

# FCC TEST REPORT

*of*

## FM Transmitter

**Brand name :** Languang and Minton

**Model No. :** LGC-5028

**Serial No. :** N/A

**Report No. :** FCC05-8018

**Date :** July 12, 2005

*Prepared for*

**Shenzhen Languang Import & Export Co., Ltd**

R314, 3F, Languang Bldg, Zhenhua Rd. Shenzhen

*Prepared by*

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## Table of Contents

|     |                                                          |    |
|-----|----------------------------------------------------------|----|
| 1   | General Description of EUT .....                         | 3  |
| 2   | Summary of Test Results .....                            | 4  |
| 3   | Test Report Certification.....                           | 4  |
| 4   | Radiated Emission Test.....                              | 5  |
| 4.1 | Limits of Radiated Emission.....                         | 5  |
| 4.2 | Test Instruments .....                                   | 5  |
| 4.3 | Test Procedure .....                                     | 5  |
| 4.4 | Test Setup .....                                         | 6  |
| 4.5 | EUT Operating Conditions .....                           | 6  |
| 4.6 | Test Results .....                                       | 7  |
| 5   | Occupied Bandwidth.....                                  | 11 |
| 5.1 | Definition.....                                          | 11 |
| 5.2 | Test Instruments .....                                   | 11 |
| 5.3 | Test Procedure .....                                     | 11 |
| 5.4 | Test Setup .....                                         | 11 |
| 5.5 | EUT Setup and Operating Conditions .....                 | 11 |
| 5.6 | Test Results .....                                       | 12 |
|     | Appendix I : Photographs of the EUT .....                | 13 |
|     | Appendix II : Photographs of the Test Configuration..... | 15 |

## 1 General Description of EUT

**Product:** FM Transmitter

**Brand name:** Languang and Minton

**Model No.:** LGC-5028

**Power Supply:** DC 12V

**Output:** /

**I/O Signal Ports:** Audio Input

**Frequency Range:** 88.22~107.94MHz

**Applicant:** Shenzhen Languang Import & Export Co., Ltd

**Applicant Address:** R314, 3F, Languang Bldg, Zhenhua Rd. Shenzhen

**Manufacturer:** Shenzhen Languang Audio Manufacture Co., Ltd

**Manufacturer Address:** No. 49, Third Industry Yard, North of Baozi Street,  
Kengzi Town Languang District, Shenzhen, 518122,  
P.R.China.

### NOTE:

1. The EUT is a short range, wireless car radio FM transmitter, classified as intentional radiators according FCC Part 15 Subpart C.

## 2 Summary of Test Results

The EUT has been tested according to FCC part 15. The test procedure is according to ANSI C63.4: 2003. The test results are as following:

| EMISSION            |                    |                                                                                                              |
|---------------------|--------------------|--------------------------------------------------------------------------------------------------------------|
| Standard            | Test Type          | Result                                                                                                       |
| \$15.207            | Conducted Emission | <input type="checkbox"/> PASS <input type="checkbox"/> Fail <input checked="" type="checkbox"/> Inapplicable |
| \$15.209 & \$15.239 | Radiated Emission  | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> Fail <input type="checkbox"/> Inapplicable |
| \$15.239            | 26 dB Bandwidth    | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> Fail <input type="checkbox"/> Inapplicable |

## 3 Test Report Certification

We, ShenZhen Electronic Product Quality Testing Center, hereby certify that the Equipment Under Test (EUT) described above has been tested in our facility. The test record, data evaluation and EUT configuration represented herein are true and accurate accounts of measurements of the sample's EMC characteristics under the conditions herein specified.

Tested by: \_\_\_\_\_, Date: \_\_\_\_\_  
Zhu Qi

Checked by: \_\_\_\_\_, Date: \_\_\_\_\_  
Smart Li

Approved by: \_\_\_\_\_, Date: \_\_\_\_\_  
Wang Keqin

## 4 Radiated Emission Test

### 4.1 Limits of Radiated Emission

The field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency of Emission (MHz) | Field Strength ( $\mu\text{V/m}$ ) | Field Strength (dB $\mu\text{V/m}$ ) |
|-----------------------------|------------------------------------|--------------------------------------|
| 30 - 88                     | 100                                | 40                                   |
| 88 - 216                    | 150                                | 43.5                                 |
| 216 - 960                   | 200                                | 46                                   |
| Above 960                   | 500                                | 54                                   |

**NOTE:**

1. Field Strength (dB $\mu\text{V/m}$ ) =  $20\log$  Field Strength ( $\mu\text{V/m}$ ).
2. In the emission tables above, the tighter limit applies at the band edges.

### 4.2 Test Instruments

| Description            | Manufacturer  | Model No. | Serial No.     | Cal. Due Date |
|------------------------|---------------|-----------|----------------|---------------|
| Test Receiver          | ROHDE&SCHWARZ | ESIB26    | 100130         | 2006.06.10    |
| Ultra Broadband Ant.   | ROHDE&SCHWARZ | HL562     | 100089         | 2006.06.05    |
| Semi- Anechoic Chamber | Albatross     | H-249     | P21505-016-001 | 2006.04.18    |

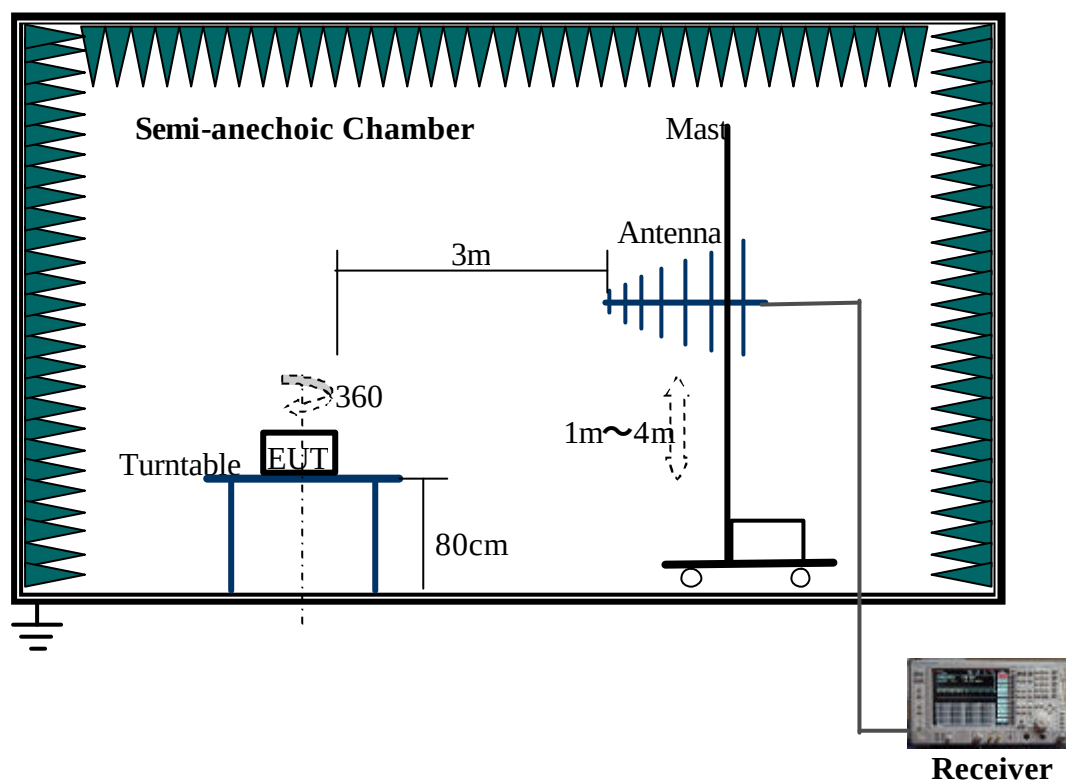
### 4.3 Test Procedure

- a. The EUT was placed on the top of a ratable 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the heights from 1 to 4 meters and the ratable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detector Function and Specified Bandwidth with

Maximum Hold Mode.

- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emission that did not have 10 dB margin would be retested one by one using the quasi-peak method.

## 4.4 Test Setup



For the actual test configuration, please refer to the related item-Photographs of the Test Configuration.

## 4.5 EUT Operating Conditions

The EUT was powered by 12Vdc.

The EUT was working continuously at the highest middle and the lowest frequency during the test.

## 4.6 Test Results

Working Frequency: 88.02MHz

| No | Frequency (MHz) | Antenna Polarization | Antenna Height (cm) | Table Angle (Degree) | QP Limits (dBm V) | Emission Level QP(dBm V) | Emission Level PK(dBm V) | Emission Level AV(dBm V) |
|----|-----------------|----------------------|---------------------|----------------------|-------------------|--------------------------|--------------------------|--------------------------|
| 1  | 88.02           | V                    | 100                 | 0                    | 47.96             | 34.45                    | 34.79                    | 34.08                    |
| 2  | 88.02           | H                    | 100                 | 0                    | 47.96             | 32.09                    | 32.37                    | 31.88                    |
| 3  | 176.04          | H                    | 100                 | 0                    | 43.5              | 21.68                    | --                       | --                       |
| 4  | 94.06           | V                    | 100                 | 0                    | 43.5              | 9.27                     | --                       | --                       |
| 5  | 94.06           | H                    | 100                 | 0                    | 43.5              | 8.79                     | --                       | --                       |
| 6  | 97.48           | V                    | 100                 | 0                    | 43.5              | 9.54                     | --                       | --                       |
| 7  | 97.48           | H                    | 100                 | 0                    | 43.5              | 9.08                     | --                       | --                       |

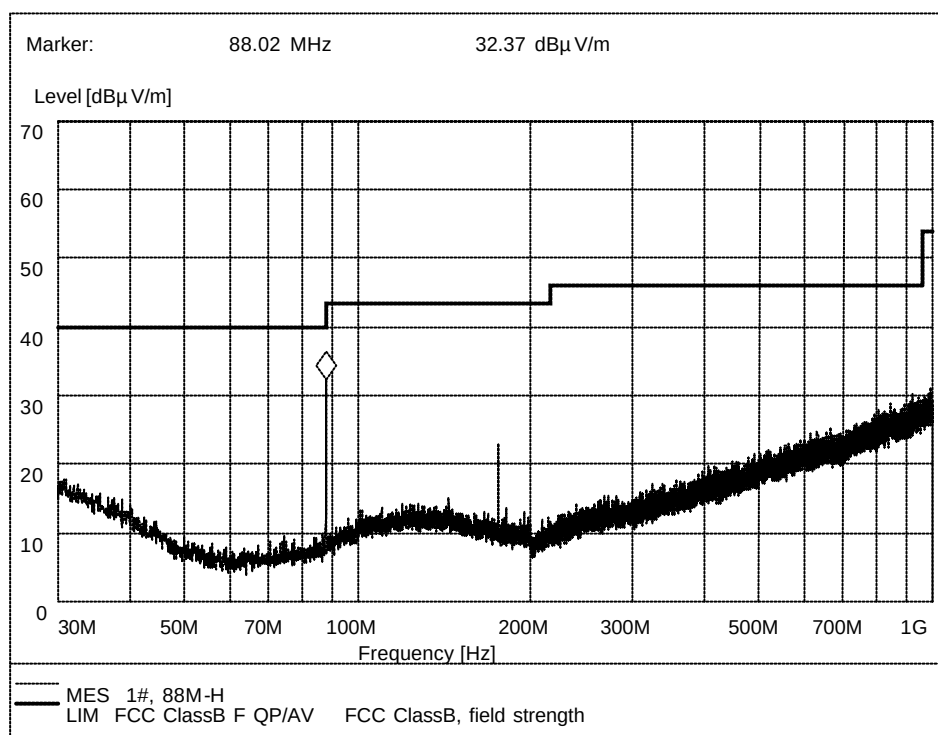
Working Frequency: 97.98MHz

| No | Frequency (MHz) | Antenna Polarization | Antenna Height (cm) | Table Angle (Degree) | QP Limits (dBm V) | Emission Level QP(dBm V) | Emission Level PK(dBm V) | Emission Level AV(dBm V) |
|----|-----------------|----------------------|---------------------|----------------------|-------------------|--------------------------|--------------------------|--------------------------|
| 1  | 97.98           | V                    | 100                 | 0                    | 47.96             | 30.49                    | 27.58                    | 24.76                    |
| 2  | 97.98           | H                    | 100                 | 0                    | 47.96             | 30.48                    | 28.19                    | 25.57                    |
| 3  | 195.96          | H                    | 100                 | 0                    | 43.5              | 21.68                    | --                       | --                       |
| 4  | 94.06           | V                    | 100                 | 0                    | 43.5              | 8.06                     | --                       | --                       |
| 5  | 94.06           | H                    | 100                 | 0                    | 43.5              | 8.45                     | --                       | --                       |
| 6  | 97.48           | V                    | 100                 | 0                    | 43.5              | 8.98                     | --                       | --                       |
| 7  | 97.48           | H                    | 100                 | 0                    | 43.5              | 8.76                     | --                       | --                       |

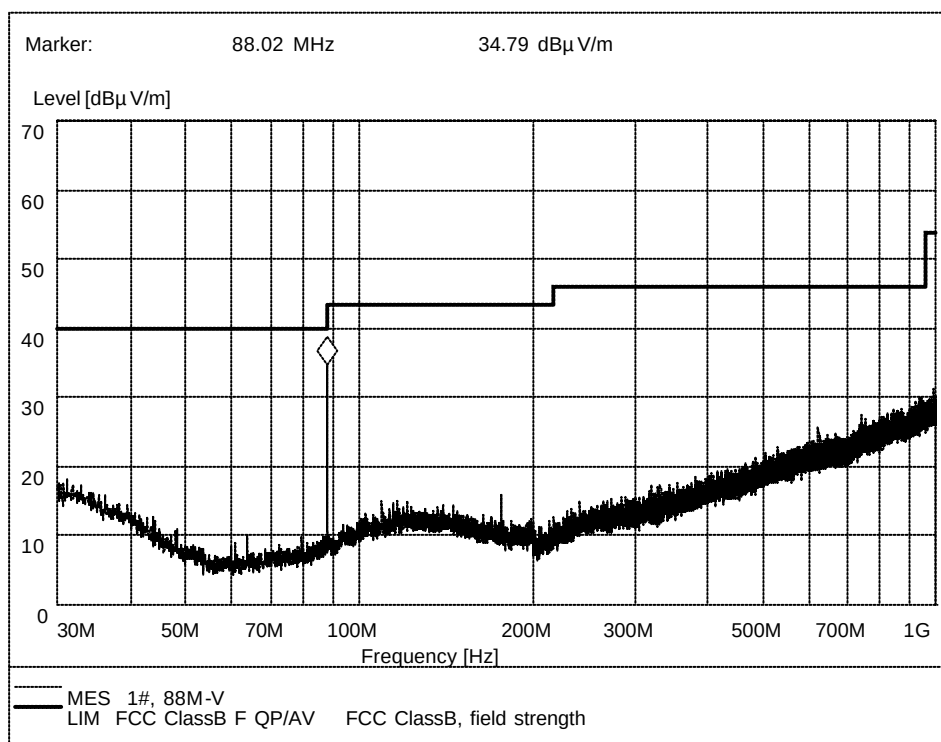
Working Frequency: 107.94MHz

| No | Frequency (MHz) | Antenna Polarization | Antenna Height (cm) | Table Angle (Degree) | QP Limits (dBm V) | Emission Level QP(dBm V) | Emission Level PK(dBm V) | Emission Level AV(dBm V) |
|----|-----------------|----------------------|---------------------|----------------------|-------------------|--------------------------|--------------------------|--------------------------|
| 1  | 107.94          | V                    | 100                 | 0                    | 47.96             | 18.08                    | 22.36                    | 17.56                    |
| 2  | 107.94          | H                    | 100                 | 0                    | 47.96             | 17.87                    | 23.19                    | 15.43                    |
| 3  | 215.88          | H                    | 150                 | 0                    | 43.5              | 22.64                    | --                       | --                       |
| 4  | 323.92          | H                    | 150                 | 0                    | 46                | 20.48                    | --                       | --                       |
| 5  | 94.06           | V                    | 100                 | 0                    | 43.5              | 8.82                     | --                       | --                       |
| 6  | 94.06           | H                    | 100                 | 0                    | 43.5              | 8.16                     | --                       | --                       |
| 7  | 97.48           | V                    | 100                 | 0                    | 43.5              | 9.46                     | --                       | --                       |
| 8  | 97.48           | H                    | 100                 | 0                    | 43.5              | 9.15                     | --                       | --                       |

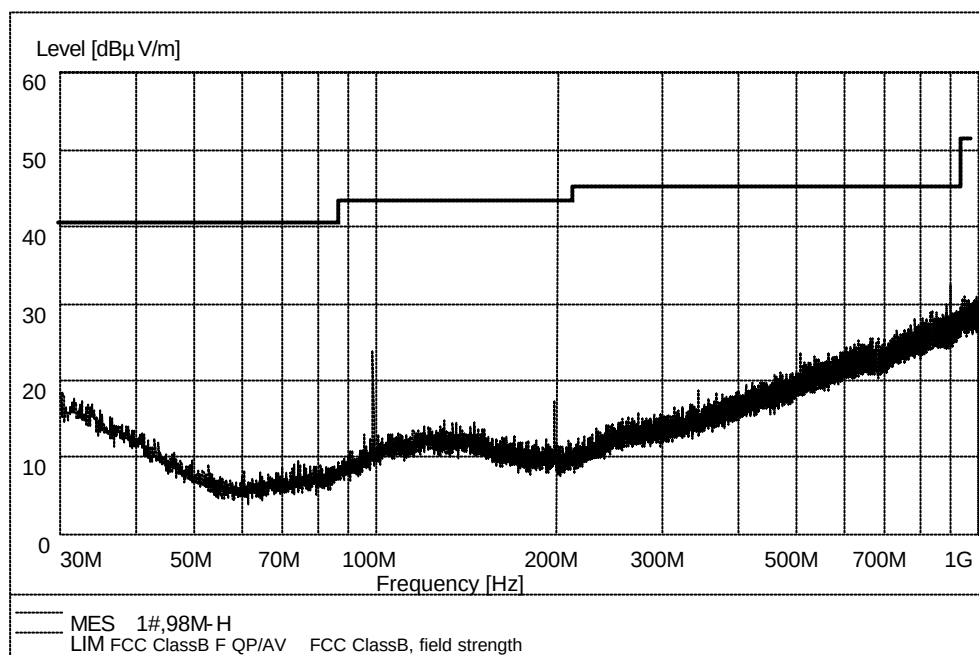
1. Electromagnetic radiation disturbances, antenna polarization: Horizontal. Working frequency: 88.02 MHz



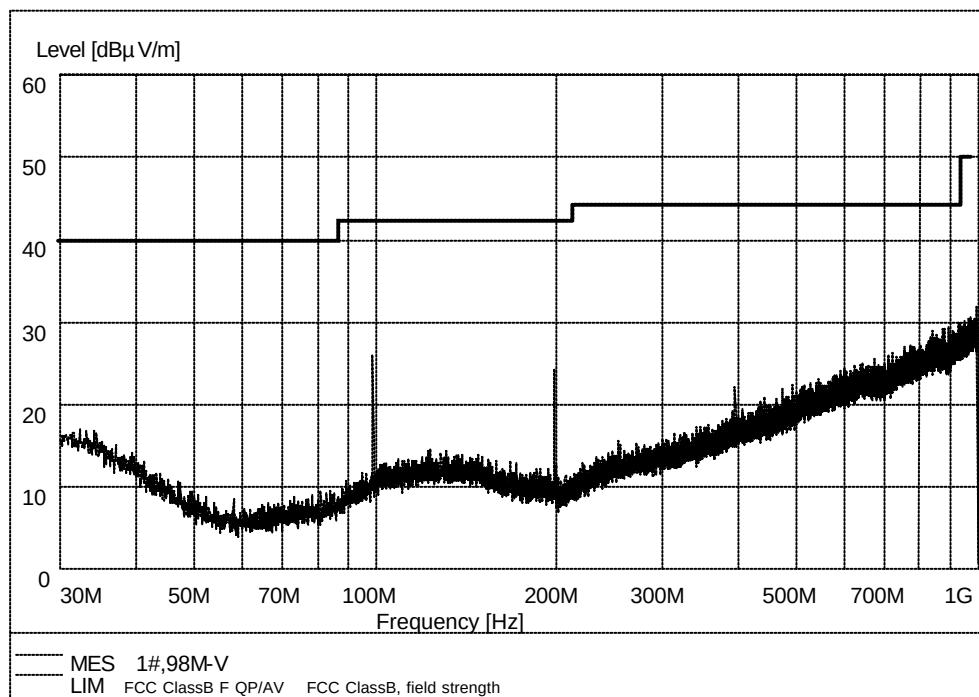
2. Electromagnetic radiation disturbances, antenna polarization: Vertical. Working frequency: 88.02 MHz



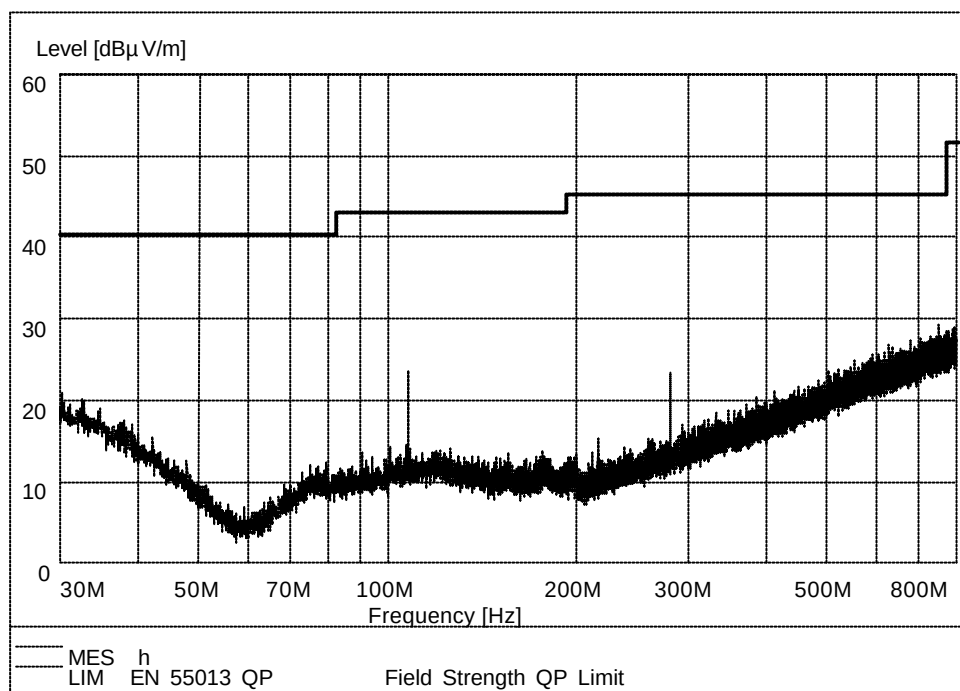
3. Electromagnetic radiation disturbances, antenna polarization: Horizontal. Working frequency: 97.98 MHz



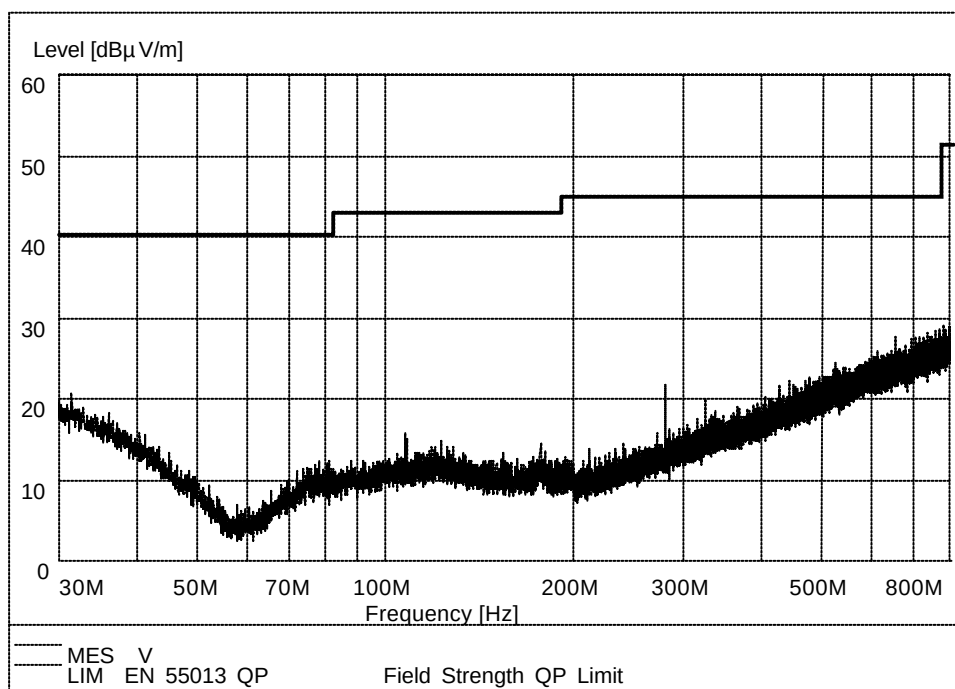
4. Electromagnetic radiation disturbances, antenna polarization: Vertical. Working frequency: 97.98 MHz



5. Electromagnetic radiation disturbances, antenna polarization: Horizontal. Working frequency: 107.94 MHz



6. Electromagnetic radiation disturbances, antenna polarization: Vertical. Working frequency: 107.94 MHz



## 5 Occupied Bandwidth

### 5.1 Definition

According to FCC §2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

### 5.2 Test Instruments

Same as 4.2

### 5.3 Test Procedure

- a. The occupied bandwidth measurement was performed in a full anechoic chamber using radiation measurement method. The air loss of the site and the factors of the test system is pre-calibrated using substitution method.
- b. The EUT was placed on the vertical axis of a turntable 0.8 meters above the ground.
- c. For the frequency range 30 MHz to 3 GHz, ultra-broadband bi-log antenna was used. The antenna was at the same height as the EUT. Since there was no reflection from the chamber floor and the site was pre-calibrated, the antenna height need not to be changed as the open site method. The polarization of the receiving antenna was the same as that of the EUT transmitting antenna.
- d. The spectrum analyzer was set to Maxpeak Detector and Maximum Hold mode. The resolution bandwidth was set to at least 1% of the emission bandwidth. For FM signal, VBW=RBW=3kHz.

### 5.4 Test Setup

Same as 4.4

### 5.5 EUT Setup and Operating Conditions

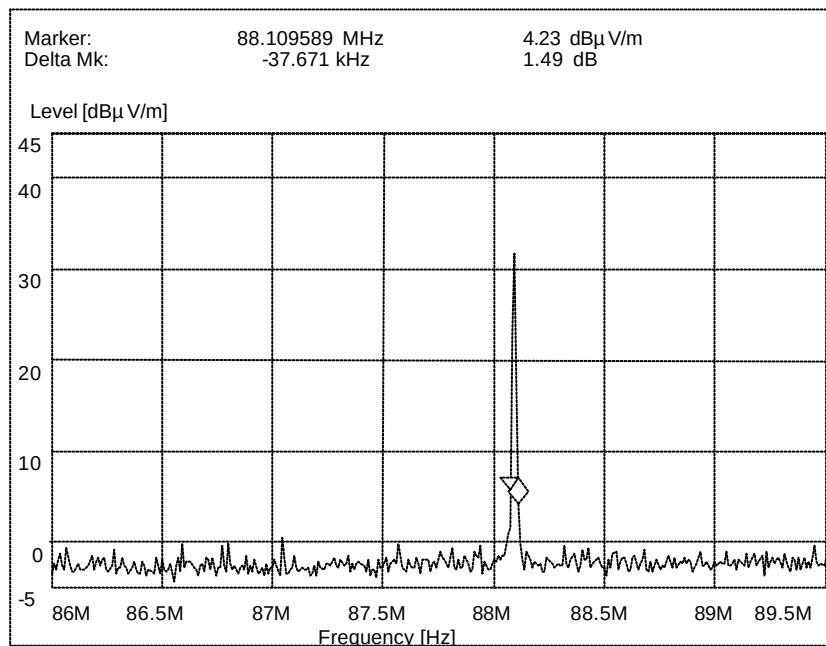
The EUT was powered by 12Vdc.

The EUT was working continuously at the highest and the lowest frequency during the test.

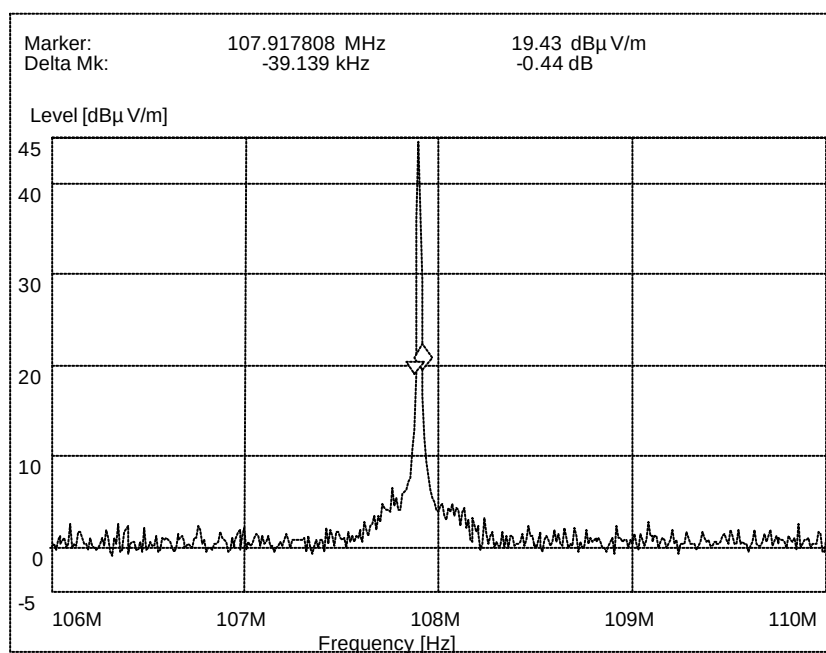
## 5.6 Test Results

The 26dB emission bandwidth at the lowest and the highest frequency is showed in the following plots.

1. Lowest frequency: 88.02MHz Occupied Bandwidth is: 37.671 kHz



2. Highest frequency: 107.94MHz Occupied Bandwidth is: 39.139 kHz

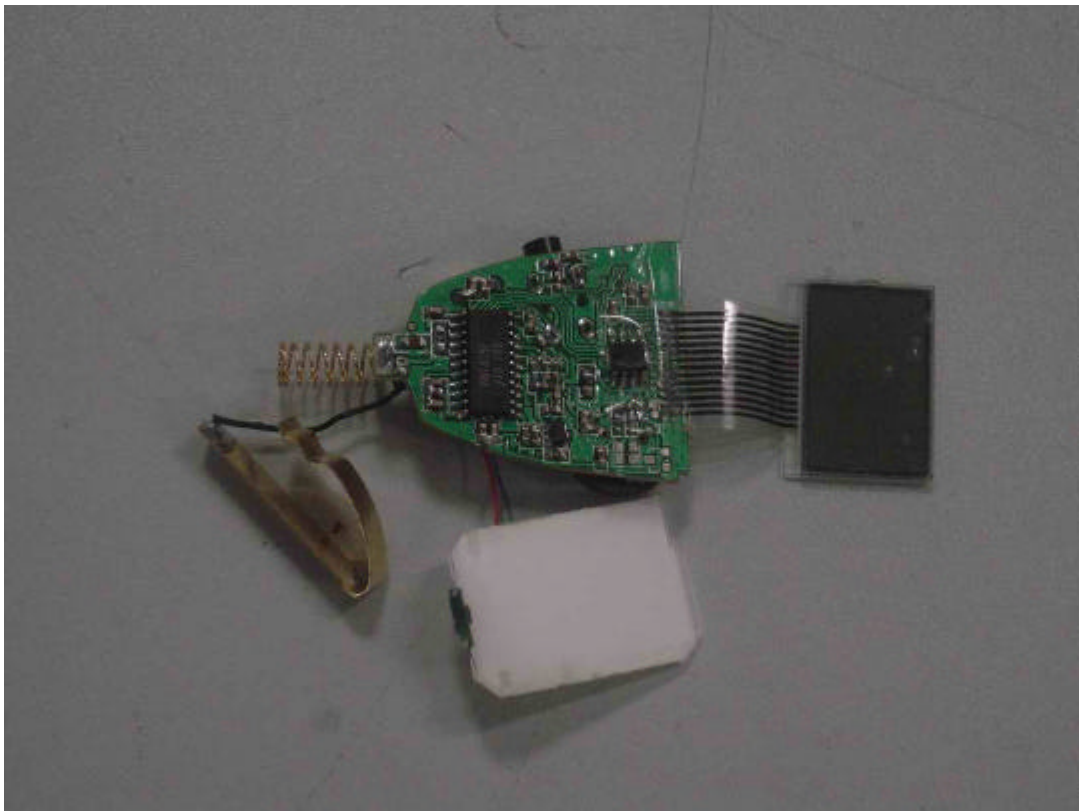
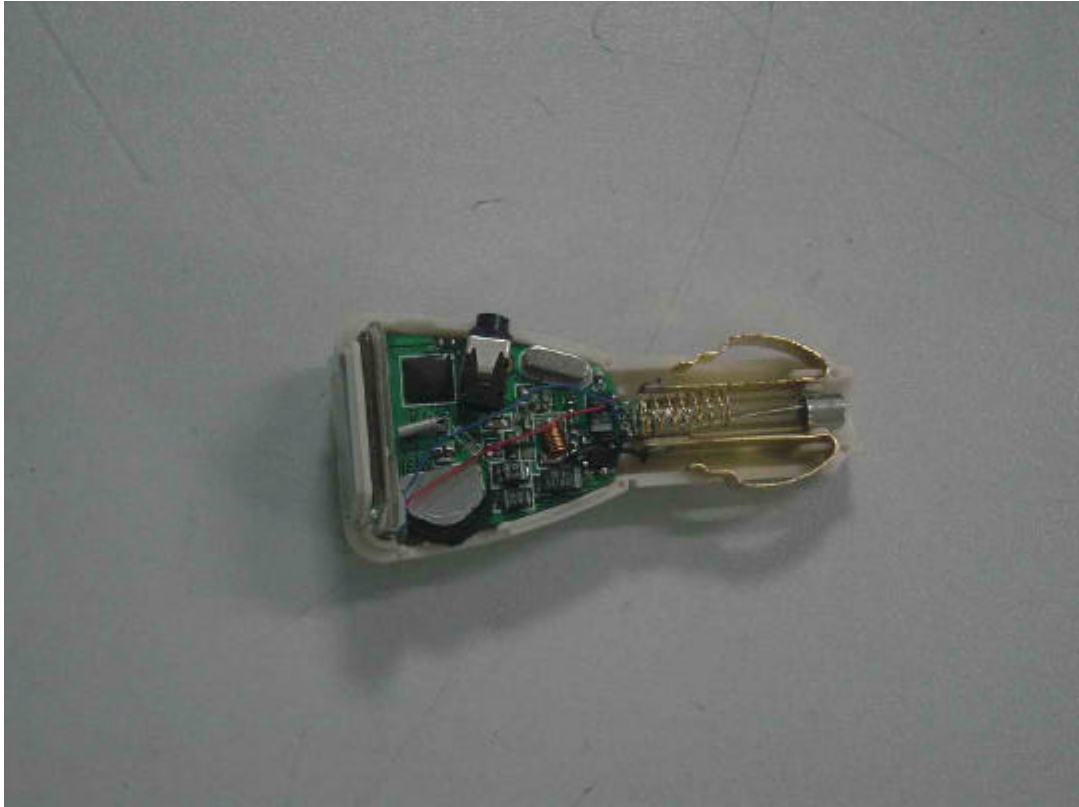


## Appendix I : Photographs of the EUT

### Appearance

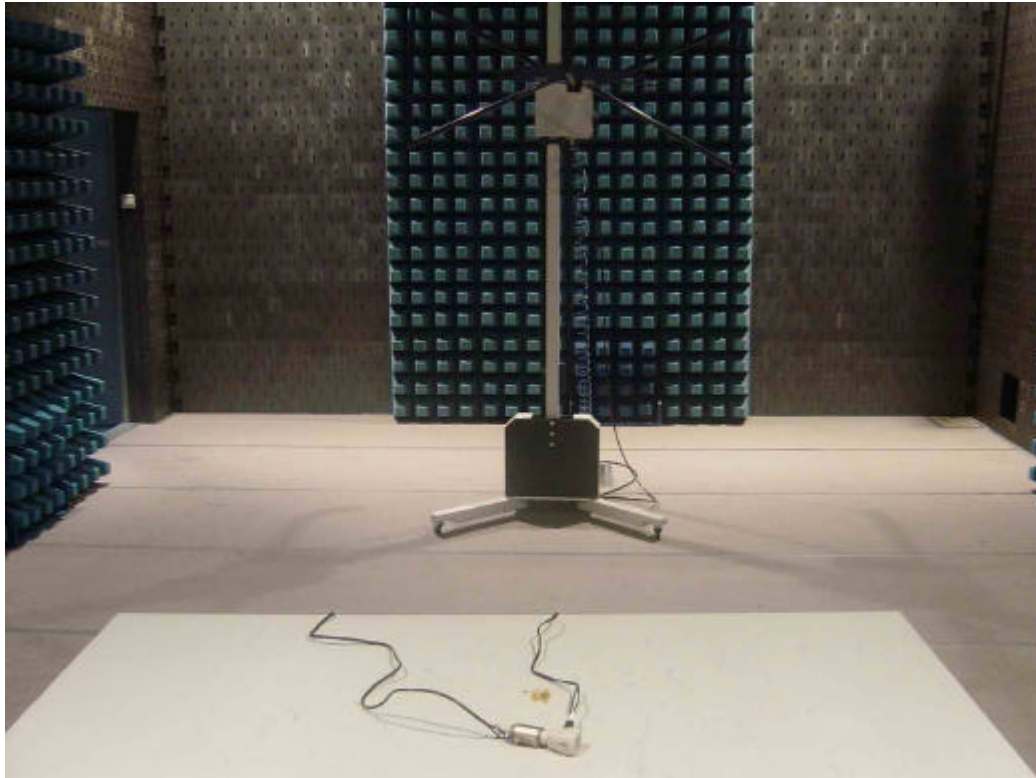


### Inside



## Appendix II : Photographs of the Test Configuration

**Radiated Emission Measurement**



**Occupied Bandwidth Measurement**

