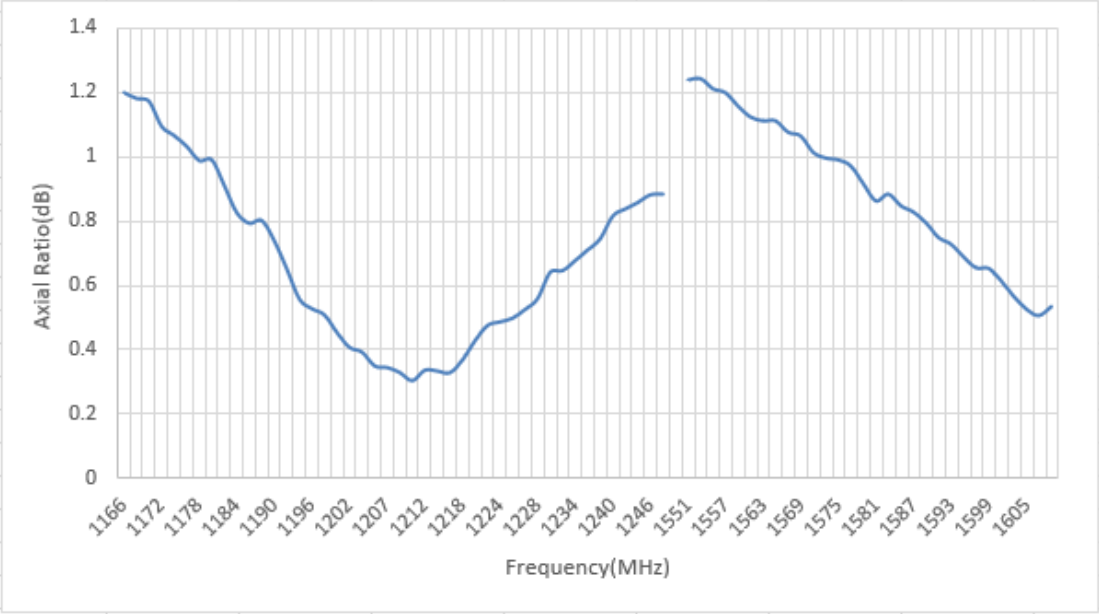

RHCP And LHCP 1575MHz(Phi=90deg)
RHCP/LHCP Gain(dB)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB


RHCP And LHCP 1602MHz(Phi=0deg)
RHCP/LHCP Gain(dB)
10
0
-10
-20
-30
-40
-50
-180 -150 -120 -90 -60 -30 0 30 60 90 120 150 180
Degrees[°]
Polar LC . Amp dB
Polar RC . Amp dB

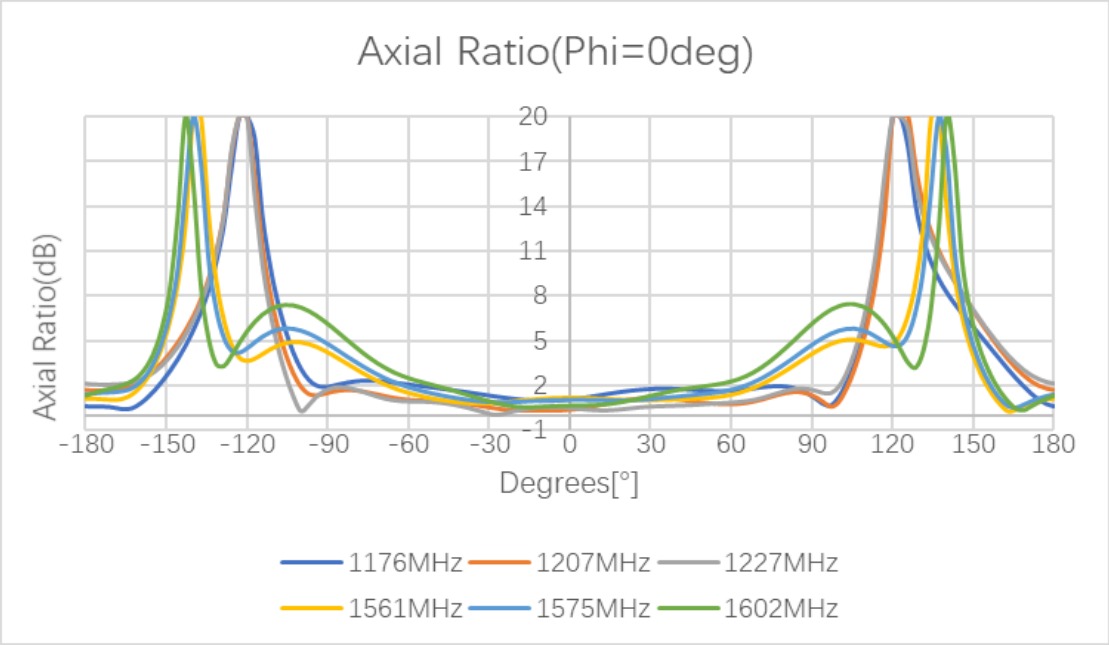


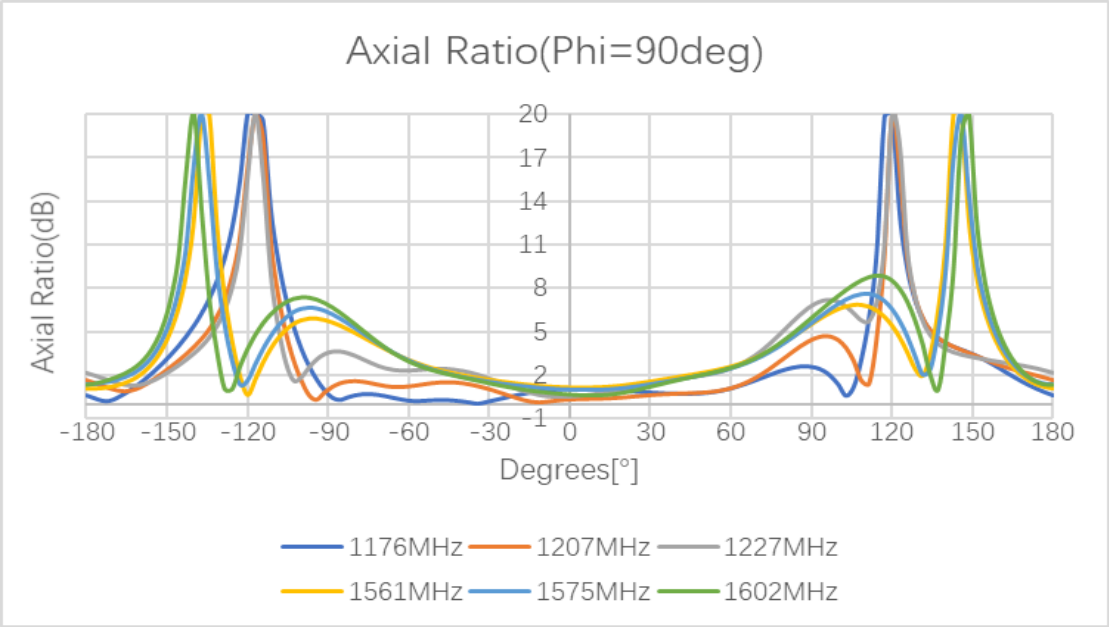
Frequency (MHz)	1176	1207	1227	1561	1575	1601
RC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	4.43	5.72	5.24	5.62	5.72	5.13
RC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	4.43	5.72	5.24	5.62	5.72	5.13
LC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	-20.08	-28.29	-25.12	-18.16	-19.15	-23.88
LC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	-20.08	-28.29	-25.12	-18.16	-19.15	-23.88

5.6. Axial Ratio



5.7. Axial Ratio in XOZ/YOZ

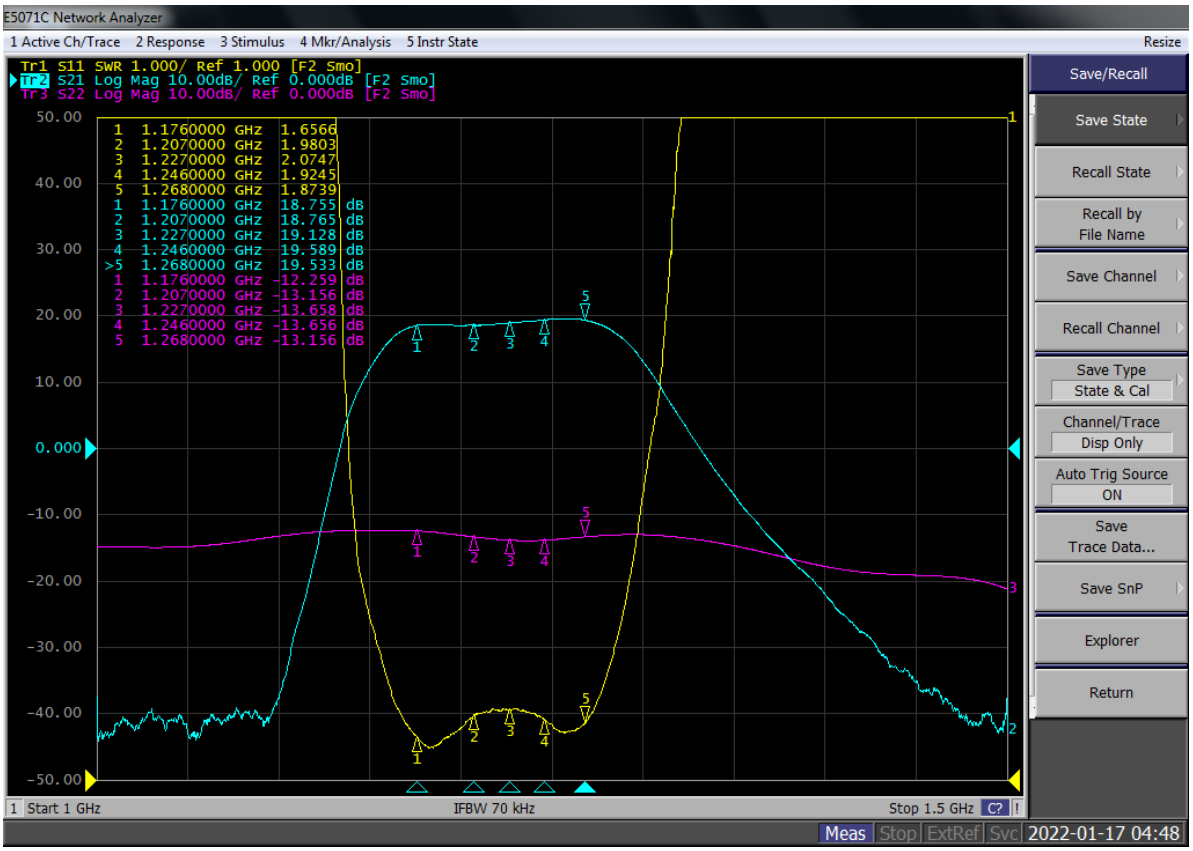


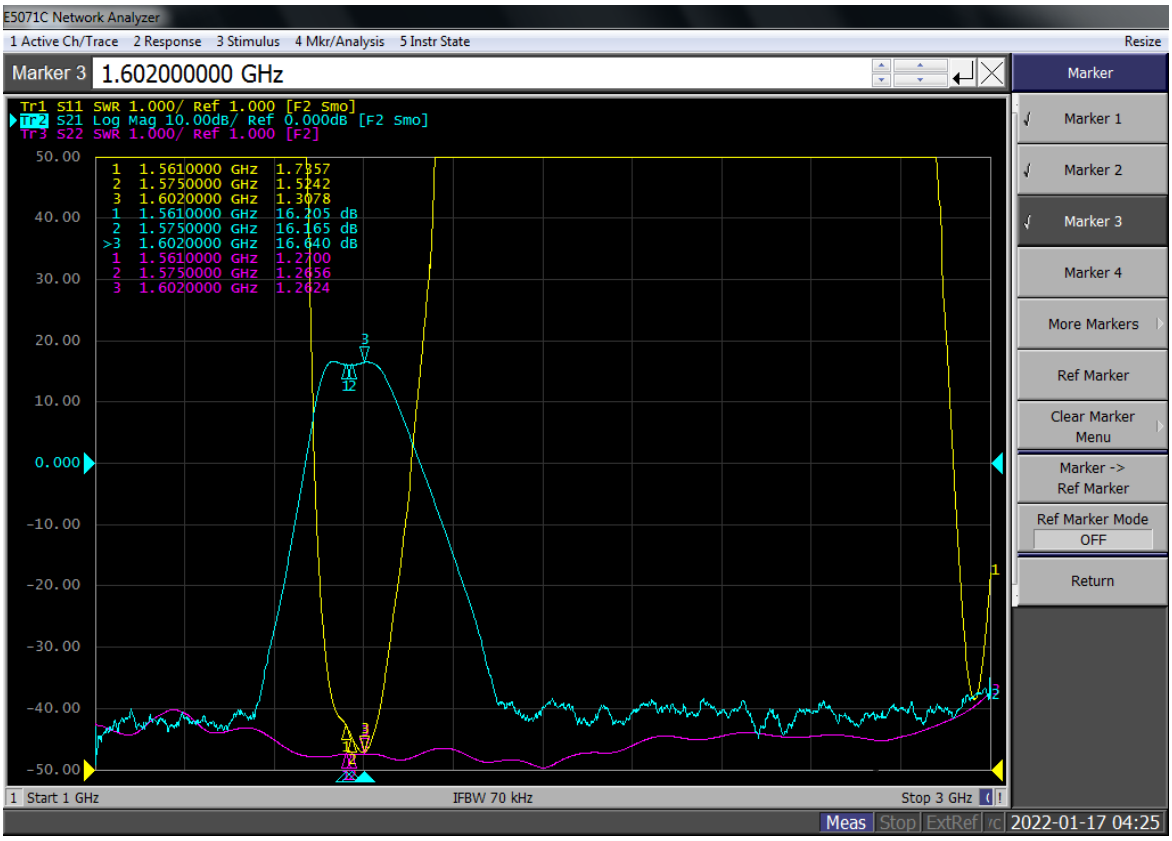


Frequency (MHz)	1176	1207	1227	1561	1575	1602
AR (dB) Phi = 0 (deg) Theta = 0 (deg)	1.03	0.35	0.53	1.12	0.99	0.61
AR (dB) Phi = 90 (deg) Theta = 0 (deg)	1.03	0.35	0.53	1.12	0.99	0.61

5.8. Active Performance

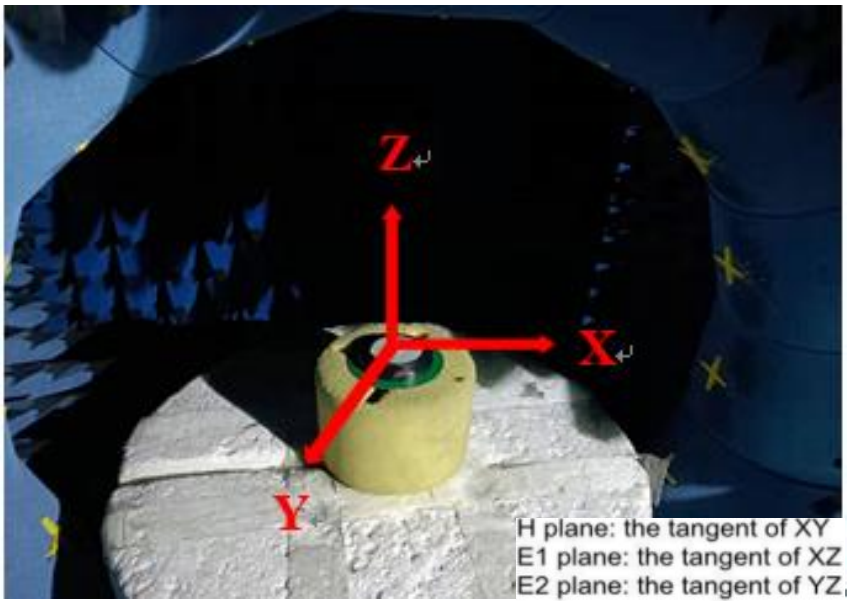
- **LNA Gain**

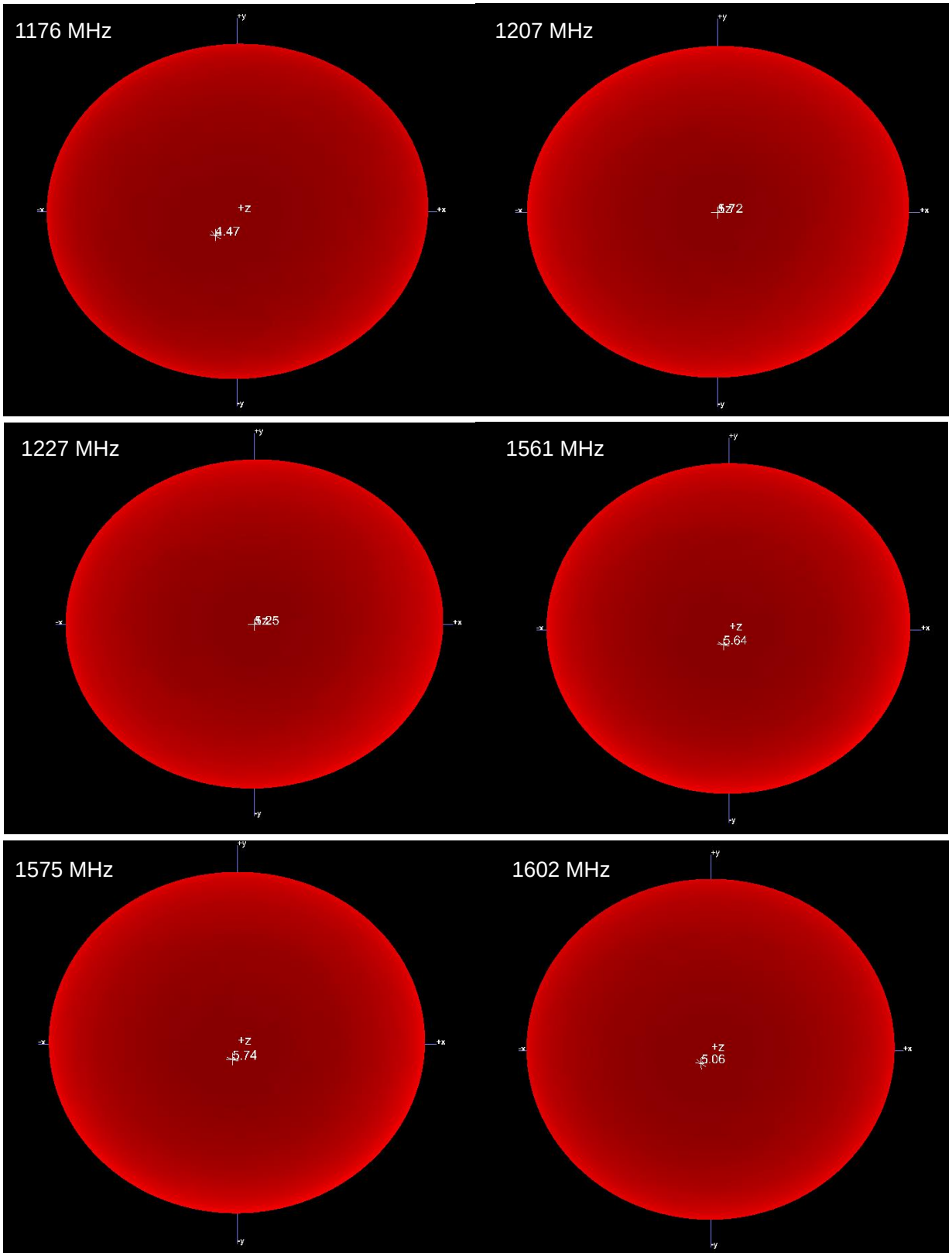




Frequency (MHz)	1176	1207	1227	1561	1575	1602
LNA Gain (dB)	18.75	18.76	19.17	16.2	16.16	16.64

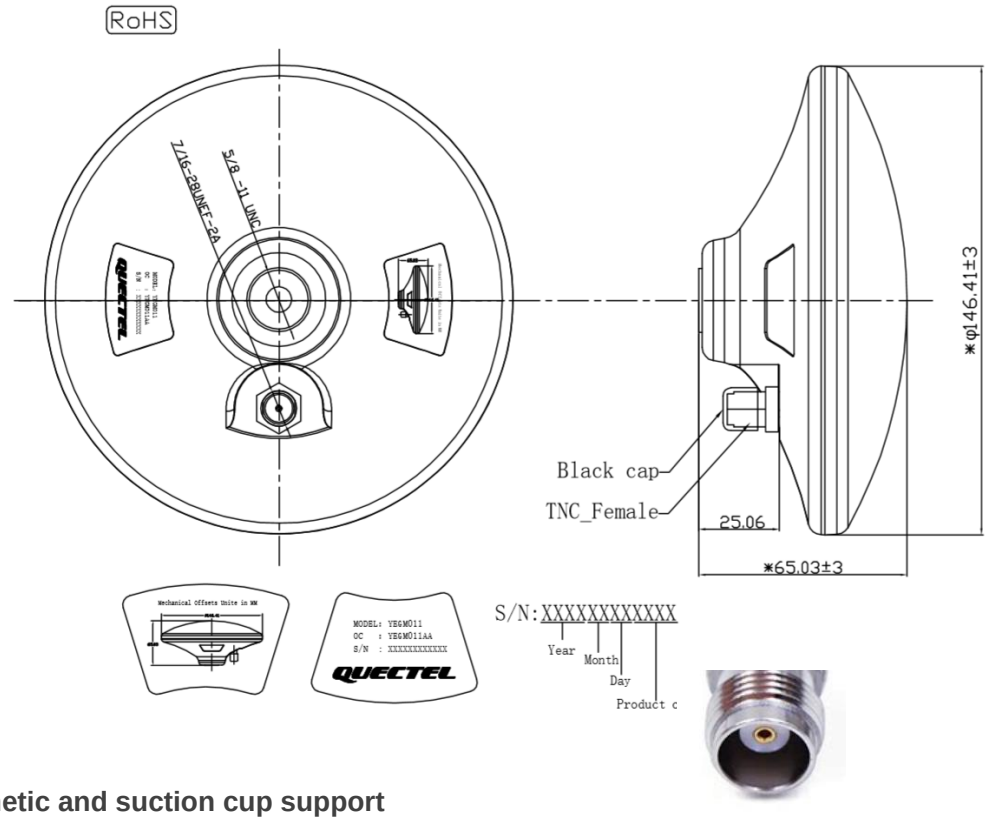
5.9. Radiation Pattern



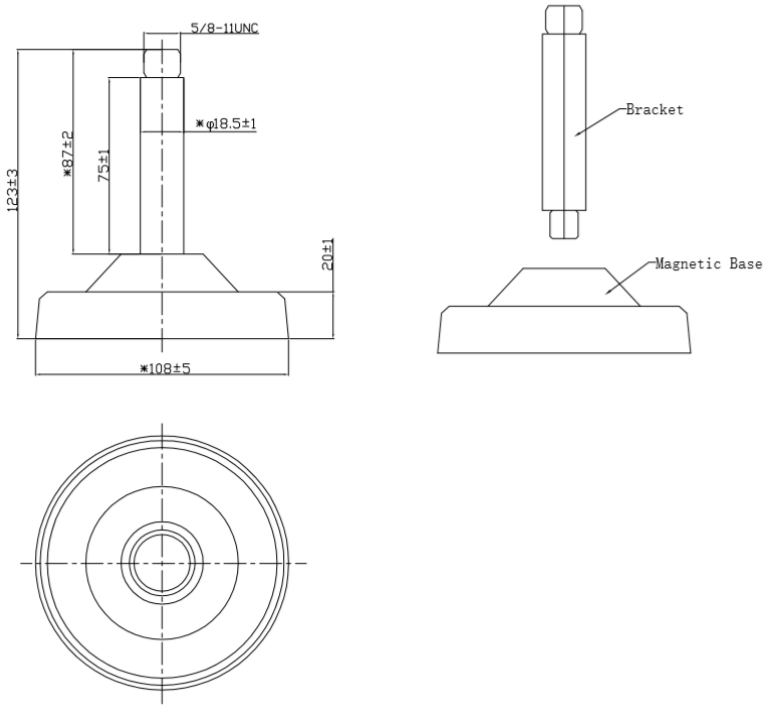

1176 MHz
+z
4.47
1207 MHz
+z
5.72
1227 MHz
+z
5.25
1561 MHz
+z
5.64
1575 MHz
+z
5.74
1602 MHz
+z
5.06

6 Product Size

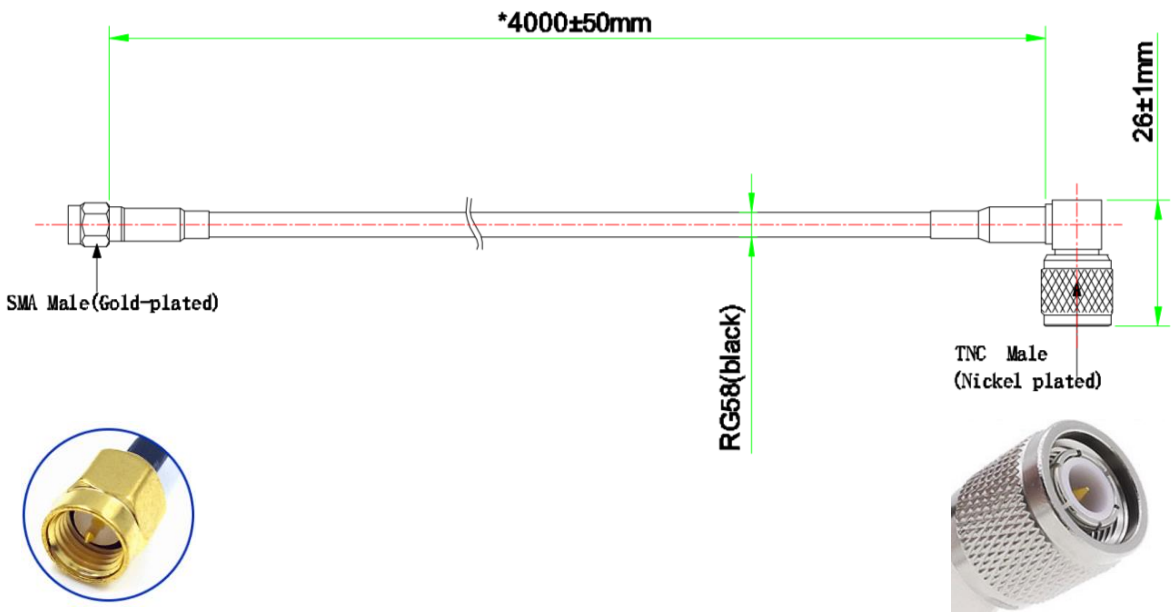
- **Antenna**



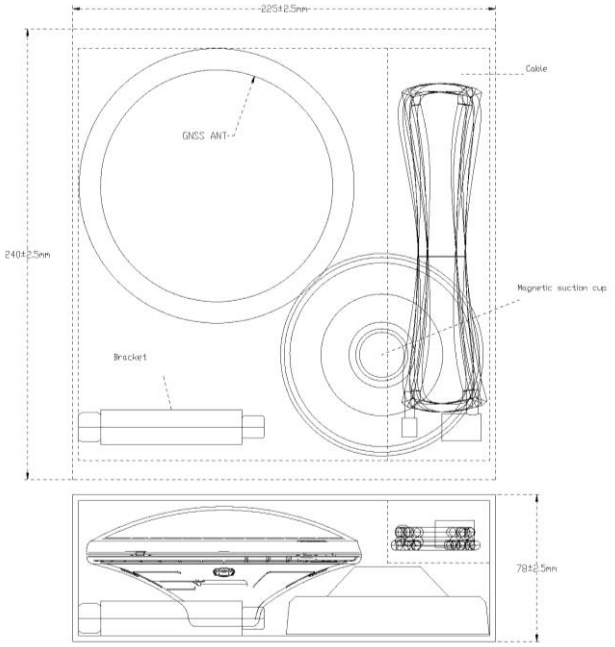
- **Magnetic and suction cup support**

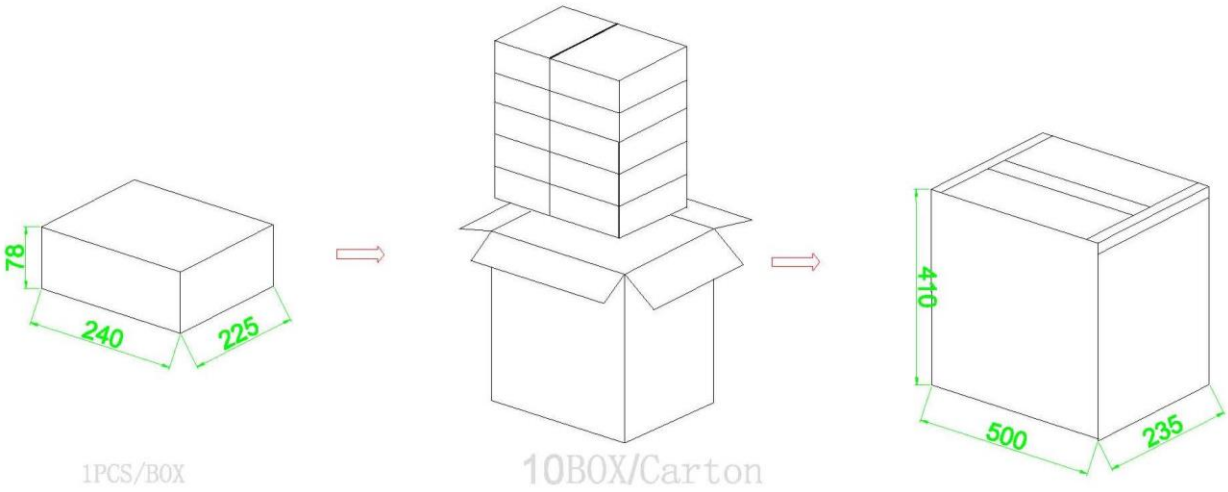


- Cable


*4000±50mm
26±1mm
SMA Male(Gold-plated)
RG58(black)
TNC Male
(Nickel plated)

7 Packaging


225±2.5mm
240±2.5mm
GNSS ANT
Cable
Magnetic suction cup
Bracket
78±2.5mm


78
240
225
1PCS/BOX
10BOX/Carton
410
500
235