RF Exposure Evaluation Report

APPLICANT	:	**Hangzhou Tuya Information Technology Co., Ltd**
EQUIPMENT	:	**Module**
MODEL NAME	:	**WBR3D**
FCC ID	:	**2ANDL-WBR3D**
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 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

ACCREDITED Cert #5145.02

Sporton International (Kunshan) Inc.
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA992508	Rev. 01	Initial issue of report	Nov. 19, 2019

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	Module
Model Name	WBR3D
FCC ID	2ANDL-WBR3D
Wireless Technology and Frequency Range	WLAN2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 ~ 2480 MHz
Mode	WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth LE
Antenna Type	WLAN: PCB Antenna Bluetooth: PCB Antenna
Antenna Gain	WLAN2.4GHz Band: 2.0dBi WLAN 5.2GHz Band: 2.6dBi WLAN 5.3GHz Band: 2.6dBi WLAN5.5GHz Band: 2.6dBi WLAN5.8GHz Band: 2.6dBi Bluetooth: 2.0dBi
HW Version	V1.0.2
SW Version	2V1
Remark: 1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description. 2. WLAN operation in 5600 MHz ~ 5650 MHz is notched	

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 and Bluetooth>

Mode		Maximum Average Power (dBm)
2.4GHz	802.11b	18.50
	802.11g	17.50
	802.11n-HT20	16.50
	802.11n-HT40	15.50
	Bluetooth LE	9.00

<WLAN 5GHz>

Mode		Maximum Average Power (dBm)
5.2GHz	802.11a	16.00
	802.11n-HT20	15.00
	802.11n-HT40	14.00
5.3GHz	802.11a	16.00
	802.11n-HT20	15.00
	802.11n-HT40	14.00
5.5GHz	802.11a	16.00
	802.11n-HT20	15.00
	802.11n-HT40	14.00
5.8GHz	802.11a	16.00
	802.11n-HT20	15.00
	802.11n-HT40	14.00

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)
WLAN2.4GHz 802.11b	2412	2.0	18.50	20.50	0.11	112.20	0.022	1.000
Bluetooth	2402	2.0	9.00	11.00	0.01	12.59	0.003	1.000
WLAN5.2GHz 802.11a	5180	2.6	16.00	18.60	0.07	72.44	0.014	1.000

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. WLAN 2.4GHz and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. According to the EUT character, WLAN 5GHz and Bluetooth cannot transmit simultaneously.
4. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
5. Chose the maximum power density to do MPE analysis.

Conclusion:

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