MPE REPORT

FCC ID: 2AKXB-W0202200

Date of issue: June 26, 2019

Report Number:	MTi190614E107
Sample Description:	SwitchBot Hub Mini
Model(s):	W0202200, W0202201, W0202202, W0202203, W0202204, W0202205
Applicant:	WoCao Technology (Shenzhen) Co., Ltd.
Address:	Baoanzhigu A510, Yintian Rd, Xixiang, Bao'an, Shenzhen, Guangdong, China
Date of Test:	June 04, 2019 to June 26, 2019

Shenzhen Microtest Co., Ltd.

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TEST RESULT CERTIFICATION	
Applicant's name:	WoCao Technology (Shenzhen) Co., Ltd.
Address:	Baoanzhigu A510, Yintian Rd, Xixiang, Bao'an, Shenzhen, Guangdong, China
Manufacture's Name:	WoCao Technology (Shenzhen) Co., Ltd.
Address:	Baoanzhigu A510, Yintian Rd, Xixiang, Bao'an, Shenzhen, Guangdong, China
Product name:	SwitchBot Hub Mini
Trademark:	SwitchBot
Model and/or type reference .:	W0202200
Serial Model.....:	W0202201, W0202202, W0202203, W0202204, W0202205
RF Exposure Procedures.....:	KDB 447498 D01 v06

This device described above has been tested by Shenzhen Microtest Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by: Jone.Lee

Jone Lee June 26, 2019

Reviewed by: Blue.Zheng

Blue Zheng June 26, 2019

Approved by: Smith Chen

Smith Chen June 26, 2019

RF EXPOSURE EVALUATION

According to FCC 1.1310: 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 §1.1307(b)

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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

Friis transmission formula: $Pd= (Pout*G)\ (4*pi*R^2)$

Where

Pd= Power density in mW/cm2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1415926

R= distance between observation point and center of the radiator in cm(20cm)

Pd the limit of MPE, 1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

BLE GFSK: 2402-2480MHz,

Power density limited: 1mW/ cm^2

Antenna Type: PIFA Antenna;
BLE /WIFI antenna gain: 3.66dBi

R=20cm

mW=10^(dBm/10)

antenna gain Numeric=10^(dBi/10)= 10^(3.66/10)=2.32

WIFI:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	Numeric		
		Ant A	Ant A	Ant A	Ant A	Ant A	Ant A	
2412	802.11b	10.29	10±1	11	12.589254	2.32	0.00581	1
2437		9.78	10±1	11	12.589254	2.32	0.00581	1
2462		10.96	10±1	11	12.589254	2.32	0.00581	1
2412	802.11g	8.31	9±1	10	10	2.32	0.00462	1
2437		8.69	9±1	10	10	2.32	0.00462	1
2462		9.3	9±1	10	10	2.32	0.00462	1
2412	802.11n H20	8.31	9±1	10	10	2.32	0.00462	1
2437		8.69	9±1	10	10	2.32	0.00462	1
2462		9.3	9±1	10	10	2.32	0.00462	1

BLE:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	-5.689	-6±1	-5	0.316	3.66	2.32	0.0001	1
2440		-5.573	-6±1	-5	0.316	3.66	2.32	0.0001	1
2480		-6.113	-6±1	-5	0.316	3.66	2.32	0.0001	1

Simultaneous transmit:

BLE+ 2.4G WiFi =0.0001+0.00581=0.00591mW/cm2

Conclusion: PASS

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