



SPORTON International Inc.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
Ph: 886-3-327-3456 / FAX: 886-3-327-0973 / www.sporton.com.tw

Project No: CB10610333

Maximum Permissible Exposure Report

Applicant's company	Ubiquiti Networks, Inc.
Applicant Address	685 Third Avenue, 27th Floor New York, New York 10017 USA
FCC ID	SWX-UAPXG
Manufacturer's company	Ubiquiti Networks, Inc.
Manufacturer Address	685 Third Avenue, 27th Floor New York, New York 10017 USA

Product Name	UniFi Access Point
Brand Name	UBIQUITI
Model Name	UAP-XG
Ref. Standard(s)	47 CFR FCC Part 2 Subpart J, section 2.1091
Received Date	May 02, 2017
Final Test Date	Sep. 22, 2017
Submission Type	Original Equipment

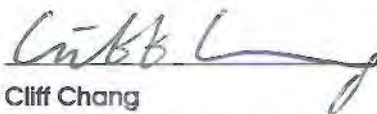

Cliff Chang
SPORTON INTERNATIONAL INC.



Table of Contents

1. GENERAL DESCRIPTION.....	1
1.1. EUT General Information	1
1.2. Testing Location.....	1
2. MAXIMUM PERMISSIBLE EXPOSURE.....	2
2.1. Limit of Maximum Permissible Exposure	2
2.2. MPE Calculation Method	3
2.3. Calculated Result and Limit.....	3

PHOTOGRAPHS OF EUT V01

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA661623-08	Rev. 01	Initial issue of report	Oct. 23, 2017

1. GENERAL DESCRIPTION

1.1. EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: DSSS (GFSK)

Note: This device contains transmitter 2.4GHz WLAN module FCC ID: SWX-M442G, 5GHz Band 1 ~ Band 2 module FCC ID: SWX-M445GL and 5GHz Band 3 ~ Band 4 module FCC ID: SWX-M445GH.

1.2. Testing Location

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

2. MAXIMUM PERMISSIBLE EXPOSURE

2.1. Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

2.2. MPE Calculation Method

The MPE was calculated at 27 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

2.3. Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For 5GHz Band 1 ~ Band 2

Contain Module FCC ID: SWX-M445GL

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11ac VHT40: 24.53 dBm

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
27	5230	8.00	6.3096	24.53	283.8166	0.1956	1	Complies

For 5GHz Band 3 ~ Band 4

Contain Module FCC ID: SWX-M445GH

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11a: 27.96 dBm

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
27	5825	8.00	6.3096	27.96	624.5291	0.4303	1	Complies

For 2.4GHz Band

Contain Module FCC ID: SWX-M442G

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11ac VHT40: 23.18 dBm

Distance (cm)	Test Freq. (MHz)	Directional Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
27	2437	12.02	15.9243	23.18	207.8346	0.3614	1	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

For Bluetooth:

FCC ID : SWX-UAPXG

Antenna Type : PIFA Antenna

Conducted Power for Bluetooth LE: 8.64 dBm

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
27	2480	1.00	1.2589	8.6400	7.3114	0.0010	1	Complies

Conclusion:

Both of the WLAN 2.4GHz Band, WLAN 5GHz Band 1 ~ Band 2, WLAN 5GHz Band 3 ~ Band 4 and Bluetooth 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

Therefore, the worst-case situation is $0.3614 / 1 + 0.0010 / 1 + 0.1956 / 1 + 0.4303 / 1 = 0.9883$, which is less than "1". This confirmed that the device complies.