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RF Exposure Evaluation Report

Report No. :	CQASZ20210801315E-02
Applicant:	Shenzhen Qianhai Runway Technology Co., LTD
Address of Applicant:	Room 201, Block A, No.1, Qianwan Road 1, Qianhai Shenzhen Hong Kong Cooperation Zone, Shenzhen.
Equipment Under Test (EUT):	
Product:	Large Capacity Pet Feeder
Model No.:	Large Capacity Pet Feeder
Test Model No.:	F5-C
Brand Name:	F5-C
FCC ID:	2AU2C-F5
Standards:	47 CFR Part 1.1307
	47 CFR Part 1.1310
	KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2021-08-09
Date of Test:	2021-08-09 to 2021-08-13
Date of Issue:	2021-08-19
Test Result :	**PASS***

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

Tested By: lewis zhou

(Lewis Zhou)

Reviewed By: Jun Li

(Jun Li)

Approved By:

(Jack ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210801315E-02	Rev.01	Initial report	2021-08-19

2 Contents

3 General Information

3.1 Client Information

Applicant:	Shenzhen Qianhai Runway Technology Co., LTD
Address of Applicant:	Room 201, Block A, No.1, Qianwan Road 1, Qianhai Shenzhen Hong Kong Cooperation Zone, Shenzhen.
Manufacturer:	Shenzhen Qianhai Runway Technology Co., LTD
Address of Manufacturer:	Room 201, Block A, No.1, Qianwan Road 1, Qianhai Shenzhen Hong Kong Cooperation Zone, Shenzhen.
Factory:	Dongguan Petwant Electronics Co., Ltd.
Address of Factory:	Room 701, East1Road, Yayao IndustrialArea,Humen Town, Dongguan, Guangdong.

3.2 General Description of EUT

Product Name:	Large Capacity Pet Feeder	
Model No.:	F5-C	
Test Model No.:	F5-C	
Trade Mark:	petwant	
EUT Supports Radios application	2.4GHz: Wi-Fi:802.11b/g/n(HT20): 2412MHz ~2462 MHz; 802.11n(HT40): 2422MHz to 2452MHz	
Hardware Version:	MAINBOARD V1.1	
Software Version:	v2.7.8	
Power Supply:	Power by DC 5V 2A	
Adapter:	Mode: ADP-60D24 Input: 100-240V 50/60Hz, 0.45A Output: DC 5V 2A	
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location	
Test Software of EUT	RTL8188F 1.25.20170609(manufacturer declare)	
Antenna Type:	PCB antenna	
Antenna Gain:	2.4G WIFI	4.9 dBi

4 RF Exposure Evaluation

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 standalone operations

For 2.4G WIFI

Antenna Gain: 4.9 dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3.09 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	7.43	6.5±1	7.5	5.623
Middle(2437MHz)	8.24	7.5±1	8.5	7.079
Highest(2462MHz)	7.38	6.5±1	7.5	5.623
802.11g mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	6.75	6.0±1	7.0	5.012
Middle(2437MHz)	7.49	6.5±1	7.5	5.623
Highest(2462MHz)	6.29	5.5±1	6.5	4.467
802.11n(HT20)mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	6.85	8.0±1	7.0	5.012
Middle(2437MHz)	7.71	7.0±1	8.0	6.310
Highest(2462MHz)	6.58	6.0±1	7.0	5.012
802.11n(HT40)mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	7.5	7.0±1	8.0	6.310
Middle(2437MHz)	7.62	7.0±1	8.0	6.310
Highest(2452MHz)	6.99	6.0±1	7.0	5.012

The worst case:

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	**Result**
7.079	4.9	0.0044	1.0	PASS

Note: 1) Refer to report No. CQASZ20200600577E-03 for EUT test Max Conducted Power Output Power value.

2) Pd = (Pout*G)/(4* Pi * R^2)=(7.079*3.09)/(4*3.1416*20^2)=0.0044