RF Exposure Report

Report No.: SA160205C08I

FCC ID: PY315200317

Test Model: EX7300

Received Date: Nov. 01, 2016

Test Date: Dec. 02 ~ Dec. 27, 2016

Issued Date: Dec. 27, 2016

Applicant: NETGEAR, INC.

Address: 350 East Plumeria Drive San Jose, CA 95134

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
SA160205C08I	Original release.	Dec. 27, 2016

1 Certificate of Conformity

Product: Nighthawk X4 AC2200 WiFi Range Extender

Brand: NETGEAR

Test Model: EX7300

Sample Status: Engineering sample

Applicant: NETGEAR, INC.

Test Date: Dec. 02 ~ Dec. 27, 2016

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 : _____ , **Date:** Dec. 27, 2016
Suntee Liu / Specialist

Approved by : _____ , **Date:** Dec. 27, 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/cm^2

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 29cm 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)
2412~2462Hz	802.11b	2412	25.56	7.16	29	0.177	1
		2437	27.25	7.69	29	0.295	1
		2462	25.53	8.27	29	0.227	1
	802.11g	2412	22.85	7.16	29	0.095	1
		2437	27.36	7.69	29	0.303	1
		2462	24.06	8.27	29	0.162	1
	802.11n (HT20)	2412	21.71	7.16	29	0.073	1
		2437	27.50	7.69	29	**0.313**	1
		2462	21.95	8.27	29	0.100	1
	802.11n (HT40)	2422	19.31	7.30	29	0.043	1
		2437	21.68	7.69	29	0.082	1
		2452	19.88	8.07	29	0.059	1
5180~5240MHz	802.11a	5180	27.13	8.60	29	0.354	1
		5200	28.04	8.76	29	0.453	1
		5240	27.39	9.01	29	0.413	1
	802.11ac (VHT20)	5180	27.11	8.60	29	0.352	1
		5200	27.90	8.76	29	0.439	1
		5240	27.20	9.01	29	0.395	1
	802.11ac (VHT40)	5190	25.66	8.64	29	0.255	1
		5230	27.46	8.89	29	0.408	1
	802.11ac (VHT80)	5210	25.76	8.87	29	0.275	1
5250~5350MHz	802.11a	5260	20.35	9.01	29	0.082	1
		5300	20.43	8.98	29	0.083	1
		5320	20.41	9.08	29	0.084	1
	802.11ac (VHT20)	5260	20.51	9.01	29	0.085	1
		5300	20.54	8.98	29	0.085	1
		5320	20.48	9.08	29	0.086	1
	802.11ac (VHT40)	5270	22.00	9.01	29	0.119	1
		5310	21.44	9.08	29	0.107	1
	802.11ac (VHT80)	5290	21.01	8.98	29	0.094	1
5470~5725MHz	802.11a	5500	20.48	8.97	29	0.083	1
		5580	20.42	9.13	29	0.085	1
		5700	20.49	9.41	29	0.092	1
	802.11ac (VHT20)	5500	20.44	8.97	29	0.083	1
		5580	20.48	9.13	29	0.086	1
		5700	20.47	9.41	29	0.092	1
	802.11ac (VHT40)	5510	21.27	9.05	29	0.102	1
		5550	21.76	9.28	29	0.120	1
		5670	22.22	9.39	29	0.137	1
	802.11ac (VHT80)	5530	23.87	9.17	29	0.191	1
		5610	23.75	9.31	29	0.191	1
5745~5825MHz	802.11a	5745	28.77	9.39	29	0.619	1
		5785	28.76	9.56	29	0.643	1
		5825	28.76	9.63	29	0.653	1
	802.11ac (VHT20)	5745	28.72	9.39	29	0.612	1
		5785	28.73	9.56	29	0.638	1
		5825	28.75	9.63	29	0.652	1
	802.11ac (VHT40)	5755	28.79	9.47	29	0.634	1
		5795	28.80	9.61	29	**0.656**	1
	802.11ac (VHT80)	5775	28.71	9.56	29	0.635	1

Beamforming Mode

Band	Modulation type	Frequency (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5180~5240MHz	802.11ac (VHT20)	5180	26.99	8.60	29	0.343	1
		5200	26.99	8.76	29	0.356	1
		5240	26.89	9.01	29	0.368	1
	802.11ac (VHT40)	5190	25.43	8.64	29	0.242	1
		5230	27.07	8.89	29	0.373	1
	802.11ac (VHT80)	5210	25.26	8.87	29	0.245	1
5250~5350MHz	802.11ac (VHT20)	5260	20.51	9.01	29	0.085	1
		5300	20.54	8.98	29	0.085	1
		5320	20.48	9.08	29	0.086	1
	802.11ac (VHT40)	5270	20.50	9.01	29	0.085	1
		5310	20.44	9.08	29	0.085	1
	802.11ac (VHT80)	5290	19.73	8.98	29	0.070	1
5470~5725MHz	802.11ac (VHT20)	5500	20.44	8.97	29	0.083	1
		5580	20.48	9.13	29	0.086	1
		5700	20.47	9.41	29	0.092	1
	802.11ac (VHT40)	5510	20.71	9.05	29	0.090	1
		5550	20.66	9.28	29	0.093	1
		5670	20.58	9.39	29	0.094	1
	802.11ac (VHT80)	5530	20.68	9.17	29	0.091	1
		5610	20.63	9.31	29	0.093	1
5745~5825MHz	802.11ac (VHT20)	5745	26.42	9.39	29	0.361	1
		5785	26.43	9.56	29	0.376	1
		5825	26.34	9.63	29	0.374	1
	802.11ac (VHT40)	5755	26.49	9.47	29	0.373	1
		5795	26.38	9.61	29	0.376	1
	802.11ac (VHT80)	5775	26.41	9.56	29	0.374	1

Note:

2412MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 7.16dBi$
2437MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 7.69dBi$
2462MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.27dBi$
2422MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 7.30dBi$
2452MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.07dBi$
5180MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.60dBi$
5200MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.76dBi$
5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 9.01dBi$
5190MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.64dBi$
5230MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.89dBi$
5210MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.87dBi$
5260MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 9.01dBi$
5300MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.98dBi$
5320MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 9.08dBi$
5270MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 9.01dBi$
5310MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 9.08dBi$
5290MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] = 8.98dBi$

5500MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 8.97dBi
5580MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.13dBi
5700MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.41dBi
5510MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.05dBi
5550MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.28dBi
5670MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.39dBi
5530MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.17dBi
5610MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.31dBi
5745MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.39dBi
5785MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.56dBi
5825MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.63dBi
5755MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.47dBi
5795MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.61dBi
5775MHz: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/N] = 9.56dBi

Conclusion:
The formula of calculated the MPE is:
CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = 0.313 + 0.656 = 0.969 < 1

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