



FCC PART 15.249

TEST REPORT

For

Wellmike Enterprise Co., LTD

3F. No2, Ln 497, Chung Cheng Rd, Hsin Tien, Taipei Hsien Taiwan.

FCC ID: OLA-DXA208U

Model: DX-A211U, DX-A208U

Report Type: Original Report	Product Type: Elderly safety Alert
Report Producer: <u>Jane Lee</u> 	
Report Number: <u>RTWL170616001-00A</u>	
Report Date: <u>2017-08-07</u>	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

Revision History

Revision	Issue Date	Description
1.0	2017.08.07	Original Report

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant: Wellmike Enterprise Co., LTD

3F. No2, Ln 497, Chung Cheng Rd, Hsin Tien, Taipei Hsien Taiwan.

Manufacturer: Wellmike Enterprise Co., LTD

3F. No2, Ln 497, Chung Cheng Rd, Hsin Tien, Taipei Hsien Taiwan.

Product: Elderly safety Alert

Test Model: DX-A211U

Series Model: DX-A208U

Trade Name: Wellmike

Frequency Range: 915.34 MHz

Antenna Specification: PCB Antenna/Gain: -3 dBi

Voltage Range: 3Vdc from battery

Dimension: 62mm(L) x 36mm(W) x 15.4mm(H)

Date of Test: June 16, 2017~Aug 07, 2017

**All measurement and test data in this report was gathered from production sample serial number: 170616001 (Assigned by BACL, Taiwan). The EUT supplied by the applicant was received on 2017-06-16.*

Objective

This report is prepared on behalf of *Wellmike Enterprise Co., LTD* in accordance with Part 2, Subpart J, Part 15, Subparts A, and C of the Federal Communications Commission's rules.

The tests were performed in order to determine of EUT compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on

70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.
 68-3, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (Taiwan) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3180) and the FCC designation No.TW3180 under the Mutual Recognition Agreement (MRA) in FCC Test. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 974454. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer. The engineering mode was configured the system transmitting with maximum power. For test mode, only 1 channel (915.34MHz) was used.

EUT Exercise Software

No test software was used.

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Description	Manufacturer	Model Number	BSMI	FCC ID	S/N
N/A	N/A	N/A	N/A	N/A	N/A

External Cable List and Details

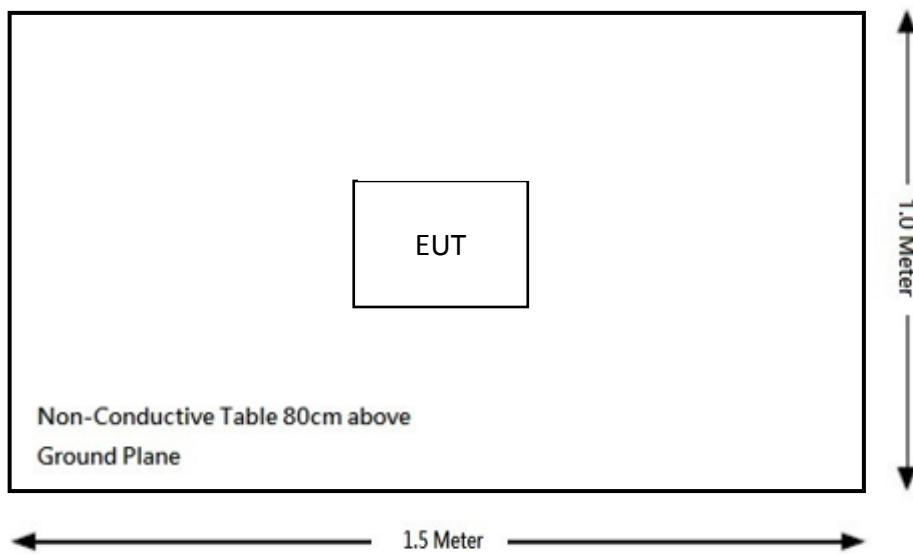
Cable Description	Length (m)	From	To
N/A	N/A	N/A	N/A

Block Diagram of Test Setup

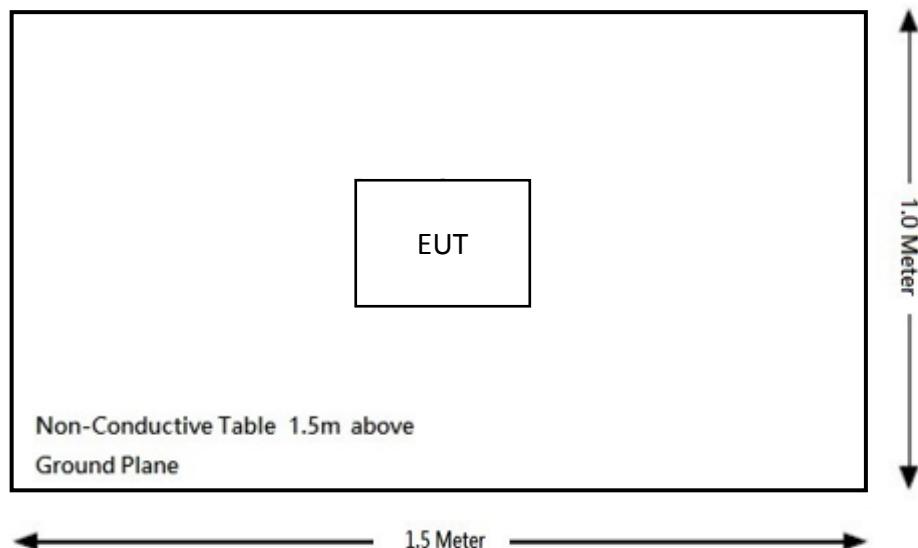
See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

Radiation

Below 1GHz:



Above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Not Applicable
§15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.215 (c)	20 dB Emission Bandwidth	Compliance

Note: It is battery operated equipment.

FCC §15.203—ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

Manufacturer	Type	Antenna Gain	Result
Wellmike Enterprise Co., LTD	PCB Antenna	-3 dBi	Compliance

The EUT has one integral antenna arrangement, which was permanently attached and the antenna gain is -3dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC§15.209, §15.205 & §15.249 - RADIATED EMISSIONS

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Measurement Uncertainty

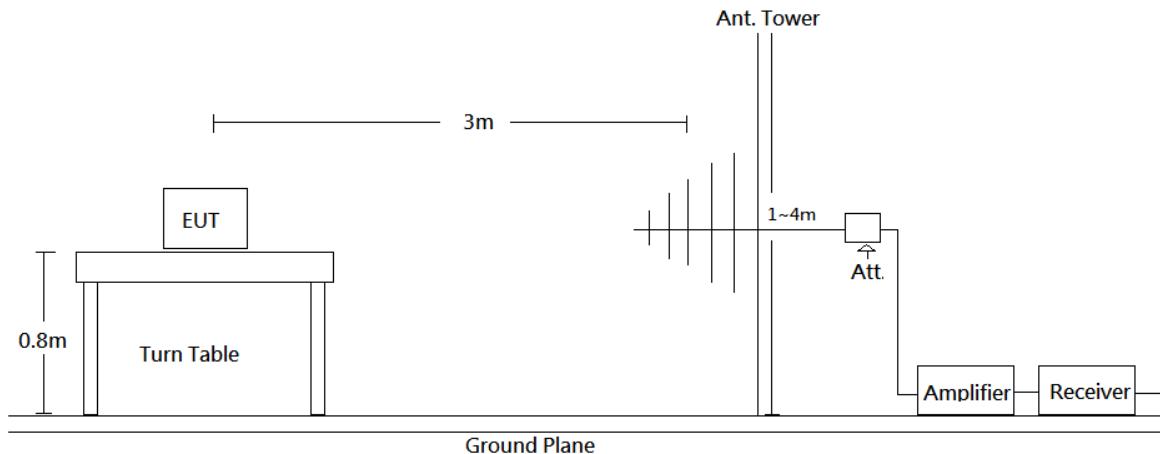
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Taiwan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report.

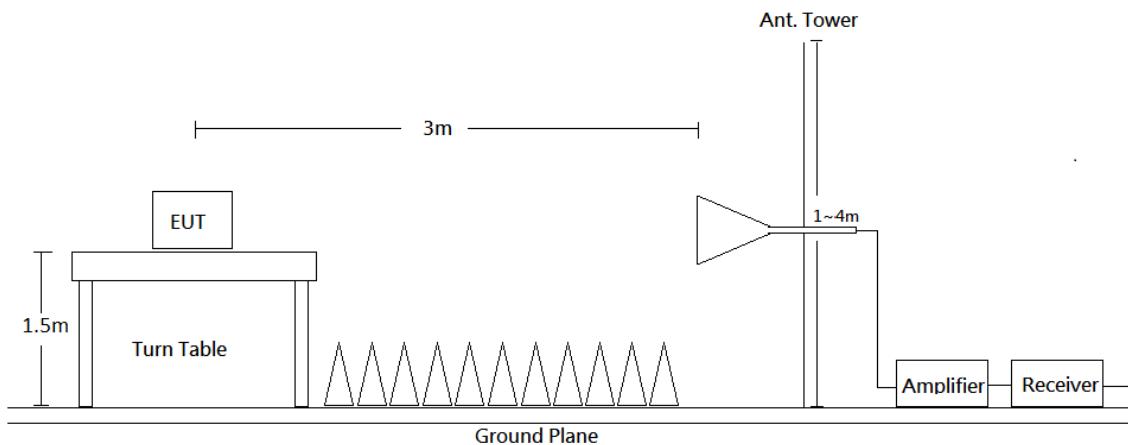
Frequency	Measurement uncertainty
30 MHz~200 MHz	4.21 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	4.41 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	4.51 dB (k=2, 95% level of confidence)
6 GHz~18 GHz	4.88 dB (k=2, 95% level of confidence)
18 GHz~26 GHz	4.30 dB (k=2, 95% level of confidence)
26 GHz~40 GHz	4.30 dB (k=2, 95% level of confidence)

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 3 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 10 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the

following configurations:

Frequency Range	SA RBW	SA Video B/W	Receiver RBW	Detector
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Bilog Antenna	Sunol & Mini-Circuits	JB6/UNAT-6+	A050115 / 15542_01	2016/11/16	2017/11/15
Horn Antenna	EMCO	3115	9311-4158	2017/05/31	2018/05/30
Horn Antenna	ETS-Lindgren	3116	00062638	2016/09/05	2017/09/04
Preamplifier	Sonoma	310N	130602	2017/07/03	2018/07/02
Preamplifier	EMEC	EM01G18G	060697	2017/04/14	2018/04/16
Preamplifier	EMEC	EM18G40G	060656	2016/12/13	2017/12/12
EMI Test Receiver	R & S	ESR7	101419	2016/11/03	2017/11/03
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2017/07/13	2018/07/12
Microflex Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2016/11/02	2017/11/01
Microflex Cable	UTIFLEX	UFA210A-1-3149-300300	MFR64639 226389-001	2016/11/29	2017/11/28
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2017/03/24	2018/03/23
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-80CM	160309-2	2017/01/20	2018/01/19
Turn Table	Champro	TT-2000	060772-T	N.C.R	N.C.R
Antenna Tower	Champro	AM-BS-4500-B	060772-A	N.C.R	N.C.R
Controller	Champro	EM1000	060772	N.C.R	N.C.R
Software	Farad	EZ_EMU	BACL-03A1	N.C.R	N.C.R

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

Corrected Amplitude & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain + Attenuator

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Result - Limit

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.249, with the worst margin reading of:

-2.96dB at 901.800 MHz in the **Horizontal** polarization of Test Mode (FSK)

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by Ian Tu on 2017-08-01.

Mode: Transmitting

Horizontal

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
30.0000	27.48	-3.59	23.89	40.00	-16.11	100	243	QP
152.2200	28.58	-11.23	17.35	43.50	-26.15	100	12	QP
332.6400	27.79	-9.15	18.64	46.00	-27.36	100	143	QP
590.6600	28.55	-4.16	24.39	46.00	-21.61	100	326	QP
730.3400	28.80	-2.21	26.59	46.00	-19.41	100	7	QP
889.4200	28.17	1.20	29.37	46.00	-16.63	100	324	QP
901.8000	41.60	1.44	43.04	46.00	-2.96	100	219	QP
915.3400	83.40	1.78	85.18	94.00	-8.82	100	217	QP
928.9000	40.52	2.13	42.65	46.00	-3.35	100	221	QP
1828.000	55.25	-6.70	48.55	74.00	-25.45	100	179	peak
1828.000	54.07	-6.70	47.37	54.00	-6.63	100	179	AVG
2746.000	53.46	-3.71	49.75	74.00	-24.25	100	163	peak
2746.000	51.00	-3.71	47.29	54.00	-6.71	100	163	AVG

Vertical

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
31.9400	30.37	-4.93	25.44	40.00	-14.56	100	95	QP
101.7800	39.04	-14.05	24.99	43.50	-18.51	100	299	QP
165.8000	36.37	-11.88	24.49	43.50	-19.01	100	360	QP
670.2000	28.68	-3.14	25.54	46.00	-20.46	100	220	QP
831.2200	27.91	0.05	27.96	46.00	-18.04	100	265	QP
994.1800	26.60	3.78	30.38	54.00	-23.62	100	103	QP
897.2000	39.84	1.34	41.18	46.00	-4.82	100	341	QP
915.3400	75.47	1.78	77.25	94.00	-16.75	100	42	QP
935.7500	40.22	2.30	42.52	46.00	-3.48	100	97	QP
1828.000	51.37	-6.70	44.67	74.00	-29.33	100	251	peak
1828.000	49.60	-6.70	42.90	54.00	-11.10	100	251	AVG
2746.000	48.77	-3.71	45.06	74.00	-28.94	100	73	peak
2746.000	44.40	-3.71	40.69	54.00	-13.31	100	73	AVG

Note:

Result = Reading + Correct Factor

Margin = Limit -Result

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain + Attenuator

The other emission levels were very low against the limit.

FCC§15.215(c) – 20 dB BANDWIDTH TESTING

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSU26	200268	2017/05/08	2018/05/07
Cable	WOKEN	SFL402	S02-160323-07	2017/02/22	2018/02/21

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

Test Data

Environmental Conditions

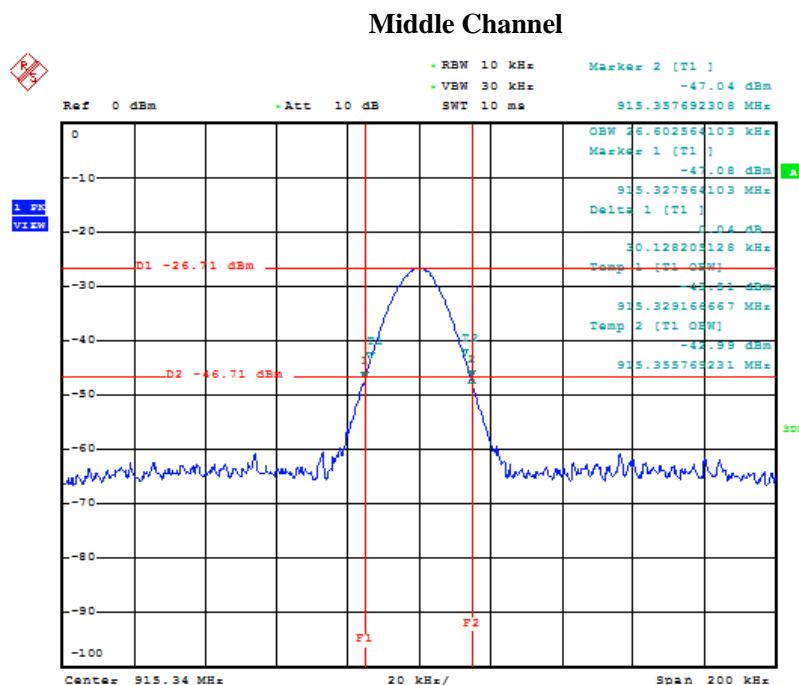
Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by Ian Tu on 2017-08-08.

Test Mode: Transmitting

Channel	Frequency (MHz)	20 dB Emission Bandwidth (MHz)
Middle	915.34	0.03

Please refer to the following tables and plots.



Date: 8.AUG.2017 10:58:54

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