

RF Exposure Report

Report No.: SA160205C08D

FCC ID: PY315300322

Test Model: EX6400

Received Date: Feb. 04, 2016

Test Date: Feb. 23 ~ Mar. 17, 2016 (For 2.4GHz and U-NII-1 Band)
May 13 ~ May 31, 2016 (For U-NII-3 Band)

Issued Date: Jun. 03, 2016

Applicant: NETGEAR, INC.

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

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Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)



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Release Control Record

| Issue No. | Description | Date Issued |
|--------------|-------------------|---------------|
| SA160205C08D | Original release. | Jun. 03, 2016 |

1 Certificate of Conformity

Product: AC1900 WiFi Range Extender

Brand: NETGEAR

Test Model: EX6400

Sample Status: Engineering sample

Applicant: NETGEAR, INC.

Test Date: Feb. 23 ~ Mar. 17, 2016 (For 2.4GHz and U-NII-1 Band)
May 13 ~ May 31, 2016 (For U-NII-3 Band)

Standards: FCC Part 2 (Section 2.1091)
KDB 447498 D01 (October 23, 2015)
IEEE C95.1

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 : Sub Li, **Date:** Jun. 03, 2016
Suntee Liu / Specialist

Approved by : Ken Liu, **Date:** Jun. 03, 2016
Ken Liu / Senior 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 ²) | 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

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 26cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Calculation Result of Maximum Conducted Power

CDD Mode

| Band | Modulation type | Frequency (MHz) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm ²) | Limit (mW/cm ²) |
|----------------|------------------|-----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2.4GHz | 802.11b | 2412 | 23.75 | 5.02 | 26 | 0.089 | 1 |
| | | 2437 | 25.48 | 5.57 | 26 | 0.150 | 1 |
| | | 2462 | 23.75 | 6.25 | 26 | 0.118 | 1 |
| | 802.11g | 2412 | 20.96 | 5.02 | 26 | 0.047 | 1 |
| | | 2437 | 25.58 | 5.57 | 26 | 0.153 | 1 |
| | | 2462 | 22.13 | 6.25 | 26 | 0.081 | 1 |
| | 802.11n (HT20) | 2412 | 19.75 | 5.02 | 26 | 0.035 | 1 |
| | | 2437 | 25.76 | 5.57 | 26 | 0.160 | 1 |
| | | 2462 | 19.95 | 6.25 | 26 | 0.049 | 1 |
| | 802.11n (HT40) | 2422 | 17.45 | 5.12 | 26 | 0.021 | 1 |
| | | 2437 | 19.85 | 5.57 | 26 | 0.041 | 1 |
| | | 2452 | 17.85 | 5.93 | 26 | 0.028 | 1 |
| 5GHz (U-NII-1) | 802.11a | 5180 | 27.13 | 8.60 | 26 | 0.440 | 1 |
| | | 5200 | 28.04 | 8.76 | 26 | 0.563 | 1 |
| | | 5240 | 27.39 | 9.01 | 26 | 0.514 | 1 |
| | 802.11ac (VHT20) | 5180 | 27.11 | 8.60 | 26 | 0.438 | 1 |
| | | 5200 | 27.90 | 8.76 | 26 | 0.546 | 1 |
| | | 5240 | 27.20 | 9.01 | 26 | 0.492 | 1 |
| | 802.11ac (VHT40) | 5190 | 25.66 | 8.64 | 26 | 0.317 | 1 |
| | | 5230 | 27.46 | 8.89 | 26 | 0.508 | 1 |
| | 802.11ac (VHT80) | 5210 | 25.76 | 8.87 | 26 | 0.342 | 1 |
| 5GHz (U-NII-3) | 802.11a | 5745 | 28.77 | 9.39 | 26 | 0.771 | 1 |
| | | 5785 | 28.76 | 9.56 | 26 | 0.800 | 1 |
| | | 5825 | 28.76 | 9.63 | 26 | 0.813 | 1 |
| | 802.11ac (VHT20) | 5745 | 28.72 | 9.39 | 26 | 0.762 | 1 |
| | | 5785 | 28.73 | 9.56 | 26 | 0.794 | 1 |
| | | 5825 | 28.75 | 9.63 | 26 | 0.811 | 1 |
| | 802.11ac (VHT40) | 5755 | 28.79 | 9.47 | 26 | 0.789 | 1 |
| | | 5795 | 28.80 | 9.61 | 26 | 0.816 | 1 |
| | 802.11ac (VHT80) | 5775 | 28.71 | 9.56 | 26 | 0.790 | 1 |

Note:

2412: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 5.02\text{dBi}$

2437: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 5.57\text{dBi}$

2462: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 6.25\text{dBi}$

2422: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 5.12\text{dBi}$

2452: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 5.93\text{dBi}$

5180: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.60\text{dBi}$

5200: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.76\text{dBi}$
5240: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.01\text{dBi}$
5190: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.64\text{dBi}$
5230: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.89\text{dBi}$
5210: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.87\text{dBi}$
5745: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.39\text{dBi}$
5785: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.56\text{dBi}$
5825: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.63\text{dBi}$
5755: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.47\text{dBi}$
5795: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.61\text{dBi}$
5775: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.56\text{dBi}$

Beamforming Mode

| Band | Modulation type | Frequency (MHz) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm ²) | Limit (mW/cm ²) |
|-------------------|------------------|-----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 5GHz (U-NII-1) | 802.11ac (VHT20) | 5180 | 26.99 | 8.60 | 26 | 0.426 | 1 |
| | | 5200 | 26.99 | 8.76 | 26 | 0.442 | 1 |
| | | 5240 | 26.89 | 9.01 | 26 | 0.458 | 1 |
| | 802.11ac (VHT40) | 5190 | 25.43 | 8.64 | 26 | 0.300 | 1 |
| | | 5230 | 27.07 | 8.89 | 26 | 0.464 | 1 |
| | 802.11ac (VHT80) | 5210 | 25.26 | 8.87 | 26 | 0.305 | 1 |
| 5GHz (U-NII-3) | 802.11ac (VHT20) | 5745 | 26.42 | 9.39 | 26 | 0.449 | 1 |
| | | 5785 | 26.43 | 9.56 | 26 | 0.468 | 1 |
| | | 5825 | 26.34 | 9.63 | 26 | 0.465 | 1 |
| | 802.11ac (VHT40) | 5755 | 26.49 | 9.47 | 26 | 0.464 | 1 |
| | | 5795 | 26.38 | 9.61 | 26 | 0.468 | 1 |
| | 802.11ac (VHT80) | 5775 | 26.41 | 9.56 | 26 | 0.465 | 1 |

Note:

5180: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.60\text{dBi}$
5200: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.76\text{dBi}$
5240: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.01\text{dBi}$
5190: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.64\text{dBi}$
5230: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.89\text{dBi}$
5210: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 8.87\text{dBi}$
5745: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.39\text{dBi}$
5785: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.56\text{dBi}$
5825: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.63\text{dBi}$
5755: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.47\text{dBi}$
5795: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.61\text{dBi}$
5775: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N] = 9.56\text{dBi}$

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

WLAN 2.4GHz + WLAN 5GHz = 0.160 + 0.816 = 0.976

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

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