

## RF Exposure Report

**Report No.:** SA161125E01

**FCC ID:** PY316400361

**Test Model:** RBW30

**Received Date:** Nov. 25, 2016

**Test Date:** Dec. 21, 2016 to Jan. 07, 2017

**Issued Date:** Feb. 10, 2017

**Applicant:** NETGEAR, Inc.

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

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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### Release Control Record

| Issue No.   | Description       | Date Issued   |
|-------------|-------------------|---------------|
| SA161125E01 | Original release. | Feb. 10, 2017 |

## 1 Certificate of Conformity

**Product:** Orbi Wall Plug Satellite

**Brand:** NETGEAR

**Test Model:** RBW30

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** NETGEAR, Inc.

**Test Date:** Dec. 21, 2016 to Jan. 07, 2017

**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 :** Wendy Wu , **Date:** Feb. 10, 2017  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Feb. 10, 2017  
May Chen / Manager

## 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 |                               |                               |                                     |                        |
| 300-1500  | ...                           | ...                           | F/1500                              | 30                     |
| 1500-100,000  | ...                           | ...                           | 1.0                                 | 30                     |

F = Frequency in MHz

### 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 23cm away from the body of the user.

So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

| <b>WLAN (Radio 1) Antenna</b>      |                |                       |              |                |
|------------------------------------|----------------|-----------------------|--------------|----------------|
| Antenna No.                        | Ant. Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type |
| 1                                  | 3              | 2.4~2.4835            | PIFA         | NA             |
|                                    | 4.5            | 5.47~5.725            |              |                |
|                                    | 4.4            | 5.725~5.85            |              |                |
| 2                                  | 3.5            | 2.4~2.4835            | PIFA         | NA             |
|                                    | 3.9            | 5.47~5.725            |              |                |
|                                    | 4              | 5.725~5.85            |              |                |
| <b>WLAN (Radio 2) Antenna</b>      |                |                       |              |                |
| Antenna No.                        | Ant. Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type |
| 3                                  | 3.6            | 5.15~5.25             | PIFA         | NA             |
|                                    | 3.7            | 5.25~5.35             |              |                |
| 4                                  | 3.2            | 5.15~5.25             | PIFA         | NA             |
|                                    | 3.3            | 5.25~5.35             |              |                |
| <b>Bluetooth (Radio 3) Antenna</b> |                |                       |              |                |
| Antenna No.                        | Ant. Gain(dBi) | Frequency range (GHz) | Antenna Type | Connector Type |
| 5                                  | 2.1            | 2.4~2.4835            | Chip         | NA             |

## Directional gain table

| Frequency (MHz) | Max Gain (dBi) |
|-----------------|----------------|
| 2412-2462       | 5.99           |
| 5180-5240       | 3.81           |
| 5745-5825       | 5.52           |

## Note:

1. Non-TxBF mode & TxBF mode antenna gain refer to KDB 662911 F 2) f) (ii)

$$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

$N_{SS}$  = the number of independent spatial streams of data;

$N_{ANT}$  = the total number of antennas

$g_{j,k} = 10^{G_k/20}$  if the  $k$ th antenna is being fed by spatial stream  $j$ , or zero if it is not;

$G_k$  is the gain in dBi of the  $k$ th antenna.

2. Above directional gain were calculated from actual measurement data.

## 2.5 Calculation Result of Maximum Conducted Power

### For Radio 1 (WLAN: Dual Band):

| Frequency (MHz) | Max. Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462       | 798.221         | 5.99               | 23            | 0.47693                             | 1                           |
| 5745-5825       | 567.608         | 5.52               | 23            | 0.30436                             | 1                           |

### For Radio 2 (WLAN: Single Band):

| Frequency (MHz) | Max. Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 5180-5240       | 309.071         | 3.81               | 23            | 0.11179                             | 1                           |

### For Radio 3 (BT-LE):

| Frequency (MHz) | Max. Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2402-2480       | 7.78            | 2.1                | 23            | 0.00190                             | 1                           |

### Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$$\text{WLAN 2.4GHz} + \text{WLAN 5GHz(UNII-3)} + \text{WLAN 5GHz(UNII-1)} + \text{BT-LE}$$

$$= 0.47693 / 1 + 0.30436 / 1 + 0.11179 / 1 + 0.00190 / 1$$

$$= 0.89498$$

Therefore the maximum calculations of above situations are less than the "1" limit.

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