Antenna Datasheet

Product OC: YP0009OA
Version: 2.2
Date: 2025-04-24
Status: Released

Product Name: 5G Adhesive Mount PCB + Cable Dipole Embedded Antenna

Key Features:

Frequency Band: 600–6000 MHz
Dimensions: 78.6 mm × 14.2 mm × 0.95 mm
Efficiency: Up to 79.2 % (FS)
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

1 Specification

Test Condition: Stick to ABS board on 130 mm × 130 mm EVB board & Free space

1.1. Electrical

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

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	EVB	4.0	2.8	3.8	5.3	2.2	1.6	1.5	2.8	2.8	2.3	2.8
	FS	3.7	3.7	2.4	3.7	3.3	1.6	1.4	2.1	2.3	2.0	2.5
Max. Return Loss (dB)	EVB	-4.4	-6.4	-4.6	-3.3	-8.3	-13.3	-13.8	-6.5	-6.4	-7.9	-6.4
	FS	-4.8	-4.8	-7.8	-4.8	-5.5	-13.0	-15.5	-9.3	-8.1	-9.7	-7.5
AVG Eff. (%)	EVB	45.0	71.4	57.0	36.5	60.2	68.4	66.2	47.9	55.8	52.7	43.5
	FS	30.0	42.6	35.1	41.2	59.9	63.3	63.2	51.5	56.5	63.7	41.5
AVG AVG Gain (dB)	EVB	-3.5	-1.5	-2.5	-4.5	-2.2	-1.6	-1.8	-3.2	-2.6	-2.8	-3.7
	FS	-5.3	-3.7	-4.6	-3.9	-2.3	-2.0	-2.0	-2.9	-2.5	-2.0	-3.9
Max. Peak	EVB	0.7	2.2	2.2	2.2	3.2	5.2	5.1	4.8	4.1	5.3	2.6

Gain (dBi)	**FS**	0.2	0.5	-0.5	2.4	3.3	5.2	5.5	5.3	5.1	4.4	1.6

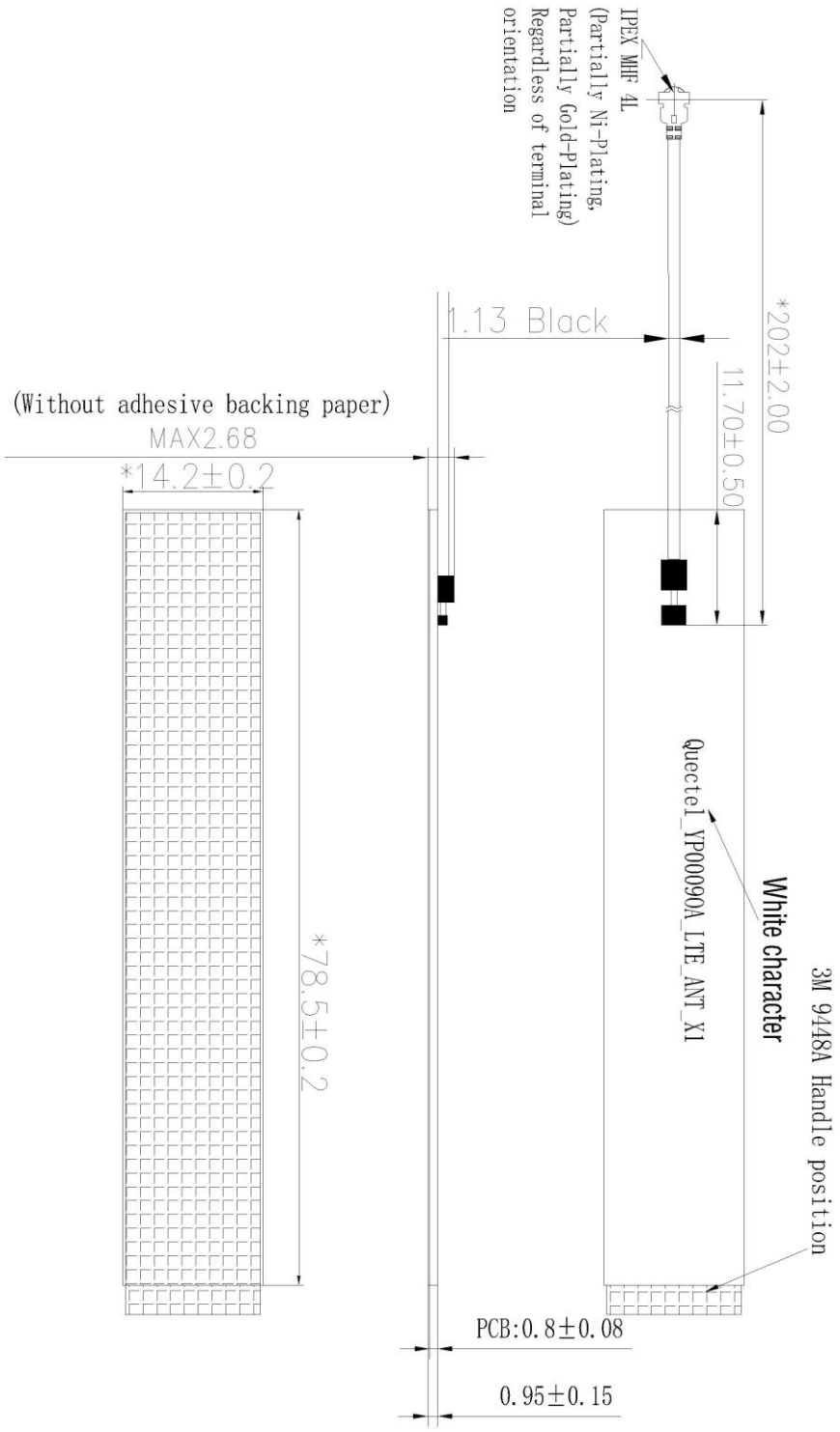
VSWR	**EVB**	≤ 5.3
	FS	≤ 3.7
Return Loss	**EVB**	≤ -3.3 dB
	FS	≤ -4.8 dB
Peak Gain	**EVB**	≤ 5.3 dBi
	FS	≤ 5.5 dBi

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

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	78.6 mm × 14.2 mm × 0.95 mm
Material & Color	PCB & Black
Cable Type & Color & Length	Φ 1.13 & Black & 202 mm
Connector Type	IPEX MHF 4L
Mounting Type	Adhesive
Weight	Typ. 2.8 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

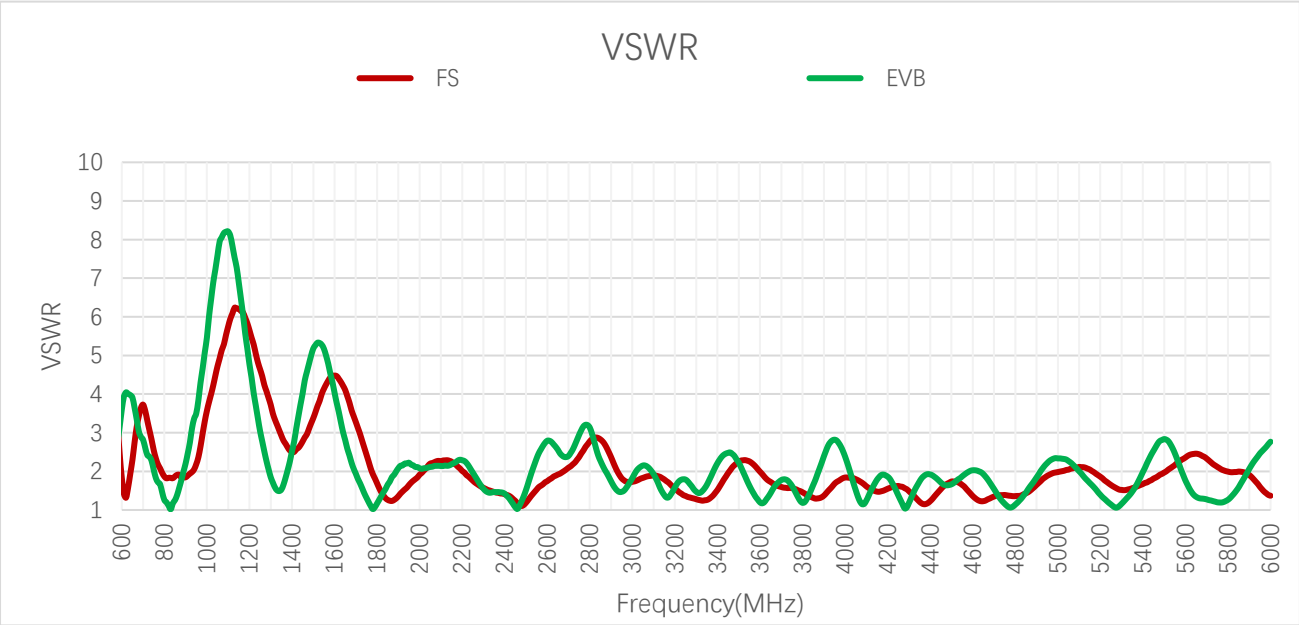
2 Drawing


IPEX MHF 4L
(Partially Ni-Plating,
Partially Gold-Plating)
Regardless of terminal
orientation
1.13 Black
*202±2.00
11.70±0.50
(Without adhesive backing paper)
MAX2.68
*14.2±0.2
*78.5±0.2
Quectel_YP0009OA_LTE_ANT_X1
White character
3M 9448A Handle position
PCB:0.8±0.08
0.95±0.15

3 Detailed Performance

3.1. S-Parameter Test

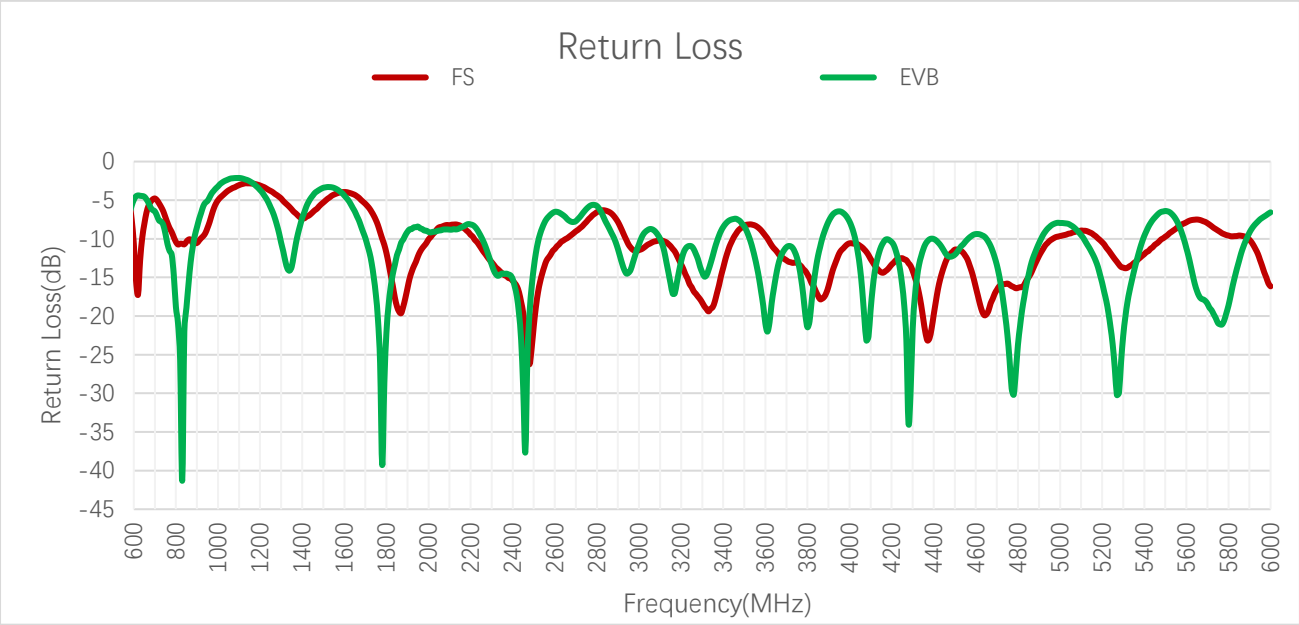
3.1.1. VSWR



VSWR

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
VSWR	EVB	3.6	4.0	2.6	1.0	2.2	3.8	3.7	1.8	1.4	1.9
	FS	1.8	1.6	3.6	1.8	1.8	2.4	2.7	3.1	2.6	1.3
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
VSWR	EVB	2.2	2.2	1.5	1.1	2.8	1.2	1.5	2.3	2.8	2.8
	FS	1.6	2.3	1.5	1.2	1.7	2.0	1.3	2.0	2.0	1.4

3.1.2. Return Loss

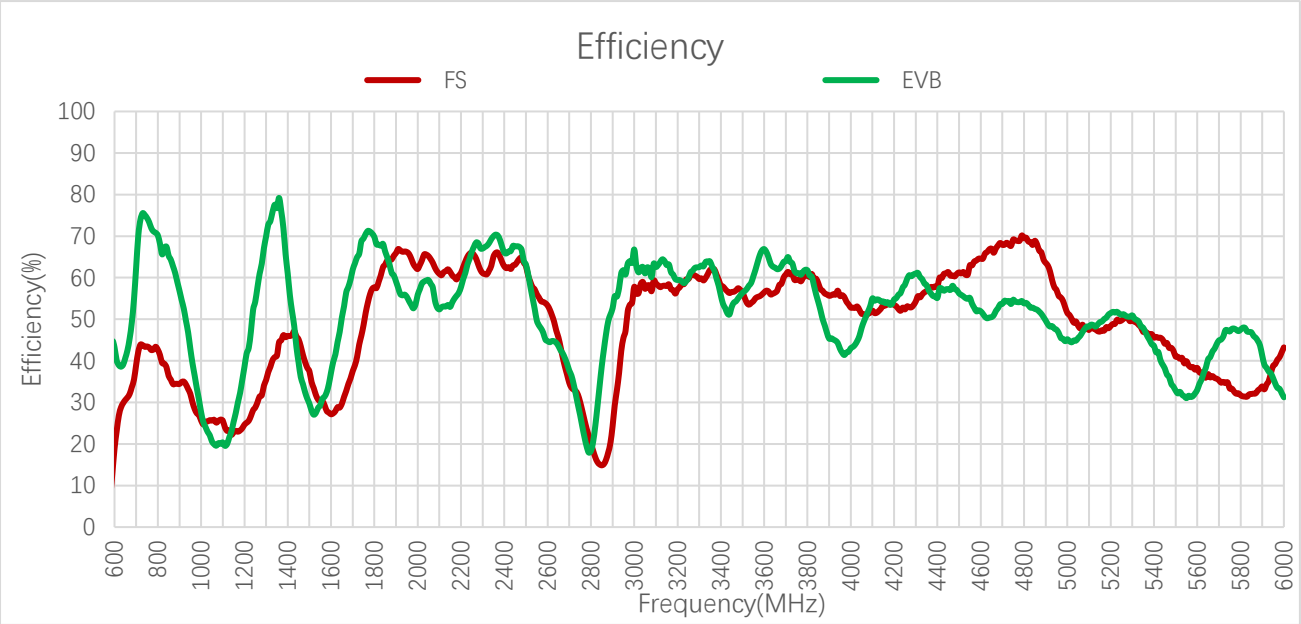


Return Loss (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	EVB	-5.0	-4.4	-7.0	-41.3	-8.5	-4.6	-4.8	-10.9	-15.0	-10.1
	FS	-10.6	-12.8	-5.0	-10.6	-10.5	-7.8	-6.8	-5.8	-7.0	-18.8
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Return Loss (dB)	EVB	-8.4	-8.7	-14.5	-29.5	-6.5	-20.9	-13.4	-8.0	-6.4	-6.6
	FS	-12.2	-8.2	-14.5	-19.6	-11.3	-9.6	-16.6	-9.7	-9.7	-16.2

3.2. Radiation Performance Test

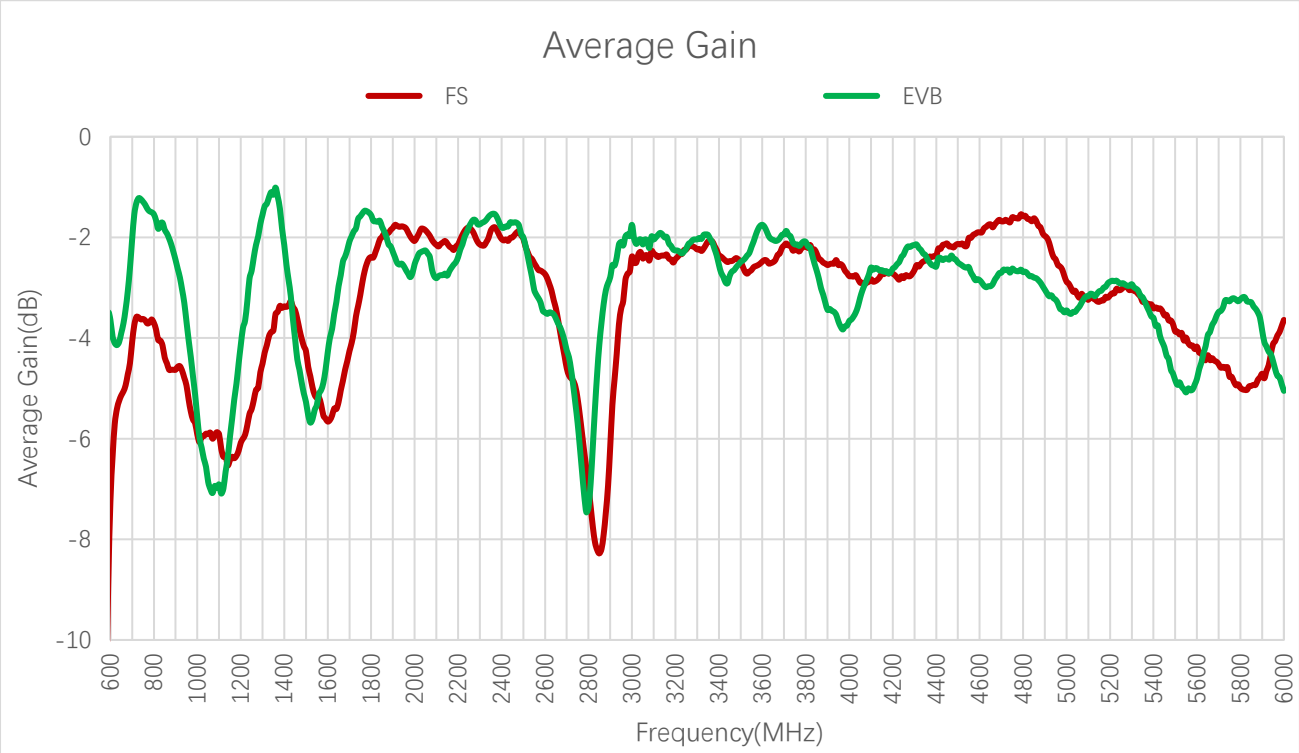
3.2.1. Efficiency



Efficiency (%)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	EVB	43.2	38.6	70.2	67.2	56.9	39.4	43.3	63.4	68.8	61.1
	FS	18.9	28.8	42.3	39.3	34.4	30.0	45.9	38.9	46.1	64.4
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Efficiency (%)	EVB	55.4	53.4	70.0	67.5	44.8	66.9	53.7	45.2	32.8	31.2
	FS	66.2	62.0	65.1	63.1	53.3	56.5	67.9	51.5	41.0	43.2

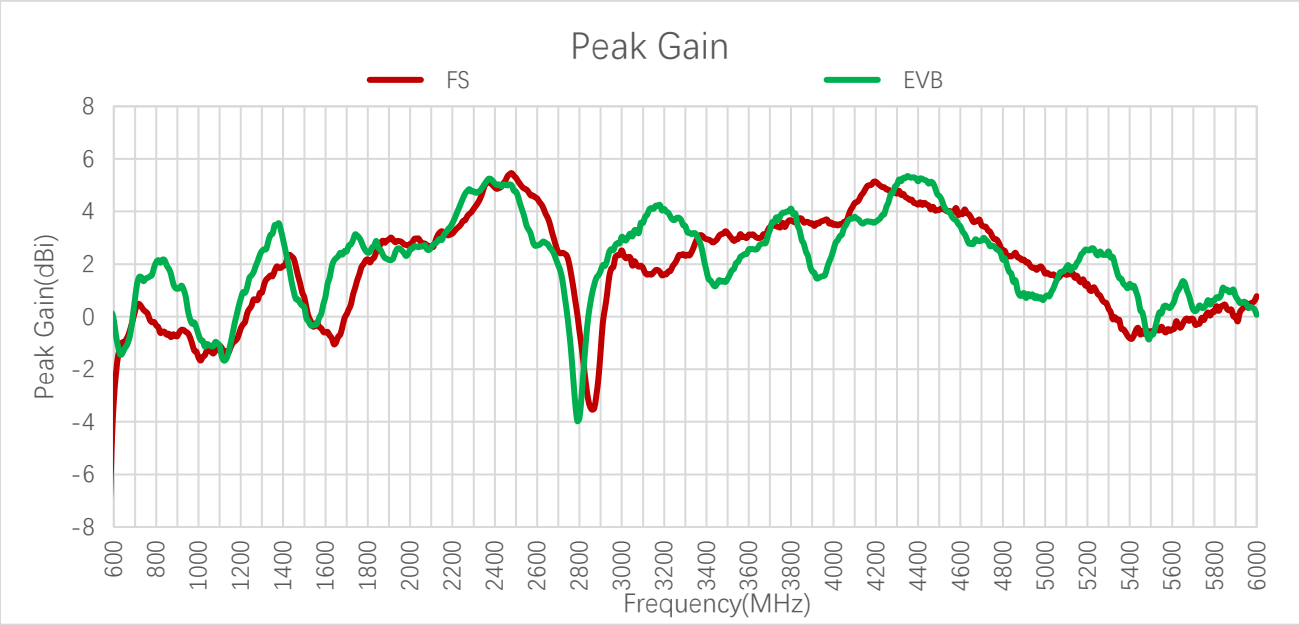
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	EVB	-3.6	-4.1	-1.5	-1.7	-2.5	-4.0	-3.6	-2.0	-1.6	-2.1
	FS	-7.3	-5.4	-3.7	-4.1	-4.6	-5.2	-3.4	-4.1	-3.4	-1.9
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Average Gain (dB)	EVB	-2.6	-2.7	-1.6	-1.7	-3.5	-1.8	-2.7	-3.5	-4.8	-5.1
	FS	-1.8	-2.1	-1.9	-2.0	-2.7	-2.5	-1.7	-2.9	-3.9	-3.6

3.2.3. Peak Gain



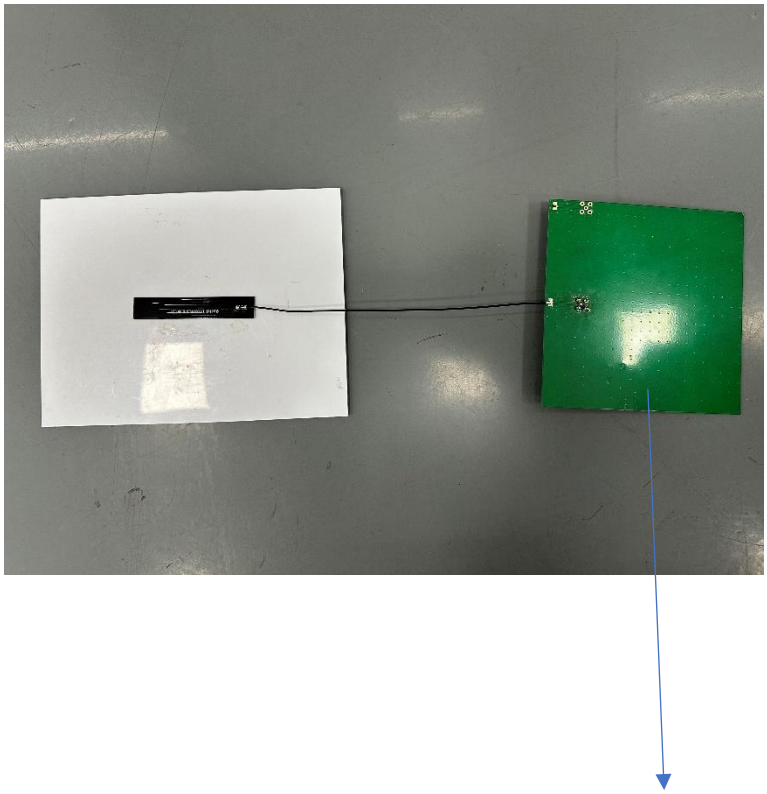
Peak Gain (dBi)

Frequency (MHz)		600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	EVB	-0.1	-1.4	1.3	2.2	1.1	-0.1	1.3	2.7	3.1	2.2
	FS	-3.2	-1.2	0.5	-0.6	-0.7	-0.8	2.3	0.3	1.1	2.8
Frequency (MHz)		**1950**	**2140**	**2350**	**2450**	**2600**	**3600**	**4700**	**5000**	**5500**	**6000**
Peak Gain (dBi)	EVB	2.6	3.0	5.0	5.0	2.7	2.6	2.9	0.8	-0.7	0.1
	FS	2.9	3.2	4.9	5.2	4.5	3.1	3.5	1.6	-0.6	0.8

3.2.4. 3D & 2D Radiation Pattern

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

- Test Chamber: HF-G-1



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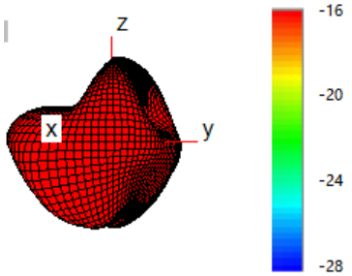
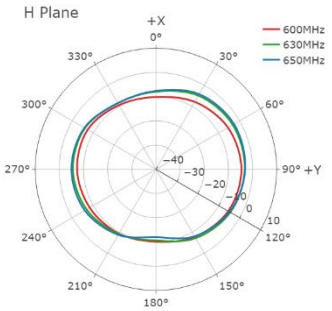
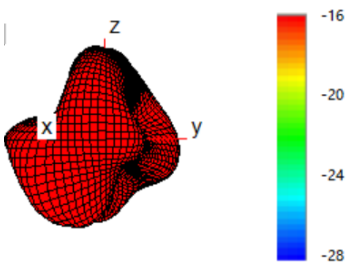
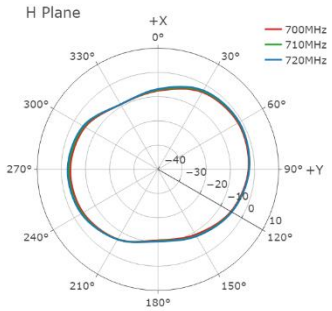
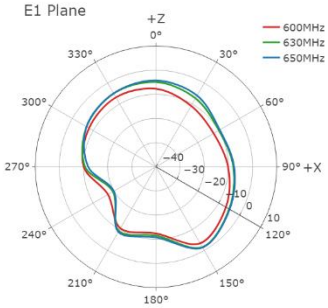
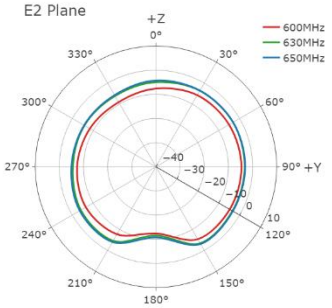
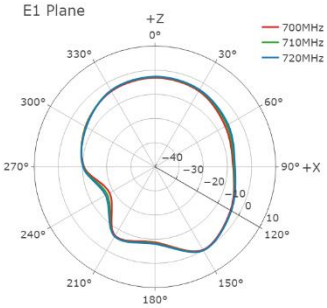
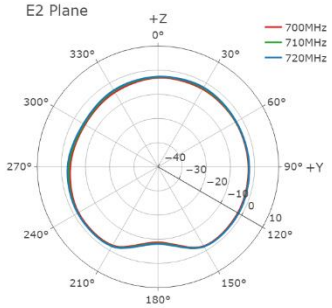
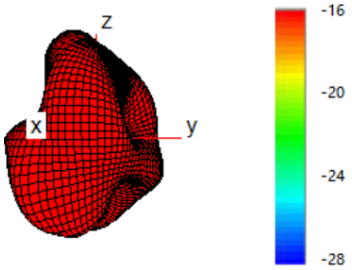
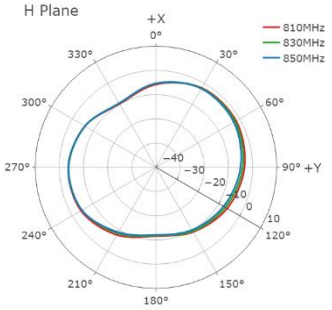
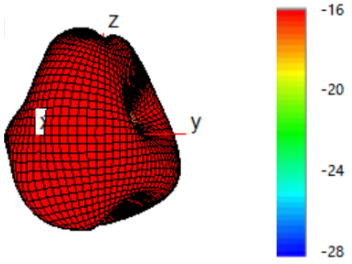
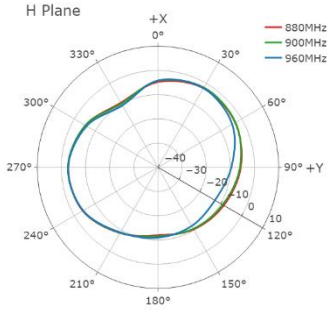
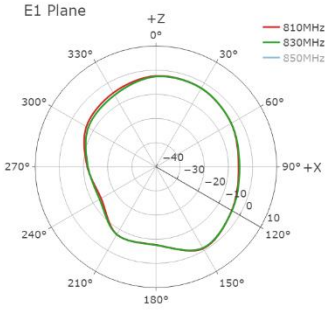
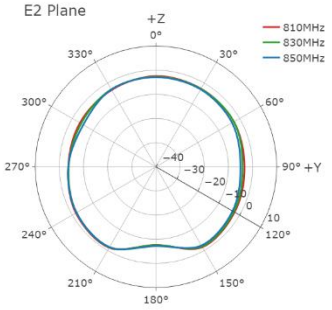
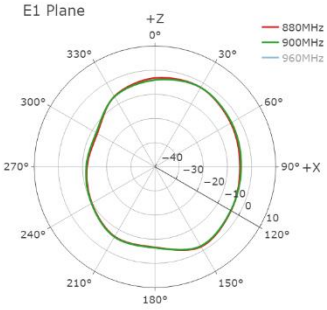
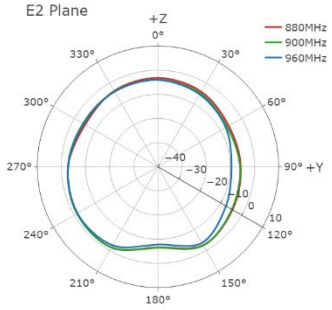
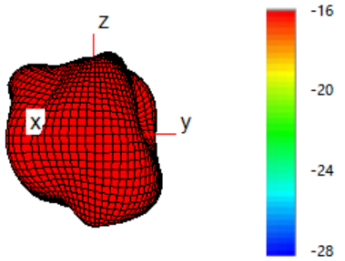
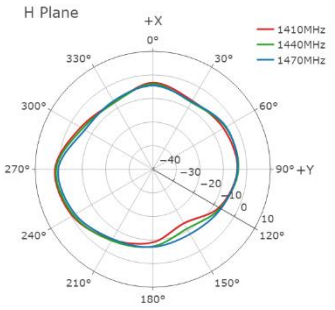
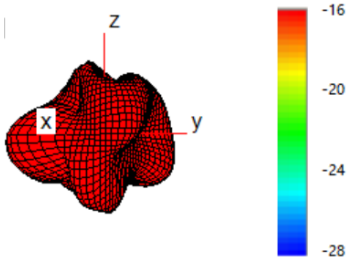
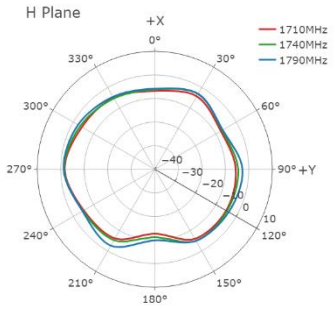
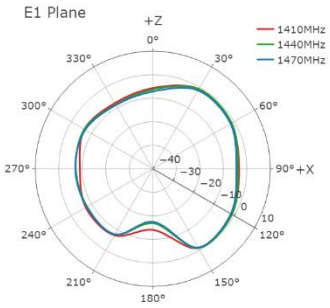
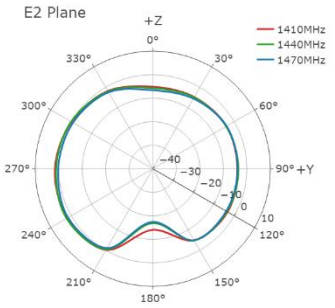
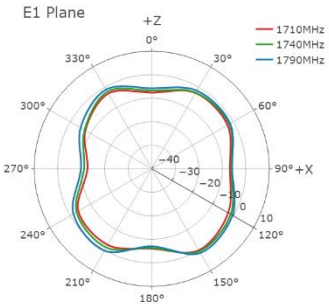
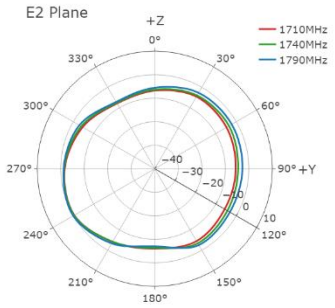
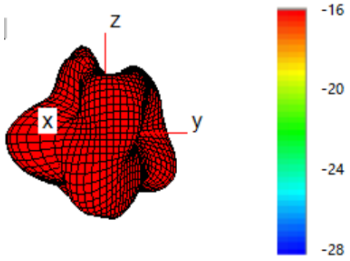
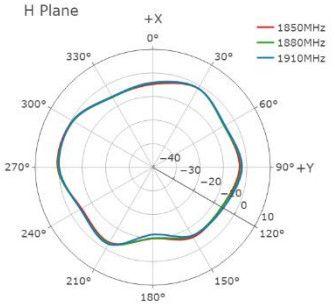
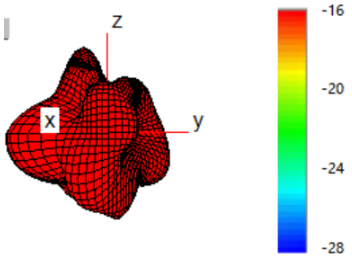
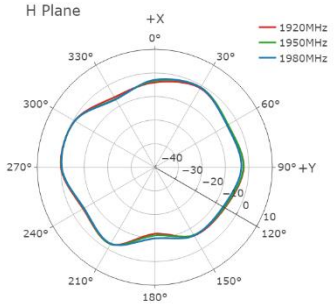
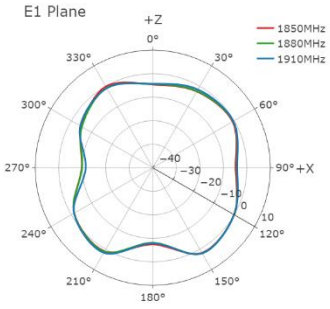
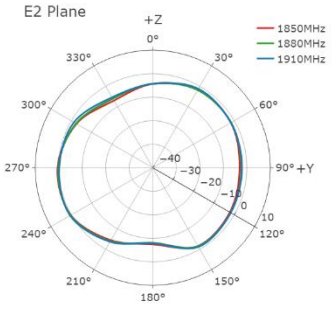
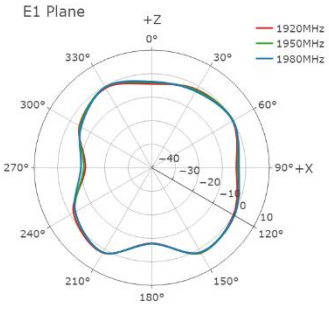
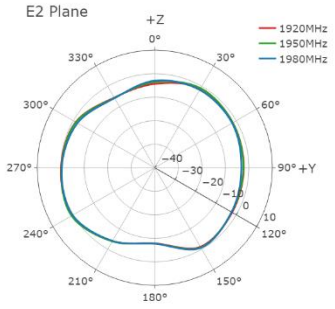
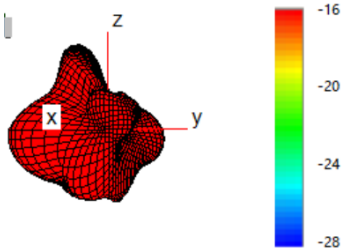
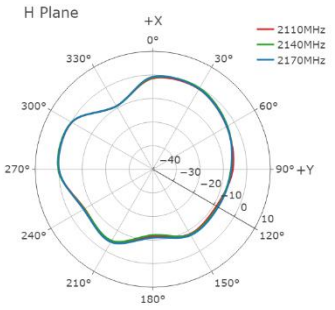
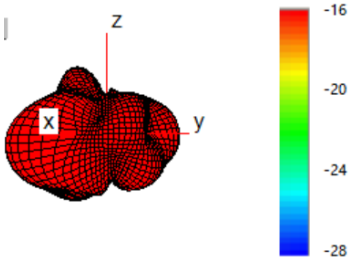
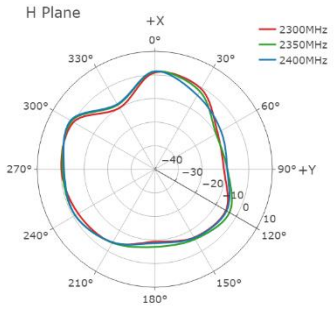
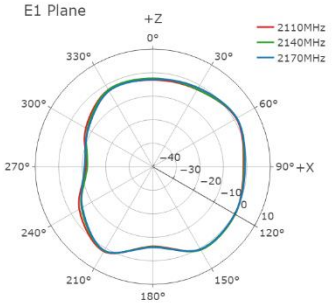
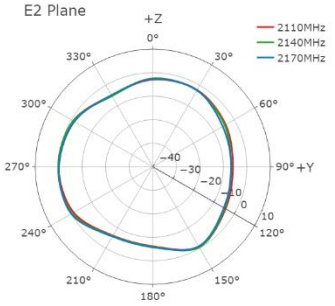
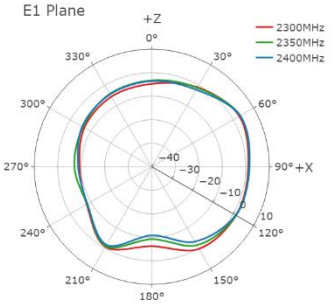
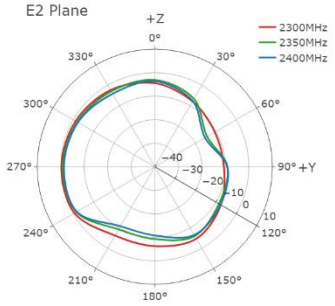
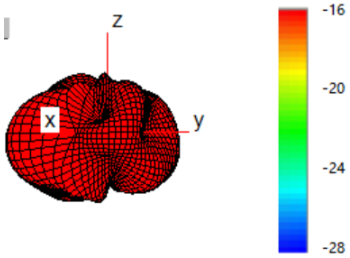
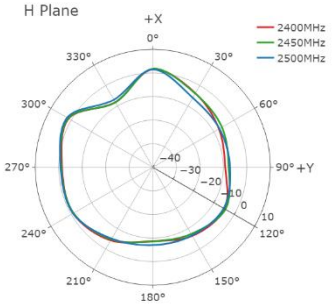
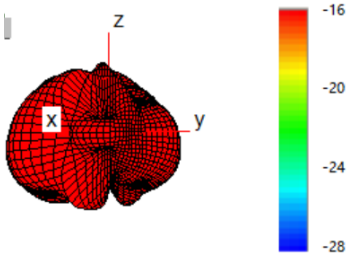
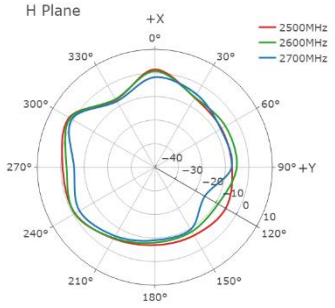
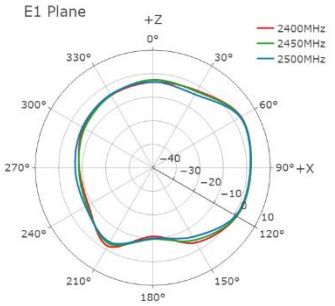
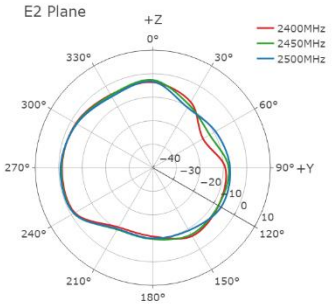
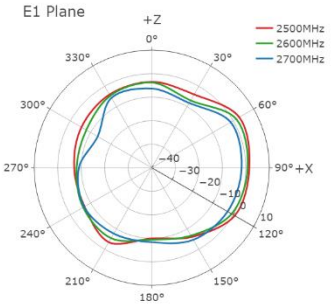
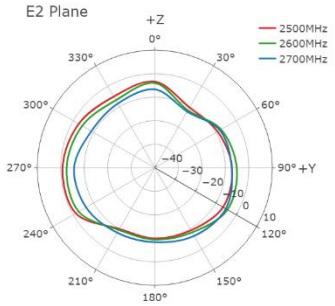
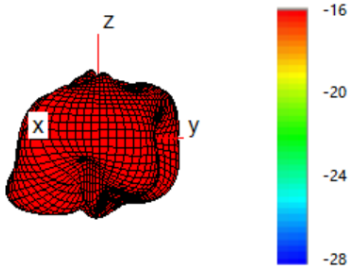
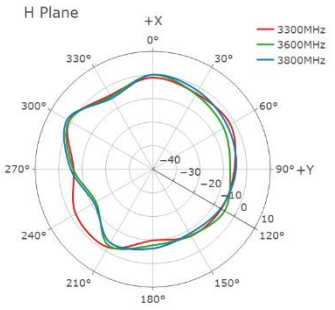
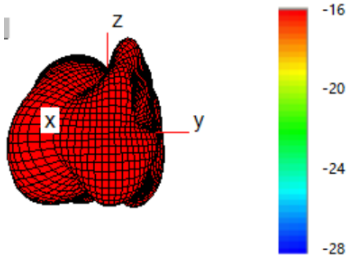
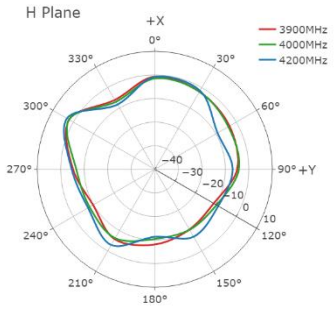
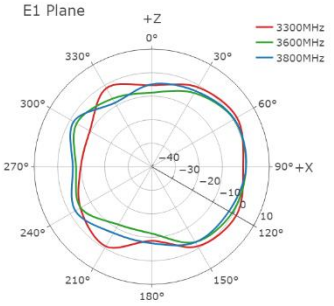
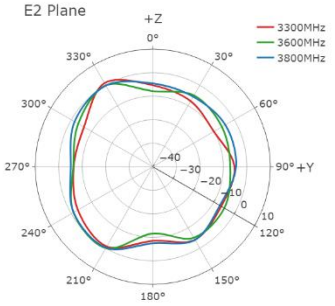
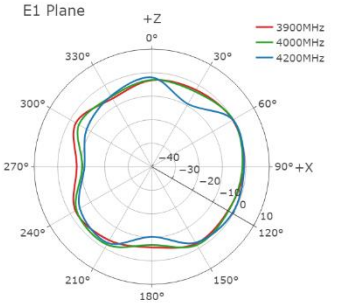
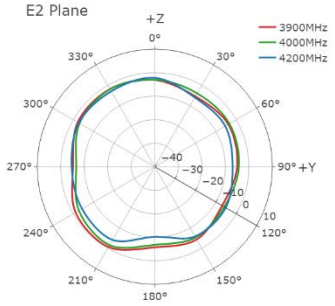
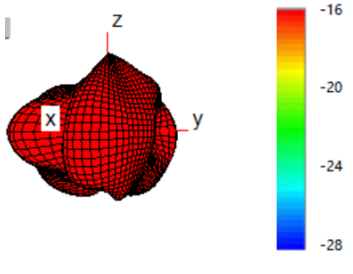
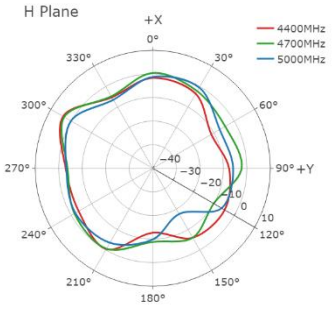
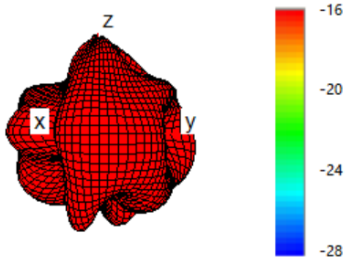
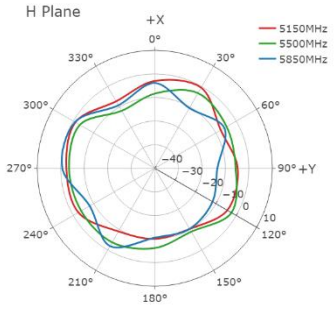
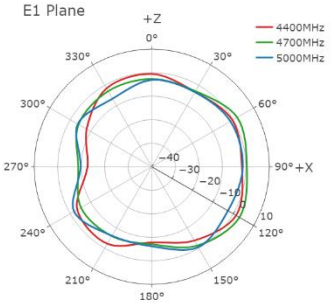
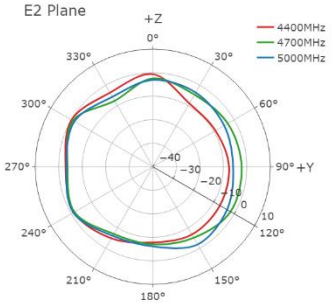
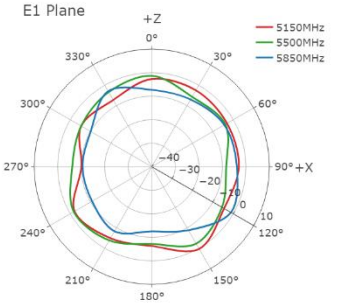
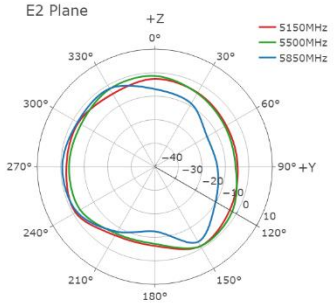
			
			
830 MHz		900 MHz	
			
			

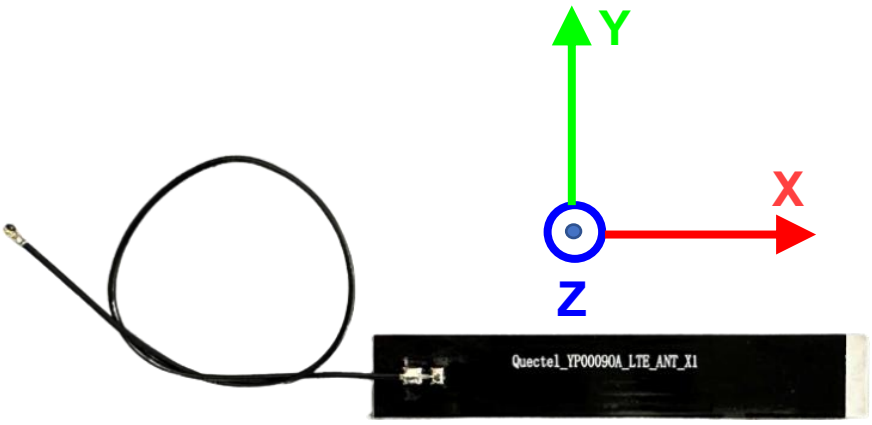
1440 MHz		1740 MHz	
			
			
1880 MHz		1950 MHz	
			
			

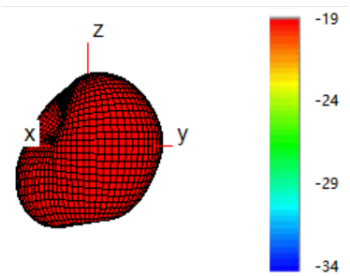
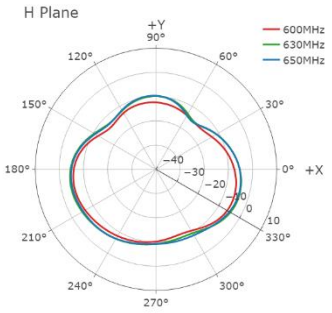
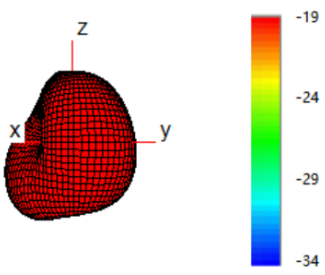
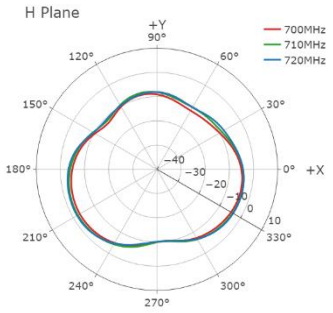
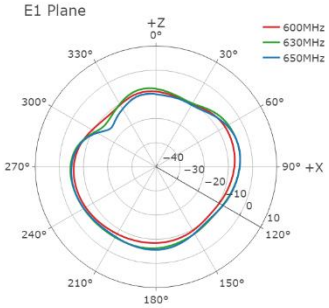
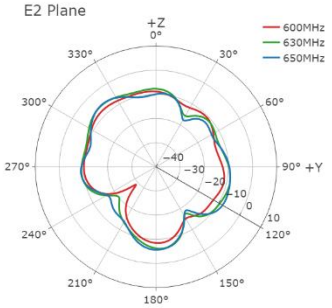
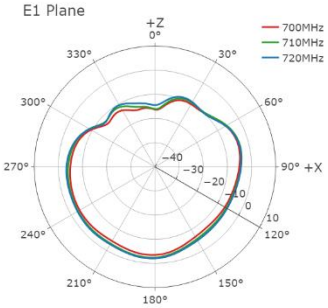
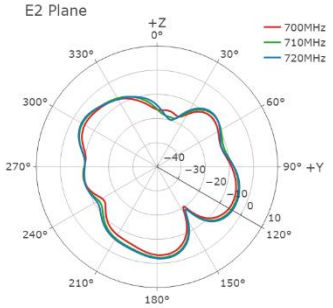
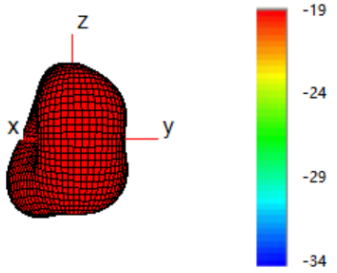
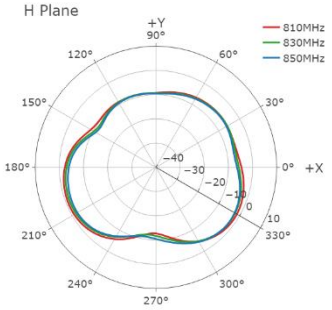
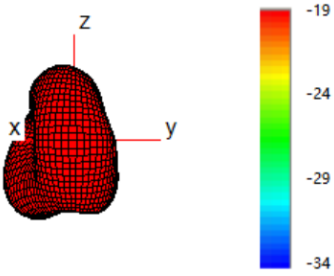
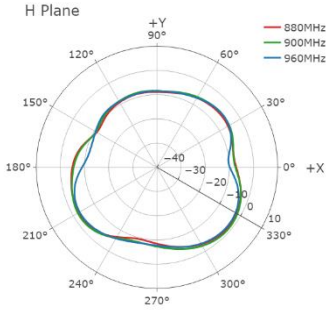
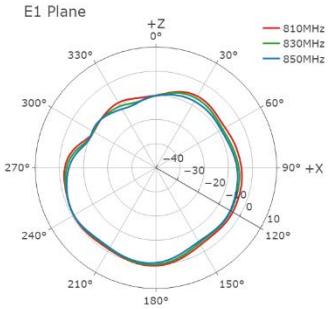
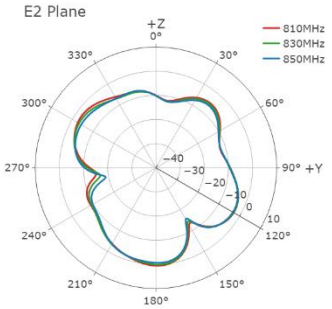
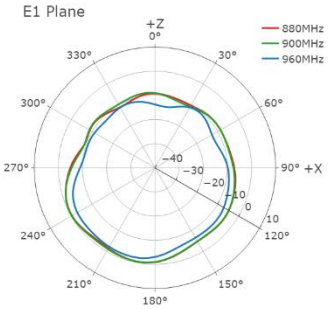
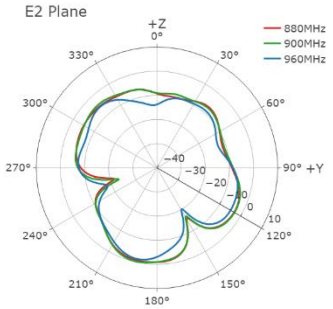
2140 MHz		2350 MHz	
			
			
2450 MHz		2600 MHz	
			
			

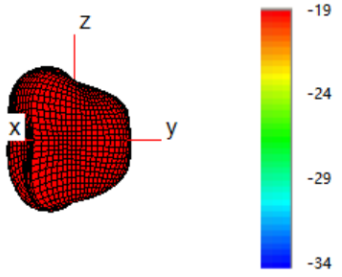
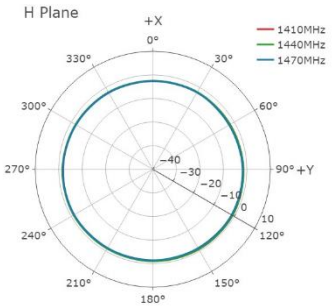
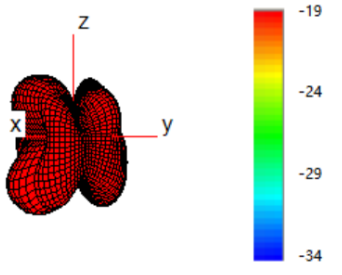
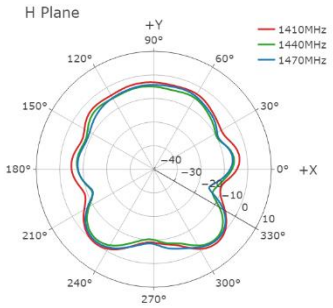
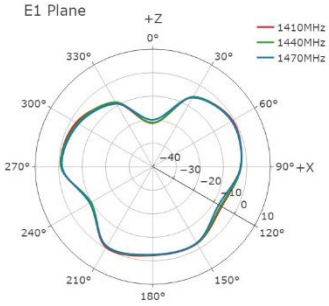
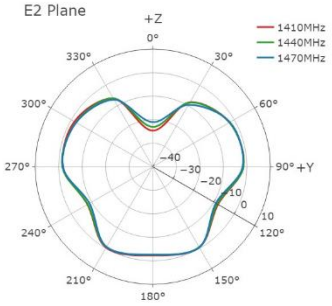
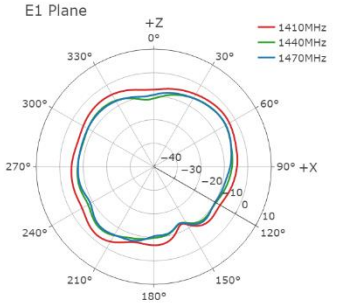
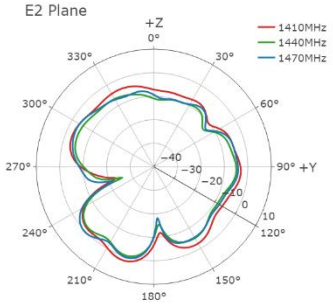
3600 MHz		4000 MHz	
			
			
4700 MHz		5500 MHz	
			
			

3.2.4.2. Test Condition: Free Space

- Test Chamber: HF-G-1



630 MHz		710 MHz	
			
			
830MHz		900 MHz	
			
			

1440 MHz		1740 MHz	
			
			
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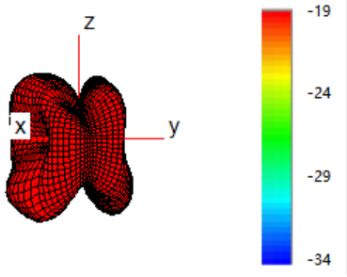	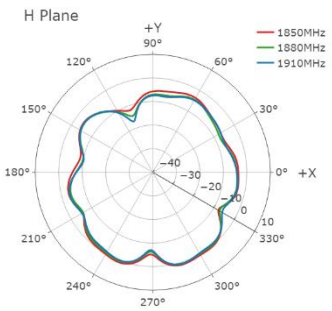	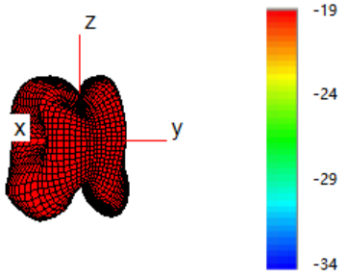	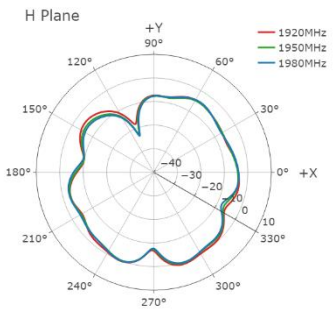
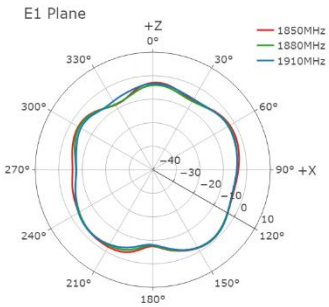	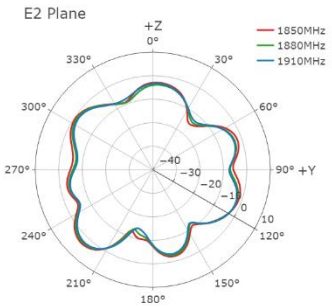	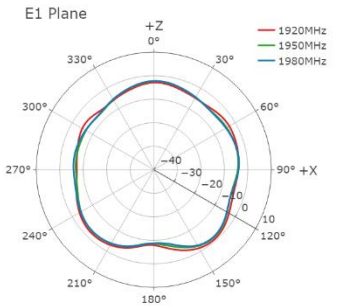	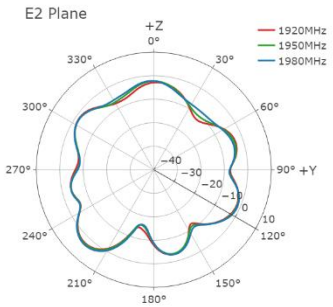

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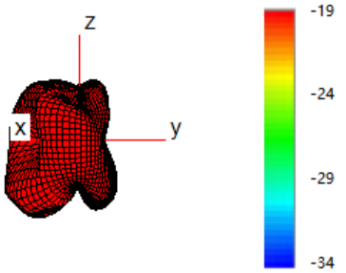	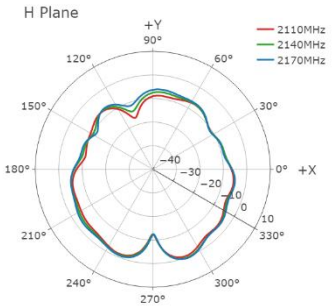	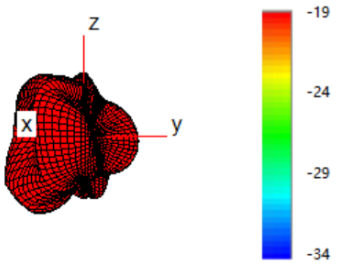	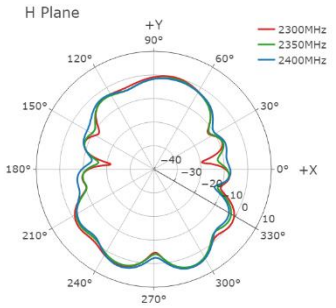
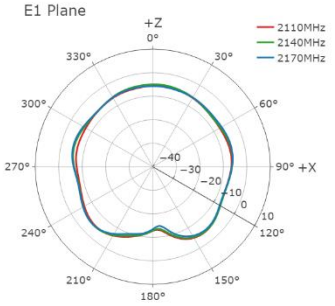	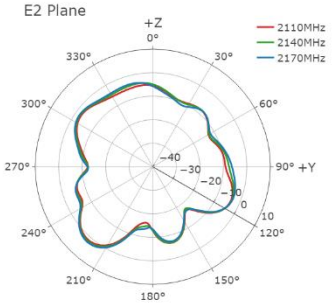	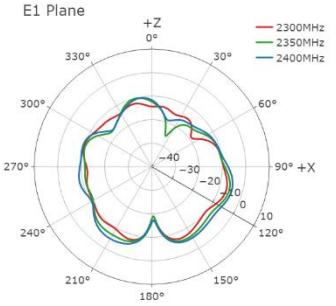	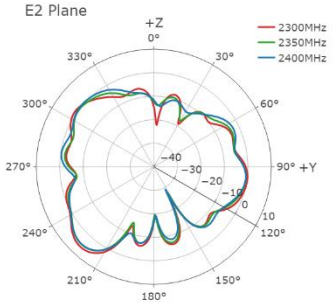
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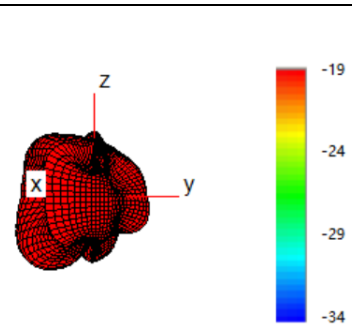	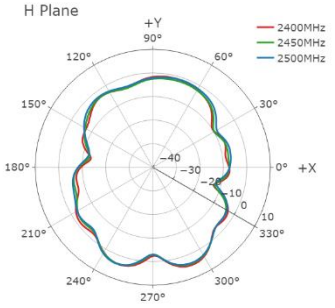	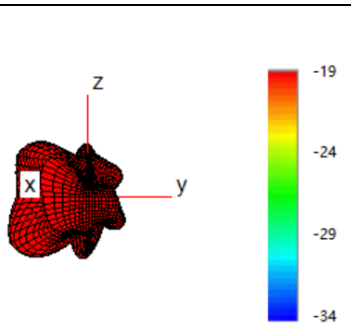	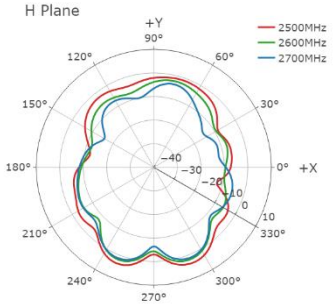
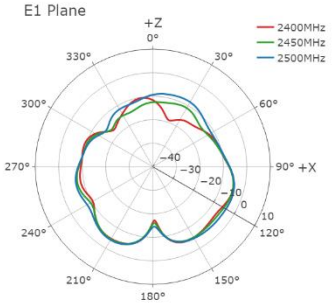	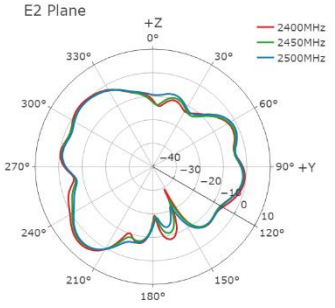	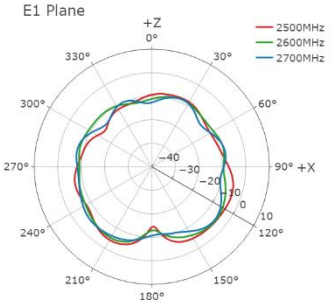	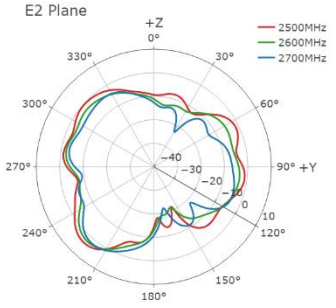

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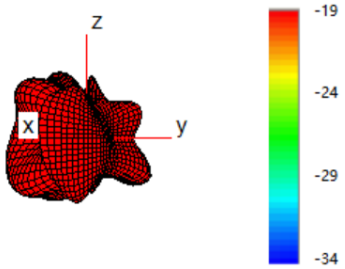
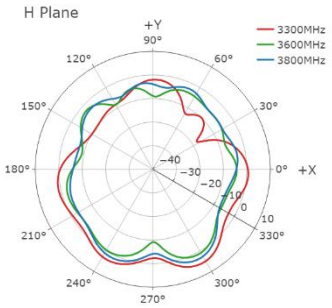
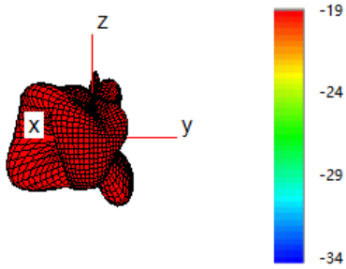
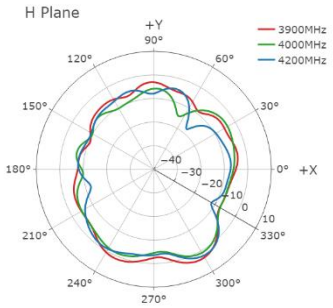
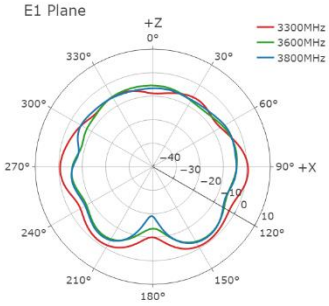
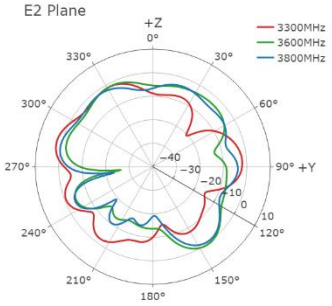
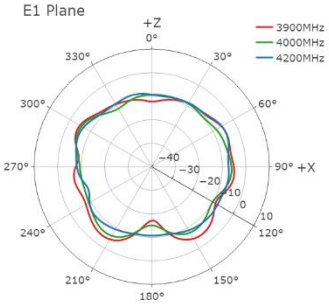
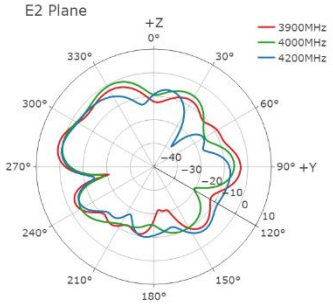
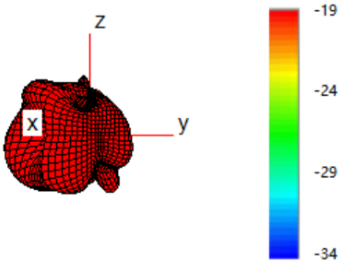
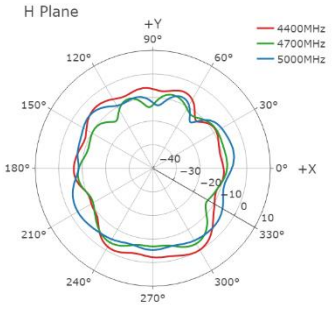
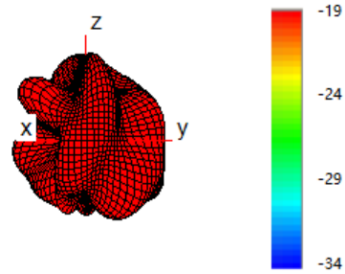
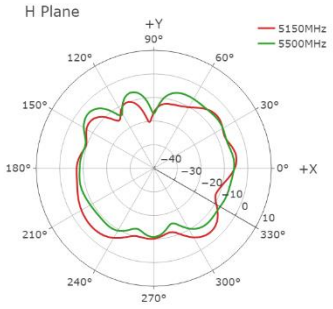
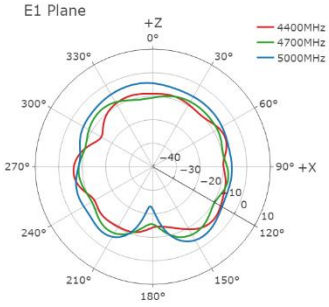
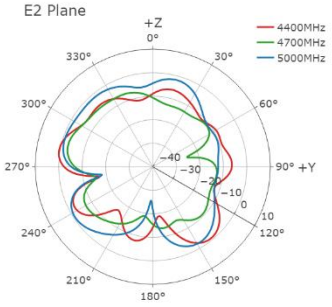
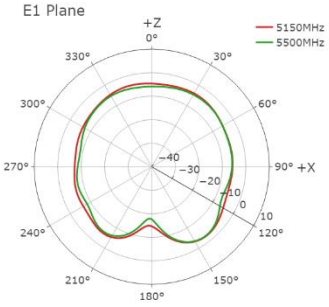
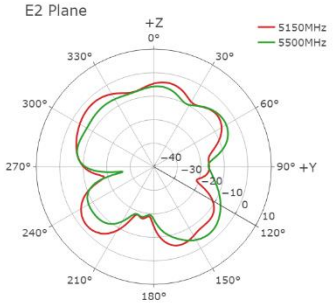
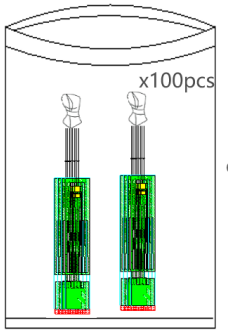
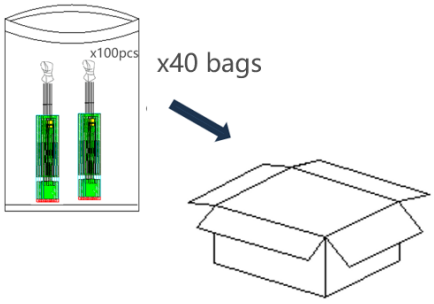
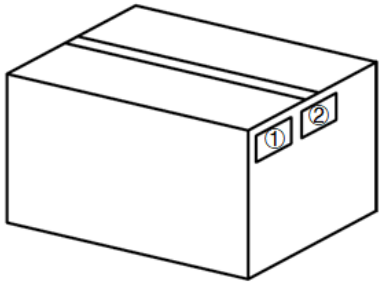
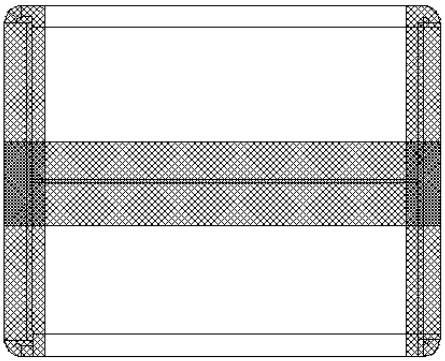
			
			
4700 MHz		5500 MHz	
			
			

4 Packaging

Step	Packaging Picture / 2D Picture	Description
1		50 pcs antenna products are wrapped with EPE foam.
2		100 pcs antenna products in a PE bag. (100 PCS Antennas / PE Bag)
3		(40 PE Bags / Carton Box) (4000 PCS Antennas / 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 = 300 × 250 × 200 mm

4		**Position for Attaching Labels** ① Carton Label ② Quality Label
5		**Sealing Cartons** H-shaped 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:

Quectel Wireless Solutions Co., Ltd.
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:
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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	2023-10-20	Zeline LIANG/ Joye WANG/ David LIU/ Aria CHU	Updated all test data in this datasheet.
2.1	2024-06-07	Joye WANG	Updated the drawing (Chapter 2).
2.2	2025-04-24	Joye WANG/ Riva REN/ Aria CHU	1. Updated the antenna dimensions. 2. Updated the antenna image (Cover page). 3. Updated the packaging (Chapter 4).

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