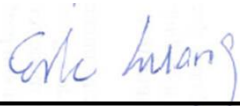


# RF Exposure Evaluation Report

APPLICANT : Ubiquiti Networks, Inc.  
EQUIPMENT : NanoBeam AC  
BRAND NAME : UBIQUITI  
MODEL NAME : NBE-5AC-Gen2  
FCC ID : SWX-NBE5ACG2W  
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



## 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   |
|-------------|---------|-------------------------|---------------|
| FA561115-03 | Rev. 01 | Initial issue of report | Sep. 04, 2017 |
|             |         |                         |               |
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**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.)<br>TEL: +886-3-327-3456<br>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                                | NanoBeam AC                                                                                                             |
| Brand Name                              | UBIQUITI                                                                                                                |
| Model Name                              | NBE-5AC-Gen2                                                                                                            |
| FCC ID                                  | SWX-NBE5ACG2W                                                                                                           |
| Wireless Technology and Frequency Range | WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz<br>WLAN 5.2GHz Band: 5160 MHz ~ 5245 MHz<br>WLAN 5.8GHz Band: 5735 MHz ~ 5840 MHz |
| Mode                                    | 802.11a/b/g/n/ac HT20/HT40/VHT10/VHT20/VHT30/VHT40/VHT50/VHT60/VHT80                                                    |
| 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        | Maximum Average Power (dBm) |
|-------------|-----------------------------|
| 2.4GHz WLAN | 16.0                        |
| 5GHz WLAN   | 23.0                        |



#### **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 <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3-3.0                                                        | 614                           | 1.63                          | *(100)                              | 6                        |
| 3.0-30                                                         | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | 6                        |
| 30-300                                                         | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1500                                                       |                               |                               | f/300                               | 6                        |
| 1500-100,000                                                   |                               |                               | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34                                                       | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34-30                                                        | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 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 29 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 29cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Power Density / Limit |
|-------------|-----------------|--------------------|---------------------|--------------------|------------------|-------------------|---------------------------------------------|-----------------------------|-----------------------|
| 2.4GHz WLAN | 2412.0          | 2.00               | 16.00               | 18.000             | 0.063            | 63.096            | 0.006                                       | 1.000                       | 0.006                 |
| 5GHz WLAN   | 5160.0          | 17.00              | 23.00               | 40.000             | 10.000           | 10000.000         | 0.947                                       | 1.000                       | 0.947                 |

**Note:** For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band

### **5.2. Collocated Power Density Calculation**

| 2.4GHz WLAN<br>Power Density / Limit | 5GHz WLAN<br>Power Density / Limit | $\Sigma$ (Power Density / Limit)<br>of<br>2.4GHz WLAN + 5GHz WLAN |
|--------------------------------------|------------------------------------|-------------------------------------------------------------------|
| 0.006                                | 0.947                              | 0.953                                                             |

**Note:**

1.  $\Sigma$ (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
2. Considering all 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.