



## RF Exposure Report

**Report No.:** SA150430E02A

**FCC ID:** PY315200309

**Test Model:** R8500

**Received Date:** June 29, 2015

**Test Date:** July 06, 2015

**Issued Date:** July 31, 2015

**Applicant:** NETGEAR, Inc.

**Address:** 350 East Plumeria Drive San Jose, CA 95134

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

**Lab Address:** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

**Test Location (1):** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

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### Release Control Record

Issue No.	Description	Date Issued
SA150430E02A	Original release.	July 31, 2015



## 1 Certificate of Conformity

**Product:** Nighthawk X8 Tri Band WiFi Router

**Brand:** NETGEAR

**Test Model:** R8500

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** NETGEAR, Inc.

**Test Date:** July 06, 2015

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D03

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 :** \_\_\_\_\_

*m-doli*  
( Midoli Peng, Specialist )

**Date:** \_\_\_\_\_

July 31, 2015

**Approved by :** \_\_\_\_\_

*May Chen*  
( May Chen, Manager )

**Date:** \_\_\_\_\_

July 31, 2015

## 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

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

where

Pd = power density in mW/cm<sup>2</sup>

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 43cm away from the body of the user.

So, this device is classified as **Mobile Device**.

### 3 Antenna Gain

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

Antenna No.	Ant. Gain(dBi)	Frequency range (GHz to GHz)	Antenna Type	Connector Type
Internal (1)	3.99	5.15~5.25GHz	Dipole	i-pex(MHF)
Internal (2)	3.71	5.25~5.35GHz	Dipole	i-pex(MHF)
Internal (3)	3.71	5.47~5.725GHz	Dipole	i-pex(MHF)
Internal (4)	3.98	5.725~5.85GHz	Dipole	i-pex(MHF)
External (1)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)
External (2)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)
External (3)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)
External (4)	0.67	2.4~2.4835GHz	Dipole	i-pex(MHF)
	-0.84	5.15~5.25GHz	Dipole	i-pex(MHF)
	-1.38	5.25~5.35GHz	Dipole	i-pex(MHF)
	-1.6	5.47~5.725GHz	Dipole	i-pex(MHF)
	-1.79	5.725~5.85GHz	Dipole	i-pex(MHF)

#### 4 Calculation Result of Maximum Conducted Power

##### For 15.247(2.4GHz) - With External antenna

<b>CDD Mode</b>					
Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	929.401	6.69	43	0.18666	1

  

<b>Beamforming Mode</b>					
Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	848.386	6.69	43	0.17039	1

NOTE:

Directional gain = 0.67dBi + 10log(4) = 6.69dBi

##### For 15.247(5GHz) - With Internal antenna

<b>CDD Mode</b>					
Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5745-5825	955.654	10	43	0.41129	1

  

<b>Beamforming Mode</b>					
Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5745-5825	388.868	10	43	0.16736	1

NOTE:

Directional gain = 3.98dBi + 10log(4) = 10dBi

##### For 15.407(5GHz) - With External antenna

<b>CDD Mode</b>					
Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	980.686	5.18	43	0.13912	1

  

<b>Beamforming Mode</b>					
Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	985.604	5.18	43	0.13982	1

NOTE:

Directional gain = -0.84dBi + 10log(4) = 5.18dBi

**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

Technology		
WLAN(2.4GHz) - External Antenna	WLAN(5GHz <5150~5250MHz>) - External Antenna	WLAN(5GHz <5725~5850MHz>) - Internal Antenna

Condition:  $0.18666 + 0.13982 + 0.41129 = 0.59795$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

**--- END ---**