RF Exposure Evaluation Report

APPLICANT	:	**Hangzhou Tuya Information Technology Co., Ltd**
EQUIPMENT	:	**WiFi&Bluetooth Module**
MODEL NAME	:	**WBR1D**
FCC ID	:	**2ANDL-WBR1D**
STANDARD	:	**47 CFR Part 2.1091** **FCC KDB 447498 D01 v06**

We, Sporton International (Kunshan) Inc., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Rose Wang

Reviewed by: Rose Wang / Supervisor

Kat Yin

Approved by: Kat Yin / Manager

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People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA9O3005	Rev. 01	Initial issue of report	Mar. 31, 2020

1. Administration Data

1.1. Testing Laboratory

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CN1257	314309

Applicant	
Company Name	Hangzhou Tuya Information Technology Co., Ltd
Address	Room701, Building3, More Center,No.87 GuDun Road, Hangzhou, Zhejiang, China

Manufacturer	
Company Name	Hangzhou Tuya Information Technology Co., Ltd
Address	Room701, Building3, More Center,No.87 GuDun Road, Hangzhou, Zhejiang, China

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	WiFi&Bluetooth Module
Model Name	WBR1D
FCC ID	2ANDL-WBR1D
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	WLAN 2.4GHz : 802.11b/g/n/ HT20/HT40 WLAN 5GHz : 802.11a/n HT20/HT40 Bluetooth LE
HW Version	1.0.1
SW Version	2V1
Antenna Type / Gain	WLAN 2.4GHz : PCB antenna with gain 2.00 dBi WLAN 5GHz : PCB antenna with gain 2.60 dBi Bluetooth: PCB antenna with gain 2.00 dBi

Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

3. Maximum RF average output power among production units

<WLAN 2.4GHz>

Mode	Maximum Average Power (dBm)
802.11b	18.0
802.11g	17.0
802.11n-HT20	16.0
802.11n-HT40	15.0

<Bluetooth>

Mode	Maximum Average Power (dBm)
Bluetooth LE	7.0

<WLAN 5GHz>

Mode		Maximum Average Power (dBm)
WLAN 5.2GHz	802.11a	15.0
	802.11n-HT20	14.5
	802.11n-HT40	13.0
WLAN 5.3GHz	802.11a	15.0
	802.11n-HT20	14.5
	802.11n-HT40	13.0
WLAN 5.5GHz	802.11a	15.0
	802.11n-HT20	14.5
	802.11n-HT40	13.0
WLAN 5.8GHz	802.11a	15.0
	802.11n-HT20	14.0
	802.11n-HT40	13.0

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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/f2)	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/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
2.4GHz WLAN	2412	2.00	18.00	20.000	0.100	100.000	0.020	1.000
WLAN 5.2GHz	5180	2.60	15.00	17.600	0.058	57.544	0.011	1.000
WLAN 5.3GHz	5260	2.60	15.00	17.600	0.058	57.544	0.011	1.000
WLAN 5.5GHz	5500	2.60	15.00	17.600	0.058	57.544	0.011	1.000
WLAN 5.8GHz	5745	2.60	15.00	17.600	0.058	57.544	0.011	1.000
Bluetooth	2402	2.00	7.00	9.000	0.008	7.943	0.002	1.000

Note:
1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum power to do MPE analysis.
3. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

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