

RF Exposure Evaluation Report

Product : ESP-12S
Trade mark : N/A
Model/Type reference : ESP-12S
Serial Number : N/A
Report Number : EED32K00061602
FCC ID : 2AHMRESP12S
Date of Issue : Apr. 08, 2018
47 CFR Part 1.1307
Test Standards : 47 CFR Part 1.1310
KDB 447498 D01v06
Test result : PASS

Prepared for:

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2 Version

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4 General Information

4.1 Client Information

Applicant:	Shenzhen Ai-Thinker Technology co., LTD.
Address of Applicant:	6/F, Block C2, Huafeng Industrial Park, Hangcheng Road, Baoan district, Shenzhen, China
Manufacturer:	Shenzhen Ai-Thinker Technology co., LTD.
Address of Manufacturer:	6/F, Block C2, Huafeng Industrial Park, Hangcheng Road, Baoan district, Shenzhen, China
Factory:	Shenzhen Ai-Thinker Technology co., LTD.
Address of Factory:	6/F, Block C2, Huafeng Industrial Park, Hangcheng Road, Baoan district, Shenzhen, China

4.2 General Description of EUT

Product Name:	ESP-12S
Model No.:	ESP-12S
Trade Mark:	N/A
EUT Supports Radios application:	Wi-Fi: 802.11 b/g/n(20M) , 2412MHz-2462MHz
Power Supply:	DC 3.3V

4.3 Product Specification subjective to this standard

Modulation Type:	DSSS, OFDM
Antenna Type:	PCB Antenna
Antenna Gain:	3dBi
Test Voltage:	DC 3.3V and AC 120V/60Hz
Conducted Peak Output Power:	14.09dBm(0.025644mW)* The Conducted Peak Output Power data refer to the report EED32K00061601
Sample Received Date:	Mar. 22, 2018
Sample tested Date:	Mar. 22, 2018 to Apr. 02, 2018
The tested sample and the sample information are provided by the client.	

4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385

No tests were sub-contracted.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 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

A rough estimation of the expected exposure in power flux density on a given point can be made with the following equation:

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R= distance to the centre of radiation of the antenna

EIRP = P*G

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user.

Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the user's manual. Therefore, the S of the device is calculated with R=20cm, and if it is below the limits, then we can conclude the device complies with the rules.

5.1.2 Test Procedure

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

5.1.3 EUT RF Exposure Evaluation

Antenna Gain: 3dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power(dBm)	Gain (dBi)	EIRP* (dBm)	EIRP (mW)	R (cm)	S (mW/cm ²)	Limit (mW/cm ²)	Result
middle	2437	14.09	3	17.09	51.17	20	0.01	1.0	Pass

Note: Refer to report No. EED32K00061601 for EUT test Max Conducted Peak Output Power value.

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32K00061601 for EUT external and internal photos.

*** End of Report ***

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