

Antenna Test Report

1. DUT Information

Equipment	Wireless Router
Model Name	L1LA10
Applicant	Kuiper Systems LLC
Manufacturer	Kuiper Systems LLC

2. Test site information

Test chamber	RayZone2800
Test Site Location	No. 158, Jinchang Road, Jinxi Town, Kunshan City, Suzhou City, Jiangsu Province

Test Condition	Test Engineer	Environment (°C/%)	Test Date
Radiated	Xucheng.Hu	25	2024.6.4

3. Test Frequency

Band (MHz)	Test Frequency (MHz)
2400-2500	2400,2410,2420,2430,2440,2450,2460,2470,2480,2490,2500

4. Antenna Information

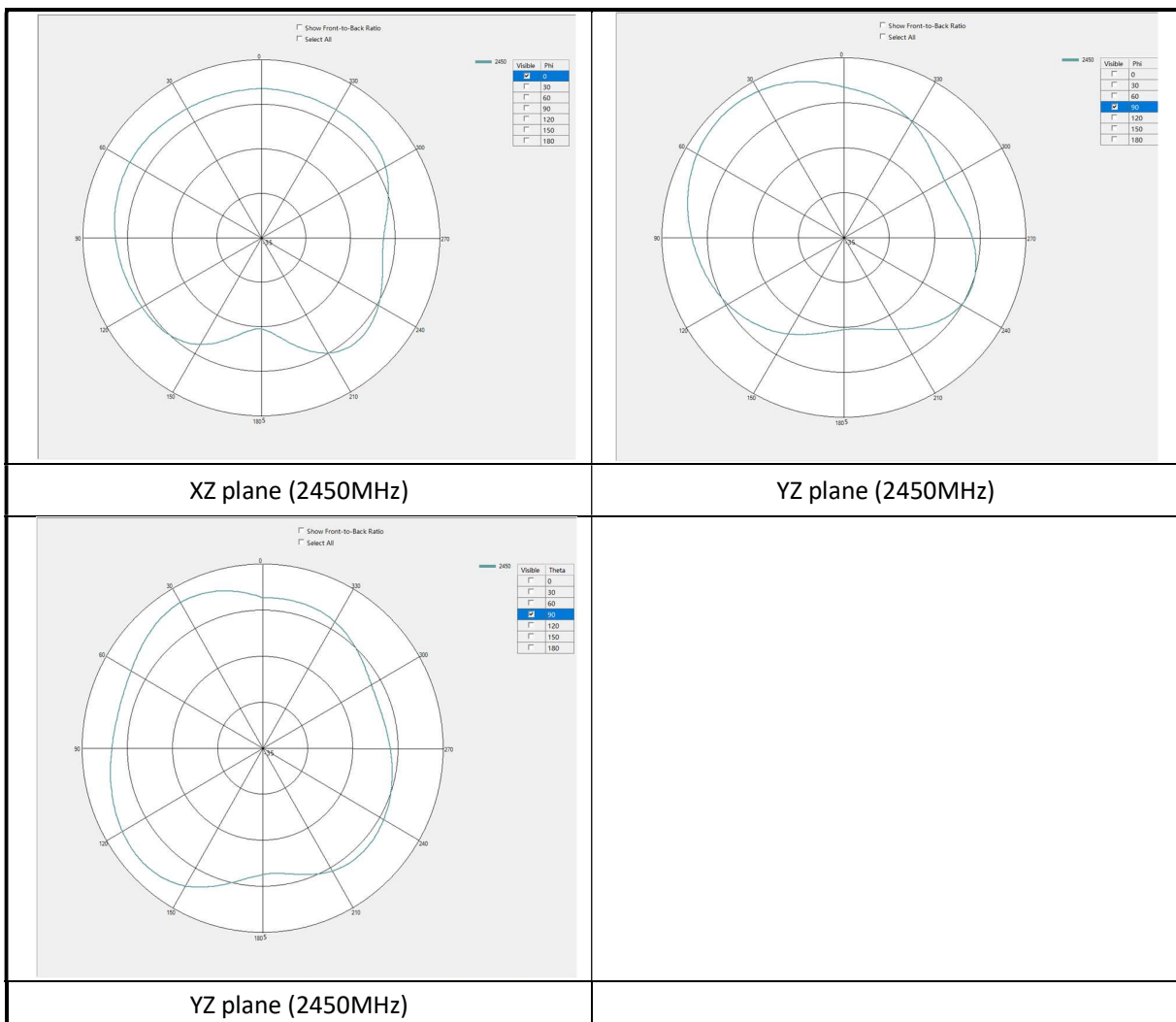
Ant. Position	Brand Name	Ant. Model	Ant. Type	Connector
Antenna #2 (BT/ZigBee 2.4GHz)	Luxshare-ict	833-00050	DIPOLE	IPEX

5. Test Results:

5.1 Antenna gain

Antenna	Frequency (MHz)	Antenna gain (dBi)
Antenna #2 BT/ZigBee	2400	3.7
	2410	3.6
	2420	3.7
	2430	3.8
	2440	3.9
	2450	3.9
	2460	4.0
	2470	4.1
	2480	4.1
	2490	4.2
	2500	4.1

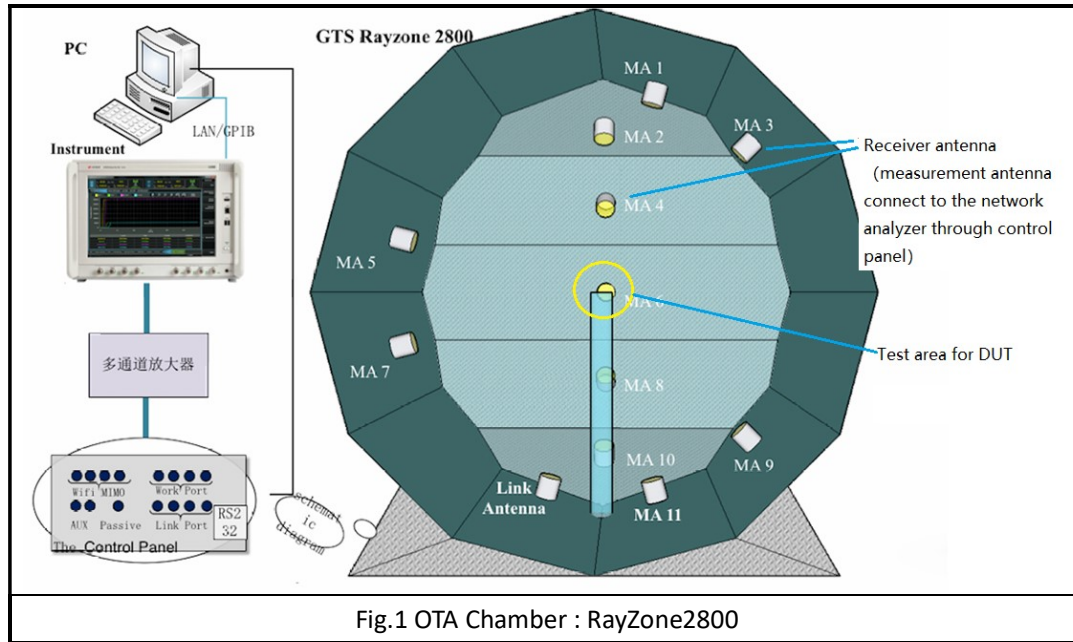
5.2 Antenna Patterns



6. Radiated Measurement Method and Environment:

The directional gain is measured using a gain-comparison method, with the antenna under test positioned center an anechoic chamber that meets the following specifications:

- Overall dimensions (L x W x H) : 3m x 3m x 3m (rectangular chamber)
- Antenna measured frequency range: 600MHz to 8.5GHz
- Quiet zone (cylindrical volume): diameter: 50cm



6.1 Radiated Test Procedure:

- This test procedure primarily adheres to Section 3 of the CTIA Test Plan [1], which outlines the scope of measurement. The total range loss—comprising air loss, receiving antenna loss, and cable loss—has been pre-calibrated by comparing it with a calibrated antenna (ETS-Lindgren Sleeve dipole and horn antenna 3117). While conducting the radiated test on the Device Under Test (DUT), the total range loss has been taken into account for final results.
- The Device Under Test (DUT) is positioned on a three-dimensional (3D) fixture constructed from low-dielectric material. Using the network analyzer to inject 0dbm signal to the DUT antenna, and connect the chamber receiving antenna to the network analyzer through control panel to measure the S21 result (chamber space loss, receiving antenna loss, cable loss to be excluded).
- A three-dimensional characterization of the antenna performance of the DUT is pieced together by analyzing the data from the spatially distributed measurements. Data points taken every 5 degrees in the theta and in the phi axes are deemed sufficient to fully characterize the DUT's Far-Field radiation pattern and total radiated power.
- The antenna gain is reported in Section 5.1 of this document and antenna patterns in section 5.2.

6.2 Test equipment:

	Device	Model	Serial	Manufacrurer	Cal. Date	Cal. due Date
1	RayZone 2800C OTA	RayZone	CT10121280B5086	GTS	2023/11/30	2024/11/30
2	Turntable	Customization	-	da mo da	N/A	N/A
3	Power And Probe Array Controller	Standard	-	GTS	N/A	N/A
4	NR Switching Unit	SW-NR0475A-M3	1011H00663	GTS	N/A	N/A
5	Power Amplification Unit	PA84	MA-2800-085	GTS	N/A	N/A
6	Cable 2M -100MHz to 25GHz	SFT205	-	Times Microwave	2023/11/30	2024/11/30
7	Temperature & Humidity	deli	-	deli	N/A	N/A
8	ENA Series Network Analyzer	E5071C	MY46528212	KeySight	2023. 12. 27	2024. 12. 27

6.3 Test Photographs

See Appendix B.

7. Reference

1. CTIA Test Plan for Wireless Device Over-the-Air Performance.