



Antenna Datasheet

Product OC: NPEBT038WFA

Version: 1.0

Date: 2025-03-21

Status: Preliminary

Product Name: External Wi-Fi/BT Antenna

Key Features:

Frequency band: 2400–2500 MHz, 5150–5850 MHz, 5925–7125 MHz

Peak efficiency: 50.12 %

Dimensions: $\Phi 13$ mm $\times$ 195 mm

RoHS Compliant

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1 Specification

Test Condition: Free Space

1.1. Electrical

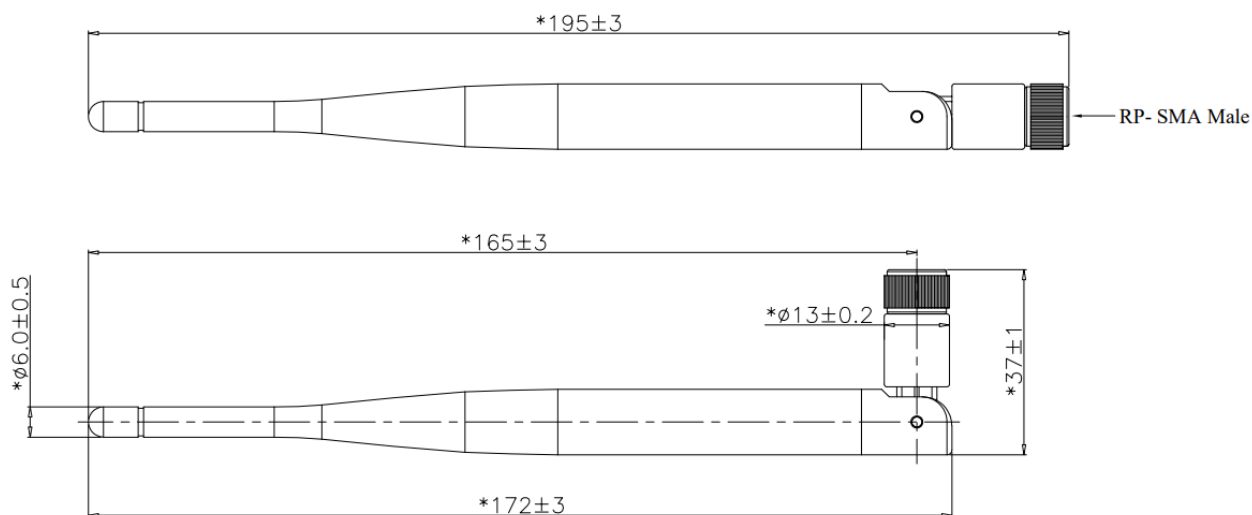
Electrical	
Frequency Range	2400–2500 MHz, 5150–5850 MHz, 5925–7125 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional
Antenna Type	Dipole

Specification	Band	Wi-Fi 2G BT	Wi-Fi 5G				Wi-Fi 7G
	Freq. (MHz)	2400 - 2500	5150 - 5250	5250 - 5350	5470 - 5725	5725 - 5850	5925-7125
Max. VSWR		2.0	2.8	2.8	2.7	2.4	2.3
Max. Return Loss (dB)		-9.3	-6.6	-6.4	-6.7	-7.6	-8.0
AVG Eff. (%)		40.6	40.6	38.6	33.8	28.7	33.4
AVG Gain (dB)		-4.0	-3.9	-4.1	-4.7	-5.4	-4.8
Max. Peak Gain (dBi)		0.2 (2500MHz)	-0.7 (5155MHz)	-0.8 (5260MHz)	-1.2 (5480MHz)	-1.5 (5820MHz)	1.6 (6915MHz)
VSWR		≤ 2.8					
Return Loss		≤ -6.4 dB					
Peak Gain		≤ 1.6 dBi					

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	Φ13 mm × 195 mm
Material & Color	TPEE & Black
Connector Type	RP SMA Male
Mounting Type	Terminal
Weight	Typ. 18 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS Compliant	Yes

2 Drawing

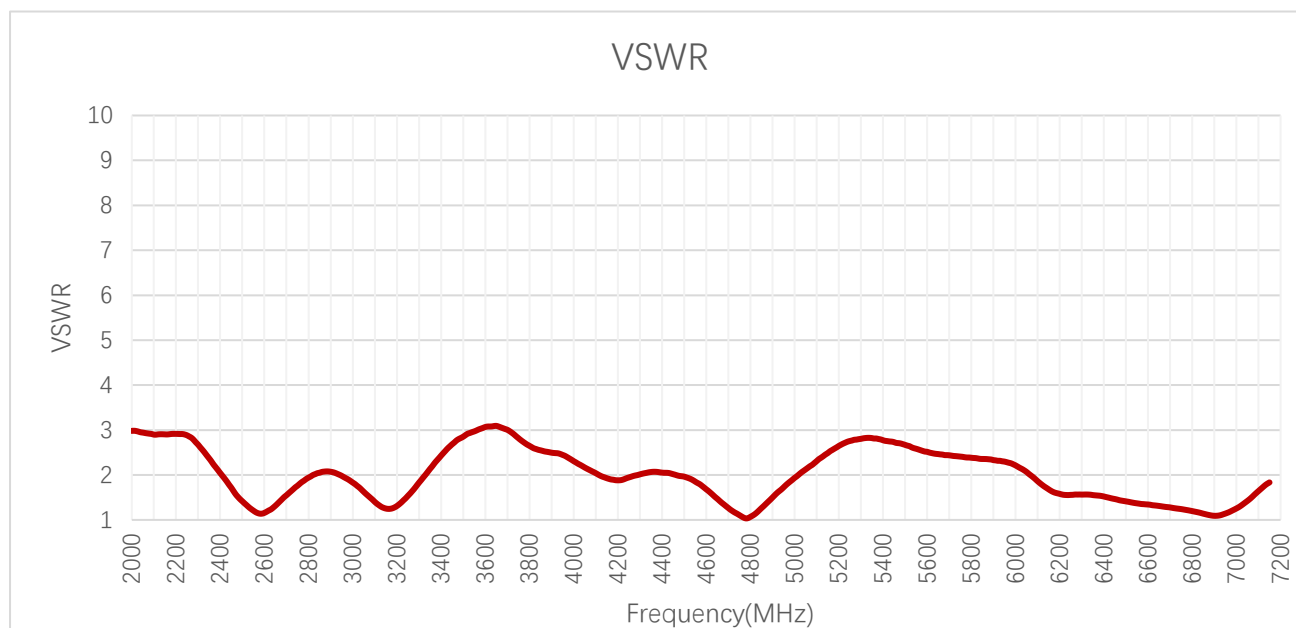


3 Detailed Performance

- 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: 2024-06-28; Due date:2025-06-27)
- Testing Software: Libra

3.1. S-Parameter Test

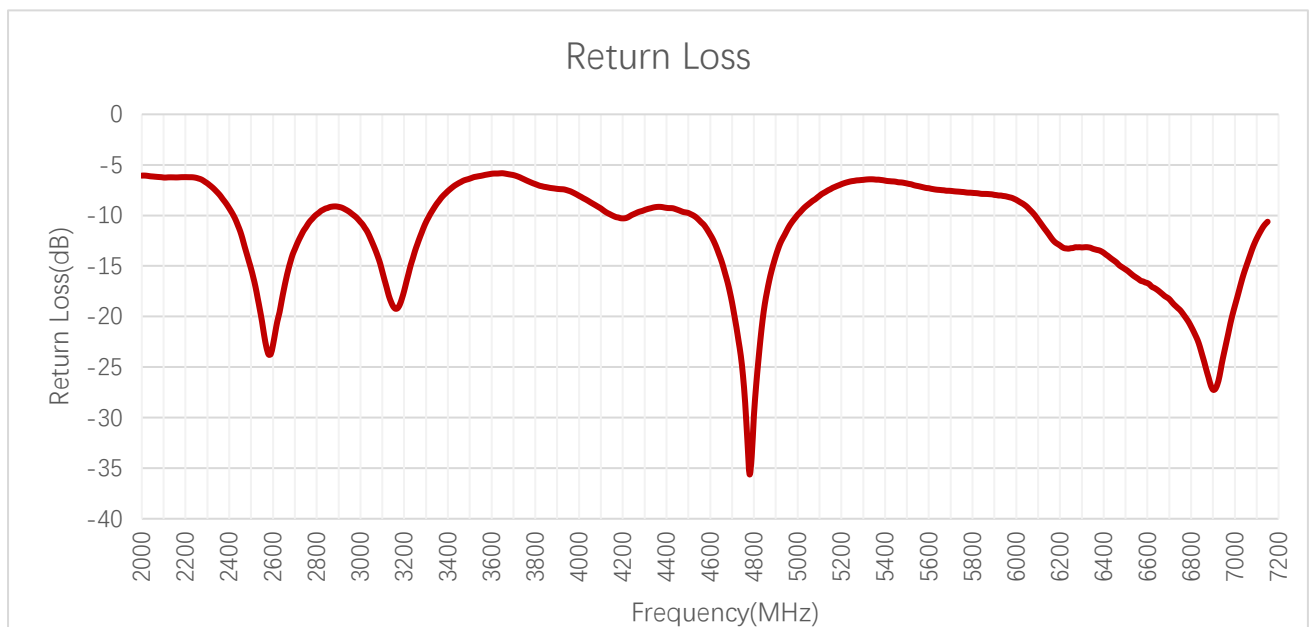
3.1.1. VSWR



VSWR

Frequency (MHz)	2400	2500	5150	5155	5250	5260	5350	5470	5480
VSWR	2.0	1.4	2.5	2.5	2.8	2.8	2.8	2.7	2.7
Frequency (MHz)	5725	5820	5850	5925	6325	6725	6915	7125	
VSWR	2.0	2.4	2.4	2.3	1.6	1.3	1.1	1.7	

3.1.2. Return Loss

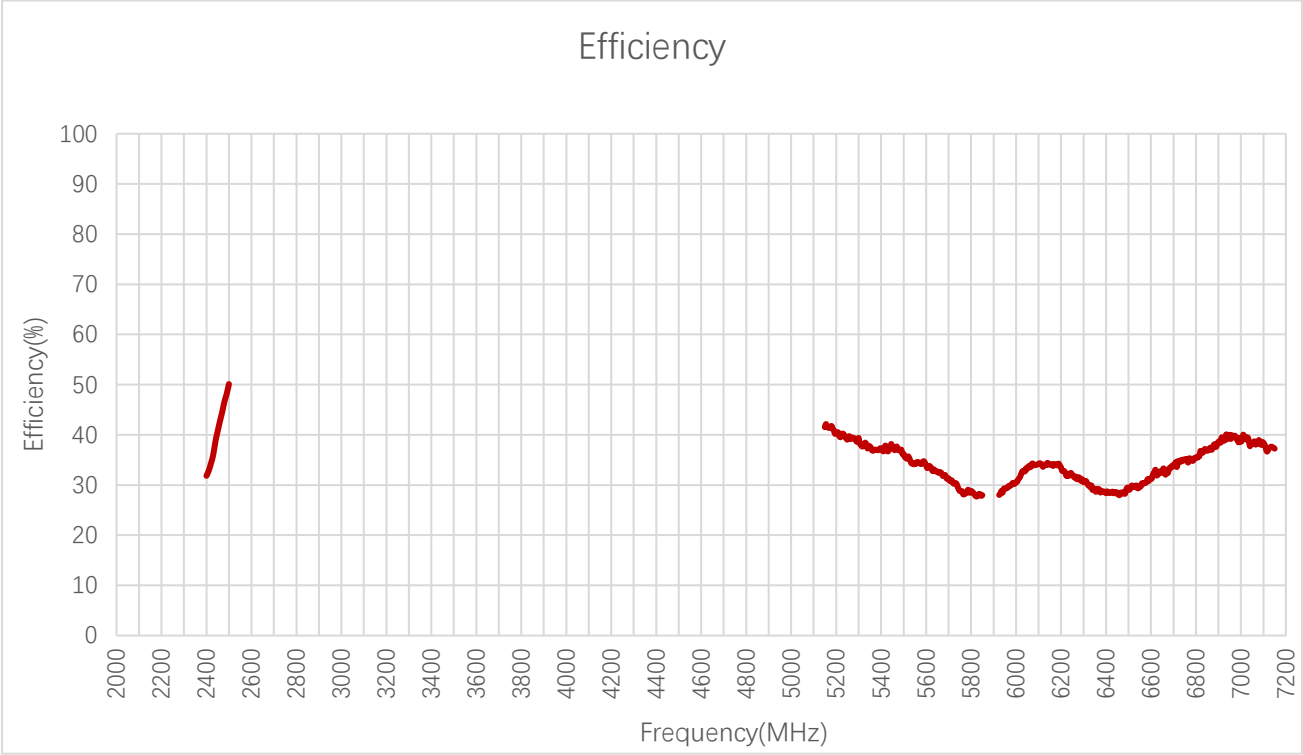


Return Loss (dB)

Frequency (MHz)	2400	2500	5150	5155	5250	5260	5350	5470	5480
Return Loss (dB)	-9.3	-15.3	-7.4	-7.4	-6.6	-6.6	-6.4	-6.7	-6.7
Frequency (MHz)	5725	5820	5850	5925	6325	6725	6915	7125	
Return Loss (dB)	-7.6	-7.8	-7.9	-8.0	-13.2	-19.0	-21.4	-11.1	

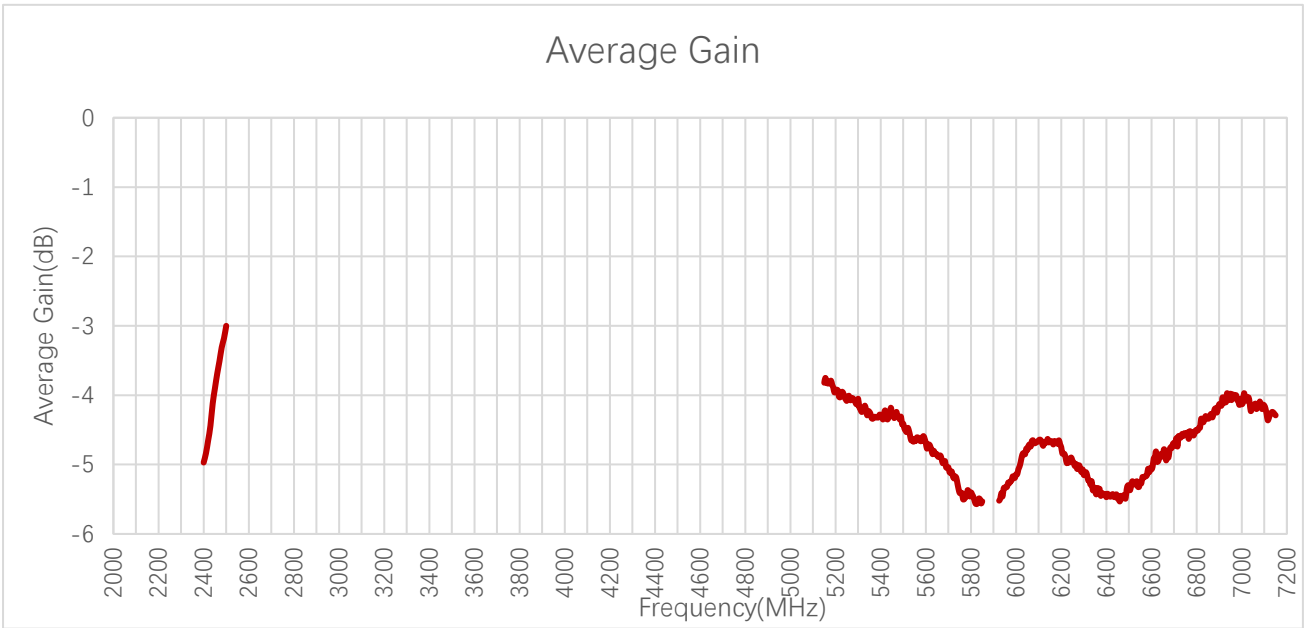
3.2. Radiation Performance Test

3.2.1. Efficiency



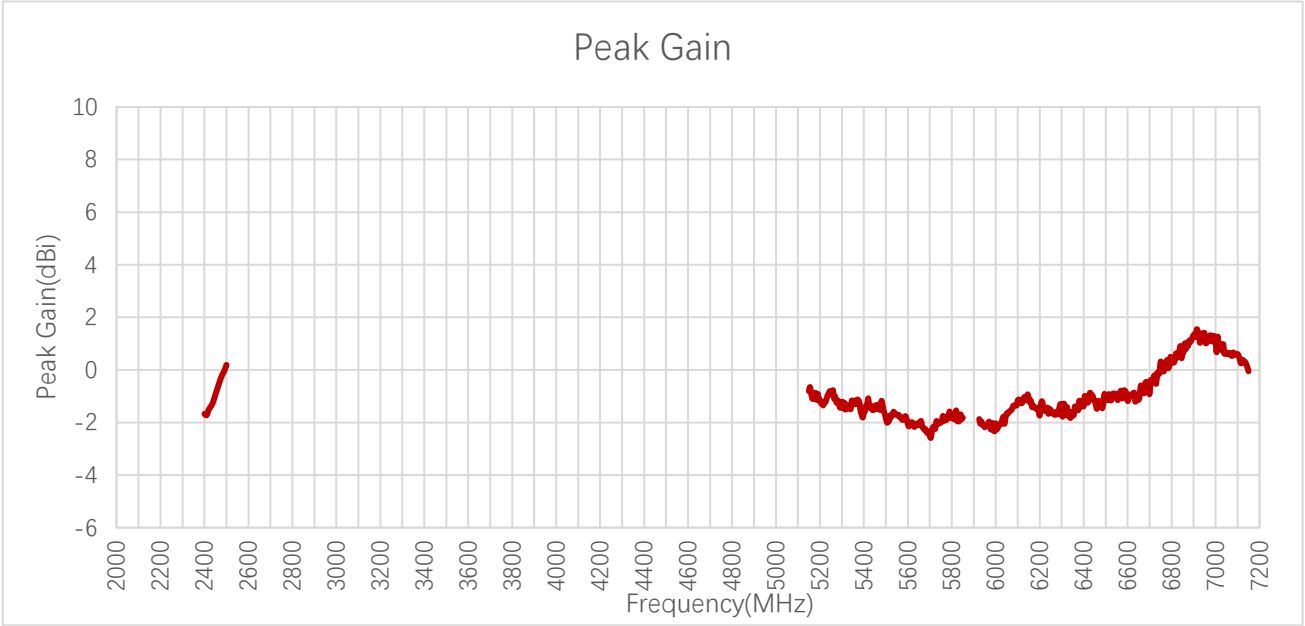
Efficiency (%)									
Frequency (MHz)	2400	2500	5150	5155	5250	5260	5350	5470	5480
Efficiency (%)	31.8	50.1	41.5	42.2	39.1	39.7	37.7	37.7	37.1
Frequency (MHz)	5725	5820	5850	5925	6325	6725	6915	7125	
Efficiency (%)	30.2	27.8	28.0	28.0	30.0	34.6	39.5	37.4	

3.2.2. Average Gain



Average Gain (dB)									
Frequency (MHz)	2400	2500	5150	5155	5250	5260	5350	5470	5480
Average Gain (dB)	-5.0	-3.0	-3.8	-3.8	-4.1	-4.0	-4.2	-4.2	-4.3
Frequency (MHz)	5725	5820	5850	5925	6325	6725	6915	7125	
Average Gain (dB)	-5.2	-5.6	-5.5	-5.5	-5.2	-4.6	-4.0	-4.3	

3.2.3. Peak Gain

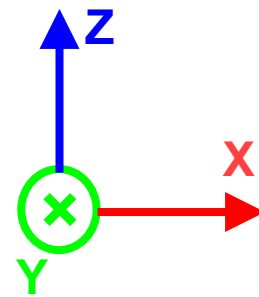
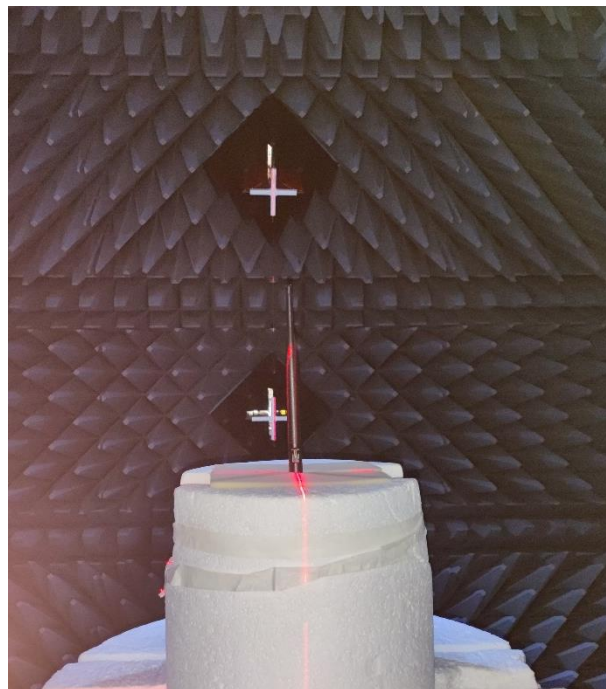


Peak Gain (dBi)									
Frequency (MHz)	2400	2500	5150	5155	5250	5260	5350	5470	5480
Peak Gain (dBi)	-1.7	0.2	-0.8	-0.7	-0.9	-0.8	-1.3	-1.4	-1.2
Frequency (MHz)	5725	5820	5850	5925	6325	6725	6915	7125	
Peak Gain (dBi)	-2.2	-1.5	-1.8	-1.9	-1.4	-0.3	1.6	0.4	

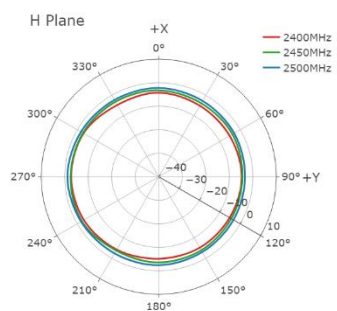
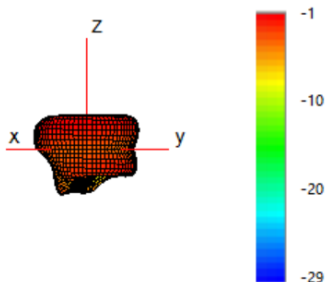
3.2.4. 3D & 2D Radiation Pattern

3.2.4.1. Test Condition: Free Space

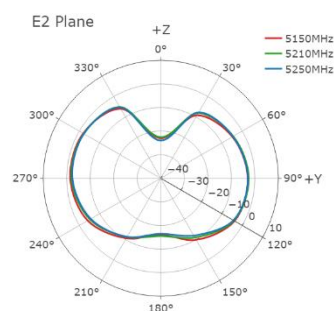
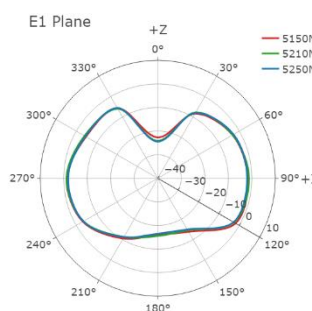
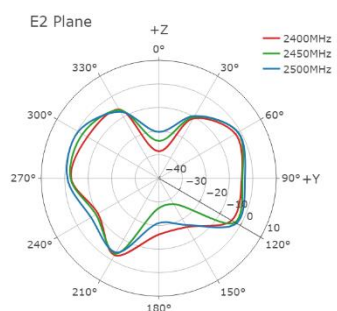
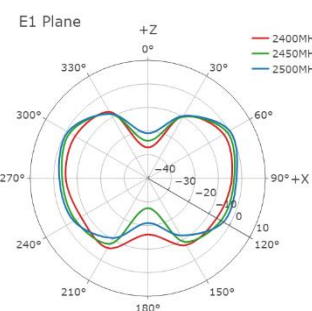
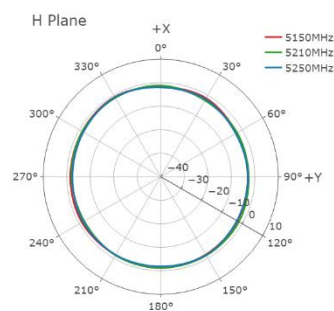
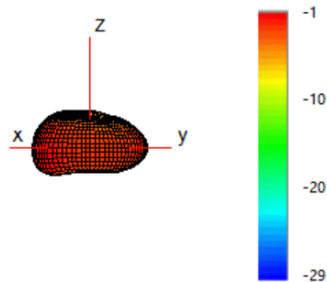
- Test Chamber: HF-G-1



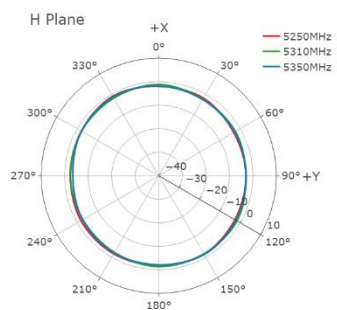
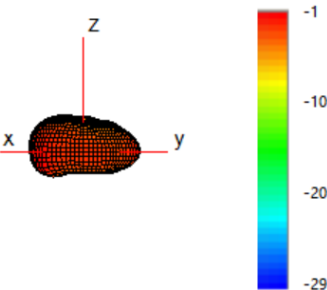
2450 MHz



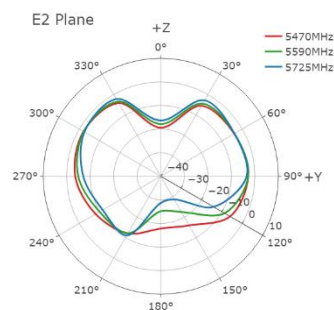
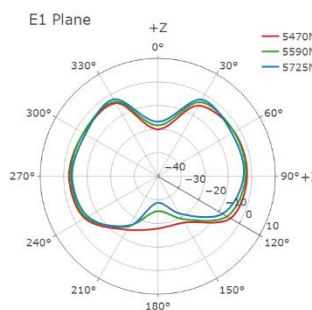
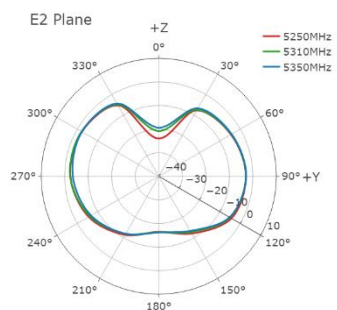
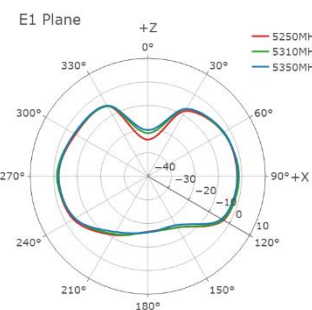
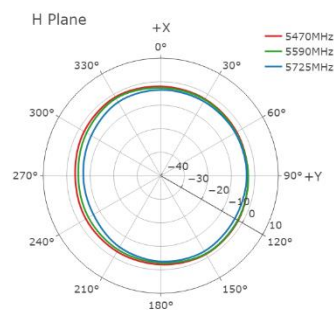
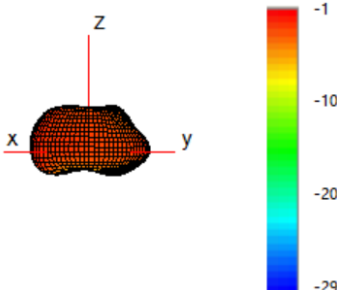
5210 MHz

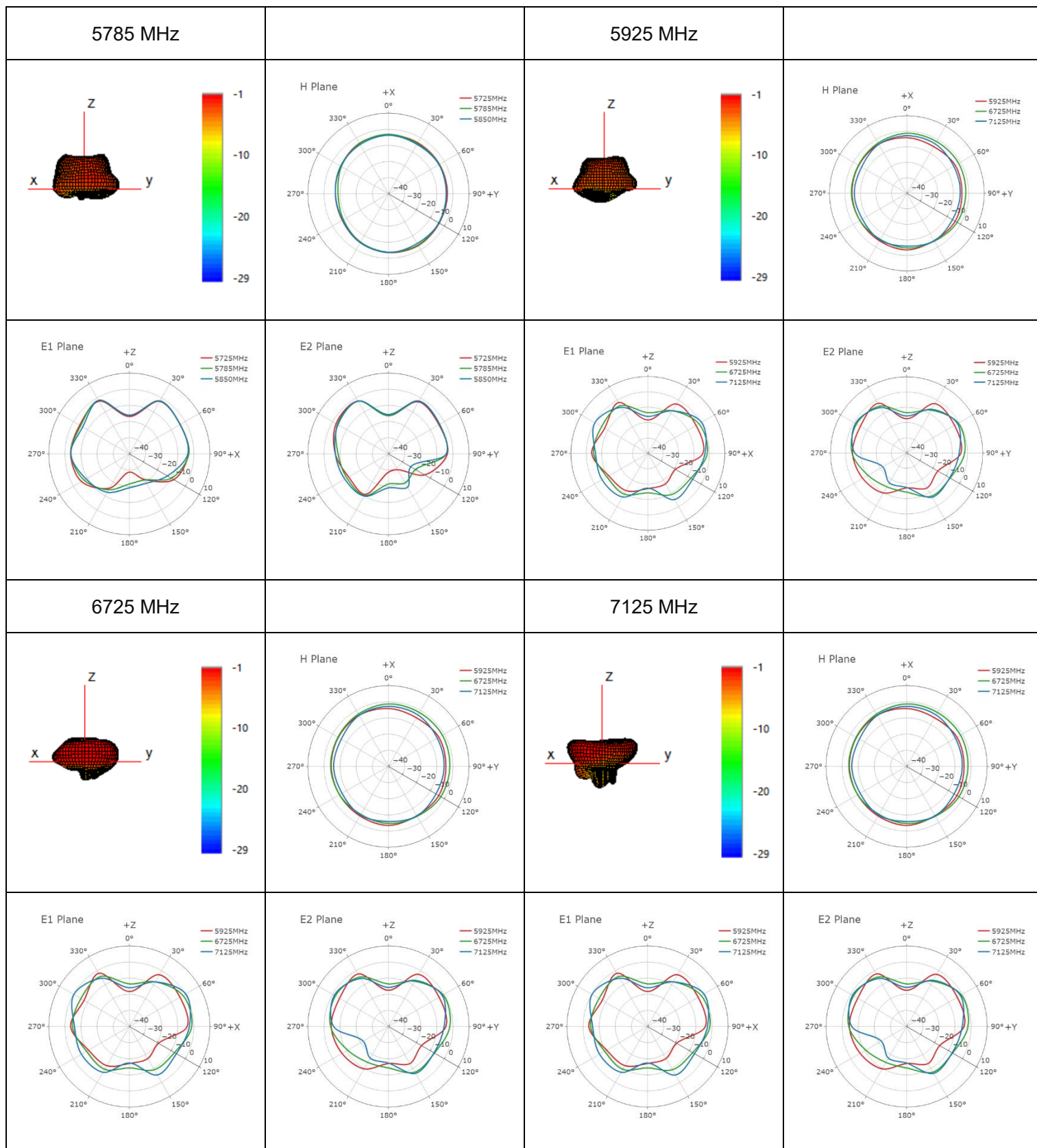


5310 MHz

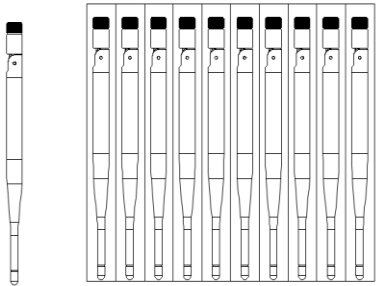
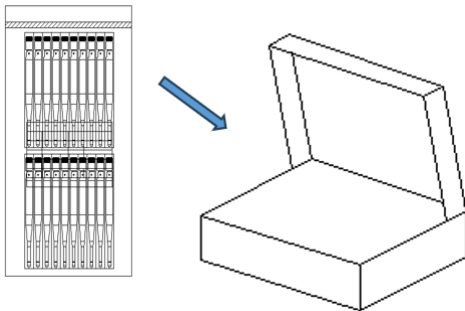
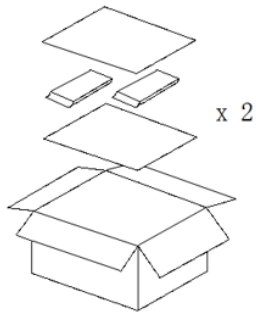


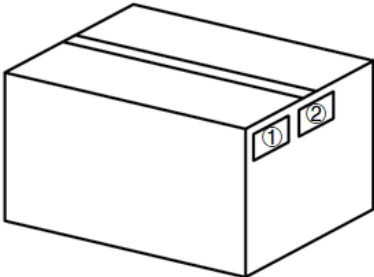
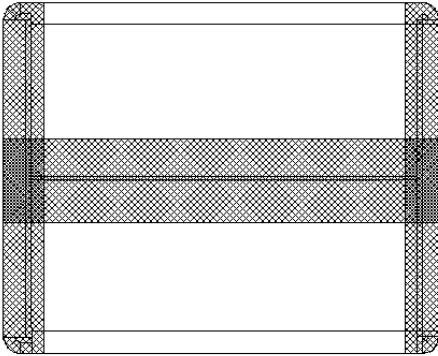
5590 MHz





4 Packaging

Step	Packaging Picture / 2D Picture	Description
1	 1 product 10 products / One-piece Bag	The product goes into a one-piece bag. (10 PCS Antennas / One-piece Bag)
2		40 pcs antenna products in a PE bag. 120 pcs antenna products in an inner box.
3	 x 2	(2 Inner Boxes / Carton Box) (240 PCS Antennas / Carton Box) Estimated quantity Products that cannot fill the entire carton box are packed in a suitable size carton box. <u>Carton Size:</u> <u>L × W × H = 325 × 325 × 200 mm</u>

4		Position for Attaching Labels ① Carton Label ② Quality Label
5		Sealing Cartons “I” 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.	

Revision History

Version	Date	Author	Note
-	2025-03-21	Mayes LI/ Aria CHU	Creation of the document
1.0	2025-03-21	Mayes LI/ Aria CHU	First official release