



# Radio Exposure Evaluation Report

**FCC ID** : ACQ-IPC4100  
**Equipment** : IP Client WiFi Set Top Box  
**Brand Name** : ARRIS  
**Model Name** : IPC4100  
**Applicant** : ARRIS  
101 Tournament Drive, Horsham PA 19044, USA  
**Manufacturer** : ARRIS  
101 Tournament Drive, Horsham PA 19044, USA  
**Standard** : 47 CFR Part 2.1091

The product was received on May 22, 2018, and testing was started from May 22, 2018 and completed on Jun. 04, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of United States government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



## Table of Contents

|                                                 |          |
|-------------------------------------------------|----------|
| <b>HISTORY OF THIS TEST REPORT .....</b>        | <b>3</b> |
| <b>1 GENERAL DESCRIPTION .....</b>              | <b>4</b> |
| 1.1 EUT General Information .....               | 4        |
| 1.2 Testing Location .....                      | 4        |
| <b>2 MAXIMUM PERMISSIBLE EXPOSURE .....</b>     | <b>5</b> |
| 2.1 Limit of Maximum Permissible Exposure ..... | 5        |
| 2.2 MPE Calculation Method .....                | 5        |
| 2.3 Calculated Result and Limit .....           | 6        |
| <b>Photographs of EUT V01</b>                   |          |



### History of this test report

| Report No. | Version | Description             | Issued Date   |
|------------|---------|-------------------------|---------------|
| FA860525   | 01      | Initial issue of report | Jul. 12, 2018 |
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**Reviewed by: Sam Tsai**

**Report Producer: Jenny Yang**

# 1 General Description

## 1.1 EUT General Information

| RF General Information |                                                  |                                                  |                                                                                               |
|------------------------|--------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Evaluation Mode        | Frequency Range (MHz)                            | Operating Frequency (MHz)                        | Modulation Type                                                                               |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5240<br>5260-5320<br>5500-5700<br>5745-5825 | 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |
| Bluetooth              | 2400-2483.5                                      | 2402-2480                                        | BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK)<br>LE: DSSS (GFSK)                             |

## 1.2 Testing Location

| Testing Location                           |        |                                                                              |                      |
|--------------------------------------------|--------|------------------------------------------------------------------------------|----------------------|
| <input checked="" type="checkbox"/>        | HWA YA | ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)    |                      |
|                                            |        | TEL : 886-3-327-3456                                                         | FAX : 886-3-327-0973 |
| Test site Designation No. TW1190 with FCC. |        |                                                                              |                      |
| <input type="checkbox"/>                   | JHUBEI | ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.) |                      |
|                                            |        | TEL : 886-3-656-9065                                                         | FAX : 886-3-656-9085 |
| Test site Designation No. TW0006 with FCC  |        |                                                                              |                      |

## 2 Maximum Permissible Exposure

### 2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                   | 6                                                                |
| 3.0-30                | 1842 / f                          | 4.89 / f                          | (900 / f <sup>2</sup> )*                 | 6                                                                |
| 30-300                | 61.4                              | 0.163                             | 1.0                                      | 6                                                                |
| 300-1500              | -                                 | -                                 | F/300                                    | 6                                                                |
| 1500-100,000          | -                                 | -                                 | 5                                        | 6                                                                |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                   | 30                                                               |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f <sup>2</sup> )*                   | 30                                                               |
| 30-300                | 27.5                              | 0.073                             | 0.2                                      | 30                                                               |
| 300-1500              | -                                 | -                                 | F/1500                                   | 30                                                               |
| 1500-100,000          | -                                 | -                                 | 1.0                                      | 30                                                               |

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



## 2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

| Mode       | DG<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) | Ratio<br>(S/Limit) |
|------------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|--------------------|
| 5.8G;D1D   | 6.60        | 29.34          | 35.94         | 0.00              | 35.94                    | 3.92645                | 20               | 0.78114                    | 1.00000                          | 0.78114            |
| 2.4G;BT-LE | 4.43        | 7.62           | 12.05         | 0.00              | 12.05                    | 0.01603                | 20               | 0.00319                    | 1.00000                          | 0.00319            |
|            |             |                |               |                   |                          |                        |                  |                            | Sum Ratio                        | 0.78433            |
|            |             |                |               |                   |                          |                        |                  |                            | Ratio Limit                      | 1                  |

————THE END————