



# RF EXPOSURE REPORT

**REPORT NO.:** SA141117E18E

**MODEL NO.:** EX6120

**FCC ID:** PY315200308

**RECEIVED:** Nov. 17, 2014

**TESTED:** Dec. 17, 2014 to Jan. 06, 2015

**ISSUED:** June 25, 2015

**APPLICANT:** NETGEAR, Inc.

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA141117E18E	Original release	June 25, 2015



## 1. CERTIFICATION

**PRODUCT:** Wi-Fi Range Extender  
**BRAND NAME:** NETGEAR  
**MODEL NO.:** EX6120  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** NETGEAR, Inc.  
**TESTED:** Dec. 17, 2014 to Jan. 06, 2015  
**STANDARDS:** FCC Part 2 (Section 2.1091)  
KDB 447498 D03  
IEEE C95.1

The above equipment (Model: EX6120) 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 :** Midoli Peng , **Date:** June 25, 2015  
( Midoli Peng, Specialist )

**Approved by :** May Chen , **Date:** June 25, 2015  
( May Chen, Manager )

## 2. RF EXPOSURE LIMIT

### 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)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 3. 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

### 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Ant. No.	Brand	Model	Antenna Gain(dBi) <including cable loss>	Frequency range (GHz ~ GHz)	Antenna Type	Connector Type	Cable Length (mm)
Antenna R	NETGEAR	NA	3.1	2.4~2.4835	Dipole	i-pec (MHF)	35
			3	5.15~5.25			
			3.2	5.25~5.35			
			3.2	5.47~5.725			
			3.3	5.725~5.85			
Antenna L	NETGEAR	NA	3.2	2.4~2.4835	Dipole	i-pec (MHF)	75
			4	5.15~5.25			
			4	5.25~5.35			
			3.9	5.47~5.725			
			3.1	5.725~5.85			

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247(2.4GHz):

### 802.11b

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 ~ 2462	326.715	6.16	20	0.26847	1

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.16\text{dBi}$

### 802.11g

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 ~ 2462	616.958	6.16	20	0.50697	1

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.16\text{dBi}$

### 802.11n (HT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 ~ 2462	583.627	6.16	20	0.47958	1

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.16\text{dBi}$

### 802.11n (HT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2422 ~ 2452	419.89	6.16	20	0.34504	1

Note: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.16\text{dBi}$

**For 15.407 (5GHz\_U-NII-1):**
**802.11a**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 ~ 5240	306.426	6.52	20	0.27356	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**802.11ac (VHT20)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 ~ 5240	281.177	6.52	20	0.25102	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**802.11ac (VHT40)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5190 ~ 5230	135.02	6.52	20	0.12054	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**802.11ac (VHT80)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5210	34.846	6.52	20	0.03111	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$



For 15.407 (5GHz\_U-NII-3):

**802.11a**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 ~ 5825	292.567	6.52	20	0.24319	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**802.11ac (VHT20)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 ~ 5825	281.355	6.52	20	0.23387	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**802.11ac (VHT40)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5755 ~ 5795	152.769	6.52	20	0.12699	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**802.11ac (VHT80)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5775	45.764	6.52	20	0.03804	1

**Note:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.52\text{dBi}$

**CONCLUSION:**

Both of the 2.4GHz and 5GHz WLAN can transmit simultaneously, the formula of calculated the MPE is:

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is  $0.50697 / 1 + 0.27356 / 1 = 0.781$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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