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RF Exposure Report

Report No.: SA160205C08A

FCC ID: PY315300322

Test Model: EX6400

Received Date: Feb. 04, 2016

Test Date: Feb. 23 ~ Mar. 17, 2016

Issued Date: Apr. 08, 2016

Applicant: NETGEAR, INC.

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

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
SA160205C08A	Original release.	Apr. 08, 2016



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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

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 : *Suntee Liu* , **Date:** Apr. 08, 2016
Suntee Liu / Specialist

Approved by : *Ken Liu* , **Date:** Apr. 08, 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

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

where

Pd = power density in mW/cm²

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 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	27.20	9.39	26	0.537
5785			28.76	9.56	26	0.800	1
5825			27.35	9.63	26	0.587	1
802.11ac (VHT20)		5745	27.07	9.39	26	0.521	1
		5785	28.73	9.56	26	0.794	1
		5825	27.22	9.63	26	0.570	1
802.11ac (VHT40)		5755	25.83	9.47	26	0.399	1
		5795	26.33	9.61	26	0.462	1
802.11ac (VHT80)		5775	25.58	9.56	26	0.384	1

Note:

2412: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N]$ = 5.02dBi

2437: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N]$ = 5.57dBi

2462: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N]$ = 6.25dBi

2422: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N]$ = 5.12dBi

2452: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N]$ = 5.93dBi

5180: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N]$ = 8.60dBi



- 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	26.31	9.39	26	0.437	1
		5785	26.28	9.56	26	0.452	1
		5825	26.33	9.63	26	0.464	1
	802.11ac (VHT40)	5755	25.57	9.47	26	0.376	1
		5795	26.30	9.61	26	0.459	1
		802.11ac (VHT80)	5775	25.41	9.56	26	0.370

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 + 0.800 = 0.960

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

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