Antenna Datasheet

Product OC: YECN009AA
Version: 0.2
Date: 2024-06-03
Status: Preliminary

Product Name: External 5G Antenna
Key Features:
Frequency Band: 600–6000 MHz
Dimensions: 200 mm × 21 mm × 8 mm
Efficiency: Up to 79.6 %
RoHS and REACH Compliant

Overview

This Quectel external 5G antenna covers 5G NR Sub-6 GHz frequency bands and is compatible with 4G/3G/2G/LPWA 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: Free Space

1.1. Electrical

Electrical	
Frequency Range	600–6000 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional
Antenna Type	Dipole

Electrical - Detail												
Band / SPEC	**Band**	**B71**	**B12 /B13 /B28**	**B5 /B8 /B26**	**B1 /B2 /B3**	**B40**	**Wi-Fi 2G**	**B38 /B41**	**B48**	**B42 /N77**	**N79**	**Wi-Fi 5G**
	Freq. (MHz)	**600–700**	**700–810**	**820–960**	**1700–2170**	**2300–2400**	**2400–2500**	**2500–2690**	**3550–3700**	**3300–4200**	**4400–5000**	**5150–5850**
Max. VSWR		3.2	2.1	1.4	1.7	1.9	1.7	2.2	2.0	2.0	1.8	2.7
Max. Return Loss (dB)		-5.7	-9.2	-14.8	-12.1	-10.4	-11.6	-8.7	-9.6	-9.5	-11.1	-6.8
AVG Eff. (%)		36.9	35.8	35.4	58.8	67.5	69.2	65.7	53.1	48.8	51.0	47.9
AVG AVG Gain (dB)		-4.3	-4.5	-4.5	-2.4	-1.7	-1.6	-1.8	-2.7	-3.2	-3.0	-3.2
Max. Peak Gain (dBi)		-0.9	-0.4	0.3	2.6	1.5	1.2	1.4	3.6	3.6	4.0	3.9
VSWR		≤ 3.2										
Return Loss		≤ -5.7 dB										
Peak Gain		≤ 4.0 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	1.5	1.4	1.4	1.5	1.5
Max. Return Loss (dB)	-13.6	-15.9	-15.5	-14.3	-13.5
AVG Eff. (%)	49.8	47.4	47.7	65.5	75.3
AVG AVG Gain (dB)	-3.0	-3.2	-3.2	-1.8	-1.2
Max. Peak Gain (dBi)	0.1	0.9	1.1	2.0	2.4
VSWR	≤ 1.5				
Return Loss	≤ -13.6 dB				
Peak Gain FS	≤ 2.4 dBi				

1.2. Supported Bands

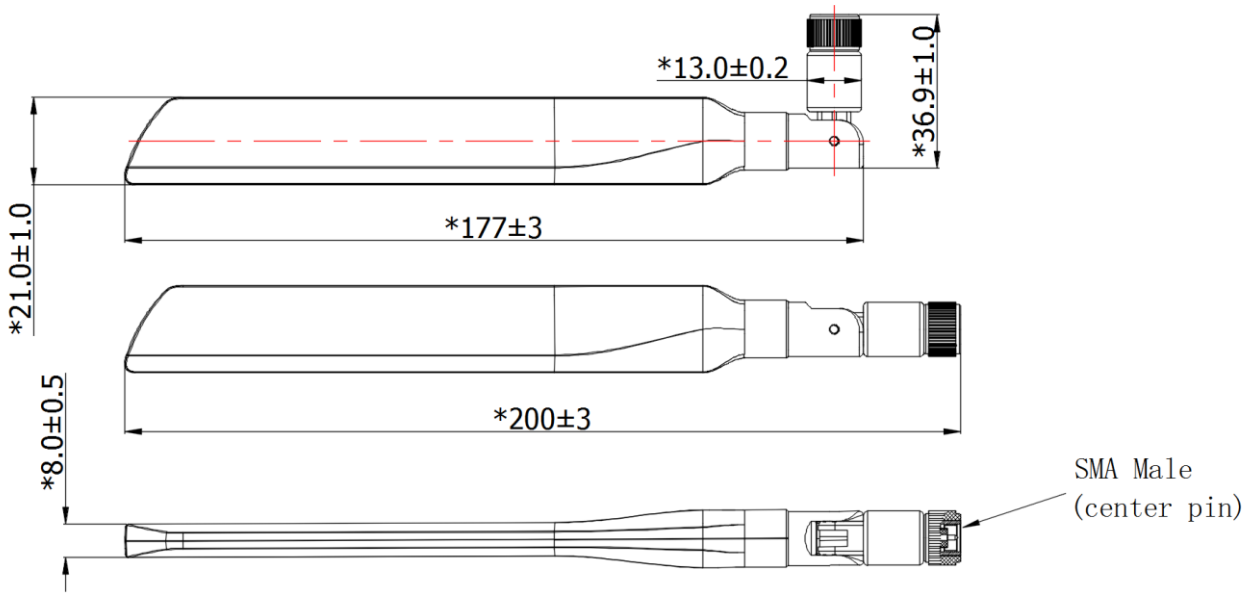
5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT		
Band	Frequency (MHz) Uplink	Max Peak Gain(dBi)
B1	1920–1980	1.3
B2	1850–1910	1.8
B3	1710–1785	1.7
B4	1710–1755	1.2
B5	824–849	0.3
B7	2500–2570	1.4
B8	880–915	0.1
B12	699–716	-0.5
B13	777–787	-0.7
B14	788–798	-0.5
B17	704–716	-0.5

5G NR/ LTE/ LTE-Advanced/ WCDMA/ HSPA/ HSPA+/ GPRS/ GSM/ NB-IoT		
Band	**Frequency (MHz) Uplink**	**Max Peak Gain(dBi)**
B18	815-830	0.1
B19	830-845	0.3
B20	832–862	0.3
B25	1850-1915	1.8
B26	814–849	0.3
B28	703–748	-0.5
B34	2010 – 2025	2.3
B38	2570 - 2620	1.4
B39	1880-1920	1.6
B40	2300-2400	1.5
B41	2496 - 2690	1.4
B42	3400 - 3600	3.4
B43	3600-3800	3.6
B66	1710 - 1780	1.5
B70	1700-1720	1.1
B71	663 - 698	-0.9
N77	3300-4200	3.6
N78	3300-3800	3.6
N79	4400-5000	4.0

1.3. Mechanical & Environmental

Mechanical	
Antenna Dimensions	200 mm × 21 mm × 8 mm
Material & Color	PC & Black
Connector Type	SMA Male
Mounting Type	Terminal
Weight	Typ. 24.9 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

2 Drawing

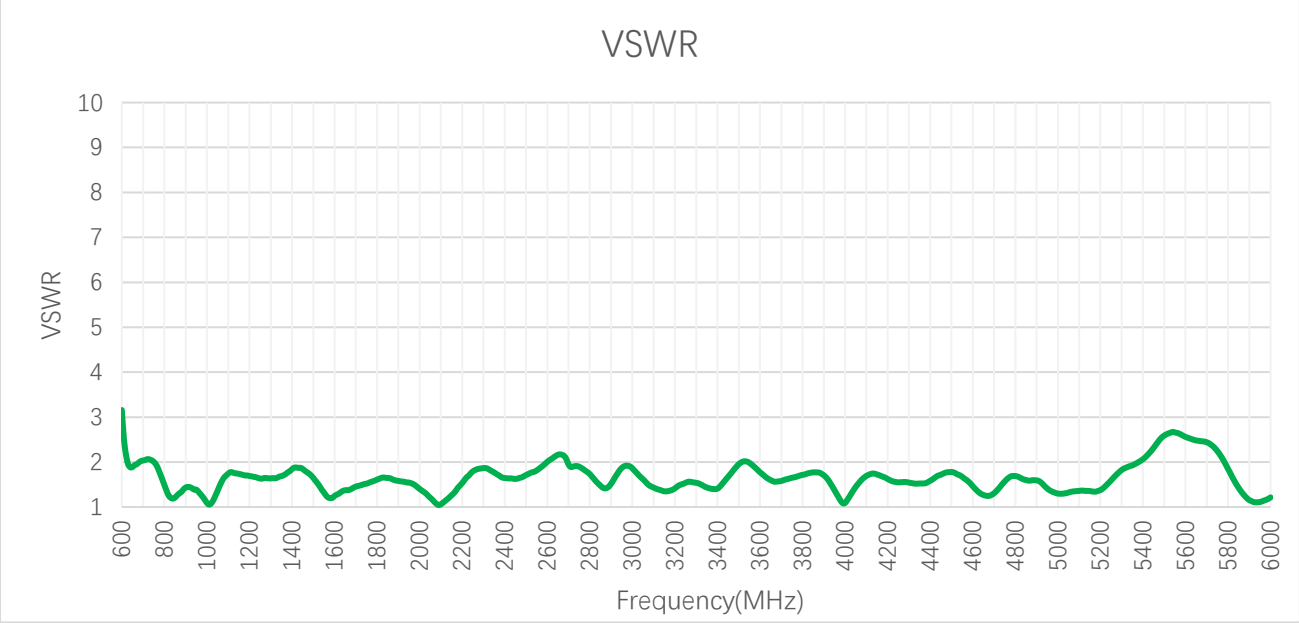


3 Detailed Performance

- Network Analyzer: Keysight E5071C (Device number: QTB6331E; Calibration date: 2023-12-27; Due date:2025-06-26)
- Chamber: OTA RayZone 2800 GTS (Device number: QTA0709; Calibration date: 2023-07-14; Due date:2024-07-13)
- Testing Software: Libra
- Test Engineer: Damon ZHANG
- Manufacturer: Quectel Wireless Solutions (Changzhou) Co., Ltd.
  Address: No.8 Nanhu West Road, Wujin District, Changzhou City, Jiangsu Province, China

3.1. S-Parameter Test

3.1.1. VSWR



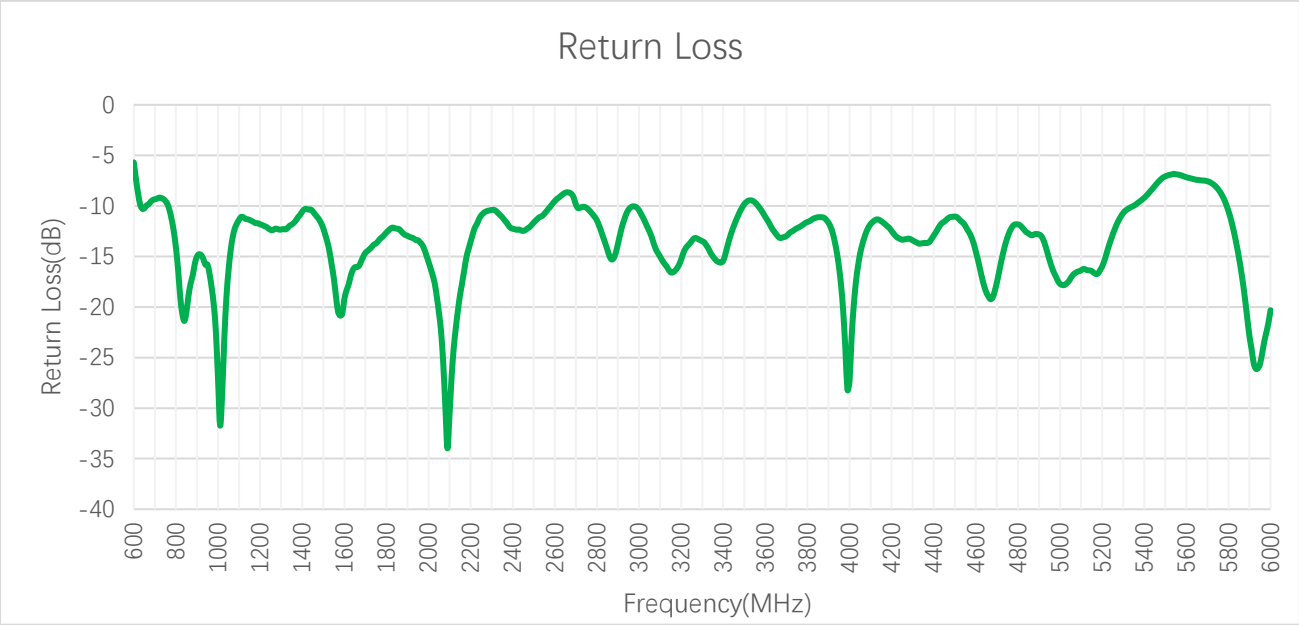
VSWR

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
VSWR	3.2	1.9	2.0	1.2	1.4	1.3	1.9	1.5	1.5	1.6
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
VSWR	1.5	1.2	1.8	1.6	2.0	1.8	1.3	1.3	2.6	1.2

VSWR - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
VSWR	1.5	1.3	1.3	1.4	1.4	1.5

3.1.2. Return Loss



Return Loss (dB)

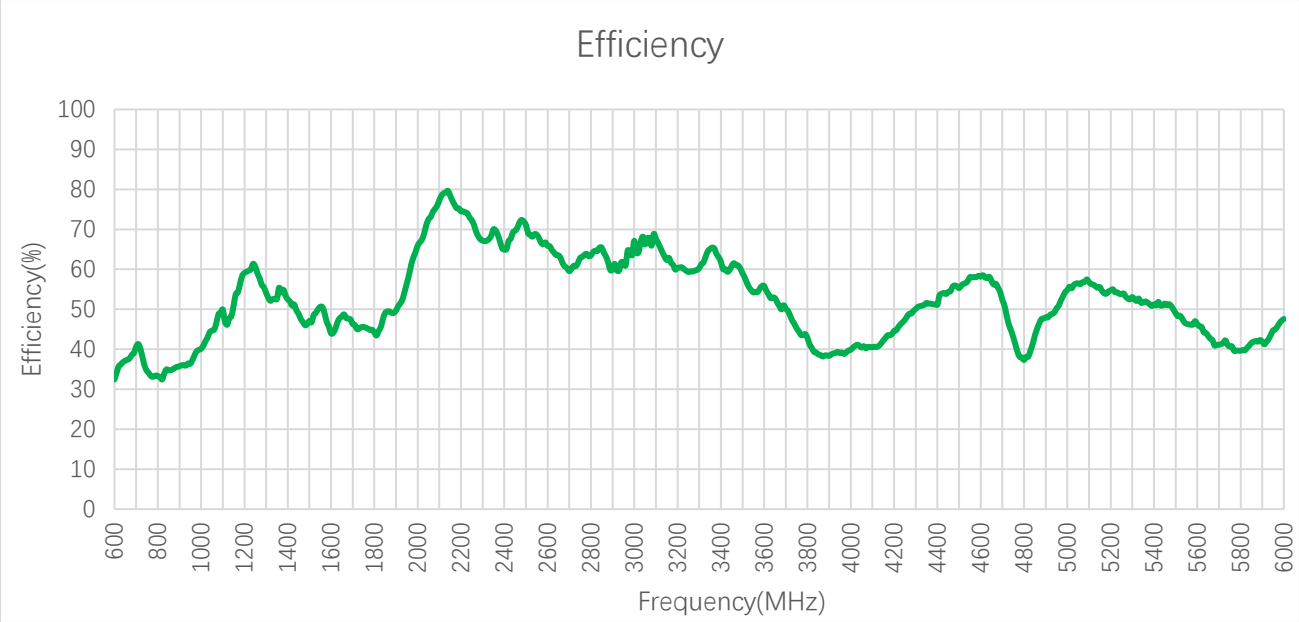
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	-5.7	-9.9	-9.3	-20.6	-15.0	-16.8	-10.4	-14.5	-13.8	-12.7
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Return Loss (dB)	-13.4	-20.3	-11.1	-12.5	-9.5	-11.1	-17.6	-17.7	-7.1	-20.3

Return Loss (dB) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Return Loss (dB)	-13.6	-18.9	-17.0	-15.5	-15.5	-13.5

3.2. Radiation Performance Test

3.2.1. Efficiency



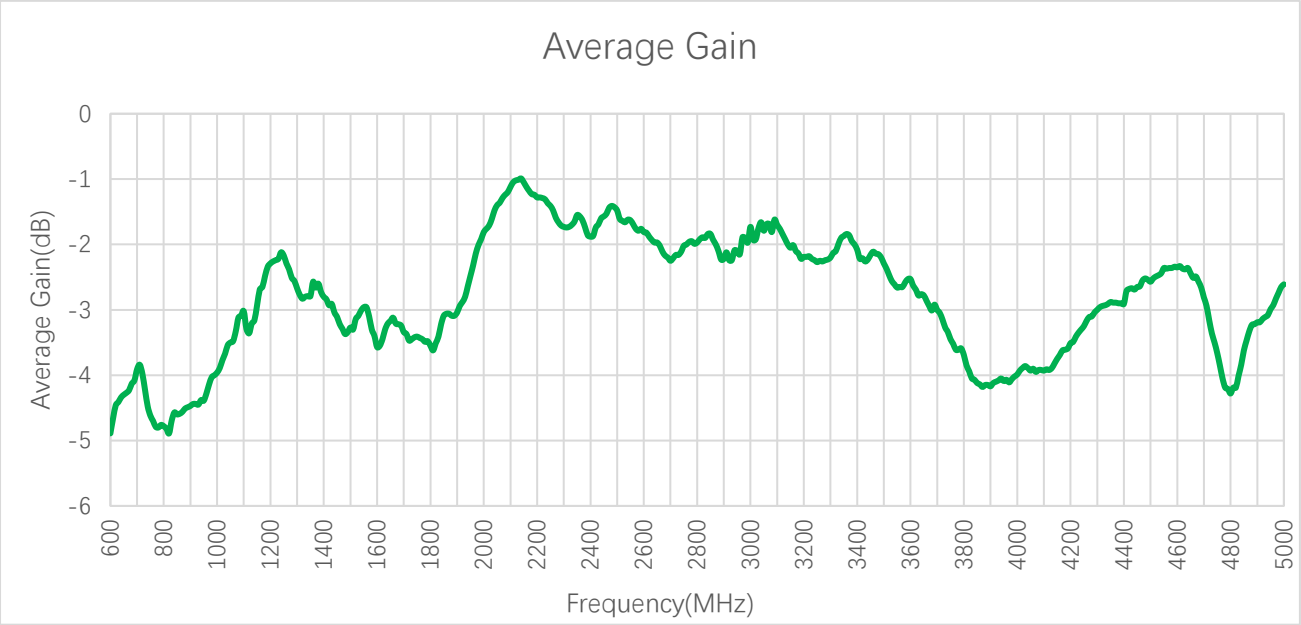
Efficiency (%)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	32.5	36.2	41.3	33.9	35.7	37.3	49.7	46.1	45.5	49.1
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Efficiency (%)	56.5	79.6	70.0	69.7	65.9	55.8	52.3	54.8	49.0	47.6

Efficiency (%) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Efficiency (%)	48.6	50.6	46.8	47.7	66.0	74.5

3.2.2. Average Gain



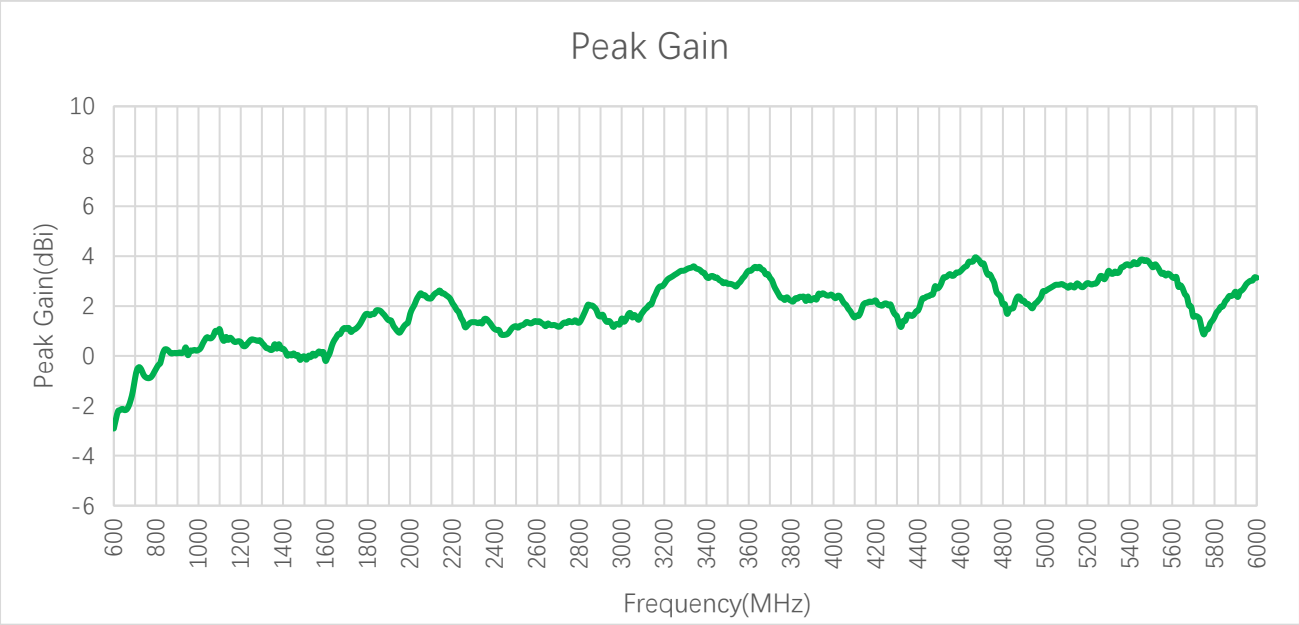
Average Gain (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	-4.9	-4.4	-3.8	-4.7	-4.5	-4.3	-3.0	-3.4	-3.4	-3.1
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Average Gain (dB)	-2.5	-1.0	-1.6	-1.6	-1.8	-2.5	-2.8	-2.6	-3.1	-3.2

Average Gain (dB) - NTN Bands

Frequency (MHz)	1520	1560	1630	1680	2000	2200
Average Gain (dB)	-3.1	-3.0	-3.3	-3.2	-1.8	-1.3

3.2.3. Peak Gain



Peak Gain (dBi)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	-2.9	-2.2	-0.5	0.1	0.1	0.2	0.0	1.1	1.1	1.6
Frequency (MHz)	**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Peak Gain (dBi)	0.9	2.6	1.5	0.9	1.4	3.4	3.7	2.6	3.6	3.1

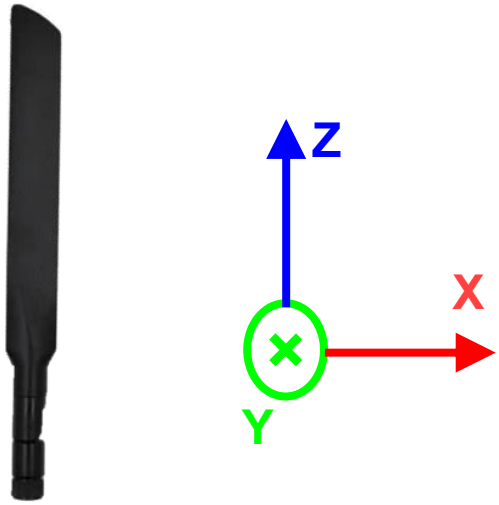
Peak Gain (dBi) - NTN Bands

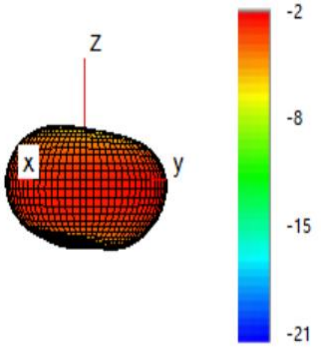
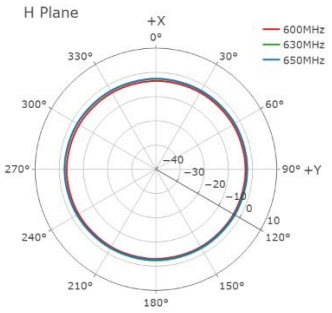
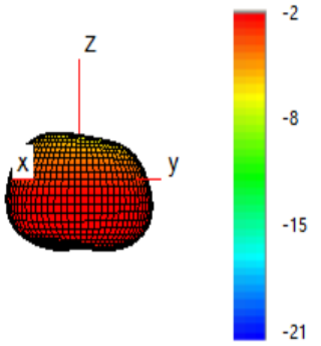
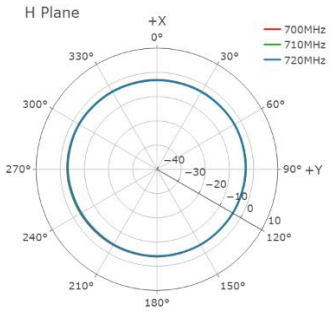
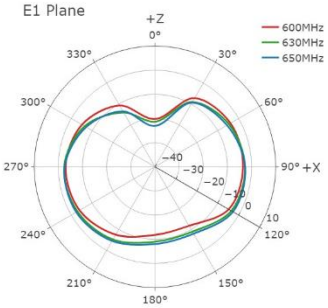
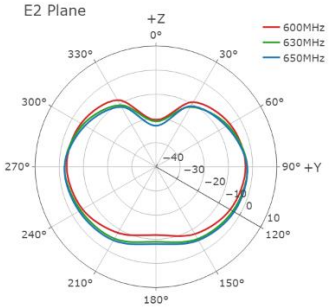
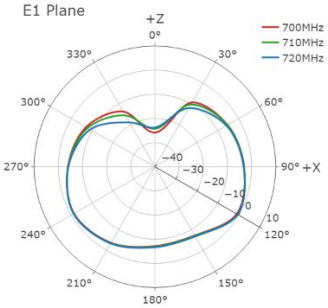
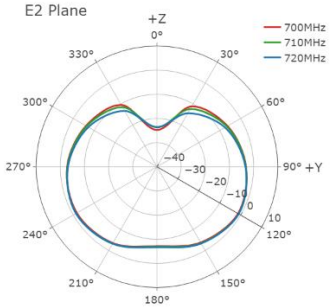
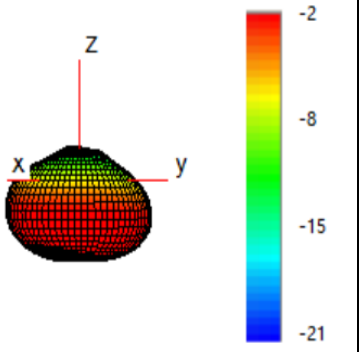
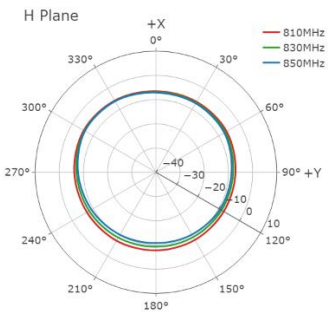
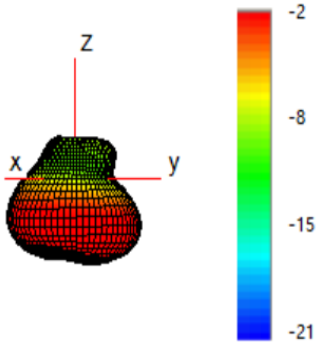
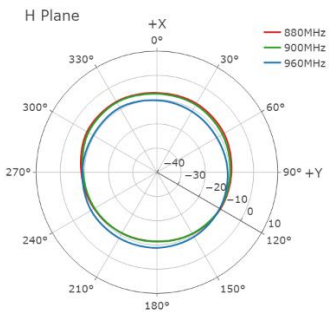
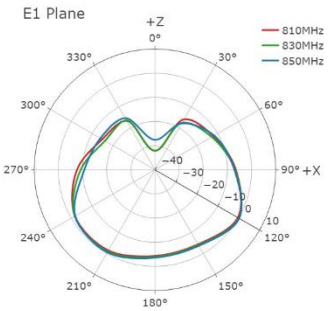
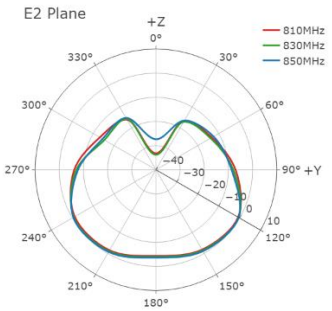
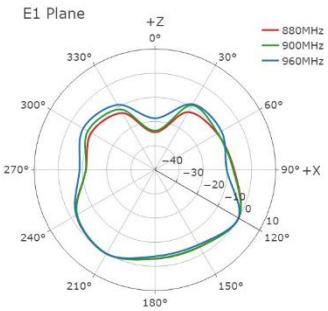
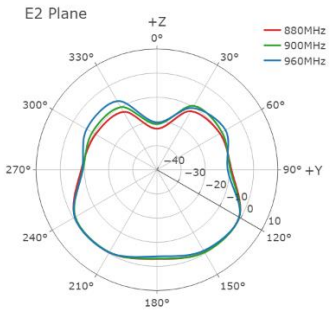
Frequency (MHz)	1520	1560	1630	1680	2000	2200
Peak Gain (dBi)	0.0	0.1	0.4	1.1	1.7	2.1

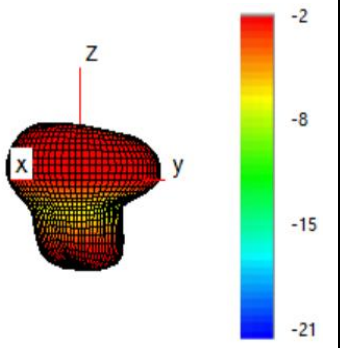
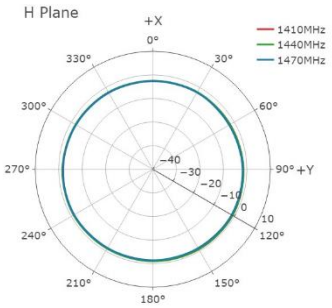
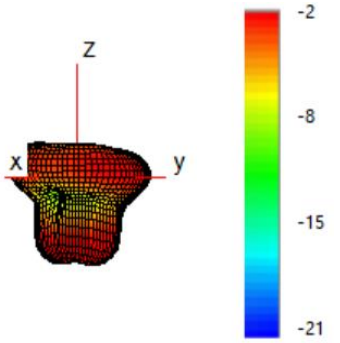
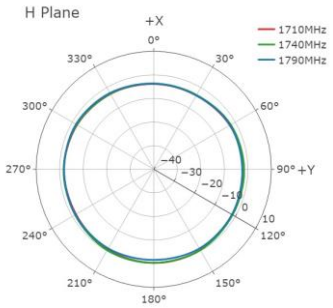
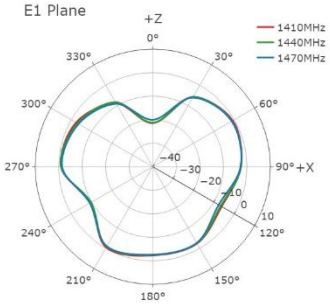
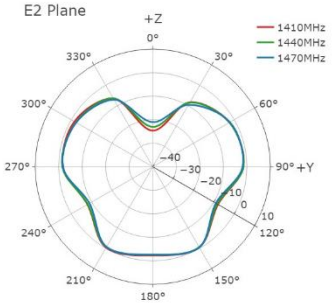
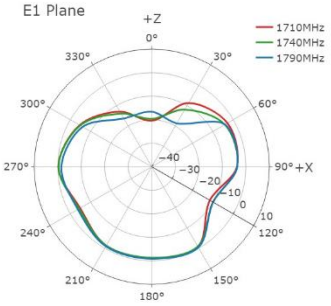
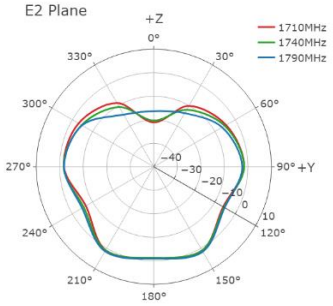
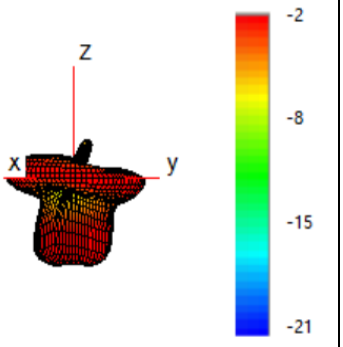
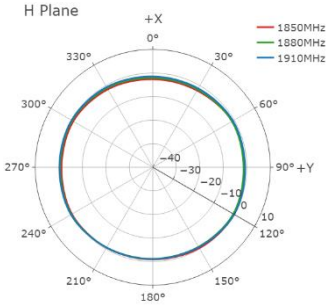
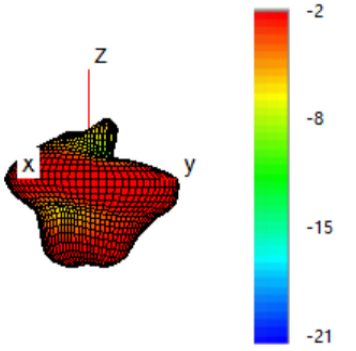
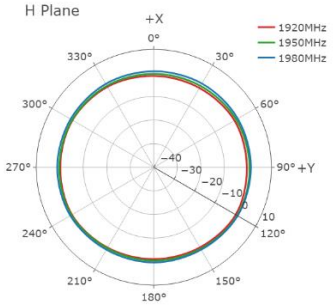
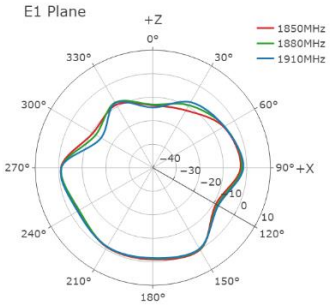
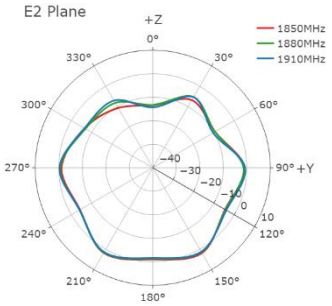
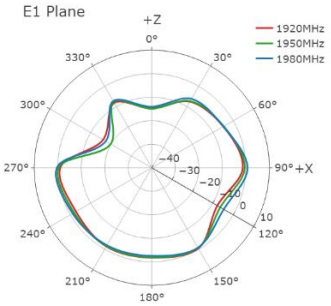
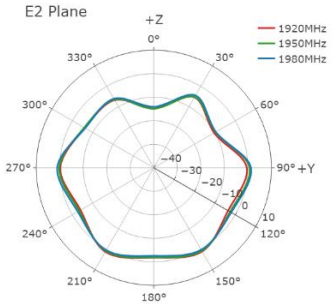
3.2.4. 3D & 2D Radiation Pattern

3.2.4.1. Test Condition: Free Space

- Test Chamber: HF-G-1



630 MHz		710 MHz	
			
			
830MHz		900 MHz	
			
			

1440 MHz		1740 MHz	
			
			
1880 MHz		1950 MHz	
			
			

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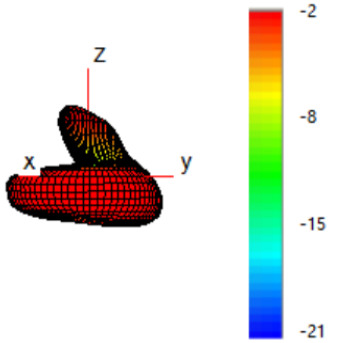
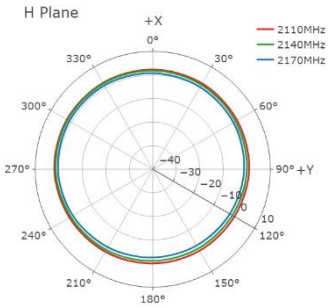
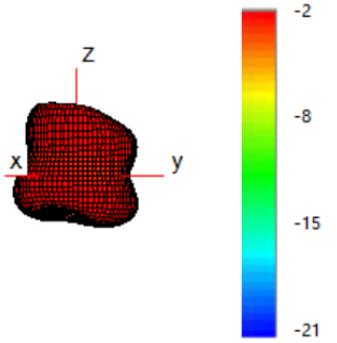
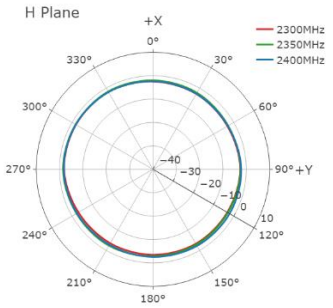
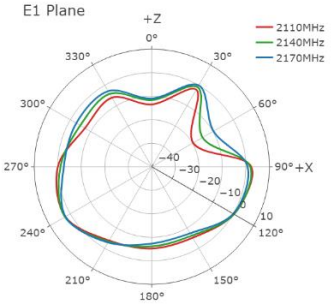
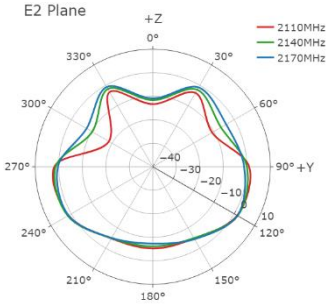
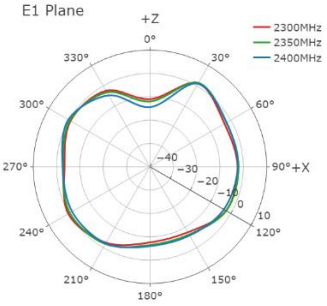
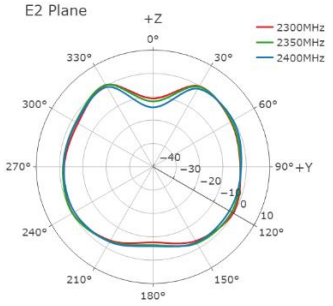
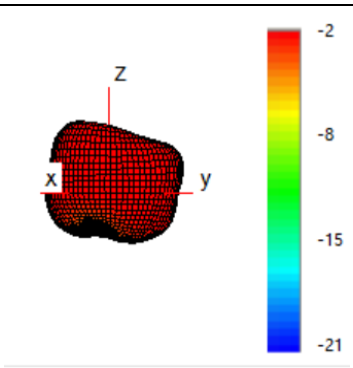
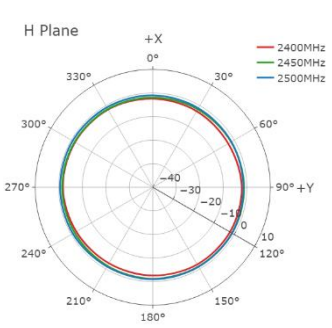
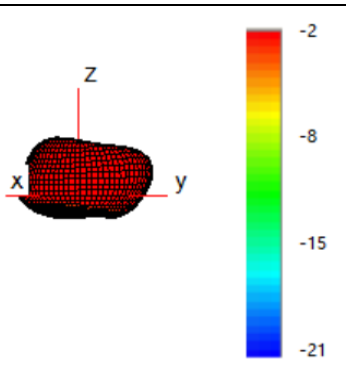
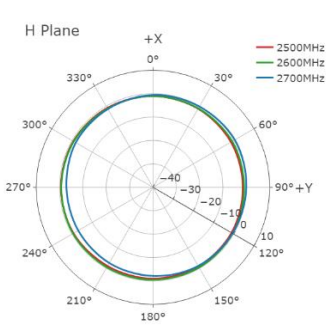
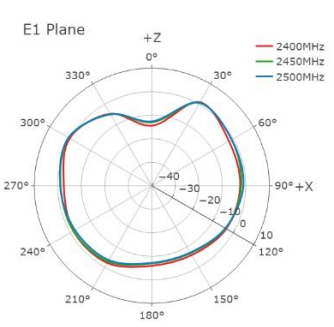
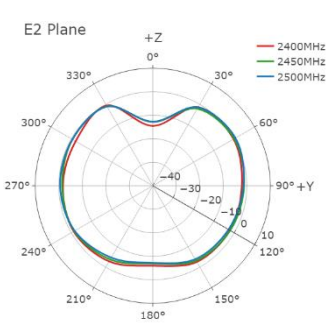
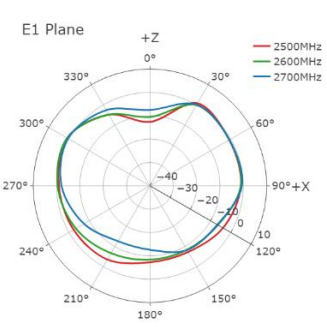
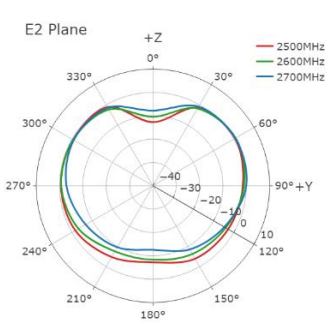
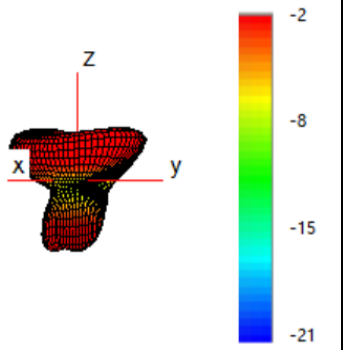
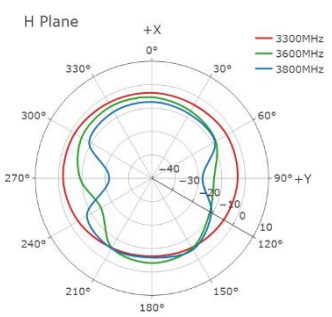
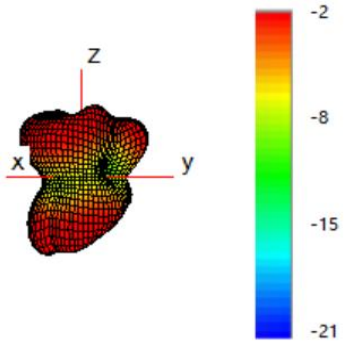
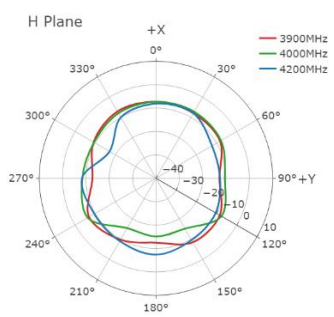
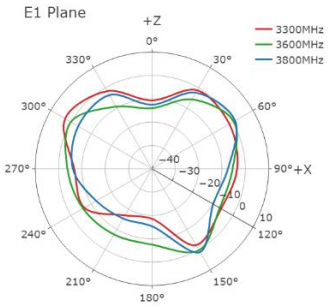
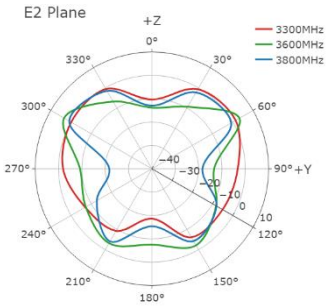
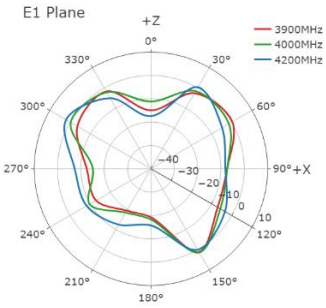
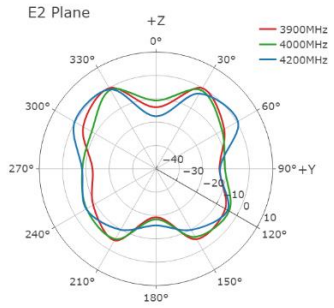
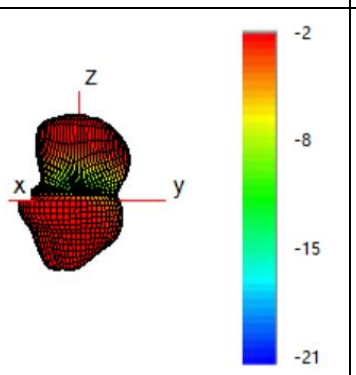
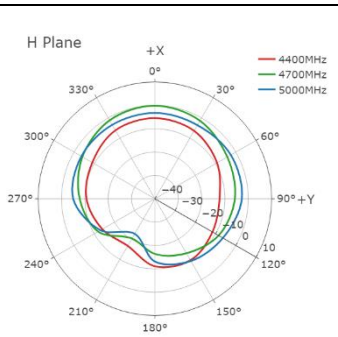
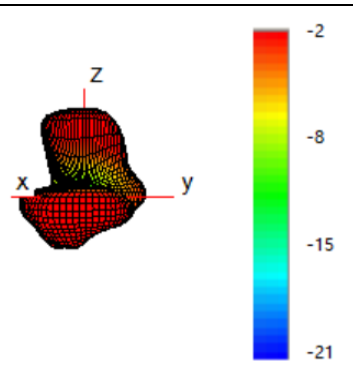
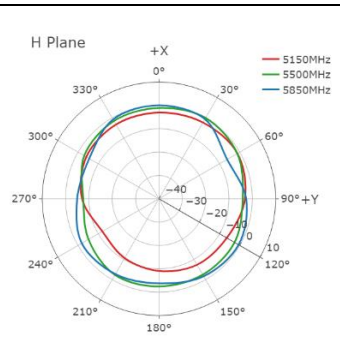
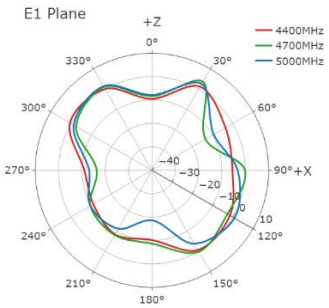
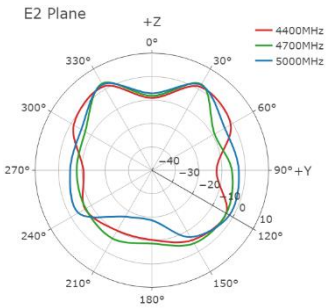
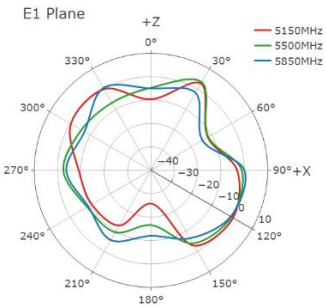
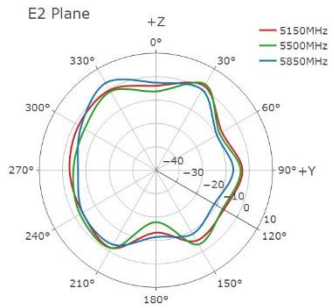
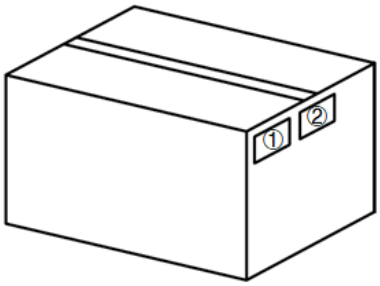
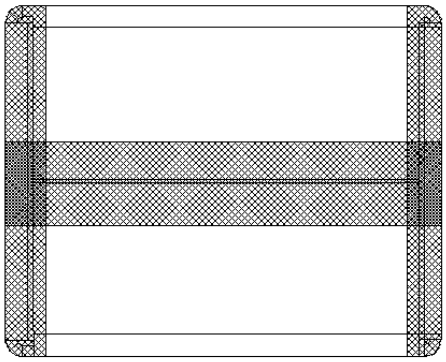
			
			
2450 MHz		2600 MHz	
			
			

3600 MHz		4000 MHz	
			
			
4700 MHz		5500 MHz	
			
			

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		40 pcs antenna products in a PE bag; (40 pcs antennas per PE bag)
2		(12 PE bags per carton box) (480 pcs antennas per carton box) Carton Size: L × W × H = 450 × 240 × 290 mm
3		**Position for Attaching Labels** ① Carton Label ② Quality Label

4		**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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Tel: +86 21 5108 6236
Email: info@quectel.com

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

Version	Date	Author	Note
-	2024-06-03	Black LI	Creation of the document
0.1	2024-06-03	Black LI	First official release

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