



Antenna Datasheet

Product OC: YCN001AA

Version: 4.0

Date: 2023-06-08

Status: Released

Product Name: 4G Antenna

Key Features:

Frequency Band: 700–960 MHz, 1560–1610 MHz, 1710–2700 MHz

Dimensions: Φ 13 mm \times 144 mm

Efficiency: Up to 63.52 % (On 130 \times 30 mm EVB)

RoHS Compliant

IP66

Overview

This Quectel external 4G/GNSS antenna covers main 4G LTE bands, 3G/2G/LPWA bands and is compatible with GNSS L1 band as well. The external antenna is barely influenced by the internal environment of devices, giving a much better performance in efficiency, radiation and gain while providing an optimized solution for a customer product. Quectel also offers flexible installation with customized cable length and connector options.

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1 Specification

Test Condition: On 130 × 130 mm EVB & Free Space

1.1. Electrical

Electrical	
Frequency Range	700–960 MHz, 1560–1610 MHz, 1710–2700 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Electrical - LTE													
SPEC	Band	Band	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	Band	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850
Max. VSWR	EVB	-	2.7	6.0	-	6.3	2.2	3.1	3.5	-	-	-	
	FS	-	2.2	3.1	-	3.2	2.1	2.3	2.6	-	-	-	
Max. Return Loss (dB)	EVB	-	-6.7	-2.9	-	-2.8	-8.4	-5.8	-5.2	-	-	-	
	FS	-	-8.7	-5.9	-	-5.7	-8.9	-8.2	-7.0	-	-	-	
AVG Eff. (%)	EVB	-	44.3	25.0	-	28.8	54.3	60.3	36.9	-	-	-	
	FS	-	37.6	33.9	-	37.1	36.2	40.4	45.2	-	-	-	
AVG AVG Gain (dB)	EVB	-	-3.6	-6.3	-	-5.8	-2.7	-2.2	-4.4	-	-	-	
	FS	-	-4.3	-4.8	-	-4.3	-4.4	-3.9	-3.5	-	-	-	

Max. Peak Gain(dBi)	EVB	-	-1.3	-1.3	-	2.2	1.5	1.7	0.8	-	-	-
	FS	-	-1.9	-1.6	-	0.7	0.9	1.2	0.9	-	-	-
VSWR		EVB		≤ 6.3								
		FS		≤ 3.2								
Return Loss		EVB		≤ -2.8 dB								
		FS		≤ -5.7 dB								
Peak Gain		EVB		≤ 2.2 dBi								
		FS		≤ 1.2 dBi								

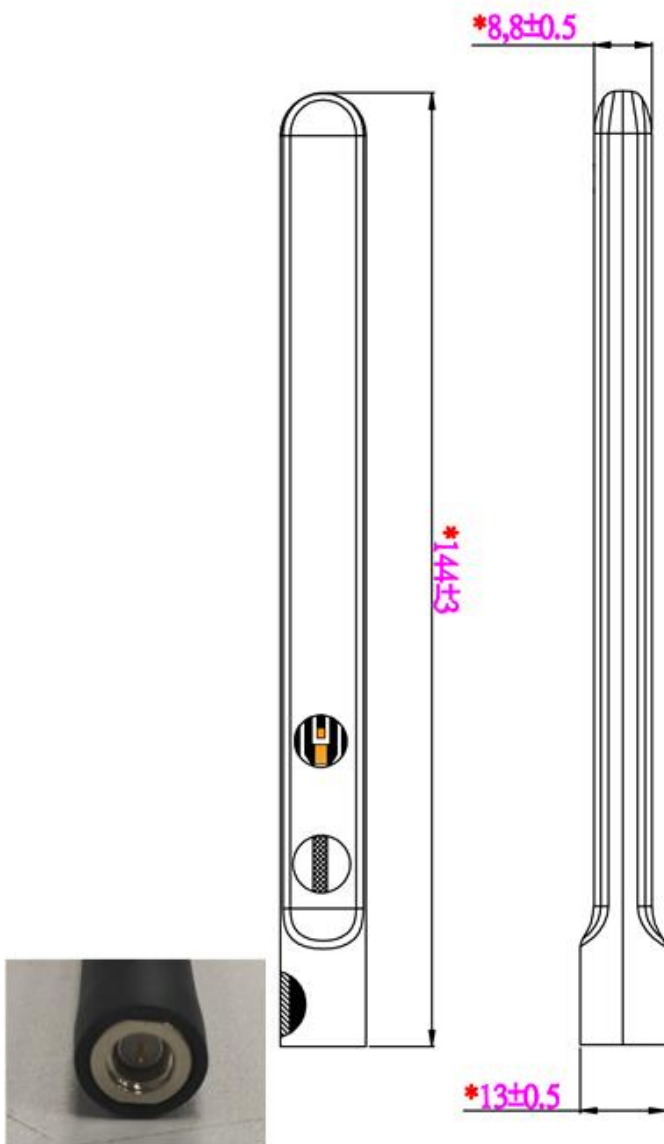
Electrical - GNSS			
SPEC	Band	L	
	Band Freq. (MHz)	1560-1610	
Max. VSWR	EVB	5.1	
	FS	2.6	
Max. Return Loss (dB)	EVB	-3.4	
	FS	-7.1	
AVG Eff. (%)	EVB	48.0	
	FS	41.6	
AVG AVG Gain (dB)	EVB	-3.2	
	FS	-3.8	
Max. Peak Gain (dBi)	EVB	0.0	
	FS	-0.3	
VSWR	EVB		≤ 5.1
	FS		≤ 2.6
Return Loss	EVB		≤ -3.4 dB
	FS		≤ -7.1 dB
Peak Gain	EVB		≤ 0.0 dBi
	FS		≤ -0.3 dBi

- FS: Free Space
- EVB: On 130 x 130 mm EV

1.2. Mechanical, Environmental & Storage

Mechanical	
Antenna Dimensions	Φ 13 × 144 mm
Casing Material & Color	TPEE & Black
Connector Type	SMA Male
Mounting Type	Terminal
Weight	Typ.15.7 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP66
RoHS Compliant	Yes
Storage	
Storage Temperature	18 °C–27 °C
Humidity	30 %–80 % RH
Storage Place	Away from corrosive gas and direct sunlight
Packaging	Antennas should be stored in unopened sealed manufacturer's plastic packaging

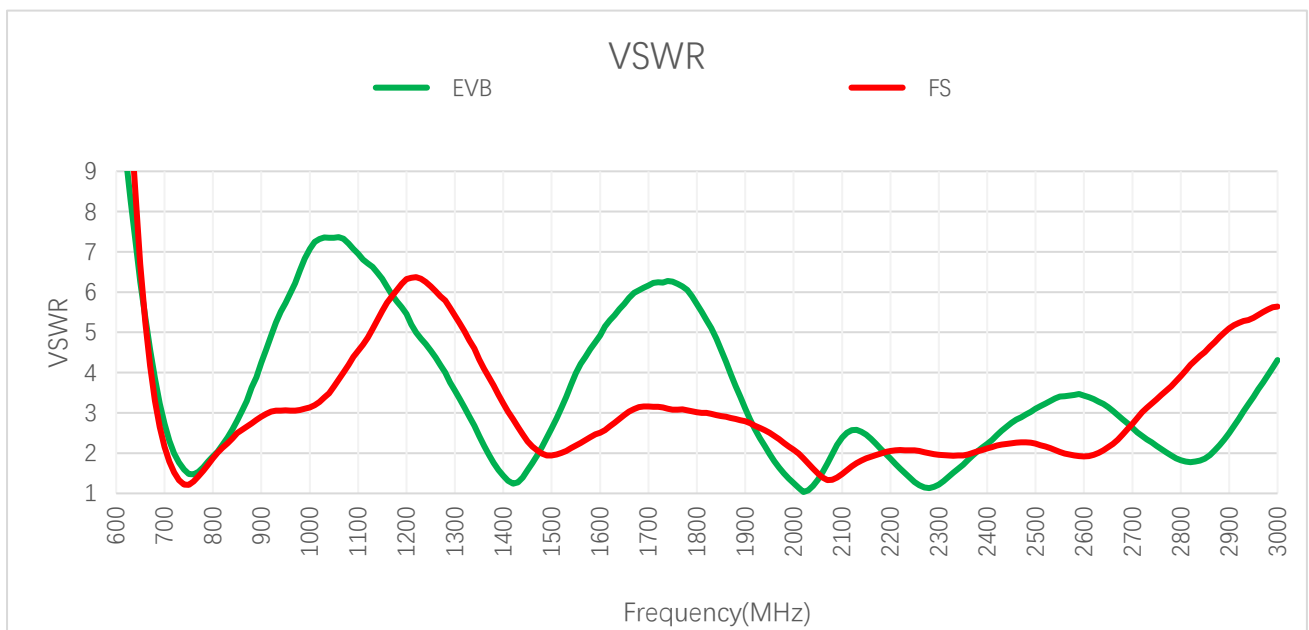
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



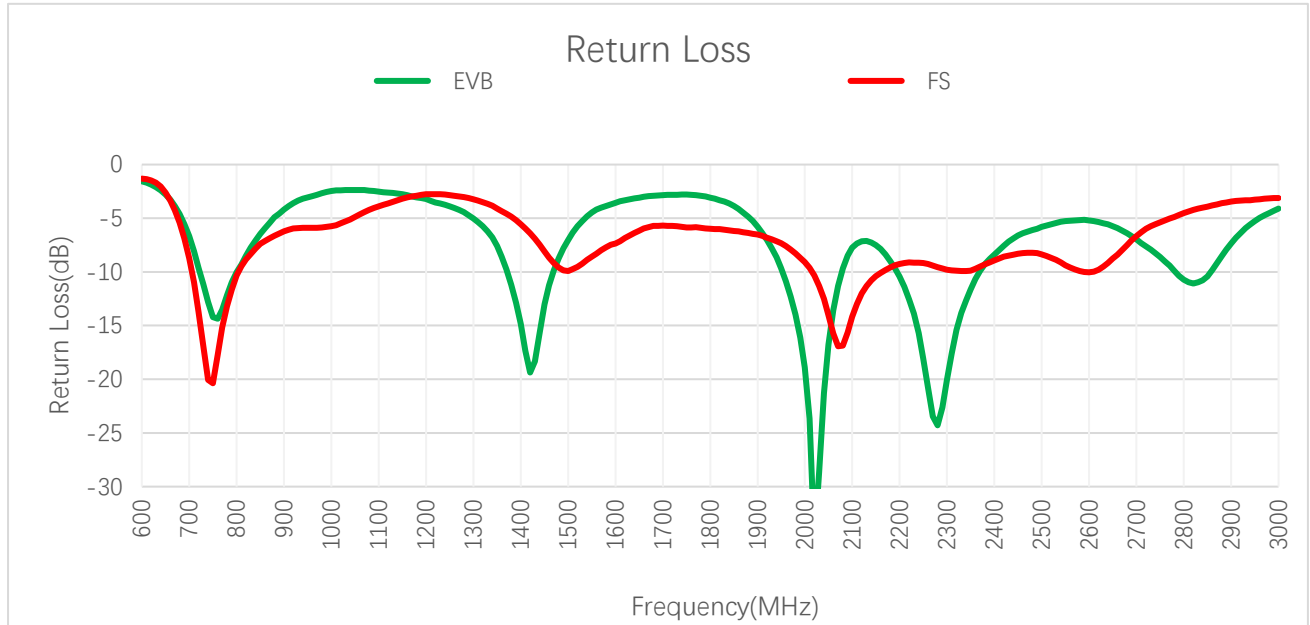
VSWR-LTE Bands

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
VSWR	EVB	-	-	2.3	2.4	4.2	6.0	-	6.2	6.3	3.7
	FS	-	-	1.8	2.2	2.9	3.1	-	3.2	3.1	2.8
Frequency (MHz)		1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
VSWR	EVB	2.0	2.5	1.7	2.8	3.4	2.7	-	-	-	-
	FS	2.5	1.8	1.9	2.2	1.9	2.6	-	-	-	-

VSWR–GNSS Bands

Frequency (MHz)		1561	1575	1602
VSWR	EVB	3.2	3.7	4.6
	FS	2.2	2.4	2.7

3.1.2. Return Loss



Return Loss (dB)–LTE Bands

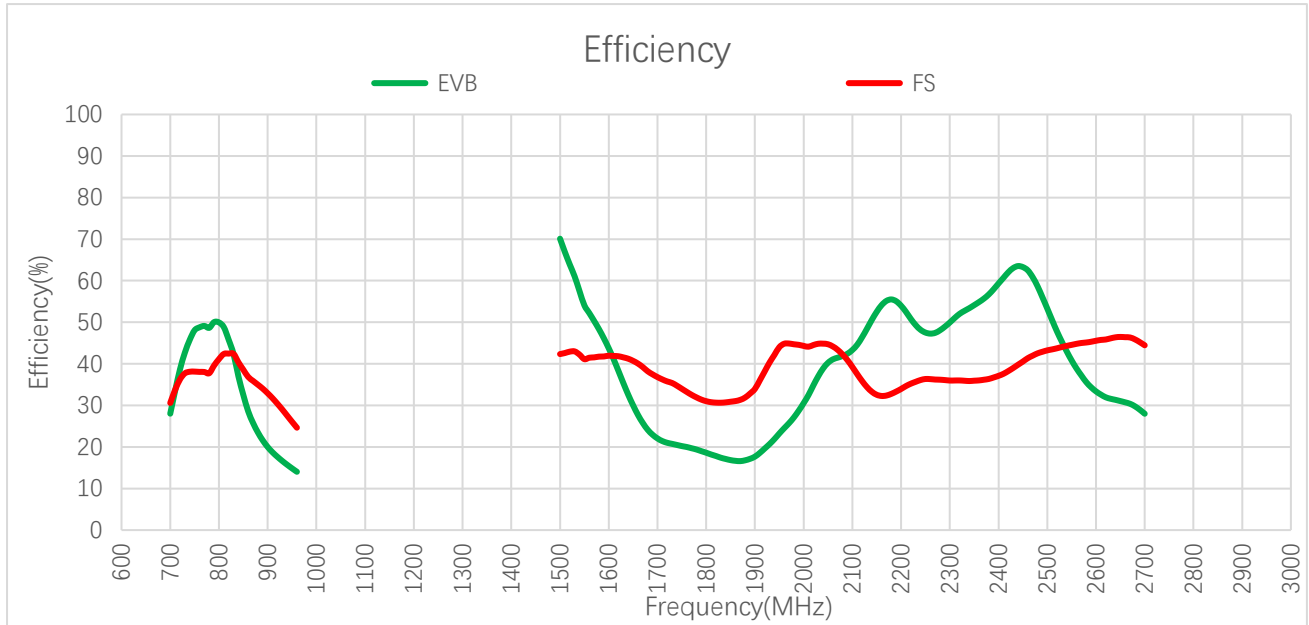
Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	EVB	-	-	-8.1	-7.7	-4.2	-2.9	-	-2.8	-2.8	-4.9
	FS	-	-	-11.0	-8.3	-6.2	-5.9	-	-5.7	-5.8	-6.4
Frequency (MHz)		1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Return Loss (dB)	EVB	-9.6	-7.3	-11.7	-6.6	-5.2	-6.7	-	-	-	-
	FS	-7.3	-10.8	-9.9	-8.3	-10.0	-7.0	-	-	-	-

Return Loss (dB)–GNSS Bands

Frequency (MHz)		1561	1575	1602
Return Loss (dB)	EVB	-5.5	-4.8	-3.9
	FS	-8.3	-7.6	-6.5

3.2. Radiation Performance Test

3.2.1. Efficiency



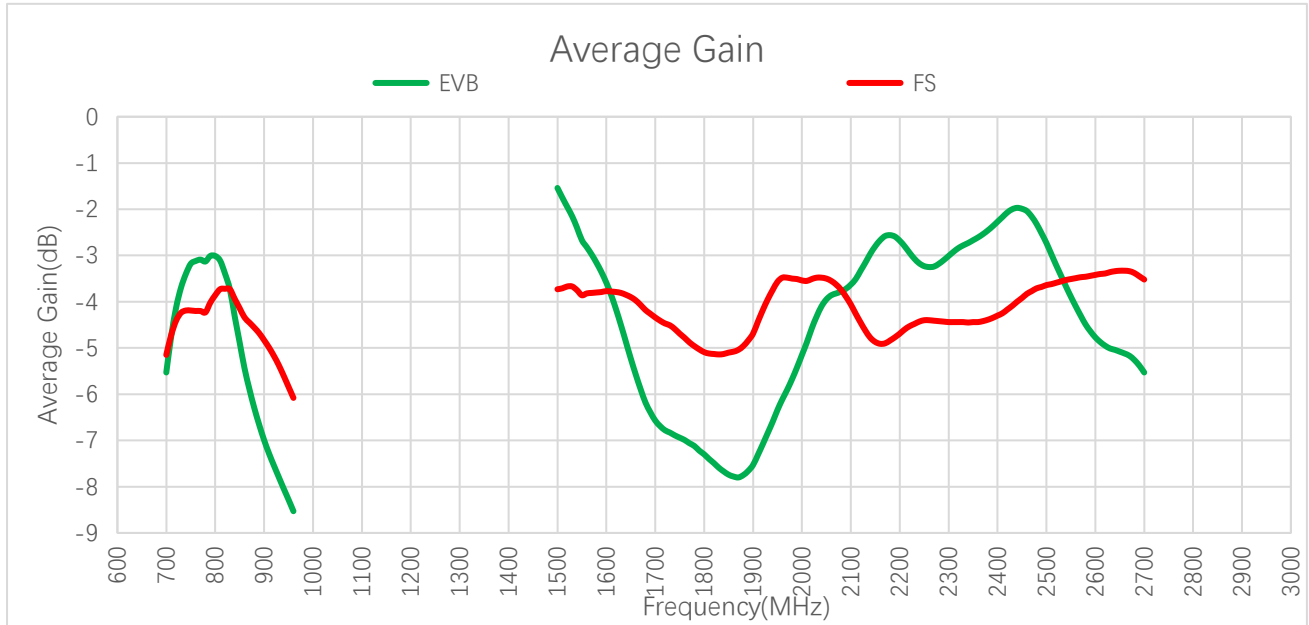
Efficiency (%)–LTE Bands

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	EVB	-	-	33.5	42.3	20.0	14.0	-	21.4	20.5	16.8
	FS	-	-	33.7	42.4	32.9	24.6	-	36.2	34.7	31.9
Frequency (MHz)		1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Efficiency (%)	EVB	23.2	50.6	54.1	63.3	33.4	29.0	-	-	-	-
	FS	44.0	33.3	35.9	40.6	45.6	45.2	-	-	-	-

Efficiency (%)–GNSS Bands

Frequency (MHz)		1561	1575	1602
Efficiency (%)	EVB	51.9	46.9	38.9
	FS	41.5	41.6	42.3

3.2.2. Average Gain



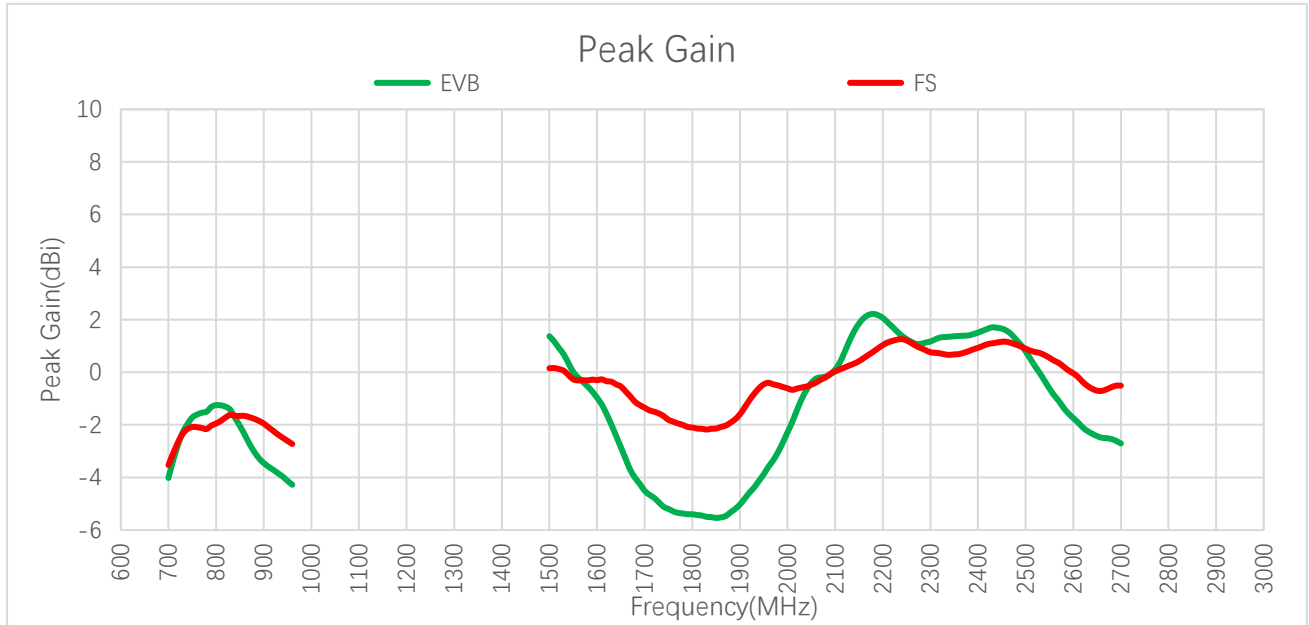
Average Gain (dB)–LTE Bands

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880	
Average Gain (dB)	EVB	-	-	-4.8	-3.7	-7.0	-8.5	-	-6.7	-6.9	-7.8
	FS	-	-	-4.7	-3.7	-4.8	-6.1	-	-4.4	-4.6	-5.0
Frequency (MHz)	1950	2140	2350	2450	2600	2690	4700	5000	5500	6000	
Average Gain (dB)	EVB	-6.3	-3.0	-2.7	-2.0	-4.8	-5.4	-	-	-	-
	FS	-3.6	-4.8	-4.4	-3.9	-3.4	-3.5	-	-	-	-

Average Gain (dB)–GNSS Bands

Frequency (MHz)	1561	1575	1602	
Average Gain (dB)	EVB	-2.8	-3.3	-4.1
	FS	-3.8	-3.8	-3.7

3.2.3. Peak Gain



Peak Gain (dBi)–LTE Bands

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	MP	-	-	-3.3	-1.4	-3.5	-4.3	-	-4.7	-5.1	-5.3
	FS	-	-	-3.1	-1.6	-2.0	-2.7	-	-1.5	-1.7	-1.9
Frequency (MHz)		1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Peak Gain (dBi)	MP	-3.9	1.6	1.4	1.7	-1.7	-2.6	-	-	-	-
	FS	-0.5	0.3	0.7	1.2	0.0	-0.5	-	-	-	-

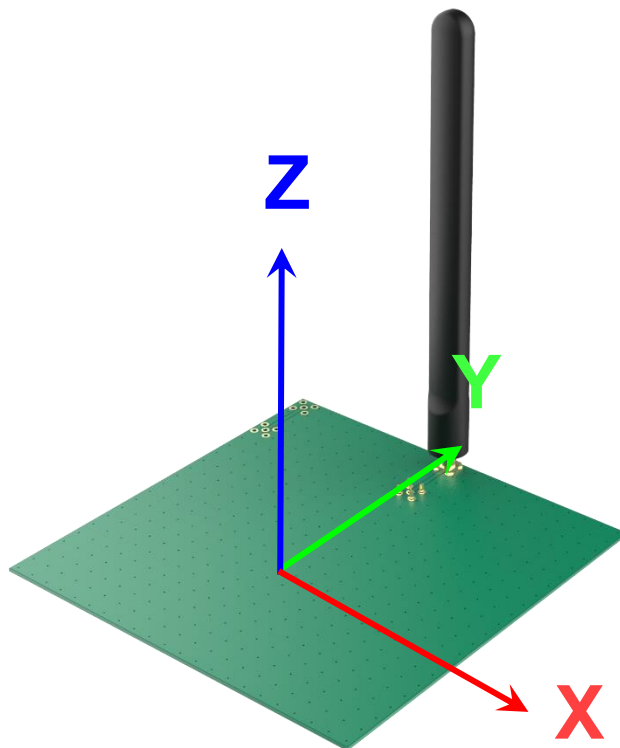
Peak Gain (dBi)–GNSS Bands

Frequency (MHz)		1561	1575	1602
Peak Gain (dBi)	MP	0	-0.6	-1.2
	FS	-0.6	-0.5	-0.5

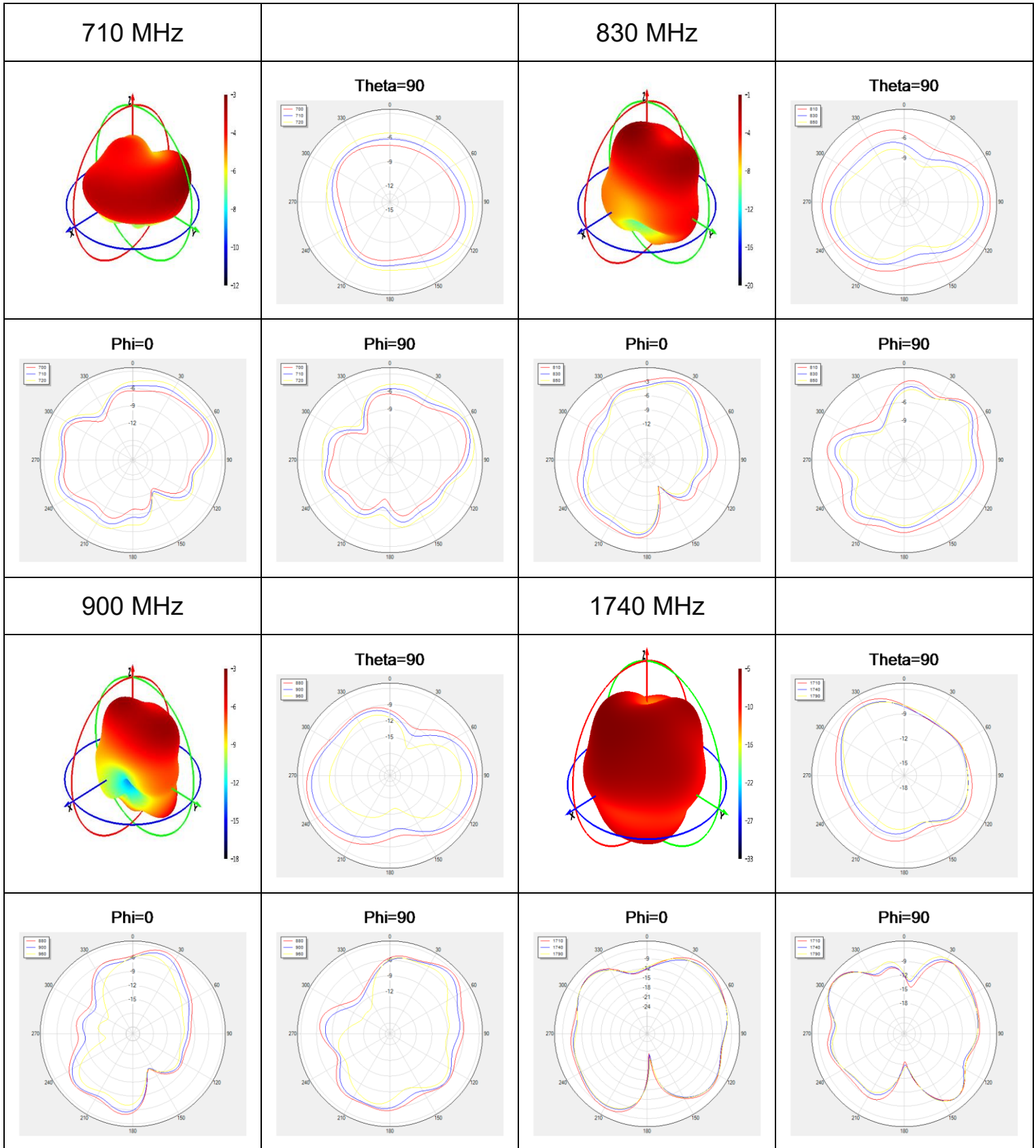
3.2.4. 3D & 2D Radiation Pattern

3.2.4.1. Test Condition: On 130 × 130 mm EVB

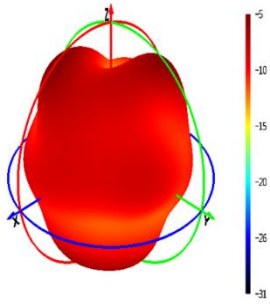
- Test Chamber: GL-S-1



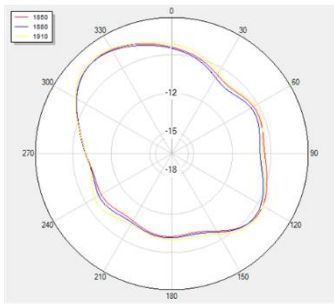
● LTE Bands



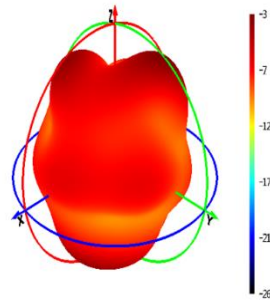
1880 MHz



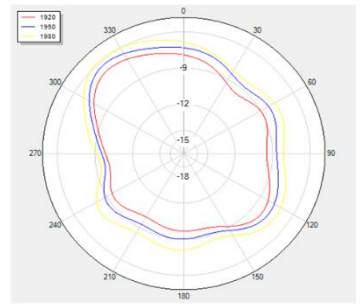
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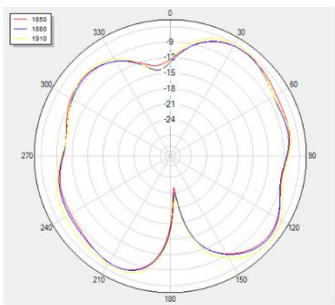
1950 MHz



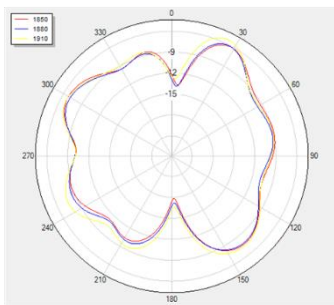
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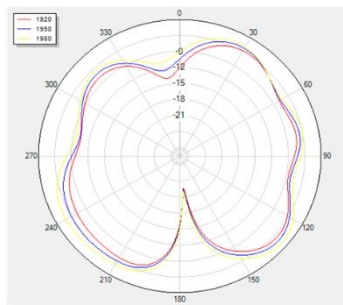
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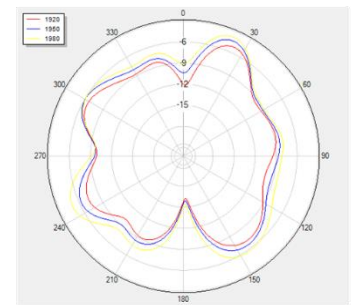
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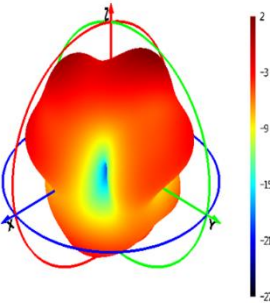
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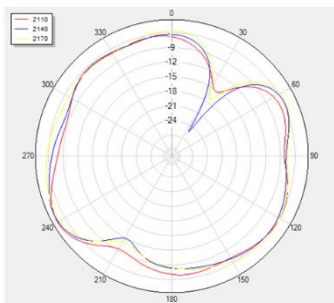
Phi=90



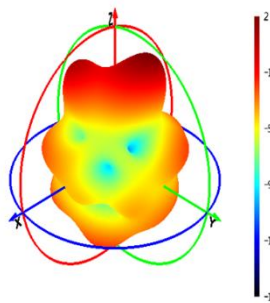
2140 MHz



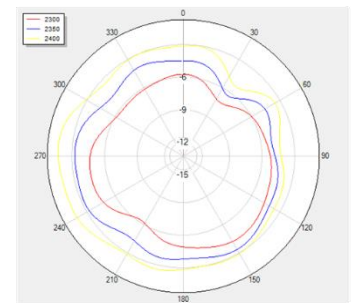
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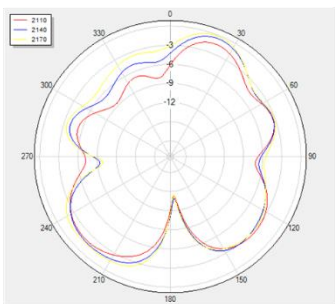
2350 MHz



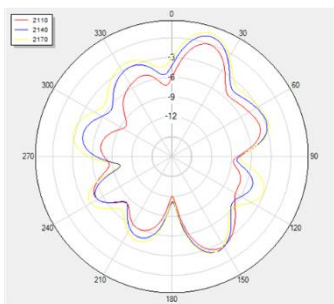
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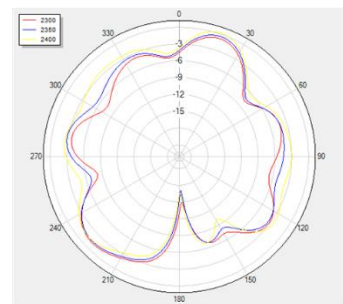
Phi=0



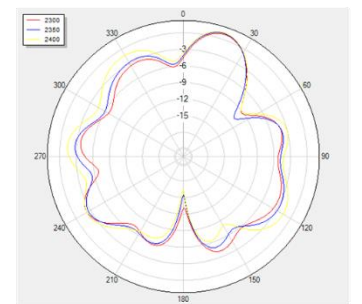
Phi=90



Phi=0

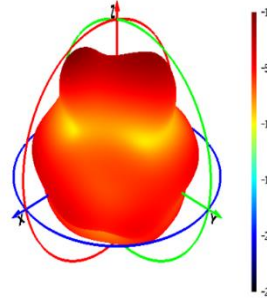
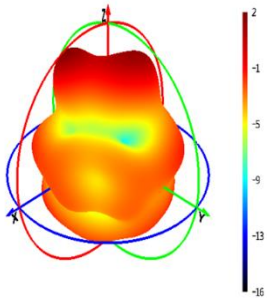


Phi=90



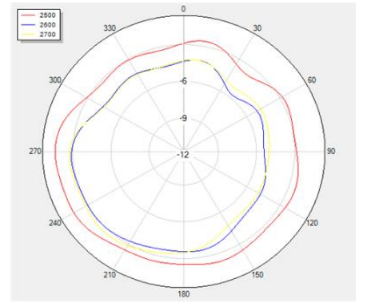
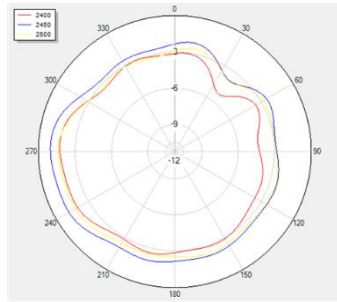
2450 MHz

2600 MHz



Theta=90

Theta=90

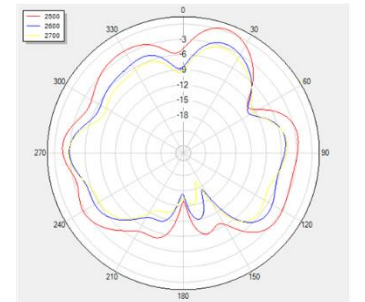
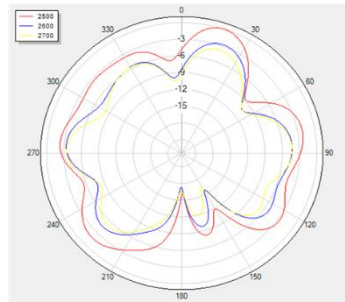
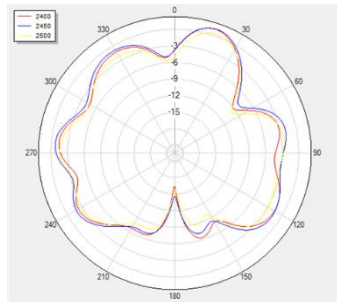
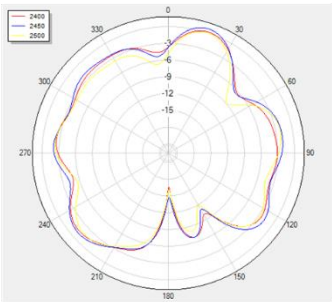


Phi=0

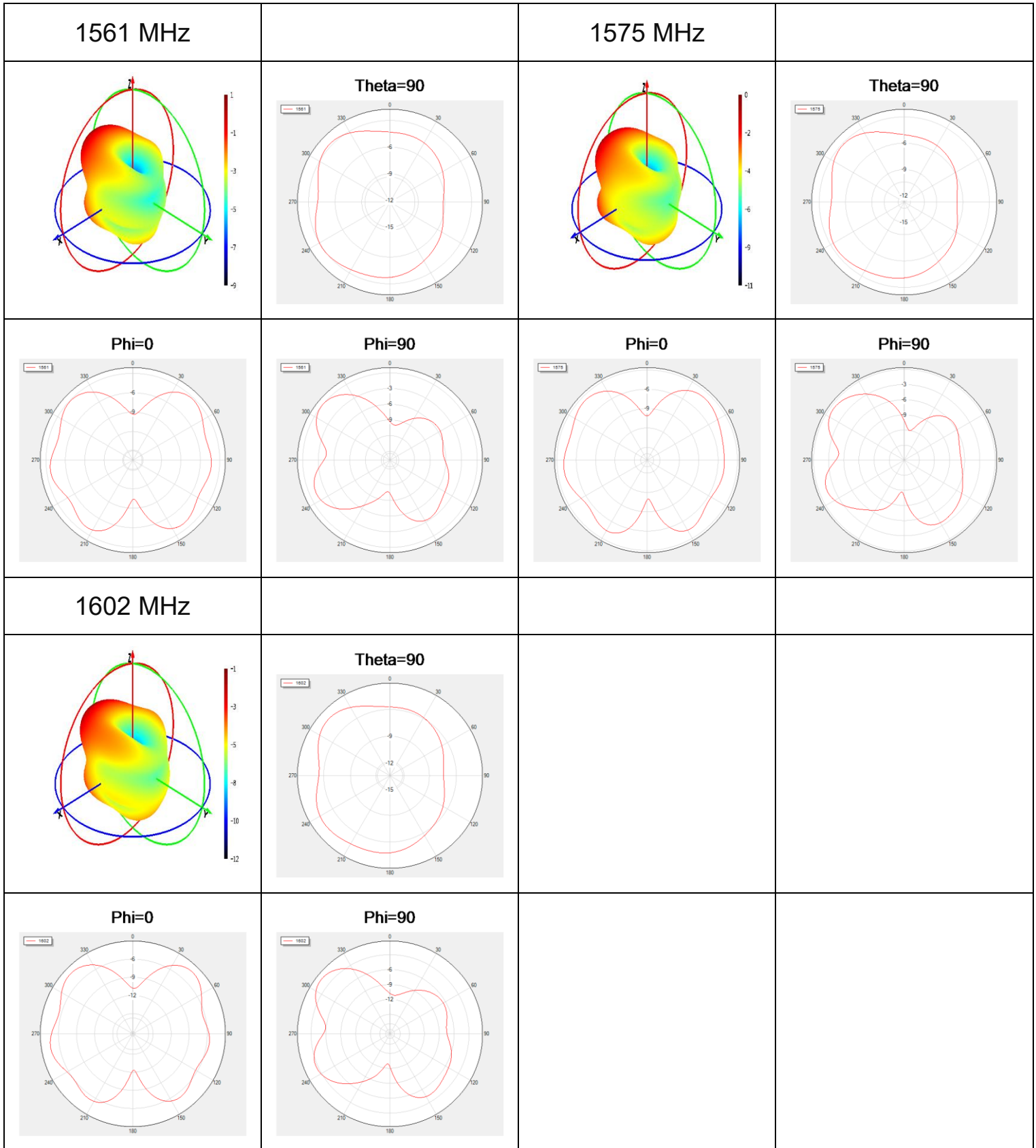
Phi=90

Phi=0

Phi=90

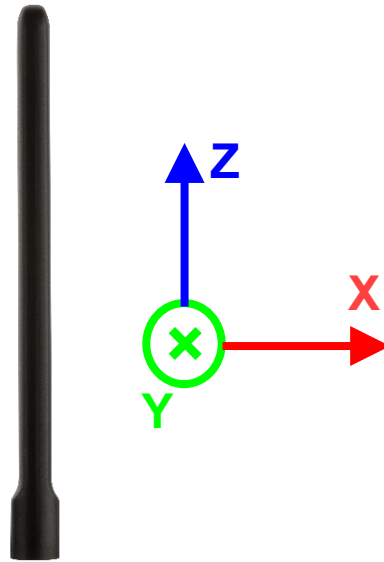


● GNSS Bands

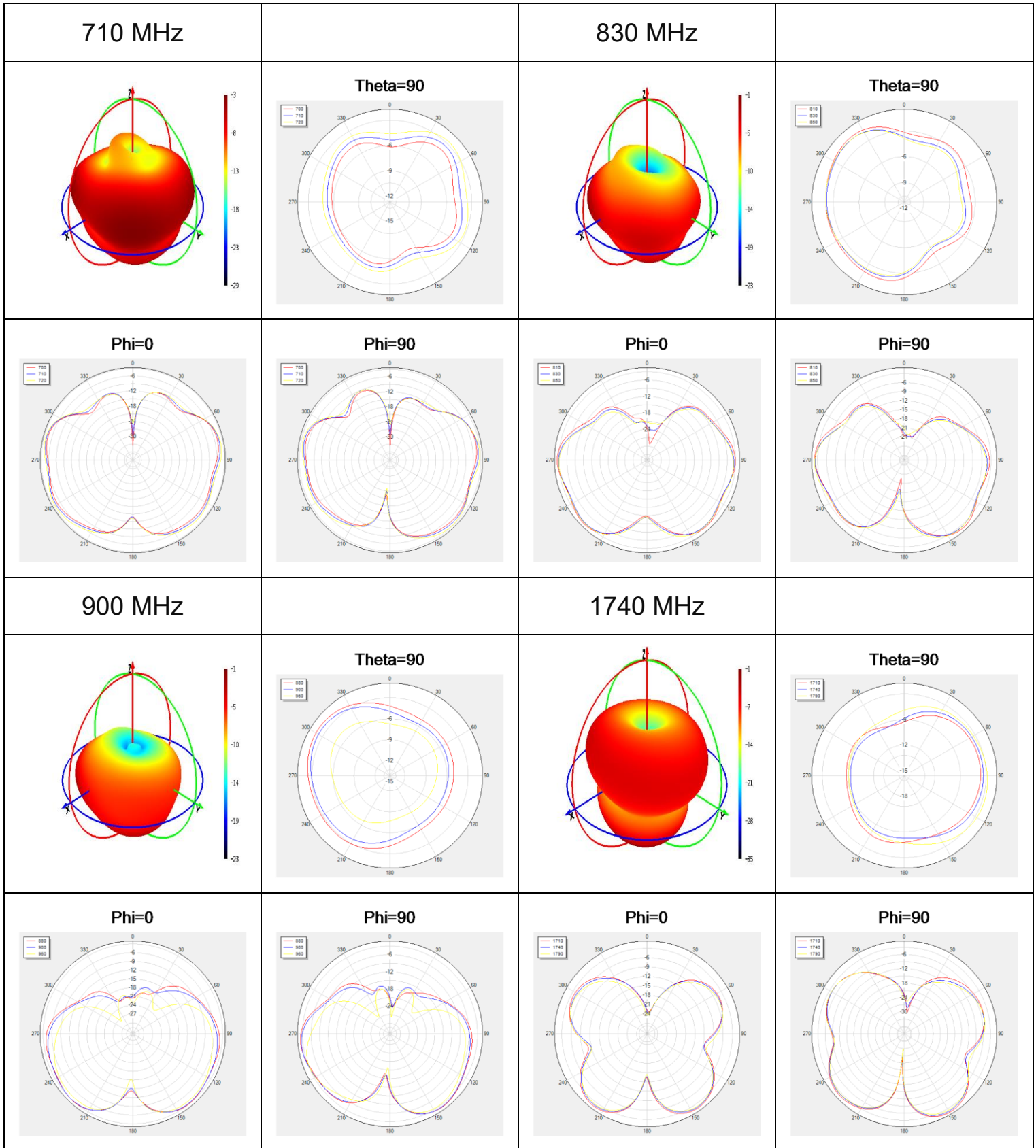


3.2.4.2. Test Condition: Free Space

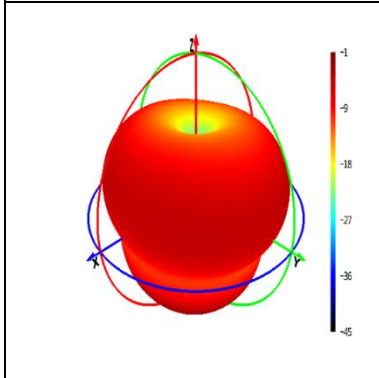
- Test Chamber: GL-S-1



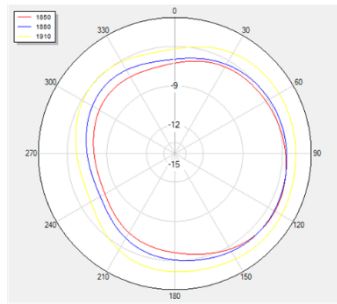
● LTN Bands



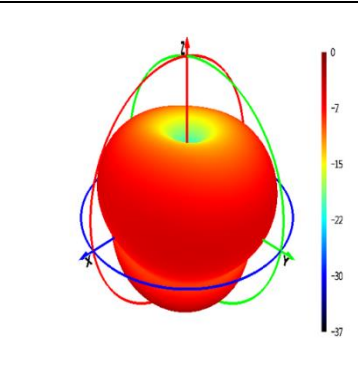
1880 MHz



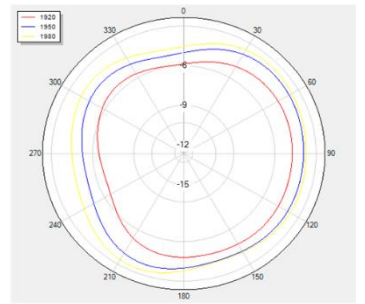
Theta=90



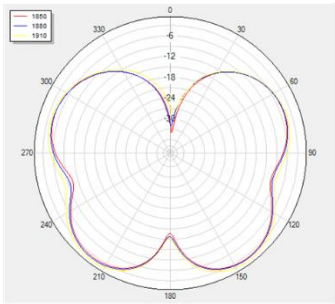
1950 MHz



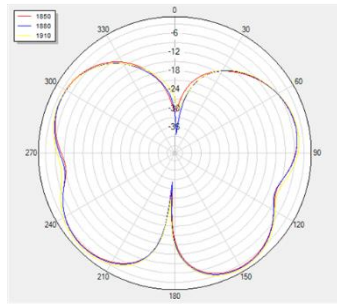
Theta=90



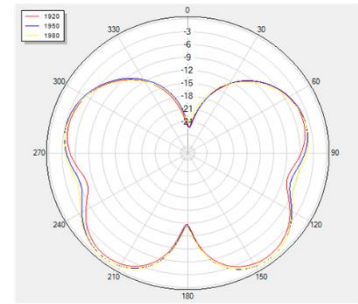
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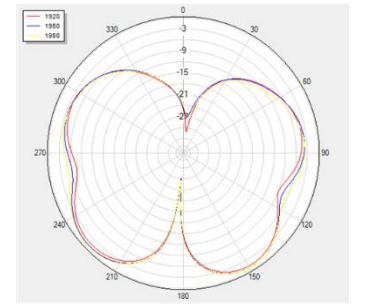
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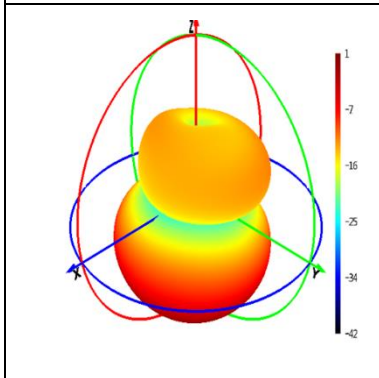
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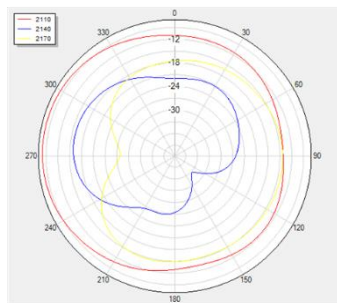
Phi=90



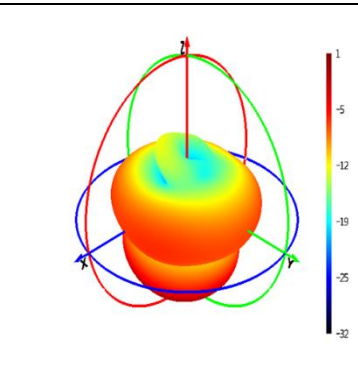
2140 MHz



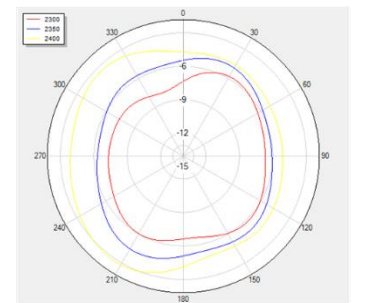
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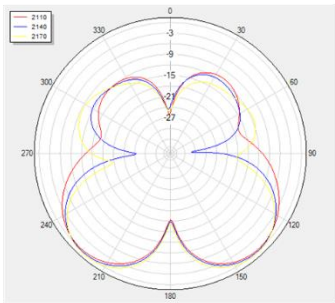
2350 MHz



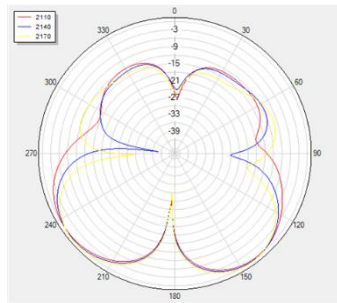
Theta=90



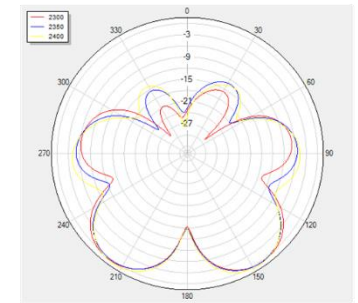
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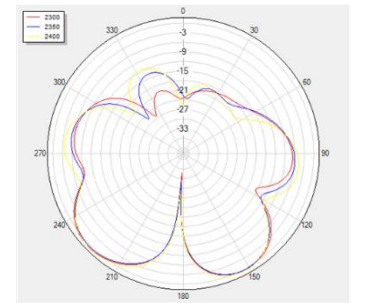
Phi=90



Phi=0

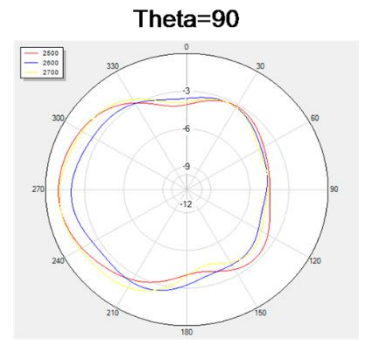
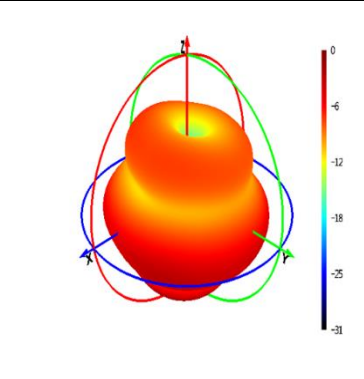
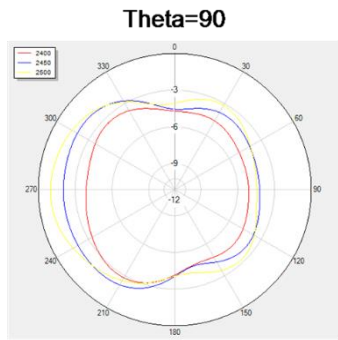
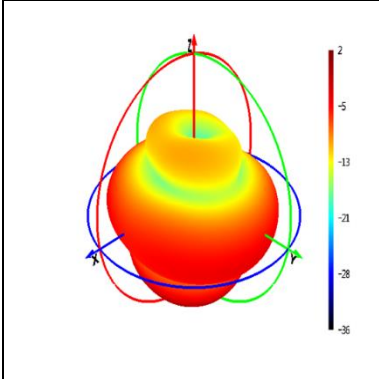


Phi=90



2450 MHz

2600 MHz

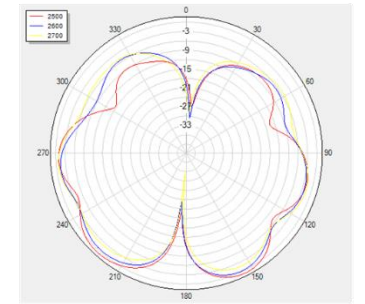
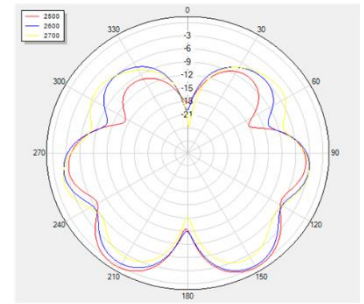
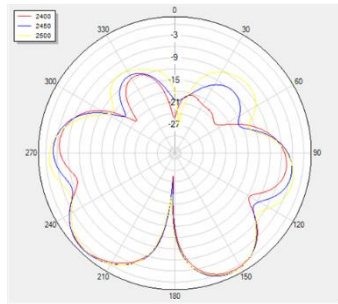
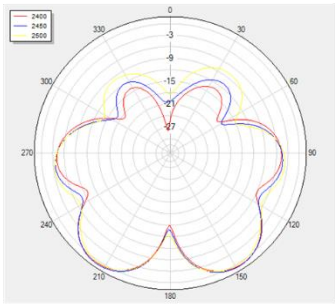


Phi=0

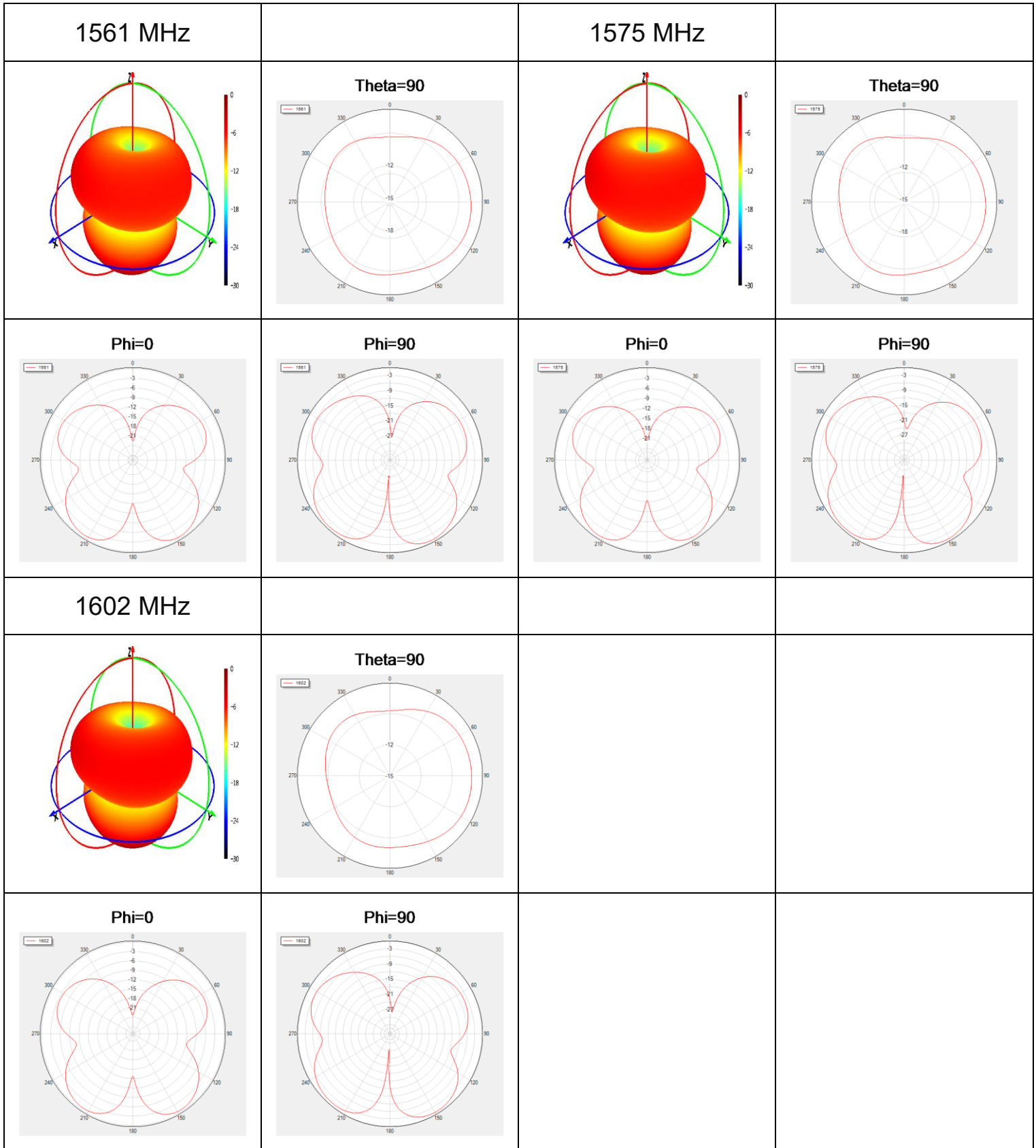
Phi=90

Phi=0

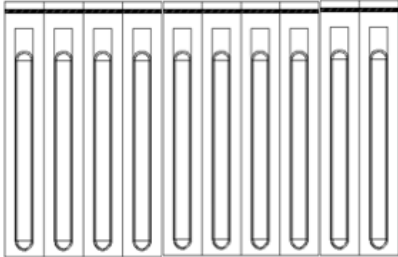
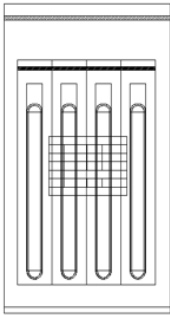
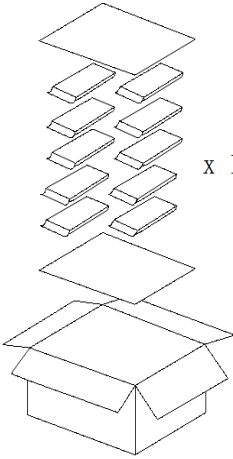
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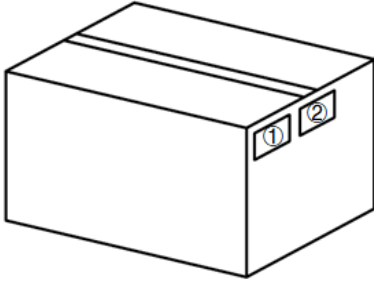
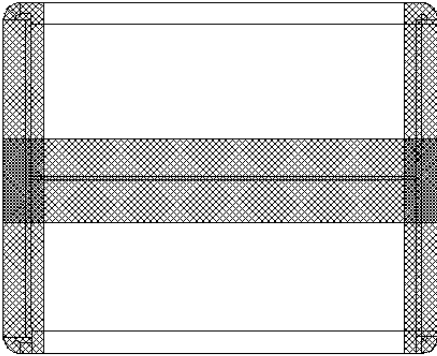


● GNSS Bands



4 Packaging

Step	Packaging picture / 2D picture	Description
1	 <p>10pcs/bag</p>	<p>Put the product in a one-piece bag 10pcs / one-piece bag</p>
2	 <p>40pcs/bag</p>	<p>40 pcs Antenna products in a big PE bag; (40 pcs Antenna / per big PE Bag)</p>
3	 <p>x 10 bag</p>	<p>Place a clapboard at the bottom and top, (10 Big PE Bags / per carton box) (400 pcs Antenna / per carton box)</p> <p><u>Carton Size: L × W × H = 325 × 325 × 200 mm</u></p>

4	 A 3D perspective drawing of a rectangular carton. On the front-right edge, there are two small rectangular labels. The left label is marked with a circled '1' and the right label is marked with a circled '2'.	<p>Position for Attaching Labels</p> <ul style="list-style-type: none">① Carton Label② Quality Label
5	 A 3D perspective drawing of a rectangular carton with a mesh-like texture. A thick, shaded horizontal band is wrapped around the middle of the carton, representing a sealing strip. The band is wider than the height of the carton's body.	<p>Sealing Cartons “I” type sealing cartons</p>

Contact US

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Revision History

Version	Date	Author	Note
-	2020-05-26	Kenny Yin	Initial
1.0	2020-05-26	Kenny Yin	First official release
1.1	2020-12-15	Kenny Yin	Updated the antenna image in Chapter 2.
1.2	2021-07-25	Kenny Yin	1. Updated working temperature. (Chapter 3) Added detailed passive electrical specifications. (Chapter 3)
1.3	2021-12-01	Kenny Yin	Updated the product description in Chapter 1.
2.0	2022-05-11	Bunny Zhang	1. Updated the product description (Chapter 1). 2. Added GNSS L1 Band supported (Chapter 2). 3. Added GNSS L1 Band parameters to Passive Electrical Specifications and Detailed Passive Electrical Specifications (Chapter 3). Added the passive data (VSWR, Efficiency, Gain, Radiation Pattern) of GNSS L1 Band (Chapter 4).
2.1	2022-09-08	Kenny Yin	Updated the IP rating to IP66.
3.0	2022-12-28	Kenny Yin	Updated test data in Chapter 4.
4.0	2023-06-08	Joyful Huang/ Lucky Feng/ David Liu/ Aria Chu	Update all data and datasheet templates

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