# RF Exposure Evaluation Report

| | | |
|---|---|---|
| APPLICANT | : | Ubiquiti Networks, Inc. |
| EQUIPMENT | : | NanoBeam® ac |
| BRAND NAME | : | UBIQUITI |
| MODEL NAME | : | NBE-2AC-13 |
| FCC ID | : | SWX-NBE2AC13 |
| 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.***
***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 |
|---|---|---|---|
| FA5D3042 | Rev. 01 | Initial issue of report | Jan. 26, 2016 |
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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 | 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** | NanoBeam® ac |
| **Brand Name** | UBIQUITI |
| **Model Name** | NBE-2AC-13 |
| **FCC ID** | SWX-NBE2AC13 |
| **Wireless Technology and Frequency Range** | WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz |
| **Mode** | • 802.11ac VHT20(10MHz)/VHT20/VHT40 |
| **Antenna Type** | Dish Antenna |
| **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 | Channel | Frequency | Transmit Path | Upper Limit |
|---|---|---|---|---|
| 802.11ac VHT20(10M) MIMO Ant 0+1 | CH 01 | 2412 MHz | 0+1 | 22.0 |
| | CH 06 | 2437 MHz | 0+1 | 22.0 |
| | CH 11 | 2462 MHz | 0+1 | 22.0 |
| 802.11ac VHT20 MIMO Ant 0+1 | CH 01 | 2412 MHz | 0+1 | 16.5 |
| | CH 06 | 2437 MHz | 0+1 | 22.0 |
| | CH 11 | 2462 MHz | 0+1 | 13.0 |
| 802.11ac VHT40 MIMO Ant 0+1 | CH 03 | 2422 MHz | 0+1 | 11.0 |
| | CH 06 | 2437 MHz | 0+1 | 15.5 |
| | CH 09 | 2452 MHz | 0+1 | 8.5 |

# 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 22 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. Power Density Calculation

| Band | Frequency (MHz) | Antenna Gain (dBi) | Maximum Power (dBm) | Maximum EIRP (dBm) | Maximum EIRP (W) | Average EIRP (mW) | Power Density at 22cm (mW/cm^2) | Limit (mW/cm^2) |
|---|---|---|---|---|---|---|---|---|
| 2.4GHz WLAN | 2412.0 | 13.0 | 22.0 | 35.000 | 3.162 | 3162.278 | 0.520 | 1.000 |

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

## Conclusion:

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