



RF EXPOSURE REPORT FOR FCC

RZBG(W) 20220421003-5

Applicant : Huzhou Hualai Technology Co.,Ltd.
Address : National University Science Park,No.669, Gaotie Rd Rm.316
Comprehensive Building.
Product Name : Ailofy Light Strip Controller
Type/Model : AILSPR
FCC ID : 2A6LIHLAILSA
TEST RESULT : PASS

SUMMARY

The equipment complies with the requirements according to the following standard(s):

47 CFR Part 2.1091: Radio frequency radiation exposure evaluation: mobile devices

FCC KDB 447498 D01: General RF Exposure Guidance v06 Limit

Date of issue: Jun. 7, 22

Prepared by

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1. GENERAL INFORMATION OF EUT

1.1 Applicant information

Applicant	Huzhou Hualai Technology Co.,Ltd
Address	National University Science Park,No.669, Gaotie Rd Rm.316 Comprehensive Building
Contact person	Chenhao Yan
Phone number	15657872505

1.2 Manufacture information

Manufacture	Huzhou Hualai Technology Co.,Ltd
Address	National University Science Park,No.669, Gaotie Rd Rm.316 Comprehensive Building.

1.3 General description for equipment under test(EUT)

EUT name	Ailofy Light Strip Controller
Trade name	Ailofy
Under test mode name	AILSPR
Series model name	N/A
Description of different model name	N/A
Hardware version	0.0.0.0
Software version	1.1.6.36
Network and Wireless connectivity	IEEE 802.11b/g/n (HT20/HT40) , BLE 1M



1.4 Technical information of equipment under test (EUT)

Operate Freq. range	Frequency range (MHz)	Modulation	Channel bandwidth (MHz)	Date rate (Mbps)
IEEE 802.11b	2412-2462	DSSS/CCK	20	Up to 11
IEEE 802.11g	2412-2462	OFDM	20	Up to 54
IEEE 802.11n(20MHz)	2412-2462	OFDM	20	Up to 72.2
IEEE 802.11n(40MHz)	2422-2452	OFDM	40	Up to 150
BLE	2402-2480	GFSK	2	1
Test channel	Low(2412 for 20MHz bandwidth,2422 for 40MHz bandwidth) Middle(2437 for 20MHz bandwidth,2437 for 40MHz bandwidth) High(2462 for 20MHz bandwidth,2452 for 40MHz bandwidth) BLE (Low2402 Middle2440 High2480)			
Maximum RF Output Power(dBm)	IEEE 802.11b:15.38 IEEE 802.11g:14.09 IEEE 802.11n(20MHz):13.81 IEEE 802.11n(40MHz):13.37 BLE:3.52			
FCC ID	2A6LIHLAIIISA			
Equipment type	<input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable <input type="checkbox"/> Fix Location			
About the Product	This wifi is used for data transmission			
Antenna Type	PCB Antenna			
Antenna Gain	2dBi			
Note:The antenna gain was declared by the manufacture.				



2. DESCRIPTION OF TEST FACILITY

<input checked="" type="checkbox"/> Company Name	Hangzhou TDT Technologies Co., Ltd.
Address	Room 101, Building 3, No. 12, Binwen Road, Xixing Street, Binjiang district, Hangzhou, Zhejiang, China
Telephone	+86571-88317620
Telefax	+86571-88316350
Test Location	Hangzhou TDT Technologies Co., Ltd.
Address	Room 101, Building 3, No. 12, Binwen Road, Xixing Street, Binjiang district, Hangzhou, Zhejiang, China
Telephone	+86571-88317620
Telefax	+86571-88316350
A2LA Certification number	4037.01
CNAS Certification number	CNAS L7728
VCCI Site registration number	C-14683, G-10832, R-14200, T-12223
FCC Site registration number	645845

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3. SUMMARY OF TEST RESULT

3.1 Test standard

No.	Identify	Document title
1	47 CFR Part 15 Sub-part 2.1091	Radio frequency radiation exposure evaluation: mobile devices
2	KDB Publication 447498 D01v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES



4. DEVICE CATEGORY AND LEVELS LIMITS

Refer users manual this device is a **smart plug**, and this device was designed used in mobile device that the minimum distance between human's body is 20cm at least. Based on the 47CFR 2.1091, this device belongs to mobile device. The definition of the category as following:

Mobile device:

CFR Title 47 & 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D01 General RF Exposure Guidance v06 Limit

Devices operating in standalone mobile exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuation are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.

When the categorical exclusion provision of § 2.1091(c) applies, the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to FCC Part 1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.



Limits for General Population/ Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength(E)(V/m)	Magnetic Field Strength (H)(A/m)	Power Density (S)(mW/cm ²)
0.3-1.34	614	1.63	(100)*
1.34-30	824/f	2.19/f	(180/f ²)*
30-300	27.5	0.073	0.2
300-1500			f/1500
1500-100,000			1.0

MPE calculation formula

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density

P = output power (mW)

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

R = separation distance between radiator and human body (cm)



5. MPE ASSESSMENT

Output average power test data

2.4G WIFI		
Mode	802.11 b	802.11 g
	Out put power	Out put power
Average output power (dBm)	15.38	14.09
Mode	802.11 n HT20	802.11 n HT40
	Out put power	Out put power
Average output power (dBm)	13.81	13.37
Mode	BLE	
	Out put power	
Average output power (dBm)	3.52	
Note: This report listed the worst case average output power value, please refer to RF test report for more details.		

Assessment result

Evolution mode	Maximum average output power (dBm)	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum average output power (mw)	Distance (cm)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	Verdict
2.4G WIFI	16	2	1.5849	39.81	20	0.0126	1	Pass
BLE	4	2	1.5849	2.51	20	0.0008	1	Pass



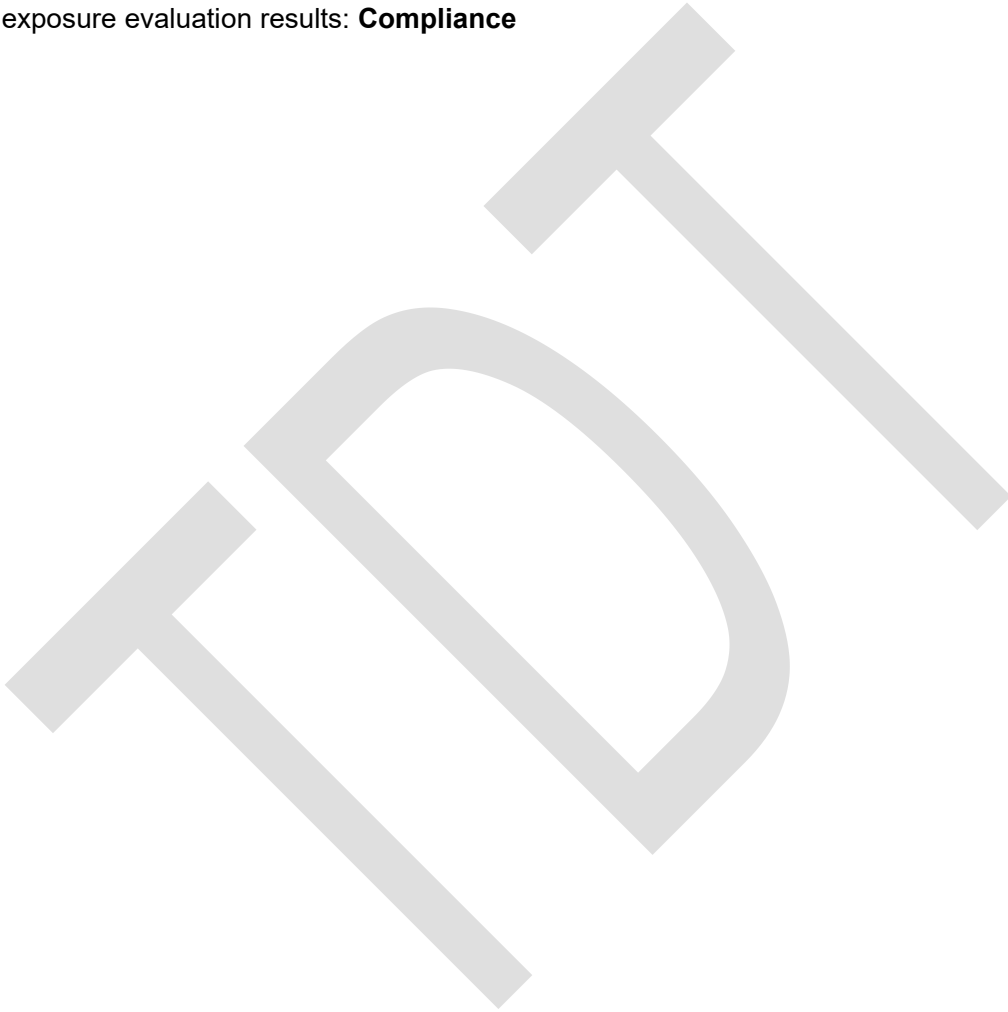
Note:

1. $\Sigma(\text{Power Density} / \text{Limit})$: This is a summation of [(power density for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WLAN 2.4GHz.
2. The 2.4GHz can transmit simultaneously, the formula of calculated the MPE is
$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density
LPD = Limit of power density
3. More power list please refer to RF test report.

Conclusion:

RF exposure evaluation results: **Compliance**





Annex A Revision History

Version	Issue Date	Revisions Content
Rev.01	May.24.2022	Initial Issue
Rev.02	Jun.01.2022	Revised the test report to address TCB's comments.
Rev.03	Jun.07.2022	Change address.
Rev.03	Jun.07.2022	Modify the address on the third page.

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