

## RF Exposure Report

**Report No.:** SA160418C29B

**FCC ID:** GZ5NVG4XXQ

**Test Model:** NVG468MQ

**Series Model:** NVG448BQ, NVG443BQ

**Received Date:** June 23, 2016

**Test Date:** July 12 to 22, 2016

**Issued Date:** Dec. 21, 2016

**Applicant:** ARRIS GROUP, INC.

**Address:** 2500 Walsh Ave. Santa Clara, CA 95051, United States

**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   |
|--------------|-------------------|---------------|
| SA160418C29B | Original release. | Dec. 21, 2016 |

## 1 Certificate of Conformity

**Product:** Ethernet and FTTH Gateway

**Brand:** ARRIS

**Test Model:** NVG468MQ

**Series Model:** NVG448BQ, NVG443BQ

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** ARRIS GROUP, INC.

**Test Date:** July 12 to 22, 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 :** Wendy Wu, **Date:** Dec. 21, 2016

Wendy Wu / Specialist

**Approved by :** May Chen, **Date:** Dec. 21, 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

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

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 27cm away from the body of the user.

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

### 2.4 Antenna Gain

| Antenna Type      | PIFA            |           |
|-------------------|-----------------|-----------|
| Antenna Connector | i-pex (MHF)     |           |
| Gain (dBi)        | Frequency (MHz) |           |
|                   | 2400-2500       | 5150-5850 |
| Ant. 1            | 4.00            | -         |
| Ant. 2            | 4.48            | -         |
| Ant. 3            | 2.52            | -         |
| Ant. 4            | -               | 3.97      |
| Ant. 5            | -               | 3.18      |
| Ant. 6            | -               | 4.56      |
| Ant. 7            | -               | 4.43      |

## 2.5 Calculation Result Of Maximum Conducted Power

For 2.4GHz and 5GHz (UNII-1 & UNII-3) data were copied from the original test report (Report No.: SA160418C29)

### 2.4GHz

| Frequency Band (MHz) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462            | 28.88           | 8.48               | 27            | 0.594                               | 1                           |

### 5GHz

| 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            | 307.49         | 10.07              | 27            | 0.341                               | 1                           |
| 5260-5320            | 237.96         | 10.07              | 27            | 0.26398                             | 1                           |
| 5500-5720            | 236.868        | 10.07              | 27            | 0.26277                             | 1                           |
| 5745-5825            | 299.513        | 10.07              | 27            | 0.332                               | 1                           |

#### NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.48 \text{dBi}$

5GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.07 \text{dBi}$

### 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 = 0.594 / 1 + 0.341 / 1 = 0.935

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

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