

## RF Exposure Report

**Report No.:** SA160809C28

**FCC ID:** PY316200339

**Test Model:** R9000

**Received Date:** Aug. 05, 2016

**Test Date:** Aug. 12 ~ Sep. 09, 2016

**Issued Date:** Sep. 10, 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
SA160809C28	Original release.	Sep. 10, 2016

## 1 Certificate of Conformity

**Product:** AD7200 Smart WiFi Router

**Brand:** NETGEAR

**Test Model:** R9000

**Sample Status:** Engineering sample


**Applicant:** NETGEAR, INC.

**Test Date:** Aug. 12 ~ Sep. 09, 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 :** , **Date:** Sep. 10, 2016  
Polly Chien / Specialist

**Approved by :** , **Date:** Sep. 10, 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

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

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 28cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 3 Calculation Result of Maximum Conducted Power

Band	Modulation type	Frequency Channel (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	
CDD Mode								
2.4GHz	802.11b	2412	28.83	6.457	28	0.343	1	
		2422	28.86	7.058	28	0.397	1	
		2437	28.91	6.619	28	0.363	1	
	802.11g	2412	25.65	6.457	28	0.165	1	
		2422	29.55	7.058	28	<b>0.465</b>	1	
		2437	26.25	6.619	28	0.197	1	
	802.11n (HT20)	2412	25.31	6.457	28	0.152	1	
		2437	29.38	7.058	28	0.447	1	
		2462	25.84	6.619	28	0.179	1	
	802.11n (HT40)	2422	22.13	6.785	28	0.079	1	
		2437	26.06	7.058	28	0.208	1	
		2452	24.08	6.783	28	0.124	1	
5GHz (U-NII-1)	802.11a	5180	26.66	5.868	28	0.182	1	
		5200	29.54	5.763	28	<b>0.344</b>	1	
		5240	29.51	5.487	28	0.321	1	
	802.11ac (VHT20)	5180	26.34	5.868	28	0.169	1	
		5200	29.54	5.763	28	<b>0.344</b>	1	
		5240	29.45	5.487	28	0.316	1	
	802.11ac (VHT40)	5190	26.23	5.918	28	0.166	1	
		5230	29.21	5.472	28	0.298	1	
	802.11ac (VHT80)	5210	24.27	5.826	28	0.104	1	
5GHz (U-NII-3)	802.11a	5745	29.64	5.649	28	0.343	1	
		5785	29.50	5.634	28	0.331	1	
		5825	29.68	5.516	28	0.336	1	
	802.11ac (VHT20)	5745	29.39	5.649	28	0.324	1	
		5785	29.47	5.634	28	0.329	1	
		5825	29.67	5.516	28	0.335	1	
	802.11ac (VHT40)	5755	29.34	5.788	28	0.331	1	
		5795	29.43	5.693	28	0.330	1	
	802.11ac (VHT80)	5775	27.75	5.713	28	0.225	1	
	Band	Modulation type	Frequency Channel (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )
5GHz (U-NII-1 & U-NII-3)	802.11ac (80MHz+80MHz)	5210	21.14	3.645	28	0.031	0.059	1
		5775	21.14	3.231		0.028		

Band	Modulation type	Frequency Channel (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	
Beamforming Mode								
2.4GHz	802.11n (HT20)	2412	25.31	6.457	28	0.152	1	
		2437	28.85	7.058	28	0.396	1	
		2462	24.92	6.619	28	0.145	1	
	802.11n (HT40)	2422	25.31	6.785	28	0.164	1	
		2437	28.85	7.058	28	0.396	1	
		2452	24.92	6.783	28	0.150	1	
5GHz (U-NII-1)	802.11ac (VHT20)	5180	26.34	5.868	28	0.169	1	
		5200	29.54	5.763	28	<b>0.344</b>	1	
		5240	29.45	5.487	28	0.316	1	
	802.11ac (VHT40)	5190	25.20	5.918	28	0.131	1	
		5230	29.21	5.472	28	0.298	1	
	802.11ac (VHT80)	5210	24.27	5.826	28	0.104	1	
5GHz (U-NII-3)	802.11ac (VHT20)	5745	29.39	5.649	28	0.324	1	
		5785	29.47	5.634	28	0.329	1	
		5825	29.67	5.516	28	0.335	1	
	802.11ac (VHT40)	5755	29.34	5.788	28	0.331	1	
		5795	29.43	5.693	28	0.330	1	
	802.11ac (VHT80)	5775	27.75	5.713	28	0.225	1	
Band	Modulation type	Frequency Channel (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5GHz (U-NII-1 & U-NII-3)	802.11ac (80MHz+80MHz)	5210	21.14	3.645	28	0.031	0.058	1
		5775	21.08	3.231		0.027		

Note:

2412MHz: Directional gain = 6.475dBi  
 2422MHz: Directional gain = 6.619dBi  
 2437MHz: Directional gain = 7.058dBi  
 2452MHz: Directional gain = 6.783dBi  
 2462MHz: Directional gain = 6.785dBi  
 5180MHz: Directional gain = 5.868dBi  
 5190MHz: Directional gain = 5.918dBi  
 5200MHz: Directional gain = 5.763dBi  
 5210MHz: Directional gain = 5.826dBi  
 5230MHz: Directional gain = 5.472dBi  
 5240MHz: Directional gain = 5.487dBi  
 5745MHz: Directional gain = 5.649dBi  
 5755MHz: Directional gain = 5.788dBi  
 5775MHz: Directional gain = 5.713dBi  
 5785MHz: Directional gain = 5.634dBi  
 5795MHz: Directional gain = 5.693dBi  
 5825MHz: Directional gain = 5.516dBi

Band	Modulation type	Frequency Channel	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2.4GHz	BT LE	2402 MHz	8.76	3.180	28	0.002	1
		2440 MHz	10.12	3.180	28	0.002	1
		2480 MHz	11.04	3.180	28	<b>0.003</b>	1
WLAN 60GHz 802.11ad		60.48 GHz	15.80	14.000	28	<b>0.097</b>	1

Note:

- BT LE: Directional gain = 3.180 dBi
- WLAN 60GHz 802.11ad uses following antenna:

Ant. Type	Connecter Type	Antenna Gain (dBi)
phased-array	I-PEX	14.000

Modulation type	Frequency Channel (MHz)	Max. Power (dBm)		Total Power (dBm)	Power Limit (dBm)
		WLAN 2.4GHz	BT LE		
CDD Mode					
802.11g +BT LE	2437 + 2480	29.55	11.04	29.61	30
Beamforming Mode					
802.11n (HT20) +BT LE	2437 + 2480	28.85	11.04	28.92	28.942

Note:

Beamforming Mode: Directional gain = 7.058dBi > 6dBi, so the power limit shall be reduced to 30-(7.058-6) = 28.942dBm.



**CONCLUSION:**

Both of the WLAN 2.4G & WLAN 5G can transmit simultaneously, 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 2.4G + WLAN 5.0G + BT LE + WLAN 60GHz 802.11ad = 0.465 + 0.344 + 0.003 + 0.097 = 0.936

Therefore, the maximum calculation of this situation is 0.931, which is less than the "1" limit.

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