Antenna Datasheet

Product OC: YECN028AA
Version: 1.0
Date: 2023-05-25
Status: Released

Product Name: 5G/NTN External Antenna
Key Features:
Frequency Band: 410–470 MHz, 617–960 MHz, 1427–6000 MHz
Dimensions: 225 × 54.5 × 13 mm
Efficiency: Up to 82.24 % (5G)
RoHS and REACH Compliant
IP66

Overview

This Quectel external 5G/NTN antenna covers 5G NR Sub-6 GHz frequency bands and is compatible with 4G/3G/2G/LPWA bands, NTN bands. Featuring high efficiency and gain, it is an ideal omni-directional antenna solution to ensure high-speed data transmission, which can be widely used in a diversity of wireless communication devices such as AP, routers, outdoor equipment, real-time monitoring equipment, and many more. The antenna is designed to work with any ground plane size or in free space for ease of integration. Quectel also offers flexible installation with custom cable length and connector options.

Contents

1 Specification

Test Condition: In Free Space

1.1. Electrical

Electrical	
Frequency Range	410–470 MHz, 617–960 MHz, 1427–6000 MHz
Radiation Pattern	Omni-directional
Polarization	Linear
Impedance	50 Ω

Electrical - Detail

SPEC / Band	Band	B31	B5/B8 /B12 /B13 /B26 /B28 /B71	N74 /N75 /N76	B1 /B2 /B3	B40 /Wi-Fi 2G	Wi-Fi 2G	B42 /B48 /N77 /N79	Wi-Fi 5G
	Freq. (MHz)	**410 - 470**	**617 - 960**	**1420 - 1520**	**1710 - 2170**	**2300 - 2500**	**2500 - 2690**	**3300 - 5000**	**5150 - 6000**
Max VSWR		4.9	3.0	1.6	2.8	2.0	1.9	2.9	2.4
Max Return Loss (dB)		-3.6	-6.0	-12.4	-6.4	-9.7	-10.4	-6.4	-7.6
AVG Eff. (%)		45.1	64.5	54.9	64.4	75.2	65.2	58.7	60.9
AVG Gain (dB)		-3.5	-2.0	-2.6	-1.9	-1.2	-1.9	-2.3	-2.2
Max Peak Gain (dBi)		0.0	0.5	2.8	2.0	2.5	2.2	5.5	5.8
VSWR		≤ 4.9							
Return Loss		≤ -3.6 dB							
Peak Gain		≤ 5.8 dBi							

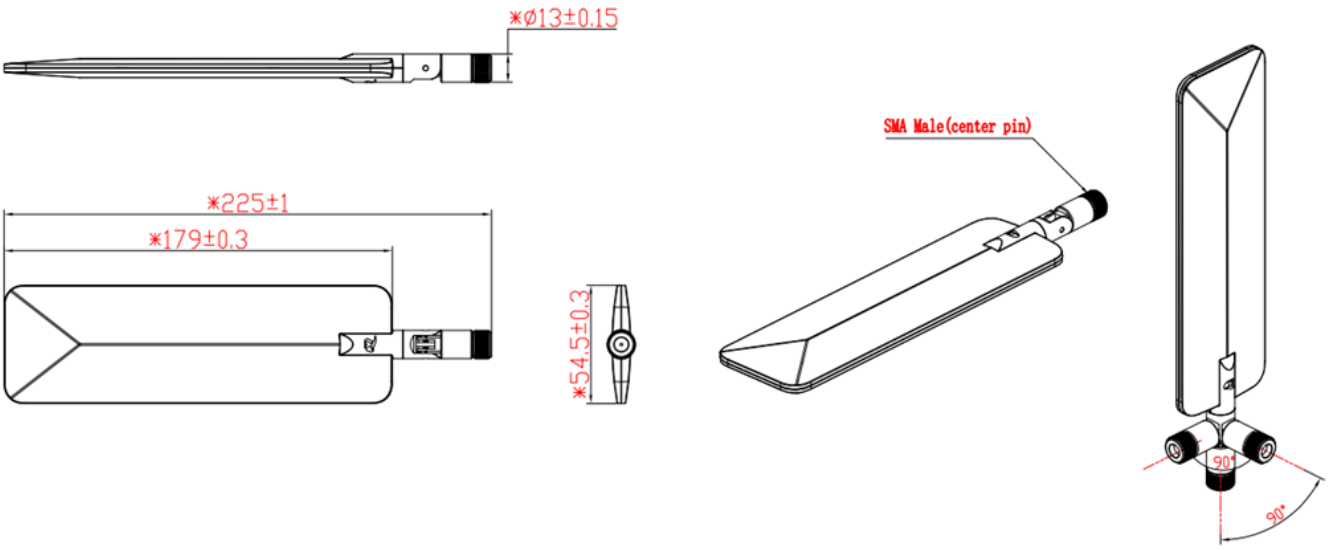
Electrical - NTN Bands					
Band / SPEC	L Band	L Band	L Band	B256 / B23	B256 / B23
	1518-1559	1620-1665	1668-1675	1980-2020	2170-2200
Max. VSWR	1.8	2.2	2.2	2.2	1.5
Max. Return Loss (dB)	-10.8	-8.7	-8.5	-8.6	-14.1
AVG Eff. (%)	64.0	60.1	62.3	65.7	68.3
AVG Gain (dB)	-1.9	-2.2	-2.1	-1.8	-1.7
Max. Peak Gain (dBi)	2.5	0.8	0.4	1.4	2.4
Upper Hemisphere Efficiency (dB)	-3.5	-3.5	-3.8	-2.5	-2.2
VSWR	≤ 2.2				
Return Loss	≤ -8.5 dB				
Peak Gain	≤ -2.2 dBi				

1.2. Mechanical, Environmental & Storage

Mechanical	
Antenna Dimensions	225 × 54.5 × 13 mm
Casing Material & Color	PC & Black
Connector Type	SMA Male
Mounting Type	Terminal
Weight	Typ. 75 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Ingress Protection (IP) Rating	IP66
RoHS & REACH Compliant	Yes

Storage	
Storage Temperature	18 ℃–27 ℃
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.

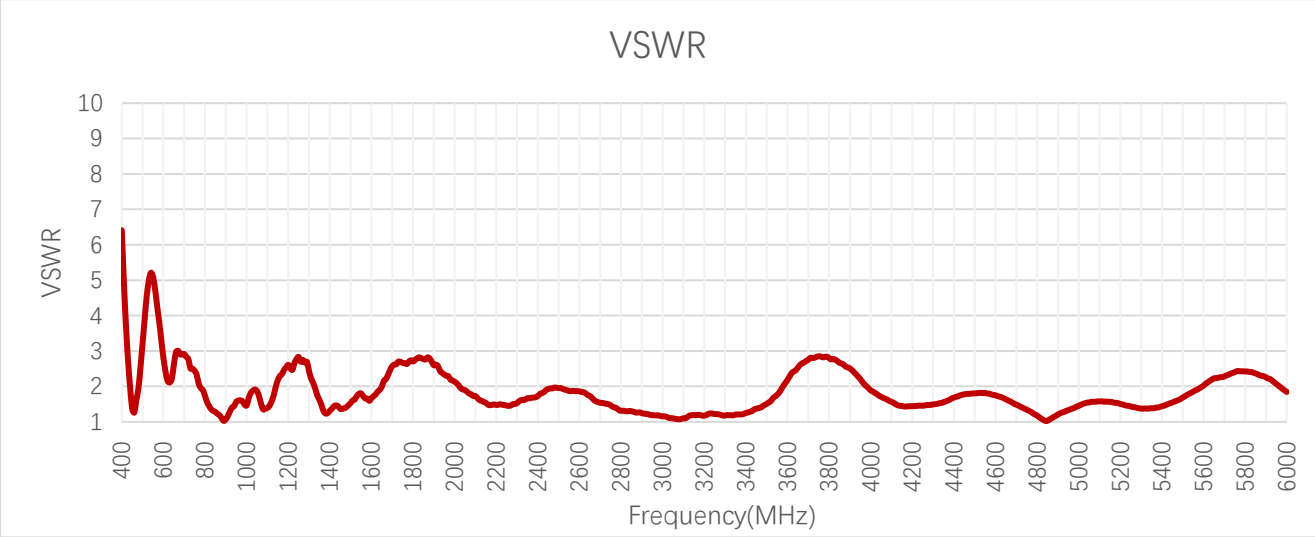
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



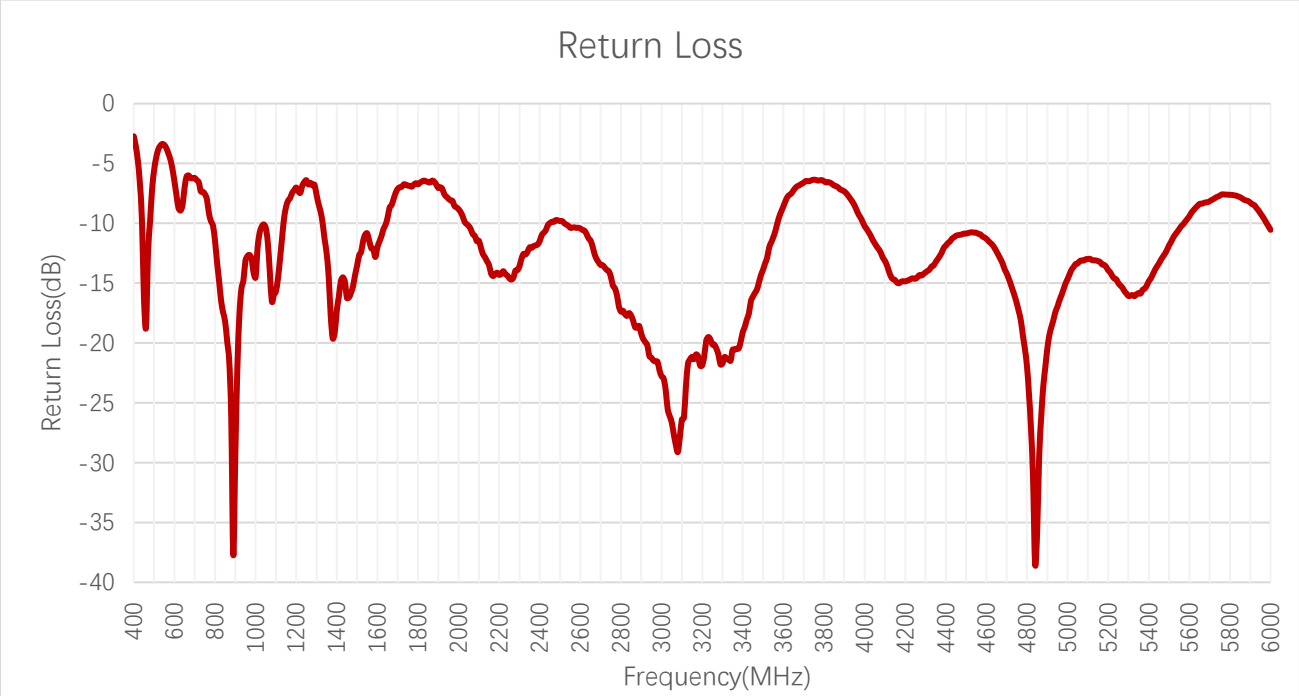
VSWR

Frequency (MHz)	410	420	460	470	600	630	700	710	810
VSWR	4.9	3.7	1.3	1.6	2.8	2.1	2.9	2.8	1.6
Frequency (MHz)	830	900	960	1440	1710	1740	1880	1950	2140
VSWR	1.4	1.1	1.6	1.4	2.6	2.7	2.8	2.3	1.6
Frequency (MHz)	2350	2450	2600	2700	3600	4000	4700	5500	6000
VSWR	1.7	1.9	1.9	1.5	2.2	1.9	1.5	1.7	1.8

VSWR - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
VSWR	1.6	1.7	1.9	2.3	2.1	1.5

3.1.2. Return Loss



Return Loss(dB)

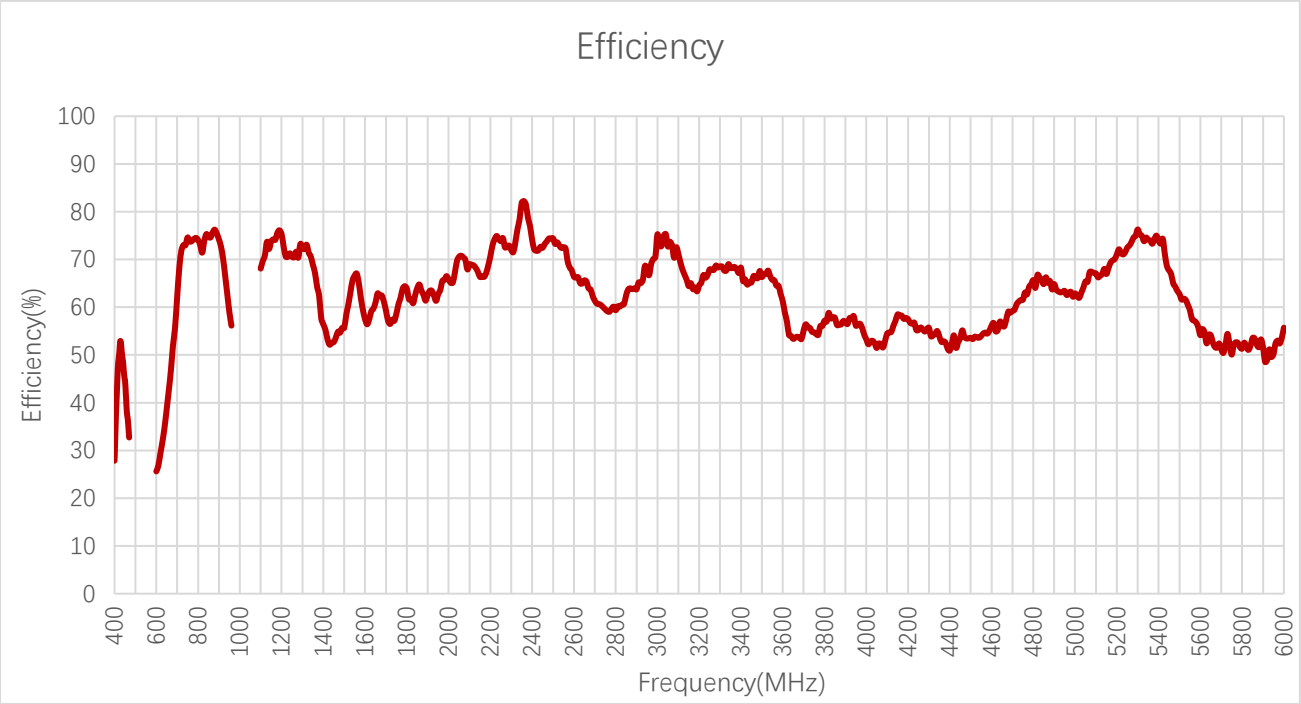
Frequency (MHz)	410	420	460	470	600	630	700	710	810
Return Loss (dB)	-3.6	-4.8	-18.7	-12.5	-6.5	-8.9	-6.2	-6.4	-13.2
Frequency (MHz)	**830**	**900**	**960**	**1440**	**1710**	**1740**	**1880**	**1950**	**2140**
Return Loss (dB)	-16.5	-29.4	-12.7	-14.9	-7.0	-6.8	-6.5	-7.9	-13.2
Frequency (MHz)	**2350**	**2450**	**2600**	**2700**	**3600**	**4000**	**4700**	**5500**	**6000**
Return Loss (dB)	-12.0	-10.0	-10.4	-13.5	-8.6	-10.2	-14.2	-11.9	-10.5

Return Loss (dB) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Return Loss (dB)	-12.4	-11.5	-10.5	-8.0	-8.8	-14.3

3.2. Radiation Performance Test

3.2.1. Efficiency



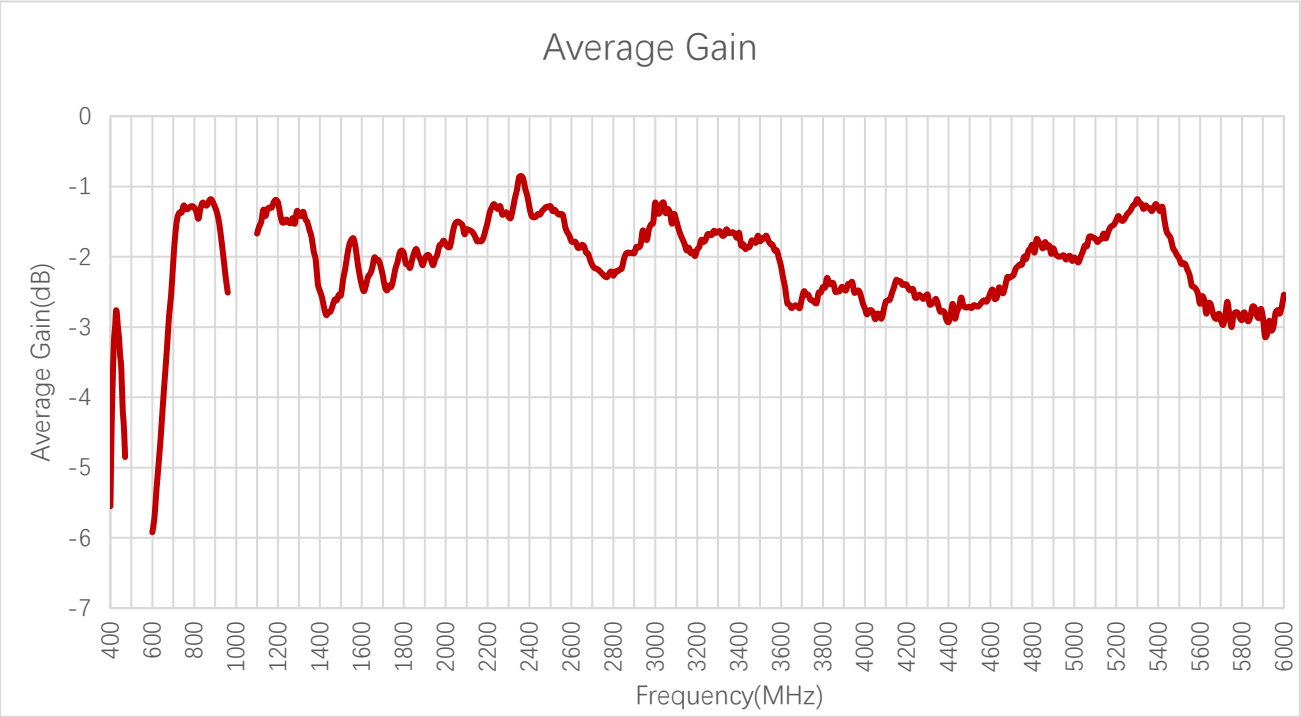
Efficiency (%)

Frequency (MHz)	410	420	460	470	600	630	700	710	810
Efficiency (%)	40.8	49.2	37.7	32.7	25.6	32.0	62.1	68.1	73.1
Frequency (MHz)	830	900	960	1440	1710	1740	1880	1950	2140
Efficiency (%)	73.9	74.2	56.1	52.6	57.2	57.2	62.6	62.7	67.4
Frequency (MHz)	2350	2450	2600	2700	3600	4000	4700	5500	6000
Efficiency (%)	81.9	72.4	66.4	61.4	61.3	53.3	59.2	62.8	55.7

Efficiency (%) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Efficiency (%)	60.6	67.0	59.2	62.4	65.8	70.7

3.2.2. Average Gain



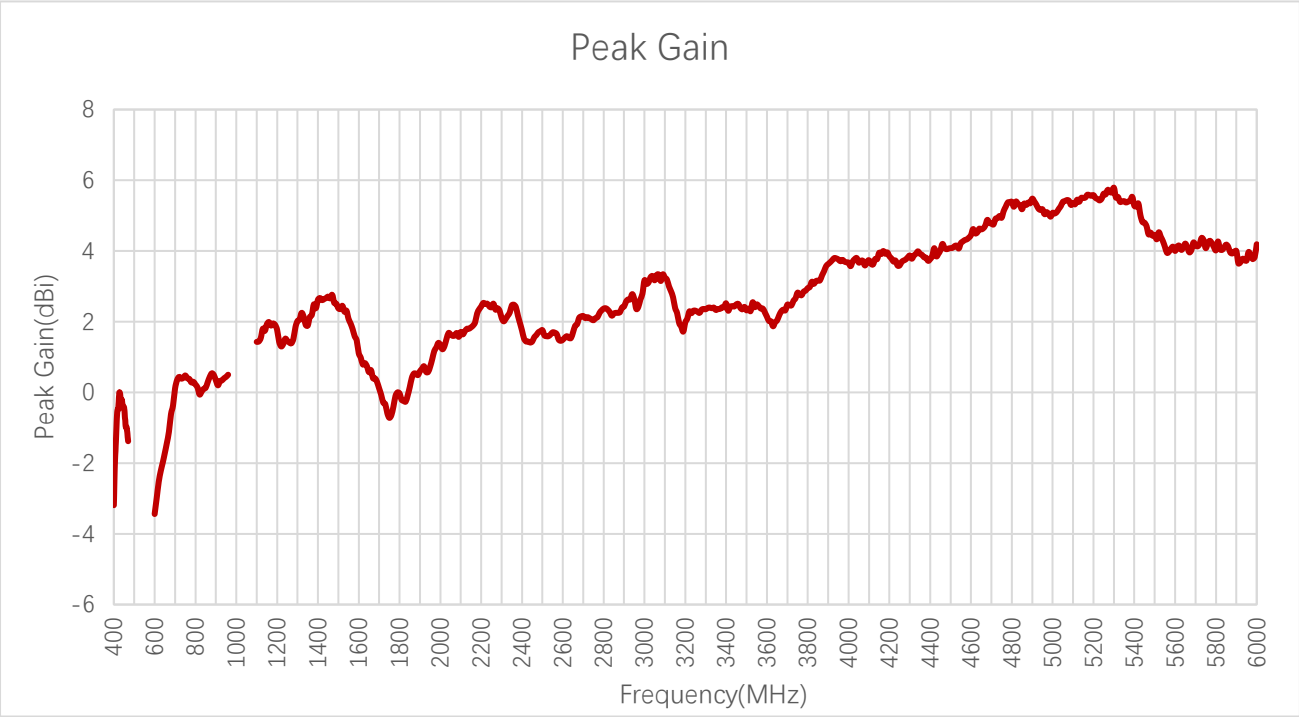
Average Gain (dB)

Frequency (MHz)	410	420	460	470	600	630	700	710	810
Average Gain (dB)	-3.9	-3.1	-4.2	-4.9	-5.9	-5.0	-2.1	-1.7	-1.4
Frequency (MHz)	830	900	960	1440	1710	1740	1880	1950	2140
Average Gain (dB)	-1.3	-1.3	-2.5	-2.8	-2.4	-2.4	-2.0	-2.0	-1.7
Frequency (MHz)	2350	2450	2600	2700	3600	4000	4700	5500	6000
Average Gain (dB)	-0.9	-1.4	-1.8	-2.1	-2.1	-2.7	-2.3	-2.0	-2.5

Average Gain (dB) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Average Gain (dB)	-2.2	-1.7	-2.3	-2.1	-1.8	-1.5

3.2.3. Peak Gain



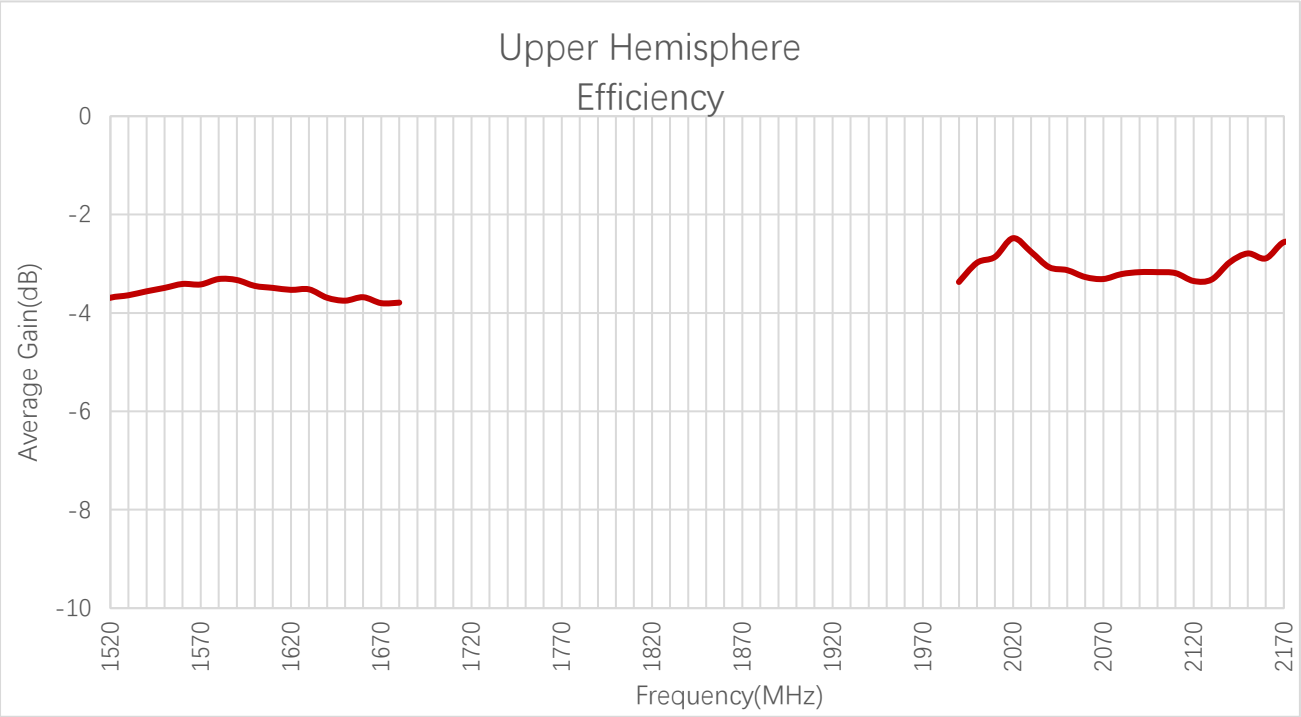
Peak Gain (dBi)

Frequency (MHz)	410	420	460	470	600	630	700	710	810
Peak Gain (dBi)	-1.4	-0.5	-1.0	-1.4	-3.4	-2.2	0.1	0.4	0.1
Frequency (MHz)	**830**	**900**	**960**	**1440**	**1710**	**1740**	**1880**	**1950**	**2140**
Peak Gain (dBi)	0.0	0.3	0.5	2.7	-0.1	-0.6	0.5	0.7	1.8
Frequency (MHz)	**2350**	**2450**	**2600**	**2700**	**3600**	**4000**	**4700**	**5500**	**6000**
Peak Gain (dBi)	2.5	1.4	1.5	2.2	2.1	3.7	4.8	4.5	4.2

Peak Gain (dBi) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Peak Gain (dBi)	2.5	2.0	0.8	0.4	1.3	2.4

3.2.4. Upper Hemisphere Efficiency

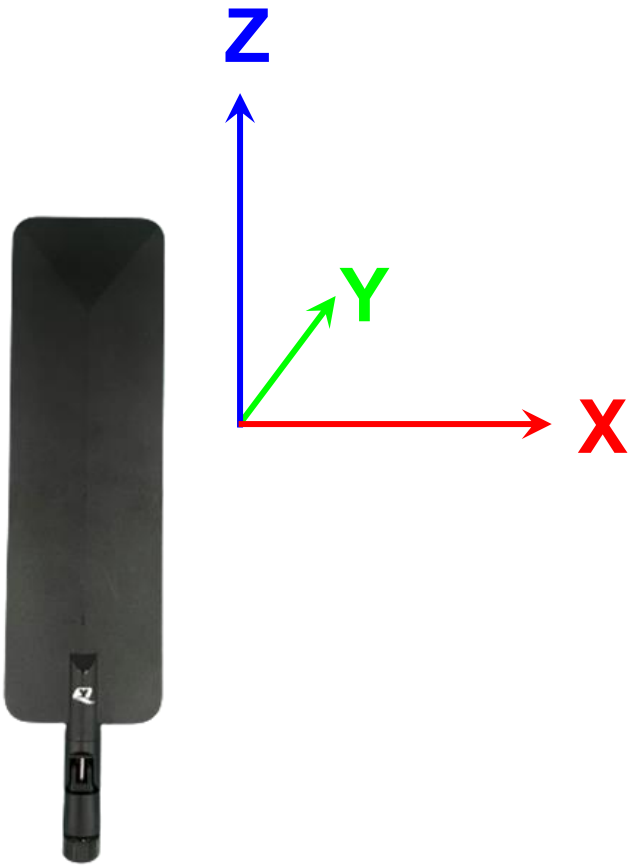


Upper Hemisphere Efficiency (dB) - NTN Bands

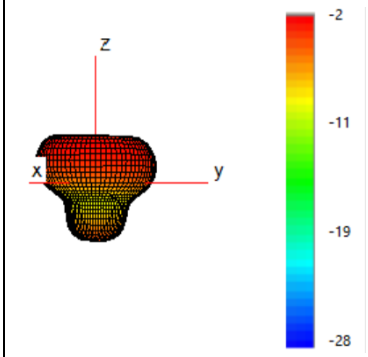
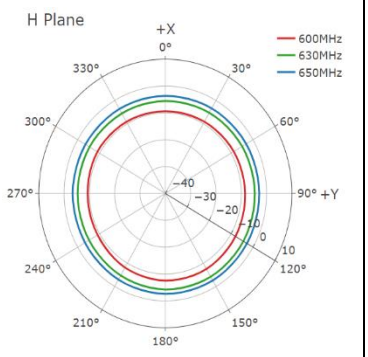
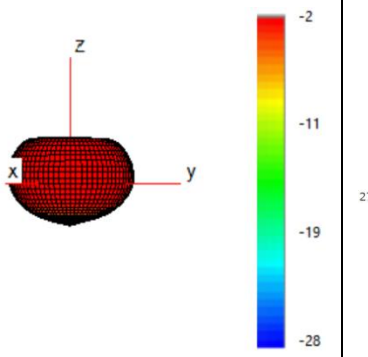
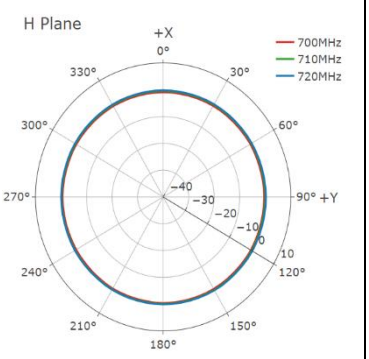
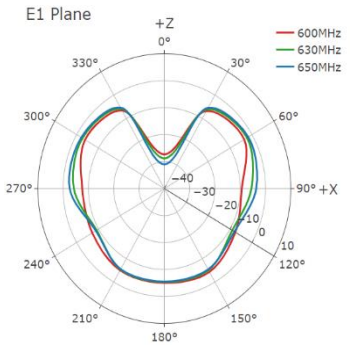
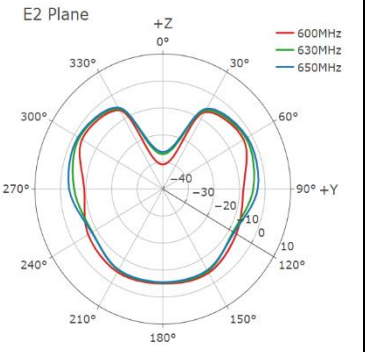
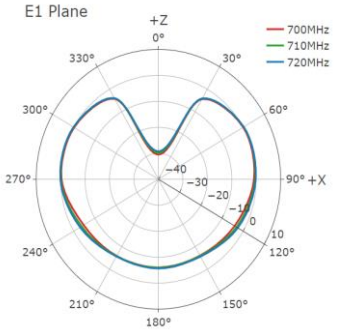
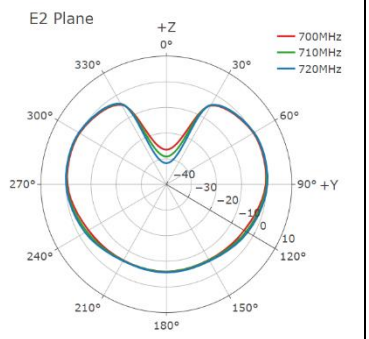
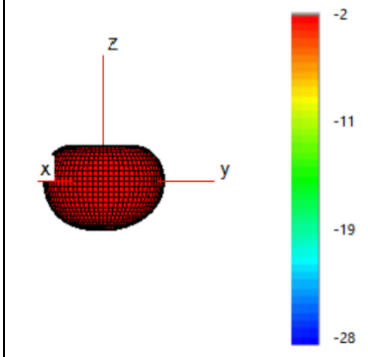
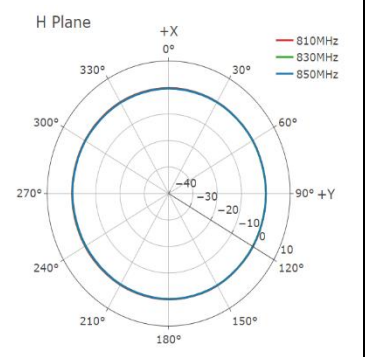
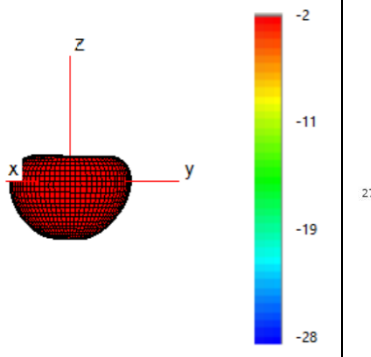
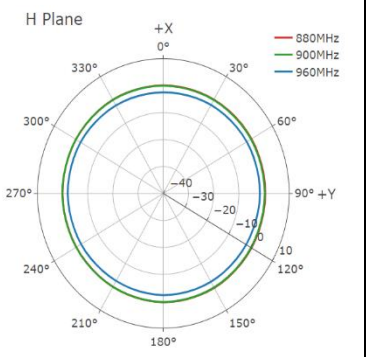
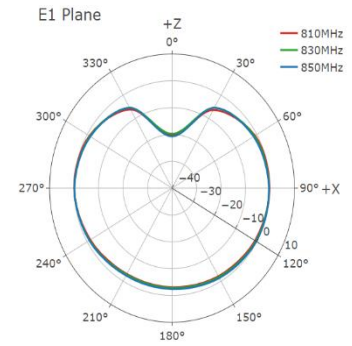
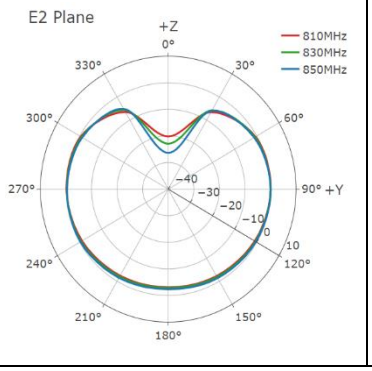
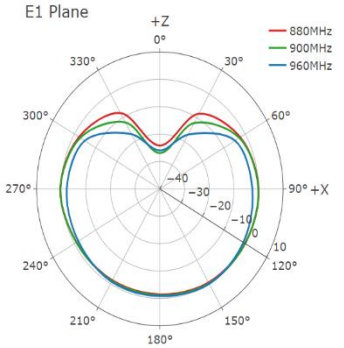
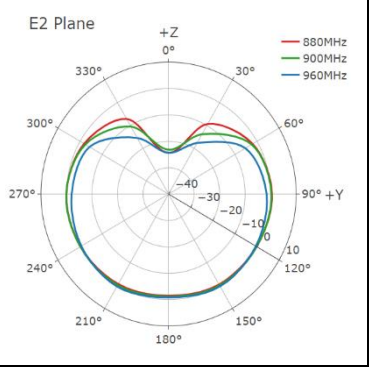
Frequency (MHz)	1520	1560	1630	1680	2000	2200
Upper Hemisphere Efficiency (dB)	-3.7	-3.4	-3.5	-3.8	-3.0	-2.2

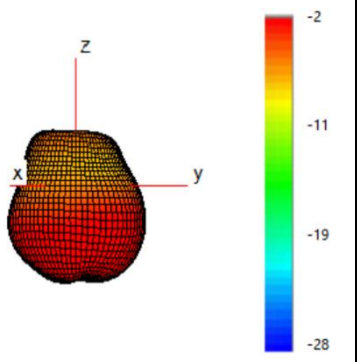
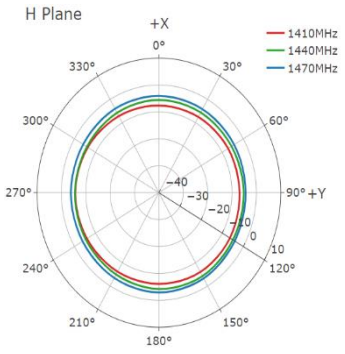
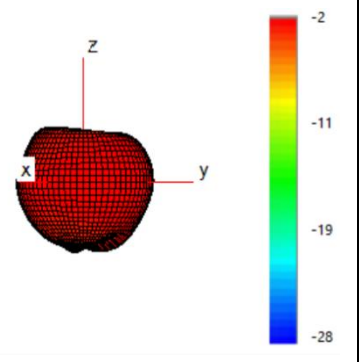
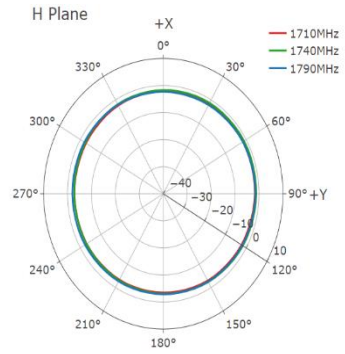
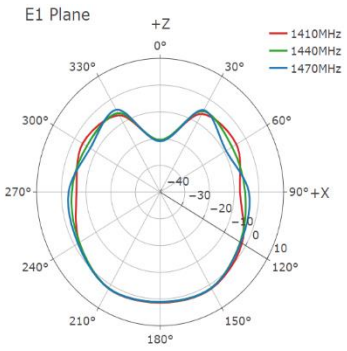
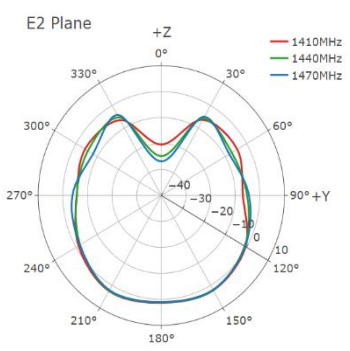
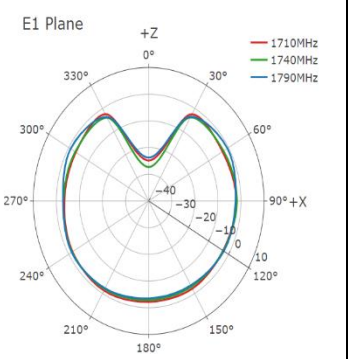
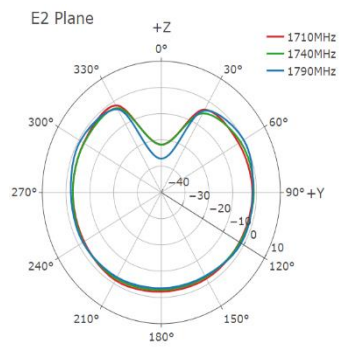
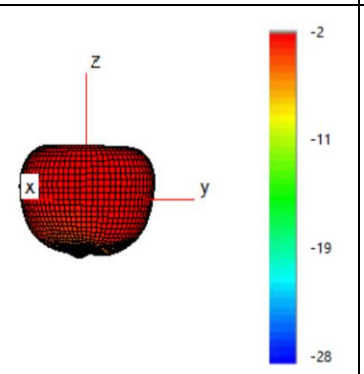
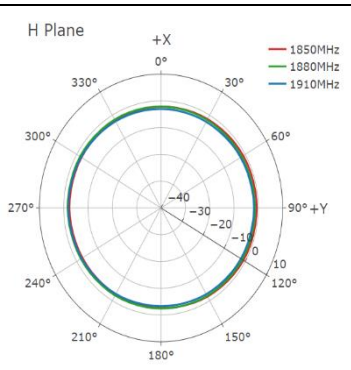
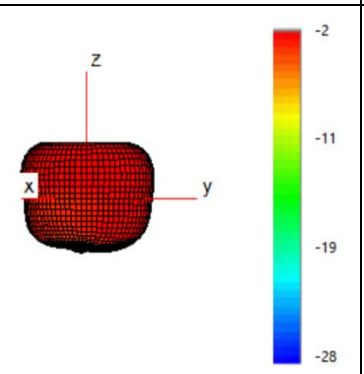
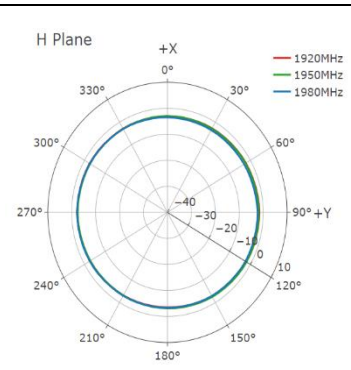
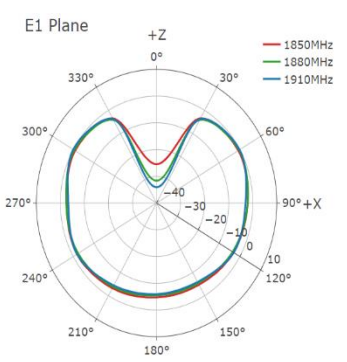
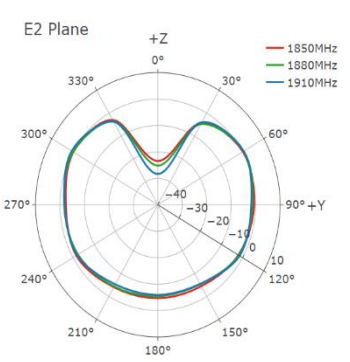
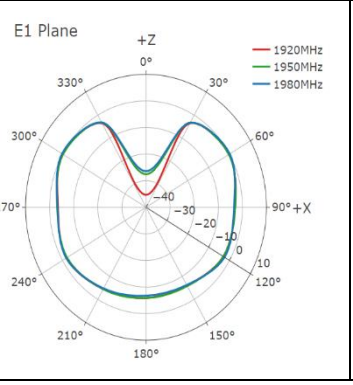
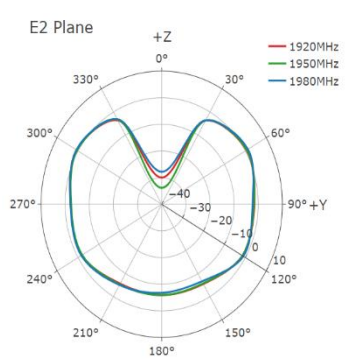
3.2.5. 3D & 2D Radiation Pattern

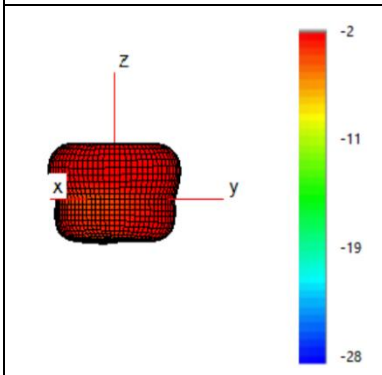
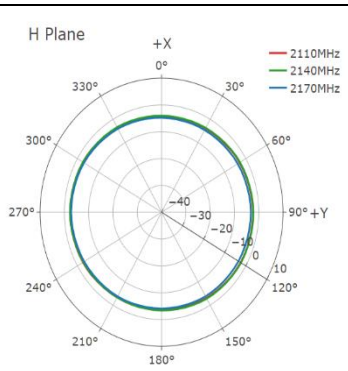
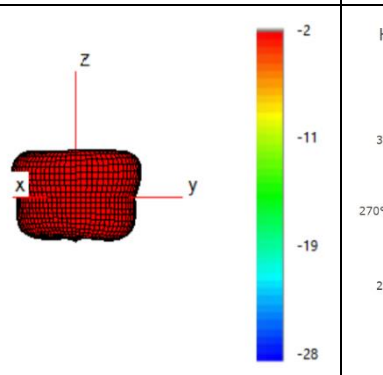
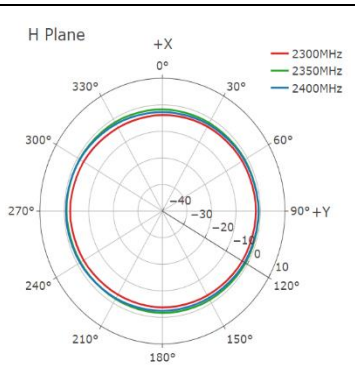
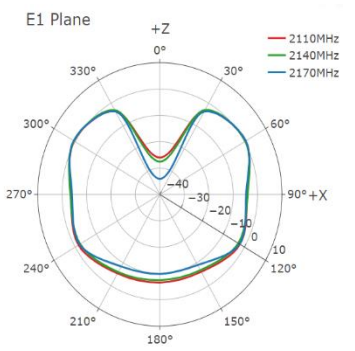
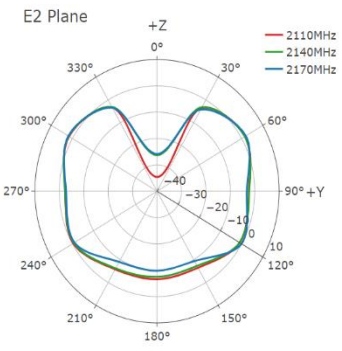
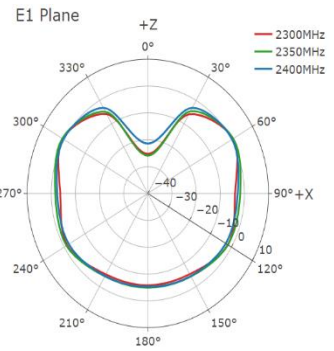
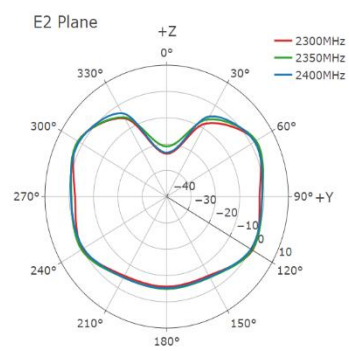
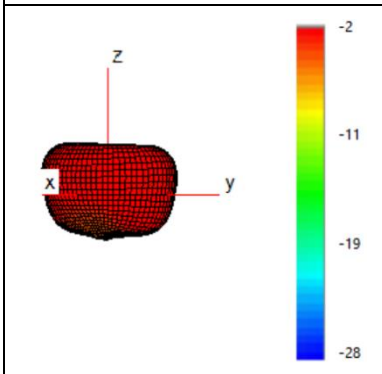
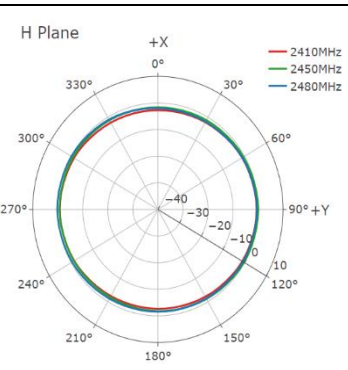
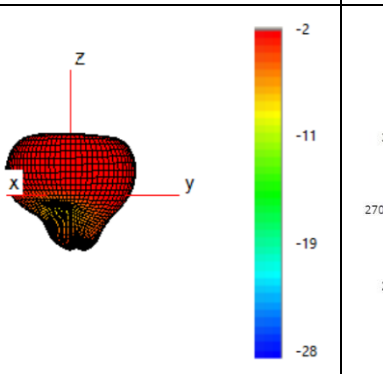
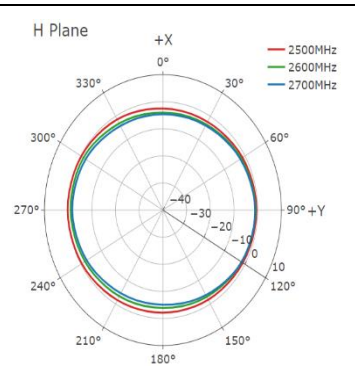
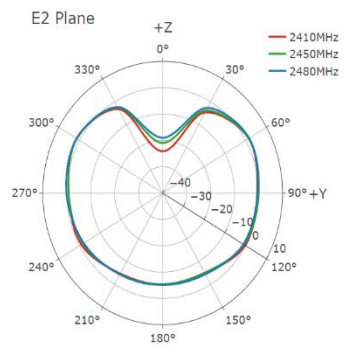
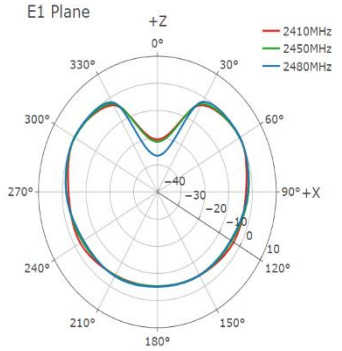
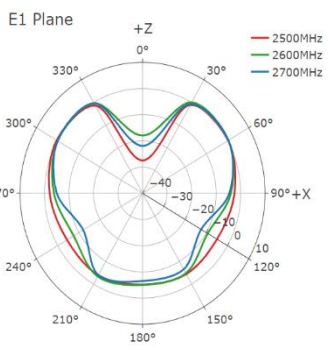
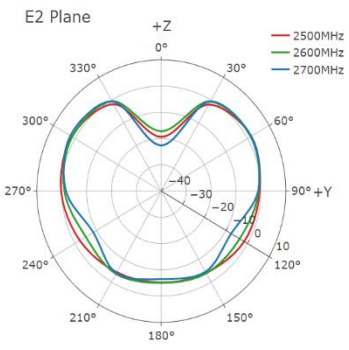
- Test Condition: Free Space
- Test Chamber: HF-G-1

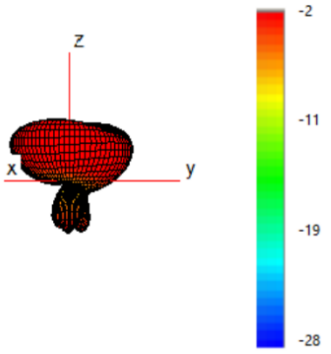
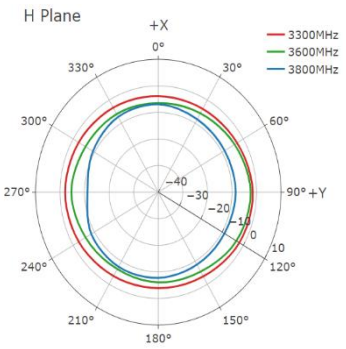
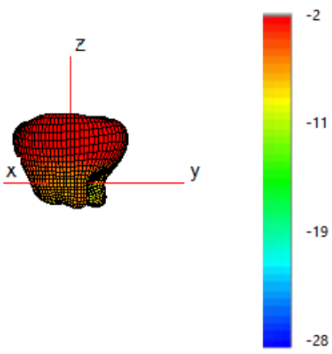
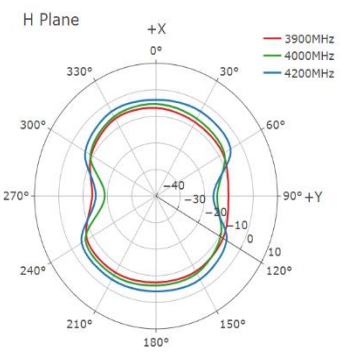
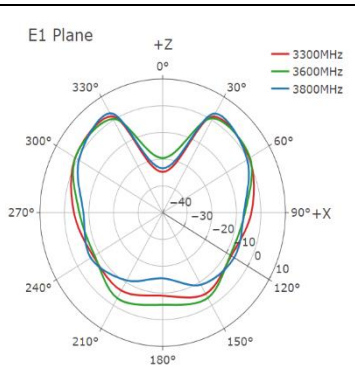
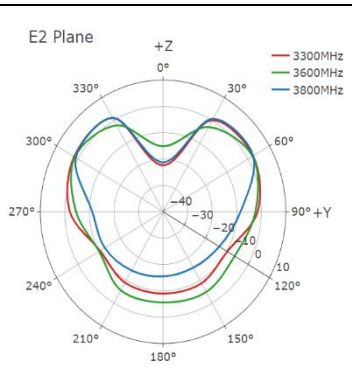
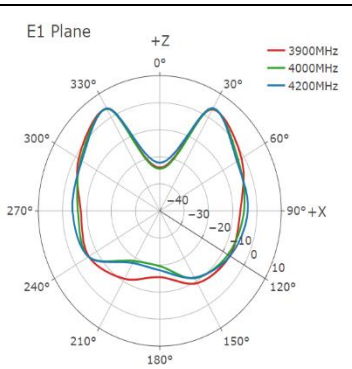
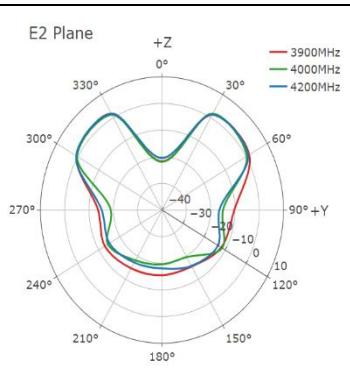
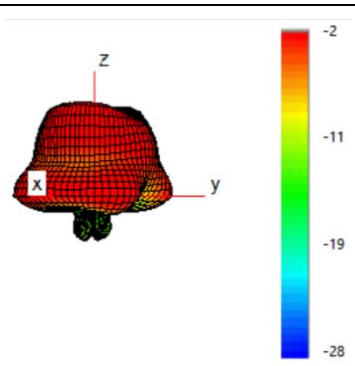
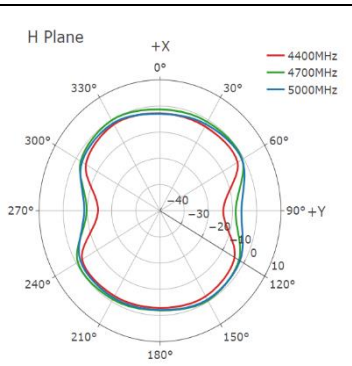
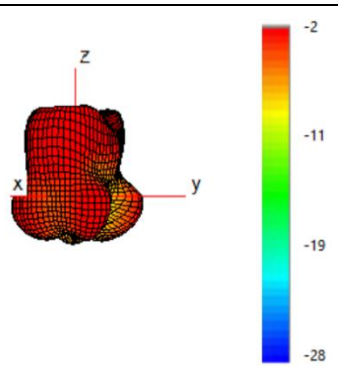
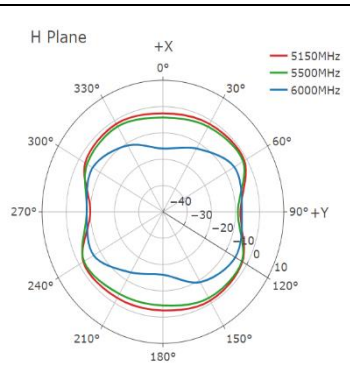
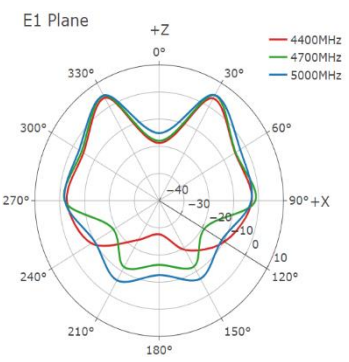
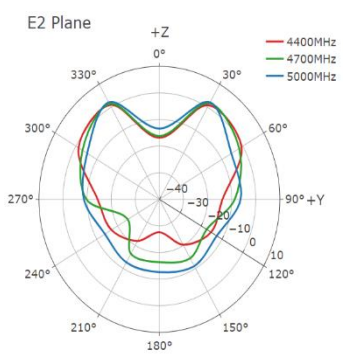
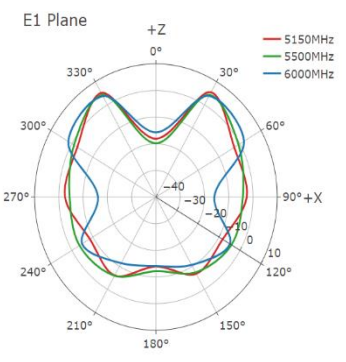
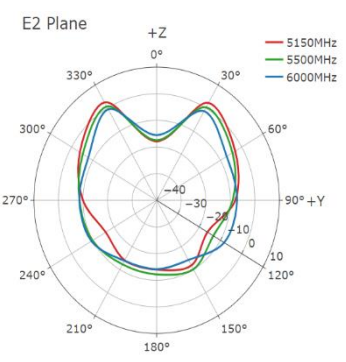


- 5G Bands

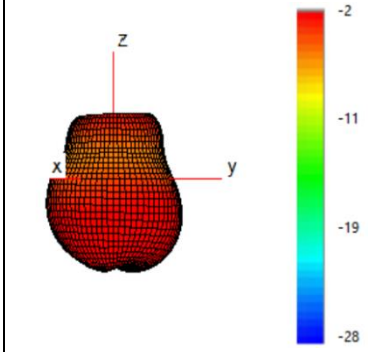
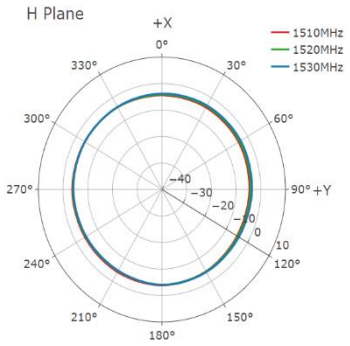
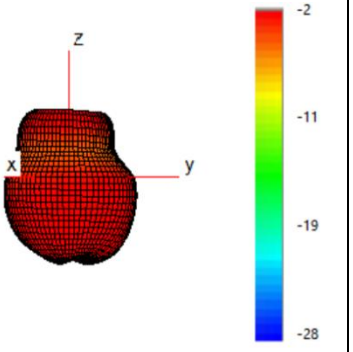
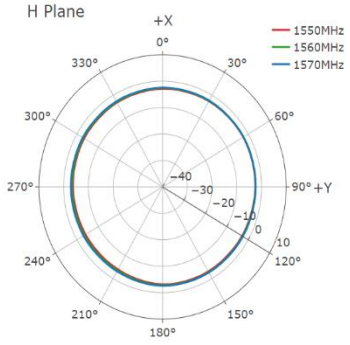
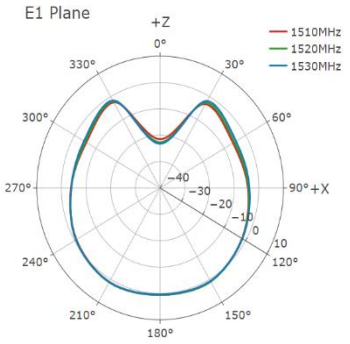
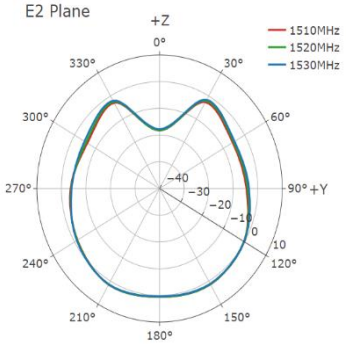
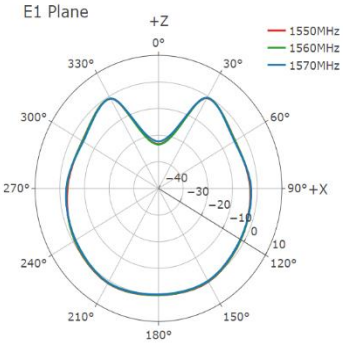
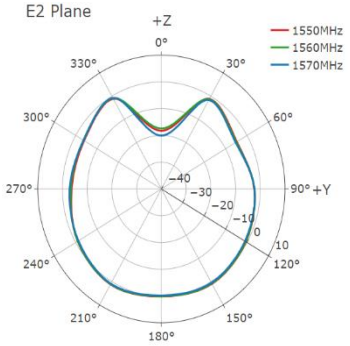
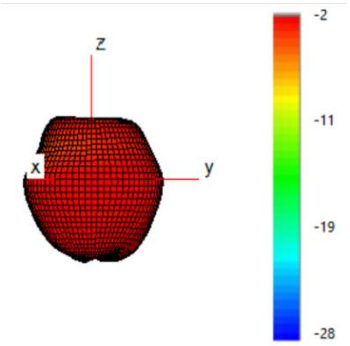
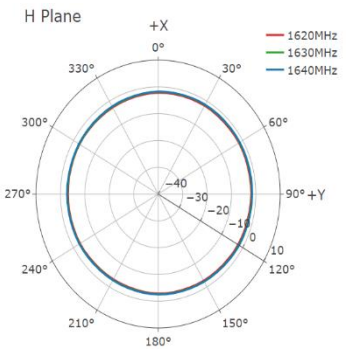
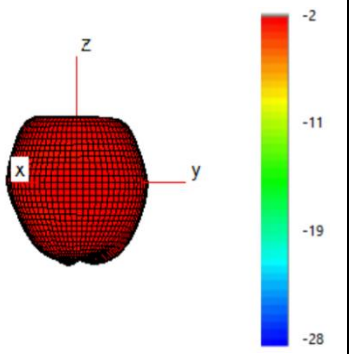
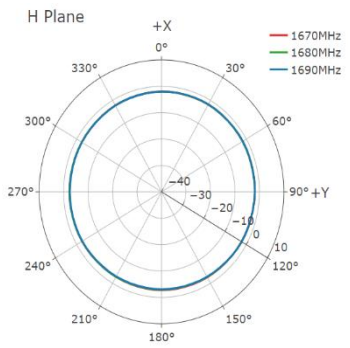
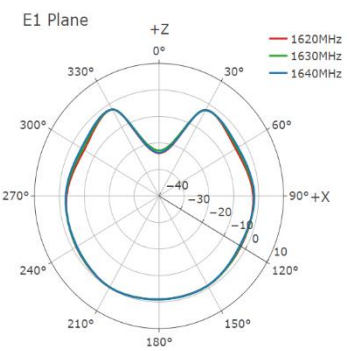
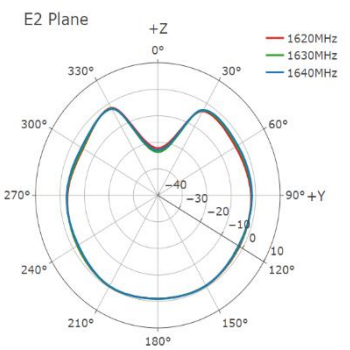
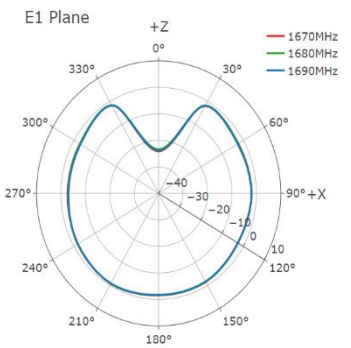
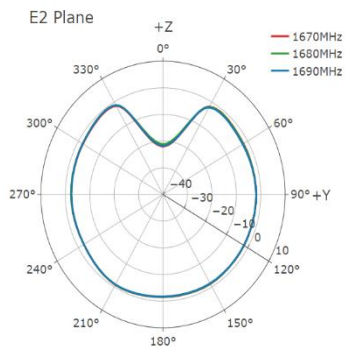
630 MHz		710 MHz	
			
			
830 MHz		900 MHz	
			
			

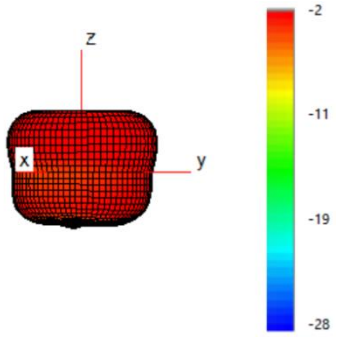
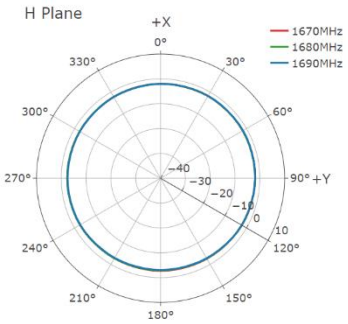
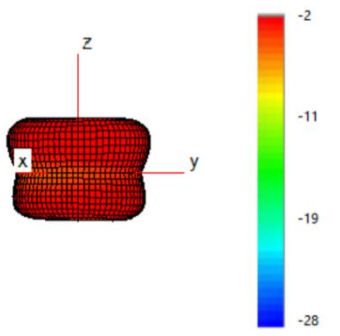
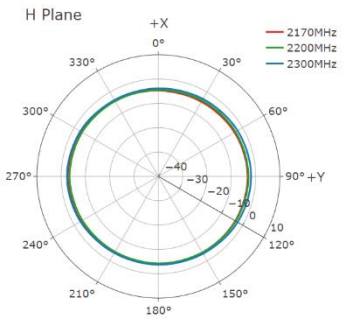
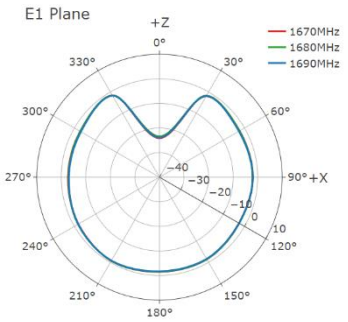
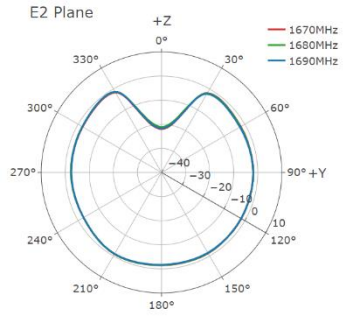
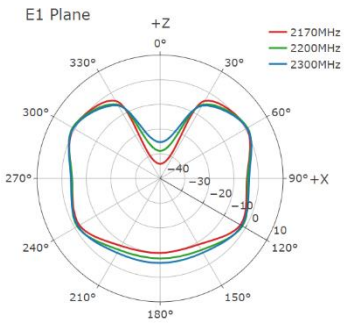
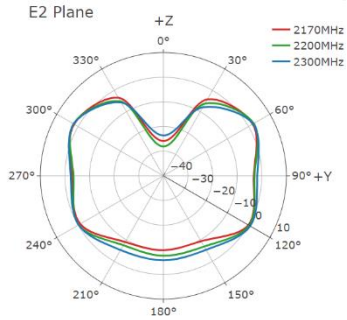
1440 MHz		1740 MHz	
			
			
1880 MHz		1950 MHz	
			
			

2140 MHz		2350 MHz	
			
			
2450 MHz		2600 MHz	
			
			

3600 MHz		4000 MHz	
			
			
4700 MHz		5500 MHz	
			
			

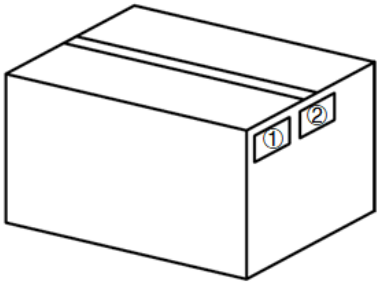
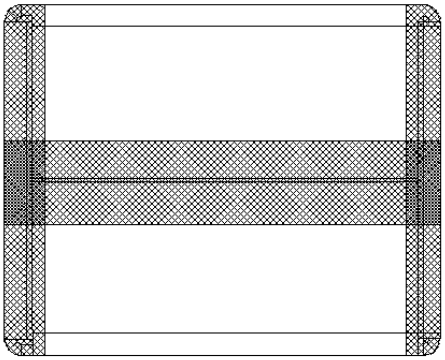
- NTN Bands

1520 MHz		1560 MHz	
			
			
1630 MHz		1680 MHz	
			
			

2000 MHz		2200 MHz	
			
			

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		Put the product in a one-piece bag; Each one-piece bag contains 10 products.
2		10 pcs antenna products in a PE bag; (10 pcs antennas per PE bag) PE Bag Size: L × W = 320 × 220 mm
3		Put bubble bags at the bottom of the carton. (10 PE bags per carton box) (100 pcs antennas per carton box) Carton Size: L × W × H = 405 × 293 × 185 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** "工" type sealing cartons

Contact Us

At Quectel, our aim is to provide timely and comprehensive services to our customers. If you require any assistance, please contact our headquarters:

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Or our local offices. For more information, please visit:
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Revision History

Version	Date	Author	Note
-	2023-05-25	Ezail TAN/ Hart HU/ David LIU/ Bunny ZHANG	Creation of the document
1.0	2023-05-25	Ezail TAN/ Hart HU/ David LIU/ Bunny ZHANG	First official release

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