

Logitech

Antenna Under Test (AUT)

Report

Model Name: Kirby(VR0041)

Equipment Type: Environmental sensor

Manufacturer: Logitech Far East LTD.

Test Location: #2, Creation Rd. 4, Science-based Ind. Park Hsinchu
Taiwan, R.O.C

Tested by: Ken

Report Date: 20250903

Report Release History

Report version	Description	Date Issued
EVT-700-007377	Original release	2025/9/05

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	5
4. 2D Radiation Pattern Measurement	6
4.1 Test Location	6
4.2 Description of the anechoic chamber	6
4.3 Test Instruments	6
4.4 Test Procedure	7
4.5 Test Setup photos	8
4.6 2D Pattern Test Plot	8
5. Appendix for Logi internal reference	11

1. EUT Antenna Information

- 1) Antenna Material : PCB on board
- 2) Antenna Type : PIFA
- 3) Antenna Dimension: 20 x 10 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.

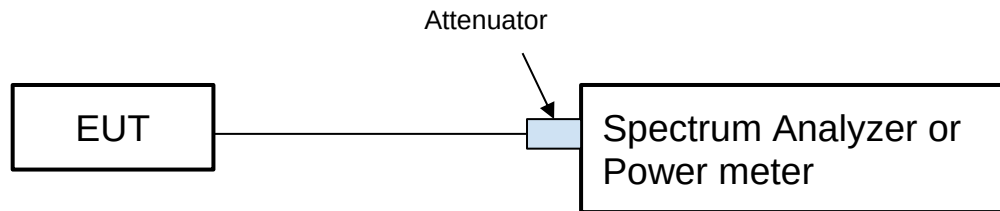
$$\text{Antenna Peak Gain (dBi)} = \text{Max EIRP(dBm)} - \text{Conducted Power (dBm)}$$

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)			
2402	-0.81	1.04	-0.81	1.04	0.62	2.47	5.93	3.41	1.52
2440	0.98	1.24	1.61	1.87	0.98	1.24	6.47	3.53	1.94
2480	0.81	0.40	2.61	2.20	0.81	0.40	7.13	3.40	2.73

Test Date: 20250821

3. Conducted Power Measurement

3.1 Test Setup



3.2 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Spectrum Analyzer	Keysight N9030B	N/A	2025/06/04
RF signal cable Woken	WOKEN 00100A2H5W3019	N/A	

Note: The calibration interval of the above test instruments is 12 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)
2402	3.41
2440	3.53
2480	3.40

Test Date: 20250821

4.3 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Spectrum Analyzer Anritsu	MS2830A	N/A	2025/06/06
Horn Antenna	B1PS 20001 0.7- 10G Horn Ant	N/A	
Software	BWant OTA	20250506_OTA	
Chamber	AC743E	N/A	2024/09/18

Note: The calibration interval of the above test instruments is 12 months

4.4 Test Procedure

- i. Connect the EUT to Spectrum Analyzer and record the power setting of EUT and the measured conducted power.
- ii. Fasten the EUT in the center of the turntable, record the coordinates and take pictures.
- iii. Configuring EUT continuously transmitting power(100% duty cycle).
- iv. Make sure the transmit signal is stable and at the maximum RF power level.
- v. Setup the channel power function by spectrum analyzer.
- vi. Read the channel power level on the spectrum analyzer and record in the following positions.
 1. The turntable is then stepped between 0 to 360 degrees along the horizontal plane in 15-degree increments.
 2. Data is recorded using the spectrum analyzer for both theta and phi polarizations at each position.
- vii. Rotate the EUT with 90 degrees and repeat step f.1 and step f.2 until all 3 planes(X-Y,X-Z,Y-Z) were measured.
- viii. According to substitution techniques, a substitution horn antenna is substituted for EUT at the same position and the signal generator exports the CW signal to the substitution antenna via a TX cable. Rotated the turntable and moved the receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a value of spectrum reading equal to "Raw Value" gotten from step vii. Record the power level of S.G.

$$EIRP = P_{SigGen} + G_T - L_C$$

where:

P_{SigGen} = power setting of the signal generator that produces the same received power reading as the DUT, in dBm;

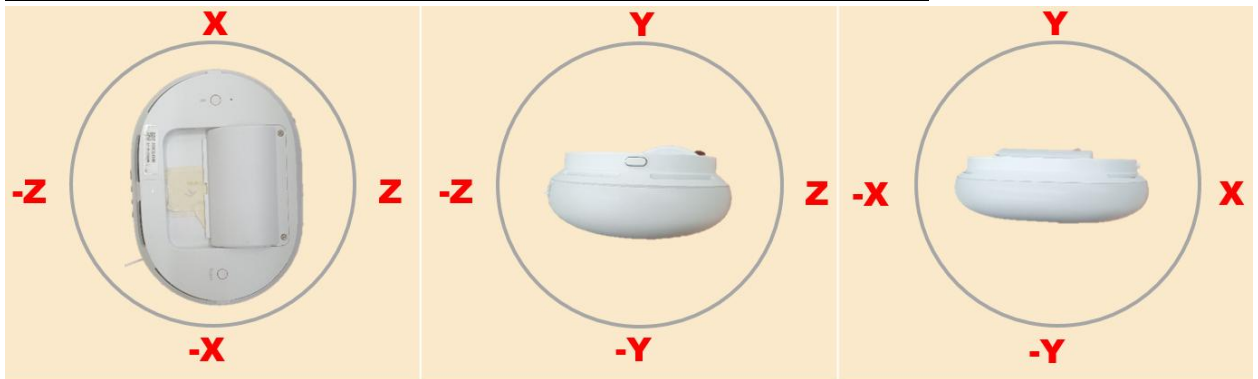
G_T = gain of the substitute antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal loss in the cable connecting the signal generator to the substitute antenna, in dB

- ix. Antenna Peak Gain (dBi) = Max EIRP(dBm) - Conducted Power (dBm)

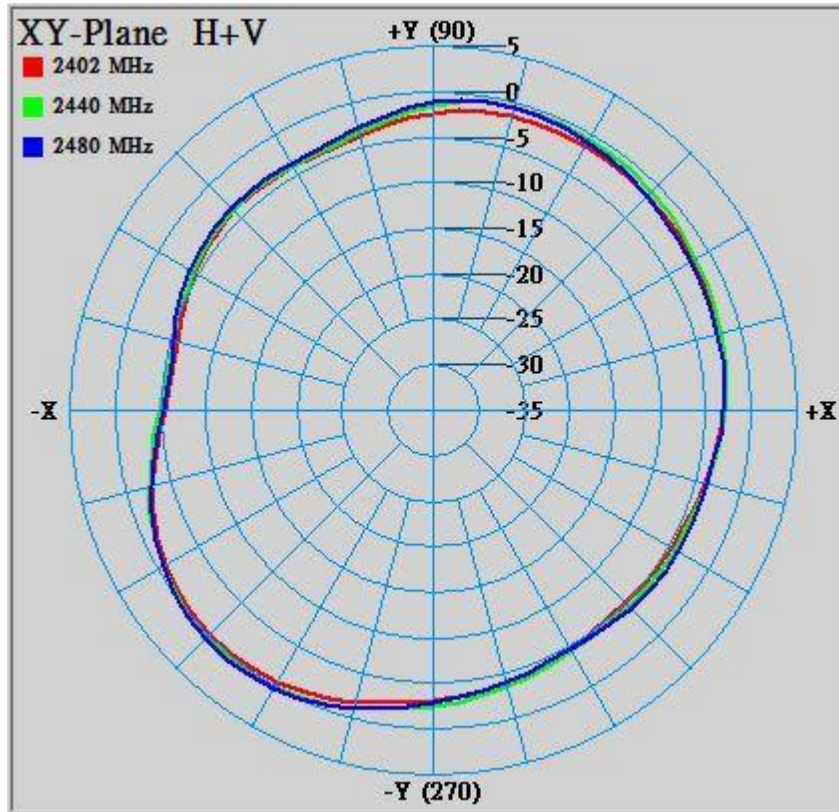
4.5 Test Setup photos

Please post at least three photos to show the test setup for each plane.

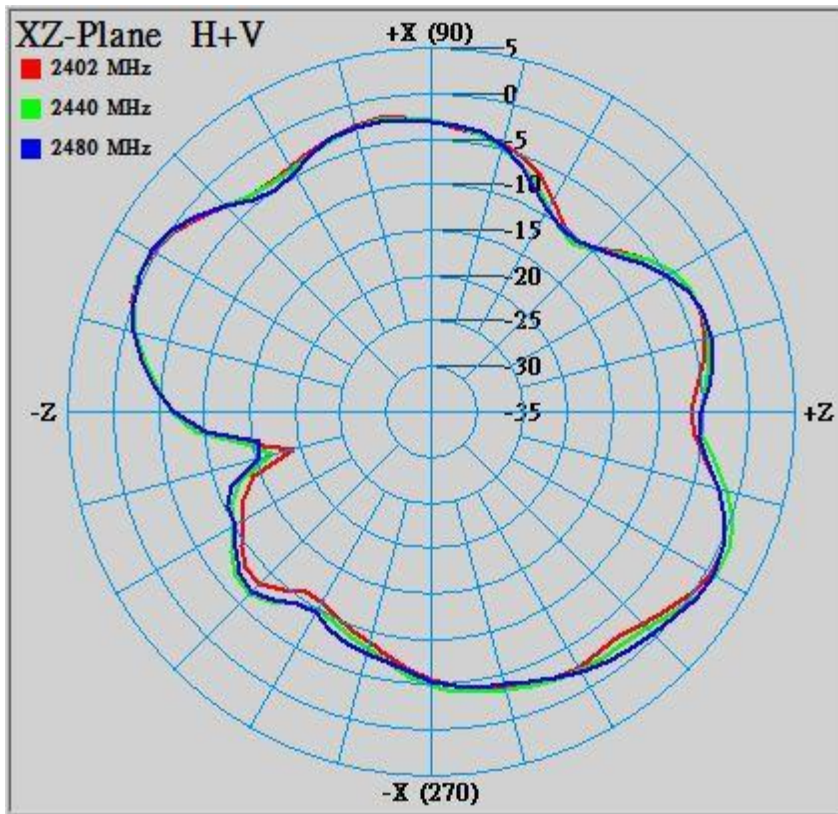


4.6 2D Pattern Test Plot

X-Y Plane: Horizontal and Vertical



X-Z Plane: Horizontal and Vertical



Y-Z Plane: Horizontal and Vertical

