

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**MP3 WMA Wireless FM Transmitter**

**MODEL No.: VRFM8BLN**

**BRAND NAME: VR3**

**FCC ID: UM78BLN**

**REPORT NO: E0609084F**

**ISSUE DATE: September 25, 2006**

*Prepared for*

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*Prepared by*

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### VERIFICATION OF COMPLIANCE

|                      |  |
|----------------------|--|
| Applicant:           | Minwa(China) Electronics Co.,Ltd.<br>Minwa(Shenzhen) Industrial Park, Fu Shing Au Village, Ping Hu Town,<br>Long Gang District, Shenzhen 518111, China |
| Product Description: | MP3 WMA Wireless FM Transmitter  |
| Brand Name:          | VR3  |
| Model Number:        | VRFM8BLN   |
| Serial Number:       | N/A  |
| File Number:         | E0609084F  |
| Date of Test:        | September 18, 2006 to October 16, 2006   |

#### We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.239.

The test results of this report relate only to the tested sample identified in this report.

*Approved By*



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**David Lee / Q.A. Manager  
SHENZHEN EMTEK CO., LTD.**

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## **1. GENERAL INFORMATION**

### **1.1 Product Description**

The Minwa(China) Electronics Co.,Ltd. Model: VRFM8BLN (referred to as the EUT in this report). The EUT is a car using stereo FM transmitter, with a high quality stereo FM transmitter IC inside, The actual tuning Controls can be manually adjusted to from 88.0 MHz to 108.0MHz with total channel spacing of 200KHz, All 12 channels: 88.1, 88.3, 88.5, 88.7, 88.9, 106.7, 106.9, 107.1, 107.3, 107.5,107.7,107.9MHz were examined.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 88.0MHz~108.0MHz.
- B). Antenna Designation: Internal.
- C). Power Supply: By Car Charger or 12.0VDC.
- D). Channel Spacing: 200KHz

### **1.2 Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: VRFM8BLN filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

### **1.3 Test Methodology**

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

### **1.4 Special Accessories**

Not available for this EUT intended for grant.

### **1.5 Equipment Modifications**

Not available for this EUT intended for grant.

## 1.6 Test Facility

Site Description  
EMC Lab. : Accredited by CNAL, 2005.11.02  
The certificate is valid until 2010.11  
The Laboratory has been assessed and proved to be in compliance  
with CNAL/AC01:2003(identical to ISO/IEC17025:1999)  
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Guangzhou, 2005.1  
The certificate is valid until 2008.2  
The Laboratory has been assessed according to the requirements  
ISO/IEC 17025:1999

Accredited by FCC, July 07, 2005  
The Certificate Registration Number is 709623.

Accredited by Industry Canada, August 30, 2005  
The Certificate Registration Number is 46405-4480

Name of Firm : SHENZHEN EMTEK CO., LTD  
Site Location : Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The Tx frequency was 88.0MHz~108.0MHz.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

### 2.4 Limitation

#### (1) Radiated Emission

- (a) The field strength of any emissions within the permitted 200kHz band shall not exceed 250 microvolts/meter at 3 meters, The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.
- (b) The field strength of any emissions radiated on any frequency outside of the specified 200Khz band shall not exceed the general radiated emission limits in Section 15.209.

Remark: The limit for average field strength dBuv/m for the fundamental frequency=48.0 dBuv/m.  
And the limit for peak field strength dBuv/m for the fundamental frequency=68.0 dBuv/m.

Intentional Radiators general limit).as below.

| Frequency (MHz) | Field strength $\mu\text{V/m}$ | Distance(m) | Field strength at 3m $\text{dB}\mu\text{V/m}$ |
|-----------------|--------------------------------|-------------|---|
| 1.705-30        | 30                             | 30          | 69.54   |
| 30-88           | 100                            | 3           | 40  |
| 88-216          | 150                            | 3           | 43.5  |
| 216-960         | 200                            | 3           | 46  |
| Above 960       | 500                            | 3           | 54  |

**(2) Occupied Bandwidth**

- (a) Emissions from the intentional radiator shall be confined within a band 200kHz wide centered on the operation frequency, The 200kHz band shall lie wholly within the frequency range of 88-108MHz.

## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**

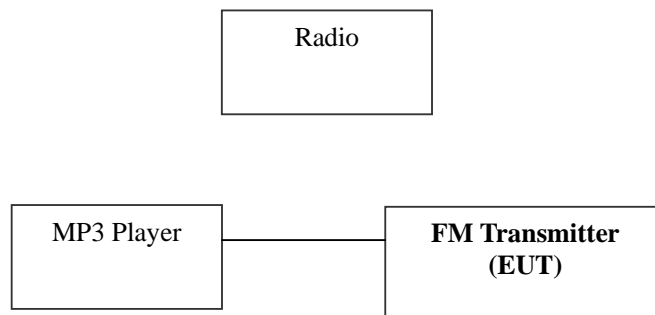


Table 2-1 Equipment Used in Tested System

| Item | Equipment                             | Mfr/Brand | Model/Type No. | FCC ID  | Series No. | Note       |
|------|---------------------------------------|-----------|----------------|---------|------------|------------|
| 1.   | MP3 WMA<br>Wireless FM<br>Transmitter | VR3       | VRFM8BLN       | UM78BLN | N/A        | <i>EUT</i> |
| 2.   | MP3 Player                            | Unitek    | M512           | N/A     | N/A        |            |
| 3.   | Radio                                 | sayin     | FM21           | N/A     | N/A        |            |

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.



### 3. Summary Of Test Results

| <b>FCC Rules</b> | <b>Description Of Test</b> | <b>Result</b> |
|------------------|----------------------------|---------------|
| § 15.239         | Radiated Emission          | Compliant     |
| § 15.239         | Bandwidth Test             | Compliant     |

### 4. Description of test modes

The EUT (MP3 WMA Wireless FM Transmitter) has been tested under normal operating condition. Three channels of EUT (the lowest channel, the middle channel and the highest channel) have been chosen for testing under Normal Operating condition. In this report, all the measured datum of the three channels have been reported. No software used to control the EUT for staying in continuous transmitting mode for testing.

1. For lowest channel : 88.10MHz
2. For middle channel : 98.10MHz
3. For highest channel: 107.9MHz

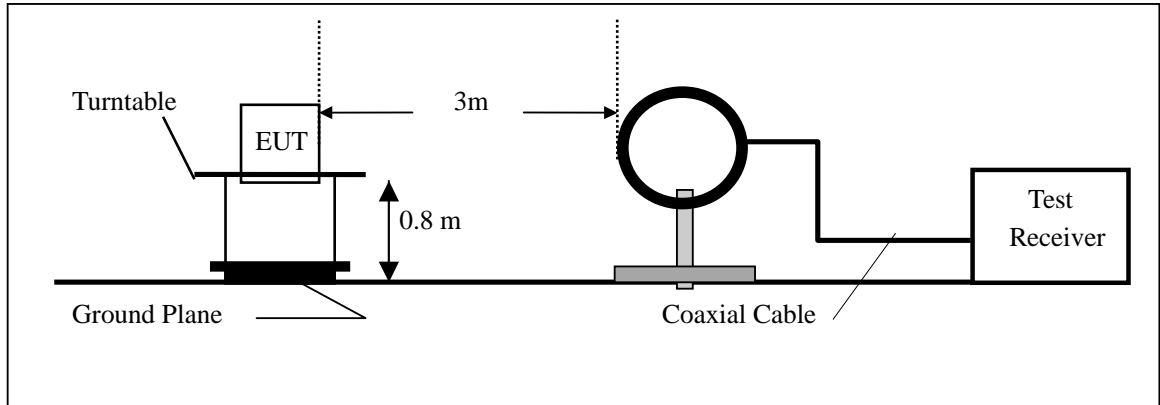
## **5. Radiated Emission Test**

### **5.1 Measurement Procedure**

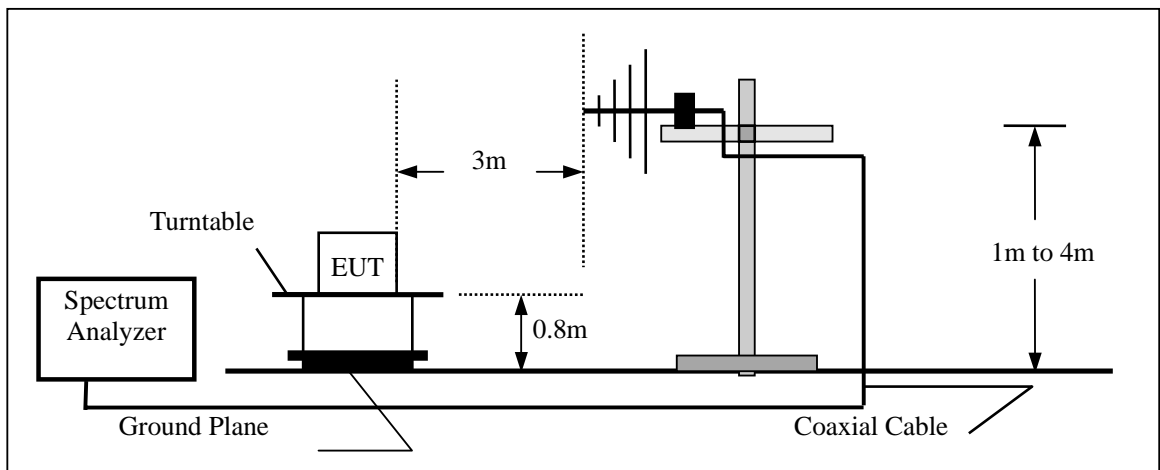
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz





Operation Mode:           Transmitting Mode                           Test Date :           October 16, 2006  
 Test Item:                Fundamental Radiated Emission Data   Temperature :        28 °C  
 Fundamental Frequency: Middle channel                   Humidity :           65 %  
 Test Result:             PASS   Test By:             Andy

Peak Measurement

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 98.10          | V               | 43.50                    | 68.00                | -24.50         | Peak |
| 98.10          | H               | 42.90                    | 68.00                | -25.10         | Peak |

Average Measurement

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 98.10          | V               | 42.60                    | 48.00                | -5.40          | AV   |
| 98.10          | H               | 42.50                    | 48.00                | -5.50          | AV   |

**Note:** (1) All Readings are Peak Value.  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss  
 (3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode:           Transmitting Mode                            Test Date :            October 16, 2006  
Test Item:                 Fundamental Radiated Emission Data    Temperature :        28 °C  
Fundamental Frequency: Highest channel                    Humidity :            65 %  
Test Result:              PASS    Test By:              Andy

Peak Measurement

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 107.90         | V               | 45.20                    | 68.00                | -22.80         | Peak |
| 107.90         | H               | 43.10                    | 68.00                | -24.90         | Peak |

Average Measurement

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 107.90         | V               | 44.80                    | 48.00                | -3.20          | AV   |
| 107.90         | H               | 42.30                    | 48.00                | -5.70          | AV   |

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.



Operation Mode:           Transmitting Mode                            Test Date :            October 16, 2006  
 Test Item:                General Radiated Emission Data                    Temperature :        28 °C  
 Fundamental Frequency: Middle channel                           Humidity :            65 %  
 Test Result:              PASS    Test By:              Andy

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 179.60         | V               | 38.60                    | 43.50                | -4.90          | Peak |
| 261.41         | V               | 39.10                    | 46.00                | -6.90          | Peak |
| 365.11         | V               | 40.10                    | 46.00                | -5.90          | Peak |
| 460.12         | V               | 40.30                    | 46.00                | -5.70          | Peak |
| 558.11         | V               | 41.52                    | 46.00                | -4.48          | Peak |
| 692.16         | V               | 41.20                    | 46.00                | -4.80          | Peak |
| 182.56         | H               | 41.60                    | 43.60                | -2.00          | Peak |
| 265.98         | H               | 38.60                    | 46.00                | -7.40          | Peak |
| 364.44         | H               | 41.30                    | 46.00                | -4.70          | Peak |
| 465.49         | H               | 39.80                    | 46.00                | -6.20          | Peak |
| 560.21         | H               | 38.60                    | 46.00                | -7.40          | Peak |
| 695.79         | H               | 41.70                    | 46.00                | -4.30          | Peak |

Note: Emission Level= Reading Level+ Probe Factor +Cable Loss

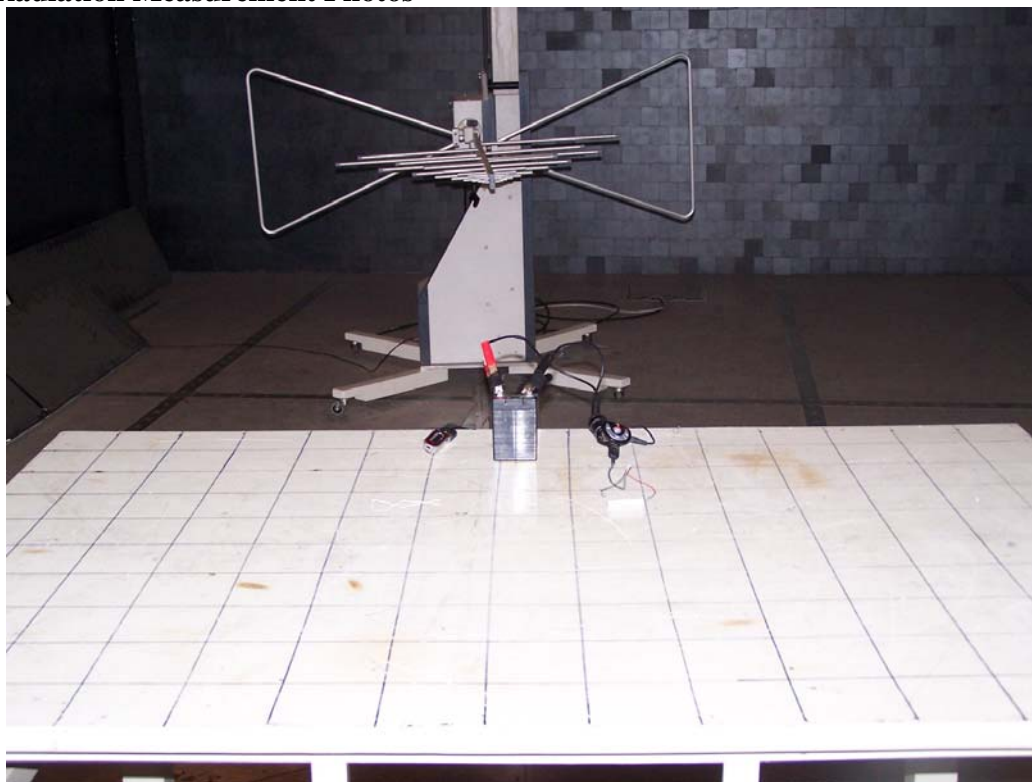


Operation Mode:           Transmitting Mode                           Test Date :           October 16, 2006  
 Test Item:                General Radiated Emission Data            Temperature :        28 °C  
 Fundamental Frequency: Highest channel           Humidity :           65 %  
 Test Result:              PASS    Test By:             Andy

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 209.18         | V               | 38.50                    | 43.50                | -5.00          | Peak |
| 312.42         | V               | 39.60                    | 46.00                | -6.40          | Peak |
| 420.23         | V               | 40.50                    | 46.00                | -5.50          | Peak |
| 531.45         | V               | 41.30                    | 46.00                | -4.70          | Peak |
| 659.12         | V               | 42.60                    | 46.00                | -3.40          | Peak |
| 831.48         | V               | 41.80                    | 46.00                | -4.20          | Peak |
| 191.69         | H               | 38.15                    | 43.60                | -5.45          | Peak |
| 287.89         | H               | 42.10                    | 46.00                | -3.90          | Peak |
| 360.22         | H               | 41.80                    | 46.00                | -4.20          | Peak |
| 433.12         | H               | 42.15                    | 46.00                | -3.85          | Peak |
| 519.87         | H               | 40.12                    | 46.00                | -5.88          | Peak |
| 619.12         | H               | 41.00                    | 46.00                | -5.00          | Peak |

Note: Emission Level= Reading Level+ Probe Factor +Cable Loss

### 5.5 Radiation Measurement Photos



## 6. Occupied Bandwidth

### 6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency , RBW = 10KHz, ,VBW= 30KHz
4. Set SPA Max hold. Mark peak.

Notes: The EUT can be connected to MP3 Player. The input signal of EUT is controlled by MP3 Player. So the volume control of MP3 Player was set to maximum during the test. It means that the test was performed with the maximum audio input.

### 6.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

### 6.3 Measurement Equipment Used:

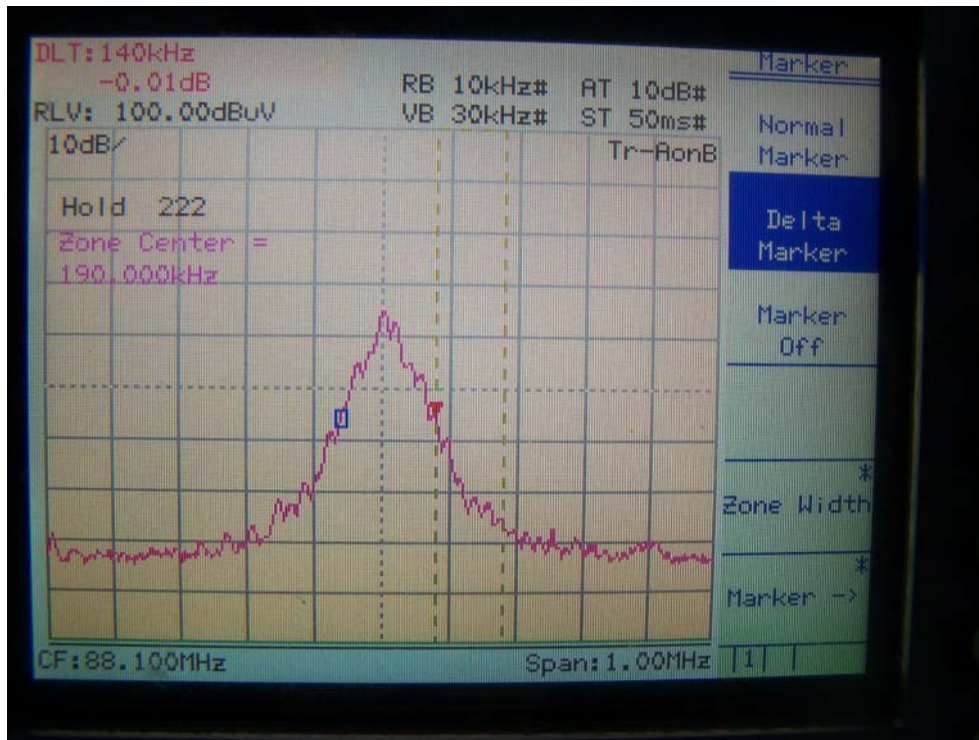
Same as 4.2 Radiated Emission Measurement.

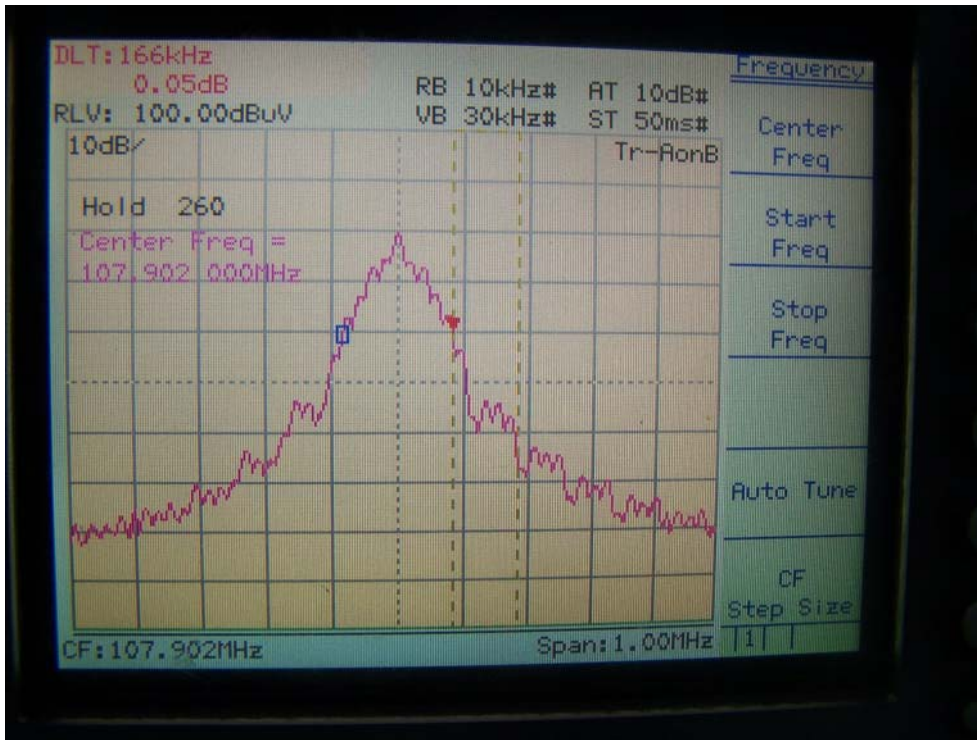
### 6.4 Measurement Results:

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209.

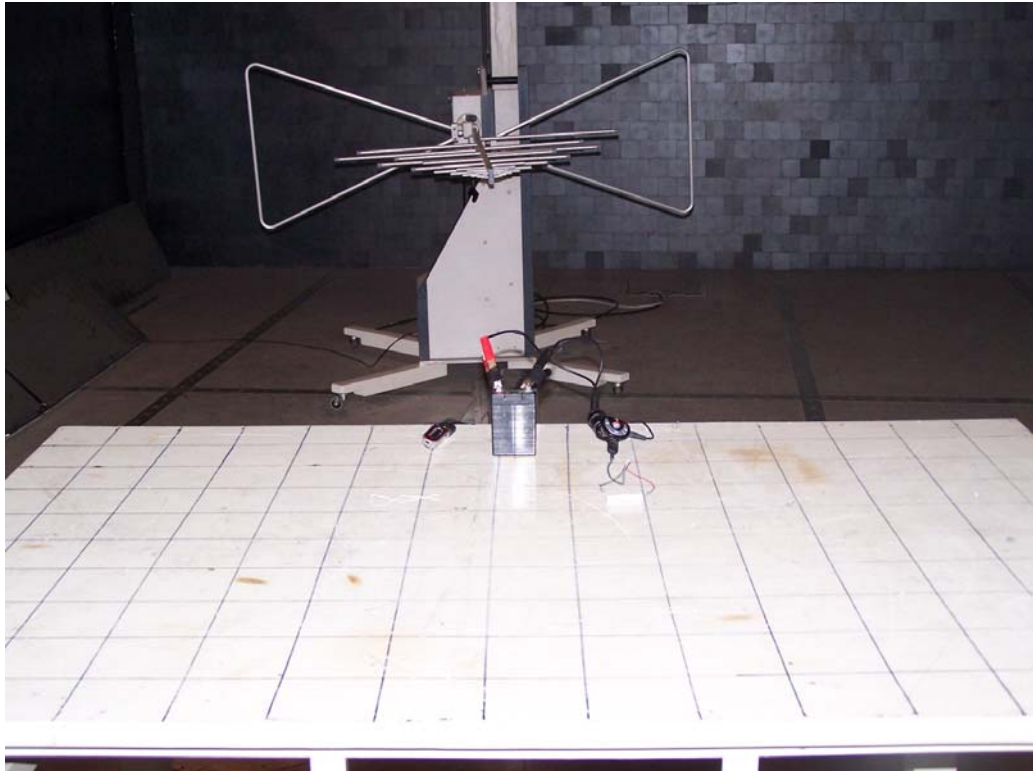
Refer to attached data chart.

### Band Width Test Data





Radiated Emission Setup Photos



## **APPENDIX 1**

### **PHOTOGRAPHS OF EUT**



***UP View of EUT***



***Bottom View of EUT***





*Side of EUT*



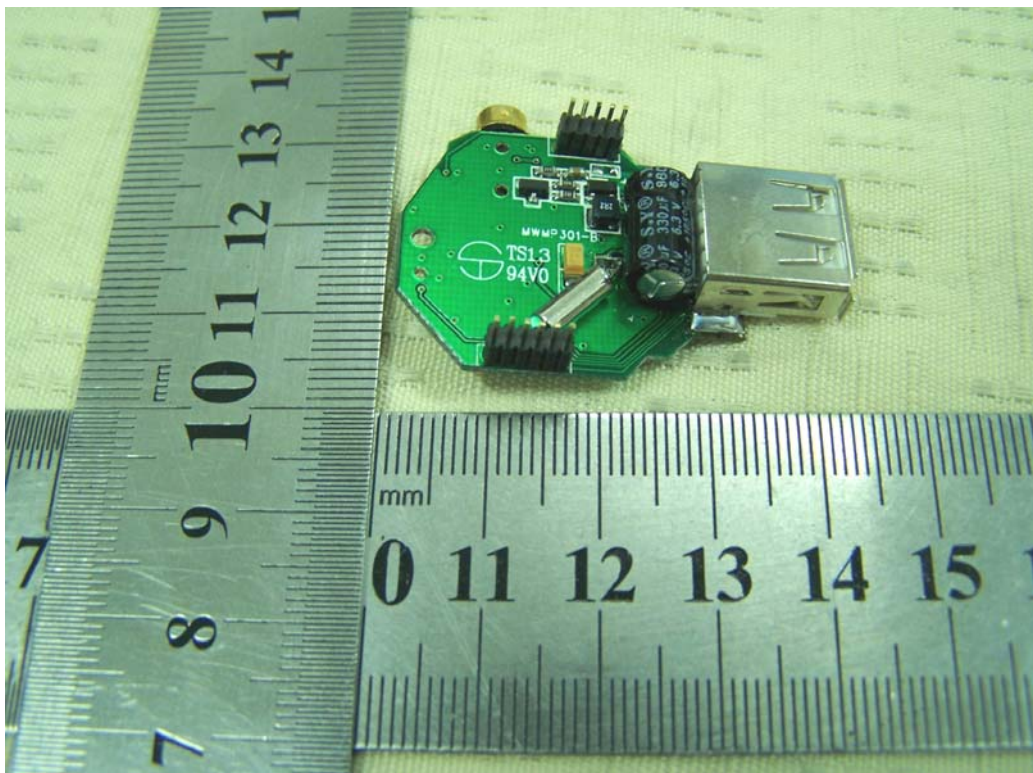
*Side of EUT*



**Internal of EUT**

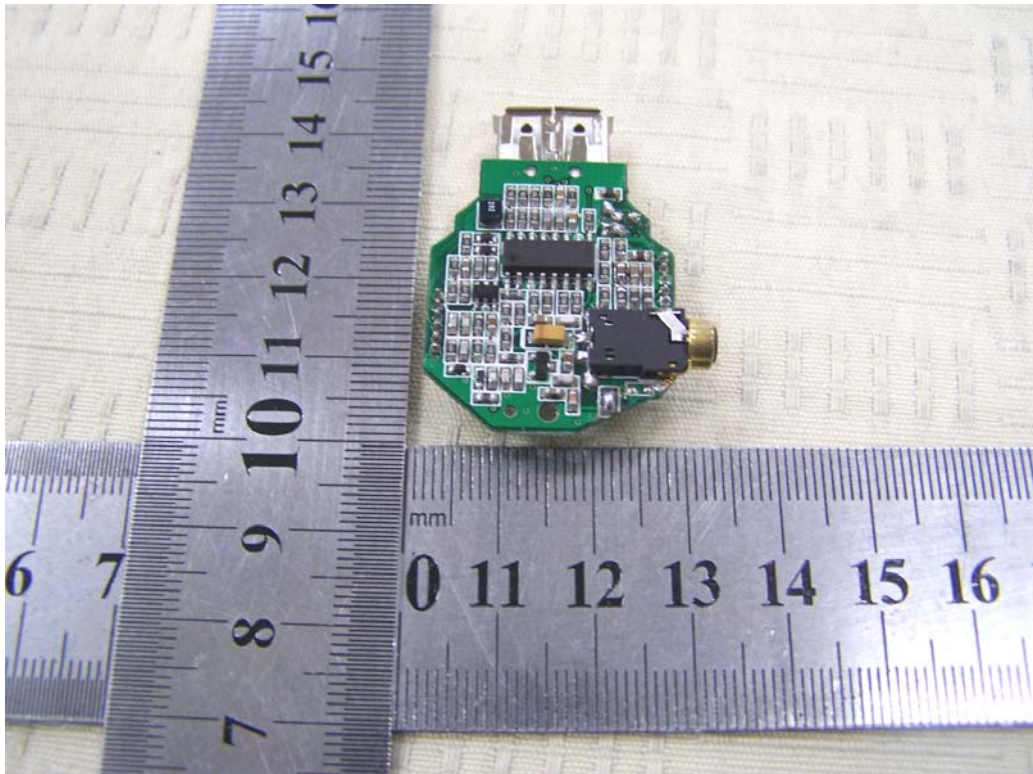


**Internal of EUT**

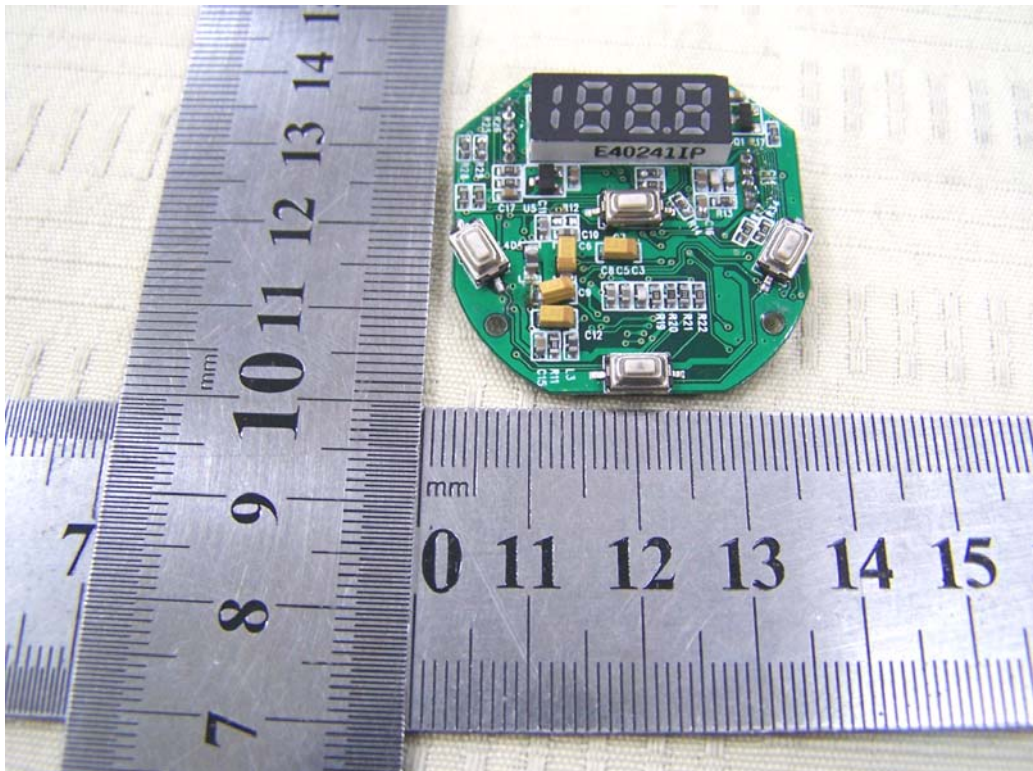




**Internal of EUT**



**Internal of EUT**



**Internal of EUT**

