

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

*OF*

**FM Transmitter**

**MODEL No.: P-13, FMT-1**

**FCC ID: WKA-MCAP-131**

**REPORT NO: ES101103020F**

**ISSUE DATE: November 11, 2010**

*Prepared for*

**Maxell Corporation of America**

**22-08 Route 208 Fair Lawn, NJ 07410**

*Prepared by*

**SHENZHEN EMTEK CO., LTD**

**Bldg 69, Majialong Industry Zone, Nanshan District,  
Shenzhen, Guangdong, China**

**TEL: 86-755-26954280**

**FAX: 86-755-26954282**

## VERIFICATION OF COMPLIANCE

Applicant:	Maxell Corporation of America 22-08 Route 208 Fair Lawn, NJ 07410
Product Description:	FM Transmitter
Brand Name:	N/A
Model Number:	P-13, FMT-1 (Note: Both the modes are the same, except their model number is different. We take FMT-1 for test.)
Serial Number:	N/A
File Number:	ES101103020F
Date of Test:	November 3, 2010 to November 11, 2010

### 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 (2009) 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.

Date of Test : November 3, 2010 to November 11, 2010

Prepared by : June  
(Engineer)

Reviewer : Winst  
(Quality Manager)

Approved & Authorized Signer : David Lee  
(Manager)



## Table of Contents

<b>1. GENERAL INFORMATION .....</b>	<b>4</b>
1.1 PRODUCT DESCRIPTION.....	4
1.2 RELATED SUBMITTAL(S) / GRANT (S) .....	4
1.3 TEST METHODOLOGY .....	4
1.4 SPECIAL ACCESSORIES .....	4
1.5 EQUIPMENT MODIFICATIONS .....	4
1.6 TEST FACILITY .....	5
<b>2. SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
2.1 EUT CONFIGURATION.....	6
2.2 EUT EXERCISE .....	6
2.3 TEST PROCEDURE.....	6
2.4 LIMITATION .....	7
2.5 CONFIGURATION OF TESTED SYSTEM.....	8
<b>3. SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>4. DESCRIPTION OF TEST MODES .....</b>	<b>9</b>
<b>5. RADIATED EMISSION TEST .....</b>	<b>10</b>
5.1 MEASUREMENT PROCEDURE.....	10
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	11
5.3 MEASUREMENT EQUIPMENT USED: .....	11
5.4 MEASUREMENT RESULT.....	12
5.5 RADIATION MEASUREMENT PHOTOS .....	18
<b>6. OCCUPIED BANDWIDTH.....</b>	<b>19</b>
6.1 MEASUREMENT PROCEDURE.....	19
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	19
6.3 MEASUREMENT EQUIPMENT USED: .....	19
6.4 MEASUREMENT RESULTS:.....	19
<b>7. ANTENNA APPLICATION .....</b>	<b>21</b>
7.1 ANTENNA REQUIREMENT .....	21

## 1. GENERAL INFORMATION

### 1.1 Product Description

The Maxell Corporation of America Model: FMT-1 (referred to as the EUT in this report). The EUT is a FM Transmitter; The actual tuning Controls can be manually adjusted to from 88.1MHz to 88.7MHz.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 88.1MHz~88.7MHz
- B). Antenna Designation: Internal
- C). Power Supply: DC4.5V

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

This submittal(s) (test report) is intended for FCC ID: WKA-MCAP-131 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 (2009). 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 CNAS, 2010.10.28  
The certificate is valid until 2013.10.29  
The Laboratory has been assessed and proved to be in compliance  
with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)  
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Guangzhou, 2010.10.25  
The Laboratory has been assessed according to the requirements  
ISO/IEC 17025

Accredited by FCC, October 28, 2010  
The Certificate Registration Number is 709623.

Accredited by Industry Canada, May 24, 2008  
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 88.1MHz~88.7MHz.

### 2.3 Test Procedure

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

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2009. 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 placed on a 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 C63.4-2009.

## 2.4 Limitation

### (1) Radiated Emission

- (b) 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.
- (c) 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 dB<sub>uv</sub>/m for the fundamental frequency=48.0 dB<sub>uv</sub>/m.  
And the limit for peak field strength dB<sub>uv</sub>/m for the fundamental frequency=68.0 dB<sub>uv</sub>/m.

Intentional Radiators general limit).as below.

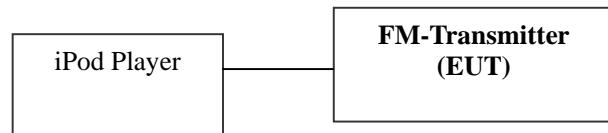
Frequency (MHz)	Field strength μV/m	Distance(m)	Field strength at 3m dB <sub>uv</sub> /m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

### (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 88.1~88.7MHz.

## 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.	FM Transmitter	CCA	FMT-1	WKA-MCAP-131	N/A	<b>EUT</b>
2.	iPod player	Apple	A1136	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

FCC Rules	Description Of Test	Result
§ 15.239	Radiated Emission	Compliant
§ 15.239	Bandwidth Test	Compliant

### 4. Description of test modes

The EUT (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 : 88.1MHz
2. For middle channel : 88.3 MHz
3. For highest channel: 88.7MHz

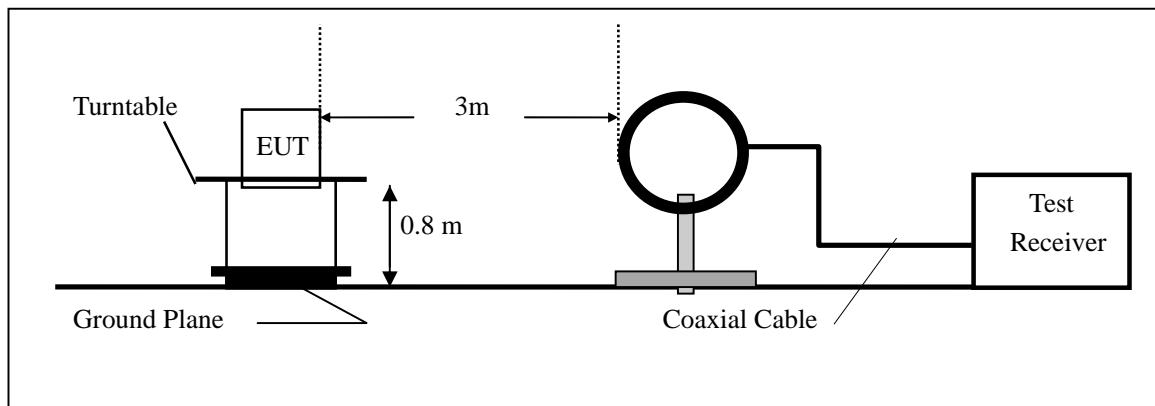
## 5. Radiated Emission Test

### 5.1 Measurement Procedure

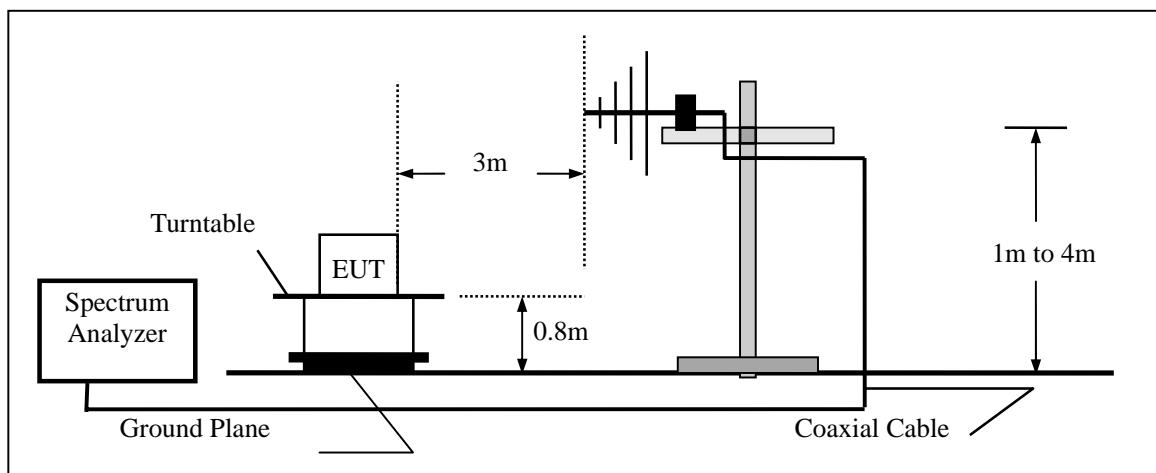
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above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



## 5.3 Measurement Equipment Used:

Test Site # 1						
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.	
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/29/2010	05/29/2011	
Pre-Amplifier	HP	8447D	2944A07999	05/29/2010	05/29/2011	
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2010	05/29/2011	
Loop Antenna	ARA	PLA-1030/ B	1029	05/29/2010	05/29/2011	

## 5.4 Measurement Result

### A. Fundamental Radiated Emission Data

Operation Mode:	Transmitting Mode	Test Date :	November 11, 2010
Test Item:	Fundamental Radiated Emission Data	Temperature :	28
Fundamental Frequency:	Lowest channel	Humidity :	65 %
Test Result:	PASS	Test By:	Andy

#### Peak Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.10	V	45.78	68.00	-22.22	Peak
88.10	H	45.13	68.00	-22.87	Peak

#### Average Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.10	V	44.91	48.00	-3.09	AV
88.10	H	44.86	48.00	-3.14	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 : November 11, 2010  
Test Item: Fundamental Radiated Emission Data Temperature : 28  
Fundamental Frequency: Middle channel Humidity : 65 %  
Test Result: PASS Test By: Andy

Peak Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.3	V	45.22	68.00	-22.78	Peak
88.3	H	44.93	68.00	-23.07	Peak

Average Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.3	V	44.15	48.00	-3.85	AV
88.3	H	44.07	48.00	-3.93	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 : November 11, 2010  
Test Item: Fundamental Radiated Emission Data Temperature : 28  
Fundamental Frequency: Highest channel Humidity : 65 %  
Test Result: PASS Test By: Andy

Peak Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.70	V	45.77	68.00	-22.23	Peak
88.70	H	44.37	68.00	-23.63	Peak

Average Measurement

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
88.70	V	44.47	48.00	-3.53	AV
88.70	H	43.98	48.00	-4.02	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.

## B. Harmonics Radiated Emission Data

Operation Mode: Transmitting Mode      Test Date : November 11, 2010  
Test Item: Radiated Emission Data      Temperature : 28  
Fundamental Frequency: Lowest channel      Humidity : 65 %  
Test Result: PASS      Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
176.12	V	25.4	43.5	-18.1	Peak
264.72	V	14.97	46	-31.03	Peak
351.77	V	18.23	46	-27.77	Peak
434.16	V	20.54	46	-25.46	Peak
563.18	V	21.37	46	-24.63	Peak
696.87	V	26.62	46	-19.38	Peak
176.12	H	36.47	43.5	-7.03	Peak
264.72	H	21.08	46	-24.92	Peak
351.77	H	24.33	46	-21.67	Peak
415.51	H	18.81	46	-27.19	Peak
538.31	H	20.99	46	-25.01	Peak
589.61	H	22.21	46	-23.79	Peak
176.12	V	25.4	43.5	-18.1	Peak

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.239**

**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 : November 11, 2010  
Test Item: Radiated Emission Data Temperature : 28  
Fundamental Frequency: Middle channel Humidity : 65 %  
Test Result: PASS Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
176.12	V	25.36	43.5	-18.14	Peak
264.72	V	15.05	46	-30.95	Peak
407.74	V	17.65	46	-28.35	Peak
521.21	V	20.77	46	-25.23	Peak
667.33	V	24.31	46	-21.69	Peak
835.22	V	26.97	46	-19.03	Peak
176.12	H	36.15	43.5	-7.35	Peak
264.72	H	23.71	46	-22.29	Peak
353.33	H	24.33	46	-21.67	Peak
516.55	H	21.65	46	-24.35	Peak
628.47	H	22.46	46	-23.54	Peak
712.42	H	24.9	46	-21.1	Peak
176.12	V	25.36	43.5	-18.14	Peak
264.72	V	15.05	46	-30.95	Peak
407.74	V	17.65	46	-28.35	Peak

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.239**

**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.

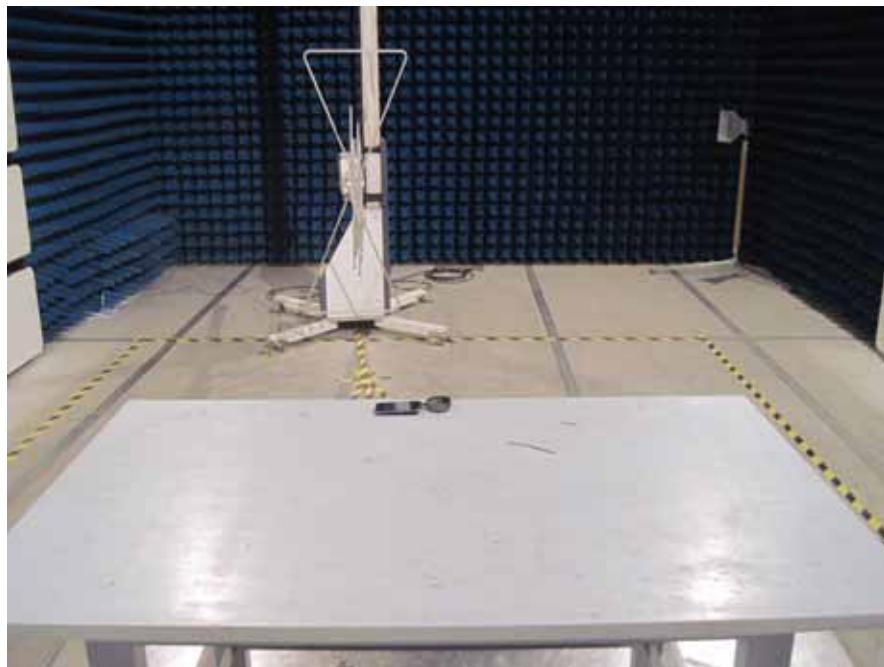
Operation Mode: Transmitting Mode Test Date : November 11, 2010  
Test Item: Radiated Emission Data Temperature : 28  
Fundamental Frequency: High channel Humidity : 65 %  
Test Result: PASS Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
177.67	V	35.84	43.5	-7.66	Peak
266.28	V	23.95	46	-22.05	Peak
354.88	V	26.12	46	-19.88	Peak
443.49	V	20.63	46	-25.37	Peak
591.17	V	21.44	46	-24.56	Peak
676.66	V	23.6	46	-22.4	Peak
177.67	H	25.63	43.5	-17.87	Peak
266.28	H	14.74	46	-31.26	Peak
354.88	H	17.55	46	-28.45	Peak
434.16	H	21.62	46	-24.38	Peak
535.2	H	21.68	46	-24.32	Peak
653.34	H	23.39	46	-22.61	Peak

**No others harmonics emissions are higher than 20dB below the limits of 47 CFR Part 15.239**

**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.

## 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.

Note: The EUT can be connected to iPod Player. The input signal of EUT is controlled by iPod Player. So the volume control of iPod 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:

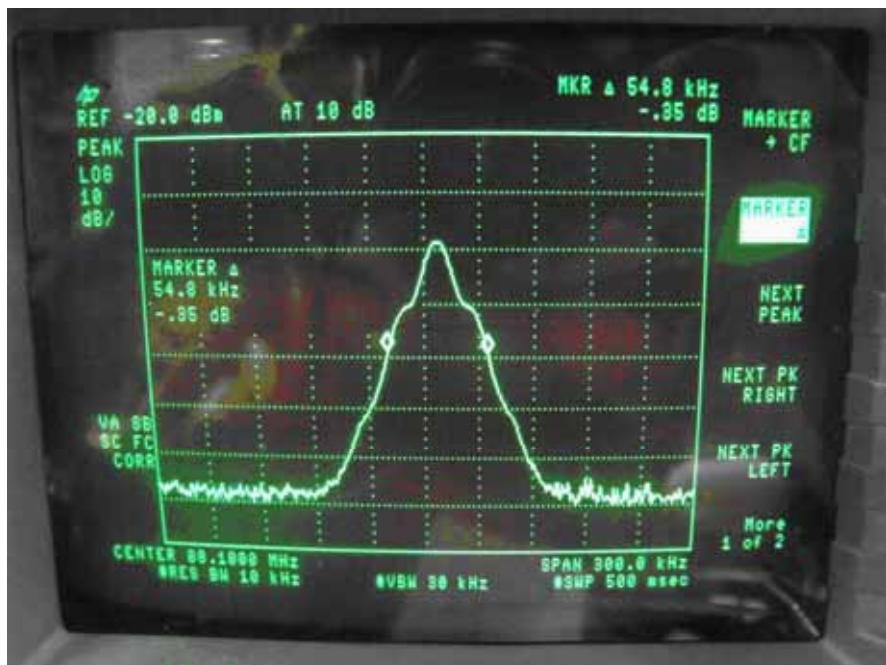
Same as 4.2 Radiated Emission Measurement.

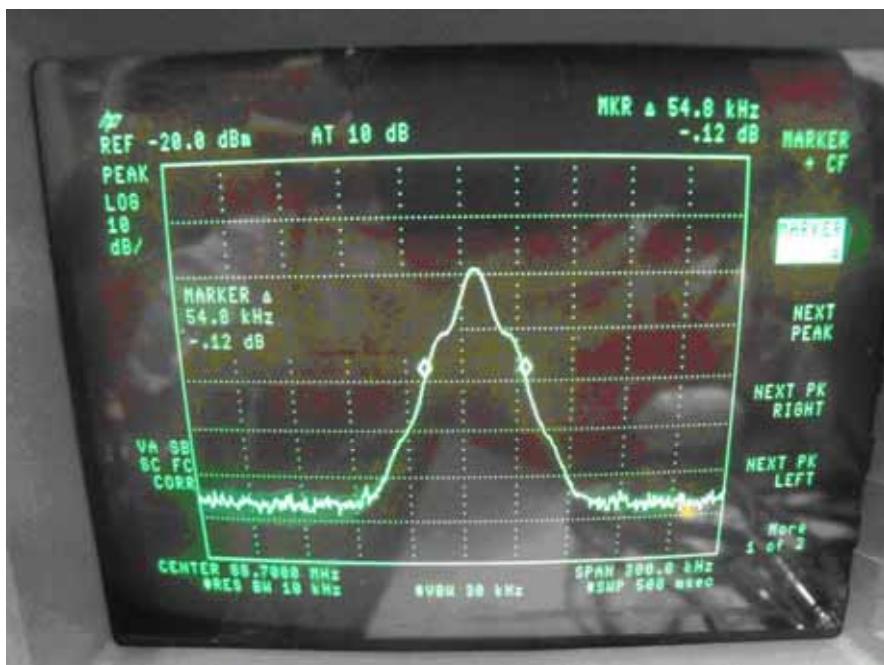
### 6.4 Measurement Results:

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





## 7. Antenna Application

### 7.1 Antenna requirement

The EUT's antenna used a dipole antenna and integrated on PCB, The EUT'S antenna is met the requirement of FCC part 15C section 15.203