

RF EXPOSURE REPORT

REPORT NO.: SA141013E03-1

MODEL NO.: C7000

FCC ID: PY314300285

RECEIVED: Oct. 13, 2014

TESTED: Nov. 12 to 21, 2014

ISSUED: June 12, 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.

This report should not be used by the client to claim
product certification, approval, or endorsement by any
government agencies.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

TABLE OF CONTENTS

RELEASE CONTROL RECORD	3
1. CERTIFICATION.....	4
2. RF EXPOSURE LIMIT	5
3. MPE CALCULATION FORMULA.....	5
4. CLASSIFICATION.....	5
5. ANTENNA GAIN	6
6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER	7



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA141013E03-1	Original release	June 12, 2015

1. CERTIFICATION

PRODUCT: AC1900 WiFi Cable Modem Router
BRAND NAME: NETGEAR
MODEL NO.: C7000
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: NETGEAR, Inc.
TESTED: Nov. 12 to 21, 2014
STANDARDS: FCC Part 2 (Section 2.1091)
KDB 447498 D03
IEEE C95.1

The above equipment (Model: C7000) 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 12, 2015
Midoli Peng / Specialist

Approved by : May Chen , Date: June 12, 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 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

3. MPE CALCULATION FORMULA

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

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 30cm 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:

PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
Chain 0	Netgear	NA	2.0 2.8	2400~2483.5 5150~5850	Dipole	i-Pex
Chain 1	Netgear	NA	2.0 2.8	2400~2483.5 5150~5850	Dipole	i-Pex
Chain 2	Netgear	NA	2.0 2.8	2400~2483.5 5150~5850	Dipole	i-Pex

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247 and 15.407(U-NII-1) data was copied from the original test report (Report No.: SA141013E03).

For 15.247(2.4GHz):

CDD Mode:

802.11b:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	736.543	6.77	30	0.30956	1

Directional gain = 2dBi + 10log(3) = 6.77dBi

802.11g:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	987.667	6.77	30	0.41510	1

Directional gain = 2dBi + 10log(3) = 6.77dBi

VHT20:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	996.326	6.77	30	0.41874	1

Directional gain = 2dBi + 10log(3) = 6.77dBi

VHT40:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2422 ~ 2452	224.324	6.77	30	0.09428	1

Directional gain = 2dBi + 10log(3) = 6.77dBi

Beamforming Mode:

VHT20:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	786.891	6.77	30	0.33027	1

Directional gain = 2dBi + 10log(3) = 6.77dBi

VHT40:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2422 ~ 2452	224.324	6.77	30	0.09428	1

Directional gain = 2dBi + 10log(3) = 6.77dBi

For 15.247(5GHz):

CDD Mode:

802.11a:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	970.815	7.57	30	0.49055	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	959.983	7.57	30	0.48508	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5755 ~ 5795	887.886	7.57	30	0.44865	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5755	353.759	7.57	30	0.17875	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

Beamforming Mode:

802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	687.638	7.57	30	0.34746	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5755 ~ 5795	665.617	7.57	30	0.33633	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5755	353.759	7.57	30	0.17875	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

For 15.407(5GHz):

CDD Mode:

802.11a:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	326.992	7.57	30	0.16523	1
5260 ~ 5320	163.428	7.57	30	0.08258	1
5500 ~ 5700	164.873	7.57	30	0.08331	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	345.639	7.57	30	0.17465	1
5260 ~ 5320	163.977	7.57	30	0.08286	1
5500 ~ 5700	166.284	7.57	30	0.08402	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 ~ 5230	276.987	7.57	30	0.13996	1
5270 ~ 5310	243.585	7.57	30	0.12308	1
5510 ~ 5670	244.659	7.57	30	0.12363	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	93.76	7.57	30	0.04738	1
5290	90.286	7.57	30	0.04562	1
5530 ~ 5610	240.664	7.57	30	0.12161	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

Beamforming Mode:

802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	345.639	7.57	30	0.17465	1
5260 ~ 5320	163.977	7.57	30	0.08286	1
5500 ~ 5700	166.284	7.57	30	0.08402	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 ~ 5230	276.987	7.57	30	0.13996	1
5260 ~ 5320	173.583	7.57	30	0.08771	1
5500 ~ 5670	174.189	7.57	30	0.08802	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	93.76	7.57	30	0.04738	1
5290	90.286	7.57	30	0.04562	1
5530 ~ 5610	169.226	7.57	30	0.08551	1

Directional gain = 2.8dBi + 10log(3) = 7.57dBi

CONCLUSION:

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

$$\text{CPD}_1 / \text{LPD}_1 + \text{CPD}_2 / \text{LPD}_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.41874 / 1 + 0.49055 / 1 = 0.909$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

--- END ---