Antenna Datasheet

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

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 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							
Gain		≤ 5.8 dBi							

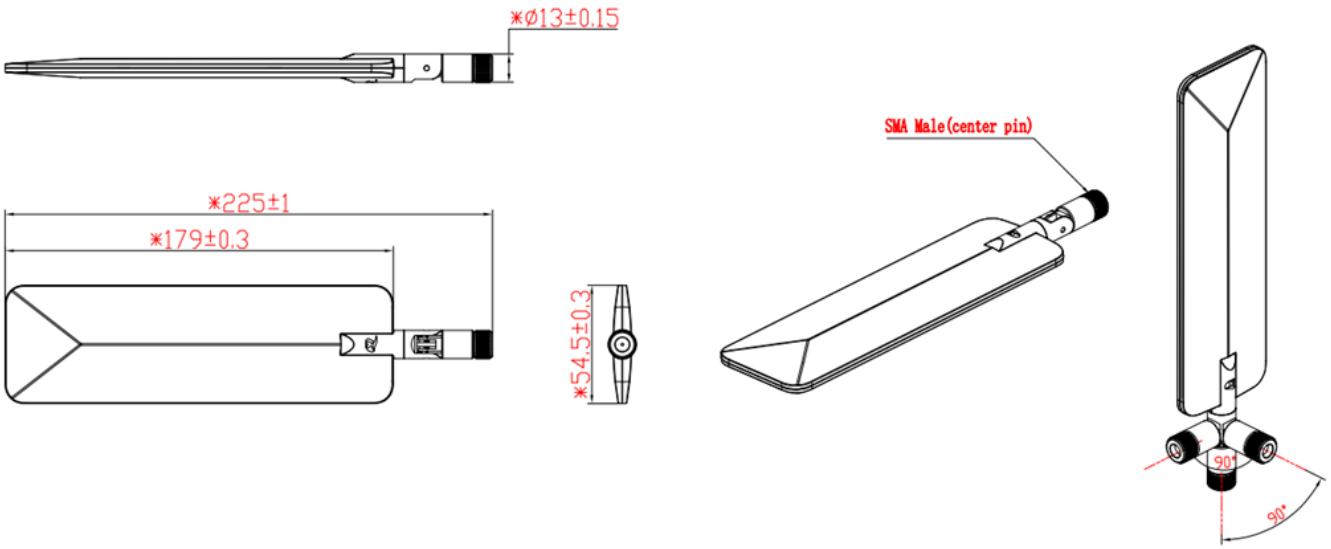
Electrical - NTN Bands					
Band / **SPEC**	**L Band**	**L Band**	**L Band**	**B256 / B23**	**B256 / B23**
	1518-1559	**1620-1665**	**1668-1675**	**1980-2020**	**2170-2200**
Max. VSWR	1.8	2.2	2.2	2.2	1.5
Max. Return Loss (dB)	-10.8	-8.7	-8.5	-8.6	-14.1
AVG Eff. (%)	64.0	60.1	62.3	65.7	68.3
AVG AVG Gain (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
Packing	Antennas should be stored in unopened sealed manufacturer's plastic packaging

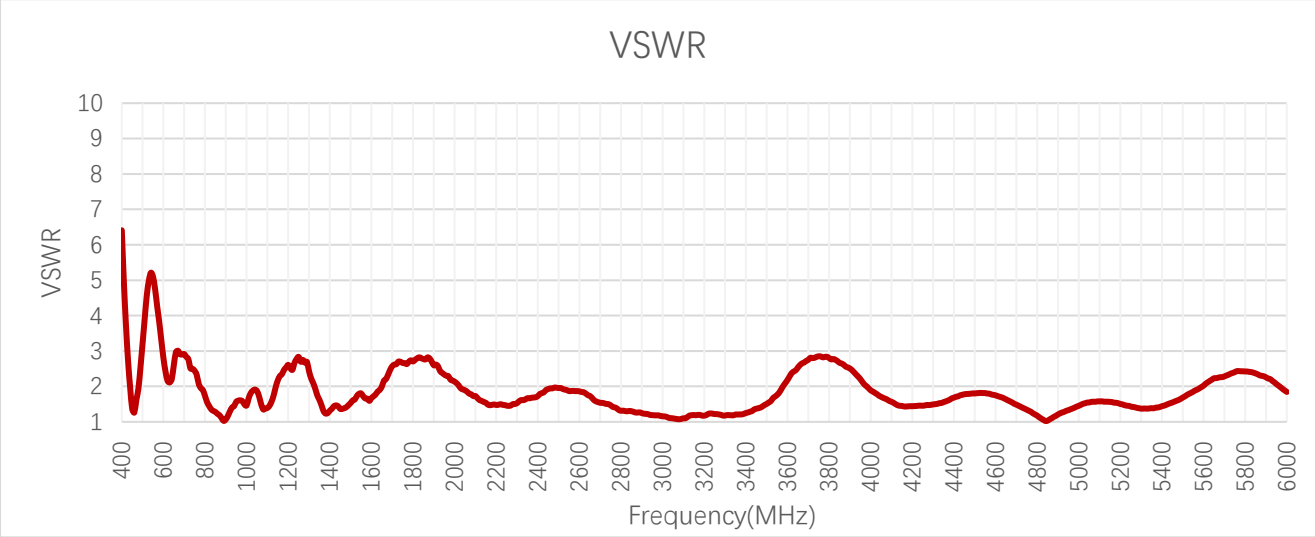
2 Drawing



3 Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



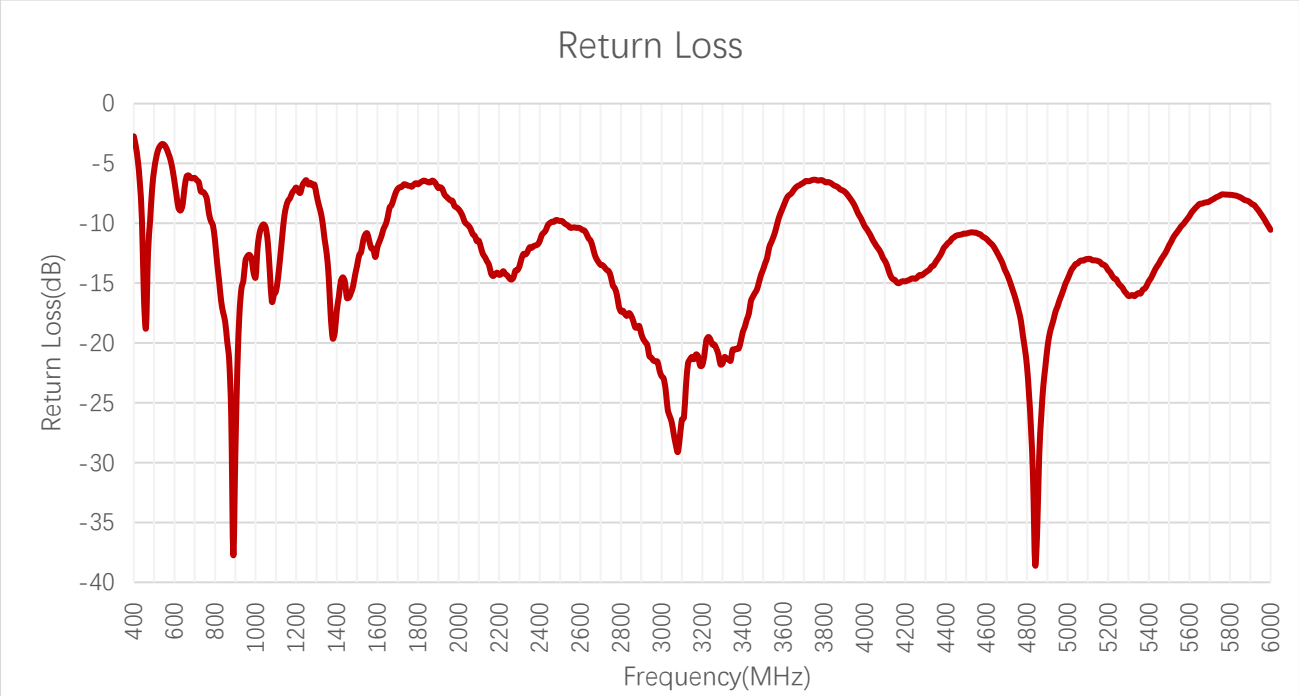
VSWR

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)

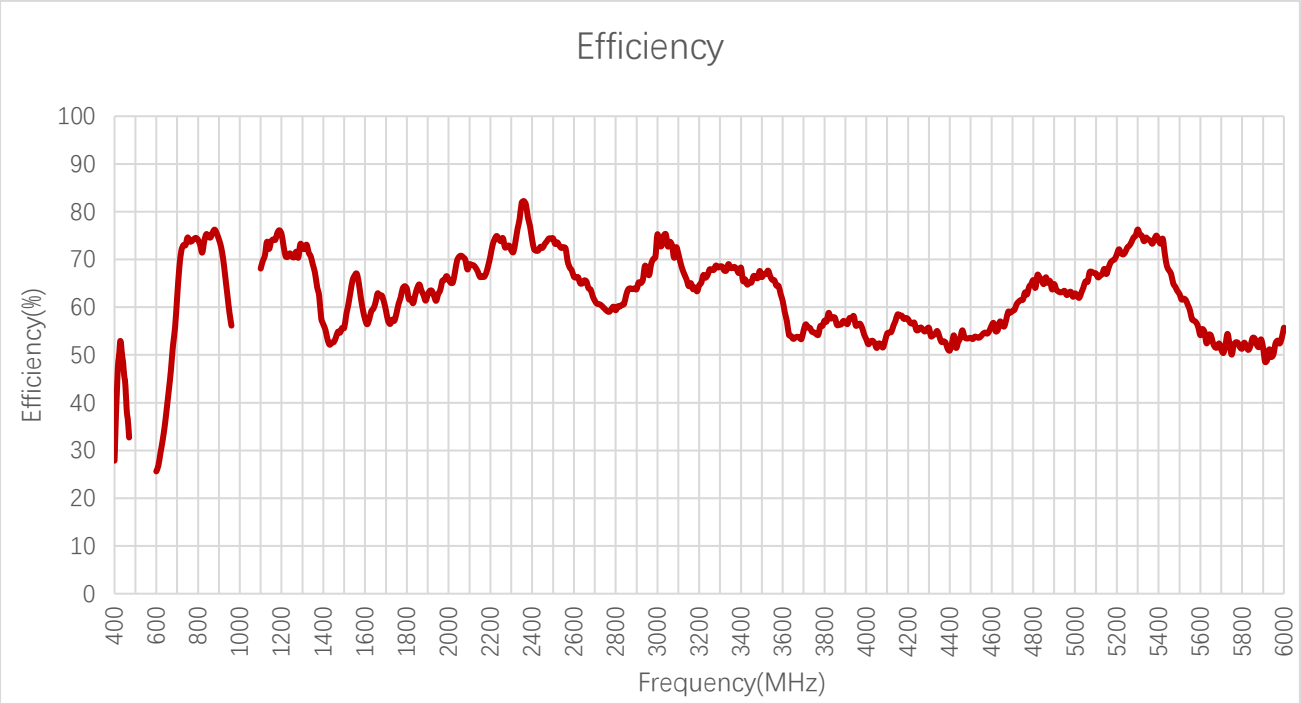
Frequency (MHz)	410	420	460	470	600	630	700	710	810
Return Loss(dB)	-3.6	-4.8	-18.7	-12.5	-6.5	-8.9	-6.2	-6.4	-13.2
Frequency (MHz)	**830**	**900**	**960**	**1440**	**1710**	**1740**	**1880**	**1950**	**2140**
Return Loss(dB)	-16.5	-29.4	-12.7	-14.9	-7.0	-6.8	-6.5	-7.9	-13.2
Frequency (MHz)	**2350**	**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



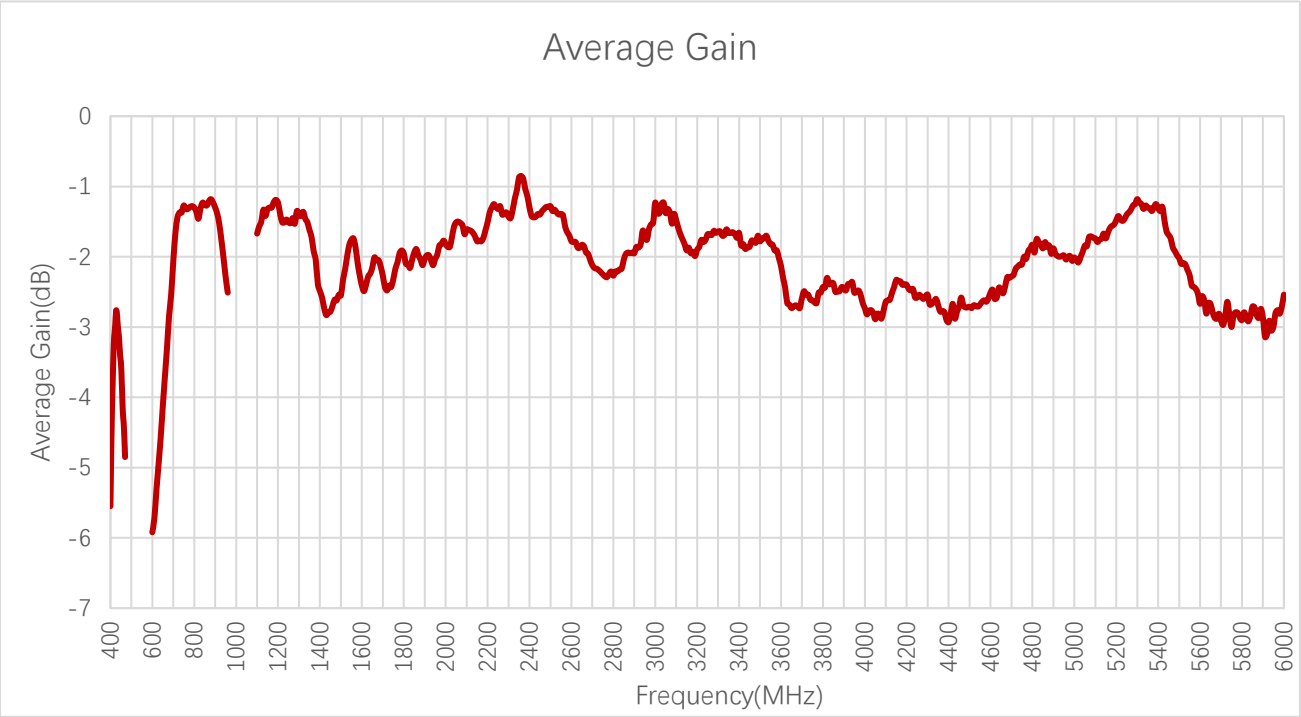
Efficiency (%)

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



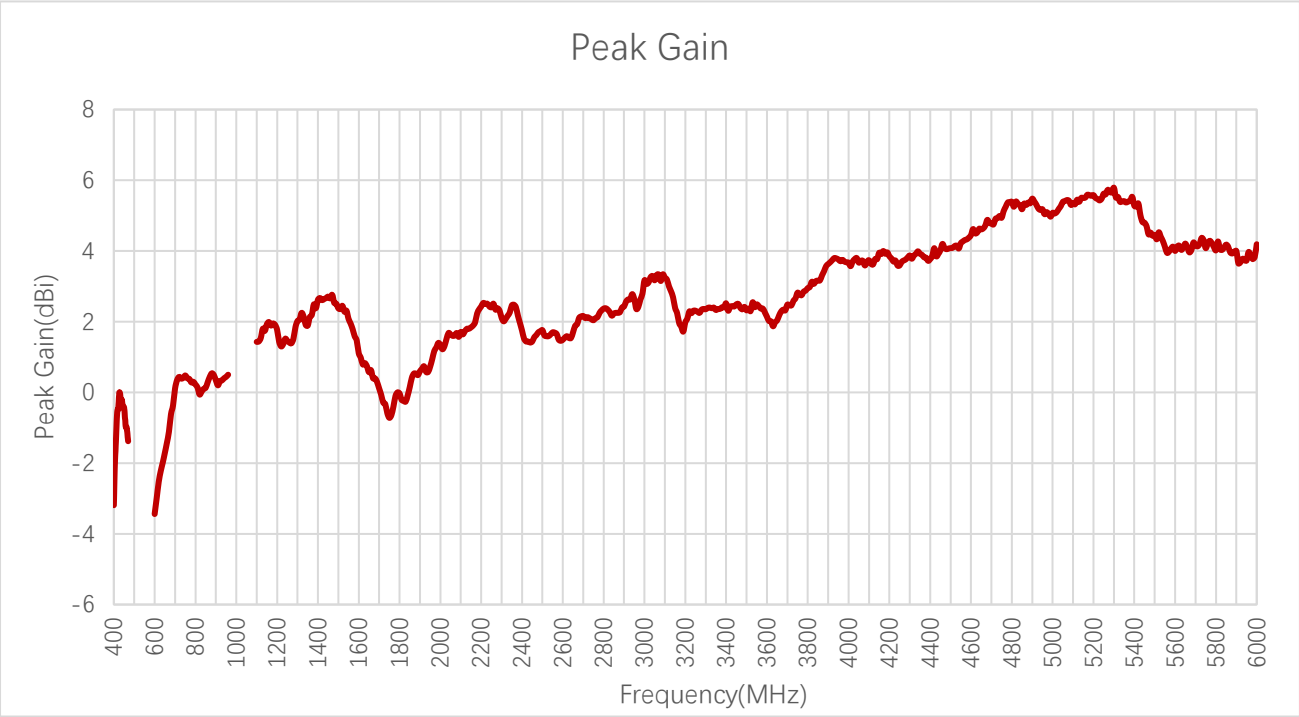
Average Gain (dB)

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



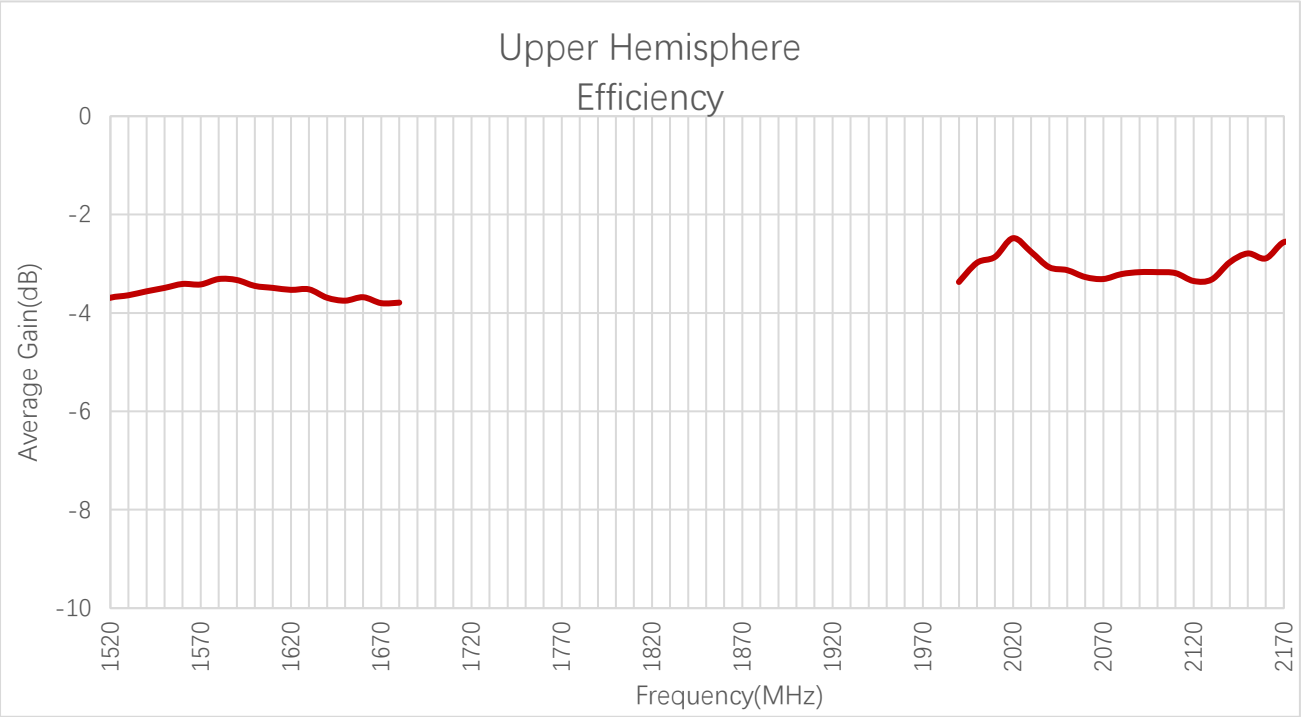
Peak Gain (dBi)

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

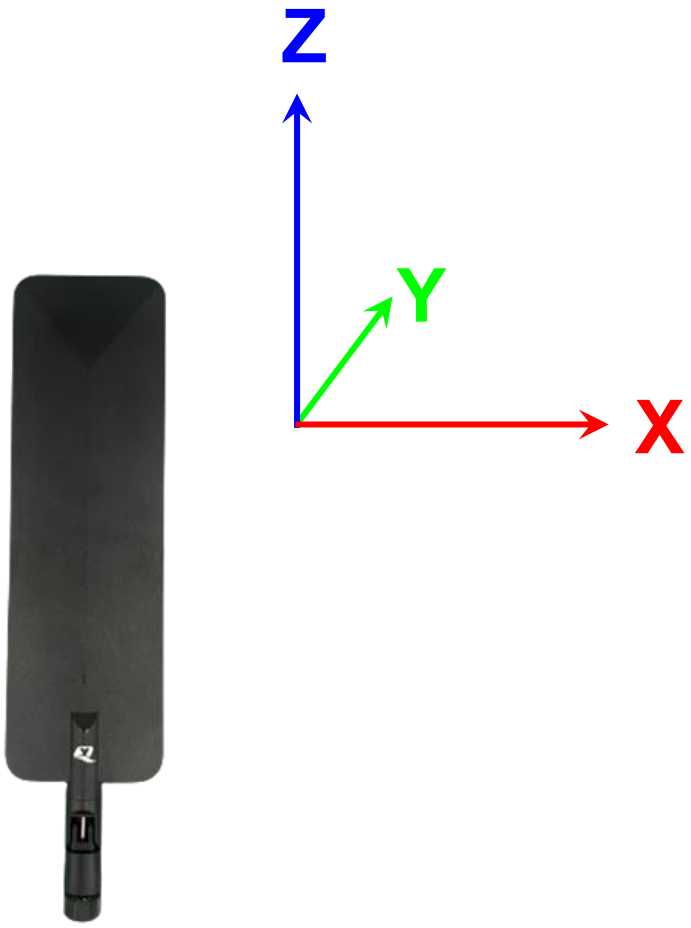


Upper Hemisphere Efficiency (dB) - NTN Bands

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

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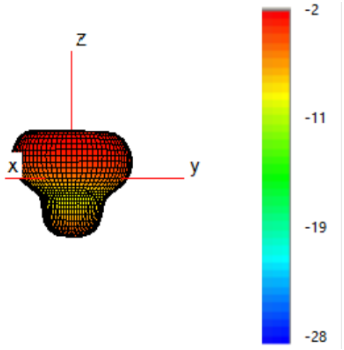	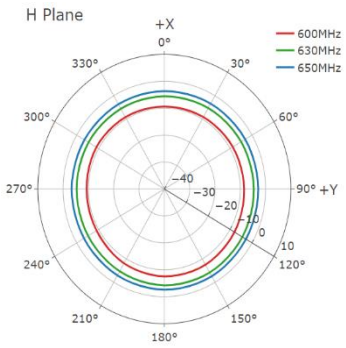	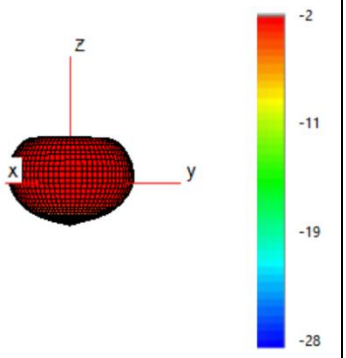	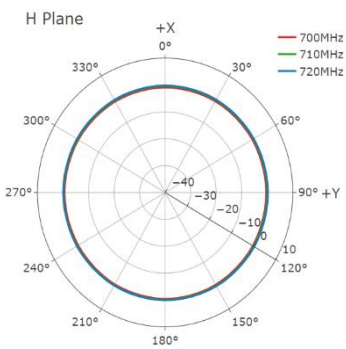
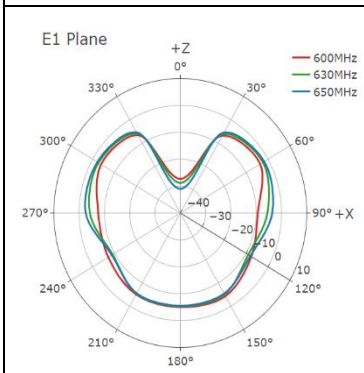	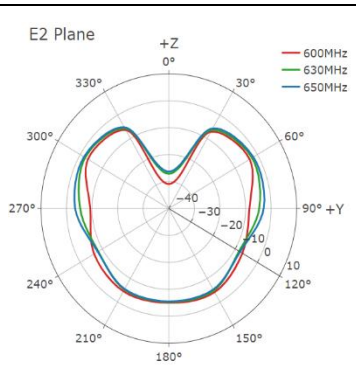	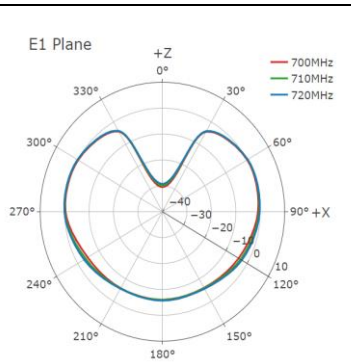	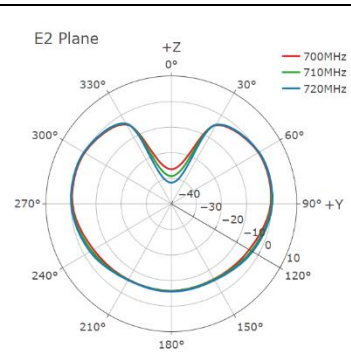
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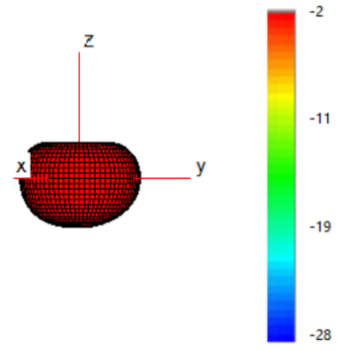
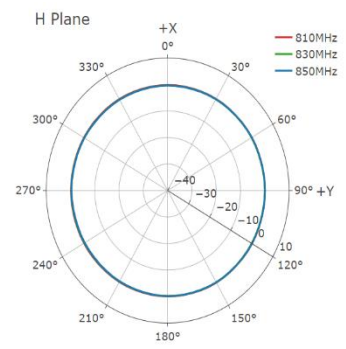
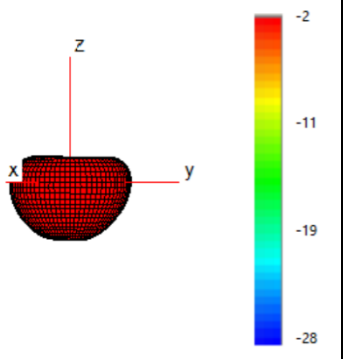
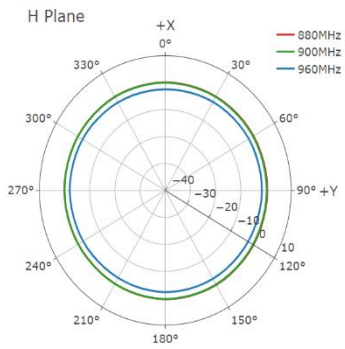
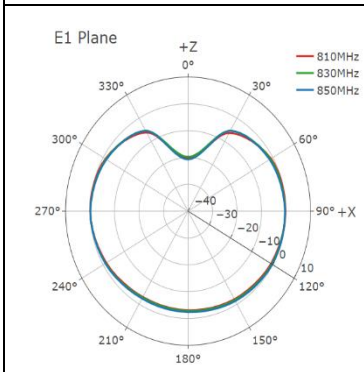
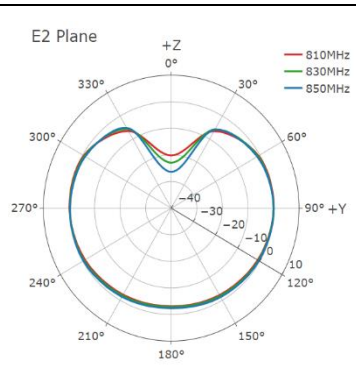
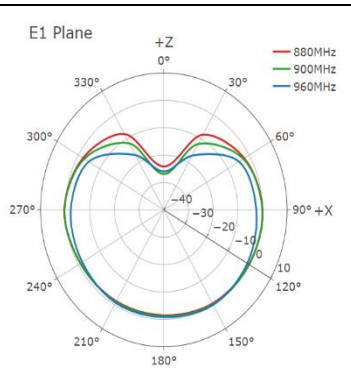
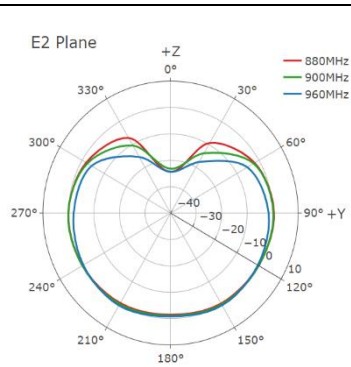
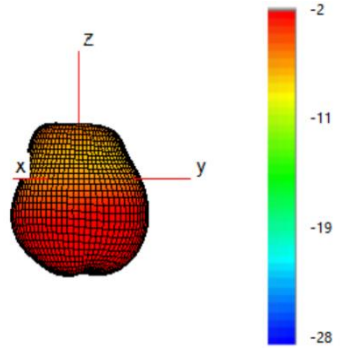
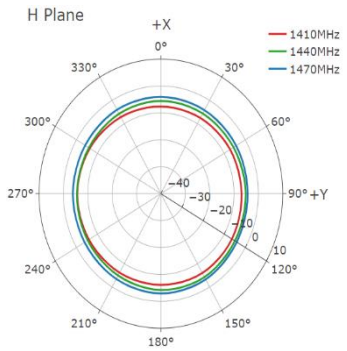
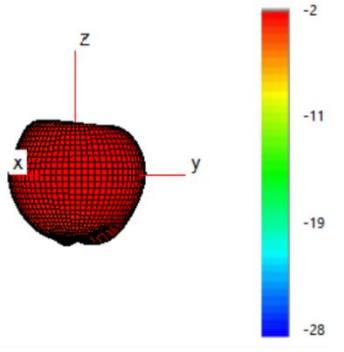
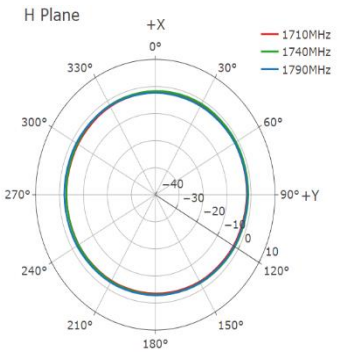
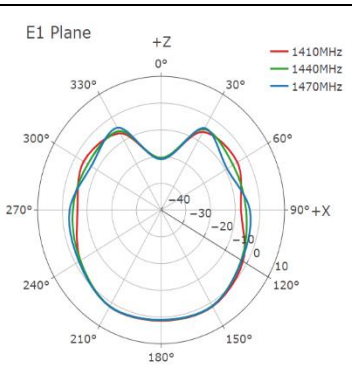
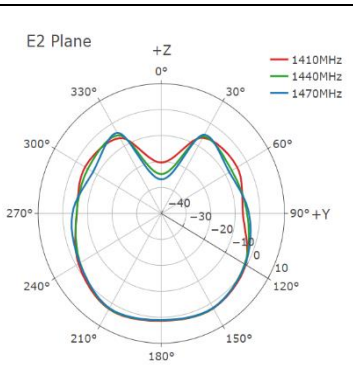
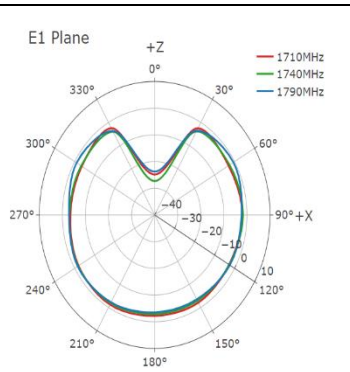
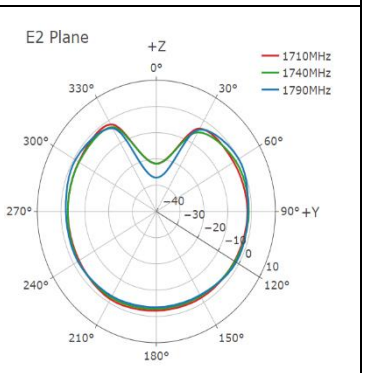
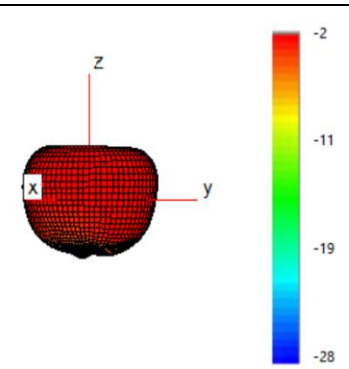
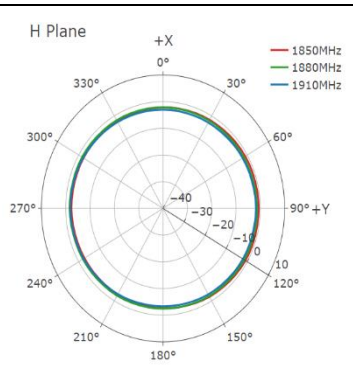
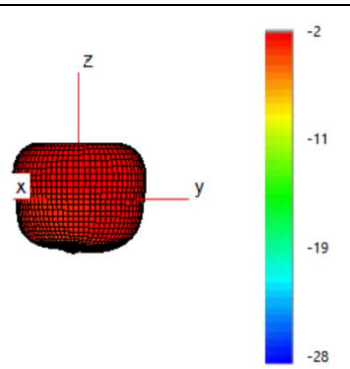
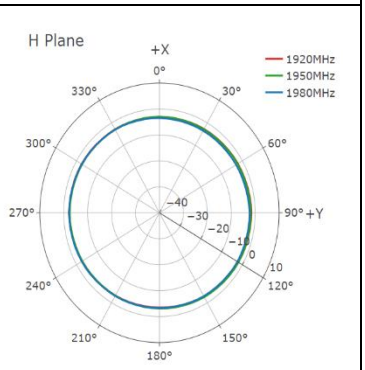
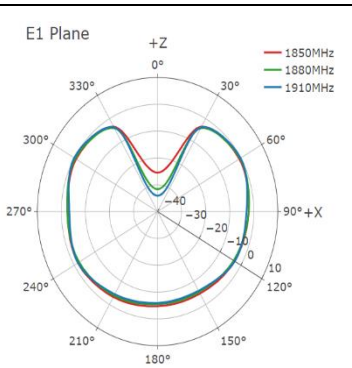
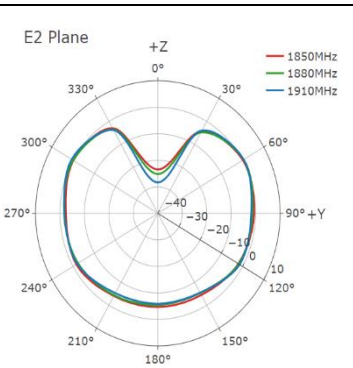
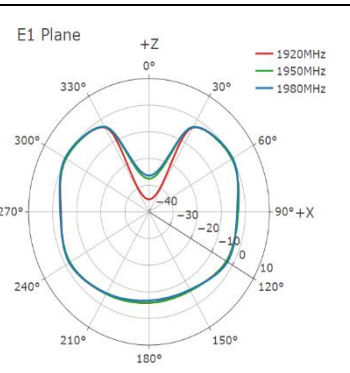
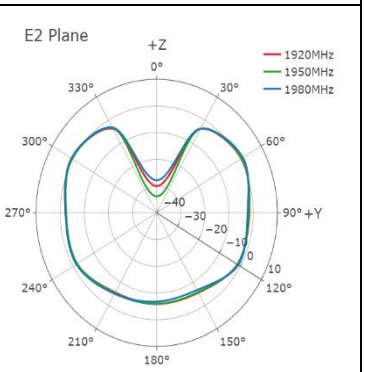
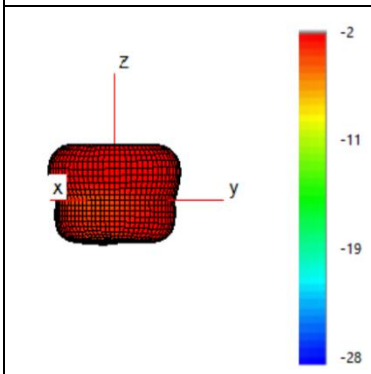
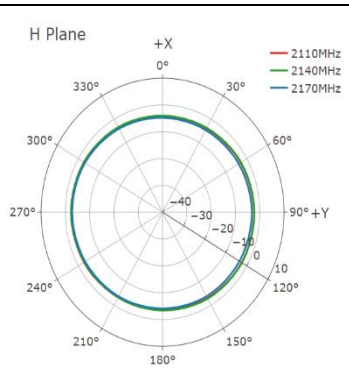
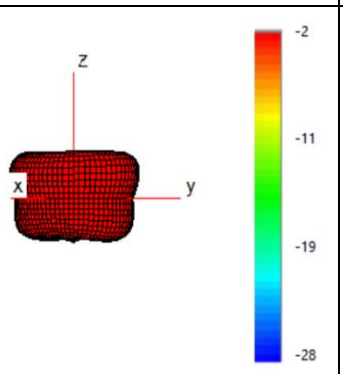
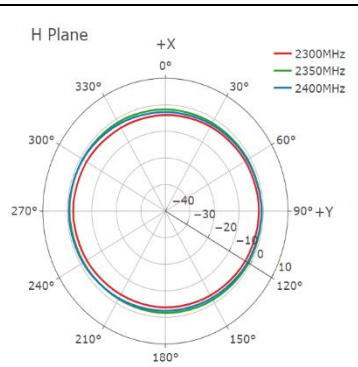
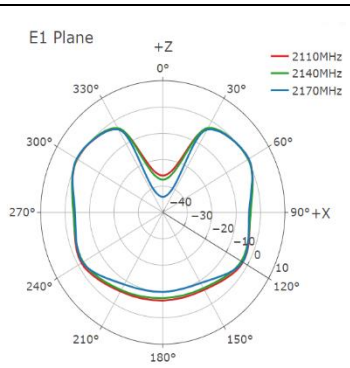
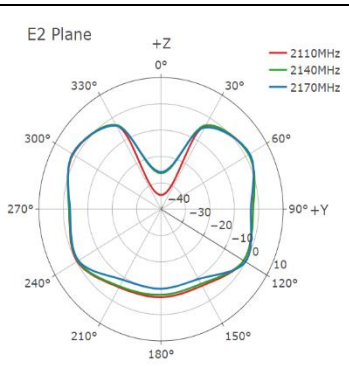
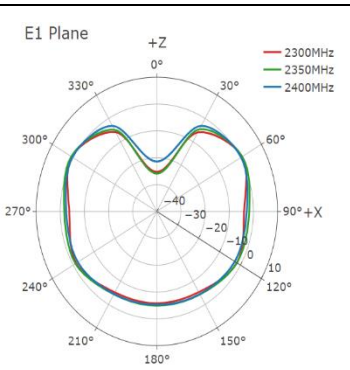
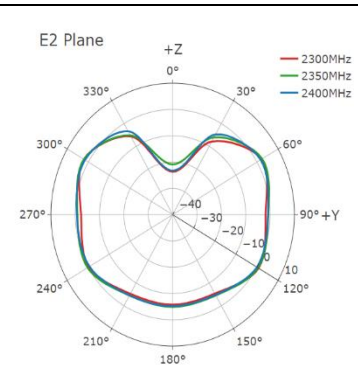
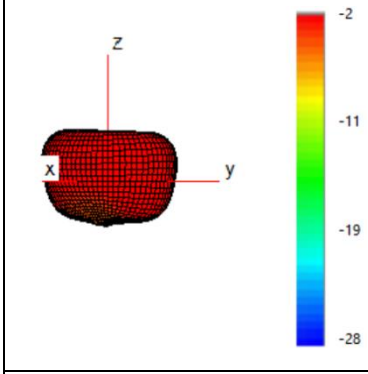
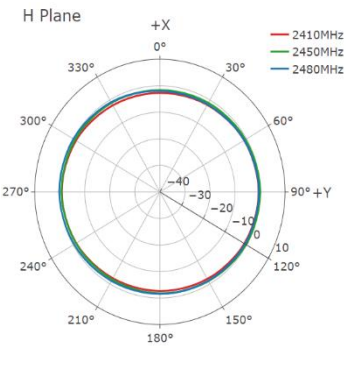
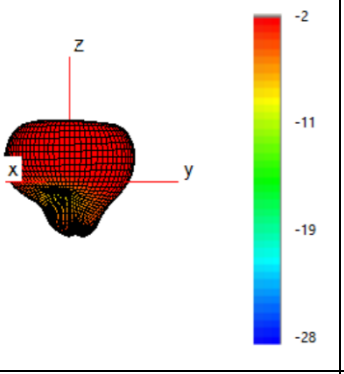
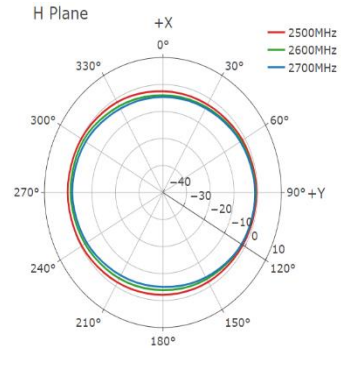
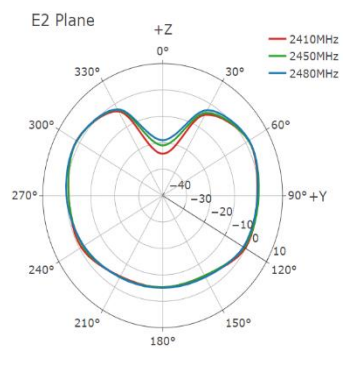
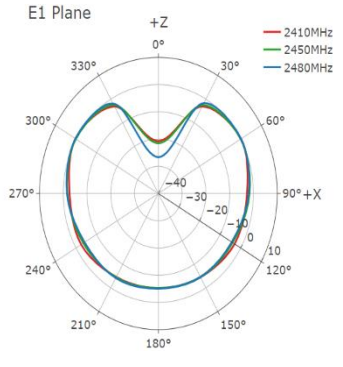
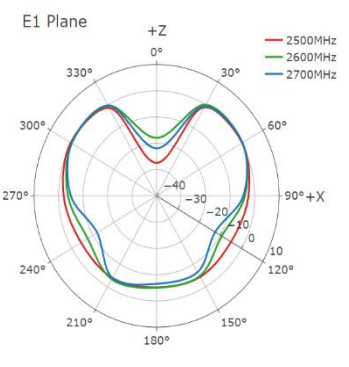
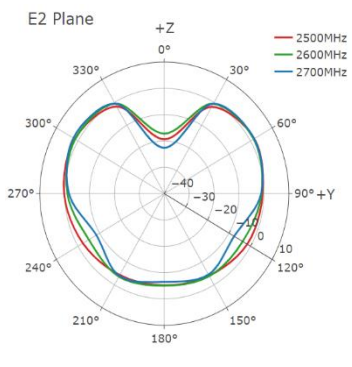
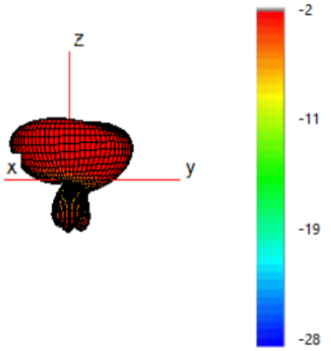
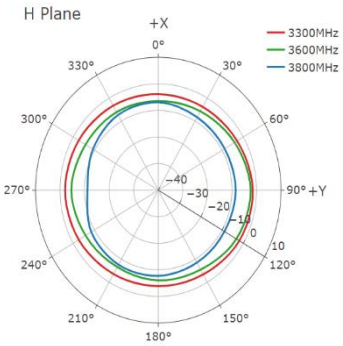
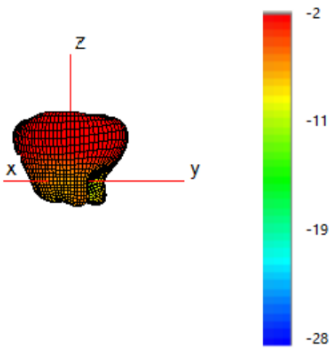
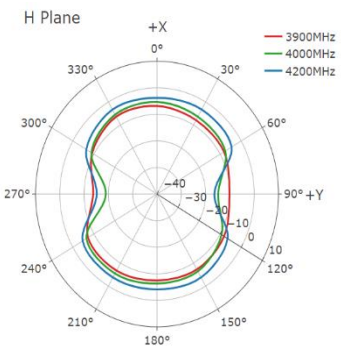
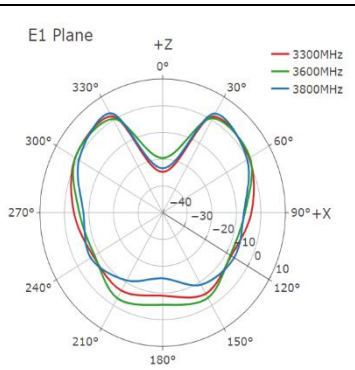
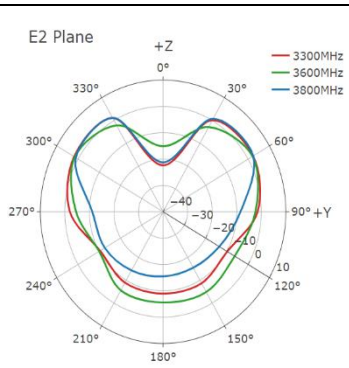
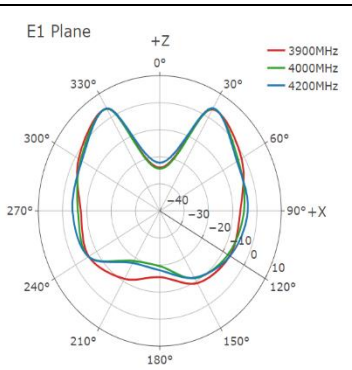
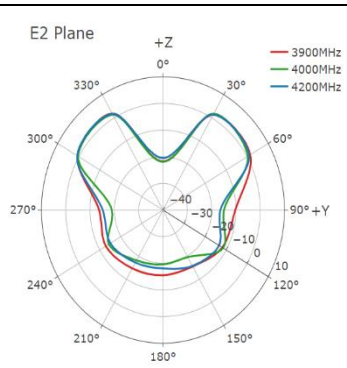
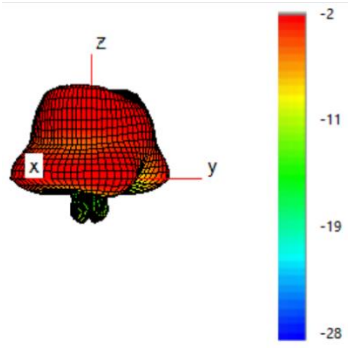
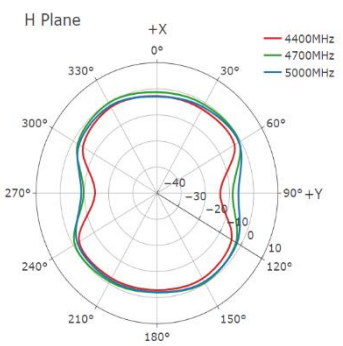
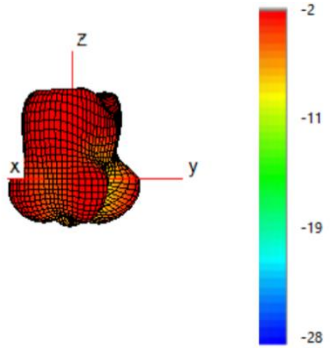
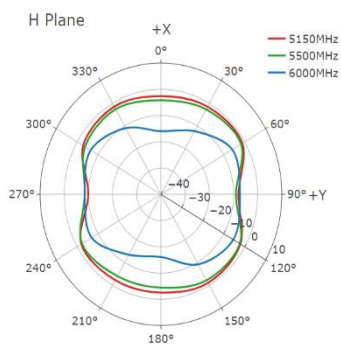
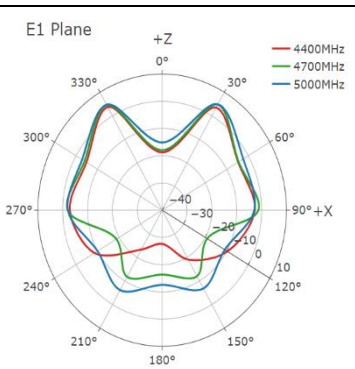
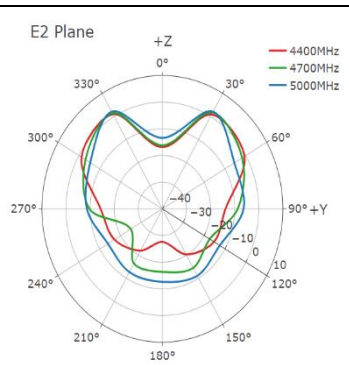
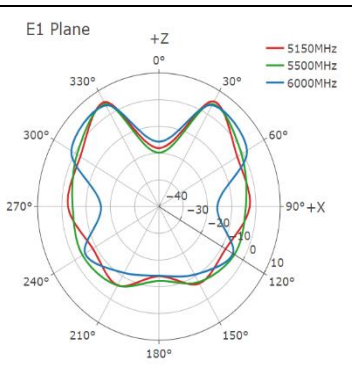
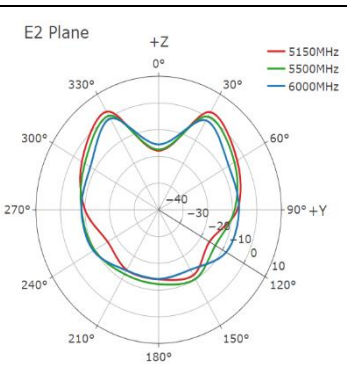
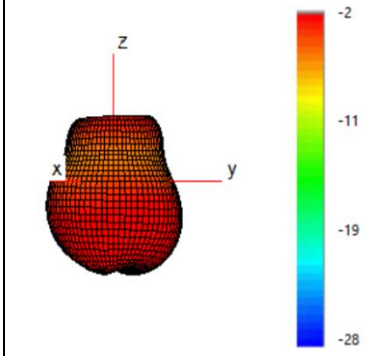
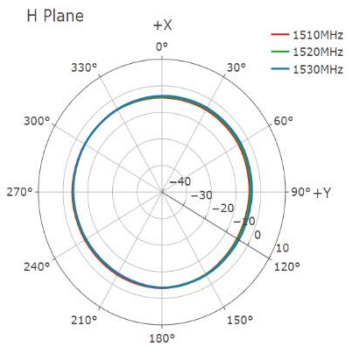
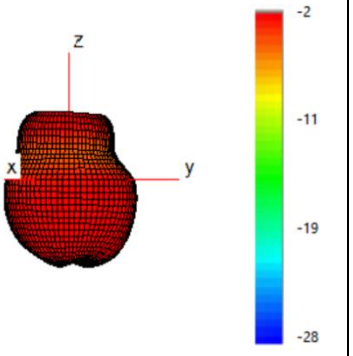
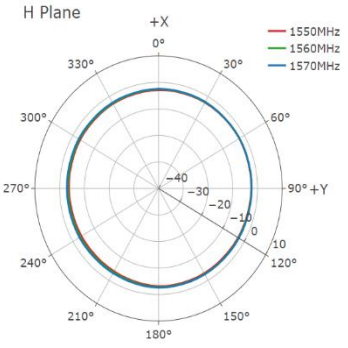
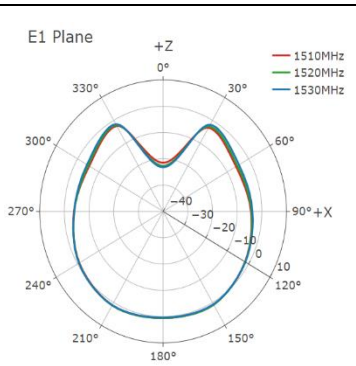
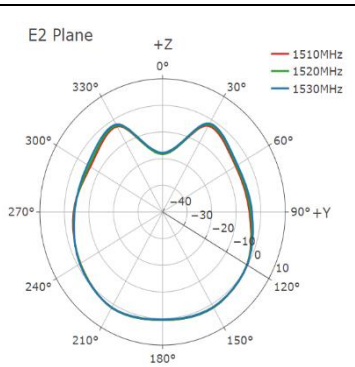
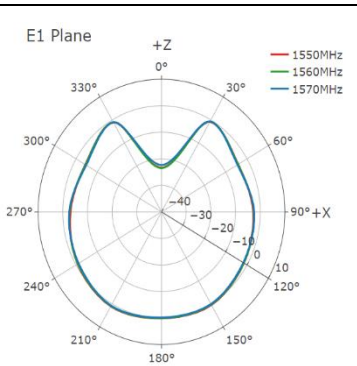
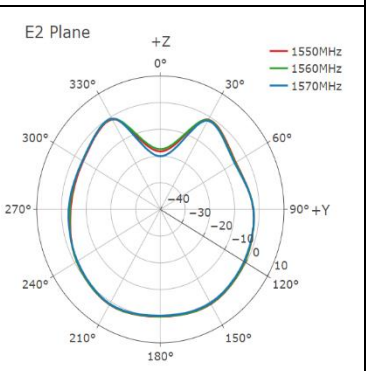
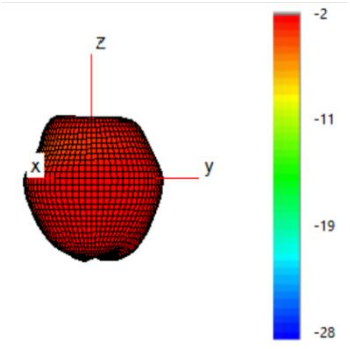
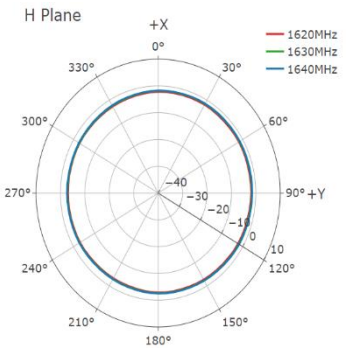
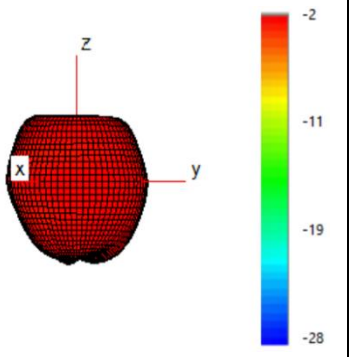
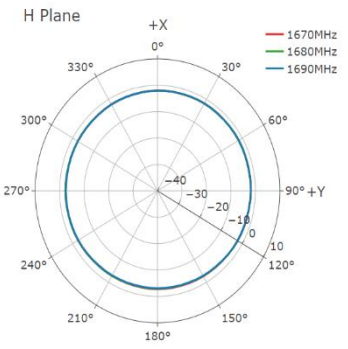
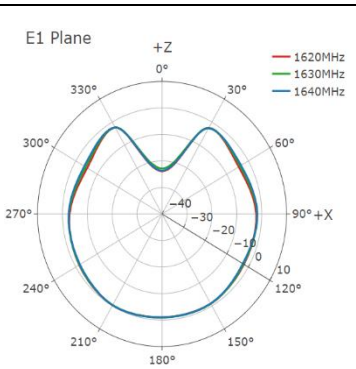
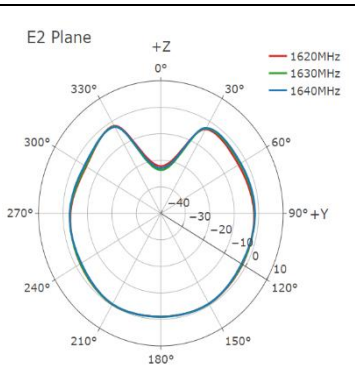
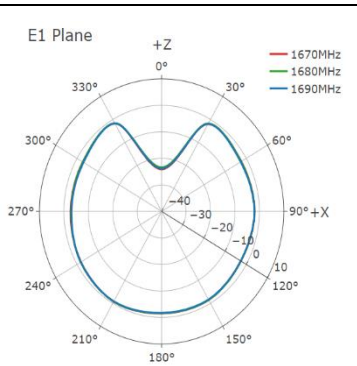
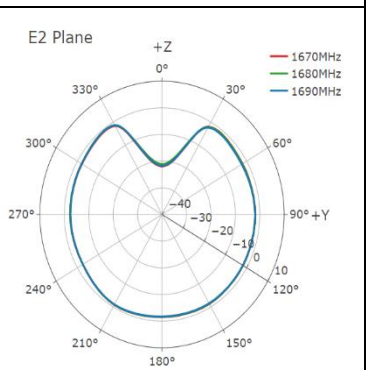
			
			

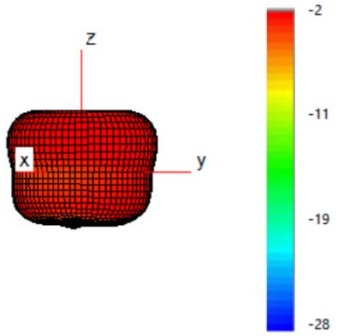
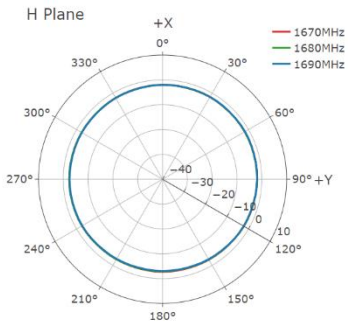
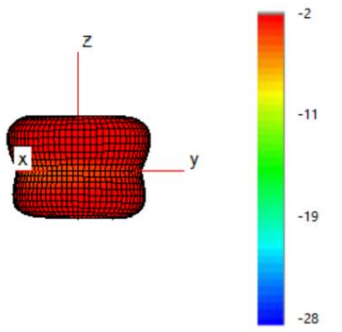
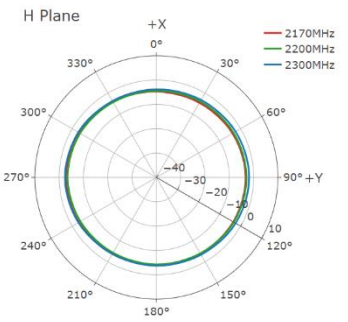
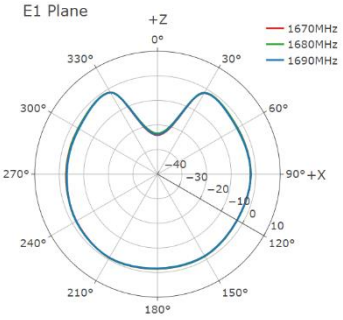
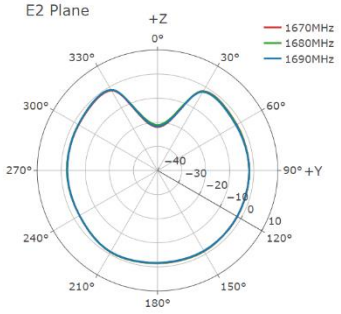
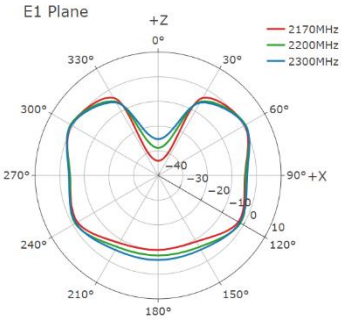
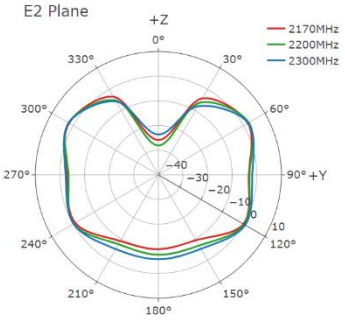
1440MHz		1740MHz	
			
			
1880MHz		1950MHz	
			
			

2140MHz		2350MHz	
			
			
2450MHz		2600MHz	
			
			

3600MHz		4000MHz	
			
			
4700MHz		5500MHz	
			
			

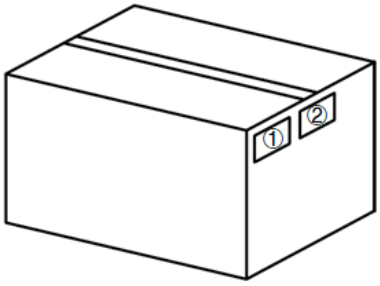
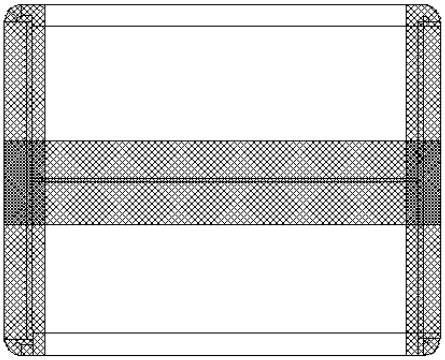
- NTN Bands

1520MHz		1560MHz	
			
			
1630MHz		1680MHz	
			
			

2000MHz		2200MHz	
			
			

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 bags; (10 pcs Antenna / Per PE Bag) Pe bag Size：L*W=320X220mm
3		Put bubble bags at the bottom of the carton 10 PE Bags / Per Carton Box) (100pcs Antenna / Per Carton Box) Carton Size:L*W*H=405*293*185mm

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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Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

Or our local offices. For more information, please visit:
http: www.quectel.com-support-sales.htm

For technical support, or to report documentation errors, 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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