



# FCC RADIO EXPOSURE TEST REPORT

**FCC ID** : MSQ-RTAXI600

**Equipment** : Wireless-AX5700 Dual-band Gigabit Router

**Brand Name** : ASUS

**Model Name** : RT-AX86U/RT-AX5700

**Applicant** : ASUSTeK COMPUTER INC.  
4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan

**Manufacturer (1)** : Compal Networking(KunShan) CO., LTD.  
No.520,Nan Bang RD., Economic & Technical  
Development Zone, KunShan,JiangSu,China

**Manufacturer (2)** : ARCADYAN TECHNOLOGY (VIETNAM) CO., LTD.  
Ba Thien Industrial Park, Ba Hien commune, Binh  
Xuyen district, Vinh Phuc Province

**Standard** : 47 CFR Part 2.1091

The product was received on Dec. 05, 2019, and testing was started from Dec. 05, 2019 and completed on Jan. 31, 2020. 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 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: Sam Chen

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

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



## Table of Contents

|                                                 |          |
|-------------------------------------------------|----------|
| History of this test report.....                | 3        |
| Summary of Test Result.....                     | 4        |
| <b>1 General Description .....</b>              | <b>5</b> |
| 1.1 EUT General Information .....               | 5        |
| 1.2 Table for EUT Supports Functions .....      | 5        |
| 1.3 Table for Multiple Listing .....            | 5        |
| 1.4 Testing Location .....                      | 6        |
| <b>2 Maximum Permissible Exposure .....</b>     | <b>7</b> |
| 2.1 Limit of Maximum Permissible Exposure ..... | 7        |
| 2.2 MPE Calculation Method.....                 | 7        |
| 2.3 Calculated Result and Limit.....            | 8        |
| <b>Photographs of EUT v01</b>                   |          |





## Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items          | Result (PASS/FAIL) | Remark |
|---------------|-----------------|---------------------|--------------------|--------|
| 2             | -               | Exposure evaluation | PASS               | -      |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Sam Chen**

**Report Producer: Cindy Peng**

# 1 General Description

## 1.1 EUT General Information

| RF General Information |                                                  |                                                  |                                                                                                                                                                                                         |
|------------------------|--------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Evaluation Mode        | Frequency Range (MHz)                            | Operating Frequency (MHz)                        | Modulation Type                                                                                                                                                                                         |
| 2.4GHz WLAN            | 2400-2483.5                                      | 2412-2462                                        | 802.11b: DSSS (DBPSK, DQPSK, CCK)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5250<br>5250-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)                                 |

## 1.2 Table for EUT Supports Functions

| Function  | Support Type                   |
|-----------|--------------------------------|
| AP Router | Master                         |
| Bridge    | Client without radar detection |
| Repeater  | Master                         |
| Mesh      | Master                         |

## 1.3 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

| Model Name | Description                                                                      |
|------------|----------------------------------------------------------------------------------|
| RT-AX86U   | There is nothing different of two model names, just for different marketing use. |
| RT-AX5700  |                                                                                  |

From the above models, model: RT-AX86U was selected as representative model for the test and its data was recorded in this report.



## 1.4 Testing Location

| Testing Location                    |        |                                                                                                                               |
|-------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973   |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



## 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)*                               | 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)*                                 | 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 26 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**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 (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|-----------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;D1D        | 6.43     | 29.45       | 35.88      | 0.11           | 35.99              | 3.97192          | 26            | 0.46757                 | 1.00000                       |
| 5.2G;D1D        | 6.63     | 29.35       | 35.98      | 0.01           | 35.99              | 3.97192          | 26            | 0.46757                 | 1.00000                       |
| 5.3G;D1D        | 6.63     | 23.32       | 29.95      | 0.04           | 29.99              | 0.99770          | 26            | 0.11745                 | 1.00000                       |
| 5.6G;D1D        | 6.67     | 23.29       | 29.96      | 0.03           | 29.99              | 0.99770          | 26            | 0.11745                 | 1.00000                       |
| 5.8G;D1D (Nss1) | 6.61     | 29.33       | 35.94      | 0.05           | 35.99              | 3.97192          | 26            | 0.46757                 | 1.00000                       |
| 5.8G;D1D (Nss2) | 4.85     | 29.37       | 34.22      | 0.5            | 34.72              | 2.96483          | 26            | 0.34901                 | 1.00000                       |

### Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;D1D | 6.43     | 29.45       | 35.88      | 0.11           | 35.99              | 3.97192          | 26            | 0.46757                 | 1.00000                       | 0.46757         |
| 5.2G;D1D | 6.63     | 29.35       | 35.98      | 0.01           | 35.99              | 3.97192          | 26            | 0.46757                 | 1.00000                       | 0.46757         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.93514         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Note: The above antenna gain was declared by manufacturer.

—THE END—