RF Exposure Report

Report No.:	SA180614E09
FCC ID:	PY318100406
Test Model:	Otter
Received Date:	June 14, 2018
Test Date:	July 10 to 12, 2018
Issued Date:	July 19, 2018
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:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA180614E09	Original release.	July 19, 2018

1 Certificate of Conformity

Product:	WiFi Device
Brand:	NETGEAR
Test Model:	Otter
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	July 10 to 12, 2018
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

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 : Phoenix Huang , **Date:** July 19, 2018

Phoenix Huang / Specialist

Approved by : , **Date:** July 19, 2018

May Chen / 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				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

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 32cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

For WLAN					
Antenna No.	Ant. Gain (dBi) (include cable loss)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Dual band (Black)	3.46	2.4 ~ 2.4835	Dipole	i-pex(MHF)	214
	2.99	5.15~5.25			
	2.99	5.25~5.35			
Dual band (Red)	2.73	2.4 ~ 2.4835	Dipole	i-pex(MHF)	156
	2.44	5.15~5.25			
	2.44	5.25~5.35			
5G Antenna (Blue)	3.31	5.47~5.725	Dipole	i-pex(MHF)	125
	2.65	5.725~5.85			
5G Antenna (Yellow)	2.26	5.47~5.725	Dipole	i-pex(MHF)	70
	3.24	5.725~5.85			
For Bluetooth					
Antenna No.	Ant. Gain (dBi) (include cable loss)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Antenna (White)	3.32	2.4 ~ 2.5	PIFA	i-pex(MHF)	200

2.5 Calculation Result

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN 2.4GHz	2437	989.7	6.11	32	0.31405	1
WLAN 5GHz (UNII-1)	5200	907.203	5.73	32	0.26375	1
WLAN 5GHz (UNII-3)	5795	936.671	5.96	32	0.28713	1
Bluetooth	2480	7.568	3.32	32	0.00126	1

Note:
2.4GHz: Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20})^2 / 2] = 6.11dBi$
5GHz:
UNII-1: Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20})^2 / 2] = 5.73dBi$
UNII-3: Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20})^2 / 2] = 5.96dBi$

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz (UNII-1) + WLAN 5GHz (UNII-3) + Bluetooth = 0.31405 / 1 + 0.26375 / 1 + 0.28713 /1 + 0.00126 / 1 = 0.86619

Therefore the maximum calculations of above situations are less than the "1" limit.

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