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RF Exposure Evaluation Report

Report No. : CQASZ20181000052E-02

Applicant: Dogness Group LLC.

Address of Applicant: 4116 W Spring Creek Parkway,Plano,TX75024,Dallas, TEXAS, USA

Manufacturer: DONGGUAN JIASHENG ENTERPRISE CO.,LTD

Address of Manufacturer: TONGSHA NEW INDUSTRIAL ZONE, TONGSHA COMMUNITY, DONGCHENG STREET OF DONGGUAN CITY, GUANGDONG PROVINCE, 523127 CHINA

Factory: Dogness Smart Technology (Donguan) Co., LTD.

Address of Factory: 3F, No.1, Tongsha Industrial zone, East district of Dongguan city

Equipment Under Test (EUT):

Product: MINI TREAT ROBOT

Model: SP02, SP02-W, SP02-P, SP02-BL, SP02-B, SP02-R

Test Model No.: SP02

Brand Name: N/A

FCC ID: 2AQ6Q-SP02

Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2018-10-22 to 2018-12-13

Date of Issue: 2018-12-13

Test Result : **PASS***

Tested By:

(Daisy Qin)

Reviewed By:

(Aaron Ma)

Approved By:

(Jack Ai)



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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20181000052E-02	Rev.01	Initial report	2018-12-13

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3 General Information

3.1 Client Information

Applicant:	Dogness Group LLC.
Address of Applicant:	4116 W Spring Creek Parkway,Plano,TX75024,Dallas, TEXAS, USA
Manufacturer:	DONGGUAN JIASHENG ENTERPRISE CO.,LTD
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Factory:	Dogness Smart Technology (Donguan) Co., LTD.
Address of Factory:	3F, No.1, Tongsha Industrial zone, East district of Dongguan city

3.2 General Description of EUT

Product Name:	MINI TREAT ROBOT
Model No.:	SP02, SP02-W, SP02-P, SP02-BL, SP02-B, SP02-R
Test Model No.:	SP02
Trade Mark:	N/A
Hardware version:	XMDZ-BLK18EV-WIFI-ZD-V1_01
Software version:	HI3518EV200_50H10L_FD_8188EU_S38_V4.02.R12.Nat.20180725_ALL
Sample Type:	internal antenna with ipex connector
Power Supply:	daptor model:GA060015 Input: AC 100~240V, 50/60Hz, 0.4A; Output: DC 5C, 1.5A

3.3 General Description of 2.4G WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20/40): OFDM (64QAM, 16QAM,QPSK,BPSK)
Test Software of EUT:	REALTEK 11n 8188EUS USB WLAN NIC Massproduction Kit (manufacture declare)
Antenna Type:	Internal antenna
Antenna Gain:	1dBi

Note:

1. All model: SP02, SP02-W, SP02-P, SP02-BL, SP02-B, SP02-R
2. Only the model SP02, was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is 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.

4.2 1.1.3 EUT RF Exposure Evaluation

1) For 2.4G WIFI

ANT1:

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.26 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	12.77	13±1	14	25.119
Middle(2437MHz)	12.74	13±1	14	25.119
Highest(2462MHz)	13.13	13±1	14	25.119
802.11g mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	11.74	12±1.0	13	19.953
Middle(2437MHz)	11.82	12±1.0	13	19.953
Highest(2462MHz)	12.78	12±1.0	13	19.953
802.11n(HT20)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	11.95	12±1.0	13	19.953
Middle(2437MHz)	12.17	12±1.0	13	19.953
Highest(2462MHz)	12.94	12±1.0	13	19.953
802.11n(HT40)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	11.58	12±1	13	19.953
Middle(2437MHz)	11.77	12±1	13	19.953
Highest(2452MHz)	12.56	12±1	13	19.953

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
25.119	1	0.0063	1.0	PASS

Note: 1) Refer to report No. CQASZ20181000052E-01 for EUT test Max Conducted average Output Power value.

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (25.119 * 1.26) / (4 * 3.1416 * 20^2) = 0.0063$$