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# RF EXPOSURE REPORT

**REPORT NO.:** SA120913C10  
**MODEL NO.:** WBR4200AGN, CR5000  
**FCC ID:** U2M-WBR4200AGN  
**RECEIVED:** Sep. 13, 2012  
**TESTED:** Aug. 22 ~ Oct. 04, 2012  
**ISSUED:** Oct. 11, 2012

**APPLICANT:** Senao Networks, Inc.

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
(H.K.) Ltd., Taoyuan Branch

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A D T

## TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	3
1. CERTIFICATION .....	4
2. RF EXPOSURE .....	5
2.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE) .....	5
2.2 MPE CALCULATION FORMULA .....	5
2.3 CLASSIFICATION .....	5
2.4 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER .....	6



## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA120913C10	Original release	Oct. 11, 2012



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## 1. CERTIFICATION

**PRODUCT:** 802.11 abgn Router  
**MODEL NO.:** WBR4200AGN, CR5000  
**BRAND:** Senao Networks  
**APPLICANT:** Senao Networks, Inc.  
**TESTED:** Aug. 22 ~ Oct. 04, 2012  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARDS:** **FCC Part 2 (Section 2.1091)**  
**FCC OET Bulletin 65, Supplement C (01-01)**  
IEEE C95.1

The above equipment (model: WBR4200AGN) 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.

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Jemma Yang / Specialist

APPROVED BY : Ken Lin , DATE : Oct. 11, 2012  
Ken Lin / 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)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 2.2 MPE calculation Formula

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

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 Calculation result of maximum conducted power

FREQUENCY BAND (MHz)	MODULATION MODE	MAX POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412-2462	802.11b	18.04	2.00	20	0.0201	1
	802.11g	24.32	5.01	20	0.1706	1
	802.11n (20MHz)	24.42	5.01	20	0.1743	1
	802.11n (40MHz)	20.61	5.01	20	0.0725	1
5180-5240	802.11a	21.65	5.01	20	0.0922	1
	802.11n (20MHz)	21.14	5.01	20	0.0820	1
	802.11n (40MHz)	21.64	5.01	20	0.0920	1
5745-5825	802.11a	15.56	5.01	20	0.0227	1
	802.11n (20MHz)	13.55	5.01	20	0.0143	1
	802.11n (40MHz)	13.80	5.01	20	0.0151	1

### NOTE:

#### 2.4GHz:

**802.11g/n:** Directional gain = 2dBi + 10log(2) = 5.01dBi

#### 5.0GHz:

**802.11a/n:** Directional gain = 2dBi + 10log(2) = 5.01dBi

### CONCLUSION:

Both of the WLAN 2.4G & 5.0G 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

$$\text{WLAN 2.4G} + \text{WLAN 5.0G} = 0.1743 + 0.0922 = 0.2665$$

**Therefore, the maximum calculation of this situation is 0.2665, which is less than the "1" limit.**