

## RF Exposure Report

**Report No.:** SA160406E07

**FCC ID:** I88NBG6617

**Test Model:** NBG6617

**Received Date:** Apr. 06, 2016

**Test Date:** June 06 to 08, 2016

**Issued Date:** July 20, 2016

**Applicant:** ZyXEL Communications Corporation

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

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### Release Control Record

Issue No.	Description	Date Issued
SA160406E07	Original release.	July 20, 2016

## 1 Certificate of Conformity

**Product:** AC1300 MU-MIMO Dual-Band Wireless Gigabit Router

**Brand:** ZyXEL

**Test Model:** NBG6617

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** ZyXEL Communications Corporation

**Test Date:** June 06 to 08, 2016

**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 :**



**Date:**

July 20, 2016

Wendy Wu / Specialist

**Approved by :**



**Date:**

July 20, 2016

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 <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

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

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

The antennas provided to the EUT, please refer to the following table:

Antenna No	PCB Chain No.	Brand	Model	Antenna Type	Antenna Connector	Gain (dBi)	Frequency (GHz to GHz)
1	Chain 0	ARISTOTLE	RFA-52-Z1-155-165	Dipole	UFL	1.44	2.4~2.4835
				Dipole	UFL	0.37	5.15~5.85
2	Chain 1		RFA-52-Z1-75-95	Dipole	UFL	1.78	2.4~2.4835
				Dipole	UFL	3.23	5.15~5.85

### 3 Calculation Result Of Maximum Conducted Power

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	502.41	4.62	20	0.28959	1
5180-5240	453.71	4.93	20	0.28087	1
5745-5825	454.749	4.93	20	0.28151	1

NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.62\text{dBi}$

5GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi}$

#### 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

$WLAN\ 2.4G + WLAN\ 5G = 0.28959 / 1 + 0.28151 / 1 = 0.57110$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

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