

## RF Exposure Report

**Report No.:** SA180614E09A

**FCC ID:** PY318100406

**Test Model:** Otter

**Received Date:** July 10, 2018

**Test Date:** July 10 to 27, 2018

**Issued Date:** Aug. 10, 2018

**Applicant:** NETGEAR, Inc.

**Address:** 350 East Plumeria Drive San Jose, CA 95134

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

| Issue No.    | Description       | Date Issued   |
|--------------|-------------------|---------------|
| SA180614E09A | Original release. | Aug. 10, 2018 |

## 1 Certificate of Conformity

**Product:** WiFi Device

**Brand:** NETGEAR

**Test Model:** Otter

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** NETGEAR, Inc.

**Test Date:** July 10 to 27, 2018

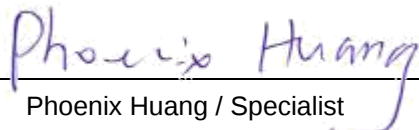
**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :**

  
Phoenix Huang / Specialist

**Date:**

Aug. 10, 2018

**Approved by :**

  
May Chen / Manager

**Date:**

Aug. 10, 2018

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

| Frequency Range (MHz)                                 | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
|-------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| Limits For General Population / Uncontrolled Exposure |                               |                               |                                     |                        |
| 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                     |

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 32cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

| For WLAN            |                                         |                       |              |                |                   |
|---------------------|-----------------------------------------|-----------------------|--------------|----------------|-------------------|
| Antenna No.         | Ant. Gain (dBi)<br>(include cable loss) | Frequency range (GHz) | Antenna Type | Connector Type | Cable Length (mm) |
| Dual band (Black)   | 3.46                                    | 2.4 ~ 2.4835          | Dipole       | i-pex(MHF)     | 214               |
|                     | 2.99                                    | 5.15~5.25             |              |                |                   |
|                     | 2.99                                    | 5.25~5.35             |              |                |                   |
| Dual band (Red)     | 2.73                                    | 2.4 ~ 2.4835          | Dipole       | i-pex(MHF)     | 156               |
|                     | 2.44                                    | 5.15~5.25             |              |                |                   |
|                     | 2.44                                    | 5.25~5.35             |              |                |                   |
| 5G Antenna (Blue)   | 3.31                                    | 5.47~5.725            | Dipole       | i-pex(MHF)     | 125               |
|                     | 2.65                                    | 5.725~5.85            |              |                |                   |
| 5G Antenna (Yellow) | 2.26                                    | 5.47~5.725            | Dipole       | i-pex(MHF)     | 70                |
|                     | 3.24                                    | 5.725~5.85            |              |                |                   |
| For Bluetooth       |                                         |                       |              |                |                   |
| Antenna No.         | Ant. Gain (dBi)<br>(include cable loss) | Frequency range (GHz) | Antenna Type | Connector Type | Cable Length (mm) |
| Antenna (White)     | 3.32                                    | 2.4 ~ 2.5             | PIFA         | i-pex(MHF)     | 200               |

## 2.5 Calculation Result

For 2.4GHz, 5GHz (U-NII-1 band and U-NII-3 band) and Bluetooth data was copied from the original test report (Report No.: SA180614E09)

| Operation Mode       | Evaluation Frequency (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|----------------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| WLAN 2.4GHz          | 2437                       | 989.7          | 6.11               | 32            | 0.31405                             | 1                           |
| WLAN 5GHz (U-NII-1)  | 5200                       | 907.203        | 5.73               | 32            | 0.26375                             | 1                           |
| WLAN 5GHz (U-NII-2A) | 5270                       | 244.502        | 5.73               | 32            | 0.07108                             | 1                           |
| WLAN 5GHz (U-NII-2C) | 5580                       | 250.042        | 5.81               | 32            | 0.07405                             | 1                           |
| WLAN 5GHz (U-NII-3)  | 5795                       | 936.671        | 5.96               | 32            | 0.28713                             | 1                           |
| Bluetooth            | 2480                       | 7.568          | 3.32               | 32            | 0.00126                             | 1                           |

Note:

2.4GHz: Directional gain =  $10 \log[(10^{\text{Chain0/20}} + 10^{\text{Chain1/20}})^2 / 2] = 6.11\text{dBi}$

5GHz:

U-NII-1, U-NII-2A band: Directional gain =  $10 \log[(10^{\text{Chain0/20}} + 10^{\text{Chain1/20}})^2 / 2] = 5.73\text{dBi}$

U-NII-2C band: Directional gain =  $10 \log[(10^{\text{Chain0/20}} + 10^{\text{Chain1/20}})^2 / 2] = 5.81\text{dBi}$

U-NII-3 band: Directional gain =  $10 \log[(10^{\text{Chain0/20}} + 10^{\text{Chain1/20}})^2 / 2] = 5.96\text{dBi}$

### Conclusion:

The formula of calculated the MPE is:

$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

$\text{WLAN 2.4GHz} + \text{WLAN 5GHz (U-NII-1)} + \text{WLAN 5GHz (U-NII-3)} + \text{Bluetooth} = 0.31405 / 1 + 0.26375 / 1 + 0.28713 / 1 + 0.00126 / 1 = 0.86619$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

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