

Antenna Datasheet

Product OC: YP0009NA
Version: 2.0
Date: 2023-10-27
Status: Released

Product Name: 5G FPC Antenna
Key Features:
Frequency Band: 1100–6000 MHz
Dimensions: 49 mm × 13 mm × 0.8 mm
Efficiency: Up to 78.9% (EVB)
RoHS and REACH Compliant

Overview

This Quectel embedded 5G FPC/PCB antenna covers 5G NR Sub-6 GHz frequency bands and is compatible with 4G/3G/2G/LPWA bands. Ground plane independent, it's designed to be mounted directly to the underside of either a plastic or non-metallic enclosure. Ease of integration with a cable and connector which can be customized to meet your product design and RF module. Used with other 5G antennas, it can achieve MIMO (multiple input, multiple output) antenna technology for wireless communications in which multiple antennas are used at both the source (transmitter) and the destination (receiver).

Contents

Overview **1**
Contents **2**

1 Specification **3**
1.1. Electrical 3
1.2. Mechanical & Environmental 4

2 Drawing **5**

3 Detailed Performance **6**
3.1. S-Parameter Test 6
3.1.1. VSWR 6
3.1.2. Return Loss 7
3.2. Radiation Performance Test 8
3.2.1. Efficiency 8
3.2.2. Average Gain 9
3.2.3. Peak Gain 10
3.2.4. 3D & 2D Radiation Pattern 11
3.2.4.1. Test Condition: Free Space 11
3.2.4.2. Test Condition: Stick to ABS Board on 130 × 130 mm EVB Board 15

4 Packaging **19**

Contact Us **21**
Legal Notices **22**
Revision History **24**

1 Specification

Test Condition: Stick to ABS Board on 130 × 130 mm EVB Board & Free Space

1.1. Electrical

Electrical	
Frequency Range	1100–6000 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Electrical - Detail

Band / SPEC	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
	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	FS	-	-	-	2.9	4.3	2.7	2.6	1.7	2.3	2.2	1.9
	EVB	-	-	-	2.2	4.1	1.7	1.6	1.6	2.5	2.0	2.2
Max. Return Loss (dB)	FS	-	-	-	-6.1	-4.1	-6.8	-7.0	-11.7	-8.2	-8.5	-10.3
	EVB	-	-	-	-8.5	-4.3	-12.1	-12.4	-13.3	-7.3	-9.3	-8.7
AVG Eff. (%)	FS	-	-	-	44.0	42.0	57.5	60.9	67.3	62.9	56.1	55.3
	EVB	-	-	-	70.8	56.6	63.1	68.4	65.7	56.4	59.3	49.0
AVG AVG Gain (dB)	FS	-	-	-	-3.6	-3.9	-2.4	-2.2	-1.7	-2.0	-2.5	-2.6

	EVB	-	-	-	-1.5	-2.7	-2.0	-1.6	-1.8	-2.5	-2.3	-3.1
Max. Peak Gain (dBi)	FS	-	-	-	2.7	3.6	3.7	3.5	3.9	4.3	3.7	4.1
	EVB	-	-	-	3.2	3.3	3.5	3.4	3.4	5.4	5.4	2.6

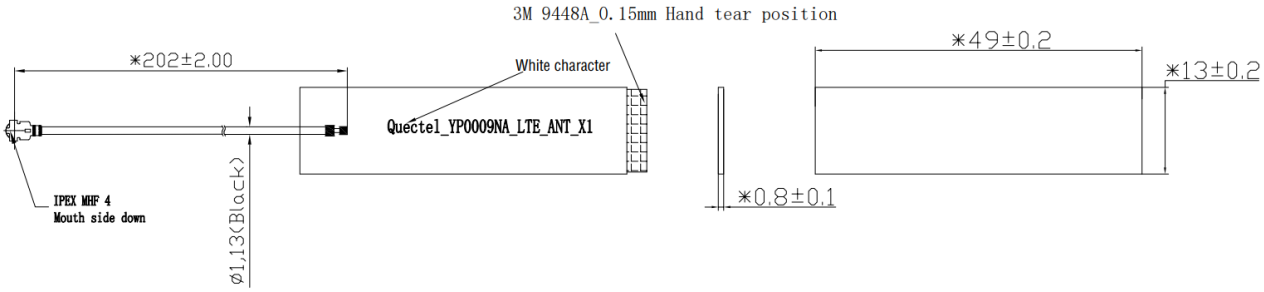
VSWR	FS	≤ 4.3
	EVB	≤ 4.1
Return Loss	FS	≤ -4.1 dB
	EVB	≤ -4.3 dB
Peak Gain	FS	≤ 4.3 dBi
	EVB	≤ 5.4 dBi

- **EVB: Stick to ABS Board on 130 × 130 mm EVB Board**
- **FS: Free Space**

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	49 × 13 × 0.8 mm
Material & Color	PCB & Black
Cable Type & Color & Length	Φ1.13 & Black & 202 mm
Connector Type	IPEX MHF 4
Mounting Type	Adhesive
Weight	Typ. 1.8 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

2 Drawing



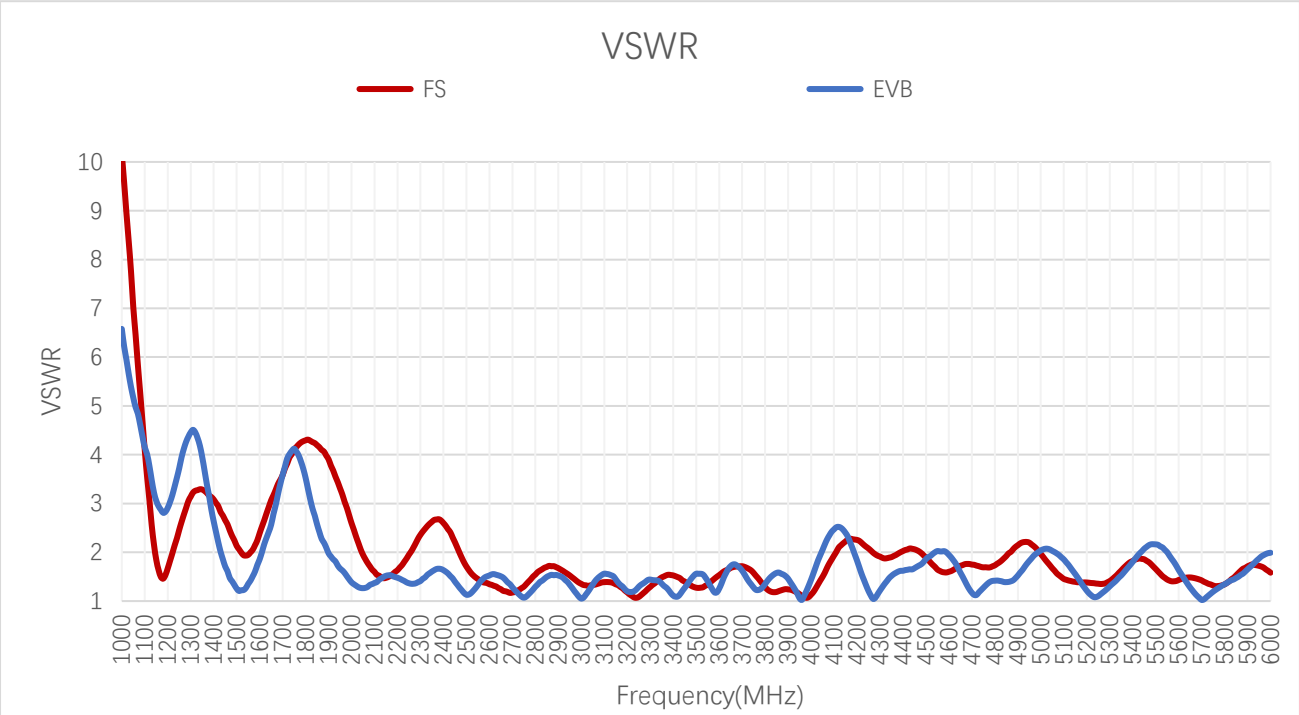
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Bottom

3 Detailed Performance

3.1. S-Parameter Test

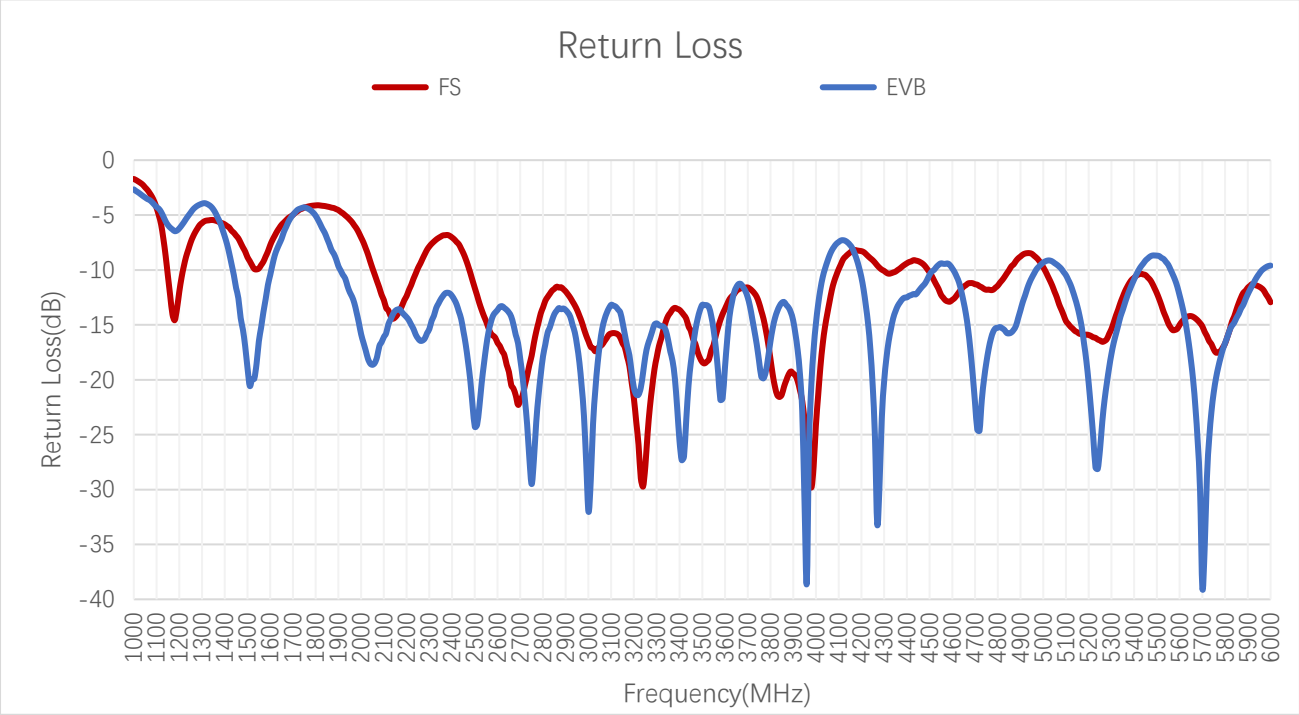
3.1.1. VSWR



VSWR

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
VSWR	FS	-	-	-	-	-	-	2.8	3.7	4.0	4.1
	EVB	-	-	-	-	-	-	1.9	3.8	4.1	2.2
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
VSWR	FS	3.3	1.5	2.6	2.2	1.3	1.5	1.7	2.0	1.7	1.6
	EVB	1.7	1.5	1.6	1.4	1.5	1.3	1.2	2.0	2.2	2.0

3.1.2. Return Loss

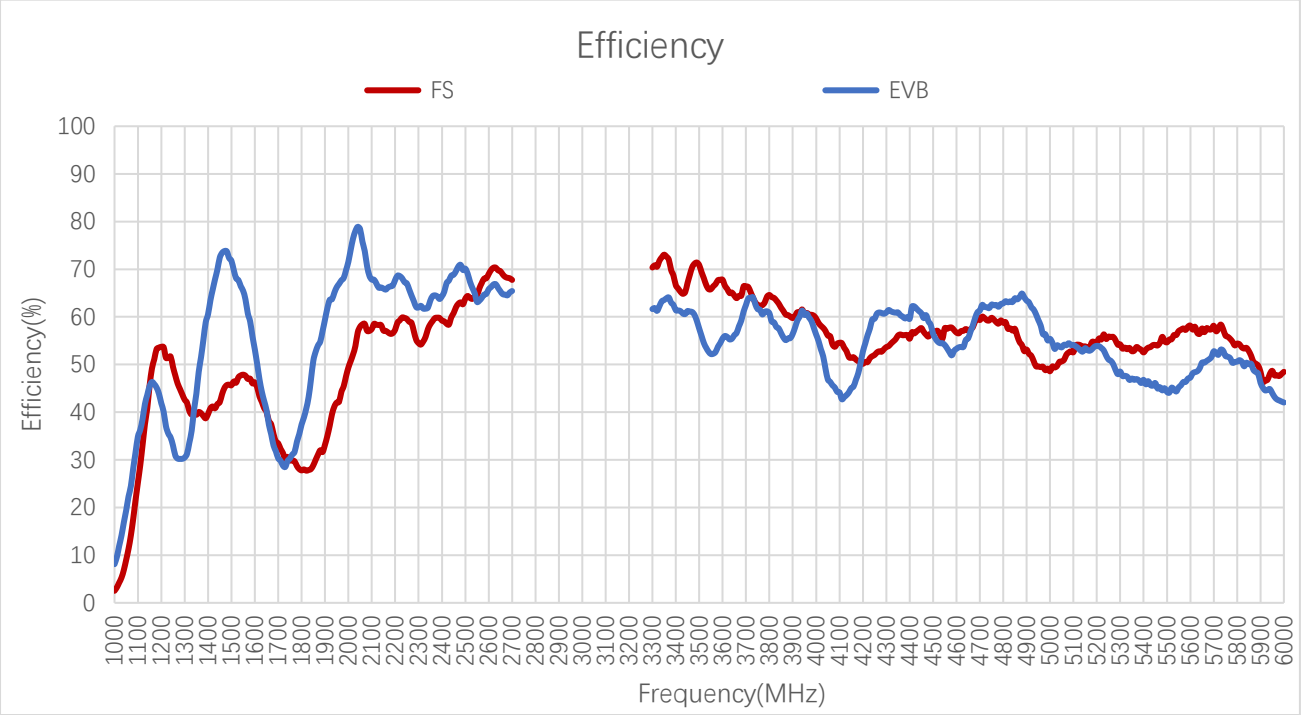


Return Loss (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	FS	-	-	-	-	-	-	-6.6	-4.8	-4.4	-4.4
	EVB	-	-	-	-	-	-	-10.5	-4.7	-4.3	-8.5
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Return Loss (dB)	FS	-5.4	-14.4	-7.0	-8.5	-16.6	-13.6	-11.3	-9.7	-12.1	-12.9
	EVB	-12.0	-14.0	-12.7	-15.6	-13.6	-18.9	-22.1	-9.3	-8.7	-9.6

3.2. Radiation Performance Test

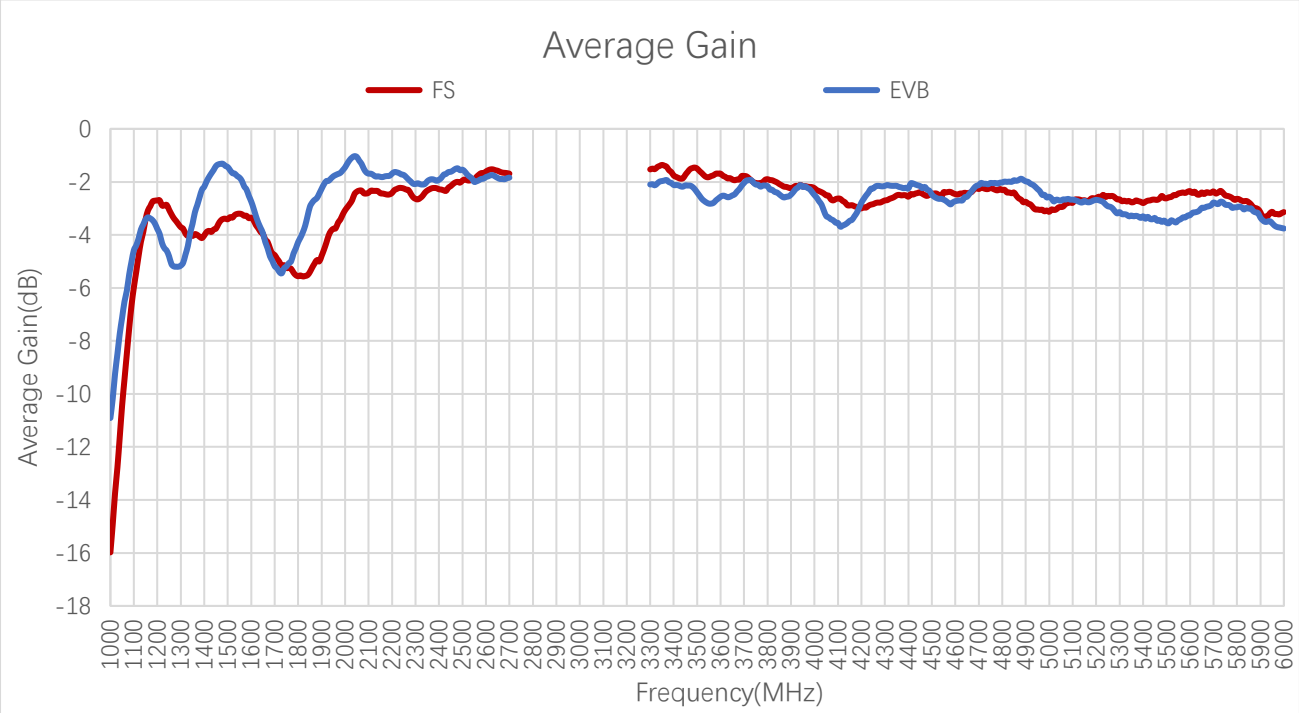
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	FS	-	-	-	-	-	-	41.7	32.3	30.6	32.0
	EVB	-	-	-	-	-	-	69.9	29.8	29.8	54.9
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Efficiency (%)	FS	42.0	58.3	58.4	60.8	69.0	67.8	59.3	48.6	54.7	48.5
	EVB	66.2	66.2	63.4	68.8	65.8	55.5	61.3	55.4	44.3	42.0

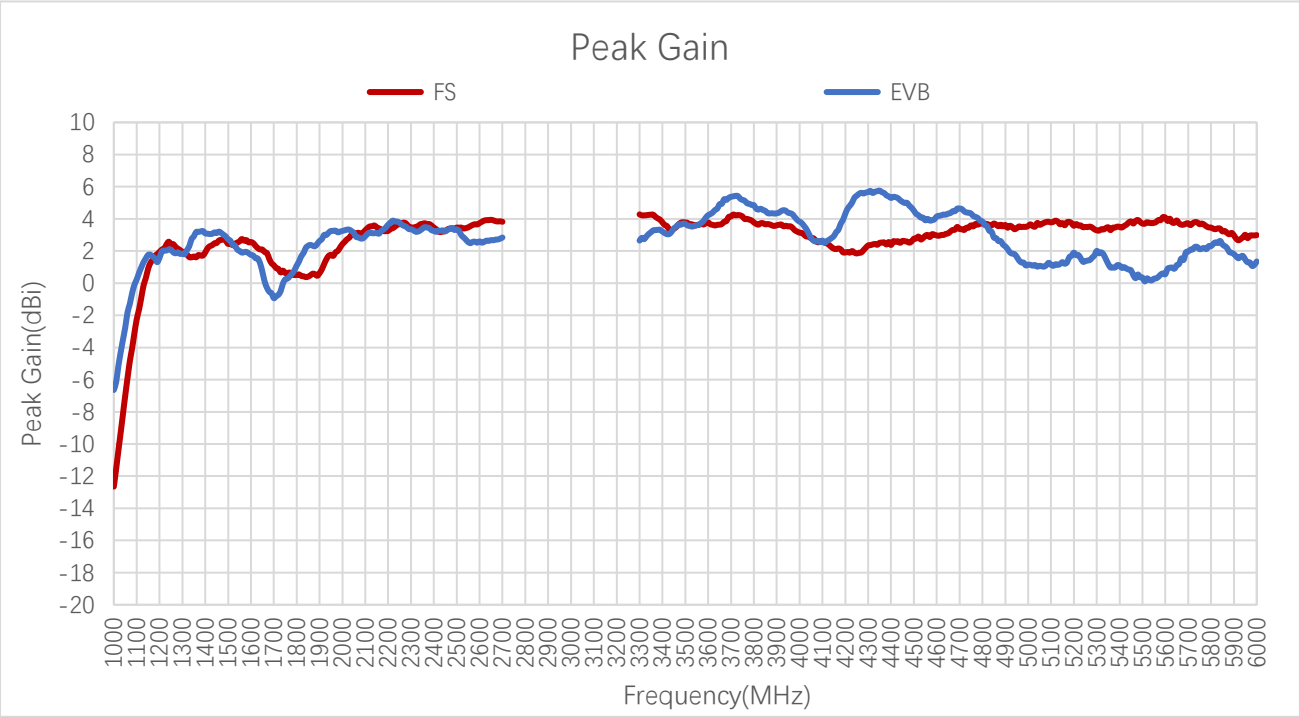
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	FS	-	-	-	-	-	-	-3.8	-4.9	-5.1	-5.0
	EVB	-	-	-	-	-	-	-1.6	-5.3	-5.3	-2.6
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Average Gain (dB)	FS	-3.8	-2.4	-2.3	-2.2	-1.6	-1.7	-2.3	-3.1	-2.6	-3.1
	EVB	-1.8	-1.8	-2.0	-1.6	-1.8	-2.6	-2.1	-2.6	-3.5	-3.8

3.2.3. Peak Gain



Peak Gain (dBi)

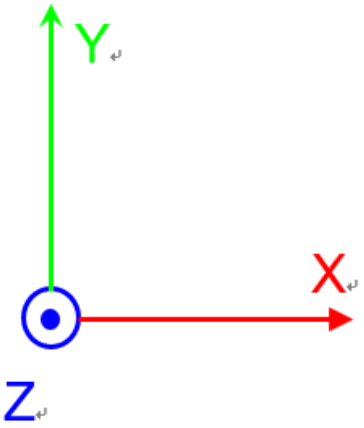
Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	FS	-	-	-	-	-	-	2.5	0.9	0.8	0.6
	EVB	-	-	-	-	-	-	3.2	-0.8	0.0	2.3
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Peak Gain (dBi)	FS	1.8	3.6	3.7	3.2	3.7	3.8	3.4	3.6	3.7	3.0
	EVB	3.3	3.1	3.4	3.2	2.6	4.2	4.6	1.2	0.4	1.4

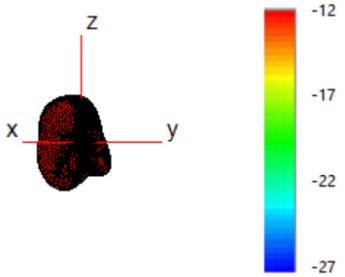
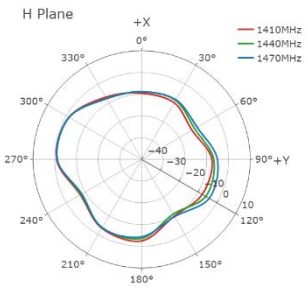
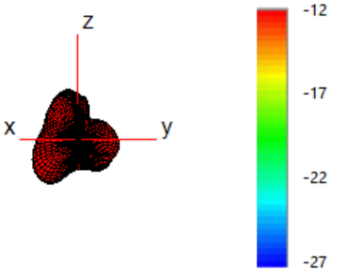
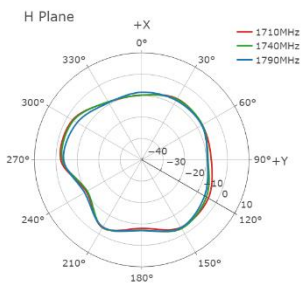
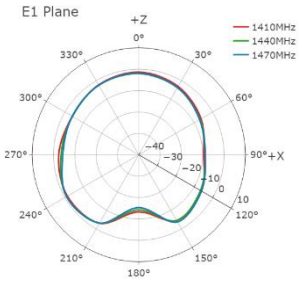
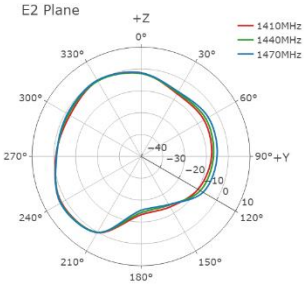
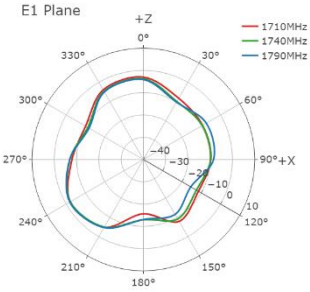
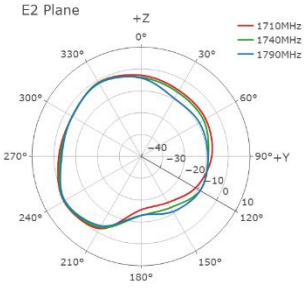
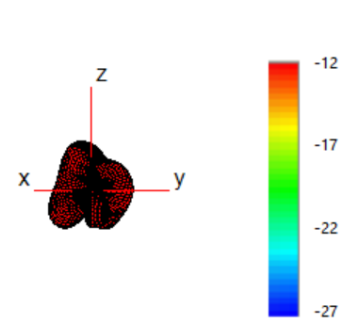
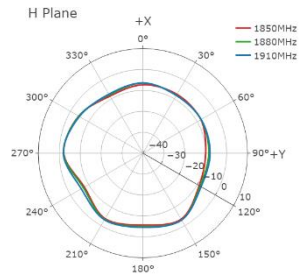
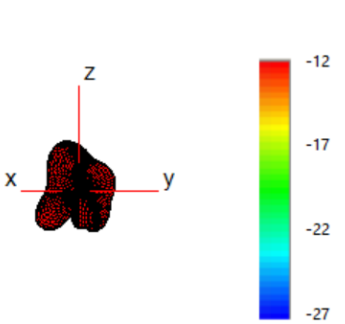
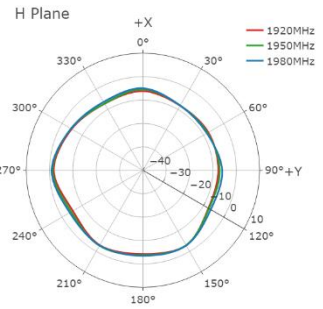
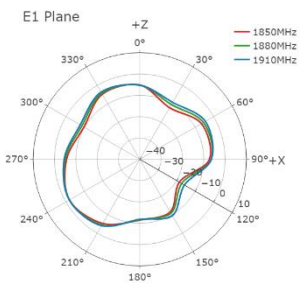
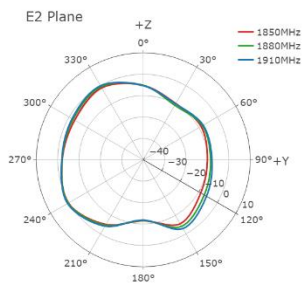
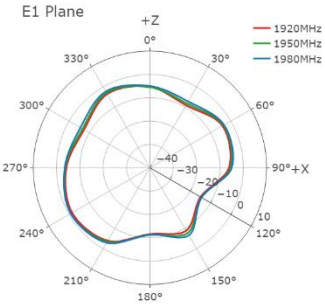
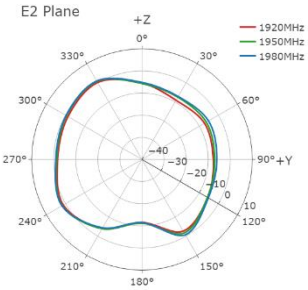
3.2.4. 3D & 2D Radiation Pattern

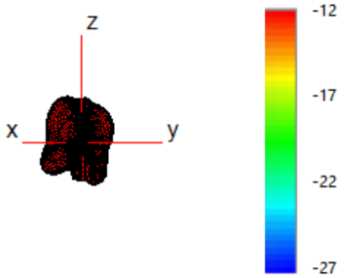
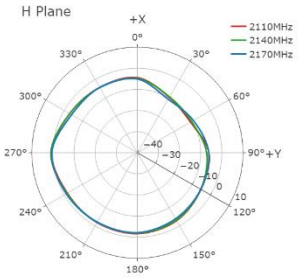
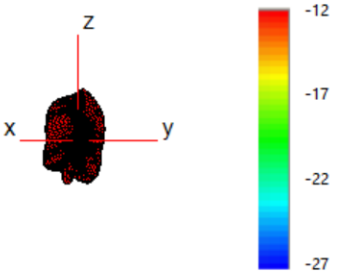
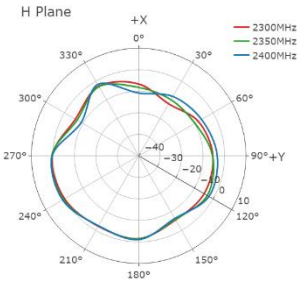
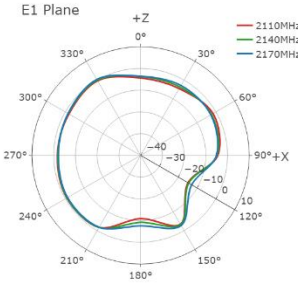
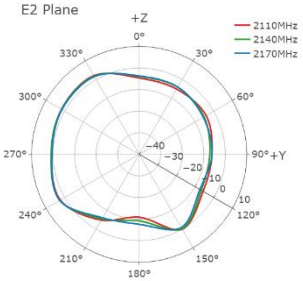
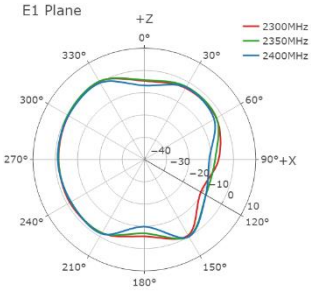
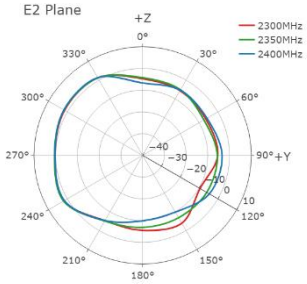
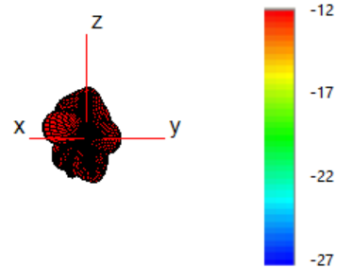
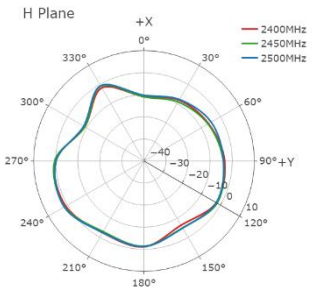
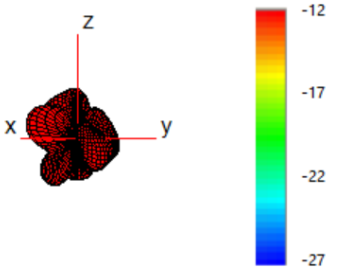
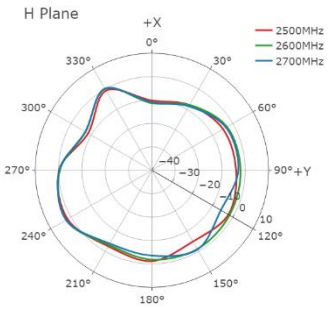
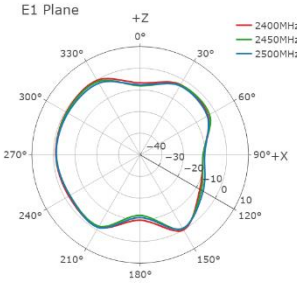
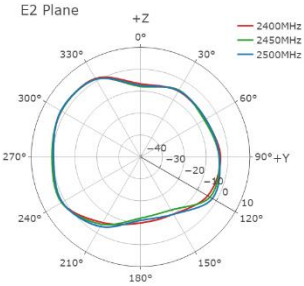
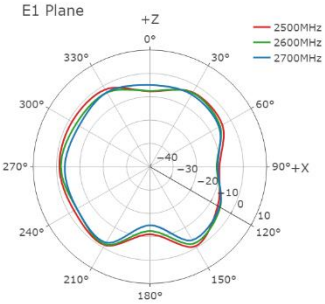
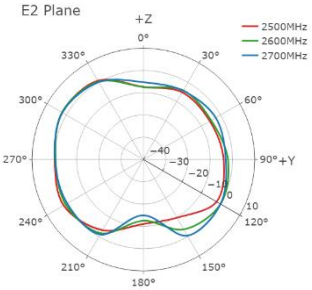
3.2.4.1. Test Condition: Free Space

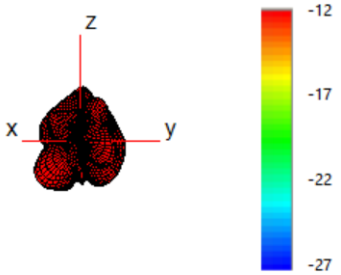
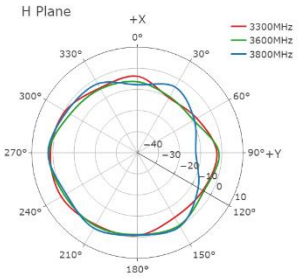
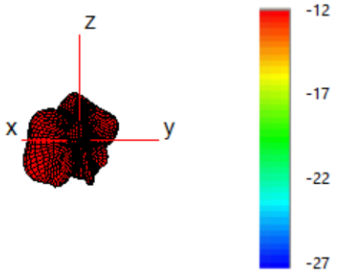
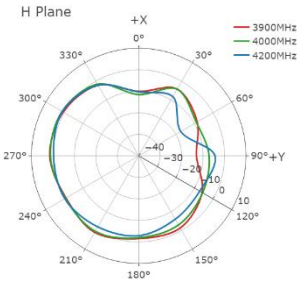
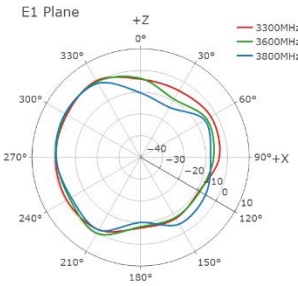
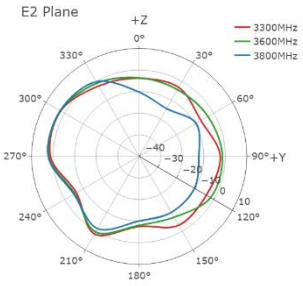
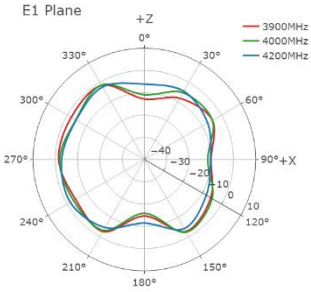
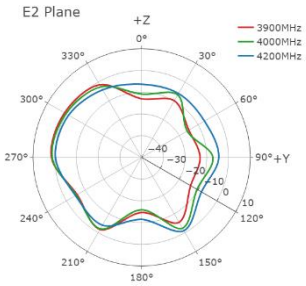
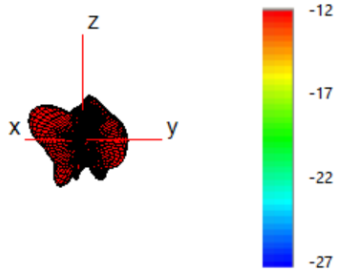
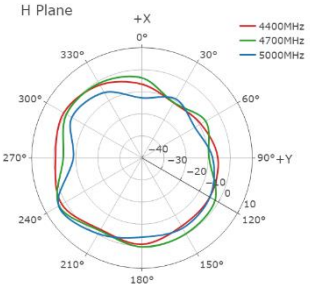
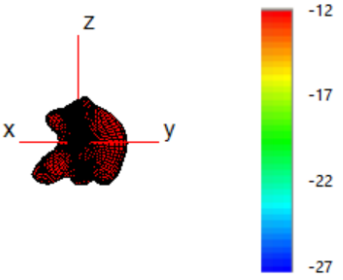
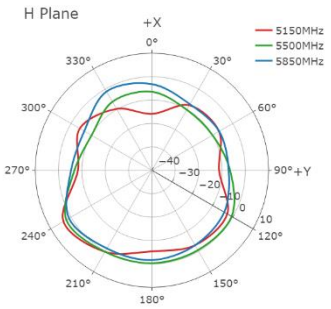
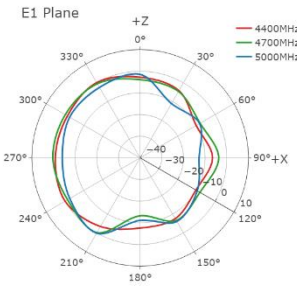
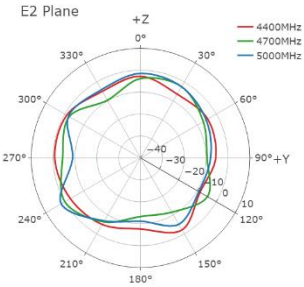
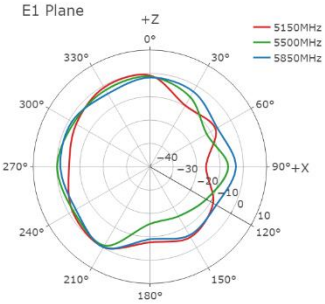
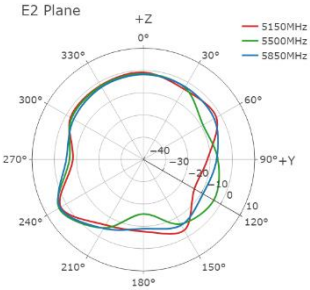
- Test Chamber: HF-G-1





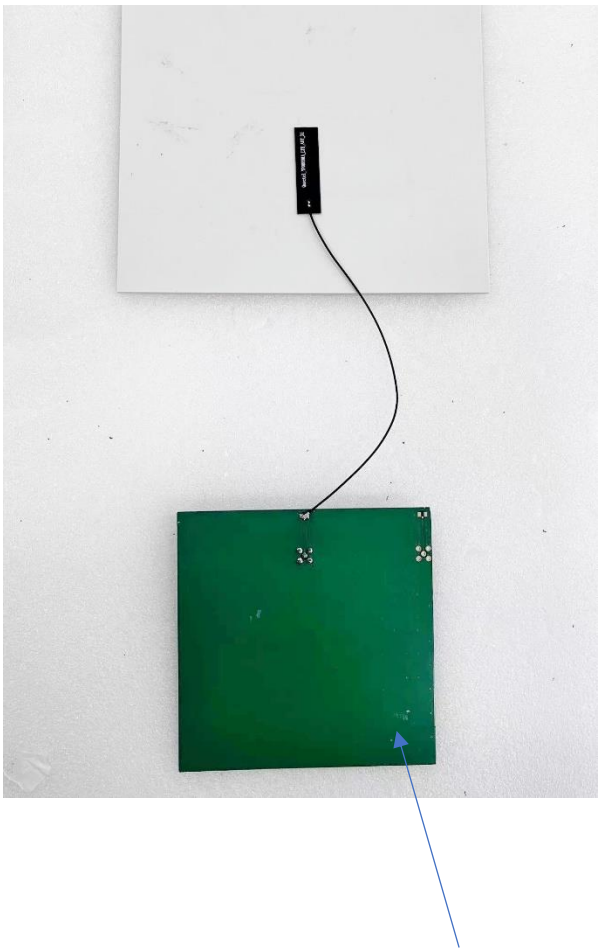
1440 MHz		1740 MHz	
			
			
1880 MHz		1950 MHz	
			
			

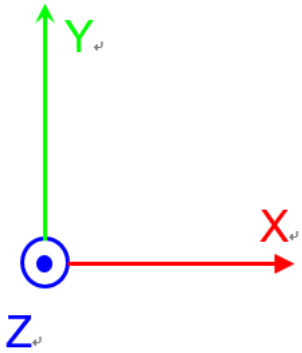
2140 MHz		2350 MHz	
			
			
2450 MHz		2600 MHz	
			
			

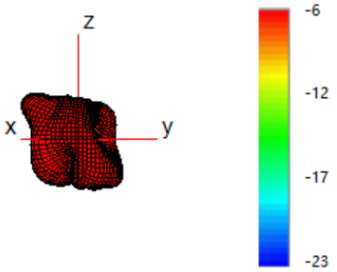
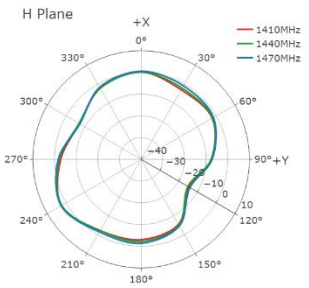
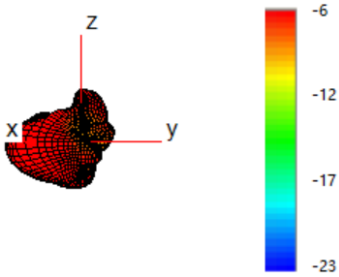
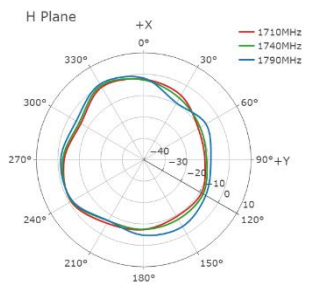
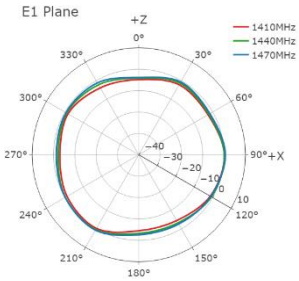
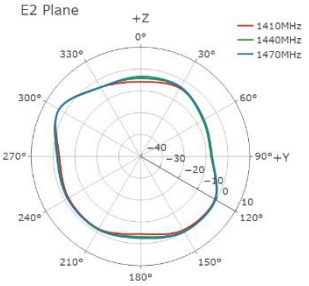
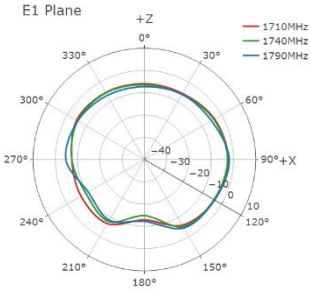
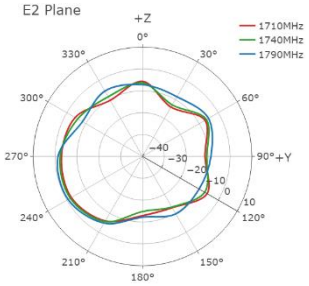
3600 MHz		4000 MHz	
			
			
4700 MHz		5500 MHz	
			
			

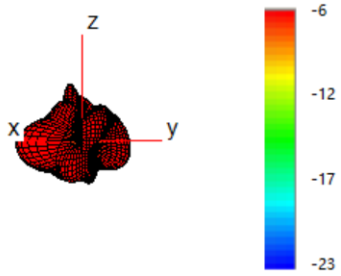
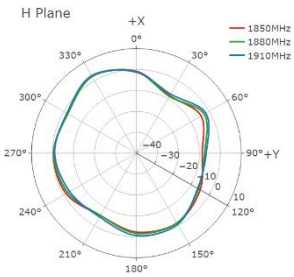
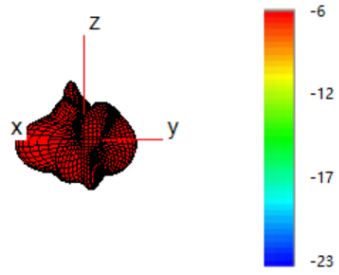
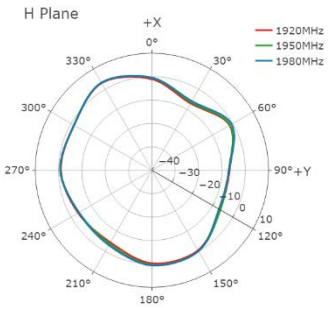
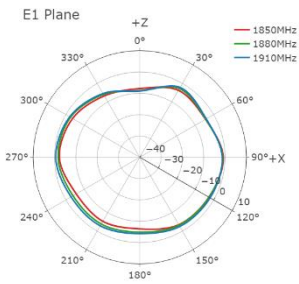
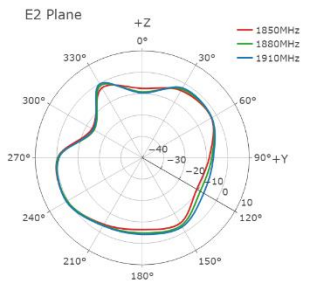
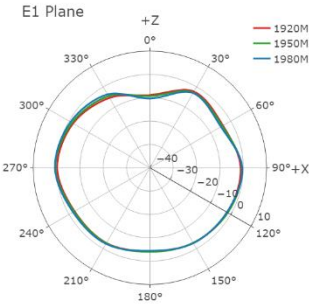
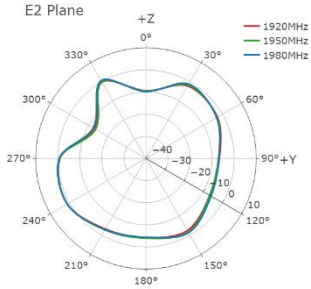
3.2.4.2. Test Condition: Stick to ABS Board on 130 × 130 mm EVB Board

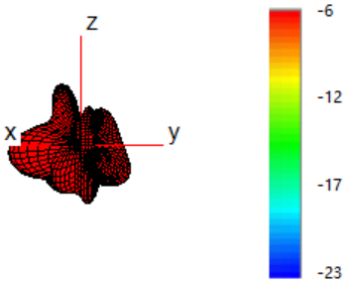
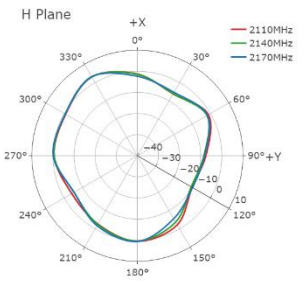
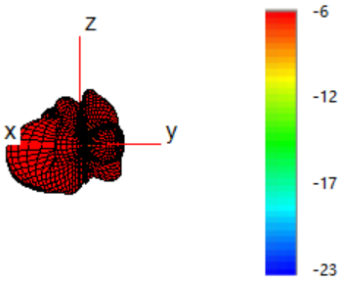
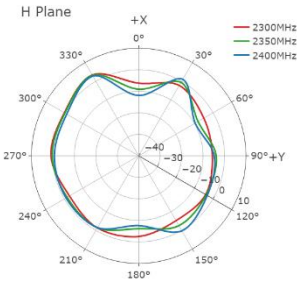
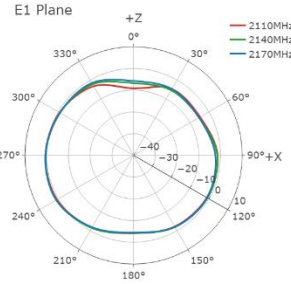
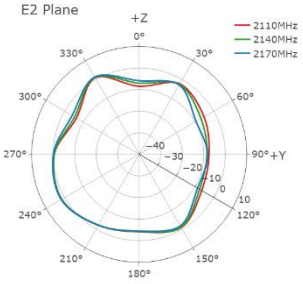
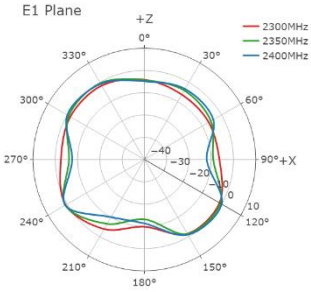
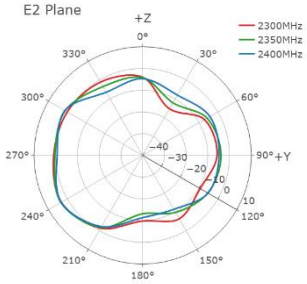
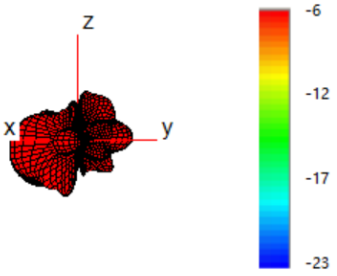
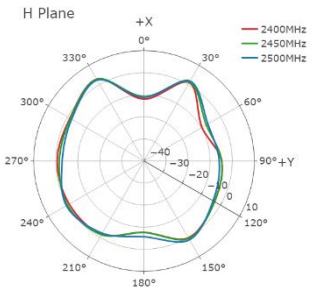
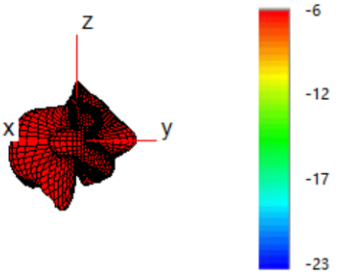
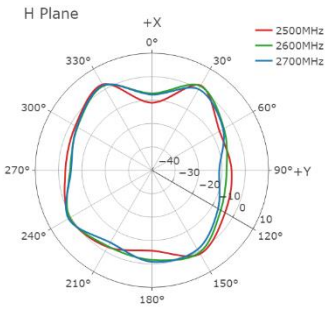
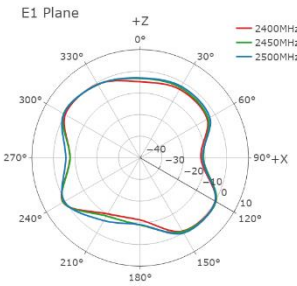
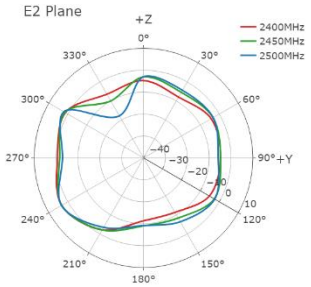
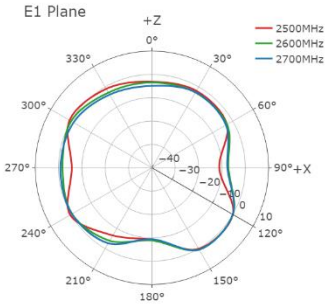
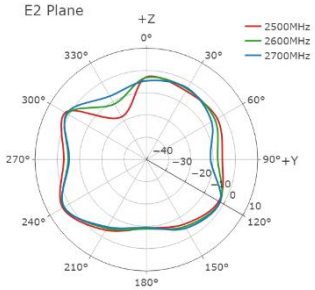
- Test Chamber: HF-G-1

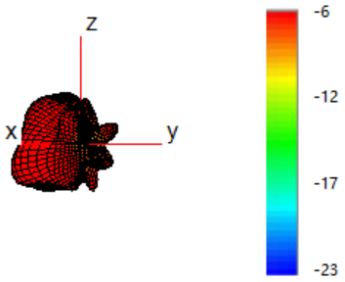
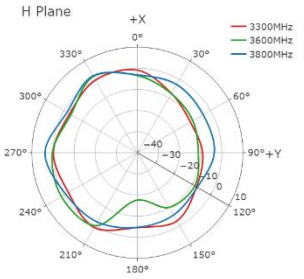
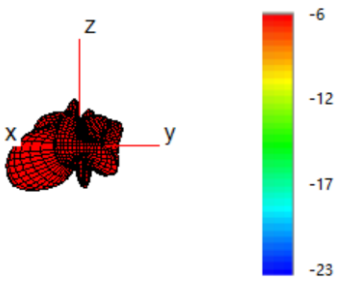
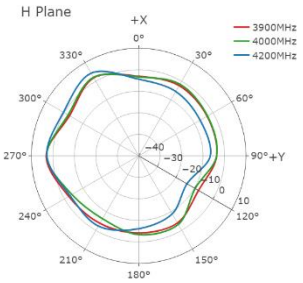
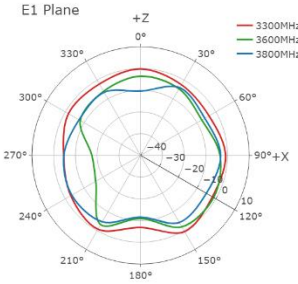
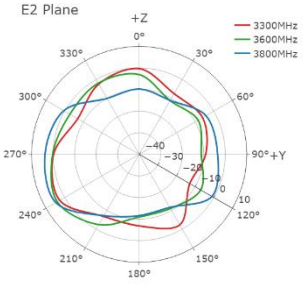
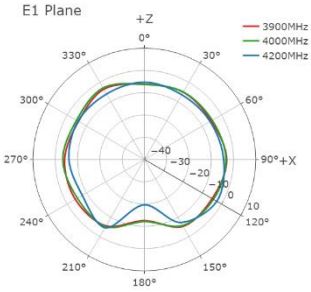
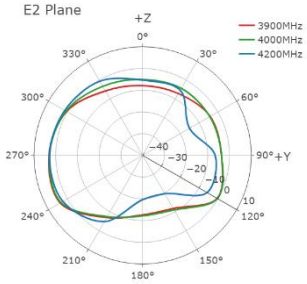
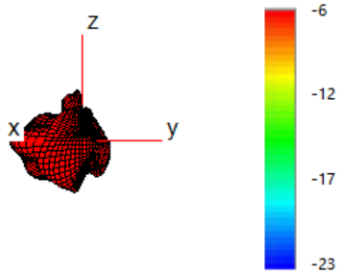
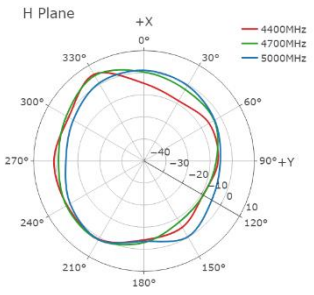
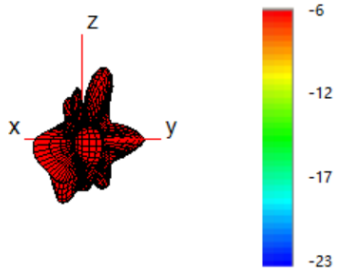
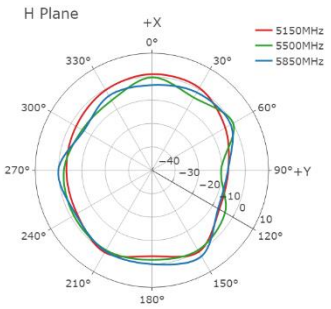
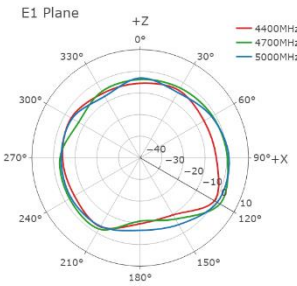
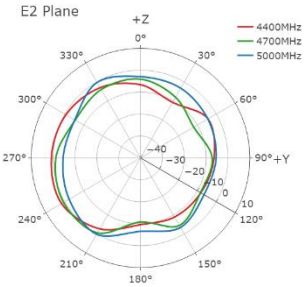
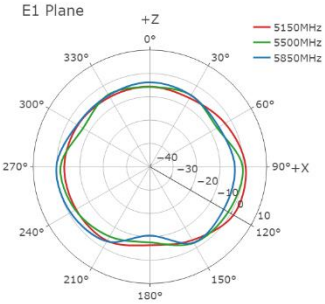
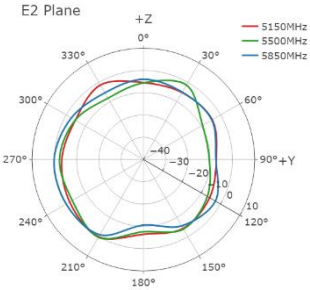




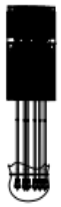
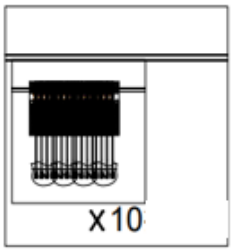
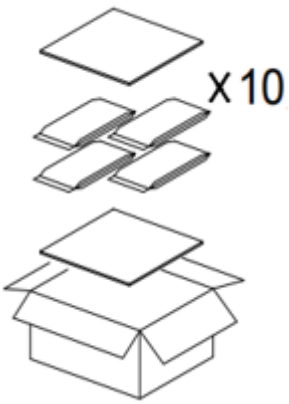
1440 MHz		1740 MHz	
			
			

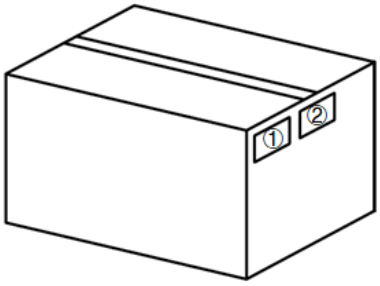
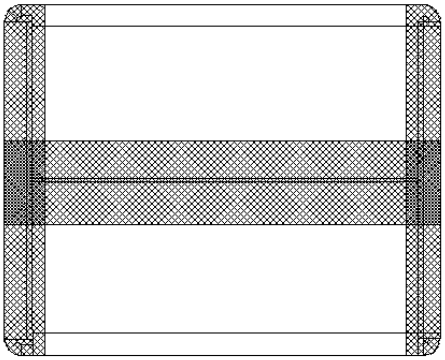
1880 MHz		1950 MHz	
			
			

2140 MHz		2350 MHz	
			
			
2450 MHz		2600 MHz	
			
			

3600 MHz		4000 MHz	
			
			
4700 MHz		5500 MHz	
			
			

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1	 20pcs/小扎	The product terminal is wrapped with EPE foam, 20 PCS / Tie.
2	 200pcs/bag	200 pcs antenna products in a PE bag. (200 PCS / PE Bag)
3		10 PE Bags / Carton Box (2000 PCS / Carton Box) Estimated Quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. Carton Size: L × W × H = 340 × 260 × 140 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** "工" type sealing cartons
Note	The initial packaging method described above is for reference only, and the final actual packaging method shall be subject to the actual shipping packaging.	

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
-	2022-08-02	Jason Li Joye Wang	Creation of the document
1.0	2022-08-02	Jason Li Joye Wang	First official release
2.0	2023-10-27	Black LI/ Lucky FENG/ David LIU Aria CHU	Numerous changes were made to this document. It should be read in its entirety.



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