

## 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 :** Sunt Lee , **Date:** Dec. 27, 2016  
Sunt Lee / Specialist

**Approved by :** Ken Liu , **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 <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

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

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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	<b>0.313</b>	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	<b>0.656</b>	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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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 =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 7.16\text{dBi}$   
2437MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 7.69\text{dBi}$   
2462MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.27\text{dBi}$   
2422MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 7.30\text{dBi}$   
2452MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.07\text{dBi}$   
5180MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.60\text{dBi}$   
5200MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.76\text{dBi}$   
5240MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 9.01\text{dBi}$   
5190MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.64\text{dBi}$   
5230MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.89\text{dBi}$   
5210MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.87\text{dBi}$   
5260MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 9.01\text{dBi}$   
5300MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.98\text{dBi}$   
5320MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 9.08\text{dBi}$   
5270MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 9.01\text{dBi}$   
5310MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 9.08\text{dBi}$   
5290MHz: Directional gain =  $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N] = 8.98\text{dBi}$

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

---END---