RF Exposure Evaluation Report

APPLICANT	:	Ubiquiti Networks, Inc.
EQUIPMENT	:	Mesh Points
BRAND NAME	:	ULABS
MODEL NAME	:	AFi-P-HD
FCC ID	:	SWX-AFPHD
STANDARD	:	47 CFR Part 2.1091

We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA630314-01	Rev. 01	Initial issue of report	Jul. 26, 2016

1. Administration Data

1.1. Testing Laboratory

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Ubiquiti Networks, Inc.
Address	12F, No.105, Song Ren Rd.,SinYi District, Taipei 110,Taiwan

Manufacturer	
Company Name	Ubiquiti Networks, Inc.
Address	12F, No.105, Song Ren Rd.,SinYi District, Taipei 110,Taiwan

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Mesh Points
Brand Name	ULABS
Model Name	AFi-P-HD
FCC ID	SWX-AFPHD
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	・802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 ・Bluetooth EDR/LE
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. Maximum RF average output power among production units

Mode / Band	Average Power (dBm)			
	EDR			LE
	1Mbps	2Mbps	3Mbps	
2.4 GHz Bluetooth	0	0	0	0

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)			
		Ant 1+2+3			
		11b	11g	HT20	HT40
2.4GHz Band	2412	**27.0**	20.0	20.0	
	2422				18.0
	2437	26.5	20.0	20.0	22.0
	2452				16.5
	2462	26.5	19.5	20.0	

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)					
		Ant 1+2+3					
		11a	HT20	HT40	VHT20	VHT40	VHT80
5.2GHz Band	5180	24.0	23.0		23.0		
	5190			17.5		17.5	
	5200				25.0		
	5210						13.5
	5220	24.5	25.0				
	5230			**26.0**		26.0	
	5240	25.0	25.0		25.0		
5.8GHz Band	5745	23.5	20.5		20.5		
	5755			22.0		22.0	
	5775						20.5
	5785	21.0	20.0		20.0		
	5795			22.5		22.5	
	5825	23.0	22.5		22.5		

Note : The Max Average Power for WLAN 2.4GHz/5GHz within the table are for MIMO mode.

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)	Power Density / Limit
Bluetooth	2402.0	1.00	0.00	1.000	0.001	1.259	0.0003	1.000	0.0003
2.4GHz WLAN	2412.0	5.00	27.00	32.000	1.585	1584.893	0.315	1.000	0.315
5GHz WLAN	5230.0	5.00	26.00	31.000	1.259	1258.925	0.251	1.000	0.251

5.2. Collocated Power Density Calculation

WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ(Power Density / Limit) of WLAN+Bluetooth
0.315	0.0003	0.3153

Note:

1. ∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WLAN + Bluetooth.
2. Considering the WLAN module collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

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