Report No.: SZEM210100084503
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RF Exposure Evaluation Report

Application No.:	SZEM2101000845CR
Applicant:	Hon Lin Technology Co., Ltd.
Address of Applicant:	11F, No.32, Jihu Rd., Neihu Dist., Taipei City 114, Taiwan
Manufacturer:	NANNING FUGUI PRECISION INDUSTRIAL CO., LTD.
Address of Manufacturer:	No.51, Tongle Avenue, Nanning, Guangxi. China
Factory:	NANNING FUGUI PRECISION INDUSTRIAL CO., LTD.
Address of Factory:	No.51, Tongle Avenue, Nanning, Guangxi. China
Equipment Under Test (EUT):	
EUT Name:	Sirius Fly Pro
Model No.:	DTU-B048-101
FCC ID:	2AQ68T99B123-03
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 47 CFR Part 2.1091
Date of Receipt:	2021-01-20
Date of Test:	2021-01-20 to 2021-02-01
Date of Issue:	2021-02-03
Test Result :	**Pass***

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

Keny Xu
EMC Laboratory Manager

SGS-CSTC Standards Technical Services Co.,Ltd. Shenzhen Branch Testing Center EMC Laboratory.
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2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2021-02-03		Original

Authorized for issue by:				
		Calvin Weng **Calvin Weng /Project Engineer**		
		Eric Fu **Eric Fu /Reviewer**		

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4 General Information

4.1 General Description of EUT

Power supply:	Switching Adapter Model: DSA-12PFT-12 FUS 120100 Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 12V, 1.0A, 12.0W
Cable(s):	DC cable: 146cm unshielded
Sample Type:	Mobile Product
For LTE:	
LTE Operation Frequency Band:	48
Frequency range:	3550-3700 MHz
Modulation Type:	UL: QPSK, 16QAM, 64QAM DL: QPSK, 16QAM, 64QAM, 256QAM
LTE Release Version:	R11
LTE Power Class:	Level 3
CA Capability MIMO:	DL 2CC 2X2 MIMO DL 1CC 2X2 MIMO UL 1CC 2X2 MIMO UL 2CC SISO Support Intra-band contiguous/non-contiguous CA and support UL MIMO
Antenna Type:	Dipole Antenna Ant 1: TX & RX Ant 2: TX & RX
Antenna Gain:	2.5dBi
SIM Card:	This device has only one SIM Card sockets.
Contained FCC ID:	2AQ68T99B123T03
For 2.4G WIFI:	
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
MIMO Capability:	802.11 n mode: 2*2UL 802.11 n mode: 2*2DL
Antenna Type:	Ant 1:PCB Antenna; Ant 2: PCB antenna

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Antenna Gain:	Ant 1: 3dBi; Ant 2: 2.3dBi

4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

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

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 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/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

For Uncontrolled Environment, the MPE limit of 1500MHz to 100000MHz is 1.0 mW/cm^2 . 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.

5.1.2 Test Procedure

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

5.1.3 EUT RF Exposure Evaluation

1) Test Results

For WIFI:

Antenna Gain: Ant 1: 3dBi; Ant 2: 2.3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is Ant 1: 2.00; Ant 2: 1.70 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Frequency (MHz)	**Max Conducted Output Power (dBm) (include tune-up power)**	**Output Power to Antenna (mW)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	MPE Ratios	**Result**
2437	18	63.10	0.025	1.0	0.025	PASS

Note: Refer to report No. SZEM210100084502 for EUT test Max Conducted Output Power value.
The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.
Only recorded maximum power with the maximum gain.

For LTE Band 48:

As the antenna type and antenna gain is still the same with previous LTE module report, RF exposure in this section is same with LTE module RF report SZEM210100084403.

SISO

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	MPE Ratios	Result
Ant1	2.5	1.78	20.5	112.20	0.0397	1.0	0.0397	PASS

MIMO

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R=20 cm (mW/cm^2)	Limit (mW/cm^2)	MPE Ratios	Result
Ant1+2	2.5	1.78	20.5	112.20	0.0397	1.0	0.0397	PASS

Since the SAR Exclusion Threshold Level is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

Simultanuously transmitting:

This device supports LTE and WIFI transmitting simultanuously.

Operating Mode	Power Density at R = 20 cm (mW/cm^2)			Limit (mW/cm^2)	Result
	2.4G WIFI	LTE band 48	Combined		
2.4G WIFI+LTE band 48	0.025	0.0397	0.0647	1.0	PASS

- End of the Report -