

# RF EXPOSURE REPORT

## CERTIFICATE OF CONFORMITY

**FCC Rule Part:** FCC Part 2 (Section 2.1093)

**Report No.:** MFBBDJ-WTW-P24090476

**FCC ID:** RRC-AM10

**Product:** Wireless Gaming Mouse

**Brand:** TUL

**Model No.:** ALPHYN AM10

**Received Date:** 2024/9/24

**Test Date:** 2024/10/17

**Issued Date:** 2024/11/5

**Applicant:** TUL Corporation

**Address:** 7F-7, NO. 79, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22101, Taiwan (R.O.C)

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**Test Location:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**FCC Registration /** 198487 / TW2021

**Designation Number:**

**Approved by:**

Jeremy Lin

**Date:**

2024/11/5

Jeremy Lin / Project Engineer

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Prepared by : Ivy Lin / Specialist

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## 1 Release Control Record

| Issue No.            | Description       | Date Issued |
|----------------------|-------------------|-------------|
| MFBBDJ-WTW-P24090476 | Original release. | 2024/11/5   |

## 2 Certificate

**Product:** Wireless Gaming Mouse

**Brand:** TUL

**Test Model:** ALPHYN AM10

**Sample Status:** Engineering sample

**Applicant:** TUL Corporation

**Test Date:** 2024/10/17

**FCC Rule Part:** FCC Part 2 (Section 2.1093)

**Standard:** KDB 447498 D04 Interim General RF Exposure Guidance v01

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 RF characteristics under the conditions specified in this report.

### 3 Applicable RF Exposure Limit

#### § 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).

(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

#### (e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

##### ➤ Limits for General Population/Uncontrolled Exposure

| 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 |                               |                               |                                     |                        |
| 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                    |
| 300-1,500                                             | ...                           | ...                           | f/1500                              | <30                    |
| 1,500-100,000                                         | ...                           | ...                           | 1.0                                 | <30                    |

f = frequency in MHz. \* = Plane-wave equivalent power density.

##### ➤ Limits for Occupational/Controlled Exposure

| 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 |                               |                               |                                     |                        |
| 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                     |
| 300-1,500                                             | ...                           | ...                           | f/300                               | <6                     |
| 1,500-100,000                                         | ...                           | ...                           | 5                                   | <6                     |

f = frequency in MHz. \* = Plane-wave equivalent power density.

#### SAR-based Exemption - §1.1307(b)(3)(i)(B)

- The SAR-based exemption formula of §1.1307(b)(3)(i)(B), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold  $P_{th}$  (mW). This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and  $f$  is in GHz,  $d$  is the separation distance (cm)

When 10-g extremity SAR applies, SAR test exemption may be considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

## 4 Test Results

|                           |              |            |            |
|---------------------------|--------------|------------|------------|
| Environmental Conditions: | 25°C, 76% RH | Tested By: | Waydi Tuan |
|---------------------------|--------------|------------|------------|

| SAR-based Exemption (10-g extremity SAR) |                      |                    |                    |                  |               |                      |             |
|------------------------------------------|----------------------|--------------------|--------------------|------------------|---------------|----------------------|-------------|
| Operation Mode                           | Frequency Band (MHz) | Average Power (mW) | Antenna Gain (dBi) | Maximum ERP (mW) | Distance (cm) | Limit Threshold (mW) | Test Result |
| GFSK                                     | 2403-2480            | 0.0191             | 2.46               | 0.02051          | 0.5           | 6.793                | Pass        |
| Bluetooth                                | 2402-2480            | 1.186              | 2.46               | 1.274            | 0.5           | 6.793                | Pass        |

Notes:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- Calculate the ERP of GFSK from the radiated field strength:  
 $ERP \text{ (dBm)} = \text{Radiated field strength (dBuV/m)} + 20 \times \text{Log}(d) - 104.77 - 2.15$   
 $d$  is the distance, in 3 m.  
 $ERP = 80.5 + 20 \times \text{Log}(3) - 104.77 - 2.15 = -16.88 \text{ dBm (0.02051 mW)}$   
 $\text{Average Power} = ERP \text{ (dBm)} - \text{Antenna Gain (dBi)} + 2.15 = -17.19 \text{ dBm (0.0191 mW)}$
- The average power used is the max tune-up power (including tolerances).

## 5 Conclusion

Source-base time average power is below Exemption Criteria and/or Routine Evaluation MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

## 6 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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