NVLAP LAB CODE 600341-0

MAXIMUM PERMISSIBLE EXPOSURE EVALUATION REPORT

Applicant:	**Xiamen Akubela Innovation Technology Co., Ltd.**
Address:	**9/F, No.56 Guanri Road，Software Park II , Xiamen 361009, China**
Product Name:	**HyPanel KeyPlus**
FCC ID:	**2BNRZ-KS53**
Standard(s):	**47 CFR §1.1310, 47 CFR §2.1091, 47 CFR §15.247(i), 47 CFR §15.407(f)**
Report Number:	**2402Y100836E-RF-00G**
Report Date:	**2025/5/6**

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

Reviewed By: **Pedro Yun**	**Approved By:** **Gavin Xu**
Title: **Project Engineer**	Title: **RF Supervisor**

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2402Y100836E-RF-00G	Original Report	2025/5/6

1. GENERAL INFORMATION

1.1 General Description Of Equipment under Test

EUT Name:	HyPanel KeyPlus
EUT Model:	KS53
Rated Input Voltage:	100-250V~50/60Hz
EUT Received Date:	2024/10/26
EUT Received Status:	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^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	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^2);
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^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
BLE	2402-2480	1.4	1.38	4.0	2.51	20.00	0.001	1.0
BT	2402-2480	1.4	1.38	4.0	2.51	20.00	0.001	1.0
2.4G WiFi	2412-2462	1.4	1.38	25.0	316.23	20.00	0.087	1.0
5G WiFi	5150-5250	0.7	1.17	16.0	39.81	20.00	0.009	1.0
	5250-5350	0.8	1.20	16.0	39.81	20.00	0.010	1.0
	5470-5725	2.7	1.86	13.5	22.39	20.00	0.008	1.0
	5725-5850	2.9	1.95	16.0	39.81	20.00	0.015	1.0
ZigBee	2405-2480	3.3	2.14	3.0	2.00	20.00	0.001	1.0

Note:

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

For Simultaneous transmission:

BT,BLE, 2.4G WiFi, or 5G WiFi can transmit simultaneously with ZigBee:

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

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

$=0.087/1.0+0.001/1.0$

$=0.088$

<1.0

Result: The device meet FCC MPE at 20 cm distance

EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the attachment 2402Y100836E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2402Y100836E-RF-INP EUT INTERNAL PHOTOGRAPHS.

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