

WELLMIKE ENTERPRISE CO., LTD.
FCC ID. : OLA-DX4310R
ETU:CAR ALARM

Exhibit C Measurement Report

FCC Part 15 Subpart B
EMI TEST REPORT
of

E.U.T. : CAR ALARM (Receiver)

FCC ID. : OLA-DX4310R

MODEL : DX4310R

Receiving Frequency : 433.87MHz

for

APPLICANT : WELLMIKE ENTERPRISE CO., LTD.

ADDRESS : 3FL. NO.2, LANE 497, CHUNG CHENG ROAD,
HSIN TIEN, TAIPEI HSIEN, TAIWAN, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN

NO. 8 LANE 29, WENMING ROAD,
LOSHAN TSUN, KWEISHAN HSIANG,
TAOYUAN, TAIWAN, R.O.C.

Tel:(03)3280026-32

Fax:(03)3280034

Report Number : ET88S-05-041-02

TEST REPORT NOTIFICATION

Applicant : WELLMIKE ENTERPRISE CO., LTD.
3FL. NO.2, LANE 497, CHUNG CHENG ROAD, HSIN TIEN,
TAIPEI HSIEN, Taiwan, R.O.C.

Manufacturer : WELLMIKE ENTERPRISE CO., LTD.
3FL. NO.2, LANE 497, CHUNG CHENG ROAD, HSIN TIEN,
TAIPEI HSIEN, Taiwan, R.O.C.

Description of EUT :

- a) Type of EUT : CAR ALARM (Receiver)
- b) Trade Name : WELLMIKE
- c) Model No. : DX4310R
- d) FCC ID : OLA-DX4310R
- e) Receiving Frequency : 433.87MHz
- f) Power Supply : DC 12V

Regulation Applied : FCC Rules and Regulations Part 15 Subpart B (1996)

I HEREBY CERTIFY THAT; The data shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

- Note : 1. The results of the testing report relate only to the items tested.
2. The testing report shall not be reproduced except in full, without the written approval of ETC.

Test Date : Jun. 25, 1999

Test Engineer : Rick Hu

Approve & Authorized
Signer :

Win-Po Tsai Jun. 25, 1999
Win-Po Tsai, Supervisor, NVLAP Signatory
EMC Dept. of ELECTRONICS
TESTING CENTER, TAIWAN

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Note:

This FCC ID. Application is for “RECEIVER”

The TRANSMITTER use for RECEIVER which had been submitted to FCC for applying, the FCC ID is “OLA-DX4310T”

1. GENERAL INFORMATION

1.1 Product Description

- a) Type of EUT : CAR ALARM (Receiver)
- b) Trade Name : WELLMIKE
- c) Model No. : DX4310R
- d) FCC ID : OLA-DX4310R
- e) Receiving Frequency : 433.87MHz
- f) Power Supply : DC 12V

1.2 Characteristics of Device

This product does not only provide security system to your car, but more than that it help you provide panic alarm sound to protect your personal safety when you are in the parking lot alone.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in section 12.1 of ANSI C63.4(1992).

For detail procedures, please see each measuring item.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.

This site has been accreditation as a FCC filing site.

2. DEFINITION AND LIMITS

2.1 Definition

Unintentional radiator:

A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

2.2 Limitation

(1) Conducted Emission Limits :

According to 15.107 , Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

Class B Line Conducted Emission Limits :

Frequency MHz	Emissions μV	Emissions dB μV
0.45 - 30.0	250	48.0

(2) Radiated Emission Limits :

According to 15.109 ,Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Class B Radiated Emission Limits :

Frequency MHz	Distance Meters	Radiated $\mu V/m$	Radiated dB $\mu V/m$
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
above 960	3	500	54.0

2.3 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.4 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3. RADIATED EMISSION MEASUREMENT

3.1 Applicable Standard

For unintentional radiator, the radiated emission shall comply with § 15.109(a).

3.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions and then each selected frequency is precisely measured. As the same purpose, for emission measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test. For super-regeneration receiver, there is tow mode of measurement, one is stand-by without a TX signal (CW), and the other is receiving a proper TX signal.
3. For emission measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the placement of cables associated with EUT to obtain the worse case and record the result.

Figure 1 : Frequencies measured below 1 GHz configuration

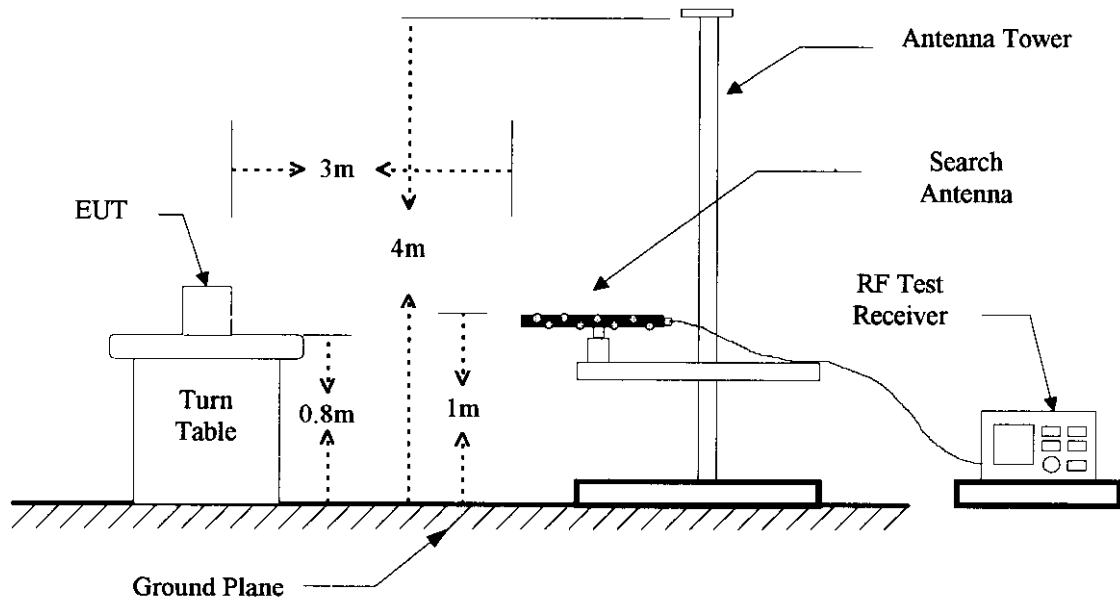
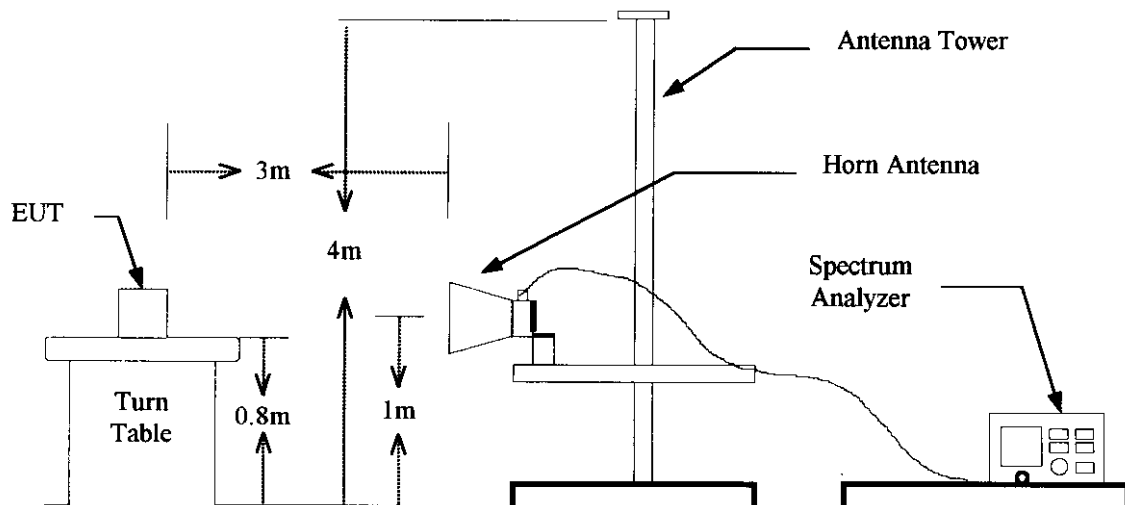


Figure 2 : Frequencies measured above 1 GHz configuration



3.3 Radiated Emission Data

Operation Mode : TX on

Test Date : Jun. 25, 1999Temperature : 21 °CHumidity : 70 %

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV) QP	Corrected Factor (dB)	Result @3m (dBuV/m) QP	Limit @3m (dBuV/m) QP	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
433.344	H	15.9	21.3	37.2	46.0	-8.8	50	1.4
433.344	V	14.0	21.3	35.3	46.0	-10.7	30	1.3
866.688	H/V	---	28.6	---	46.0	---	---	---
1300.032	H/V	---	26.5	---	54.0	---	---	---
1733.376	H/V	---	28.4	---	54.0	---	---	---

Remark "—" means that the emission level is too low to be measured.

3.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\text{RESULT} = \text{READING} + \text{CORR. FACTOR}$$

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

Assume a receiver reading of 22.5 dB μ V is obtained. The Antenna Factor of 14.5 and a Cable Factor of 1.5 is added. The total of field strength is 38.5 dB μ V/m.

$$\text{RESULT} = 22.5 + 14.5 + 1.5 = 38.5 \text{ dB } \mu \text{ V/m}$$

$$\begin{aligned} \text{Level in } \mu \text{ V/m} &= \text{Common Antilogarithm}[(38.5 \text{ dB } \mu \text{ V/m})/20] \\ &= 84.14 \mu \text{ V/m} \end{aligned}$$

3.5 Radiated Emission Measuring Equipment

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
EMI Test Receiver	Hewlett-Packard	8546A	3411A00192	Nov. 04, 1999
Horn Antenna	EMCO	3115	9107-3729	May 16, 2000
BiconiLog Antenna	EMCO	3142	9702-1142	Aug. 20, 1999

Note: The standards used to perform this calibration are traceable to NML/ROC and NIST/USA.

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	Auto

3.3 Test Data

Temperature : 19 °C
 Humidity : 78 %
 Operated mode : Transmitting
 Test Date : Jun. 25, 1999

Frequency (MHz)	Ant Pol H/V	Reading (dBuV) QP	Correct Factor (dB)	Result @3m (dBuV/m) QP	Limit @3m (dBuV/m) AVG	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
433.833	H	45.4	21.3	66.7	80.8	-14.1	35	1.8
433.833	V	47.4	21.3	68.7	80.8	-12.1	30	3.0
867.666	H	14.1	28.6	42.7	60.8	-18.1	45	1.5
867.666	V	17.8	28.6	46.4	60.8	-14.4	60	1.2
1301.499	H/V	---	26.5	---	---	---	---	---
1735.332	H/V	---	28.4	---	---	---	---	---
2169.165	H/V	---	30.5	---	---	---	---	---
2602.998	H/V	---	32.5	---	---	---	---	---
3036.831	H/V	---	33.4	---	---	---	---	---
3470.664	H/V	---	34.3	---	---	---	---	---
3904.497	H/V	---	34.8	---	---	---	---	---
4338.330	H/V	---	36.1	---	---	---	---	---

a. Limit on the field strength of fundamental

$$41.6667 \times 433.833 - 7083.3333 = 10993 \mu\text{V/m} \approx 80.8\text{dB} \mu\text{V/m}$$

b. Limit on the field strength of spurious less than limit value 20dB

Note :

If the measured frequencies fall in the restricted frequency band, the limit employed is § 15.209 general requirement when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function, no duty factor applied.

3.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$RESULT = READING + CORR. FACTOR$$

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

Assume a receiver reading of 22.5 dB μ V is obtained. The Antenna Factor of 14.5 and a Cable Factor of 1.5 is added. The total of field strength is 38.5 dB μ V/m.

$$RESULT = 22.5 + 14.5 + 1.5 = 38.5 \text{ dB } \mu \text{ V/m}$$

$$\begin{aligned} \text{Level in } \mu \text{ V/m} &= \text{Common Antilogarithm}[(38.5 \text{ dB } \mu \text{ V/m})/20] \\ &= 84.14 \mu \text{ V/m} \end{aligned}$$

3.5 Radiated Test Equipment

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
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BiconiLog Antenna	EMCO	3142	9702-1142	Aug. 20, 1999

Note: The standards used to perform this calibration are traceable to NML/ROC, NIST/USA and NPL.

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	Auto

3.6 Measuring Instrument Setup

Explanation of measuring instrument setup in frequency band measured is as following :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz

4. CONDUCTED EMISSION MEASUREMENT

4.1 Standard Applicable

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to § 15.207 (d), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.