

RF EXPOSURE REPORT

REPORT NO.: SA141013E03

MODEL NO.: C7000

FCC ID: PY314300285

RECEIVED: Oct. 13, 2014

TESTED: Nov. 12 to 13, 2014

ISSUED: Dec. 12, 2014

APPLICANT: NETGEAR, Inc.

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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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	Original release	Dec. 12, 2014



A D T

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 13, 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:** Dec. 12, 2014
(Midoli Peng, Specialist)

Approved By : May Chen, **Date:** Dec. 12, 2014
(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(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

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

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

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

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

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

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

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:

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + ...etc. < 1$$

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.

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