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^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 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^2)	Limit (mW/cm^2)
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	**0.465**	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	**0.344**	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	**0.344**	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^2)	Total Power Density (mW/cm^2)	Limit (mW/cm^2)
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^2)	Limit (mW/cm^2)
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	**0.344**	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^2)	Total Power Density (mW/cm^2)	Limit (mW/cm^2)
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^2)	Limit (mW/cm^2)
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	**0.003**	1
WLAN 60GHz 802.11ad		60.48 GHz	15.80	14.000	28	**0.097**	1

Note:
1. BT LE: Directional gain = 3.180 dBi
2. 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.

CONCULSION:

Both of the WLAN 2.4G & WLAN 5G can transmit simultaneously, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……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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