



A D T

## RF Exposure Report

**Report No.:** SA150122E07A

**FCC ID:** UIDSBG6900

**Test Model:** SBG6900-AC

**Received Date:** Jan. 22, 2015

**Test Date:** Mar. 11 to 24, 2015

**Issued Date:** July 23, 2015

**Applicant:** ARRIS Group, Inc.

**Address:** 3871 Lakefield Drive Suite 300 Suwanee, GA30024

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

**Lab Address:** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

**Test Location (1):** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement or any government agencies.



## 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     Antenna Gain .....</b>	<b>5</b>
<b>4     Calculation Result of Maximum Conducted Power .....</b>	<b>6</b>



A D T

### Release Control Record

Issue No.	Description	Date Issued
SA150122E07A	Original release.	July 23, 2015



A D T

## 1 Certificate of Conformity

**Product:** Wireless Cable Modem & Router

**Brand:** ARRIS

**Test Model:** SBG6900-AC

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** ARRIS Group, Inc.

**Test Date:** Mar. 11 to 24, 2015


**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D03

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:** July 23, 2015  
Lori Chung / Specialist

**Approved by :** , **Date:** July 23, 2015  
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 29cm away from the body of the user.

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

## 3 Antenna Gain

2.4GHz								
Antenna No.	PCB Chain No.	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Ant. Type	Connector Type	Cable Length (mm)
361.00624.005	1	FIT	FX02A04-0G-EF	3.72	2.4~2.4835	PCB	i-pex(MHF)	185
361.00625.005	2	FIT	FX02A05-0G-EF	4.59	2.4~2.4835	PCB	i-pex(MHF)	111
361.00626.005	0	FIT	FX02A06-0G-EF	4.2	2.4~2.4835	PCB	i-pex(MHF)	210
5GHz								
Antenna No.	PCB Chain No.	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Ant. Type	Connector Type	Cable Length (mm)
361.00628.005	1	FIT	FX02A07-0G-EF	5.59	5.15~5.85	PCB	i-pex(MHF)	120
361.00629.005	2	FIT	FX02A08-0G-EF	3.42	5.15~5.85	PCB	i-pex(MHF)	190
361.00630.005	0	FIT	FX02A10-0G-EF	3.88	5.15~5.85	PCB	i-pex(MHF)	255

#### 4 Calculation Result of Maximum Conducted Power

For 15.247 and 15.407 (U-NII-1 band & U-NII 3 band – except straddling 5725MHz) data was copied from the original test report (Report No.: SA150122E07)

##### CDD MODE

For 15.247:

##### 802.11b

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	300.9	8.95	29	0.22357	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.95\text{dBi}$$

##### 802.11g

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	541.786	8.95	29	0.40255	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.95\text{dBi}$$

##### VHT20

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	598.855	8.95	29	0.44495	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.95\text{dBi}$$

##### VHT40

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2422-2452	223.357	8.95	29	0.16596	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.95\text{dBi}$$

**For 15.407:**  
**802.11a**

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	469.588	9.12	29	0.36284	1
5260-5320	120.458	9.12	29	0.09307	1
5500-5700	121.032	9.12	29	0.09352	1
5720	48.057	9.12	29	0.03713	1
5745-5825	638.049	9.12	29	0.49300	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$$

**802.11ac (VHT20)**

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	483.992	9.12	29	0.37397	1
5260-5320	122.175	9.12	29	0.09440	1
5500-5700	121.281	9.12	29	0.09371	1
5720	54.284	9.12	29	0.04194	1
5745-5825	651.264	9.12	29	0.50321	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$$

**802.11ac (VHT40)**

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5190-5230	267.197	9.12	29	0.20645	1
5270-5310	233.797	9.12	29	0.18065	1
5510-5670	241.715	9.12	29	0.18677	1
5710	100.26	9.12	29	0.07747	1
5755-5795	531.625	9.12	29	0.41077	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$$

### 802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5210	160.238	9.12	29	0.12381	1
5290	138.967	9.12	29	0.10738	1
5530-5610	239.322	9.12	29	0.18492	1
5690	120.366	9.12	29	0.09300	1
5775	94.227	9.12	29	0.07281	1

NOTE:

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$



## Beamforming MODE

For 15.247:

### VHT20

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	489.08	8.95	29	0.36339	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.95\text{dBi}$$

### VHT40

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2422-2452	186.699	8.95	29	0.13872	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.95\text{dBi}$$

For 15.407:

### 802.11ac (VHT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	306.853	9.12	29	0.23710	1
5260-5320	122.175	9.12	29	0.09440	1
5500-5700	121.281	9.12	29	0.09371	1
5720	54.284	9.12	29	0.04194	1
5745-5825	303.129	9.12	29	0.23422	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$$

### 802.11ac (VHT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5190-5230	248.09	9.12	29	0.19169	1
5270-5310	105.553	9.12	29	0.08156	1
5510-5670	121.234	9.12	29	0.09367	1
5710	58.402	9.12	29	0.04513	1
5755-5795	352.462	9.12	29	0.27234	1

NOTE:

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$$

### 802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5210	105.496	9.12	29	0.08151	1
5290	45.64	9.12	29	0.03526	1
5530-5610	121.084	9.12	29	0.09356	1
5690	47.624	9.12	29	0.03680	1
5775	50.708	9.12	29	0.03918	1

#### NOTE:

Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.12\text{dBi}$

#### Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = 0.44495 + 0.50321 = 0.948

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

--- END ---