

Logitech

Antenna Under Test (AUT)

Report

Model Name: MR0119- MR0120

Equipment Type: Gaming wireless mouse

Manufacturer: Logitech Far East LTD.

Test Location: BIC

Tested by: _____ **Andrea Furlani** _____

Report Date: _____ **21/03/2025** _____

Report Release History

Report version	Description	Date Issued
1.00	Original release	21/3/2025
1.01	Updated section 4 : setup and measurements	01/04/2025
1.02	Corrections, updated plots	02/04/2025
1.03	Corrected freq.in cond.mode, add notes	08/04/2025

Table of Contents

1. EUT Antenna Information	3
2. Measured Values and Calculation of Antenna Gains	3
3. Conducted Power Measurement	4
3.1 Test Setup	4
3.2 Test Instruments	4
3.3 Test Procedure	4
3.4 Test Result of RF conducted Power	4
4. 2D Radiation Pattern Measurement	6
4.1 Test Location	6
4.2 Description of the anechoic chamber	6
4.3 Test Instruments	7
4.4 Test Procedure	7
4.5 Test Setup photos	8
4.6 2D Pattern Test Plot	8

1. EUT Antenna Information

- 1) Antenna Material : PCB on board
- 2) Antenna Type : PIFA
- 3) Antenna Dimension: 7 x 11 mm
- 4) Operating Frequency : 2.4 GHz - 2.4835 GHz
- 5) Input Impedance : 50 Ω
- 6) Standing-Wave Ratio : 2:1

2. Measured Values and Calculation of Antenna Gains

Measure peak horizontal/vertical EIRP on each x-y, y-z, x-z plane. The highest measured values will be used to calculate the antenna peak gain.

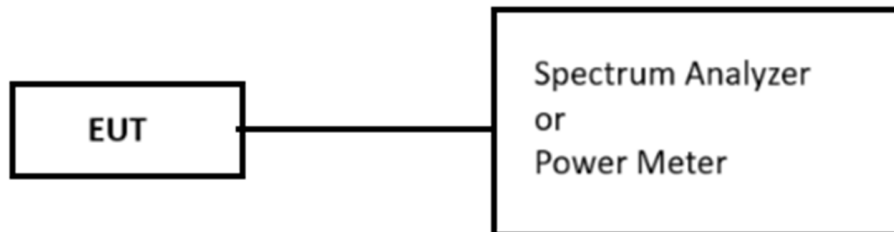
$$\text{Antenna Peak Gain (dBi)} = \text{Max EIRP(dBm)} - \text{Conducted Power (dBm)}$$

Frequency	X-Y Plane $\phi=0\sim360^\circ, \theta=90^\circ$		X-Z Plane $\phi=0^\circ, \theta=0\sim360^\circ$		Y-Z Plane $\phi=90^\circ, \theta=0\sim360^\circ$		Max Peak EIRP (dBm)	Conducted Power (dBm)	Antenna Peak Gain (dBi)
	Ver. Peak EIRP (dBm)	Hori. Peak EIRP (dBm)	Ver. Peak EIRP (dBm)	Hori. Peak EIRP (dBm)	Ver. Peak EIRP (dBm)	Hori. Peak EIRP (dBm)			
2403	-2.4	7	-0.8	9.5	7.8	6.7	9.5	5.91	3.59
2442	-3.1	6.6	-1.7	9.1	7.6	6.3	9.1	5.99	3.11
2479	-3.3	6,6	-1.1	9.1	7.8	6.3	9.1	5.81	3.29

Test Date: 20/03/2025

3. Conducted Power Measurement

3.1 Test Setup



3.2 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Spectrum Analyzer Keysight	N9020A	442000739HW001	8/11/2023

Note: The calibration interval of the above test instruments is __24__ months

3.3 Test Procedure

A spectrum analyzer or Power meter was used to perform output power measurement, setting the detector to average and configuring EUT continuously transmitting power(100% duty cycle).

3.4 Test Result of RF conducted Power

Frequency	Conducted Power (dBm)
2403	5.91
2442	5.99
2479	5.81

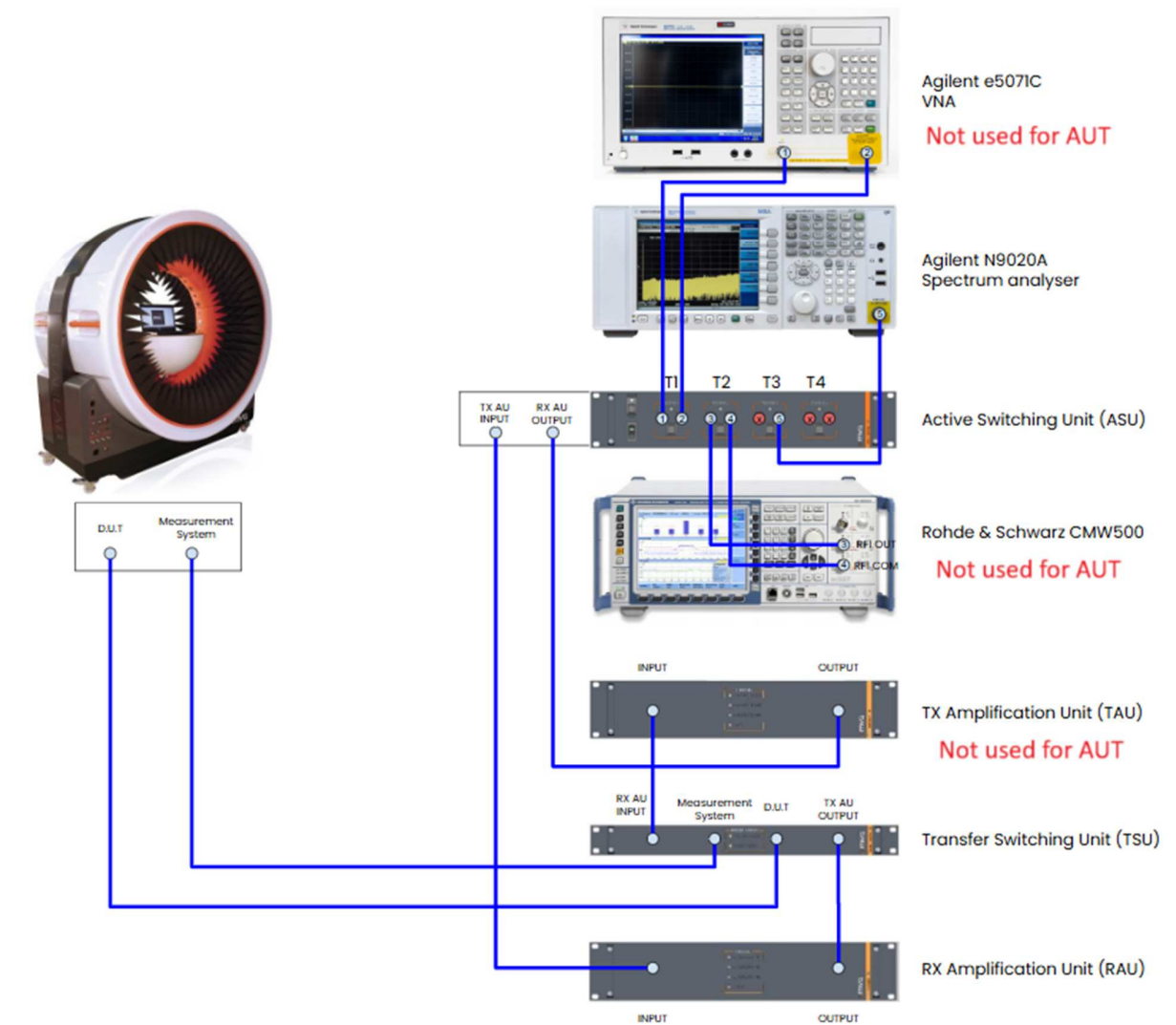
Test Date: 20/3/2025

4. Radiation Pattern Measurement

4.1 Test Location

Radiation pattern measurement in the anechoic chamber

4.2 Description of the anechoic chamber



4.3 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Anechoic chamber Keysight	Microwave Vision Group: 650Mhz to 18GHz , 4.7 x 4.6 x 3.2 m	N.A.	N.A.
Starlab Main Unit	SL V2_065-18GHz	1102284-0035	9 Aug. 2024
Starlab (Active Switching Unit)			
Starlab (Tx Amplification Unit)			
Starlab (Transfer Switching Unit)			
Starlab (Rx Amplification Unit)			
Spectrum Analyzer	Keysight N9020B MXA Signal Analyzer, Multi- touch, 10 Hz to 26.5 GHz	MY60110720	27 Jul 2023
VNA	Agilent E5071C	MY46111439	18 Jul. 2024
Software	WaveStudio for passive and active measurements	V22.1	
Workstation	Asus 841R6 windows 10	N.A.	N.A.

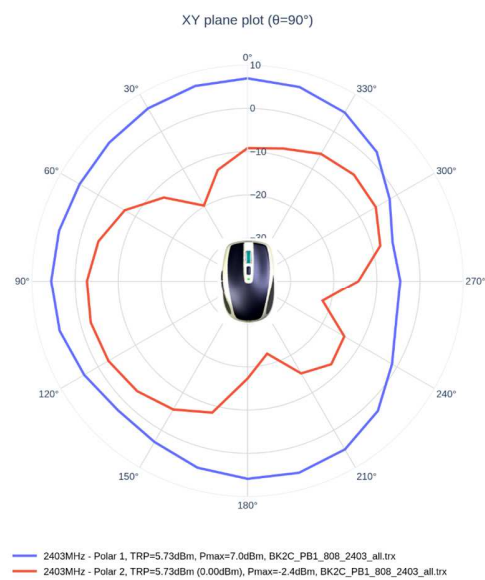
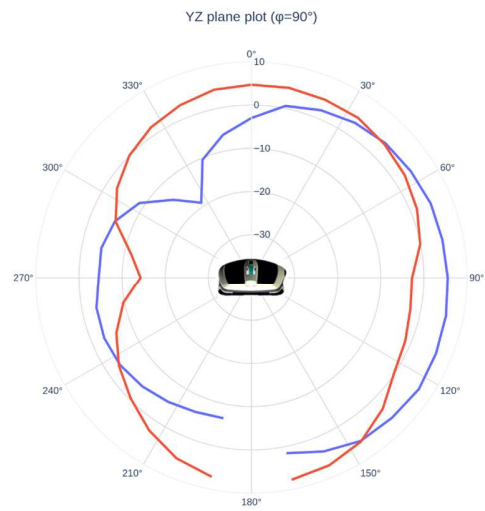
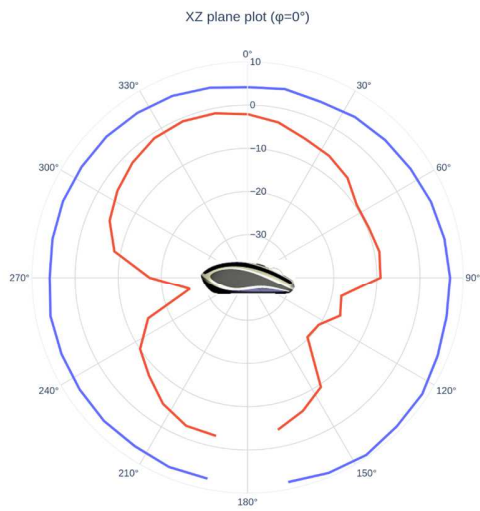
Note: The calibration interval of the above test instruments is 24 and 36 months

4.4 Test Procedure

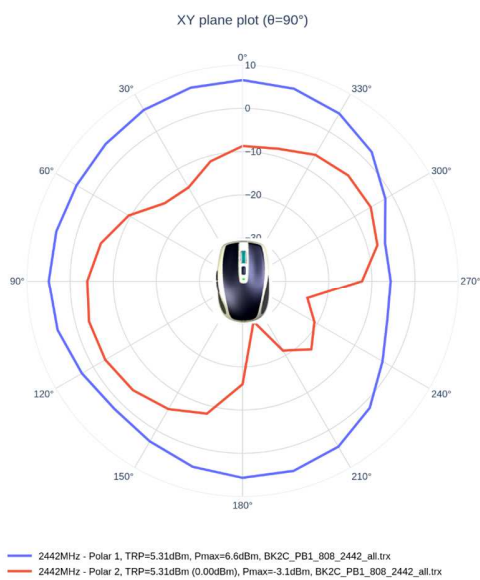
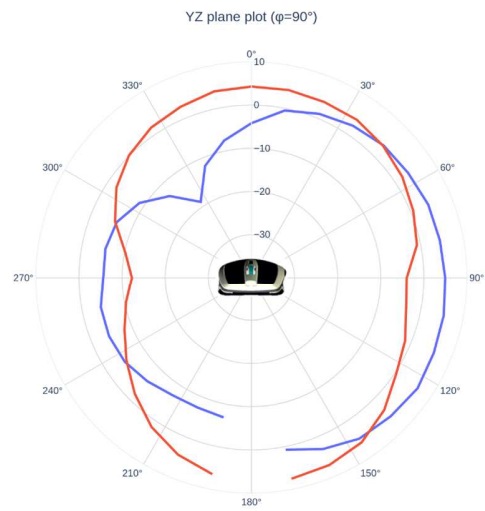
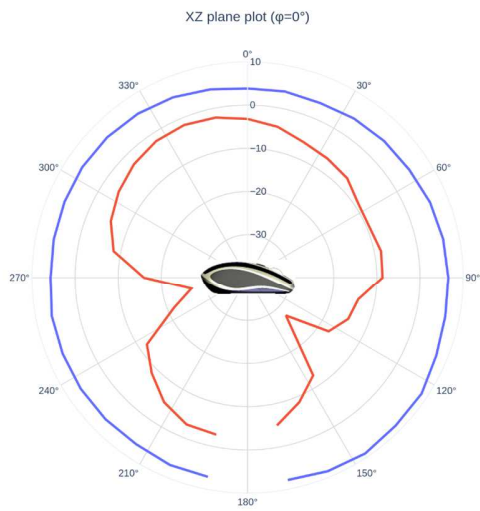
- i. Set the EUT in testmode, fixed frequency, carrier only, 100% duty cycle, at maximum RF power level..
- ii. Place the EUT on the White support (front of the EUT on the X direction) in the Starlab chamber
- iii. Setup the Wave studio software to the frequency set in the EUT (2.403 GHz, 2.442 GHz or 2.479 GHz
- iv. Set the starlab chamber to measure the data of emitted radiation power in steps of 15 degrees.
- v. Verify that the signal is stable and not perturbed
- vi. Close the door of the anechoic chamber
- vii. Run the test. The starlab chamber measures the data of emitted radiation power in steps of 15 degrees. In theta and Phi, for both Horizontal and Vertical antenna polarization.
- viii. Once the test is completed, save the results for both Horizontal and Vertical polarization to a file.
- ix. Record the maximum radiation pattern among the 3 planes XY, XZ, YZ .
 $\text{Antenna Peak Gain (dBi)} = \text{Max EIRP (dBm)} - \text{Conducted power (dBm)}$

4.5 Test Setup photos

EUT at 2.403 Ghz: measured radiated power. Polar 1 = H , Polar 2 = V



EUT at 2.442 Ghz: measured radiated power. Polar 1 = H , Polar 2 = V



EUT at 2.479 Ghz: measured radiated power. Polar 1 = H , Polar 2 = V

