

## RF Exposure Report

**Report No.:** SA161229C25G

**FCC ID:** PY317400404

**Test Model:** RBR40

**Series Model:** RBS40

**Received Date:** Dec. 22, 2016

**Test Date:** Dec. 23, 2016 ~ Mar. 15, 2017

**Issued Date:** Feb. 02, 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

**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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## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 RF Exposure</b> .....	<b>5</b>
2.1 Limits for Maximum Permissible Exposure (MPE).....	5
2.2 MPE Calculation Formula .....	5
2.3 Classification .....	5
<b>3 Calculation Result of Maximum Conducted Power</b> .....	<b>6</b>


### Release Control Record

Issue No.	Description	Date Issued
SA161229C25G	Original release	Feb. 02, 2018

## 1 Certificate of Conformity

**Product:** Orbi Router, Orbi Satellite  
**Brand:** NETGEAR  
**Test Model:** RBR40  
**Series Model:** RBS40  
**Sample Status:** Engineering sample  
**Applicant:** NETGEAR, INC.  
**Test Date:** Dec. 23, 2016 ~ Mar. 15, 2017  
**Standards:** FCC Part 2 (Section 2.1091)  
 KDB 447498 D03 (January 17, 2014)  
 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:** Feb. 02, 2018  
 Pettie Chen / Senior Specialist

**Approved by :**  , **Date:** Feb. 02, 2018  
 Bruce Chen / Project Engineer

Note: All models are electrically identical except software firmware. Model: RBR40 is the representative for final test.

Brand	Product Name	Model	Function	Band	RF Module	Difference
NETGEAR	Orbi Router	RBR40	Router	2.4G/ U-NII-2C/ UNII-3	Module 1	1. Master mode only
				UNII-1/ U-NII-2A	Module 2	2. With internet function
	Orbi Satellite	RBS40	Satellite	2.4G/ U-NII-2C / UNII-3	Module 1	Master mode and Client mode for 2.4GHz
				UNII-1/ U-NII-2A	Module 2	Client mode for U-NII-2C, UNII-3 Master mode only for UNII-1, U-NII-2A

\*RBK40= RBR40 + RBS40

## 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

$$Pd = (Pout * G) / (4 * pi * r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

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 31cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
<b>WLAN</b>					
<b>CDD Mode</b>					
2412-2462	29.86	5.75	31	0.301	1
5180-5240	29.41	6.62	31	0.332	1
5260-5320	23.68	6.56	31	0.100	1
5500-5700	23.67	6.51	31	0.099	1
5745-5825	29.45	6.70	31	0.341	1
<b>Beamforming Mode</b>					
2412-2462	29.64	5.75	31	0.286	1
5180-5240	29.32	6.62	31	0.325	1
5260-5320	23.42	6.56	31	0.094	1
5500-5700	23.47	6.51	31	0.094	1
5745-5825	29.25	6.70	31	0.326	1

Note:

**2.4GHz:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 5.75dBi

**5.0GHz:**

For U-NII-1: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 6.62dBi

For U-NII-2A: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 6.56dBi

For U-NII-2C: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 6.51dBi

For U-NII-3: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 6.70dBi

**Conclusion:**

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

The simultaneous operation mode was determined by client.

No	Mode
1	WLAN 2.4GHz + WLAN 5GHz B2
2	WLAN 2.4GHz + WLAN 5GHz B3
3	WLAN 5GHz B2 + WLAN 5GHz B3
4	WLAN 5GHz B2 + WLAN 5GHz B4
5	WLAN 5GHz B1 + WLAN 5GHz B3
6	WLAN 2.4GHz + WLAN 5GHz B2 + WLAN 5GHz B4
7	WLAN 2.4GHz + WLAN 5GHz B1 + WLAN 5GHz B3
8	WLAN 2.4GHz + WLAN 5GHz B2 + WLAN 5GHz B3

1.  $WLAN\ 2.4GHz + WLAN\ 5GHz\ B2 = 0.301 + 0.100 = 0.401$

2.  $WLAN\ 2.4GHz + WLAN\ 5GHz\ B3 = 0.301 + 0.099 = 0.400$

3.  $WLAN\ 5GHz\ B2 + WLAN\ 5GHz\ B3 = 0.100 + 0.099 = 0.199$

4.  $WLAN\ 5GHz\ B2 + WLAN\ 5GHz\ B4 = 0.100 + 0.341 = 0.441$

5.  $WLAN\ 5GHz\ B1 + WLAN\ 5GHz\ B3 = 0.332 + 0.099 = 0.431$

6.  $WLAN\ 2.4GHz + WLAN\ 5GHz\ B2 + WLAN\ 5GHz\ B4 = 0.301 + 0.100 + 0.341 = 0.742$

7.  $WLAN\ 2.4GHz + WLAN\ 5GHz\ B1 + WLAN\ 5GHz\ B3 = 0.301 + 0.332 + 0.099 = 0.732$

8.  $WLAN\ 2.4GHz + WLAN\ 5GHz\ B2 + WLAN\ 5GHz\ B3 = 0.301 + 0.100 + 0.099 = 0.500$

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

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