EN 50364:2018

ASSESSMENT REPORT

For

XonTel Technology Trd. Co. W.L.L

Kuwait City, Qibla, Aladel Tower, F21, state of Kuwait. zip code: 13065

Tested Model: XT-12P

Report Type:	**Product Type:**
Amended Report	Door Phone

Report Number:	RXM220104050-01D
Report Date:	2022-01-11
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Issue
1	RXM200819050-01D	Original Report	2020-09-16
2	RXM220104050-01D	Amended Report	2022-01-11

Note:

This is an amended report application based on RXM200819050-01D, the details as below:

1. Changing the applicant to “XonTel Technology Trd. Co. W.L.L”.

2. Changing the address to “Kuwait City, Qibla, Aladel Tower, F21, state of Kuwait. zip code: 13065.”

3. Changing the trade name “Xontel”.

4. Changing model name to “XT-12P”

For above difference, We Updated the EUT external photographs, all test data and other photos were referred to the original report RXM200819050-01D that issued on 2020-09-16.

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant	AKUVOX (XIAMEN) NETWORKS CO., LTD.
Tested Model	XT-12P
Operation Frequency	125kHz,13.56MHz
Product Type	Door Phone
Power Supply	DC 12V power by External power supply or DC 48V power by POE
RF Function	RFID
Operating Band/Frequency	119~140kHz, 13.553~13.567MHz
Antenna Type	125kHz : Loop antenna 13.56MHz: PCB antenna
*Maximum Antenna Gain	0.0 dBi

**Note: The maximum antenna gain was declared by the applicant.*

All measurement and test data in this report was gathered from production sample serial number: 20200819050. (Assigned by the BACL(Kunshan). The EUT supplied by the applicant was received on 2020-08-19)

Objective

This report is prepared on behalf of *AKUVOX (XIAMEN) NETWORKS CO., LTD.* in accordance with EN 50364:2018 Limitation of human exposure to electromagnetic fields from devices operating in the frequency range 0 Hz to 300 GHz, used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications.

The objective is to determine the compliance of EUT with EN 50364:2018.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with EN 50364:2018.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

RF Exposure Measurement

1. Introduction

This product standard applies to devices operating within the frequency range 0 Hz to 300 GHz, used in electronic article surveillance (EAS), radio frequency identification (RFID) and similar applications, in relation to exposure to electromagnetic fields

The object of this product standard is to provide a route for evaluation of such equipment against limits on human exposure to electric, magnetic and electromagnetic fields, and induced and contact current.

NOTE: Other standards can apply to products covered by this document. In particular this document is not designed to evaluate the electromagnetic compatibility with other equipment; nor does it reflect any product safety requirements other than those specifically related to human exposure to electromagnetic fields.

2 Exposure conditions

Equipment which meets the limits for general public exposure as given in this document (Clause 5) will automatically meet the limits for workers.

Equipment which meets the limits for workers will not necessarily meet the limits for the general public and, unless intended only for workers' use when at work, equipment shall be tested against general public limits.

Equipment intended only for use by workers when at work shall have this condition clearly identified in the user instructions. This use condition shall be identified in the test report.

All intended operating conditions as well as the reasonably foreseeable conditions of human exposure from the product shall be taken into account in the evaluation.

The reasonably foreseeable conditions of exposure should be based on realistic exposure and/or installation parameters representative of all readily-predictable human and system behaviour such as the duration of exposure, time varying of transmitted power, simultaneously operated frequency bands and time averaging as defined in normative limits.

In cases where the reasonably foreseeable exposure conditions for workers are different from the reasonably foreseeable exposure conditions for the general public, then a separate assessment shall be made covering those differences.

3 Normative limits

For equipment intended for use by the general public the relevant exposure restrictions in Council Recommendation 1999/519/EC shall be applied. For equipment intended only for use by workers when at work, the relevant exposure restrictions in Directive 2013/35/EU shall be applied, with a statement as to whether the limit chosen provides protection against health effects or sensory effects or both.

Details of where limits are to be found in Directive 2013/35/EU, and how they relate to test methods, are given in 6.3.

Basic restriction for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	Magnetic flux density (mT)	Current density (mA/m2)	Whole body average SAR(W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density, S (W/m2)
0 Hz	40	--	--	--	--	--
>0-1 Hz	--	8	--	--	--	--
1-4 Hz	--	8/f	--	--	--	--
4-1000 Hz	--	2	--	--	--	--
1000 Hz-100 kHz	--	f/500	--	--	--	--
100 kHz-10 MHz	--	f/500	0.08	2	4	--
10 MHz-10 GHz	--	--	0.08	2	4	--
10-300 GHz	--	--	--	--	--	10

Notes:

1. f is the frequency in Hz.
2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.
3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1cm2 perpendicular to the current direction.
4. For frequencies up to 100 kHz, peak current density values can be obtained by multiplying the rms value by $\sqrt{2}$(=1.414). For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as=1/(2tp)
5. For frequencies up to 100kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
6. All SAR values are to be averaged over any six-minute period.
7. Localised SAR averaging mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct physical measurements. A simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservation values relative to the exposure guidelines.
8. For pulses of duration tp the equivalent frequency to apply in the basic restrictions should be calculated as=1/(2tp). Additionally, for pulsed exposures, in the frequency range 0.3 to 10 GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that SA should not exceed 2mJ kg-1 averaged over 10g of tissue.

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz, unperturbed rms values)

Frequency Range	E-field strength (V/m)	H-field strength (A/m)	B-field (uT)	Equivalent plane wave power density S_{eq}(W/m2)
0-1 Hz	--	3.2×10^4	4×10^4	--
1-8 Hz	10000	$3.2\times10^4/f^2$	$4\times10^4/f^2$	--
8-25 Hz	10000	4000/f	5000/f	--
0.025-0.8 KHz	250/f	4/f	5/f	--
0.8-3 kHz	250/f	5	6.25	--
3-150 kHz	87	5	6.25	--
0.15-1 MHz	87	0.73/f	0.92/f	--
1-10 MHz	$87/f^{1/2}$	0.73/f	0.92/f	--
10-400 MHz	28	0.073	0.092 2	2
400-2000 MHz	$1.375f^{1/2}$	$0.0037f^{1/2}$	$0.0046f^{1/2}$	f/200
2-300 GHz	61	0.16	0.20	10

Notes:

1. As indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, S_{eq}, E2, H2 and B2 are to be averaged over any sixminute period.
3. For frequencies exceeding 10GHz, S_{eq}, E2, H2 and B2 are to be averaged over any 68/f1.05-minute period (.in GHz).
4. No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.

3. Evaluation of compliance

3.1 General

The EC Recommendation shall be consulted to determine whether an exposure assessment is required for the general public. Certain types of equipment and applications may be excluded or given special consideration. It must be noted that such consideration may not be on a harmonised basis.

The measurements and calculations to demonstrate equipment compliance shall be made according to EN 62369-1, Clause 4. The general conditions as defined in that clause shall apply to all equipment.

3.2 Evaluation of emitted EMF

3.2.1 Assessment methods

If an exposure assessment is necessary the emitted EMF shall be evaluated using one of the following methods. It is not necessary to demonstrate compliance using more than one method. The exposure distances shall be as described in EN 62369-1, Table 1 and Figures 3 to 11, measured from the edge or face of the equipment nearest to the relevant position of exposure. For equipment which is similar but does not match the categories provided, then other positioning may be used provided it uses the same principles as the positioning provided in EN 62369-1. Any variations in positioning shall be documented.

3.2.2 Assessment to show compliance with derived reference levels

Measurements shall be made according to EN 62369-1, using one of the methods from EN 62369-1, 4.2, as appropriate. The method used, the assessment set-up and the results shall be documented.

The results shall be compared with the EC Recommendation, Annex III – Reference levels, using values provided in Table 2 of that document, and any applicable notes to the table.

3.2.3 Assessment to show compliance with basic restrictions

Assessment shall be made according to EN 62369-1, using one of the methods from EN 62369-1, 4.3, 4.4 or 4.5 as appropriate. The method used, the assessment set-up and the results shall be documented. Where numerical modelling is used, the details of the body model, the source model construction and any validations shall also be documented.

EN 62369-1, Annex B (informative), provides additional information for numerical modelling:

- for frequencies up to 10 MHz, the results used for induced current density comparison shall be those derived for Central Nervous System (CNS) tissue in the head and/or trunk of the body (brain and/or spinal cord tissue) as appropriate to the type of exposure;

- for frequencies above 100 kHz, the results used for SAR or power density comparison shall be the whole body average, and the localised average taken over 10 g of contiguous tissue;

- for frequencies between 100 kHz and 10 MHz, results for both induced current density in CNS tissue and SAR (or power density) shall be evaluated, as described in the bullet points above.

The results shall be compared with the EC Recommendation, Annex II – Basic restrictions, using values provided in Table 1 of that document, and any applicable notes to the table.

3.3 Evaluation of limb currents and contact currents from conductive objects

This subclause is applicable for equipment that emits single or multiple frequencies at up to 110 MHz. Evaluation shall be made according to EN 62369-1, 4.6. The method used, the assessment set-up and the results shall be documented.

For general public exposure, the results shall be compared with the EC Recommendation, Annex III – Reference levels, using values provided in Table 3 of that document and the paragraph beneath.

3.4 Assessment of devices which emit multiple frequencies

The operating nature of equipment covered by this product standard is such that they operate on one or more discrete frequencies with other frequencies suppressed by more than 30 dB. Where this is the case, the exposure assessment shall be made at the declared operating frequency or frequencies without requiring all other frequencies to be assessed. If this is not the case, then the exposure assessment must be made at all frequencies that are not suppressed by more than 30 dB.

For equipment that can emit more than one frequency, but not all frequencies simultaneously, then the frequency or frequencies which are most representative of the worst exposure condition shall be used. Again emitted frequencies suppressed by more than 30 dB need not be considered.

In situations where simultaneous exposure to fields of different frequencies does occur, the possibility that these exposures will be additive in their effects must be considered. Assessment based on such additive ffects shall be performed separately for each effect. The assessment shall be made according to EN 62369-1, Clause 6. Separate evaluations and comparisons shall be made for thermal and electrical stimulation effects on the body, and for non-simultaneous effects.

For general public exposure, the summation shall be made according to the EC Recommendation, Annex IV.

3.5 Assessments after delivery or installation

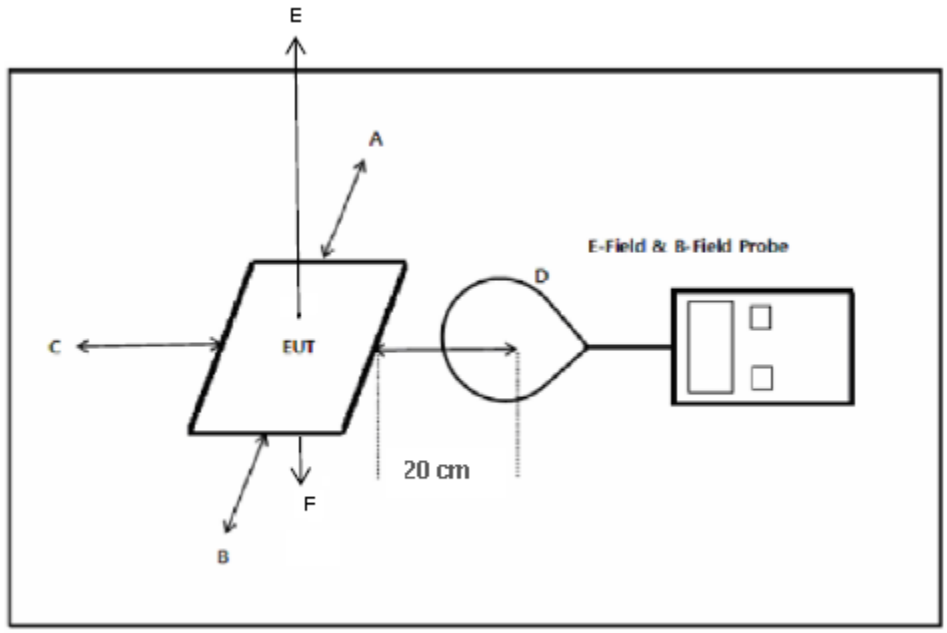
There is no requirement for assessments to be made after installation or delivery. The installer of the equipment should make such checks as are specified by the manufacturer to ensure that the equipment is operating according to its designed parameters, but this is not a requirement of this standard.

If there are parameters of the equipment that have to be set at installation which would affect the compliance according to this product standard, these changes shall be made. Details of such changes shall be clearly defined in the documentation for the equipment along with any tests, measurements or checks necessary to ensure that the changes have been implemented correctly.

Test Equipment

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS	Isotropic Field Probe	HI-6005	00200234	2020-05-22	2021-05-21

Test Setup



Test Data

Environmental Conditions

Temperature:	24.3 ℃
Relative Humidity:	50 %
ATM Pressure:	101.3 kPa

The testing was performed by Chao Gao on 2020-09-03.

Frequency	E-Field (V/m)						E-Field Limit (V/m)	Result
	A	B	C	D	E	F		
0.125 MHz	3.4	3.5	3.1	2	2.2	2.8	28	Pass
13.56 MHz	3.5	2.9	3.2	1.9	2.4	2.4	28	Pass

Note:

The distance from observation point to the antenna is 20 cm.

Conclusion: Compliant.

EXHIBIT A - EUT PHOTOGRAPHS

Refer to report NO. RXM220104050-01B

EXHIBIT B - TEST SETUP PHOTOGRAPHS

E-Filed Strength View-1

E-Filed Strength View-2

Declarations

1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

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

3: Otherwise required by the applicant or Product Regulations, 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 with the 95% confidence interval.

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