RF Exposure Evaluation Report

APPLICANT	:	Ubiquiti Networks, Inc.
EQUIPMENT	:	NanoStation AC Loco
BRAND NAME	:	UBIQUITI
MODEL NAME	:	NS-5ACL
FCC ID	:	SWX-NS5ACLW
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 / Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA720828-03	Rev. 01	Initial issue of report	Nov. 09, 2017

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	685 Third Avenue, 27th Floor New York, New York 10017 USA

Manufacturer	
Company Name	Ubiquiti Networks, Inc.
Address	685 Third Avenue, 27th Floor New York, New York 10017 USA

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	NanoStation AC Loco
Brand Name	UBIQUITI
Model Name	NS-5ACL
FCC ID	SWX-NS5ACLW
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 ~ 5840 MHz
Mode	802.11b/g/n/ac HT20/HT40/VHT10/VHT20/VHT30/VHT40/VHT50/VHT60/VHT80
EUT Stage	Identical Prototype
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. Variant report to enable 5.3/5.5GHz WLAN.	

3. Maximum RF average output power among production units

Mode	Maximum Average power(dBm)
5.3GHz WLAN	17.0
5.5GHz WLAN	16.5

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 25 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 25cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
5.3GHz WLAN	5260.0	13.00	17.00	30.000	1.000	1000.000	0.127	1.000	0.127
5.5GHz WLAN	5500.0	13.00	16.50	29.500	0.891	891.251	0.114	1.000	0.114

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band
2. This is a variant report to enable 5.3GHz / 5.5GHz WLAN operation and the 5.3GHz / 5.5GHz WLAN evaluation please refer above table, for standalone power density of 2.4GHz / 5.2GHz / 5.8GHz WLAN is 0.007 W/m^2, 0.914 W/m^2 and 0.502 W/m^2, the detail evaluation of 2.4GHz / 5.2GHz /5.8GHz WLAN which can referred to the Original Report, Report No: FA720828-02.

5.2. Collocated Power Density Calculation

2.4GHz WLAN Power Density / Limit	5GHz WLAN Power Density / Limit	∑(Power Density / Limit) of 2.4GHz WLAN + 5GHz WLAN
0.007	0.914	0.921

Note:

1. 2.4GHz WLAN and 5GHz WLAN can transmit simultaneously.
2. The table above has considered the collocation of power density for all radio transmitters, for WLAN 2.4GHz and WLAN 5.2GHz / 5.8GHz power density can refer to Sporton RF Exposure Evaluation Original Report, Report No: FA720828-02.
3. ∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for 2.4GHz WLAN + 5GHz WLAN.
4. Considering the WLAN 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.