

## MAXIMUM PERMISSIBLE EXPOSURE EVALUATION REPORT

**Applicant:** AKUVOX (XIAMEN) NETWORKS CO., LTD.

**Address:** 10/F, No.56 Guanri Road, Software Park II , Xiamen 361009,  
China

**Product Name:** HyPanel Plus

**FCC ID:** 2AHCR-PS52V2

**Standard(s):** 47 CFR §1.1310, 47 CFR §2.1091,  
47 CFR §15.247(i), 47 CFR §15.407(f)

**Report Number:** 2402V45633E-RF-00H

**Report Date:** 2024/9/19

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).

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**DOCUMENT REVISION HISTORY**

| Revision Number | Report Number      | Description of Revision | Date of Revision |
|-----------------|--------------------|-------------------------|------------------|
| 1.0             | 2402V45633E-RF-00H | Original Report         | 2024/9/19        |

## 1. GENERAL INFORMATION

### 1.1 General Description Of Equipment under Test

|                             |                  |
|-----------------------------|------------------|
| <b>EUT Name:</b>            | HyPanel Plus     |
| <b>EUT Model:</b>           | PS52V2           |
| <b>Rated Input Voltage:</b> | DC 12V From Base |
| <b>EUT Received Date:</b>   | 2024/7/4         |
| <b>EUT Received Status:</b> | Good             |

## 2. RF EXPOSURE EVALUATION (MPE)

### 2.1 RF Exposure Evaluation

#### 2.1.1 Applicable Standard

According to subpart 15.247(i), 15.407(f) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

| (B) 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> ) | Averaging Time (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                       |

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

According to §1.1310 and §2.1091 RF exposure is calculated.

#### 2.1.2 Calculation formula:

Prediction of power density at the distance of the applicable MPE limit

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

**2.1.3 Calculated Data:**

| Operation Modes | Frequency (MHz) | Antenna Gain |           | Conducted output power including Tune-up Tolerance |        | Evaluation Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | MPE Limit (mW/cm <sup>2</sup> ) |
|-----------------|-----------------|--------------|-----------|----------------------------------------------------|--------|--------------------------|-------------------------------------|---------------------------------|
|                 |                 | (dBi)        | (numeric) | (dBm)                                              | (mW)   |                          |                                     |                                 |
| ZigBee          | 2405-2480       | -2.57        | 0.55      | 7.0                                                | 5.01   | 20.00                    | 0.001                               | 1.0                             |
| BT              | 2402-2480       | 2.52         | 1.79      | 4.5                                                | 2.82   | 20.00                    | 0.001                               | 1.0                             |
| BLE             | 2402-2480       | 2.52         | 1.79      | 4.5                                                | 2.82   | 20.00                    | 0.001                               | 1.0                             |
| 2.4G Wifi       | 2412-2462       | 2.52         | 1.79      | 20.5                                               | 112.20 | 20.00                    | 0.040                               | 1.0                             |
| 5G Wifi         | 5150-5250       | 1.67         | 1.47      | 17.0                                               | 50.12  | 20.00                    | 0.015                               | 1.0                             |
|                 | 5250-5350       | 1.67         | 1.47      | 17.5                                               | 56.23  | 20.00                    | 0.016                               | 1.0                             |
|                 | 5470-5725       | 1.67         | 1.47      | 17.5                                               | 56.23  | 20.00                    | 0.016                               | 1.0                             |
|                 | 5725-5850       | 1.67         | 1.47      | 12.5                                               | 17.78  | 20.00                    | 0.005                               | 1.0                             |

**Note:**

The Conducted output power including Tune-up Tolerance provided by manufacturer.

**Simultaneous transmission:**

BT, BLE, 2.4G Wifi and 5G Wifi can't transmit simultaneously, but BT, BLE, 2.4G Wifi or 5G Wifi can transmit simultaneously with ZigBee:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

$$S_{ZigBee}/S_{limit-ZigBee} + S_{2.4G\ Wifi}/S_{limit-2.4G\ Wifi}$$

$$=0.001/1.0+0.040/1.0$$

$$=0.041$$

$$< 1.0$$

**Result: Compliant. The device compliant Simultaneous transmission at 20cm distances.**

## **EXHIBIT A - EUT PHOTOGRAPHS**

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Please refer to the attachment 2402V45633E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2402V45633E-RF-INP EUT INTERNAL PHOTOGRAPHS.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***