# SAR EVALUATION REPORT

**FCC 47 CFR § 2.1093**
**IEEE Std 1528-2013**

*For*
**Gaming Headset**

**FCC ID: 2AYYS-PRO-HS**
**Model Name: PRO-HS**

**Report Number: 4791096000-US-S0-V0**
**Issue Date: 2024/4/19**

*Prepared for*
**Luxshare Precision Industry Co., Ltd.**
**Floor 2,Block A,Sanyo New Industrial Area, West Haoyi Community,Shajing Subdistrict Office, Bao an District Shenzhen, P. R. China**

*Prepared by*
**Underwriters Laboratories Taiwan Co., Ltd.,**
**Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd.,**
**Zhudong Township, Hsinchu County, Taiwan**
**TEL: +886-2-7737-3000**
**FAX: +886-3-583-7948**
**Website: www.ul.com**

REVISION HISTORY

| Rev. | Date | Revisions | Revised By |
|---|---|---|---|
| V0 | 2024/4/19 | Initial Issue | Sally Lu |
| | | | |
| | | | |
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**Table of Contents**

# 1. Attestation of Test Results

| | |
|---|---|
| Applicant Name | Luxshare Precision Industry Co., Ltd. |
| FCC ID | 2AYYS-PRO-HS |
| Model Name | PRO-HS |
| Exposure Category | General Population/Uncontrolled Exposure |
| Applicable Standards | FCC 47 CFR § 2.1093<br>Published RF exposure KDB procedures<br>IEEE Std 1528-2013 |
| Exposure Category | SAR Limits (W/Kg) |
| | Peak spatial-average(1g of tissue) |
| General population/Uncontrolled exposure | 1.6 |
| RF Exposure Conditions | Equipment Class - Highest Reported SAR (W/kg) |
| | Bluetooth |
| Head | 0.061 |
| Date Tested | 2024/4/2 ~ 2024/4/8 |
| Test Results | Pass |

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of any government. This report is written to support regulatory compliance of the applicable standards stated above.

| Approved and Authorized By: | Prepared By: |
|---|---|
|  |  |
| Kent Liu<br>Senior Laboratory Engineer<br>Underwriters Laboratories Taiwan Co., Ltd. | Sally Lu<br>Project Handler<br>Underwriters Laboratories Taiwan Co., Ltd. |

# 2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures:

- 447498 D01 General RF Exposure Guidance v06
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02

# 3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at

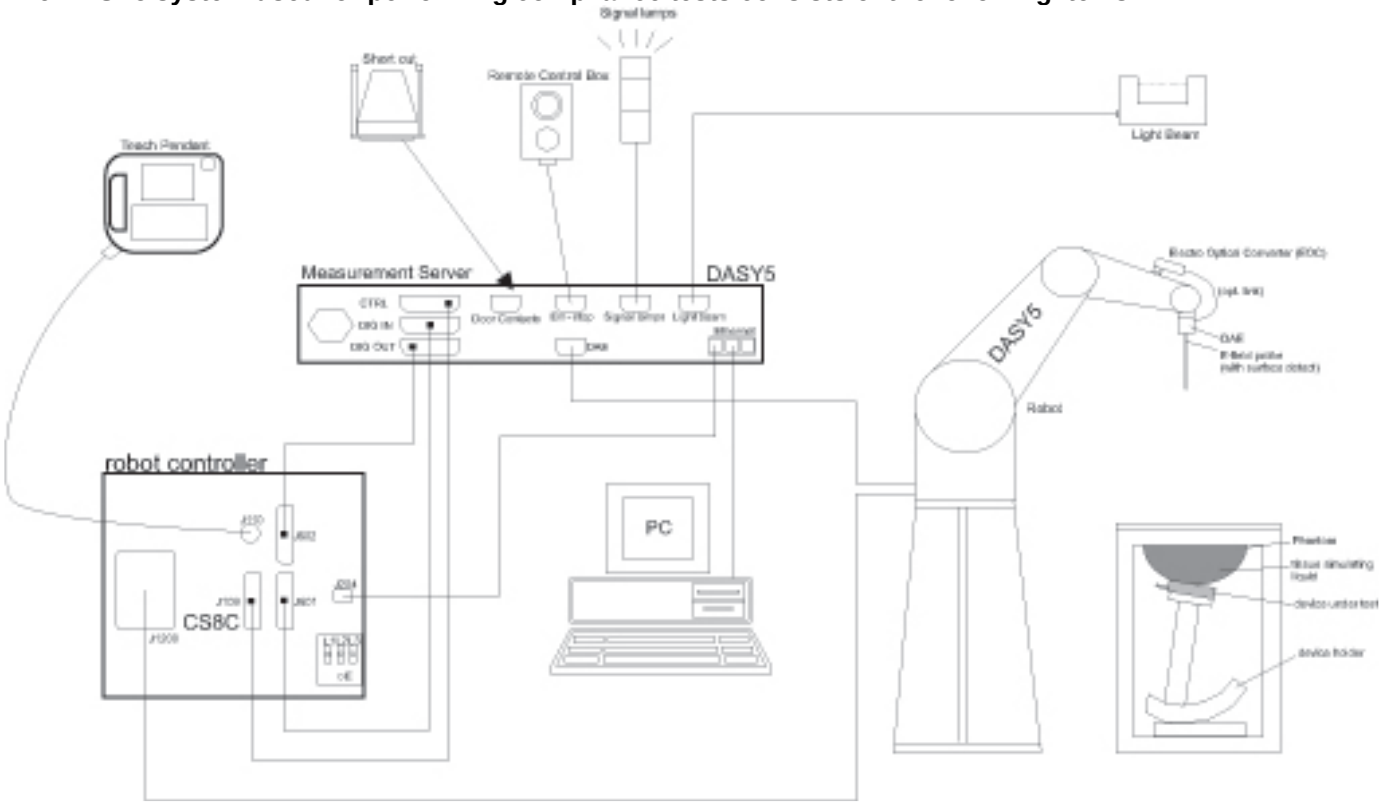
| Underwriters Laboratories Taiwan Co., Ltd., |
|---|
| SAR Room |

Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

# 4. SAR Measurement System & Test Equipment

## 4.1. SAR Measurement System

**The DASY5 system used for performing compliance tests consists of the following items:**




- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 or Win10 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 4.2. SAR Scan Procedures

**Step 1: Power Reference Measurement**

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

**Step 2: Area Scan**

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEC 62209-1528 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

<table>
<tr><td></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$</td><td>≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
</table>

**Step 3: Zoom Scan**

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$, $\Delta y_{Zoom}$</td><td>≤ 2 GHz: ≤ 8 mm<br>2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*<br>4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm<br>4 – 5 GHz: ≤ 3 mm<br>5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm<br>4 – 5 GHz: ≤ 2.5 mm<br>5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.<br>* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

**Step 4: Power drift measurement**

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

## 4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

**Dielectric Property Measurements**

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Date |
|---|---|---|---|---|
| Network Analyzer | Anritsu | MS46322B | 1740002 | 2024/1/17 |
| Dielectric Assessment Kit | SPEAG | DAK-3.5 | 1058 | 2023/9/19 |
| Humidity/Temp meter | TECPEL | DTM-20 | 17020736 | 2023/5/3 |

**System Check**

| Name of Equipment | Manufacturer | Type/Model | Serial No. | Cal. Date |
|---|---|---|---|---|
| EXG-B RF Vector Signal Generator | Keysight Technologies | N5172B | MY56200320 | 2023/12/22 |
| Power Meter | Keysight Technologies | N1914A | MY56360007 | 2023/11/29 |
| Power Sensor | Keysight Technologies | N8481H | MY56350009 | 2023/11/29 |
| Power Meter | Anritsu | ML2495A | 1645002 | 2023/12/11 |
| Power Sensor | Anritsu | MA2411B | 1531202 | 2023/12/11 |
| Dosimetric E-Field Probe | SPEAG | EX3DV4 | 3901 | 2023/5/23 |
| Data Acquisition Electronice | SPEAG | DAE3 | 360 | 2023/12/11 |
| System Validation Dipole | SPEAG | D2450V2 | 988 | 2023/9/12 |
| Humidity/Temp meter | TECPEL | DTM-20 | 17020735 | 2023/4/11 |

UL Software

| Software Version |
|---|
| DASY NEO52 D10.4 S14.6.14 |
| SEMCAD-X-PostPro |

# 5. Measurement Uncertainty

Measurement uncertainty for 300 MHz to 3 GHz

| Source of Uncertainty | Tolerance (± %) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (± %, 1g) | Standard Uncertainty (± %, 10g) | (Vi) Veff |
|---|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | | |
| Probe Calibration | 6 | Normal | 1 | 1 | 1 | 6.00 | 6.00 | ∞ |
| Axial Isotropy | 4.7 | Rectangular | 1.732 | 0.7 | 0.7 | 1.90 | 1.90 | ∞ |
| Hemispherical Isotropy | 9.6 | Rectangular | 1.732 | 0.7 | 0.7 | 3.88 | 3.88 | ∞ |
| Boundary Effect | 1 | Rectangular | 1.732 | 1 | 1 | 0.58 | 0.58 | ∞ |
| Probe Linearity | 4.7 | Rectangular | 1.732 | 1 | 1 | 2.71 | 2.71 | ∞ |
| System Detection Limits | 1 | Rectangular | 1.732 | 1 | 1 | 0.58 | 0.58 | ∞ |
| Readout Electronics | 0.3 | Normal | 1 | 1 | 1 | 0.30 | 0.30 | ∞ |
| Probe Modulation Response | 2.61 | Rectangular | 1.732 | 1 | 1 | 1.51 | 1.51 | ∞ |
| Response Time | 0.8 | Rectangular | 1.732 | 1 | 1 | 0.46 | 0.46 | ∞ |
| Integration Time | 2.6 | Rectangular | 1.732 | 1 | 1 | 1.50 | 1.50 | ∞ |
| RF Ambient Conditions – Noise | 3 | Rectangular | 1.732 | 1 | 1 | 1.73 | 1.73 | ∞ |
| RF Ambient Conditions – Reflections | 3 | Rectangular | 1.732 | 1 | 1 | 1.73 | 1.73 | ∞ |
| Probe Positioner Mechanical Restrictions | 0.4 | Rectangular | 1.732 | 1 | 1 | 0.23 | 0.23 | ∞ |
| Probe Positioning with Respect to Phantom Shell | 2.9 | Rectangular | 1.732 | 1 | 1 | 1.67 | 1.67 | ∞ |
| Interpolation, Extrapolation and Averaged SAR calculation algorithms of the Postprocessor | 2 | Rectangular | 1.732 | 1 | 1 | 1.15 | 1.15 | ∞ |
| **Test Sample Related** | | | | | | | | |
| Device Positioning | 3 | Normal | 1 | 1 | 1 | 3.00 | 3.00 | 47 |
| Device Holder Disturbance | 3.6 | Normal | 1 | 1 | 1 | 3.60 | 3.60 | 2 |
| DUT Power Drift of Measured SAR | 5 | Rectangular | 1.732 | 1 | 1 | 2.89 | 2.89 | ∞ |
| SAR Scaling | 0 | Rectangular | 1.732 | 1 | 1 | 0.00 | 0.00 | ∞ |
| **Phantom and Setup** | | | | | | | | |
| Phantom Uncertainty - Shape,Thickness and Permittivity | 6.1 | Rectangular | 1.732 | 1 | 1 | 3.52 | 3.52 | ∞ |
| SAR Correction for Deviations in Permittivity and Conductivity | 1.9 | Normal | 1 | 1 | 0.84 | 1.90 | 1.60 | ∞ |
| Liquid Conductivity - measurement(DAK) | 2.5 | Normal | 1 | 0.78 | 0.71 | 1.95 | 1.78 | ∞ |
| Liquid Permittivity - measurement(DAK) | 2.5 | Normal | 1 | 0.23 | 0.26 | 0.58 | 0.65 | ∞ |
| Liquid Conductivity – Temperature Uncertainty | 2.32 | Rectangular | 1.732 | 0.78 | 0.71 | 1.04 | 0.95 | 4 |
| Liquid Permittivity – Temperature Uncertainty | 0.85 | Rectangular | 1.732 | 0.23 | 0.26 | 0.11 | 0.13 | 4 |
| **Combined Standard Uncertainty (K=1)** | | | | | | 11.37 | 11.29 | 185 |
| **Expanded Uncertainty U (K=2)** | | | | | | **22.74** | **22.58** | |

Measurement uncertainty for 3 GHz to 6 GHz

| Source of Uncertainty | Tolerance (± %) | Probability Distribution | Divisor | Ci (1g) | Ci (10g) | Standard Uncertainty (± %, 1g) | Standard Uncertainty (± %, 10g) | (Vi) Veff |
|---|---|---|---|---|---|---|---|---|
| **Measurement System** | | | | | | | | |
| Probe Calibration | 6.55 | Normal | 1 | 1 | 1 | 6.55 | 6.55 | ∞ |
| Axial Isotropy | 4.7 | Rectangular | 1.732 | 0.7 | 0.7 | 1.90 | 1.90 | ∞ |
| Hemispherical Isotropy | 9.6 | Rectangular | 1.732 | 0.7 | 0.7 | 3.88 | 3.88 | ∞ |
| Boundary Effect | 2 | Rectangular | 1.732 | 1 | 1 | 1.15 | 1.15 | ∞ |
| Probe Linearity | 4.7 | Rectangular | 1.732 | 1 | 1 | 2.71 | 2.71 | ∞ |
| System Detection Limits | 1 | Rectangular | 1.732 | 1 | 1 | 0.58 | 0.58 | ∞ |
| Readout Electronics | 0.3 | Normal | 1 | 1 | 1 | 0.30 | 0.30 | ∞ |
| Probe Modulation Response | 2.61 | Rectangular | 1.732 | 1 | 1 | 1.51 | 1.51 | ∞ |
| Response Time | 0.8 | Rectangular | 1.732 | 1 | 1 | 0.46 | 0.46 | ∞ |
| Integration Time | 2.6 | Rectangular | 1.732 | 1 | 1 | 1.50 | 1.50 | ∞ |
| RF Ambient Conditions – Noise | 3 | Rectangular | 1.732 | 1 | 1 | 1.73 | 1.73 | ∞ |
| RF Ambient Conditions – Reflections | 3 | Rectangular | 1.732 | 1 | 1 | 1.73 | 1.73 | ∞ |
| Probe Positioner Mechanical Restrictions | 0.8 | Rectangular | 1.732 | 1 | 1 | 0.46 | 0.46 | ∞ |
| Probe Positioning with Respect to Phantom Shell | 6.7 | Rectangular | 1.732 | 1 | 1 | 3.87 | 3.87 | ∞ |
| Interpolation, Extrapolation and Averaged SAR calculation algorithms of the Postprocessor | 4 | Rectangular | 1.732 | 1 | 1 | 2.31 | 2.31 | ∞ |
| **Test Sample Related** | | | | | | | | |
| Device Positioning | 3 | Normal | 1 | 1 | 1 | 3.00 | 3.00 | 47 |
| Device Holder Disturbance | 3.6 | Normal | 1 | 1 | 1 | 3.60 | 3.60 | 2 |
| DUT Power Drift of Measured SAR | 5 | Rectangular | 1.732 | 1 | 1 | 2.89 | 2.89 | ∞ |
| SAR Scaling | 0 | Rectangular | 1.732 | 1 | 1 | 0.00 | 0.00 | ∞ |
| **Phantom and Setup** | | | | | | | | |
| Phantom Uncertainty - Shape,Thickness and Permittivity | 6.6 | Rectangular | 1.732 | 1 | 1 | 3.81 | 3.81 | ∞ |
| SAR Correction for Deviations in Permittivity and Conductivity | 1.9 | Normal | 1 | 1 | 0.84 | 1.90 | 1.60 | ∞ |
| Liquid Conductivity - measurement(DAK) | 2.5 | Normal | 1 | 0.78 | 0.71 | 1.95 | 1.78 | ∞ |
| Liquid Permittivity - measurement(DAK) | 2.5 | Normal | 1 | 0.23 | 0.26 | 0.58 | 0.65 | ∞ |
| Liquid Conductivity – Temperature Uncertainty | 2.32 | Rectangular | 1.732 | 0.78 | 0.71 | 1.04 | 0.95 | 4 |
| Liquid Permittivity – Temperature Uncertainty | 0.85 | Rectangular | 1.732 | 0.23 | 0.26 | 0.11 | 0.13 | 4 |
| **Combined Standard Uncertainty (K=1)** | | | | | | 12.47 | 12.40 | 269 |
| **Expanded Uncertainty U (K=2)** | | | | | | **24.95** | **24.80** | |

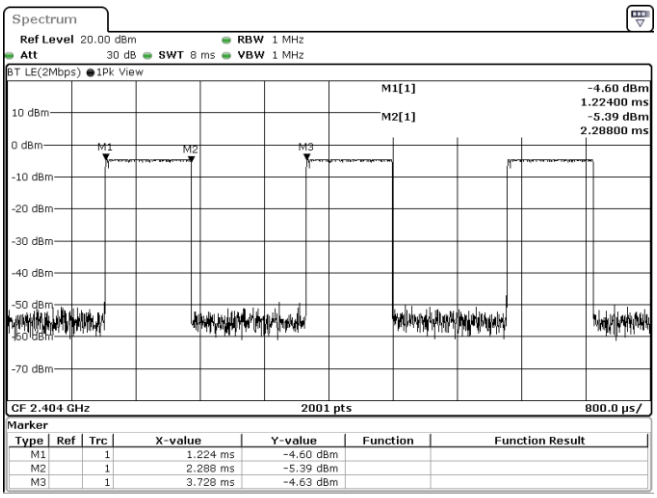
# 6. Device Under Test (DUT) Information

## 6.1. DUT Description

| | |
|---|---|
| **Product** | Gaming Headset |
| **Brand Name** | ALIENWARE |
| **Model Name** | PRO-HS |
| **Operating Frequency** | 2402MHz ~ 2480MHz |
| **Modulation** | GFSK, 8DPSK, π/4-DQPSK |
| **Sample ID** | 7041466 |
| **Hardware Version** | N/A |
| **Software Version** | N/A |
| **Received Date** | 2024/3/21 |

## 6.2. Wireless Technologies

| Wireless technologies | Frequency bands | Operating mode | Duty Cycle used for SAR testing |
|---|---|---|---|
| Bluetooth | 2.4 GHz | BT-BR | - |
| Bluetooth | 2.4 GHz | BT-EDR | - |
| Bluetooth | 2.4 GHz | BT-LE | 42.49% |



# 7. RF Exposure Conditions (Test Configurations)

| Band | Test Position | separation distance(mm) | Max. EIRP power(dBm) | Max. EIRP power(mW) | Exemption Limits(mW) | Test Require |
|---|---|---|---|---|---|---|
| Bluetooth | inner ear | 120.00 | 8.74 | 7.48 | 219 | Yes |
| | Left touch | 460.00 | | | 219 | Yes |
| | Rear | 19.95 | | | 38 | Yes |

# 8. Dielectric Property Measurements & System Check

## 8.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.
The dielectric constant (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

**Tissue Dielectric Parameters**

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

| Target Frequency (MHz) | Head | |
|---|---|---|
| | $\varepsilon_r$ | σ (S/m) |
| 150 | 52.3 | 0.76 |
| 300 | 45.3 | 0.87 |
| 450 | 43.5 | 0.87 |
| 835 | 41.5 | 0.90 |
| 900 | 41.5 | 0.97 |
| 915 | 41.5 | 0.98 |
| 1450 | 40.5 | 1.20 |
| 1610 | 40.3 | 1.29 |
| 1800 – 2000 | 40.0 | 1.40 |
| 2450 | 39.2 | 1.80 |
| 3000 | 38.5 | 2.40 |
| 5000 | 36.2 | 4.45 |
| 5100 | 36.1 | 4.55 |
| 5200 | 36.0 | 4.66 |
| 5300 | 35.9 | 4.76 |
| 5400 | 35.8 | 4.86 |
| 5500 | 35.6 | 4.96 |
| 5600 | 35.5 | 5.07 |
| 5700 | 35.4 | 5.17 |
| 5800 | 35.3 | 5.27 |

**IEEE Std 1528-2013**

Refer to Table 3 within the IEEE Std 1528-2013

**Dielectric Property Measurements Results:**

| Date | Tissue Type | Frequency (MHz) | Relative Permittivity (εr) | | | Conductivity (σ) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Measured | Target | Delta (%) | Measured | Target | Delta (%) |
| 2024/4/2 | Head | 2404 | 38.71 | 39.27 | -1.43 | 1.82 | 1.76 | 3.78 |
| | | 2440 | 38.60 | 39.21 | -1.57 | 1.86 | 1.79 | 3.60 |
| | | 2450 | 38.57 | 39.20 | -1.62 | 1.85 | 1.80 | 2.94 |
| | | 2478 | 38.50 | 39.16 | -1.70 | 1.87 | 1.83 | 2.43 |
| 2024/4/8 | Head | 2404 | 38.78 | 39.27 | -1.23 | 1.83 | 1.76 | 3.88 |
| | | 2440 | 38.76 | 39.21 | -1.16 | 1.87 | 1.79 | 4.71 |
| | | 2450 | 38.59 | 39.20 | -1.56 | 1.87 | 1.80 | 3.71 |
| | | 2478 | 38.68 | 39.16 | -1.23 | 1.88 | 1.83 | 2.93 |

## 8.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

**System Check Results**

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

| Date | Tissue Type | Dipole S/N | Input Power (mW) | Measured 1g SAR (W/kg) | Targeted 1g SAR (W/kg) | Normalized 1g SAR (W/kg) | Delta 1g ±10 (%) | Measured 10g SAR (W/kg) | Targeted 10g SAR (W/kg) | Normalized 10g SAR (W/kg) | Delta 10g ±10 (%) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2024/4/2 | Head | D2450V2-988 | 250 | 13.7 | 51.90 | 54.8 | 5.59 | 6.26 | 24.60 | 25.04 | 1.79 | 1 |
| 2024/4/8 | Head | D2450V2-988 | 250 | 13.7 | 51.90 | 54.8 | 5.59 | 6.04 | 24.60 | 24.16 | -1.79 | 2 |

# 9. Conducted Output Power Measurements

## 9.1. Bluetooth

**Average Power Measured Results**

| Band | Mode | Data Rate | Ch # | Freq. (MHz) | Meas. Avg Pwr (dBm) | Tune-up Limit (dBm) | SAR Test (Yes/No) |
|---|---|---|---|---|---|---|---|
| Bluetooth | BR | 1 Mbps | 0 | 2402 | 7.21 | 7.5 | No |
| | | | 39 | 2441 | 7.16 | 7.5 | |
| | | | 78 | 2480 | 7.09 | 7.5 | |
| | EDR | 2 Mbps | 0 | 2402 | 7.19 | 7.5 | No |
| | | | 39 | 2441 | 7.15 | 7.5 | |
| | | | 78 | 2480 | 7.08 | 7.5 | |
| | EDR | 3 Mbps | 0 | 2402 | 7.20 | 7.5 | No |
| | | | 39 | 2441 | 7.16 | 7.5 | |
| | | | 78 | 2480 | 7.09 | 7.5 | |
| | BLE | 1 Mbps | 0 | 2402 | 7.20 | 7.5 | No |
| | | | 19 | 2440 | 7.13 | 7.5 | |
| | | | 39 | 2480 | 7.03 | 7.5 | |
| | BLE | 2 Mbps | 1 | 2404 | 7.18 | 7.5 | Yes |
| | | | 19 | 2440 | 7.11 | 7.5 | |
| | | | 38 | 2478 | 7.01 | 7.5 | |

# 10. Measured and Reported (Scaled) SAR Results

**SAR Test Reduction criteria are as follows:**

**KDB 447498 D01 General RF Exposure Guidance:**
Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

## 10.1. Test Condition

| Test Item | Test Site No. | Test Date | Tested by |
|---|---|---|---|
| SAR | SAR1 | 2024/4/2 ~ 2024/4/8 | Edison Hu |

## 10.2. Bluetooth

| Mode | Dist. (mm) | Test Position | Ch #. | Freq. (MHz) | Duty Cycle | Power (dBm) | | 1-g SAR (W/kg) | | 10-g SAR (W/kg) | | Power Drift | Note | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Tune-up Limit | Meas. | Meas. | Scaled | Meas. | Scaled | | | |
| Bluetooth | 0 | inner ear | 1 | 2404 | 42.49% | 7.5 | 7.18 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | |
| Bluetooth | 0 | Left touch | 1 | 2404 | 42.49% | 7.5 | 7.18 | 0.000 | 0.000 | 0.000 | 0.000 | - | - | |
| Bluetooth | 0 | Rear | 1 | 2404 | 42.49% | 7.5 | 7.18 | 0.024 | 0.061 | 0.006 | 0.016 | 0.04 | - | 1 |
| Bluetooth | 0 | Rear | 19 | 2440 | 42.49% | 7.5 | 7.11 | 0.012 | 0.031 | 0.002 | 0.005 | 0.04 | - | |
| Bluetooth | 0 | Rear | 38 | 2478 | 42.49% | 7.5 | 7.01 | 0.005 | 0.012 | 0.001 | 0.002 | -0.09 | - | |
| Bluetooth | 0 | Rear | 1 | 2404 | 42.49% | 7.5 | 7.18 | 0.023 | 0.058 | 0.005 | 0.013 | 0.01 | Microphone | |

# Appendixes

**Refer to separated files for the following appendixes.**

**4791096000-US-S0-V0_Appendix A: SAR Setup Photos**

**4791096000-US-S0-V0_Appendix B: Antenna Dimensions and Separation Distances**

**4791096000-US-S0-V0_Appendix C: SAR System Check Plots**

**4791096000-US-S0-V0_Appendix D: Highest SAR Test Plots**

**4791096000-US-S0-V0_Appendix E: SAR Probe and Dipole Calibration Certificates**

## END OF REPORT