Logitech Antenna Under Test (AUT) Report

Report No.: EVT-700-006573

Model Name: C-U0008

Equipment Type: Dongle

Manufacturer: Logitech Far East LTD.

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Par k, Hsinchu City, Taiwan

Tested by: Tobey Chen

Report Date: 2023/11/07

Report Release History

Report version	Description	Date Issued	
C-U0008 AUT Report	Original release	2023/11/07	

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1. EUT Antenna Information

- 1) Antenna Material : PCB on board
- 2) Antenna Type : PIFA
- **3)** Antenna Dimension: 10.5 x 5.0 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 val ues will be used to calculate the antenna peak gain.

Frequency	X-Y Plane $\phi = 0 \sim 360^\circ, \theta = 90^\circ$		X-Z Plane $\phi=0^\circ, \theta=0\sim360^\circ$		Y-Z Plane $\phi = 90^\circ, \theta = 0 \sim 360^\circ$		Max Peak E	Conducted Do	Antenna Pe
	Ver. Peak EIRP (dB m)	Hori. Pea k EIRP (d Bm)	Ver. Peak EIRP (dB m)	Hori. Pea k EIRP (d Bm)	Ver. Peak EIRP (dB m)	Hori. Pea k EIRP (d Bm)	IRP (dBm)	wer (dBm)	ak Gain (dB i)
2403	1.43	5.61	4.45	5.96	4.19	-0.14	5.96	-0.60	6.56
2442	2.46	4.39	5.21	4.18	3.71	-0.77	5.21	-0.41	5.62
2479	1.21	4.27	3.18	3.2	3.31	-1.27	4.27	-0.46	4.73

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

Test Date: 2023/11/07

3. RF Conducted Power Measurement

3.1 Test Setup



3.2 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Spectrum Analyzer Keysight	N9010B	MY63440332	2022/12/20

Note: The calibration interval of the above test instruments is __12__ months

3.3 Test ProcedureE

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

3.4 Test Result of RF conducted Power

Frequency (MHz)	Measured Power (dBm)
2403	-0.60
2442	-0.41
2479	-0.46

Test Date: 2023/11/07

4. 2D Radiation Pattern Measurement

4.1 Test Location

2D radiation pattern measurement in the anechoic chamber

4.2 Description of the anechoic chamber

Anechoic Chamber

- Length: 10m
- Width: 5m
- Height: 5m
- Turntable height: 1.5m
- Measurement Antenna height: 1.5m



4.3 Test Instruments

Description	Model No.	Serial No.	Last Calibration	
Spectrum Analyzer Keysight	N9030A	MY55330160	2023/02/03	
Horn Antenna	BBHA 9120 D	124	2022/11/13	

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ETS			
Software	Antenna Pattern V6.3	N/A	N/A
Antenna Tower/ Turnta ble	MF-7802	MF780208411	N/A
PSG analog signal gene rator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2023/6/14
RF Coaxial Cable	EMC102-KM-KM-1000	160202R	2023/06/02

Note: The calibration interval of the above test instruments is __12__ months

4.4 Test Procedure

- i. Connect the EUT to power meter and record the power setting of EUT and the me asured conducted power.
- ii. Fasten the EUT in the center of the turntable, record the coordinates and take pictu res.
- iii. Configuring EUT continuously transmitting (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 power level on the spectrum analyzer and record in the following positio ns.
 - 1. The turntable is then stepped between 0 to 360 degrees along the horizonta l plane in 1-degree increments.
 - **2.** Data is recorded using the spectrum analyzer for both theta and phi polariz ations 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. The substitution horn antenna is substituted for EUT at the same position and signa ls generator export the CW signal to the substitution antenna via a TX cable. Rotat ed the Turn Table and moved receiving antenna to find the maximum radiation po wer. Adjust output power level of S.G to get a Value of spectrum reading equal to "Raw Value". 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 powe r 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 anten na, in dB

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

4.5 Test Setup photos



4.6 2D Pattern Test Plot











