RF EXPOSURE EVALUATION REPORT

Application No.:	FYCR2211000436AT
Applicant:	Hon Lin Technology Co., Ltd.
Address of Applicant:	11F, No.32, Jihu Rd., Neihu Dist., Taipei City, Taiwan
Manufacturer:	Foxconn Industrial Internet Co.,Ltd
Address of Manufacturer:	No.2,2nd Donghuan Road,10th Yousong Industrial District, Longhua, Shenzhen City, Guangdong Provice, China
Factory:	Nanning Fulian Fugui Precision Co.,Ltd
Address of Factory:	No.51, Tongle Boulevard, Shajing, Jiangnan District, Nanning, P. R. CHINA
Equipment Under Test (EUT):	
EUT Name:	LTE GPS Tracker
Model No.:	QTS110
Trade Mark:	Qualcomm Aware
FCC ID:	2AQ68-QTS110
Standard(s) :	47 CFR Part 1.1307
	47 CFR Part 1.1310
	FCC Rules 47 CFR §2.1091
	KDB 447498 D04 interim General RF Exposure Guidance v01
Date of Receipt:	2022-11-02
Date of Evaluation:	2022-11-03 to 2022-12-09
Date of Issue:	2022-12-12
Evaluation Result:	**Pass***

* In the configuration evaluated, the EUT complied with the standards specified above.

Winkey Wang
EMC Technical Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2022-12-12		Original

Authorized for issue by:				
		Tree Zhan **Tree Zhan/Project Engineer**		
		Winkey Wang **Winkey Wang/Reviewer**		

2 Contents

3 General Information

3.1 General Description of E.U.T.

Product Type:	☐ Portable device
	☒ Mobile device
	☐ Fixed device

3.2 Details of E.U.T.

Power supply:	DC3.7V by li-ion battery Recharged input: DC5V/1.5A
For 2.4G Wi-Fi:	
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2.81 dBi
For GSM:	
Support Network:	GPRS, EGPRS
Operation Frequency Band:	GSM850/PCS1900
Modulation Type:	GMSK for GPRS/EGPRS 8PSK for EGPRS
GPRS Class:	12
EGPRS Class:	12
Antenna Type:	PIFA antenna
Antenna Gain:	GSM850:3.53dBi, 1900: 2.65dBi
For LTE:	
LTE Operation Frequency Band:	LTE Cat M1 B2,4,5,12,13,14,19,25,26,66,85 LTE Cat NB B2,4,5,12,13,19,25,26,66,85
Modulation Type:	QPSK, 16QAM For Cat M1 BPSK, QPSK for Cat NB
LTE Power Class:	Class 5(Rated Power: 20dBm)
Antenna Type:	PIFA Antenna
Antenna Gain:	B2: 2.65dBi

	B4: 3.05dBi B5: 3.53dBi B12: 1.95dBi B13: 1.22dBi B14: 2.54dBi B19: 3.48dBi B25: 2.65dBi B26: 3.53dBi B66: 3.05dBi B85: 1.95dBi

Remark: The information in this section is provided by the applicant or manufacturer, CCS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

3.3 Test Location

All tests were performed at:

Compliance Certification Services（Kunshan）Inc. Shenzhen branch.

Fuyong lab. Xinlong TechnoPark,Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China

Tel: +86 755 8866 3988 Fax: +86 755 2671 0594

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 6606.01)

Compliance Certification Services（Kunshan）Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6606.01.

• FCC –Designation Number: CN1322

Compliance Certification Services（Kunshan）Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• Innovation, Science and Economic Development Canada

Compliance Certification Services（Kunshan）Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

3.5 Deviation from Standards

None

3.6 Abnormalities from Standard Conditions

None

4 Radio Spectrum Technical Requirement

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4* Pi * R 2)

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1.3 EUT RF Exposure Evaluation

For Stand alone:

For 2.4G WIFI:

Antenna Gain: 2.81dBi, which is 1.91 in linear scale

Output Power Into Antenna & RF Exposure Evaluation Distance:

Frequency (MHz)	Max Conducted AV Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 30 cm (mW/cm^2)	Limit (mW/cm^2)	MPE ratio	Result
2437	22	158.4893	0.0268	1.0000	0.0268	PASS

For GSM:

Antenna Gain: 3.53dBi for GSM850, 2.65dBi for PCS1900

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.25 for GSM850, 1.84 for PCS1900 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Frequency (MHz)	Operation Band	Max Conducted AV Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 30 cm (mW/cm^2)	Limit (mW/cm^2)	MPE ratio	Result
824.2	5	29.83	961.6123	0.1917	0.5495	0.3489	PASS
1850.2	2	27.83	606.7363	0.0988	1.0000	0.0988	PASS

Remark: GSM850 and PCS1900 power are time average based power(including tune up), correction factor is as below:

Number of Time Slot(s)	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.075
Correction factor	-9.19	-6.18	-4.42	-3.17

For LTE:

Antenna Gain: B2: 2.65dBi, B4: 3.05dBi, B5: 3.53dBi, B12: 1.95dBi, B13: 1.22dBi, B14: 2.54dBi

B19: 3.48dBi, B25: 2.65dBi, B26: 3.53dBi, B66: 3.05dBi, B85: 1.95dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is B2: 1.84, B4: 2.02, B5: 2.25, B12: 1.57, B13: 1.32, B14: 1.79, B19: 2.23, B25: 1.84, B26: 2.25, B66: 2.02, B85: 1.57dBi in linear scale.

Frequency (MHz)	Operation Band	Max Conducted Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 30 cm (mW/cm^2)	Limit (mW/cm^2)	MPE ratio	Result
1850.7	2	22	158.4893	0.0258	1.00	0.0258	PASS
1710.7	4	22	158.4893	0.0283	1.00	0.0283	PASS
824.7	5	22	158.4893	0.0316	0.55	0.0575	PASS
699.7	12	22	158.4893	0.0220	0.4665	0.0472	PASS
779.5	13	22	158.4893	0.0186	0.5197	0.0358	PASS
790.5	14	22	158.4893	0.0252	0.5270	0.0478	PASS
832.5	19	22	158.4893	0.0312	0.5550	0.0562	PASS
1850.7	25	22	158.4893	0.0258	1.0000	0.0258	PASS
814.7	26	22	158.4893	0.0316	0.5431	0.0582	PASS
1710.7	66	22	158.4893	0.0283	1.0000	0.0283	PASS
700.5	85	22	158.4893	0.0220	0.47	0.0471	PASS

Remark: Max output power including tune up.

For Maximum Simultaneous Transmission:

Operation mode	MPE ratio	Limit	Result
2.4G Wi-Fi + GSM	0.3757	1.0000	PASS
2.4G Wi-Fi + LTE	0.0850	1.0000	PASS

Remark: all the power listed above included tune up tolerance.

5 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for FYCR2211000436AT.

--End of the Report--