Antenna Datasheet

Antenna Services

Product OC: V1194-217-A-01

Version: 1.0

Date: 2025-09-18

Status: Released

Product Name: L1 L2 L5 GNSS Helical Antenna

Key Features:

Covering GPS L1/L2/L5, BD B1/B2/B3,

GLONASS G1/G2/G3,GALILEO E1/E5/E6,

QZSS L1/L2/L5/L6, IRNSS L5

Dimension: Φ57.5mm×27.8 mm

Connector: SMA Male

IP Rating: IP67

ISO9001 ISO14001 ISO45001 IATF16949

Contents

1 Product Description

This VLG GNSS antenna adopts a diversity of forms to guarantee the most suitable polarization type. VLG positioning products support single-band or multi-band operation modes to meet various high-precision positioning requirements of customers' products. VLG ~~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 FAKRA. 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
- High efficiency
- Excellent performance

3 Product Specifications

3.1 Electrical

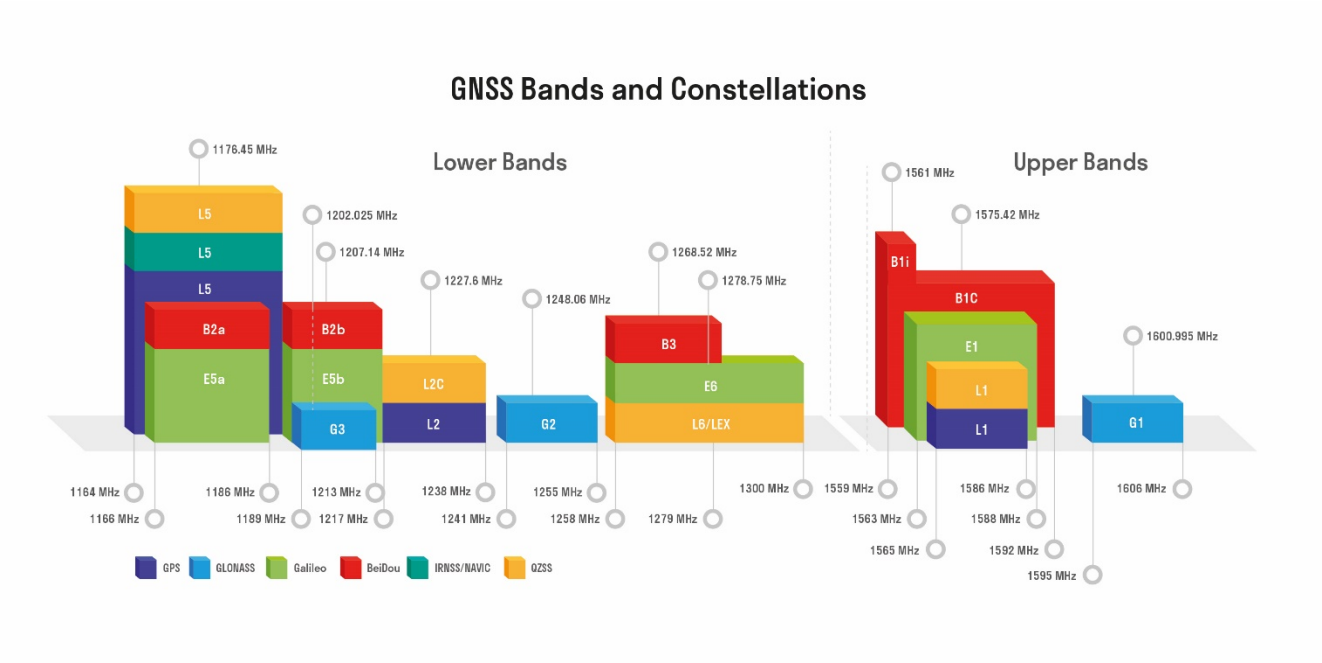
Electrical Specifications	
Nominal Frequency	GPS L1/L2/L5, BD B1/B2/B3, GLONASS G1/G2/G3 GALILEO E1/E5/E6, QZSS L1/L2/L5/L6, IRNSS L5
VSWR	≤ 2.0
Efficiency	≥ 40%
Gain	≥ 2.0 dBi
Polarization Type	RHCP
Axial Ratio	≤ 3 dB
Impedance	50 Ω
LNA Electrical Properties	
Center Frequency	GPS L1/L2/L5, BD B1/B2/B3, GLONASS G1/G2/G3 GALILEO E1/E5/E6, QZSS L1/L2/L5/L6, IRNSS L5
Gain	32 ±2 dB
Noise Figure	≤ 2.0 dB
Voltage	3.0–5.0 V
Current	≤ 25 mA
Impedance	50 Ω

3.2 Mechanical & Environment

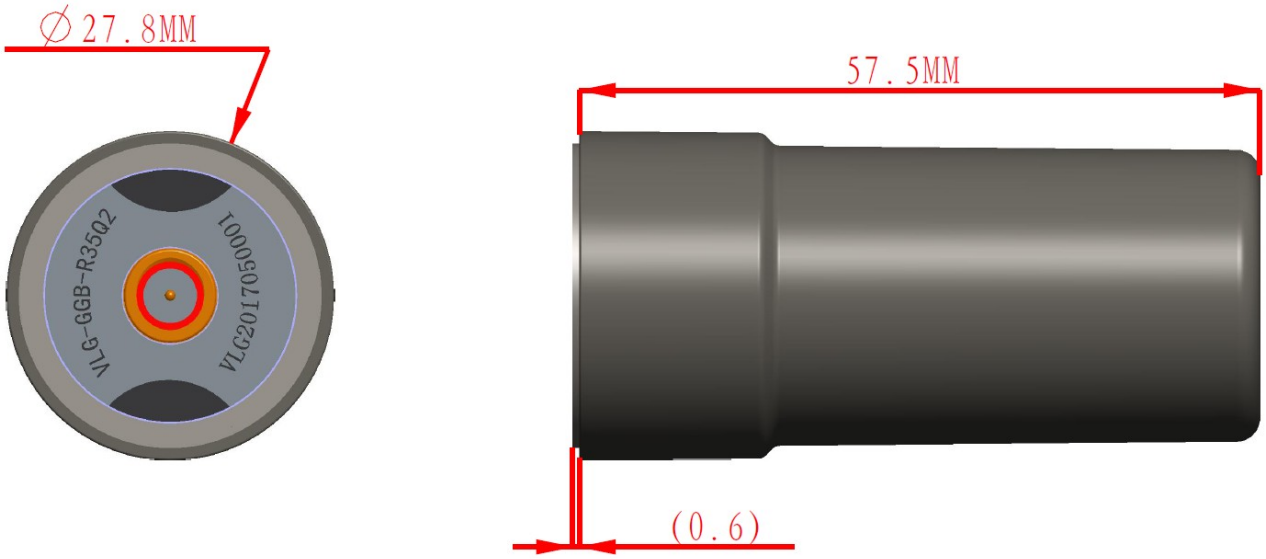
Mechanical Specifications	
Antenna Size	Φ57.5 mm ×27.8mm
Casing Material & Color	PC+ABS & Black
Connector Type	SMA Male (center pin)
Working Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
IP Rating	IP67
Weight	14.5(g)
RoHS & REACH Compliant	ROHS

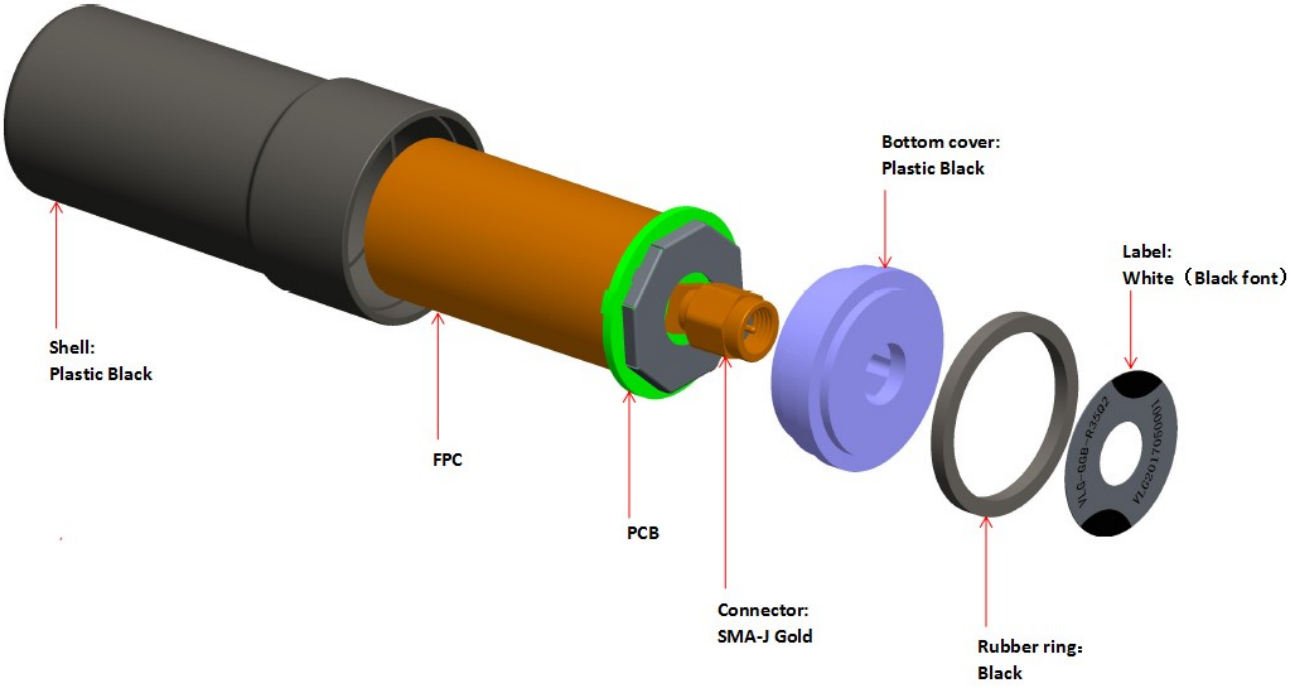
3.3 Supported Bands

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)	
	•	•	•	•	
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
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
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. Drawing

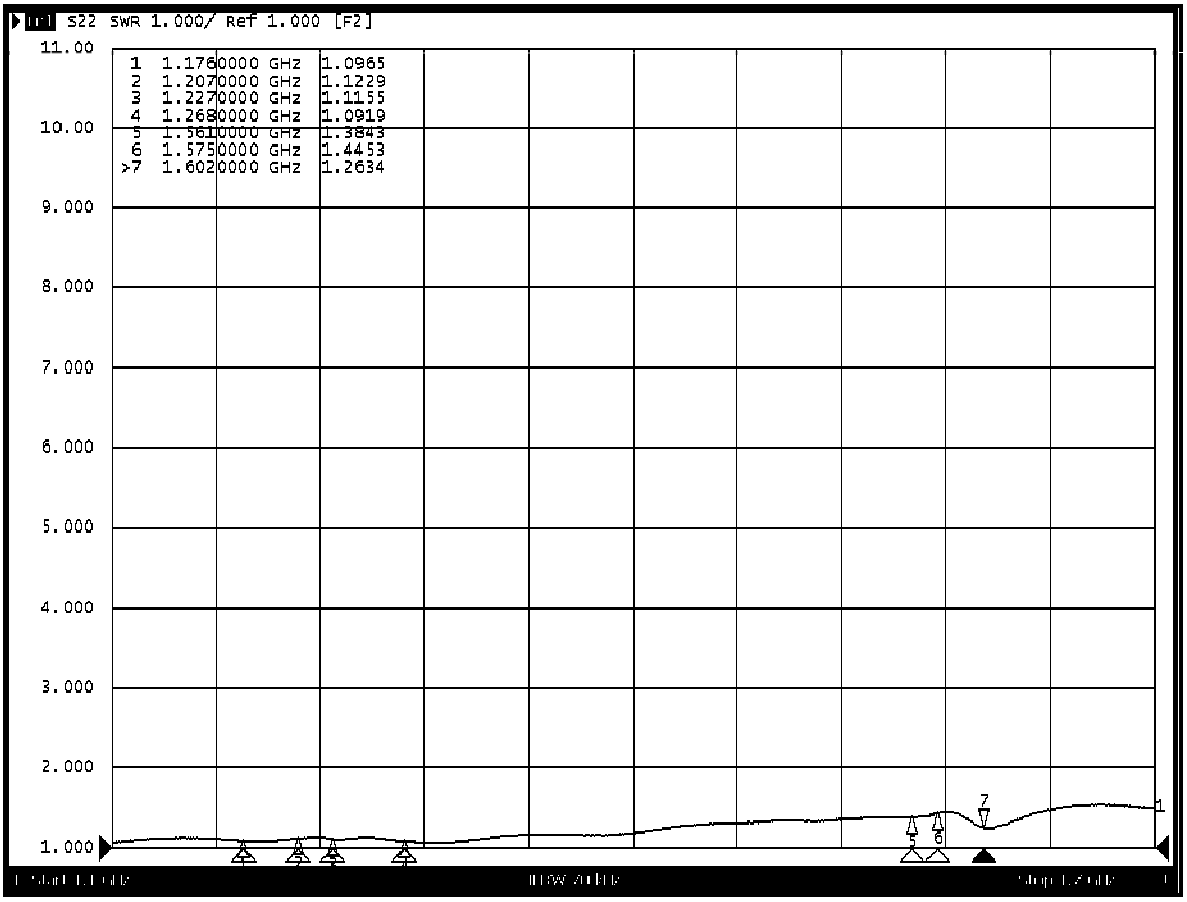

∅27.8MM
VLG-GGB-R3502
VLG20170500001
57.5MM
(0.6)


Shell:
Plastic Black
FPC
PCB
Connector:
SMA-J Gold
Bottom cover:
Plastic Black
Rubber ring:
Black
Label:
White（Black font）

5.Overall Performance

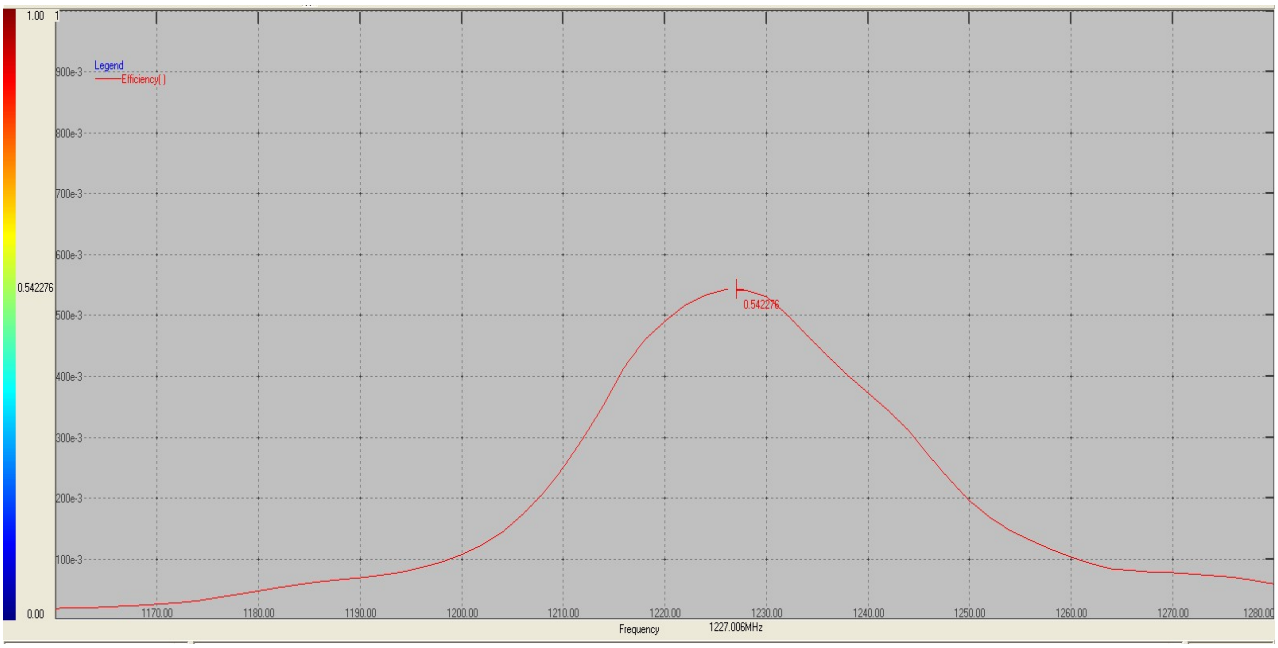
5.1. Test Environment

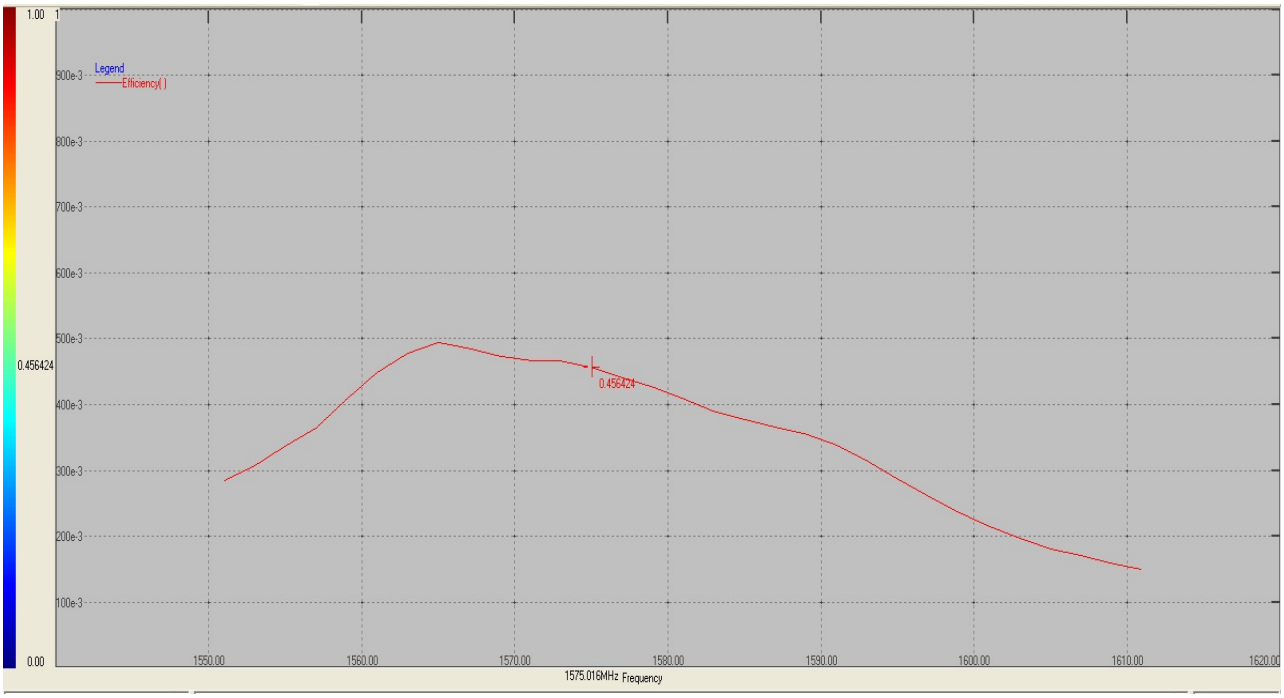
5.2. VSWR



Frequency (MHz)	1176	1207	1227	1268	1561	1575	1602
VSWR	1.09	1.12	1.11	1.09	1.38	1.44	1.26

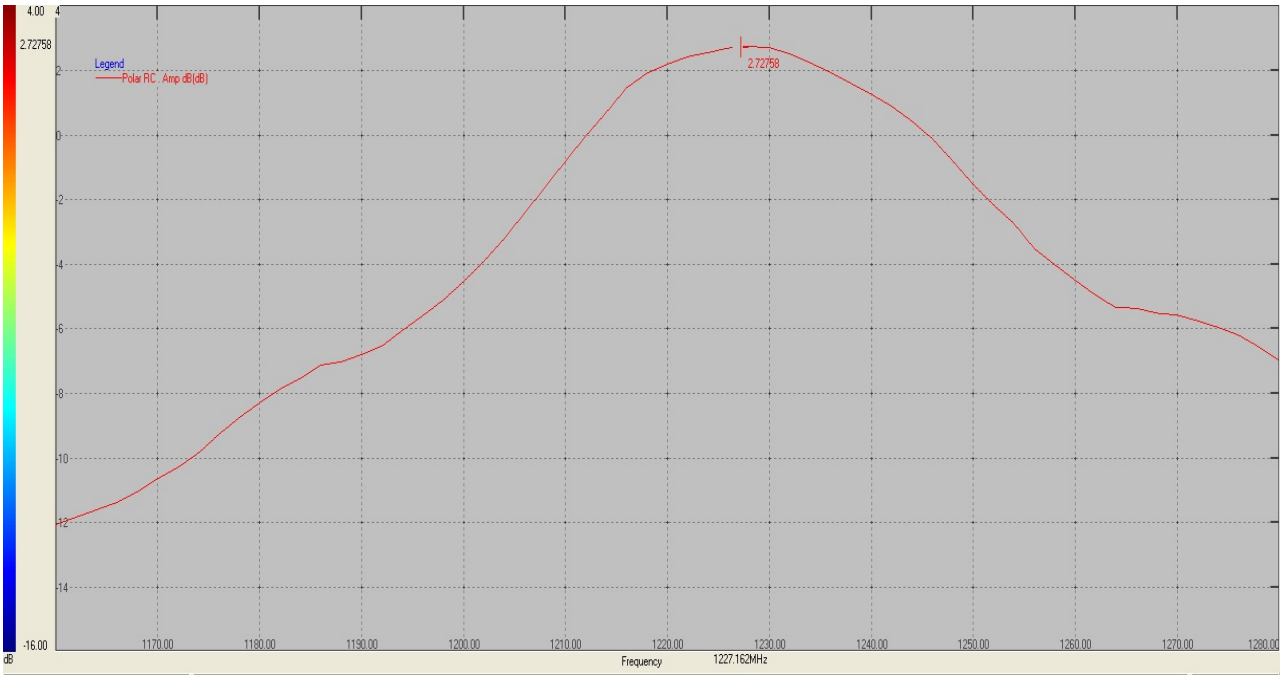
5.3. Efficiency

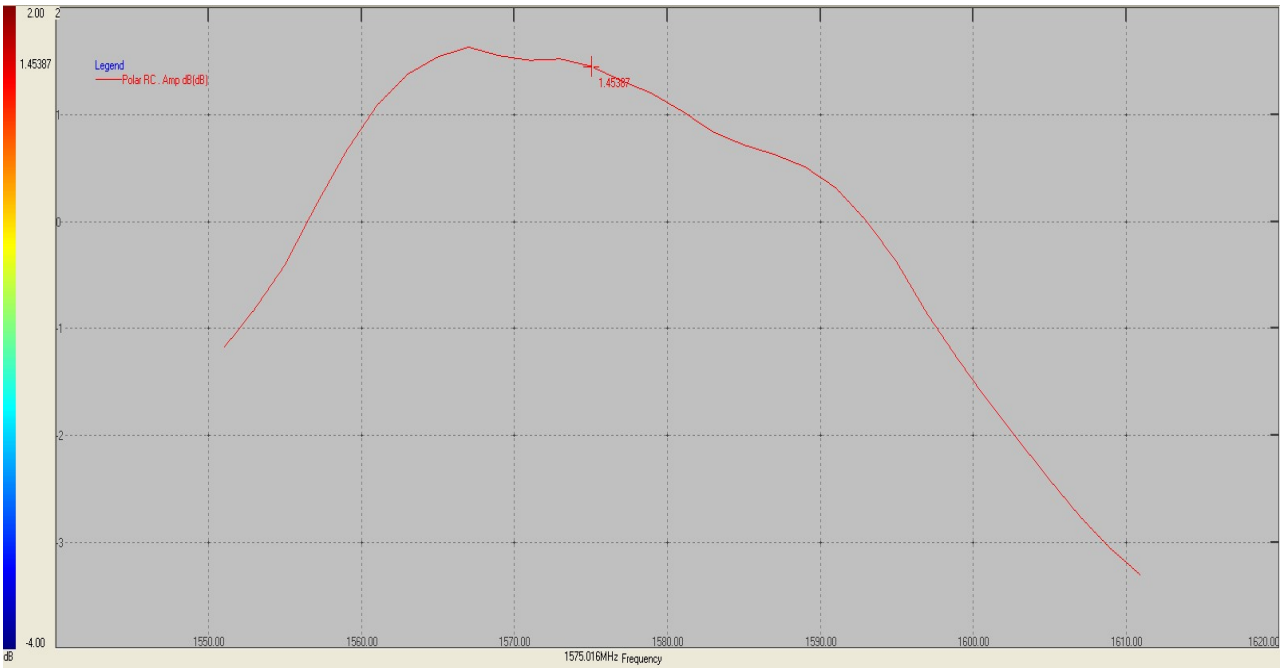




Frequency (MHz)	1176	1207	1227	1268	1561	1575	1602
Efficiency (%)	3.7	20.8	54.2	7.8	44.9	45.6	21.5

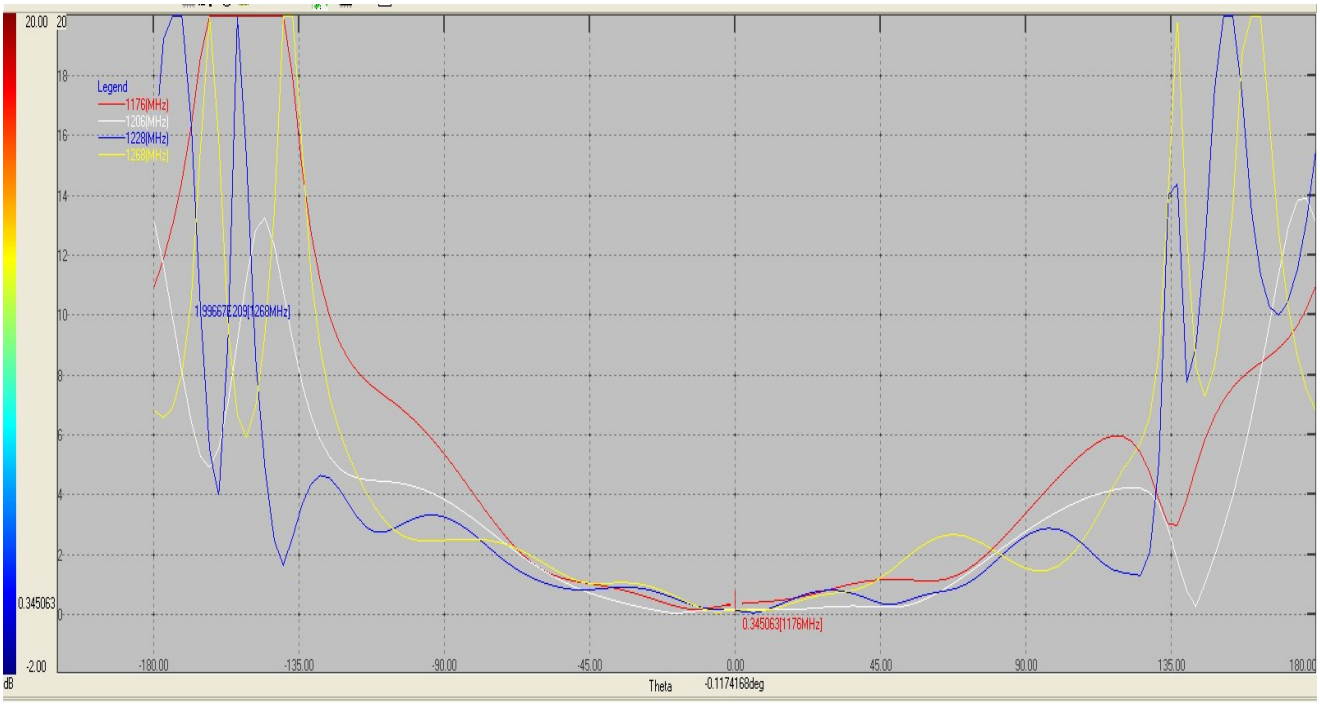
5.4. Gain

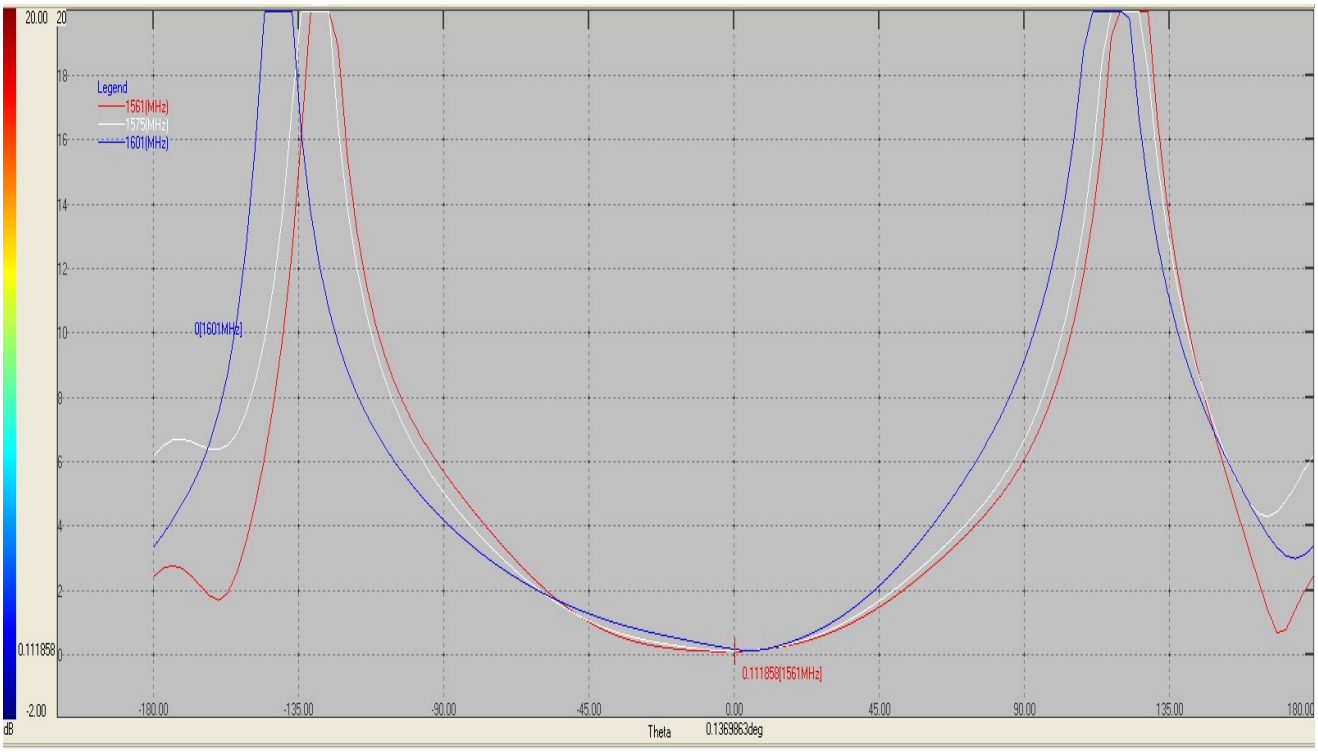




Frequency (MHz)	1176	1207	1227	1268	1561	1575	1602
Gain (dBi)	-9.25	-1.61	2.70	-5.50	1.08	1.45	-1.68

5.5. Axial Ratio

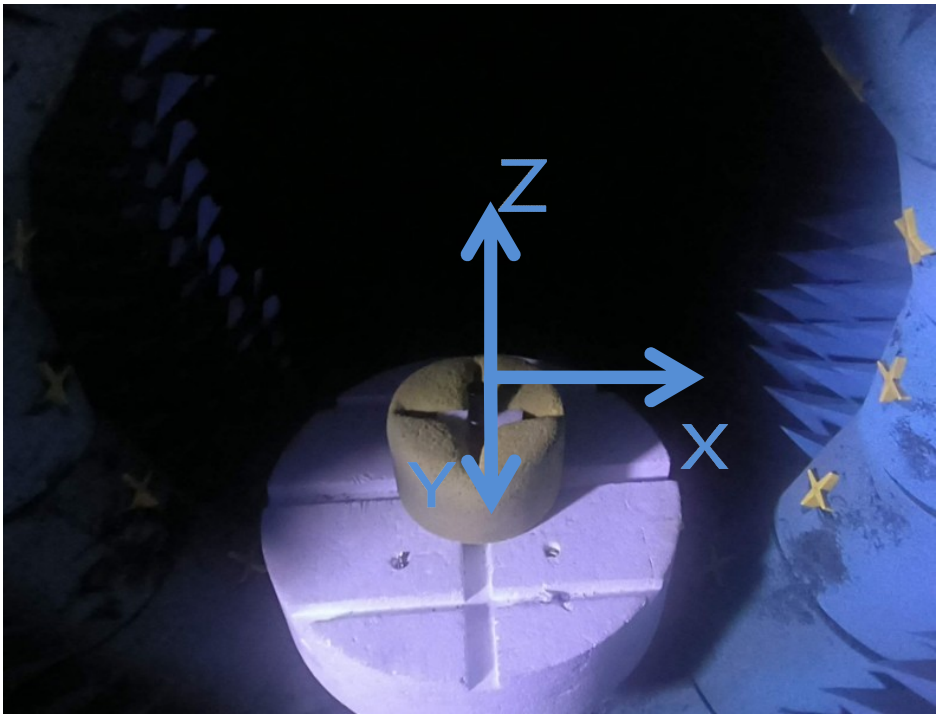




Frequency (MHz)	1176	1207	1227	1268	1561	1575	1602
Axial Ratio (dB)	0.35	0.19	0.14	0.16	0.11	0.11	0.18

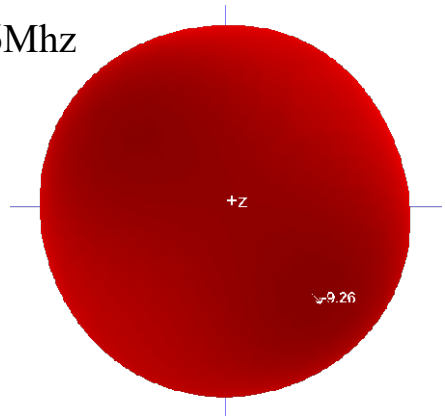
5.6. 3D & 2D Radiation Pattern

5.6.1 Test Environment



5.6.2 Test Result

1176Mhz



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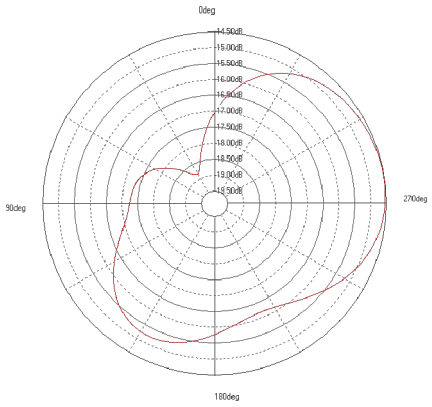
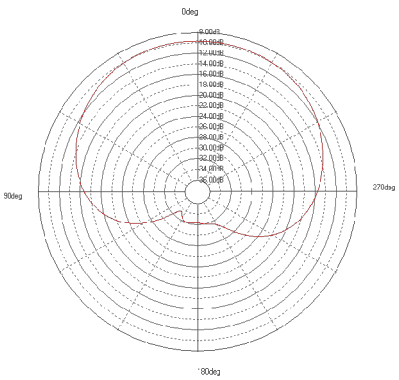


E1



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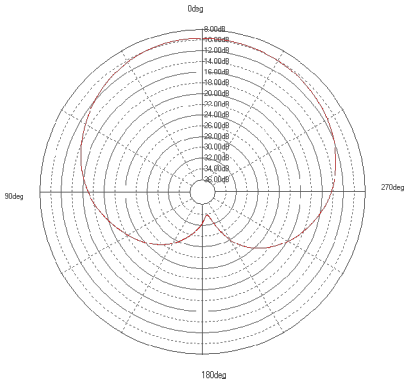
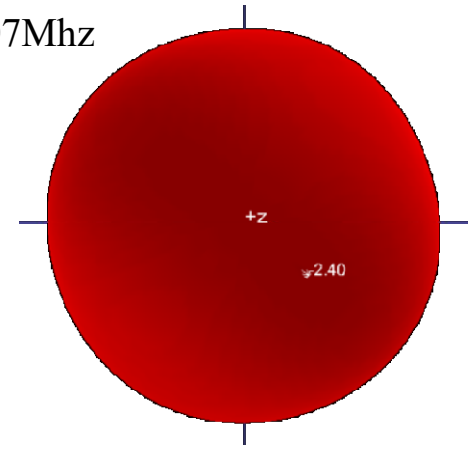


1207Mhz



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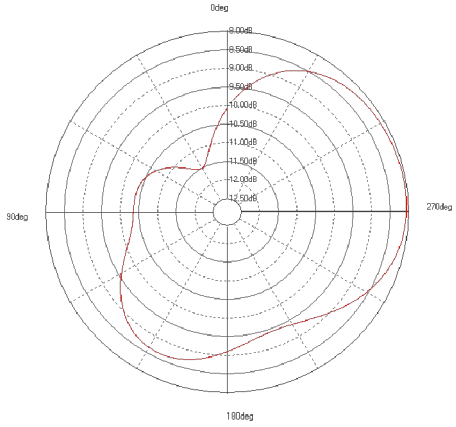

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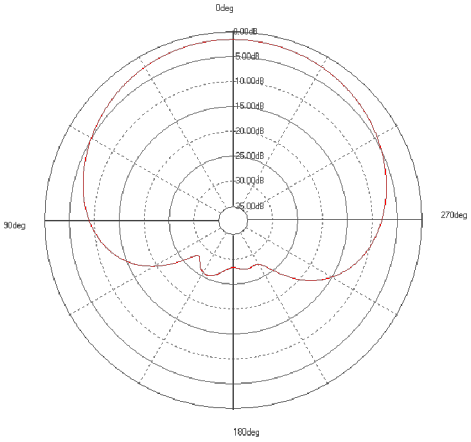

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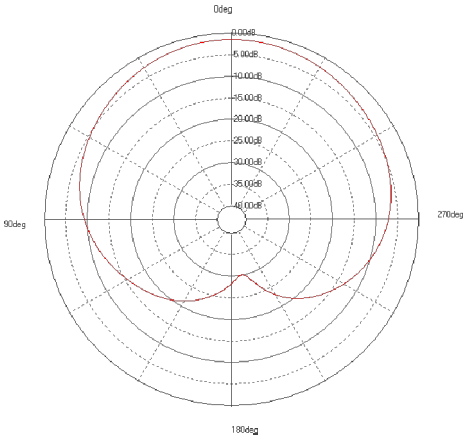
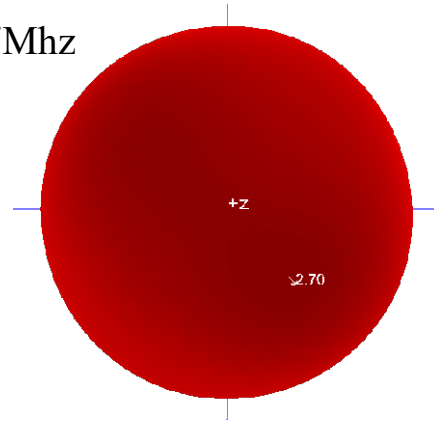


1227Mhz



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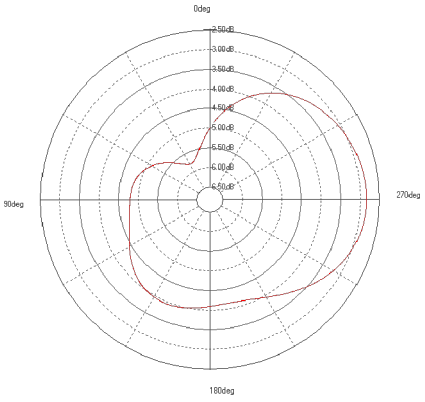

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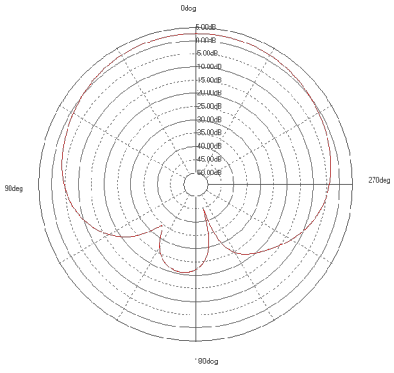

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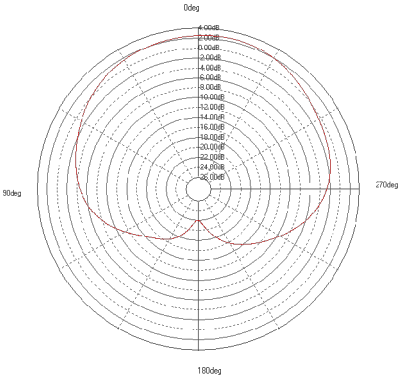
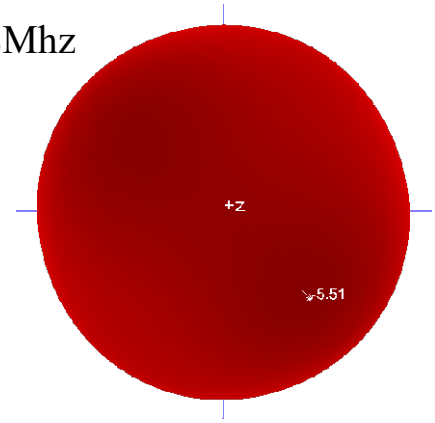


1268Mhz



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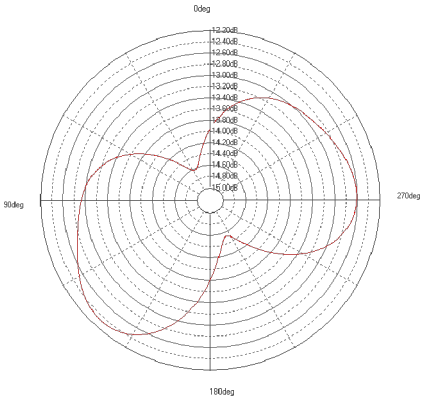

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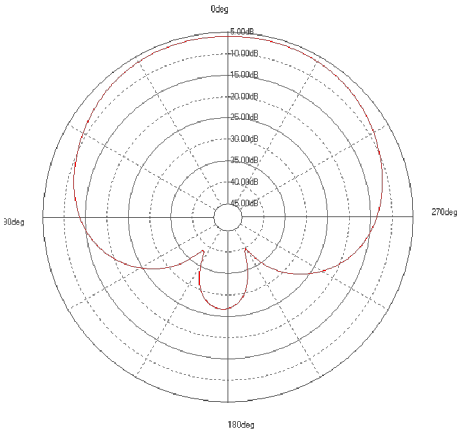

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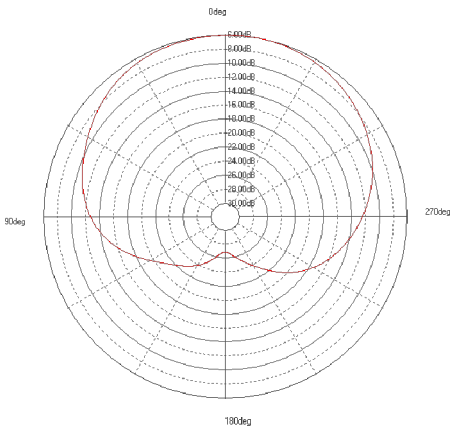
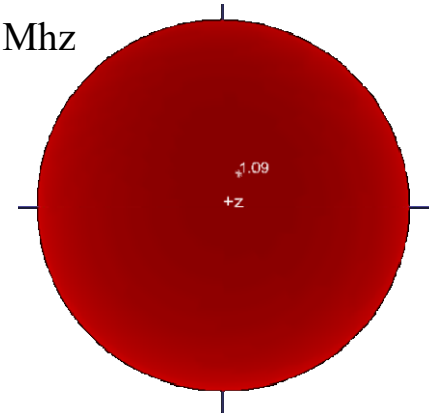


1561Mhz



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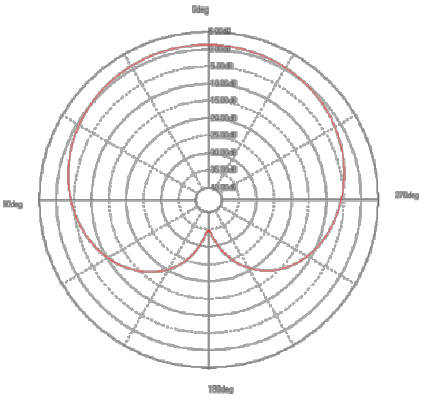

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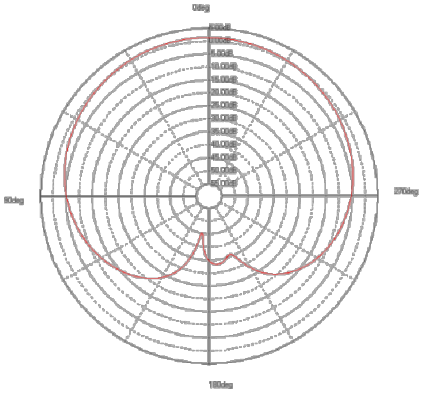

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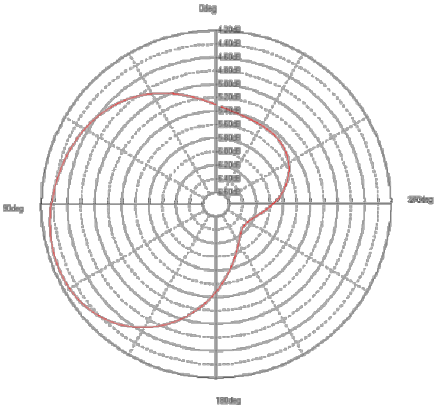
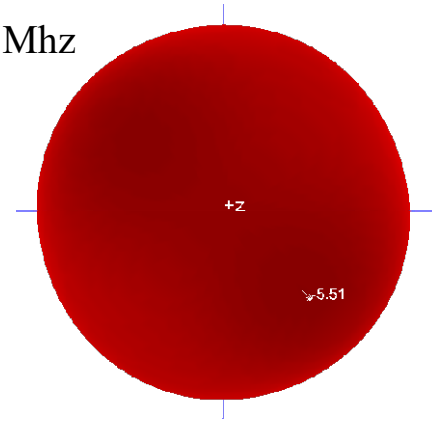


1575Mhz



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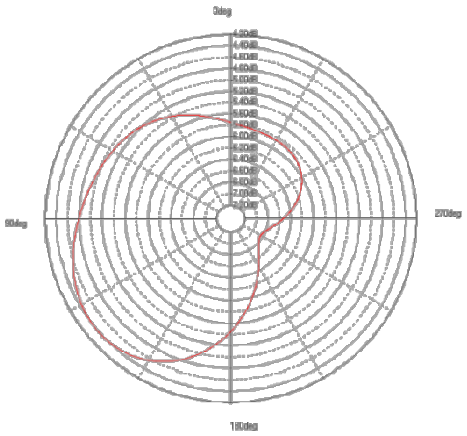

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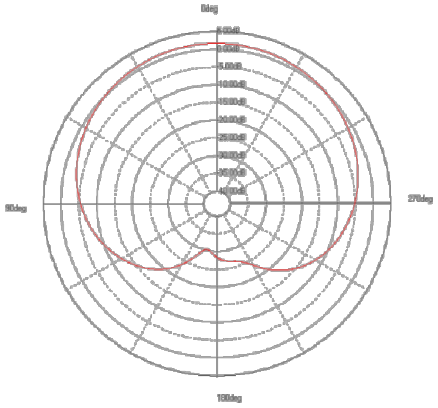

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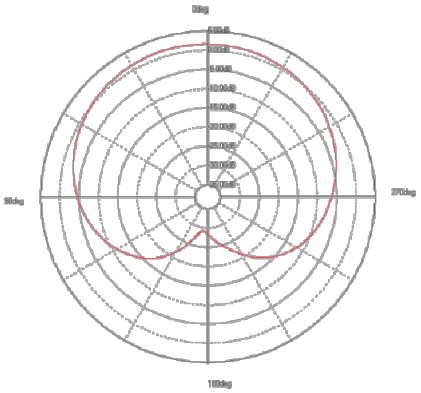
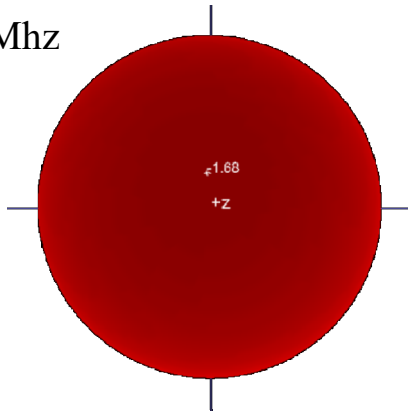


1602Mhz



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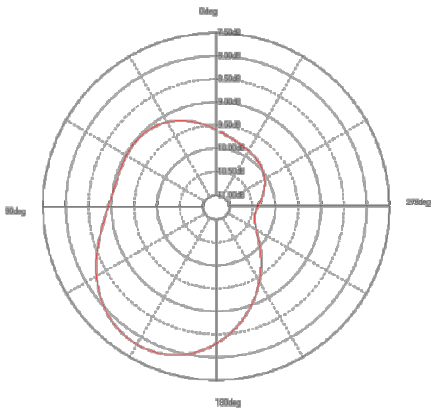

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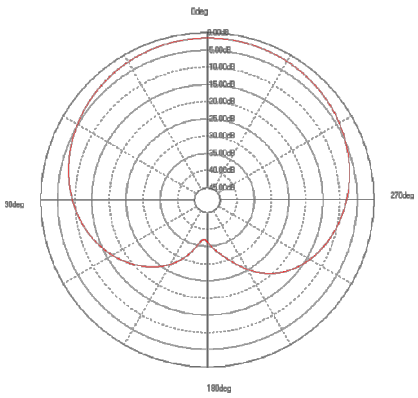

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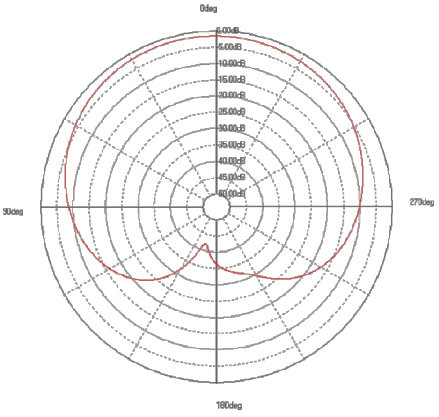
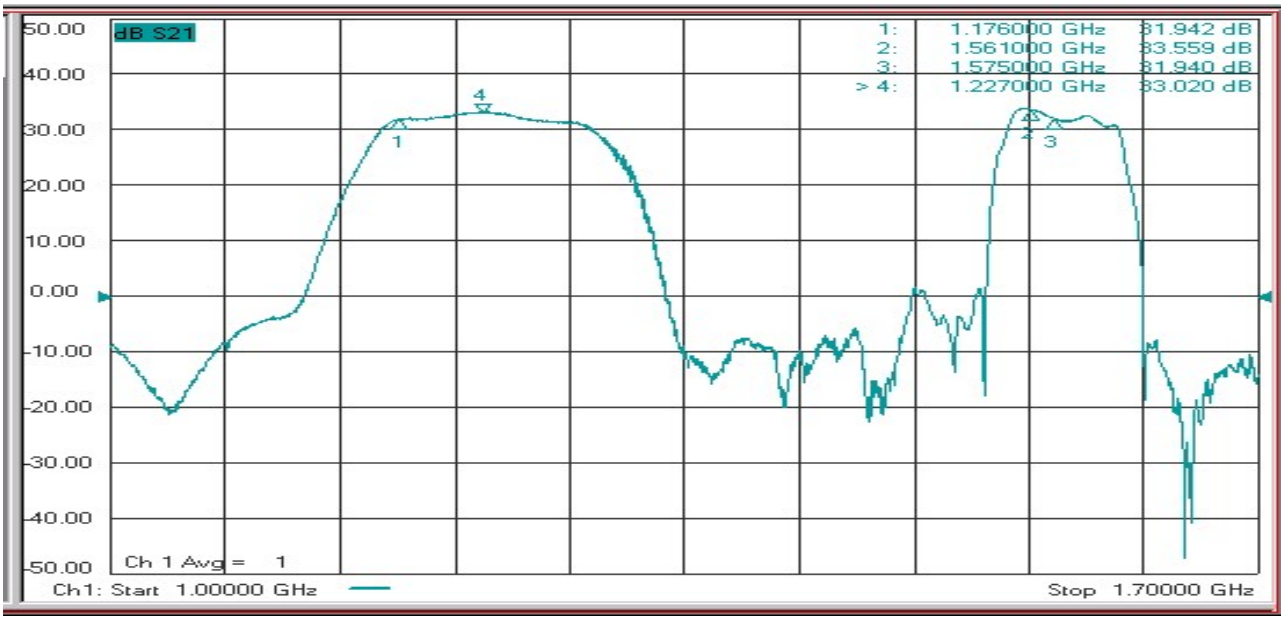


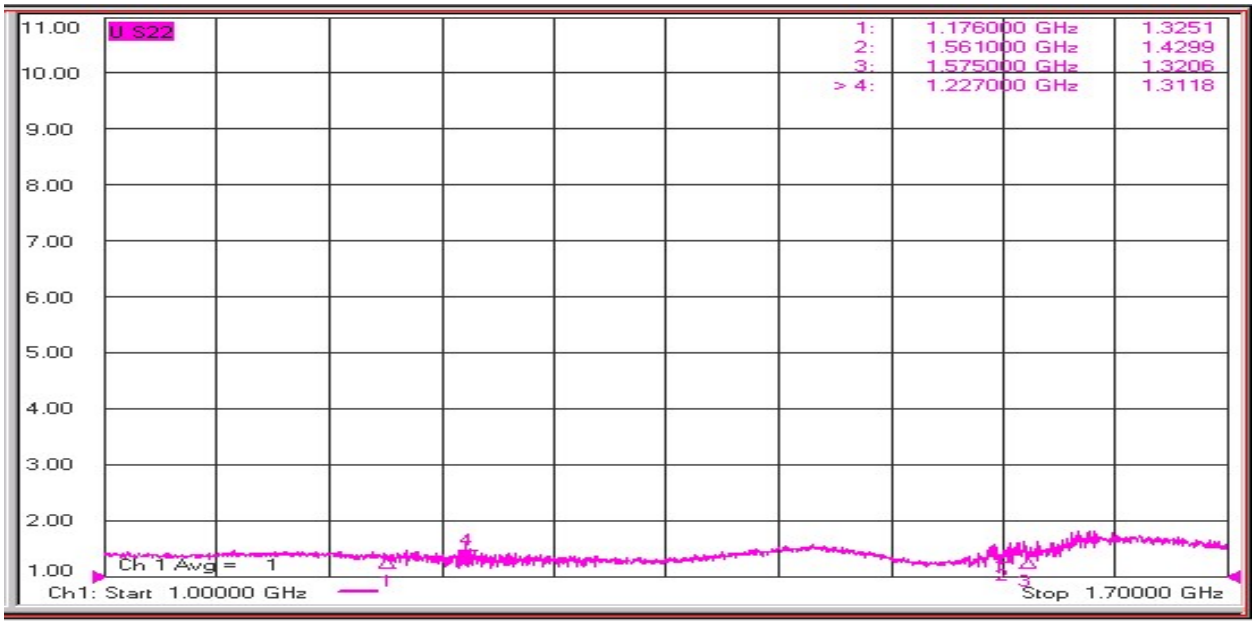
5.7. LNA

5.7.1 LNA Gain



Frequency (MHz)	1176	1227	1561	1575
Gain (dB)	31.94	33.02	33.55	31.94

5.7.2 LNA VSWR



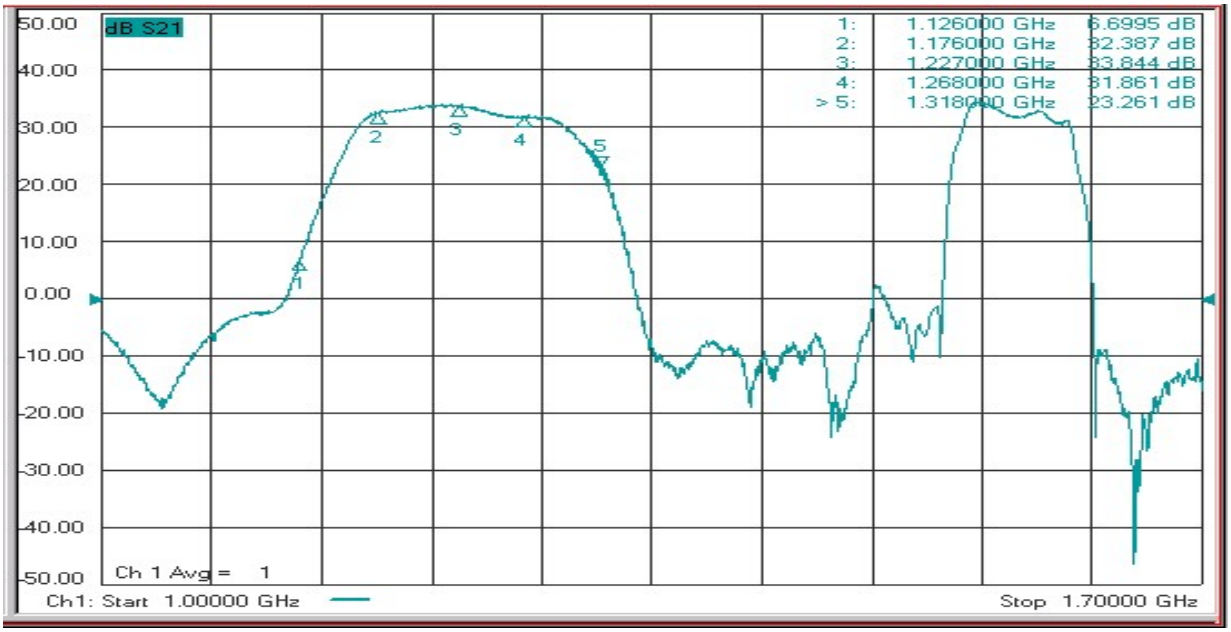
Frequency (MHz)	1176	1227	1561	1575
VSWR	1.32	1.31	1.42	1.32

5.8. Noise Figure &Out-of-band rejection

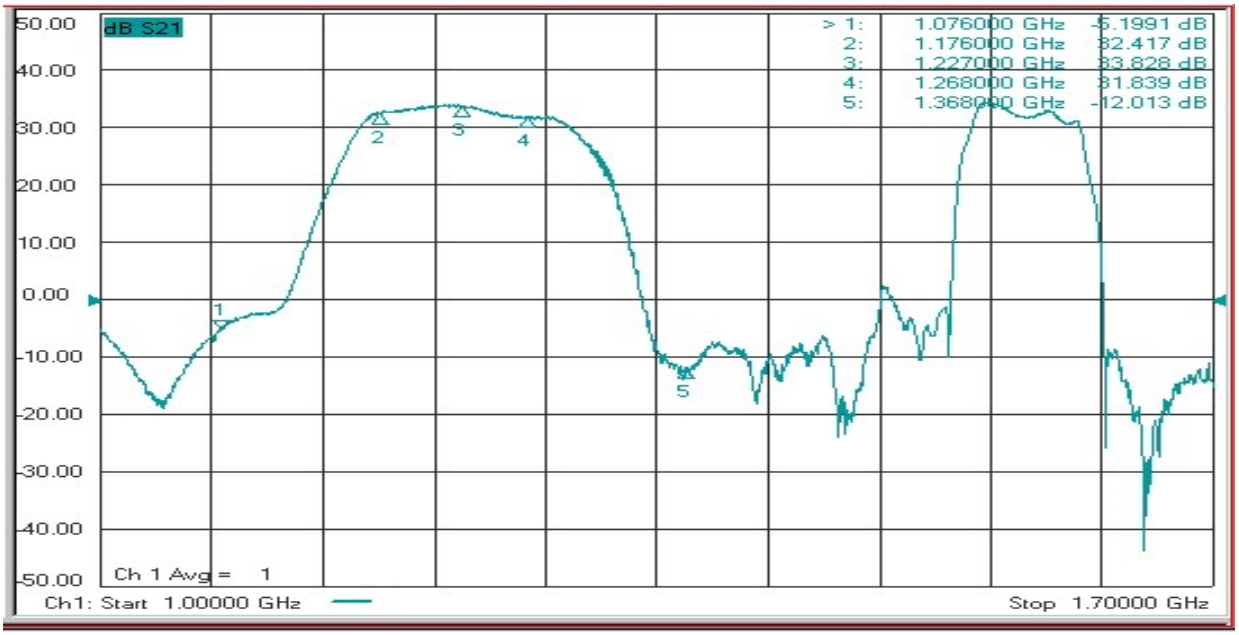
5.8.1.Noise Figure

Frequency (MHz)	1176	1207	1227	1561	1575	1602
Noise Figure	1.03	0.99	0.95	1.02	0.99	0.95

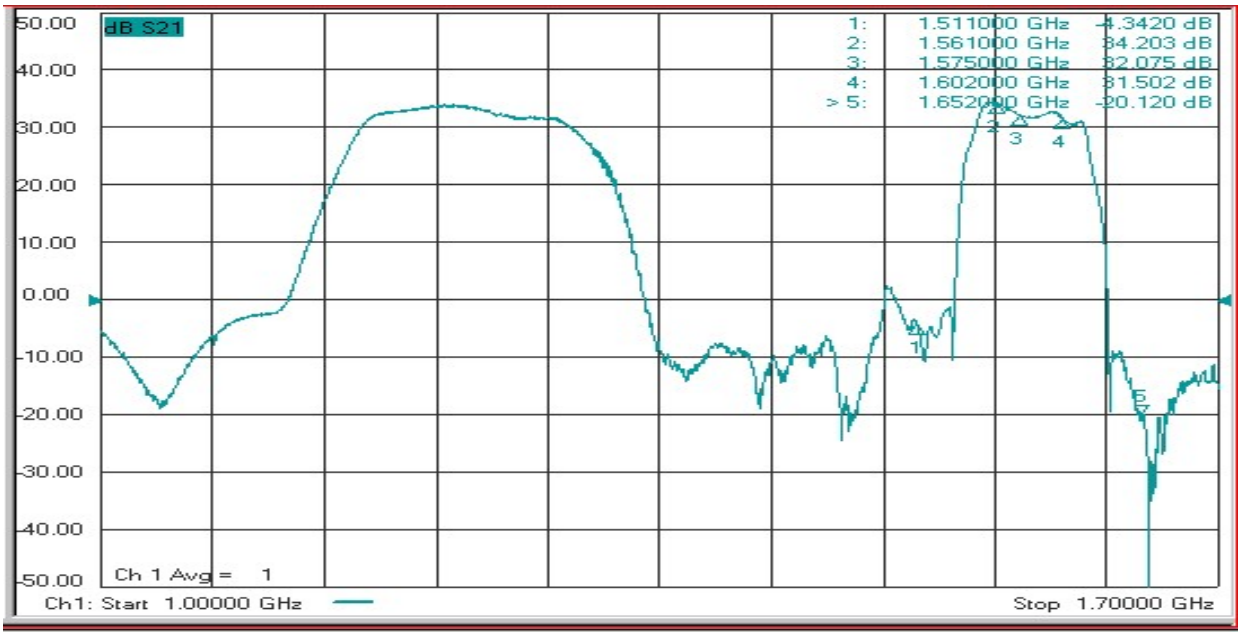
5.8.2.Out-of-band rejection



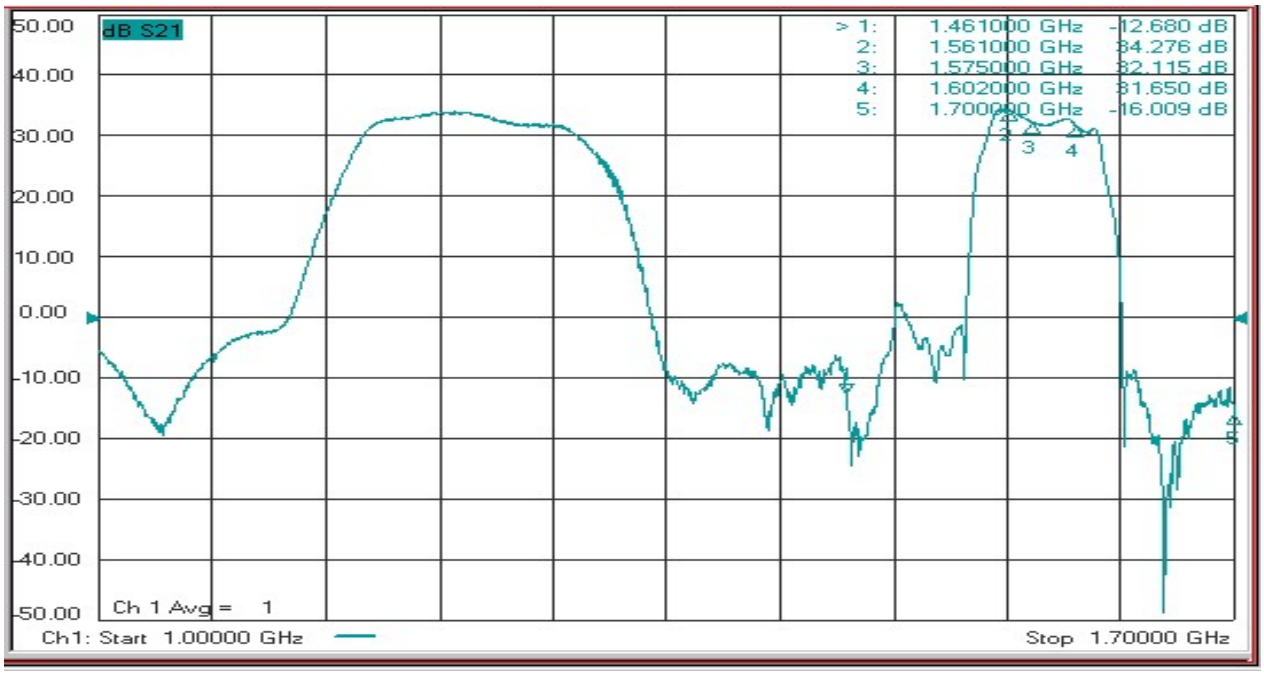
center frequency	out-of-band rejection	difference value
1176MHZ	Fo-50MHZ	26dB
1268MHZ	Fo+50MHZ	8dB



center frequency	out-of-band rejection	difference value
1176MHZ	Fo-100MHZ	37dB
1268MHZ	Fo+100MHZ	43dB

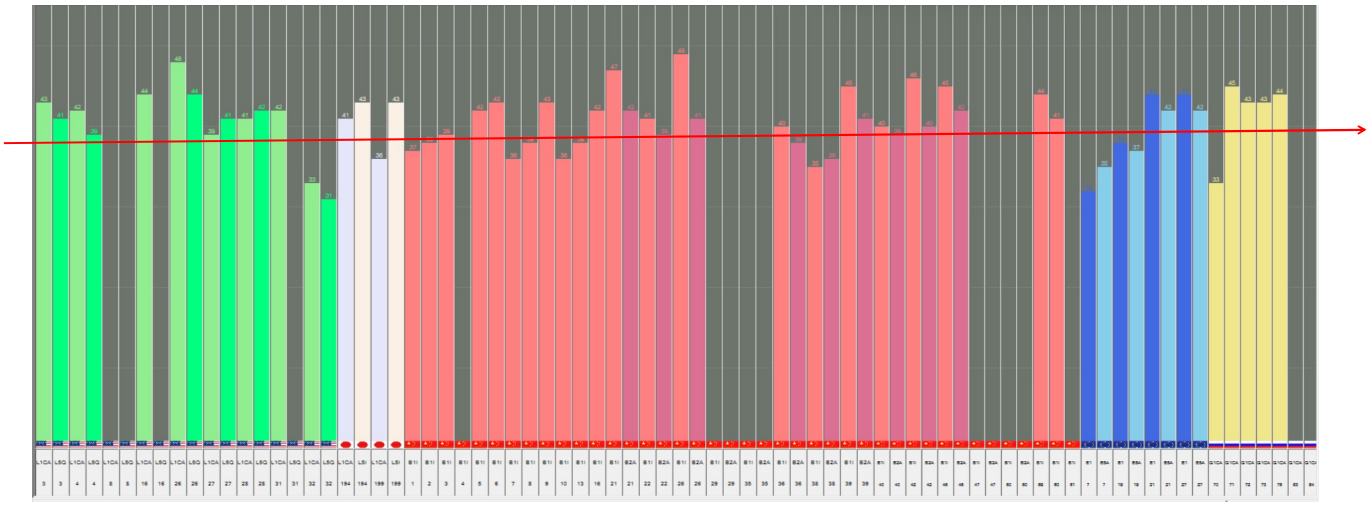


center frequency	out-of-band rejection	difference value
1561MHZ	Fo-50MHZ	38dB
1602MHZ	Fo+50MHZ	51dB



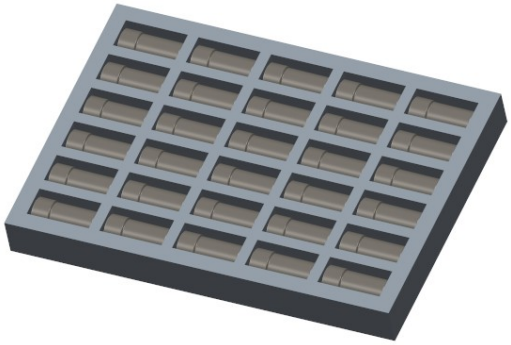
center frequency	out-of-band rejection	difference value
1561MHZ	Fo-100MHZ	46dB
1602MHZ	Fo+100MHZ	47dB

5.9. Outdoor actual satellite search

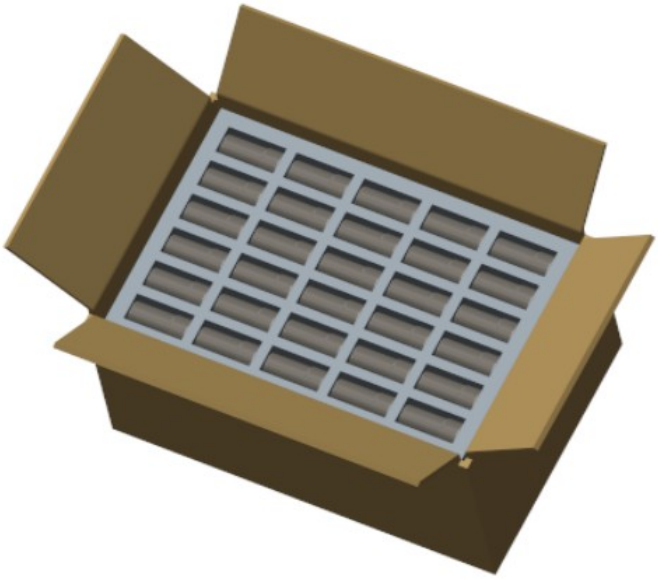


Note: The CN value of bars above the red line is ⩾40dBHz

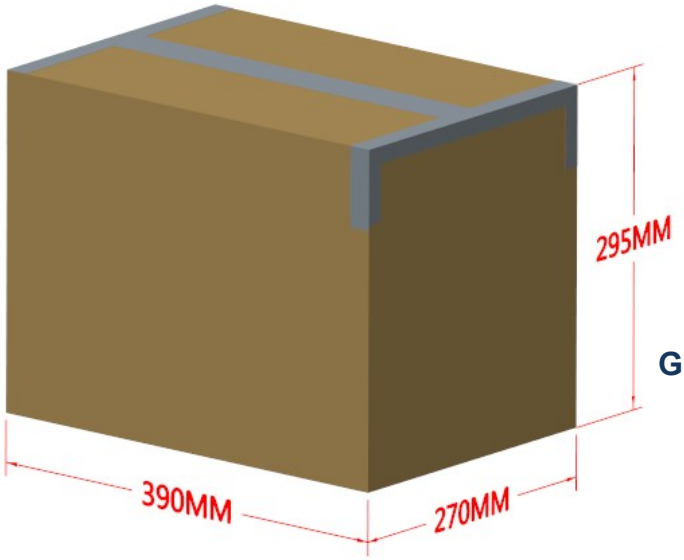
6.Packaging



30pcs/Layer



7Layers/Carton
(210pcs)



Gross weight : 3.8（kg）

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8.Revision History

Version	Date	Author	Note
V1.0	2025.9.1	Yongxing Tang	Creation of the document
V1.0	2025.10.20	Yongxing Tang	First official release

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