



STC Test Report

Date : 2008-05-19

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No. : HM161714

Applicant (ARE003):

ARTLIGHT ELECTRICAL MFG CO LTD.
Unit 301, 3/F, Eastern Centre, 1065 King's Road, Hong Kong

Manufacturer:

ARTLIGHT ELECTRICAL MFG CO LTD.
Unit 301, 3/F, Eastern Centre, 1065 King's Road, Hong Kong

Description of Samples:

Product: FM Wireless Microphone
Brand Name: N/A
Model Number: AL82314
FCC ID: CIXAL82314

Date Samples Received:

2008-05-10

Date Tested:

2008-05-15

Investigation Requested:

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2007 and ANSI C63.4:2003 for FCC Certification.

Conclusions:

The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks:

For additional models details, see page 5.

Dr. LEE Kam Chuen,
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.

10 Dai Wang Street, Tai Po Industrial Estate, N.T., Hong Kong

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Appendix A

List of Measurement Equipment

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Appendix B

Photographs

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details **Applicant**

ARTLIGHT ELECTRICAL MFG CO LTD.
Unit 301, 3/F, Eastern Centre, 1065 King's Road, Hong Kong

Manufacturer

ARTLIGHT ELECTRICAL MFG CO LTD.
Unit 301, 3/F, Eastern Centre, 1065 King's Road, Hong Kong

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1.3 Equipment Under Test [EUT] Description of Sample

Model Name: FM Wireless Microphone
Manufacturer: ARTLIGHT ELECTRICAL MFG CO LTD.
Brand Name: N/A
Model Number: AL82314
Additional Model Number(s): AL88921, AL2360, AL2361, AL2361(N), AL64836, AL2360©, AL2111, AL80663
Input Voltage: 3Vd.c. ("AA" size battery x 2)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is an ARTLIGHT ELECTRICAL MFG CO LTD., FM Wireless Microphone. The transmitter is a switch transmitter, The EUT continues to transmit while switch on, It is a voice transmitter, Modulation by microphone; and type is frequency modulation.

1.4 Date of Order

2008-05-10

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2008-05-15

1.7 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2007 and ANSI C63.4: 2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary					
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result	
				Pass	Failed
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.239	ANSI C63.4:2003	N/A	☒	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	☒	☐

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

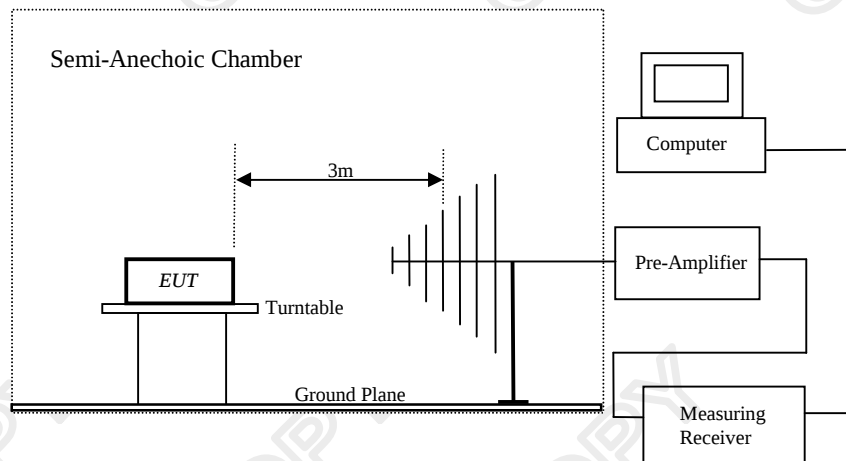
Test Requirement: FCC 47CFR 15.239
Test Method: ANSI C63.4:2003
Test Date: 2008-05-15
Mode of Operation: Tx mode

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations and the frequency spectrum should be measured from the lowest operating frequency of the EUT.
. The emissions worst-case are shown in Test Results of the following pages.

* Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Peak Limits [$\mu\text{V/m}$]	Average Limits [$\mu\text{V/m}$]
88-108	2,500	250

Results of Tx Mode (99.7MHz): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μV	Correction Factor dB/m	Field Strength dB $\mu\text{V/m}$	Field Strength $\mu\text{V/m}$	Limit @3m $\mu\text{V/m}$	E-Field Polarity
99.70	32.30	10.1	42.4	131.8	2,500	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dB μV	Correction Factor dB/m	Field Strength dB $\mu\text{V/m}$	Field Strength $\mu\text{V/m}$	Limit @3m $\mu\text{V/m}$	E-Field Polarity
99.70	31.60	10.1	41.7	121.6	250	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Limits [$\mu\text{V/m}$]
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of Tx Mode (99.7MHz): PASS

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dB μV	Correction Factor dB/m	Field Strength dB $\mu\text{V/m}$	Field Strength $\mu\text{V/m}$	Limit @3m $\mu\text{V/m}$	E-Field Polarity
199.40	< 1.0	11.0	< 12.0	< 4.0	150	Vertical
299.10	< 1.0	14.0	< 15.0	< 5.6	200	Vertical
398.80	< 1.0	17.5	< 18.5	< 8.4	200	Vertical
498.50	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
598.20	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
697.90	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
797.60	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
897.30	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
997.00	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz 5.2dB

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3.2 20B Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.239
Test Method: ANSI C63.4:2003 (Section 13.1.7)
Test Date: 2008-05-15
Mode of Operation: Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth. Verify the lowest and highest tunable frequency, insure the tunable frequency range is within the frequency band specified in this part. After the measurements, ensure the transmitter is still functional.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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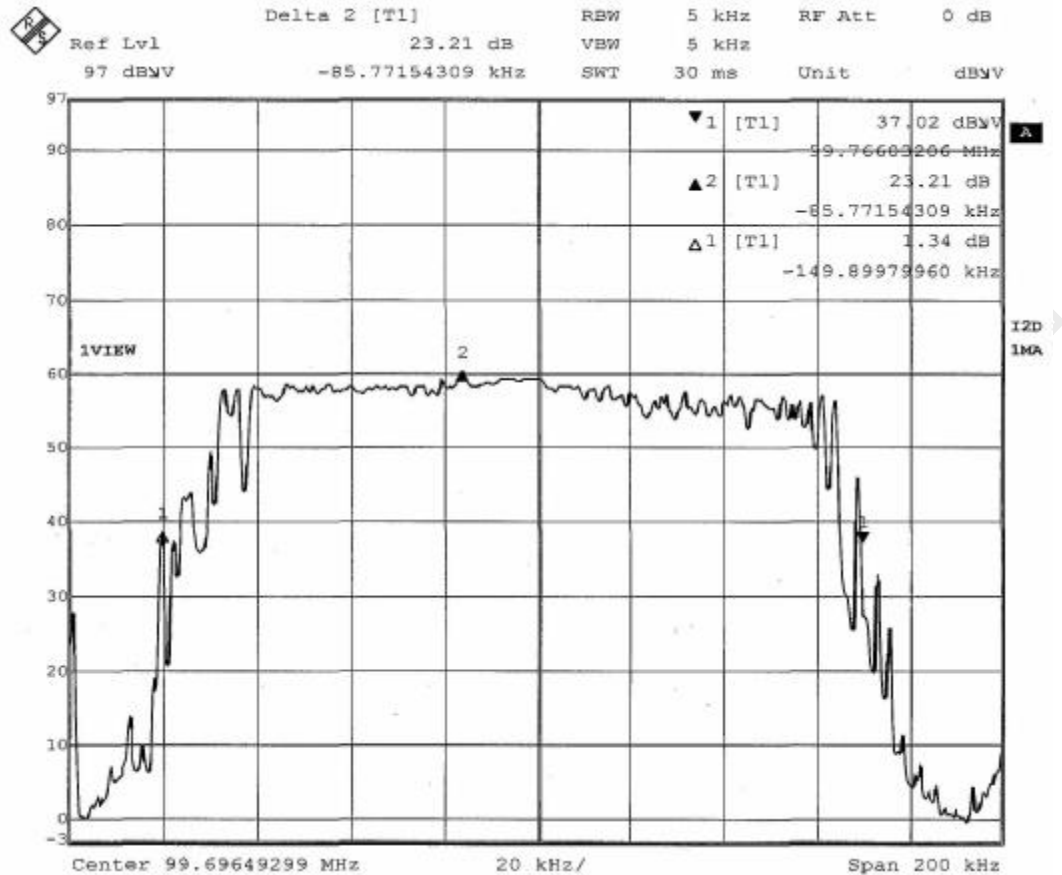
Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
99.7	149.7	200

Result of Tx mode:

The following figure is the measured bandwidth of Fundamental Emission.

20dB Bandwidth of Fundamental Emission



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Operation Description

3.3.1 Operating Frequency and Rating

The transmitter is a FM transmitter operating at 92-106MHz band. The transmitter is powered by 3Vd.c. and the transmitting frequency is LC controlled. The operation is achieved by different combinations of from frequency modulation signal on the 82-106MHz carrier frequency.

3.3.2 EUT Antenna

No external antenna, 56cm long metal antenna. There is no external ground connection. The ground is only that of the printed circuit board.

3.3.3 Installation Method

(Please refer to user manual)

3.3.4 Test Procedure Used

ANSI C36.4 test method is adopted.

3.3.5 Test Method for car adapter equipment

According to ANSI C36.4, EUT will be test on the turntable; there are no specific test requirements for EUT use inside a car.

3.3.6 Tuning range of the EUT

The EUT is able to tune from 100MHz only. This product cannot be tuned frequency by user.

3.3.7 Test signal

A audio source will be place next to the audio input of the EUT, the audio signal will consist of different sound, the volume will be also turn to maximum in order to obtain the worst case scenario.

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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2006/05/02	2009/05/02
EM219	BICONILOG ANTENNA	EMCO	3142C	00029071	2006/08/23	2008/08/23
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2007/07/20	2008/08/20

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

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Appendix B

Photographs of EUT

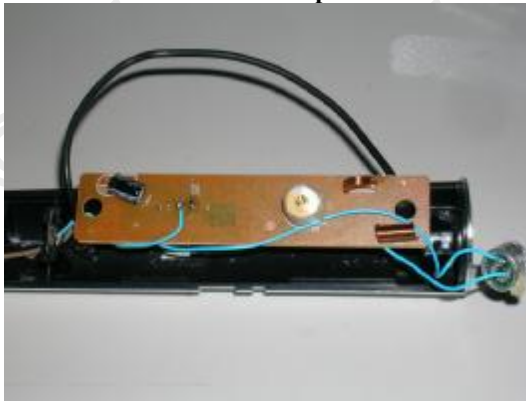
Front View of the product



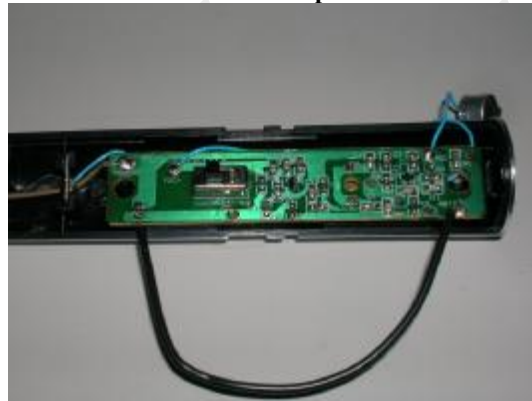
Rear View of the product



Front View of the product



Rear View of the product



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Photographs of EUT

Measurement of Radiated Emission Test Set Up



***** End of Test Report *****

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