

# FCC CERTIFICATION TEST REPORT

for

I-TEC ELECTRONICS

IPOD FM Transmitter

Model Number : T1057

Prepared for : I-TEC ELECTRONICS  
Address : 5255,NW 159th STREET MIAMI,FL33014 U.S.A

Prepared By : NS Electromagnetic Technology Co., Ltd.  
Address : Chenwu Industrial Zone, Houjie Town, Dongguan City,  
Guangdong, China

Tel : 86-769-85935656  
Fax: 86-769-85991080

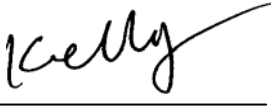
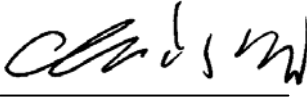
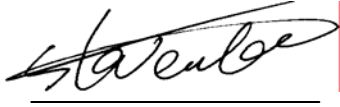
Report Number : NSE-F0612195  
Date of Test : Nov. 22, 2006  
Date of Report : Nov. 23 2006

## TABLE OF CONTENTS

Test Report Declaration		Page
<b>1. GENERAL PRODUCT INFORMATION .....</b>		<b>4</b>
1.1. Product Function .....		4
1.2. Description of Device (EUT) .....		4
1.3. Operation Modes .....		4
<b>2. TEST SITES.....</b>		<b>5</b>
2.1. Test Facilities .....		5
2.2. List of Test and Measurement Instruments .....		6
<b>3. TEST SET-UP AND OPERATION MODES .....</b>		<b>7</b>
3.1. Principle of Configuration Selection .....		7
3.2. Block Diagram of Test Set-up .....		7
3.3. Test Operation Mode and Test Software .....		7
3.4. Special Accessories and Auxiliary Equipment .....		7
3.5. Countermeasures to Achieve EMC Compliance.....		7
<b>4. EMISSION TEST RESULTS.....</b>		<b>8</b>
4.1. Conducted Emission Test .....		8
4.2. Radiated Emission Test .....		9
4.3. Frequency Range Test .....		14
4.4. Bandwidth Test.....		15



# NS Electromagnetic Technology Co., Ltd.

<b>Applicant:</b>	I-TEC ELECTRONICS		
<b>Address:</b>	5255,NW 159th STREET MIAMI,FL33014 U.S.A		
<b>Manufacturer:</b>	STAR ORIENT		
<b>Address:</b>	#2 West Puyuan Road Sang Yuan Industrial Zone DongCheng Area, Dongguan City ,Guangdong ,China		
<b>E.U.T:</b>	IPOD FM Transmitter		
<b>Model Number:</b>	T1057		
<b>Trade Name:</b>	<b>Serial No.:</b> -----		
<b>Date of Receipt:</b>	Oct. 22, 2006	<b>Date of Test:</b>	Nov. 22, 2006
<b>Test Specification:</b>	FCC Part 15 Subpart C, 2005 ANSI C63.4:2003		
<b>Test Result:</b>	The equipment under test was found to be compliance with the requirements of the standards applied.		
			<b>Issue Date: Nov. 22, 2006</b>
Tested by:	Reviewed by:	Approved by:	
			
Kelly / Engineer	Chris Du / Supervisor	Steven Lee / Manager	
<b>Other Aspects:</b>	None.		
Abbreviations: OK/P=passed    fail/F=failed    n.a/N=not applicable    E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products, It is not permitted to be duplicated in extracts without written approval of NS Electromagnetic Technology Co., Ltd..			

## 1. GENERAL PRODUCT INFORMATION

### 1.1. Product Function

Refer to Technical Construction Form and User Manual.

### 1.2. Description of Device (EUT)

Description	:	IPOD FM Transmitter
Model No.	:	T1057
System Input Voltage	:	DC 12V
Operational frequency	:	88.1MHz-107.9MHz

### 1.3. Operation Modes

1.3.1. TX: 88.1MHz

1.3.2. TX: 98MHz

1.3.3. TX: 107.9MHz

## 2. TEST SITES

### 2.1. Test Facilities

EMC Lab : Certificated by TUV Rheinland, Germany.  
Date of registration: July 28, 2003

Certificated by FCC, USA  
Registration No.: 897109  
Date of registration: October 10, 2003

Certificated by VCCI, Japan  
Registration No.: R-1798 & C-1926  
Date of registration: January 30, 2004

Certificated by CNAL, CHINA  
Registration No.: L1744  
Date of registration: November 25, 2004

Certificated by Intertek ETL SEMKO  
Registration No.: TMP-013  
Date of registration: June 11, 2005

Certificated by TUV/PS, Hong Kong  
Date of registration: December 1, 2005

Certificated by Industry Canada  
Registration No.: 5936  
Date of registration: March 24, 2006

Certificated by ATCB, America  
Date of registration: August 03, 2006

Name of Firm : NS Electromagnetic Technology Co., Ltd.

Site Location : Chenwu Industrial Zone, Houjie Town, Dongguan City,  
Guangdong, China

## 2.2. List of Test and Measurement Instruments

### 2.2.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESCS30	100199	Jun. 3,06	Jun. 3,07
L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	100071	Jun. 3,06	Jun. 3,07
L.I.S.N.#2(AUX)	Rohde & Schwarz	ESH3-Z5	100317	Jun. 3,06	Jun. 3,07

### 2.2.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESCS30	100340	Jun. 3,06	Jun. 3,07
Spectrum Analyzer	HP	8590L	3412A00251	Jun. 3,06	Jun. 3,07
Amplifier	Agilent	8447D	2944A10488	May 2,06	May 2,07
Bilog Antenna	EMCO	3142B	00022050	May 2,06	May 2,07

### 2.2.3. For frequency range test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Test Receiver	Rohde & Schwarz	ESCS30	100340	Jun. 3,06	Jun. 3,07
Bilog Antenna	EMCO	3142B	00022050	May 2,06	May 2,07

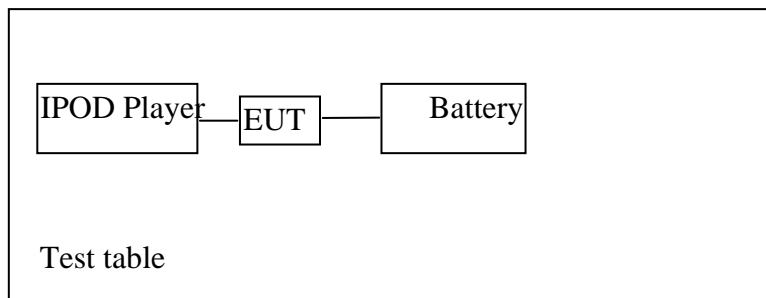
### 3. TEST SET-UP AND OPERATION MODES

#### 3.1. Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

#### 3.2. Block Diagram of Test Set-up

System Diagram of Connections Between EUT and Simulators



*(EUT:IPOD FM Transmitter)*

*Note: 1) we test lie orientation, side orientation and stand orientation. The stand orientation is the worst mode, so only the worst mode test data was included in the report.  
2) IPOD player input EUT an audio signal, and IPOD player were turned up the highest volume.*

#### 3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4.

#### 3.4. Special Accessories and Auxiliary Equipment

None.

#### 3.5. Countermeasures to Achieve EMC Compliance

None.

## **4. EMISSION TEST RESULTS**

### **4.1. Conducted Emission Test**

According to paragraph of FCC Part 15 Section 15.207, 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 provision for operation while connected to the AC power.



## 4.2. Radiated Emission Test

**RESULT** : **Pass**  
Test procedure : ANSI C63.4:2003  
Frequency range : 30~1000MHz  
Test Site : 966 Chamber  
FCC Rules : FCC Part 15 Subpart C &15.239/&15.209/&15.35/&15.205

### Test Setup

Date of testing : Nov. 22, 2006  
Input Voltage : DC 12V  
Operation Mode : TX: 88.1MHz; 98 MHz ,107.9MHz

### Standard Limits:

The field strength of any emission within the permitted 200kHz band shall not exceed 250microvolts meter at 3meters. The emission limit in this paragraph is based on measurement instrumentation employ an average detector. The provisions in &15.35 for limiting peak emission apply.

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 &15.209.

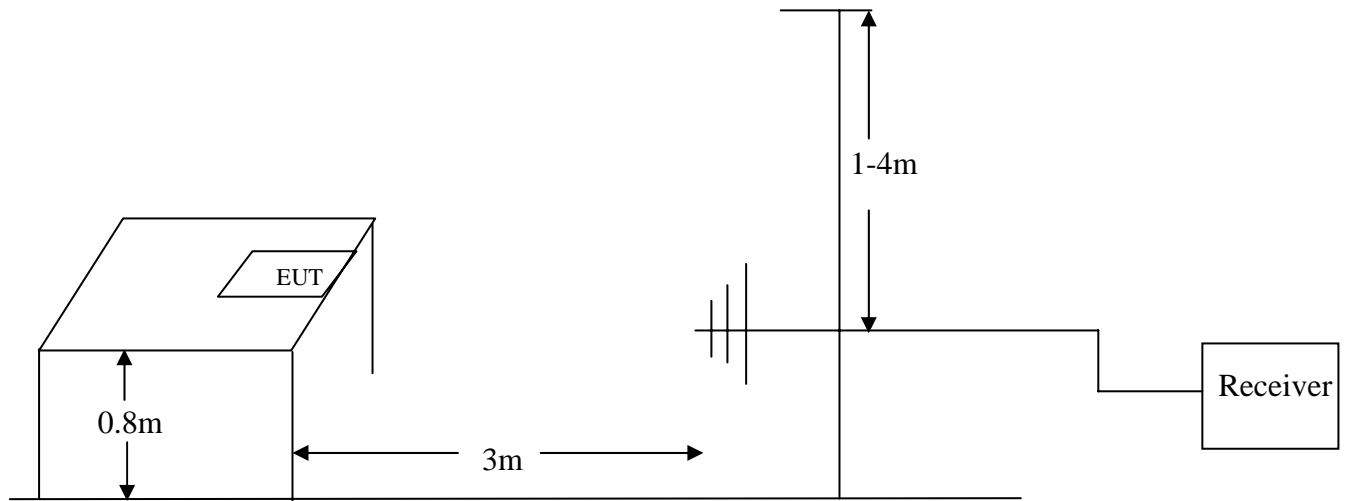
The EUT was placed on a rotated table which was 0.8 meter above ground. The rotated table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower, the measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna was used as a receiving antenna.

The bandwidth setting on the test receiver was 120 KHz.

The EUT was tested in Chamber Site.

The test data of the worst case condition(s) was reported on the following pages.

## 4.2.1. Test set-up diagram



## 4.2.2. Test Data

EUT:	IPOD FM Transmitter	Temperature:	25°C
M/N:	T1057	Humidity:	55%
Test Mode:	TX 88.1MHz	Test Engineer:	Kelly

Frequency	Factor	Meter Reading	Emission Level	Over	Limits	Detector
		Horizontal	Horizontal	Limits		
MHz	dB	dBμV	dBμV/m	dB	dBμV/m	
88.100	12.20	23.75	35.95	-12.05	48.00	Average
88.100	12.20	25.10	37.30	-30.70	68.00	Peak
288.990	17.43	13.60	31.03	-14.97	46.00	QP
313.240	18.09	17.47	35.56	-14.44	46.00	QP
<b>337.490</b>	<b>18.70</b>	<b>15.29</b>	<b>33.99</b>	<b>-12.01</b>	<b>46.00</b>	<b>QP</b>
361.740	19.49	14.15	33.64	-12.36	46.00	QP
385.990	19.61	13.23	32.84	-13.16	46.00	QP

Remark: The worst emission was detected at **337.490MHz** with corrected signal level of **33.99dBμV/m**(Limit is **46.00 dBμV/m**) when the antenna was at **Horizontal** polarization and at **1.85m** high and the turn table was at **45°** .

Frequency	Factor	Meter Reading	Emission Level	Over	Limits	Detector
		Vertical	Vertical	Limits		
MHz	dB	dBμV	dBμV/m	dB	dBμV/m	
88.101	12.20	18.63	30.83	-17.17	48.00	Average
88.101	12.20	21.40	33.60	-34.40	68.00	Peak
313.240	18.09	9.77	27.86	-18.14	46.00	QP
337.490	18.70	10.13	28.83	-17.17	46.00	QP
361.740	19.49	9.82	29.31	-16.69	46.00	QP
385.990	19.61	8.54	28.15	-17.85	46.00	QP
<b>194.630</b>	<b>21.36</b>	<b>8.16</b>	<b>29.52</b>	<b>-16.48</b>	<b>46.00</b>	<b>QP</b>

Remark: The worst emission was detected at **194.630MHz** with corrected signal level of **329.52dBμV/m** (Limit is **46.00 dBμV/m**) when the antenna was at **Vertical** polarization and at **1.12m** high and the turn table was at **240°** .

EUT:	IPOD FM Transmitter	Temperature:	25°C
M/N:	T1057	Humidity:	55%
Test Mode:	TX 98MHz	Test Engineer:	Kelly

Frequency	Factor	Meter Reading	Emission Level	Over	Limits	Detector
		Horizontal	Horizontal	Limits		
MHz	dB	dBμV	dBμV/m	dB	dBμV/m	
<b>98.000</b>	<b>12.67</b>	<b>23.95</b>	<b>36.62</b>	<b>-11.38</b>	<b>48.00</b>	<b>Average</b>
98.000	12.67	26.33	39.00	-29.00	68.00	Peak
206.540	14.78	11.72	26.50	-17.00	43.50	QP
290.930	17.46	11.65	29.11	-16.89	46.00	QP
313.240	18.09	14.07	32.16	-13.84	46.00	QP
361.740	19.49	13.80	33.29	-12.71	46.00	QP
385.990	19.61	11.31	30.92	-15.08	46.00	QP

Remark: The worst emission was detected at **98.000MHz** with corrected signal level of **36.62dBμV/m**(Limit is **48.00 dBμV/m**) when the antenna was at **Horizontal** polarization and at **1.80m** high and the turn table was at **50°** .

Frequency	Factor	Meter Reading	Emission Level	Over	Limits	Detector
		Vertical	Vertical	Limits		
MHz	dB	dBμV	dBμV/m	dB	dBμV/m	
98.000	12.67	16.00	28.67	-19.33	48.00	Average
98.000	12.67	19.93	32.60	-35.40	68.00	Peak
313.240	18.09	9.73	27.82	-18.18	46.00	QP
361.740	19.49	9.50	28.99	-17.01	46.00	QP
385.990	19.61	10.32	29.93	-16.07	46.00	QP
<b>463.590</b>	<b>20.78</b>	<b>10.11</b>	<b>30.89</b>	<b>-15.11</b>	<b>46.00</b>	<b>QP</b>
492.690	21.32	8.16	29.48	-16.52	46.00	QP

Remark: The worst emission was detected at **463.590MHz** with corrected signal level of **30.89dBμV/m** (Limit is **46.00 dBμV/m**) when the antenna was at **Vertical** polarization and at **1.15m** high and the turn table was at **230°** .

EUT:	IPOD FM Transmitter	Temperature:	25°C
M/N:	T1057	Humidity:	55%
Test Mode:	TX 107.9MHz	Test Engineer:	Kelly

Frequency	Factor	Meter Reading	Emission Level	Over	Limits	Detector
		Horizontal	Horizontal	Limits		
MHz	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m	
<b>107.901</b>	<b>12.37</b>	<b>28.13</b>	<b>40.48</b>	<b>-7.52</b>	<b>48.00</b>	<b>Average</b>
107.901	12.37	30.33	43.70	-24.30	68.00	Peak
313.240	18.09	16.27	34.36	-11.64	46.00	QP
324.880	18.37	16.89	35.26	-10.74	46.00	QP
361.740	19.49	13.57	33.06	-12.94	46.00	QP
385.990	19.61	12.70	32.31	-13.69	46.00	QP
431.580	20.13	8.75	28.88	-17.12	46.00	QP

Remark: The worst emission was detected at **107.901MHz** with corrected signal level of **40.48dB $\mu$ V/m**(Limit is **48.00 dB $\mu$ V/m**) when the antenna was at **Horizontal** polarization and at **1.85m** high and the turn table was at **45°** .

Frequency	Factor	Meter Reading	Emission Level	Over	Limits	Detector
		Vertical	Vertical	Limits		
MHz	dB	dB $\mu$ V	dB $\mu$ V/m	dB	dB $\mu$ V/m	
107.901	12.37	21.76	34.11	-13.89	48.00	Average
107.901	12.37	25.03	37.40	-30.60	68.00	Peak
313.240	18.09	13.06	31.15	-14.85	46.00	QP
324.880	18.37	14.24	32.61	-13.39	46.00	QP
385.990	19.61	10.53	30.14	-15.86	46.00	QP
434.490	20.20	11.83	32.03	-13.97	46.00	QP
<b>541.190</b>	<b>22.34</b>	<b>12.55</b>	<b>34.89</b>	<b>-11.11</b>	<b>46.00</b>	<b>QP</b>

Remark: The worst emission was detected at **541.1901MHz** with corrected signal level of **34.89dB $\mu$ V/m** (Limit is **46.00 dB $\mu$ V/m**) when the antenna was at **Vertical** polarization and at **1.10m** high and the turn table was at **250°**

- Notes:
1. Emission Level = Antenna Factor + Cable Loss + Meter Reading
  2. 0 ° was the table front facing the antenna. Degree was calculated from 0 ° clockwise facing the antenna.
  3. Test uncertainty:  $\pm 4.76$ dB at a level of confidence of 95%.

### 4.3. Frequency Range Test

#### 4.3.1 Test Standard:

FCC Part 15: 2005, Subpart C (Section: 15.239):

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

(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 § 15.209.

#### 4.3.2. Test Result:

Pass.

1) To Section: 15.239(a) requirement, See the page 15.

2) To Section: 15.239(c) requirement , see test data 4.2.2.. Because of the highest fundamental level is 43.70dB $\mu$ v, the level of down 20dB from the fundamental level which is subject to the general radiated emission limits in § 15.209. so the field strength of any emissions radiated on any frequency outside of the specified 200kHz band is also subject to the general radiated emission limits in § 15.209.

#### 4.4. Bandwidth Test

##### 4.4.1 Test Standard:

FCC Part 15: 2005, Subpart C (Section: 15.215(c)):

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of –band operation.

##### 4.4.2. Test result

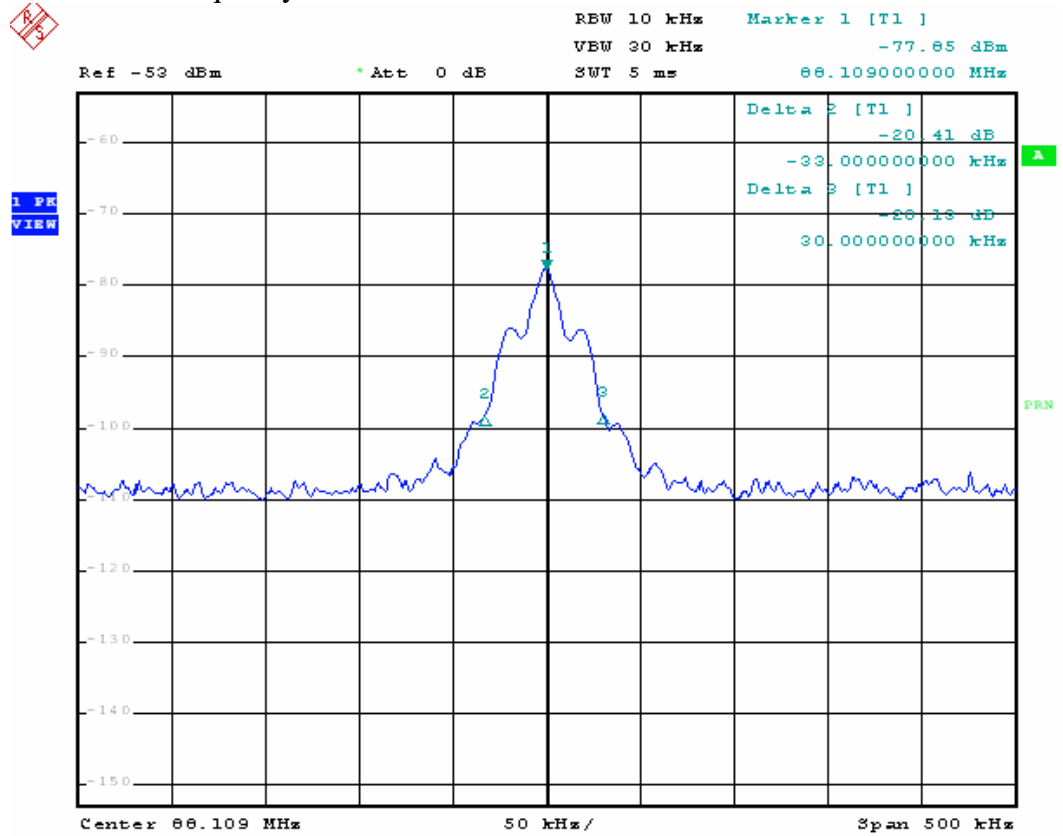
Because of the fundamental emission level is too lowest to measure the actual bandwidth, so the EUT is placed at 1m distance when to measure the bandwidth.

Fundamental Frequency (MHz)	Frequency error Down 20dB level(KHz)		Actual Bandwidth (KHz)	Bandwidth limit (KHz)	Result Pass/Fail
88.10	Left	33	63	200	Pass
	Right	30			
98.00	Left	44	89	200	Pass
	Right	45			
107.9	Left	49	97	200	Pass
	Right	48			

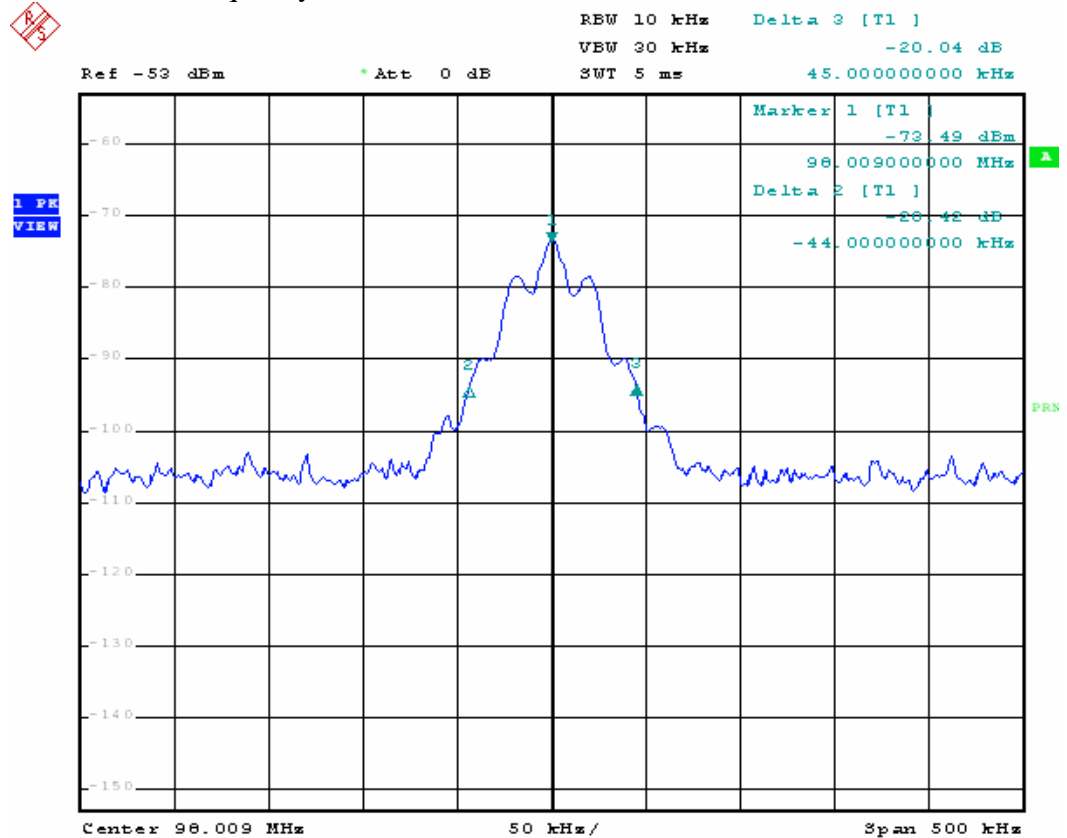
##### 4.4.3. The plot of test result is attached as below:

EUT input an audio signal of music, and the IPOD player were turned up the highest volume. Test bandwidth is 97 KHz, is subject to the 200 KHz bandwidth requirement.

## 4.4.3.1. Frequency: 88.1MHz



## 4.4.3.2. Frequency: 98MHz





4.4.3.3. Frequency: 107.9MHz

