

Antenna

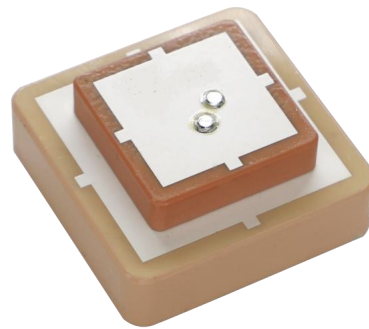
YCGA012AA Datasheet

Antenna Services

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About the Document

Revision History

Version	Date	Author	Note
-	2022-02-10	Kenny YIN/ Riona HAN	Creation of the document
1.0	2022-03-02	Kenny YIN/ Riona HAN	First official release
1.1	2022-04-02	Jun LI	Updated the drawing (Chapter 7).

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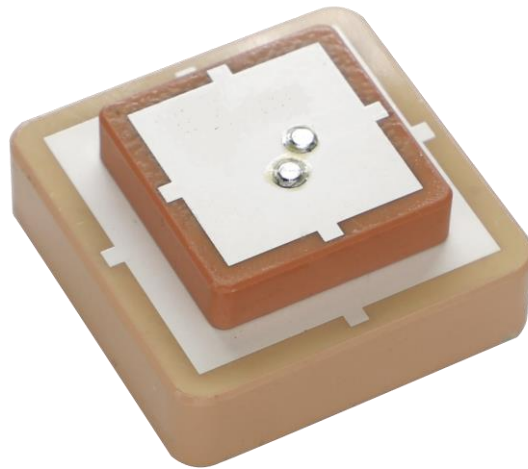
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1 Product Description

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

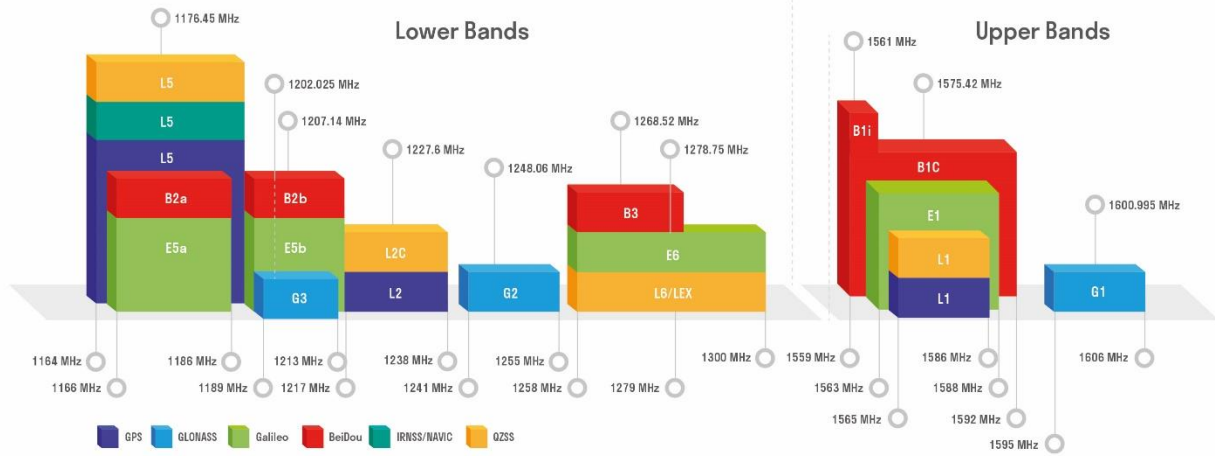
- GNSS L1 L5
- Compact Dual Feed Patch Element
- Excellent Performance



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



4 Product Specification

- 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
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
Casing	Ceramics
Connector Type	-
Working Temperature	-40 °C to +85 °C
Color	-

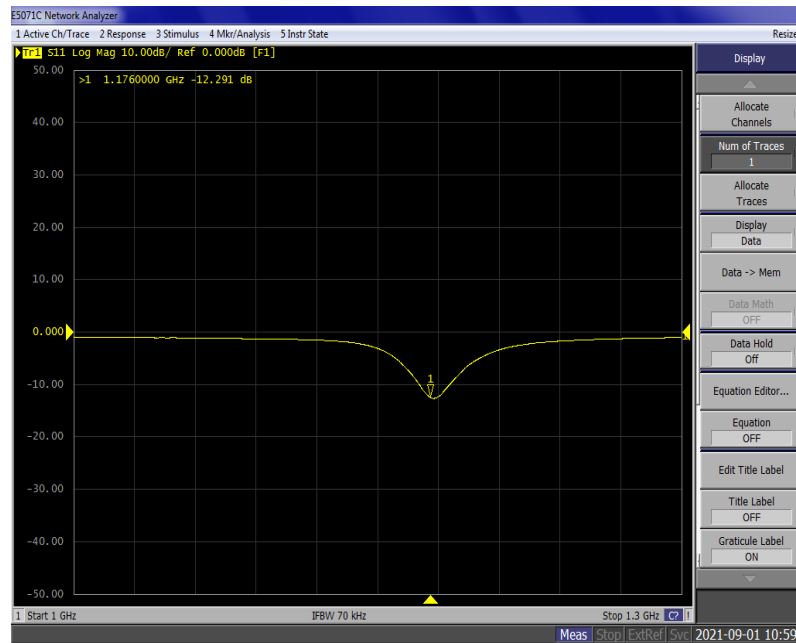
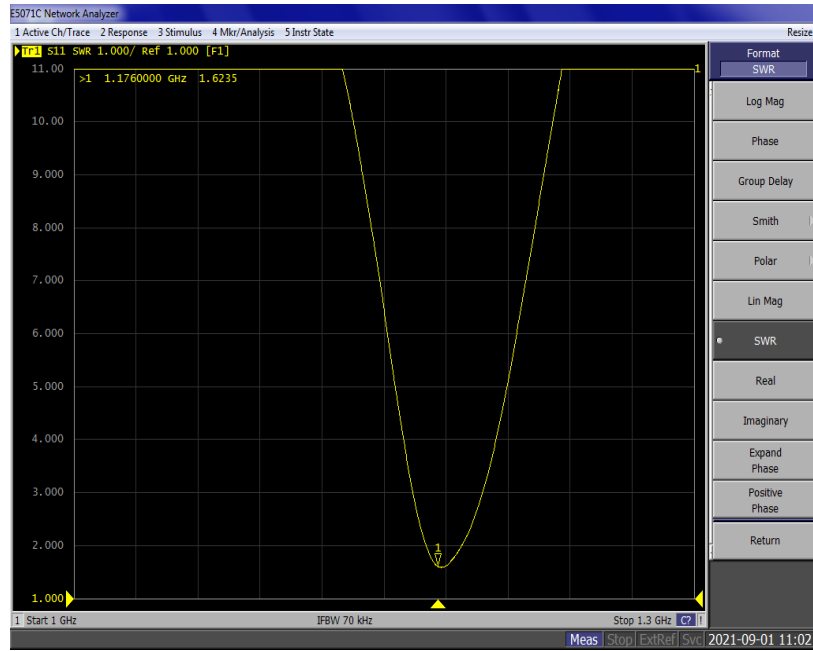
5 Overall Performance

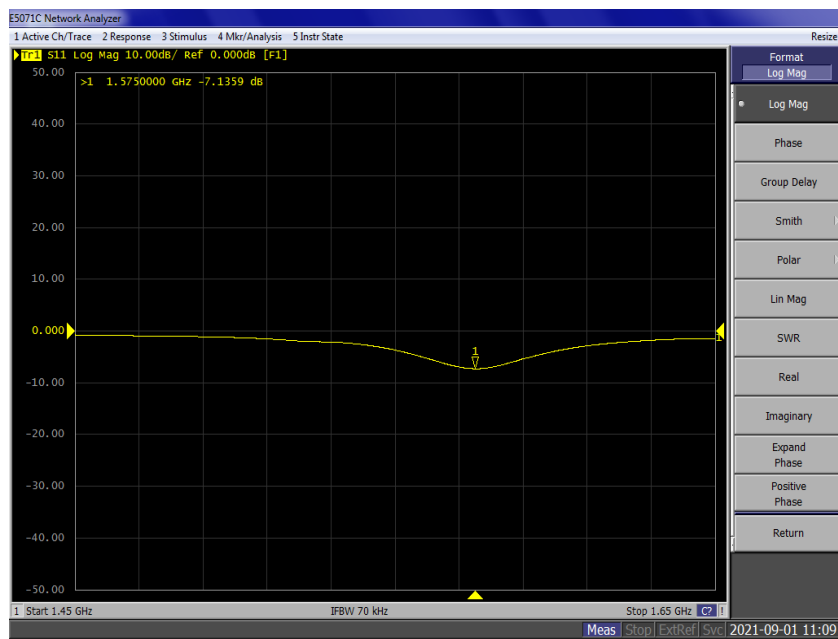
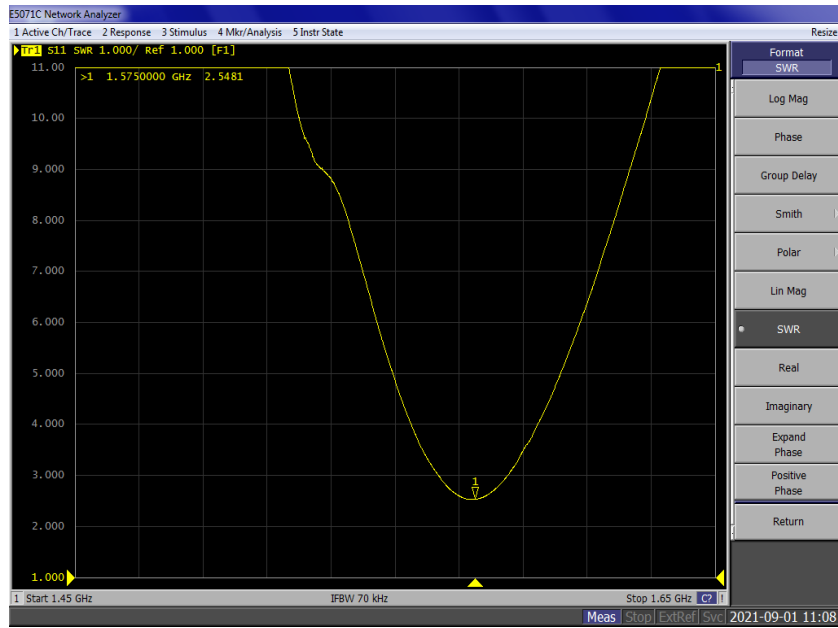
5.1 Test Environment

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



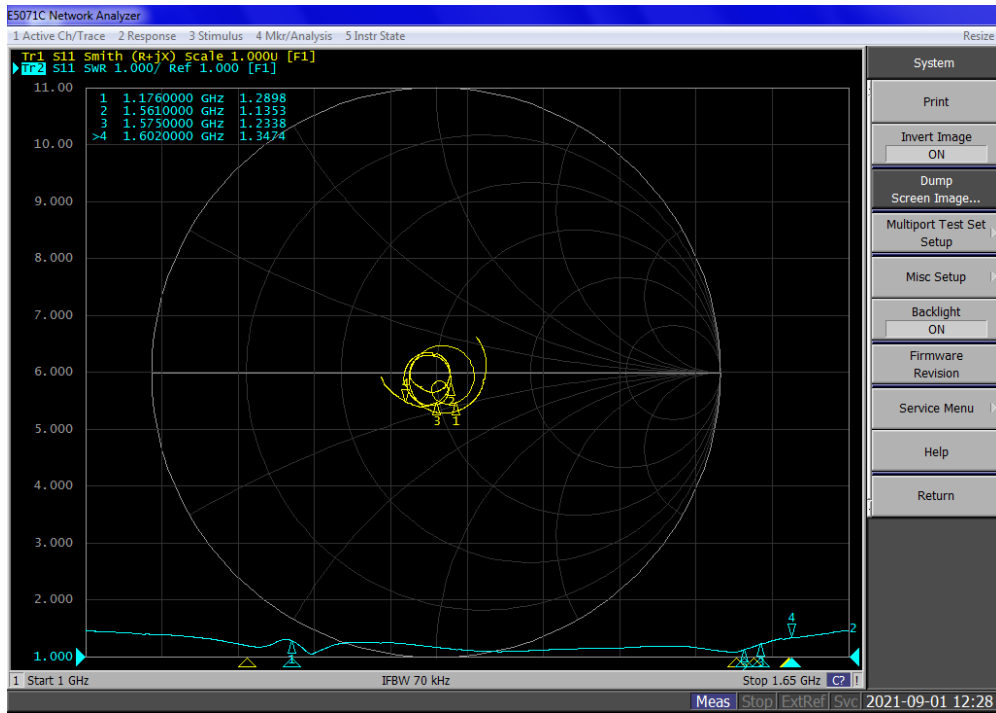
5.2 VSWR





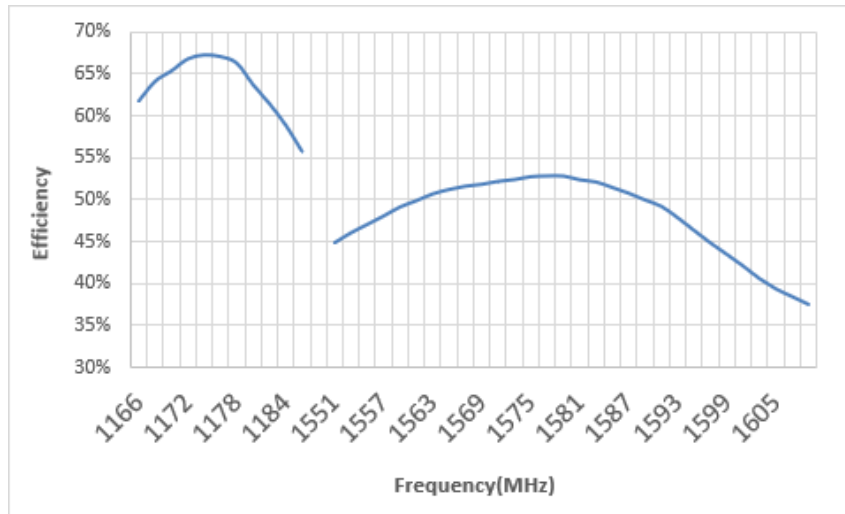
Frequency (MHz)	1176	1575
VSWR	1.62	2.54

5.3 VSWR After Hybrid Coupler



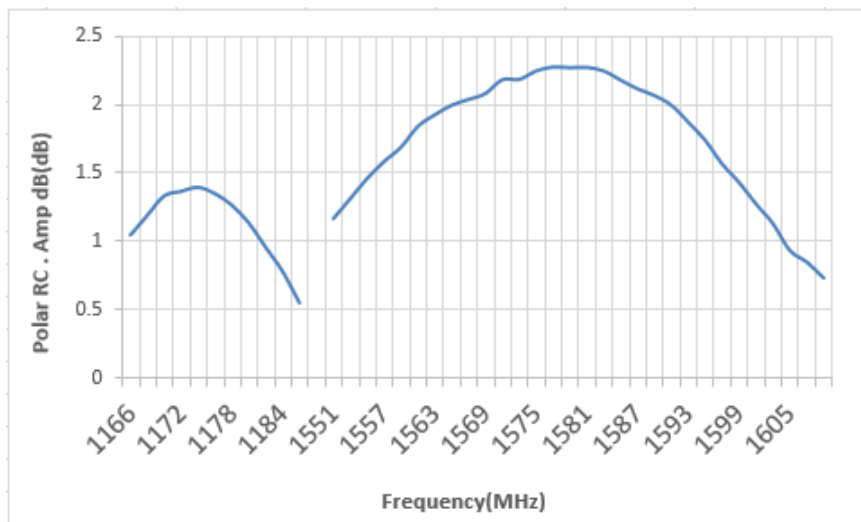
Frequency (MHz)	1176	1561	1575	1602
VSWR	1.29	1.13	1.23	1.34

5.4 Efficiency



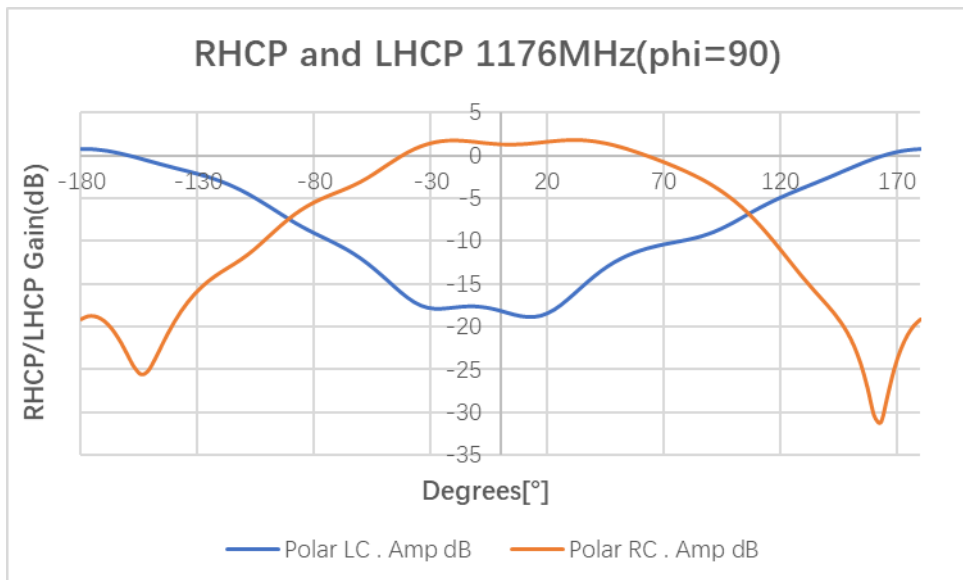
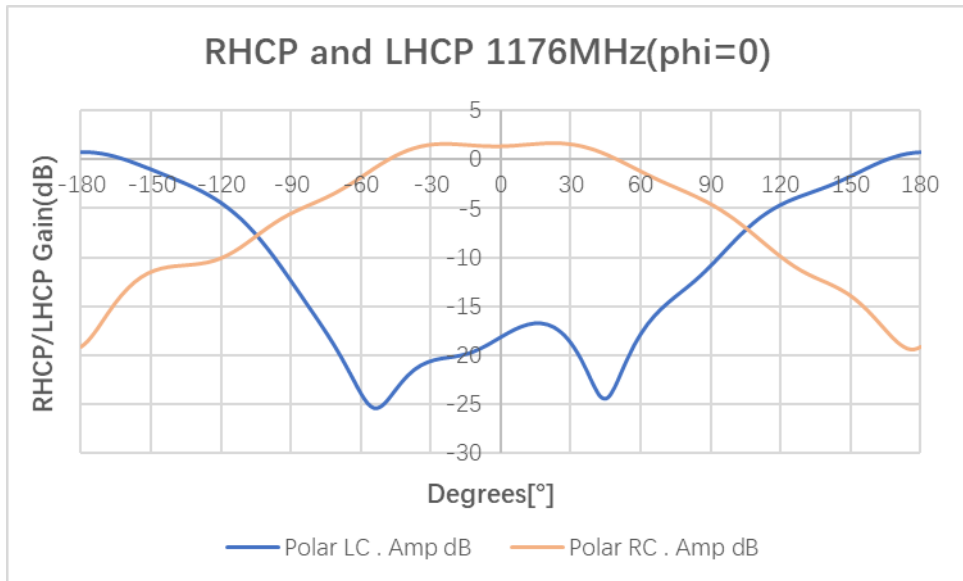
Frequency (MHz)	1176	1561	1575	1602
Efficiency (%)	67	50	53	42

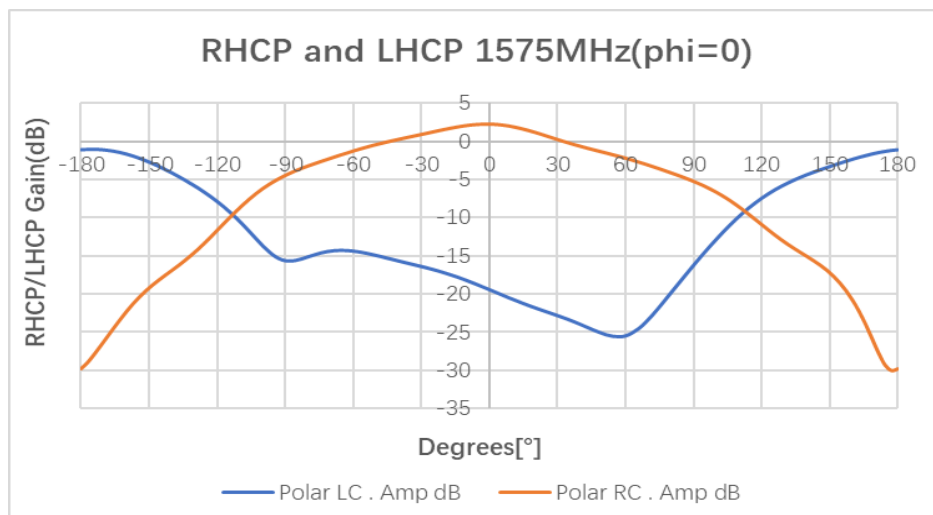
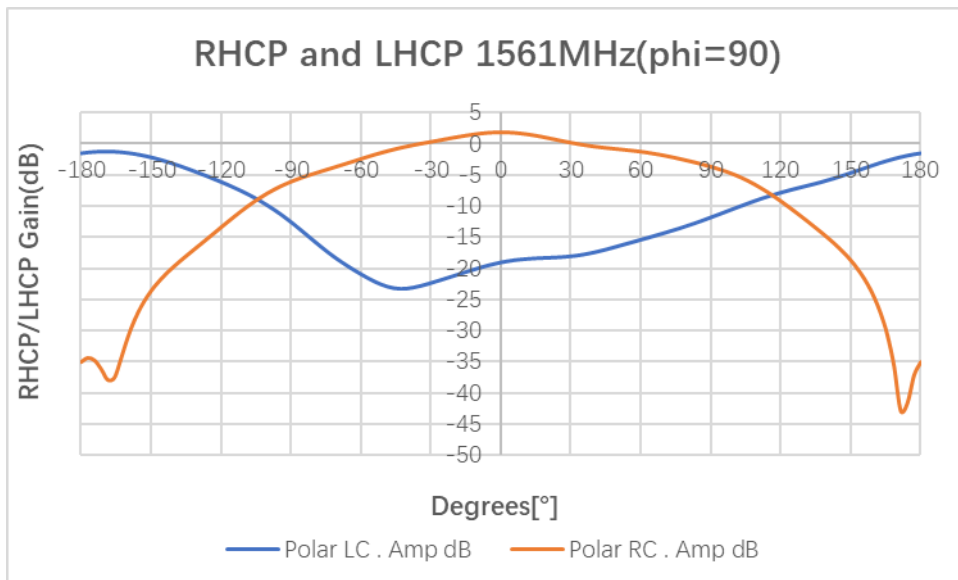
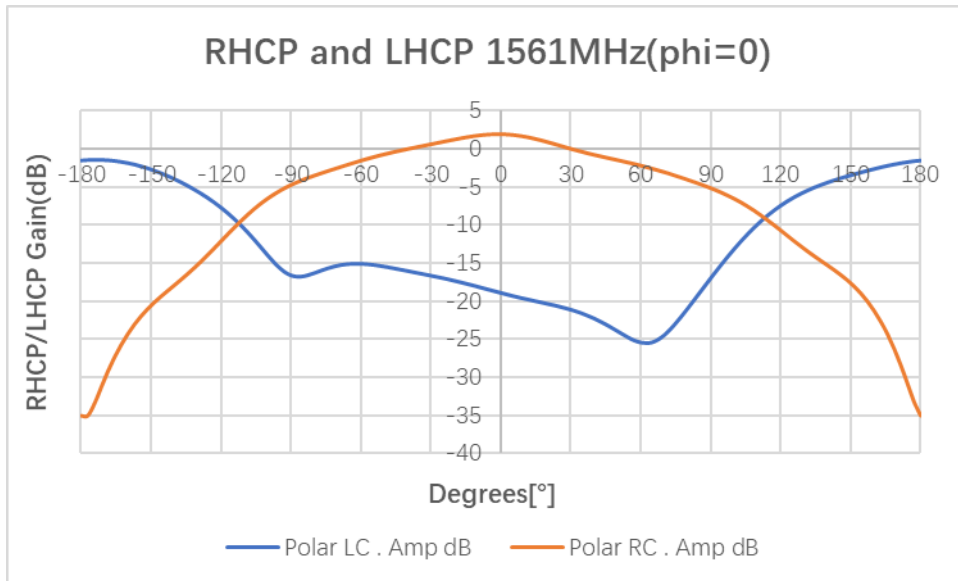
5.5 Gain

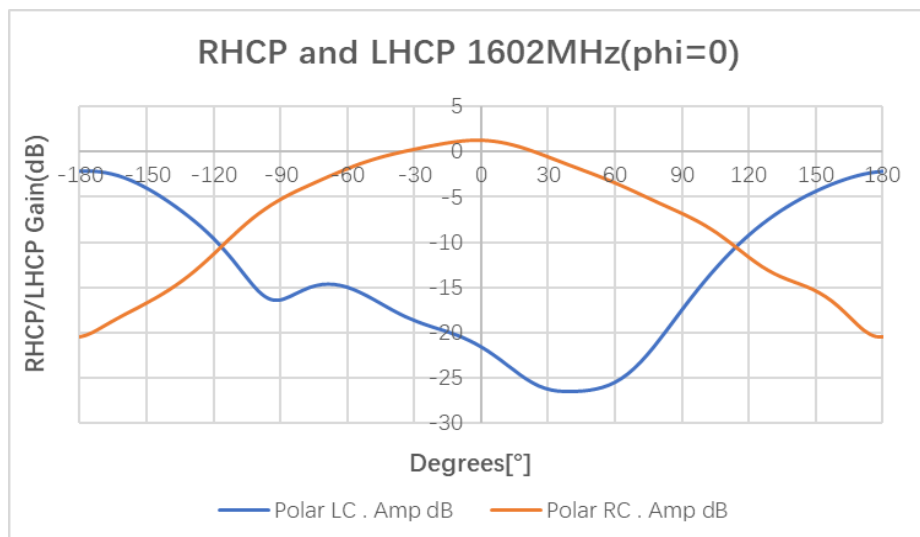
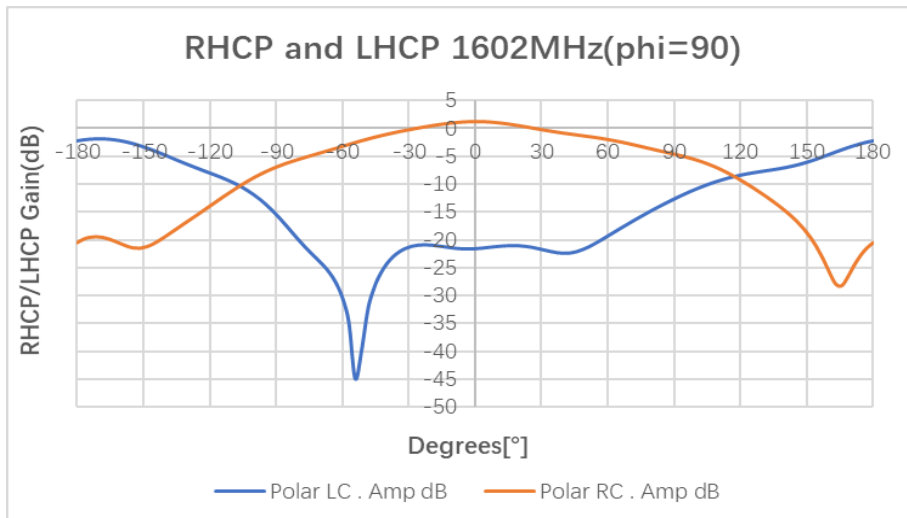
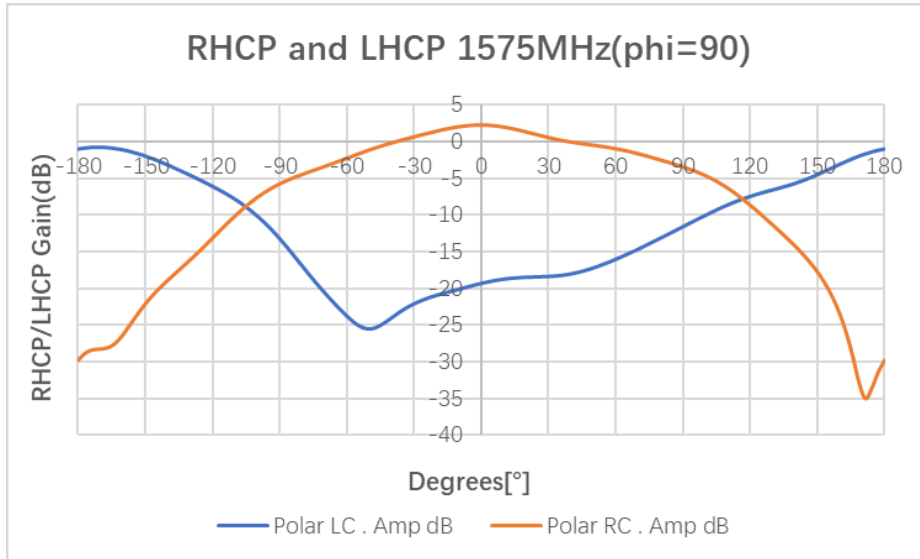


Frequency (MHz)	1176	1561	1575	1602
Gain (dBi)	1.35	1.84	2.24	1.27

5.6 2D RHCP and LHCP Gain

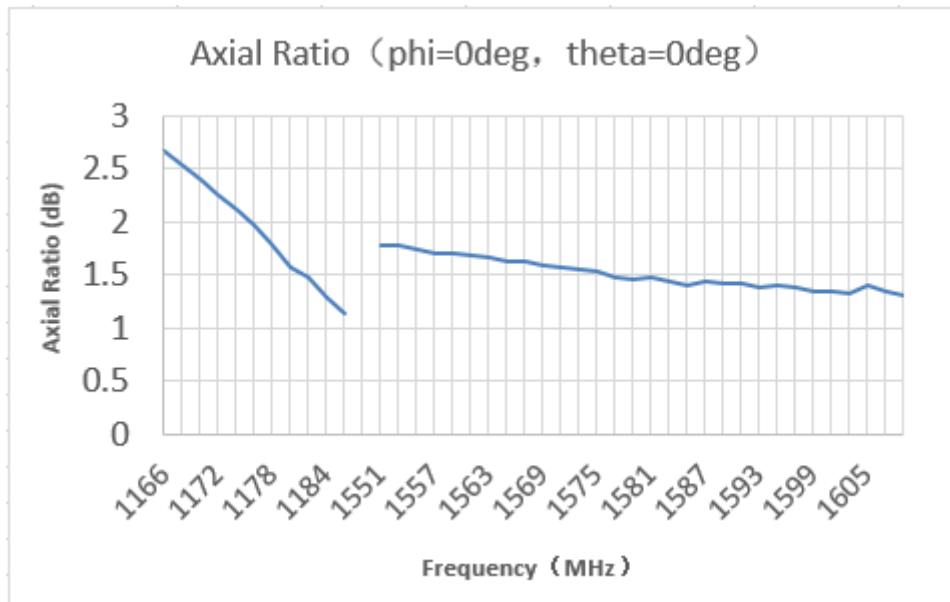




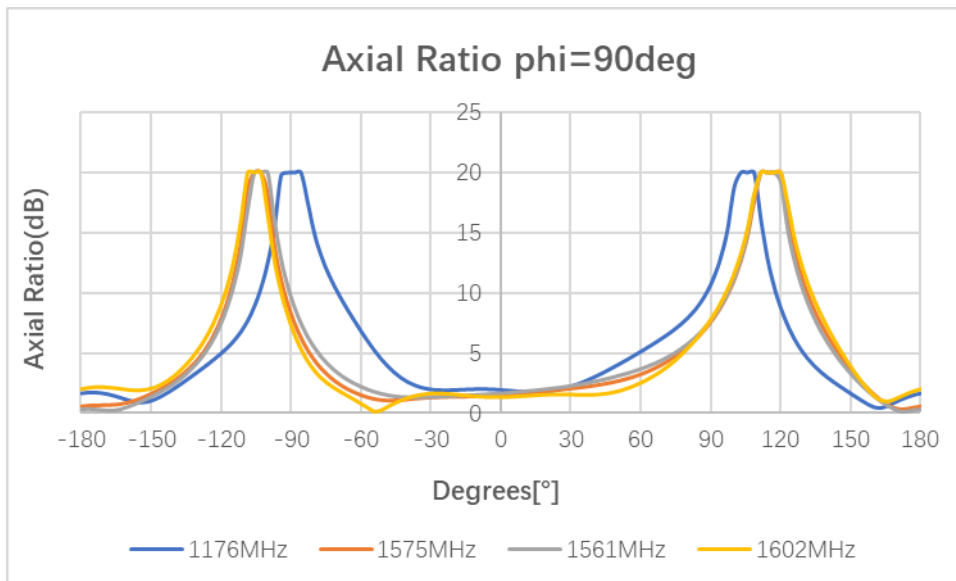
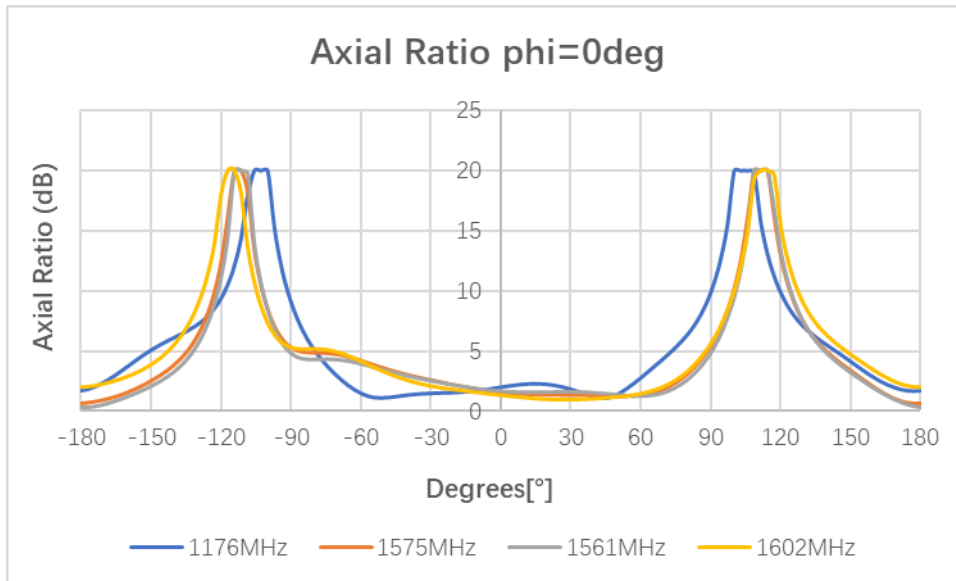


Frequency (MHz)	1176	1561	1575	1602
RC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	1.35	1.84	2.24	1.27
RC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	1.35	1.84	2.24	1.27
LC Gain (dB) Phi = 0 (deg) Theta = 0 (deg)	-18.15	-18.97	-19.38	-21.54
LC Gain (dB) Phi = 90 (deg) Theta = 0 (deg)	-18.15	-18.97	-19.38	-21.54

5.7 Axial Ratio

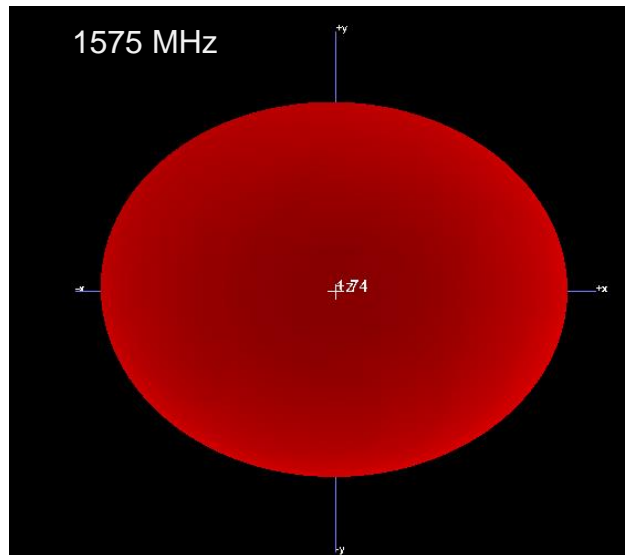
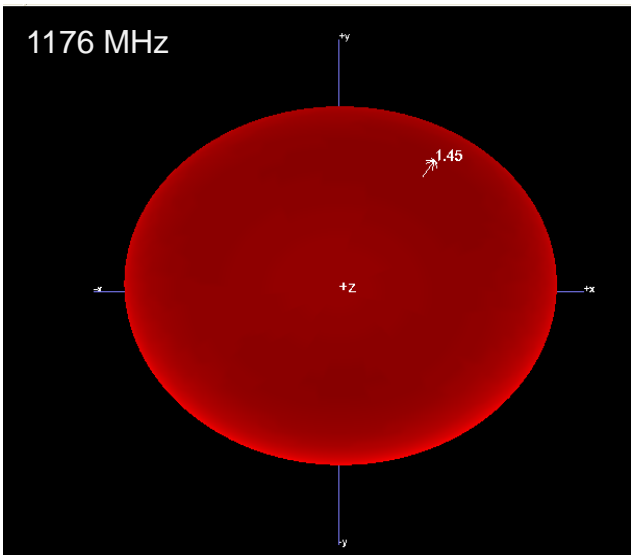
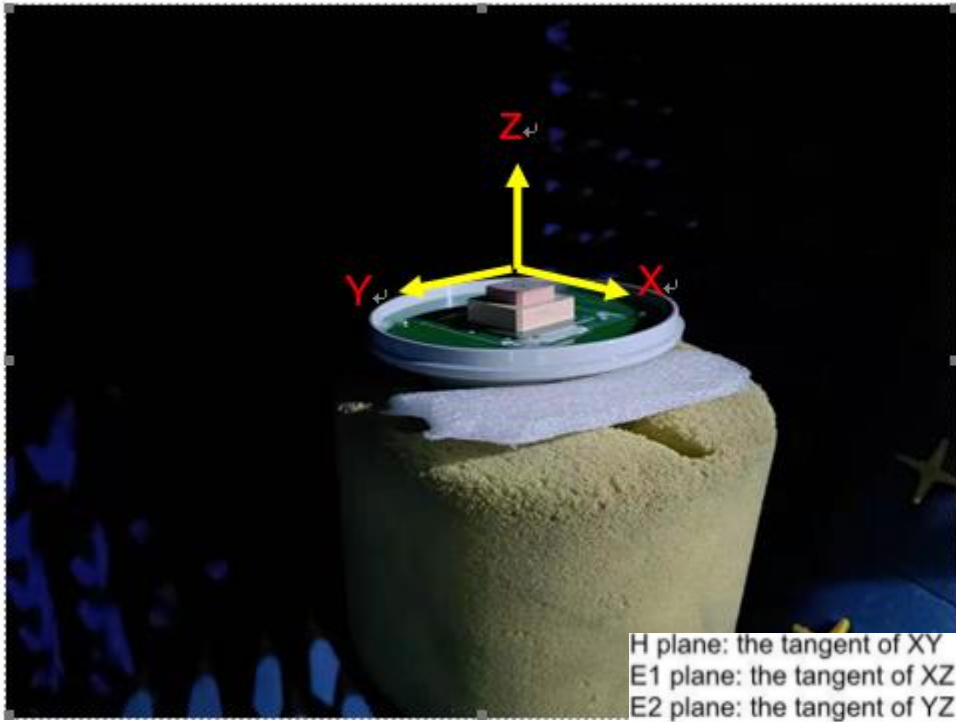


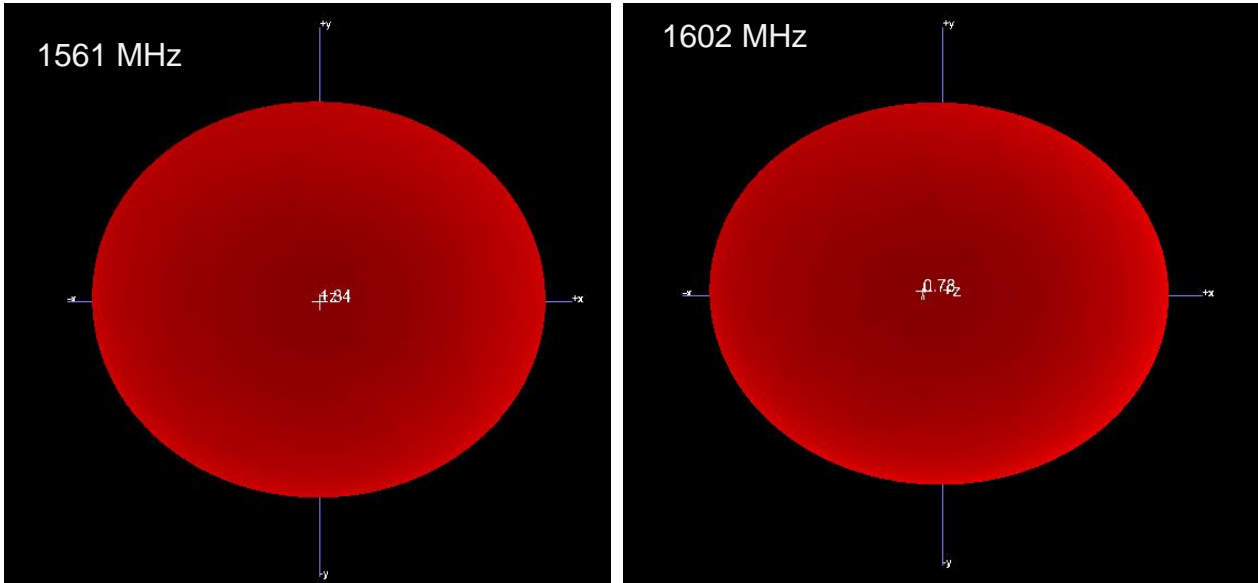
5.8 Axial Ratio in XOZ/YOZ



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

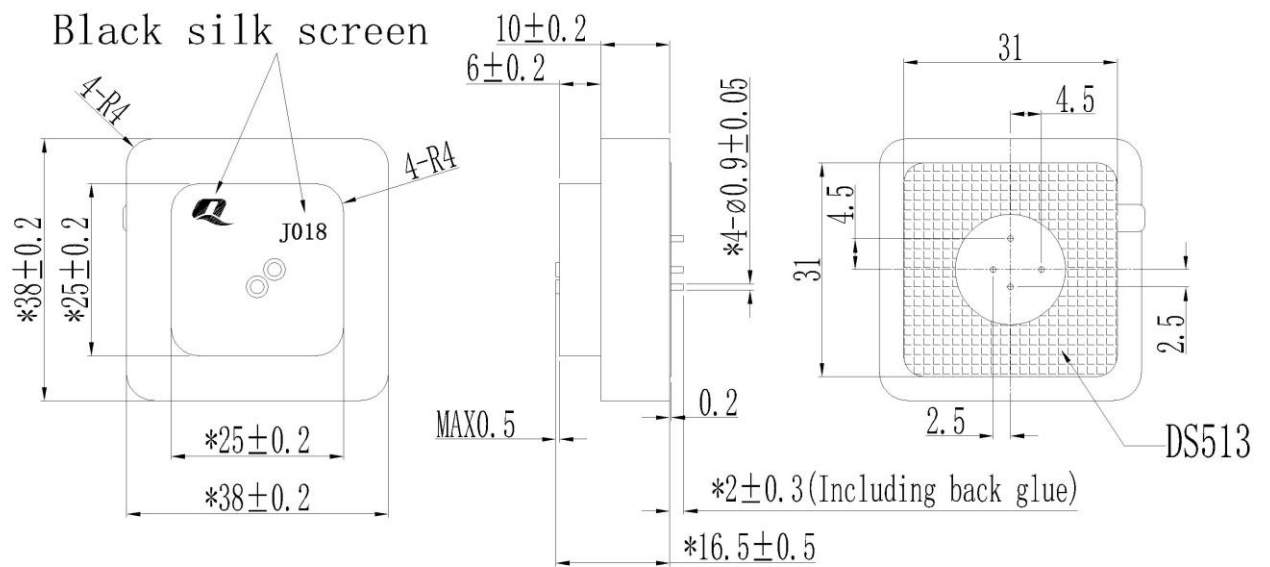
5.9 Radiation Pattern





6 Product Size

RoHS



Unit:mm

7 PCB Footprint Recommendation

