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.

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Release Control Record

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

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^2)	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^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 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	Connecter 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	Connecter 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^2)	Limit (mW/cm^2)
2412-2462	300.9	8.95	29	0.22357	1

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

802.11g

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	541.786	8.95	29	0.40255	1

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

VHT20

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	598.855	8.95	29	0.44495	1

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

VHT40

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

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

For 15.407:

802.11a

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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:
Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.12dBi

802.11ac (VHT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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:
Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.12dBi

802.11ac (VHT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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:
Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 9.12dBi

802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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] = 9.12dBi

Beamforming MODE

For 15.247:

VHT20

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	489.08	8.95	29	0.36339	1

NOTE:

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

VHT40

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

NOTE:

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

For 15.407:

802.11ac (VHT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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:

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

802.11ac (VHT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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:

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

802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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] = 9.12dBi

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 = 0.44495 + 0.50321 = 0.948

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

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