RF EXPOSURE REPORT FOR FCC

RZBG(W)20200513001-4

Applicant : HANGZHOU KAITE ELECTRICAL APPLIANCE CO., LTD.
SANDU INDUSTRIAL ZONE, JIANDE CITY, ZHEJIAN PROVINCE
CHINA

Manufacturer : Kingtec (vietnam) technologies co., ltd.
HAISHAN INDUSTRIAL ZONE, PINGQIAN VILLAGE, HEXIA,
DEHE COUNTY, Long An Province

Product Name : Smart plug

Type/Model : 30154

FCC ID : 2ACXG-30154

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: 2020.07.03

Prepared by	Reviewed by:	Issued by：
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Chao Hu	Zhao Yang	Bing Cai

报告专用章

Content

1. GENERAL INFORMATION OF EUT

1.1 Applicant information

Applicant	HANGZHOU KAITE ELECTRICAL APPLIANCE CO., LTD
Address	SANDU INDUSTRIAL ZONE, JIANDE CITY, ZHEJIANG PROVINCE, CHINA
Contact person	N/A
Phone number	N/A

1.2 Manufacture information

Manufacture	Kingtec (vietnam) technologies co., ltd
Address	HAISHAN INDUSTRIAL ZONE, PINGQIAN VILLAGE, HEXIA, DEHE COUNTY, Long An Province

1.3 General description for equipment under test(EUT)

EUT name	Smart plug
Trade name	KMC
Under test mode name	30154
Series model name	N/A
Description of different model name	N/A
Hardware version	1.0
Software version	N/A
Network and Wireless connectivity	IEEE 802.11b/g/n（HT20/HT40）

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
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)			
Maximum RF Output Power(dBm)	IEEE 802.11b:13.29 IEEE 802.11g:16.02 IEEE 802.11n(20MHz):15.23 IEEE 802.11n(40MHz):14.66			
FCC ID	2ACXG-30154			
Equipment type	☒ Mobile ☐ Portable ☐ Fix Location			
About the Product	This wifi is used for data transmission			
Antenna Type	PCB Antenna			
Antenna Gain	-1dBi			
Note:The antenna gain was declared by the manufacture.				

2. DESCRIPTION OF TEST FACLITY

☒	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
	IC Site registration number	12179A

Announce：

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3	The test report is invalid if there is any evidence and/or falsification.
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8	This is the second version of the report, which replaces the previous one. See the revision history for details

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 attenuations 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 the 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/f2)*
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)	13.29	16.02
Mode	802.11 n HT20	802.11 n HT40
	Out put power	Out put power
Average output power (dBm)	15.23	14.66
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)	Directional Gain (dBi)	Numeric Gain	Total Power (mw)	Distance (cm)	Power Density (mW/cm²)	Limit of Power Density (mW/cm²)	Verdict
2.4G WIFI	16.02	-1	0.794	39.99	20	0.0063	1	Pass

Note:

1. Σ(Power Density / 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

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

3. The smart socket work frequency range used is 2400MHz~2483.5MHz, the result close to the limit by the
4. 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	Jun.29.2020	Initial Issue
Rev.02	Jul.03.2020	Revise the directional gain to numeric gain and revise the result on page 9

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