

## RF Exposure Evaluation Declaration

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**FCC ID:** 2AXJ4AX11000V2

**APPLICANT:** TP-Link Corporation Limited

**Application Type:** Certification

**Product:** AX11000 Tri-Band Wi-Fi 6 Gaming Router

**Model No.:** Archer AX11000

**Trademark:** tp-link

**FCC Classification:** FCC Part 15 Spread Spectrum Transmitter (DSS)

Digital Transmission System (DTS)

Unlicensed National Information Infrastructure (NII)

**Test Date:** August 29, 2021

Reviewed By:



( Paddy Chen )

Approved By:



( Chenz Ker )



Testing Laboratory  
3261

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

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## Revision History

| Report No.    | Version | Description     | Issue Date | Note  |
|---------------|---------|-----------------|------------|-------|
| 2105TW0003-U6 | V1.0    | Original report | 2021-08-29 | Valid |
|               |         |                 |            |       |

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## CONTENTS

| Description                                      | Page      |
|--|-----------|
| <b>1. INTRODUCTION.....</b>                      | <b>5</b>  |
| 1.1. Scope .....                                 | 5         |
| 1.2. MRT Test Location.....                      | 5         |
| <b>2. PRODUCT INFORMATION.....</b>               | <b>6</b>  |
| 2.1. Feature of Equipment under Test.....        | 6         |
| 2.2. Description of Available Antennas .....     | 6         |
| <b>3. RF Exposure Evaluation .....</b>           | <b>7</b>  |
| 3.1. Limits .....                                | 7         |
| 3.2. Test Result of RF Exposure Evaluation ..... | 8         |
| <b>Appendix A - External Photograph .....</b>    | <b>9</b>  |
| <b>Appendix B - Internal Photograph .....</b>    | <b>10</b> |

## General Information

|                                 |   |
|---------------------------------|---|
| <b>Applicant</b>                | TP-Link Corporation Limited   |
| <b>Applicant Address</b>        | Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hongkong                                  |
| <b>Manufacturer</b>             | TP-Link Corporation Limited   |
| <b>Manufacturer Address</b>     | Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hongkong                                  |
| <b>Test Site</b>                | MRT Technology (Taiwan) Co., Ltd  |
| <b>Test Site Address</b>        | No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)  |
| <b>MRT FCC Registration No.</b> | 291082  |
| <b>Test Device Serial No.</b>   | N/A <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering |

## Test Facility / Accreditations

1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.

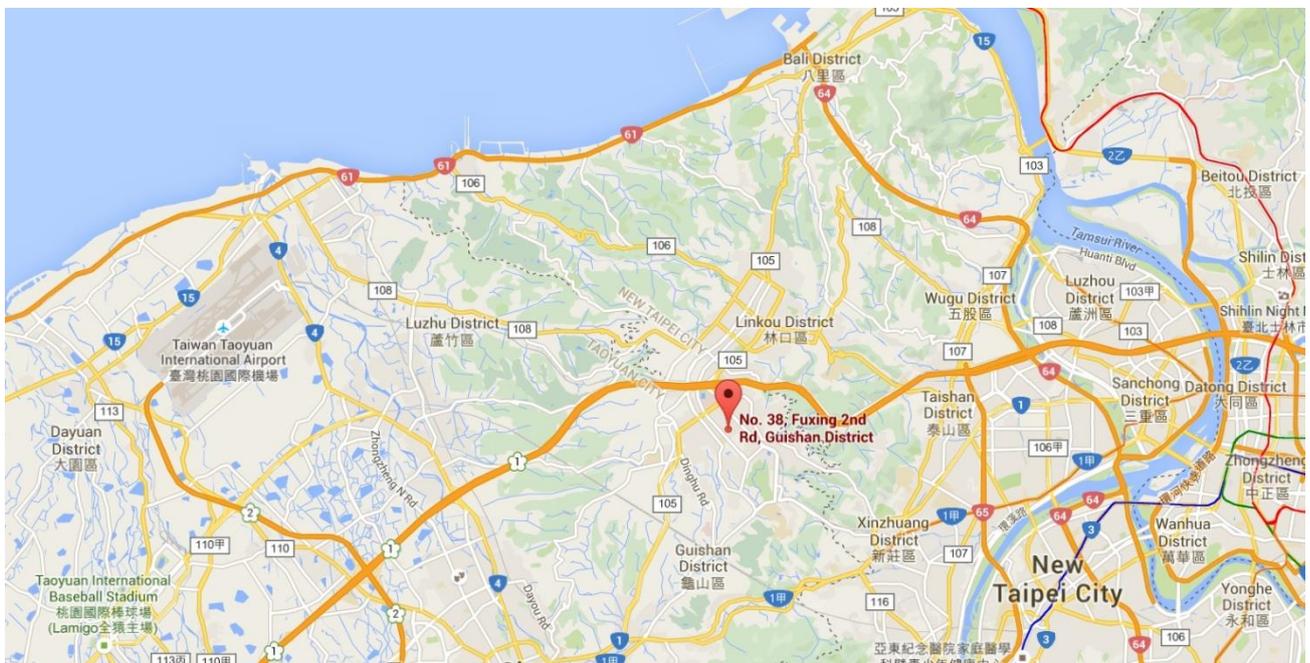
## 1. INTRODUCTION

### 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

### 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

|                          |   |
|--------------------------|---|
| Product Name:            | AX11000 Tri-Band Wi-Fi 6 Gaming Router  |
| Model No.:               | Archer AX11000  |
| Brand Name:              | tp-link   |
| Wi-Fi Specification:     | 802.11a/b/g/n/ac/ax   |
| Bluetooth Specification: | V4.2 (Dual mode)  |
| EUT Identification No.:  | 20210510Sample#12 (Conducted)<br>20210510Sample#11 (Radiated and AC conducted Emission) |
| Power Type               | By Adapter  |
| Accessory                |   |
| Adapter:                 | Model: S065PQ1200500<br>INPYUT: 100-240~50/60Hz 1.8A<br>OUTPUT: DC12.0V, 5.0A           |

### 2.2. Description of Available Antennas

| Antenna Type      | Frequency Band (MHz) | Tx Paths | Max Antenna Gain (dBi) | Beamforming Directional Gain (dBi) | CDD Directional Gain (dBi) |         |
|-------------------|----------------------|----------|------------------------|------------------------------------|----------------------------|---------|
|                   |                      |          |                        |                                    | For Power                  | For PSD |
| Wi-Fi Antenna     |                      |          |                        |                                    |                            |         |
| Dipole Antenna    | 2412 ~ 2462          | 4        | 1.80                   | 7.82                               | 1.80                       | 7.82    |
|                   | 5150 ~ 5850          | 4        | 1.80                   | 7.82                               | 1.80                       | 7.82    |
| Bluetooth Antenna |                      |          |                        |                                    |                            |         |
| Dipole Antenna    | 2412 ~ 2462          | 1        |                        | 1.8                                |                            |         |

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT} + \text{Array Gain}$ , where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

Array Gain =  $10 \log (N_{ANT} / N_{SS})$  dB;

- For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB for  $N_{ANT} \leq 4$ ;

2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11ac/ax, not include 802.11a/b/g/n. BF Directional gain =  $G_{ANT} + 10 \log (N_{ANT})$ .
3. All information declared by manufacturer.

### 3. RF Exposure Evaluation

#### 3.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### 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) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures            |                               |                               |                                     |                        |
| 300-1500  | --                            | --                            | f/300                               | 6                      |
| 1500-100,000  | --                            | --                            | 5                                   | 6                      |
| (B) Limits for General Population/ Uncontrolled Exposures |                               |                               |                                     |                        |
| 300-1500  | --                            | --                            | f/1500                              | 6                      |
| 1500-100,000  | --                            | --                            | 1                                   | 30                     |

f= Frequency in MHz

Calculation Formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

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

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### 3.2. Test Result of RF Exposure Evaluation

|           |  |
|-----------|--|
| Product   | AX11000 Tri-Band Wi-Fi 6 Gaming Router |
| Test Item | RF Exposure Evaluation                 |

Antenna Gain: Refer to clause 2.2.

| Test Mode       | Frequency Band (MHz)       | Conducted Power (dBm) | Antenna Gain (dBi) | Maximum EIRP (dBm) |
|-----------------|----------------------------|-----------------------|--------------------|--------------------|
| Bluetooth       | 2402 ~ 2480                | 9.07                  | 1.8                | 10.87              |
| 802.11b/g/n/ax  | 2412 ~ 2462                | 27.90                 | 7.82               | 35.72              |
| 802.11a/n/ac/ax | 5180 ~ 5240<br>5260 ~ 5320 | 27.87                 | 7.82               | 35.69              |
| 802.11a/n/ac/ax | 5500 ~ 5720<br>5745 ~ 5825 | 28.12                 | 7.82               | 35.94              |

| Test Mode       | Frequency Band (MHz)       | Maximum EIRP (dBm) | Compliance Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit of Power Density (mW/cm <sup>2</sup> ) |
|-----------------|----------------------------|--------------------|--------------------------|-------------------------------------|--|
| Bluetooth       | 2402 ~ 2480                | 10.87              | 30.10                    | 0.0011                              | 1  |
| 802.11b/g/n/ax  | 2412 ~ 2462                | 35.72              | 30.10                    | 0.3278                              | 1  |
| 802.11a/n/ac/ax | 5180 ~ 5240<br>5260 ~ 5320 | 35.69              | 30.10                    | 0.3256                              | 1  |
| 802.11a/n/ac/ax | 5500 ~ 5720<br>5745 ~ 5825 | 35.94              | 30.10                    | 0.3449                              | 1  |

#### CONCLUSION:

Bluetooth, WLAN 2.4GHz Band and WLAN 5GHz can transmit simultaneously.

The max Power Density at R (30.1 cm) =  $0.0011\text{mW/cm}^2 + 0.3278\text{mW/cm}^2 + 0.3256\text{mW/cm}^2 + 0.3449\text{mW/cm}^2 = 0.9994\text{ mW/cm}^2 < 1\text{mW/cm}^2$ .

So the compliance distance is 30.1cm for device installed without any other radio equipment.

\_\_\_\_\_ The End \_\_\_\_\_

## **Appendix A - External Photograph**

Refer to "2105TW0003-External Photo" file.

## **Appendix B - Internal Photograph**

Refer to "2105TW0003-Internal Photo" file.