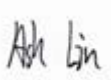# RF EXPOSURE REPORT

For

AKUVOX (XIAMEN) NETWORKS CO., LTD.

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

FCC ID: 2AHCR-A08S

Report Type:	Product Name:
Original Report	Access Control Terminal

Report Number: XMDN240311-12032E-RF-04

Report Date: 2024-09-13

Reviewed By: Ash Lin

Approved By: Miles Chen

Prepared By: Bay Area Compliance Laboratories Corp. (Xiamen)
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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	XMDN240311-12032E-RF-04	R1V1	2024-09-13	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	AKUVOX (XIAMEN) NETWORKS CO., LTD.
Product Name:	Access Control Terminal
Tested Model:	A08S
Firmware version:	0000
Tested Model:	A08S
Power Supply:	DC 48V from PoE or DC 12V from USB port
Maximum Output Power:	BLE: 9.95dBm NFC: 46.57dBµV/m @ 3m RFID:51.15dBµV/m @ 3m
Operating Band/Frequency:	BLE: 2402-2480 MHz NFC: 13.56 MHz RFID: 125kHz
Antenna Type:	BLE: FPC NFC: FPC RFID: Coil
★Maximum Antenna Gain:	BLE: -3 dBi
EUT Received Status:	Good

Note:
1. The Maximum Antenna Gain was declared by the manufacturer.
2. All measurement and test data in this report was gathered from production sample serial number:
XMDN240311-12032E-RF-1. (Assigned by the BACL(Xiamen). The EUT supplied by the applicant was
received on 2024-04-16)

Objective

This test report is prepared for *AKUVOX (XIAMEN) NETWORKS CO., LTD.* in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Xiamen) to collect test data is located on the Unit 102, No. 902 Meifeng South Road, Binhai West Avenue, Science and Technology Innovation Park, Torch High tech Zone XiaMen.

Bay Area Compliance Laboratories Corp. (Xiamen) Lab is accredited to ISO/IEC 17025 by A2LA (Certificate Number: 7134.01) and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN1384.

TEST EQUIPMENT

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Exposure Test(RFID)					
Broadband Field Meter	narda	NBM-550	E-0696	2024/09/13	2025/09/12
E-Field probe	narda	EF 0391	D-1748	2024/09/13	2025/09/12

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Xiamen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

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/cm²)	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 & §2.1091 RF exposure is calculated.

Block Diagram of Test Setup for RFID
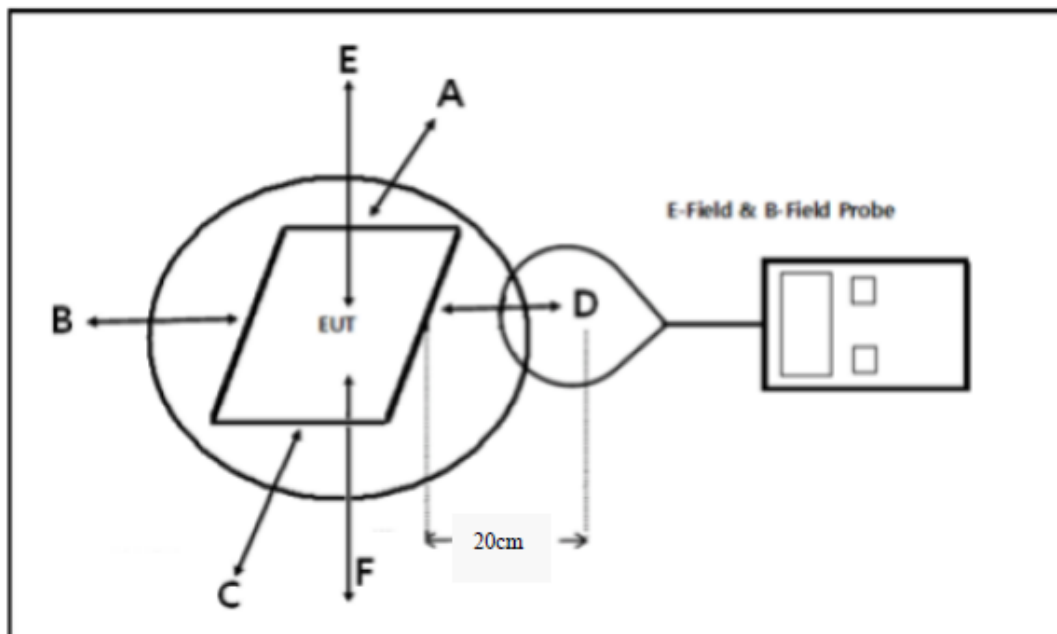
Test Procedure:

H-Field &E-Field Probe instrument was used to test and record magnetic and electric fields in five directions A, B, C, D, E and F at a distance of 20cm from EUT.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);
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);

Test Data for 125 kHz RFID

Test Mode:	Transmitting	Test Engineer:	Apollo Luo
Test Date:	2024-09-13	Environment:	Temp.: 23.8℃ Humi.: 56% Atm:100.8kPa

H-Field Strength

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limit (A/m)
125	0.0139	0.0131	0.0135	0.0151	0.0153	0.0138	1.63

Note: Test with 20cm distance from the center of the probe(s) to the edge of the device, 20 cm for top test.

E-Field Strength

Frequency Range (kHz)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	Position F (V/m)	Limit (V/m)
125	2.25	2.64	2.48	2.49	2.54	3.54	614

Note: Test with 20cm distance from the center of the probe(s) to the edge of the device, 20 cm for top test.

Note: according to KDB 680106 D01 Wireless Power Transfer v04 clause 3.2, for all RF devices, the MPE limits between 100 kHz to 300 kHz are to be considered the same as those at 300 kHz in Table 1 of §1.1310, that is, 614V/m and 1.63 A/m, for the electric field and magnetic field, respectively.

Power Density Calculation

Mode	Frequency (MHz)	Antenna Gain		Tune-up Output Power		Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limt (mW/cm²)
		(dBi)	(numeric)	(dBm)	(mW)			
BLE	2402-2480	-3	0.50	10	10	20	0.0010	1

Note: The Tune-up output power was declared by the Manufacturer

Mode	Frequency (MHz)	Tune-up Max EIRP		Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limt (mW/cm²)
		(dBm)	(mW)			
NFC	13.56	-48.63	0.000014	20	<<0.0001	0.98

Note:
1. The Tune-up output power was declared by the Manufacturer
2. NFC(13.56MHz) field strength is 46.57dBμV/m @ 3m = -48.63dBm (0.000014mW) EIRP. That equal to antenna gain is 0dBi and used the EIRP value as conducted power.

Simultaneous transmission

BLE, NFC, and RFID can transmissions simultaneously:

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

$= S_{BLE}/S_{limit-BLE} + S_{NFC}/S_{limit-NFC} + H_{RFID}/H_{limit-RFID}$

$= 0.001/1 + 0.0001/0.98 + 0.0153/1.63$

$= 0.001 + 0.0001 + 0.0094$

$= 0.0105$

Result: The device meets MPE at distance 20cm.

Declarations

1. Bay Area Compliance Laboratories Corp. (Xiamen) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk "★".

2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.

3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.

4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95.45% confidence interval.

5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Xiamen).

6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

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