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FEDERAL COMMUNICATIONS COMMISSION

Registration number: 282399

Report No.: GLEMR070100210RFT

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FCC ID: TZ9I705

FCC TEST REPORT

Application No. : GLEMR070100210RF
Applicant: SEATUNE ELECTRONICS CO.,LTD
FCC ID: TZ9I705
Fundamental Carrier Frequency : 88.1MHz to 107.9MHz

Equipment Under Test (EUT):

Name: FM Transmitter

Model: i705

Band Name: Not supply by client

Standards: FCC PART 15.239: 2006

Please refer to section 2 for further details.

Date of Receipt: 29 January 2007

Date of Test: 29 January 2007 to 14 February 2007

Date of Issue: 01 March 2007

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jerry Chen
Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Radiated Emission (30MHz to 1000MHz)	FCC PART 15 :2006	Section 15.239	PASS
Occupied Bandwidth	FCC PART 15 :2006	Section 15.239	PASS *

* The EUT passed the Occupied Bandwidth test after modification carried out by the applicant.



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4 General Information

4.1 Client Information

Applicant Name: SEATUNE ELECTRONICS CO.,LTD

Applicant Address: No.27,ShuiKou Avenue,ShuiKou Town,HuiZhou City,GuangDong,China.

4.2 General Description of E.U.T.

Product Name: FM Transmitter

Model: i705

Power Supply: 3.3Vdc Supplied by iPod.

Power Cord: Not Applied.

4.3 Description of the Transmitter and Support Units

The EUT was tested with a audio source ipod.

The transmitter have 199 channels between the 88.1MHz & 107.9MHz with 100KHz channel spacing can be in exchange for choice manually by software setup. The antenna is a permanently antenna (a black wire with an extended wire lay on PCB) coupling to the intentional radiator and do not connect as part of the car wiring. About the installation and operation of this device, please refer to the user manual for more detail.

Antenna photo:



4.4 Standards Applicable for Testing

The customer requested FCC tests for a FM transmitter .

The standard used was FCC PART 15, SUBPART C (2006) section 15.239.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198 Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

4.6 Other Information Requested by the Customer

None.



4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **ACA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS L0167**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.

- **Industry Canada (IC)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620B-1.

Date of Registration: Jan 15, 2007. Valid until Jan 15, 2009

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460 and C-2584 respectively.



5 Test Results

5.1 E.U.T. Operation

Input voltage:	3.3Vdc Supplied by iPod.
Operating Environment:	
Temperature:	26.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1011 mbar
EUT Operation:	Test in transmitting mode:
	1. For lowest channel: 88.1MHz.
	2. For middle channel: 98.0MHz.
	3. For highest channel:107.9MHz.

5.2 Test Instruments



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No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0039	Temperature Chamber	TERCHY	MHG-800RR	0118	05-12-2006	05-12-2007
EMC0009	D.C. Power Supply	Instek	PS-3030	9862036	Check when used	
EMC0007	DMM	Fluke	73	70671122	27-09-2006	27-09-2007
EMC0006	DMM	Fluke	73	70681569	27-09-2006	27-09-2007
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	06-03-2006	06-03-2007
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	22-08-2006	22-08-2007
EMC0502	Biconical Antenna (Rx)	Rohde & Schwarz	HK116	100032	31-07-2006	31-07-2007
EMC0503	Biconical Antenna (Tx)	Rohde & Schwarz	HK116	100033	31-07-2006	31-07-2007
EMC0504	Log-Perd. Dipole Antenna (Rx)	Rohde & Schwarz	HL223	100039	31-07-2006	31-07-2007
EMC0505	Log-Perd. Dipole Antenna (Tx)	Rohde & Schwarz	HL223	100040	31-07-2006	31-07-2007
EMC0517	Horn Antenna (Rx)	Rohde & Schwarz	HF906	100095	29-07-2006	29-07-2007
EMC0519	Bilog Type Antenna	Schaffner Chase	CBL6143	5070	31-07-2006	31-07-2007
EMC0520	0.1-1300 MHz Pre Amplifier	HP	8447D OPT 010	2944A06252	06-03-2006	06-03-2007
EMC0521	1-26.5GHz Pre Amplifier	Agilent	8449B	3008A01649	06-03-2006	06-03-2007
EMC0507	Antenna Mask (Tx)	HD-GmbH	AS620M	620/408	N/A	N/A
EMC0508	Antenna Mask (Rx)	HD-GmbH	MA240	240/619	N/A	N/A
EMC0509	Turntable	HD-GmbH	DT430	N/A	N/A	N/A
EMC0510	Turntable & Antenna Mask Controller	HD-GmbH	HD100	N/A	N/A	N/A
EMC0512	EMI Test Software	Rohde & Schwarz	ES-K1	N/A	N/A	N/A
EMC0511	Coaxial cable	Rohde & Schwarz	N/A	N/A	04-11-2006	03-11-2007
EMC0514	Coaxial cable	Rohde & Schwarz	N/A	N/A	04-11-2006	03-11-2007
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	05-12-2006	05-12-2007
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2006	05-12-2007
EMC0516	Signal Generator	Rohde & Schwarz	SMR20	100416	05-12-2006	05-12-2007
EMC0032	Radio Communication Monitor	Rohde & Schwarz	CMS54	100137	20-12-2006	20-12-2007
EMC0904	Power Meter	Rohde & Schwarz	NRVS	825770/074	22-07-2006	22-07-2007
EMC0905	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	22-07-2006	22-07-2007
EMC0906	Dual Directional Coupler	Werlatone Inc.	C1795	6634	20-11-2006	20-11-2007
EMC1508	Audio Analyzer	Rohde & Schwarz	UPL	100855	11-09-2006	11-09-2007
EMC1005	Digital Oscilloscope	Tektronix	TDS3012	B015508	14-07-2006	14-07-2007
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0001	Temp. Humidity/Barometer	Oregon Scientific	BA-888	EMC0001	20-09-2006	20-09-2007



5.3 Test Procedure & Measurement Data

5.3.1 Radiated Emissions

5.3.1.1 Test in transmitting mode .

Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part 15 C Section 15.239
Test Date:	14 February 2007
Measurement Distance:	3m (Semi-Anechoic Chamber)
Frequency range	30 MHz – 10GHz for transmitting mode. Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 M – 25GHz)
Operation:	Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal

Requirements:

- (b) The field strength of any emissions within the permitted 200 kHz 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 200 kHz band shall not exceed the general radiated emission limits in Section 15.209.

The EUT have 199 channels between 88.1MHz and 107.9MHz with 100KHz channel spacing can in exchange for choice, According to ANSI 63.4 chapter 12, the test fundamental frequency of the EUT is lowest channel 88.1MHz, middle channel 98MHz and highest channel 107.9MHz.

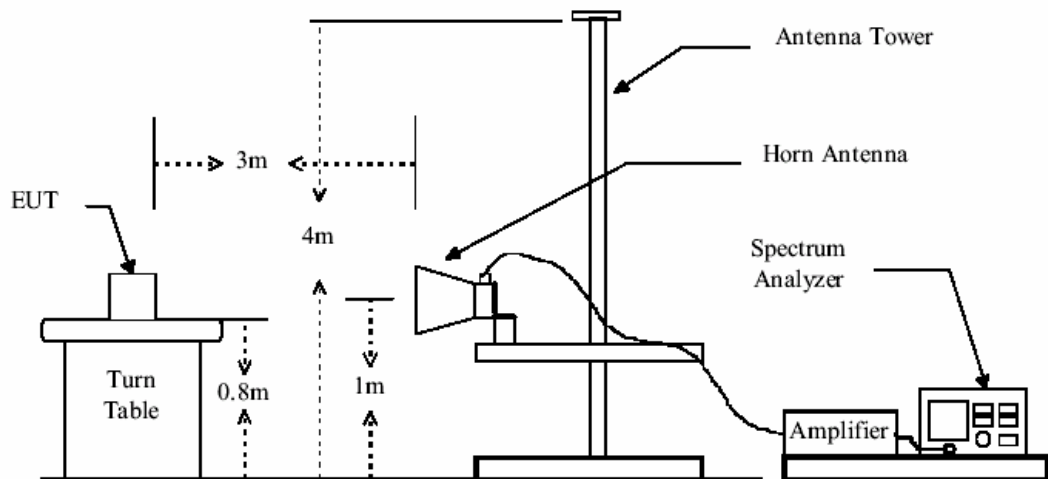
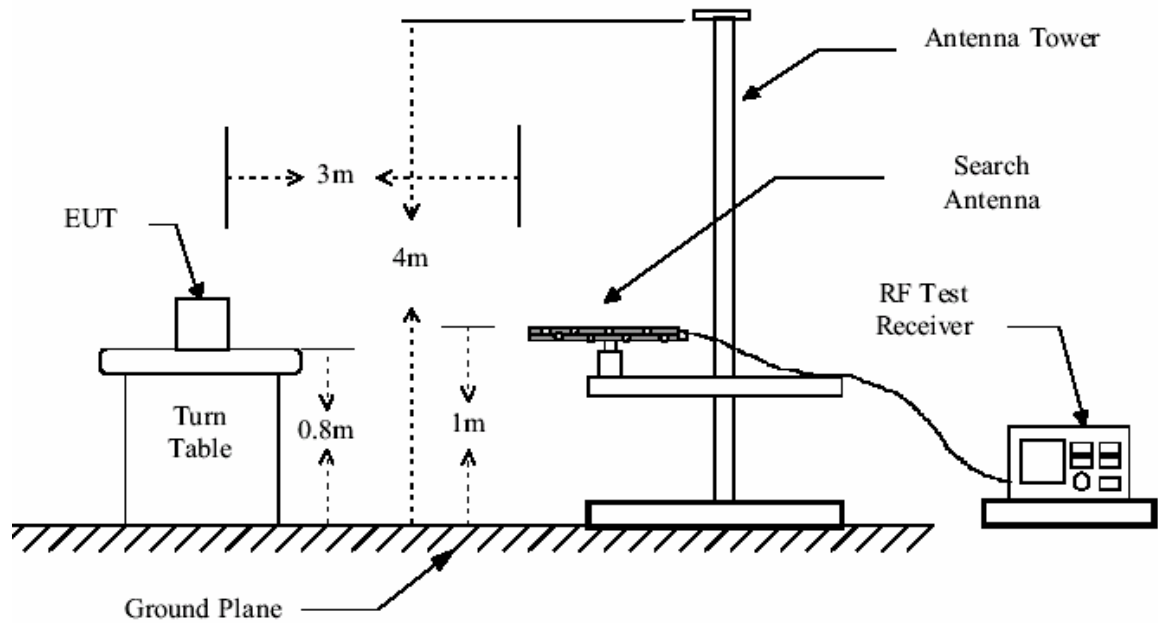
The limit for average field strength dB μ V/m for the fundamental frequency = 48.0 dB μ V/m.

And the limit for peak field strength dB μ V/m for the fundamental frequency = 68.0 dB μ V/m

Test Procedure:

The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Test Configuration:





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The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

The following test results were performed on the EUT:

For **The lowest channel ,88.1MHz:**

Fundamental Emission, Harmonic Emission, Band edge emission , Restricted band (108-121.94MHz)

Emission and all other spurious emission.

(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
88.100	47.2	10.2	0.8	25.2	33.1	48.0	-14.9	AVERAGE
88.100	49.3	10.2	0.8	25.2	35.1	68.0	-32.9	PEAK
88.000	43.2	10.2	0.8	25.2	29.1	40.0	-10.9	QP
108.000	23.7	11.8	0.9	25.1	11.3	43.5	-32.2	QP
113.000	23.4	12.5	1.0	25.1	11.8	43.5	-31.7	QP
121.940	24.6	12.8	1.0	25.1	13.3	43.5	-30.2	QP
176.200	25.1	8.4	1.2	24.8	9.9	43.5	-33.6	QP
264.300	22.2	13.3	1.5	24.4	12.6	46.0	-33.4	QP
352.400	24.0	16.8	1.8	24.7	17.8	46.0	-28.2	QP
563.500	23.9	19.9	2.4	25.8	20.4	46.0	-25.7	QP
634.310	23.5	20.4	2.6	25.8	20.7	46.0	-25.3	QP

(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
88.100	45.5	7.5	0.8	25.2	28.6	48.0	-19.4	PEAK
88.100	43.0	7.5	0.8	25.2	26.1	68.0	-41.9	AVERAGE
88.000	39.2	7.5	0.8	25.2	22.3	40.0	-17.7	QP
108.000	23.8	10.0	0.9	25.1	9.6	43.5	-33.9	QP
176.200	23.7	10.8	1.2	24.8	10.9	43.5	-32.6	QP
264.300	22.1	12.5	1.5	24.4	11.7	46.0	-34.3	QP
352.400	22.4	15.4	1.8	24.7	14.8	46.0	-31.2	QP
505.300	23.3	19.1	2.2	25.9	18.7	46.0	-27.3	QP

Remark:

For this intentional radiator operates below 10 GHz, the spectrum was investigated to the tenth harmonic of the highest fundamental frequency. The frequency was not recorded if the level of the spurious emission is very weak.



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The following test results were performed on the EUT:

For **middle channel ,98.0MHz:**

Fundamental Emission, Harmonic Emission, Band edge emission, Restricted band (108-121.94MHz)

Emission and all other spurious emission.

(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
98.000	47.4	10.7	0.9	25.1	33.8	48.0	-14.2	PEAK
98.000	44.9	10.7	0.9	25.1	31.4	68.0	-36.6	AVERAGE
36.790	23.9	20.6	0.6	25.3	19.7	40.0	-20.3	QP
196.000	24.9	9.1	1.3	24.6	10.6	43.5	-32.9	QP
294.000	22.1	13.6	1.6	24.4	12.8	46.0	-33.2	QP
392.000	22.8	16.2	1.9	25.0	16.0	46.0	-30.0	QP
575.140	23.6	20.1	2.4	25.8	20.3	46.0	-25.7	QP

(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
98.000	41.7	7.7	0.9	25.1	25.1	48.0	-22.9	AVERAGE
98.000	44.5	7.7	0.9	25.1	27.9	68.0	-40.1	PEAK
32.910	23.9	15.9	0.5	25.4	15.0	40.0	-25.0	QP
196.000	23.7	11.0	1.3	24.6	11.4	43.5	-32.1	QP
294.000	22.2	12.9	1.6	24.4	12.3	46.0	-33.7	QP
392.000	22.7	15.8	1.9	25.0	15.4	46.0	-30.6	QP
490.000	23.2	18.7	2.2	25.8	18.3	46.0	-27.7	QP

Remark:

For this intentional radiator operates below 10 GHz, the spectrum was investigated to the tenth harmonic of the highest fundamental frequency. The frequency was not be recorded if the level of the spurious emission is very weak.



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The following test results were performed on the EUT:

For **The Highest channel ,107.9MHz:**

Fundamental Emission, Harmonic Emission, Band edge emission , Restricted band (108-121.94MHz) Emission and all other spurious emission.

(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
107.900	42.8	11.8	0.9	25.1	30.5	48.0	-17.5	PEAK
107.900	38.3	11.8	0.9	25.1	25.9	68.0	-42.1	AVERAGE
88.000	24.5	10.2	0.8	25.2	10.4	40.0	-29.6	QP
108.000	41.4	11.8	0.9	25.1	29.0	43.5	-14.5	QP
112.000	24.4	12.7	1.0	25.1	13.0	43.5	-30.5	QP
121.940	23.6	12.8	1.0	25.1	12.3	43.5	-31.2	QP
215.800	25.3	10.4	1.4	24.5	12.6	43.5	-31.0	QP
323.700	38.3	14.2	1.7	24.6	29.6	46.0	-16.4	QP
431.600	24.1	17.6	2.0	25.3	18.4	46.0	-27.6	QP
539.500	23.4	18.7	2.3	25.9	18.6	46.0	-27.4	QP

(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
107.900	35.8	10.0	0.9	25.1	21.7	48.0	-26.4	AVERAGE
107.900	40.6	10.0	0.9	25.1	26.4	68.0	-41.6	PEAK
30.000	22.9	19.2	0.5	25.5	17.1	40.0	-22.9	QP
108.000	36.7	10.0	0.9	25.1	22.5	43.5	-21.0	QP
112.000	23.4	11.3	1.0	25.1	10.5	43.5	-33.0	QP
121.940	23.6	10.7	1.0	25.1	10.3	43.5	-33.3	QP
215.800	22.3	10.9	1.4	24.5	10.0	43.5	-33.5	QP
323.700	25.6	15.0	1.7	24.6	17.7	46.0	-28.3	QP
431.600	23.0	17.2	2.0	25.3	17.0	46.0	-29.0	QP
539.500	23.3	19.5	2.3	25.9	19.3	46.0	-26.7	QP

Remark:

For this intentional radiator operates below 10 GHz, the spectrum was investigated to the tenth harmonic of the highest fundamental frequency. The frequency was not recorded if the level of the emission is very weak.

TEST RESULTS: The unit does meet the FCC requirements.



5.3.2 Occupied Bandwidth

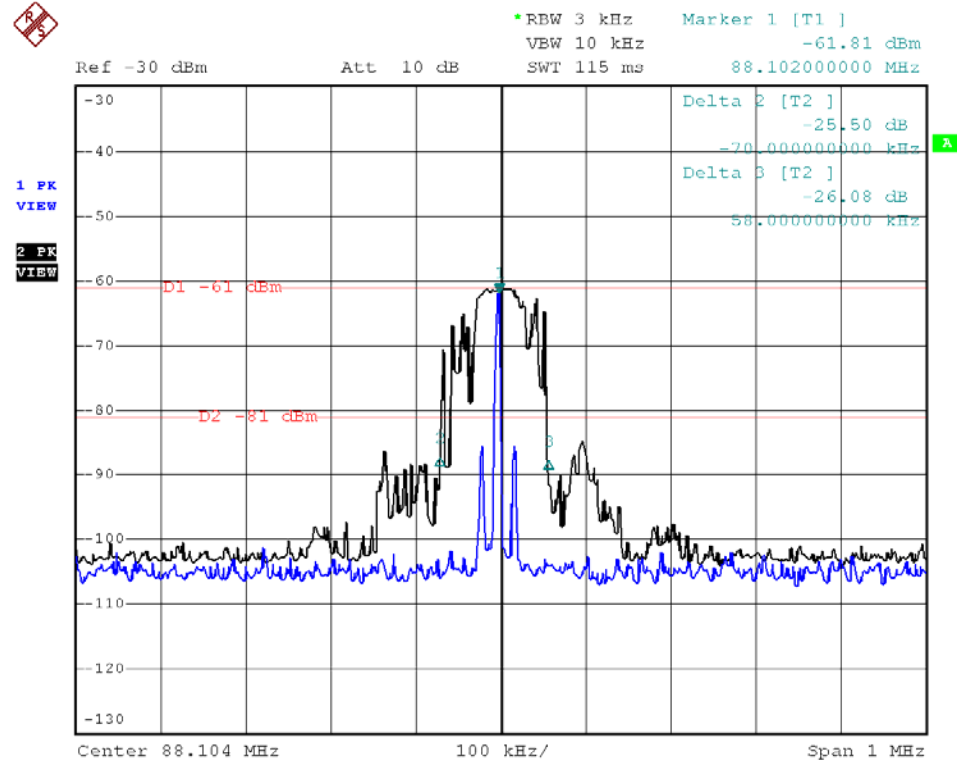
Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.239. Operation within the band 88MHz – 108MHz
Test Date:	01 February 2007 (initial test); 13 February 2007(final test)
Requirements:	(a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.
Test procedure:	1.Play typical song as audio input source: (1)Play a typical song ('New Stores' (Highway Blues), from sample music of Windows XP ®) as the audio input source, input level as the Max volume of the player, nearly 10mV(r.m.s). (2)Set the RBW=3KHz, VBW=10KHz,Sweep time= Auto for the Spectrum Analyzer setting. (3)Record and report the plot as below: 2.Play Gauss white noise as audio input source: (1)Play the gauss white noise as the audio input source, input level as the Max volume of the player, nearly 10mV(r.m.s). (2)Set the RBW=3KHz, VBW=10KHz,Sweep time= Auto for the Spectrum Analyzer setting. (3)Record and report the plot as below:



1. Play typical song

(1). For lowest Channel: 88.1 MHz

The occupied bandwidth as below:



Date: 1.MAR.2007 13:48:10

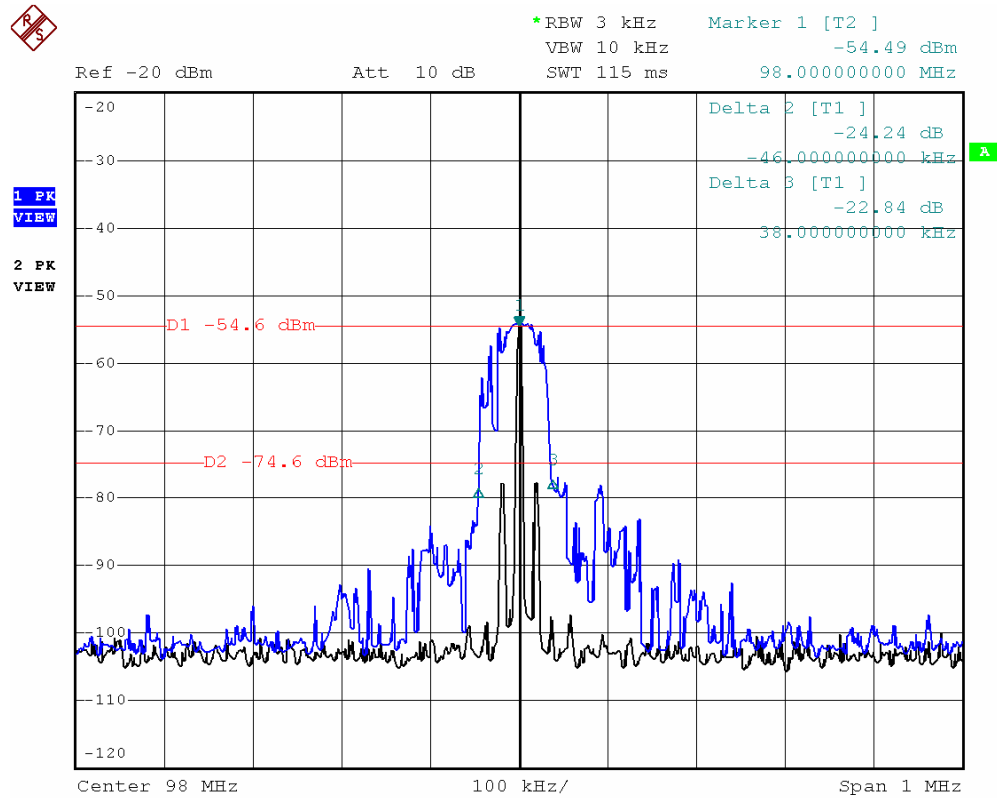
20dB bandwidth of the emission is 128.0 kHz.

Black track: modulated signal.

Blue track: unmodulated carrier.

(2). For middle Channel: 98.0MHz

The occupied bandwidth as below:



Date: 1.MAR.2007 14:17:58

20dB bandwidth of the emission is 84.0 kHz

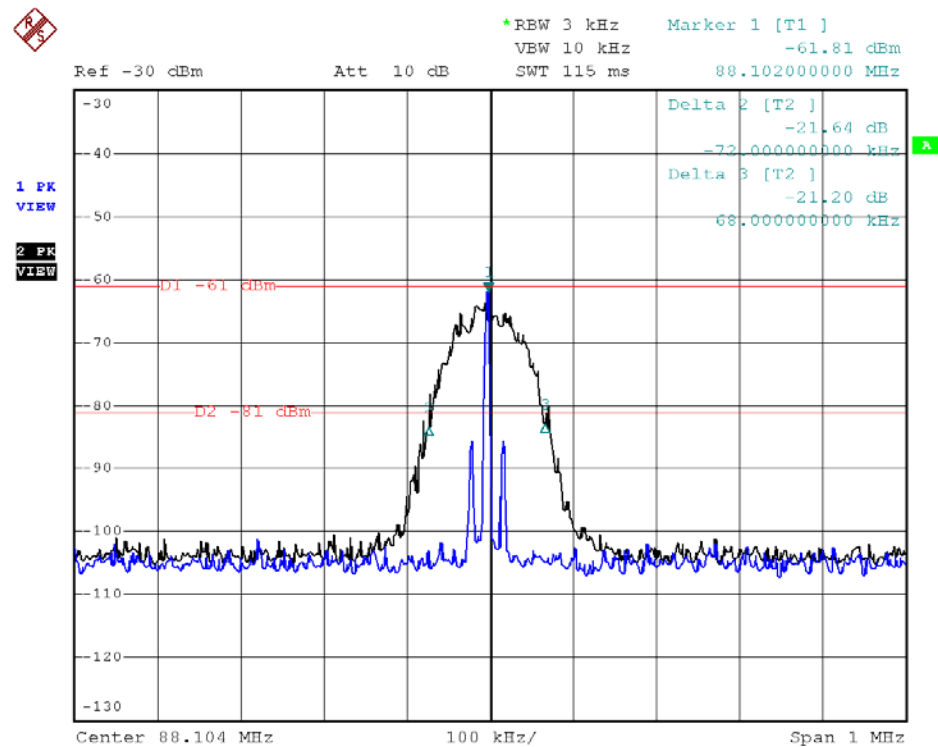
Blue track: modulated signal.
Black track: unmodulated carrier.



1. Play Gauss white noise

(1). For lowest Channel: 88.1MHz

The occupied bandwidth as below:



Date: 1.MAR.2007 13:50:31

20dB bandwidth of the emission is 140.0 kHz.

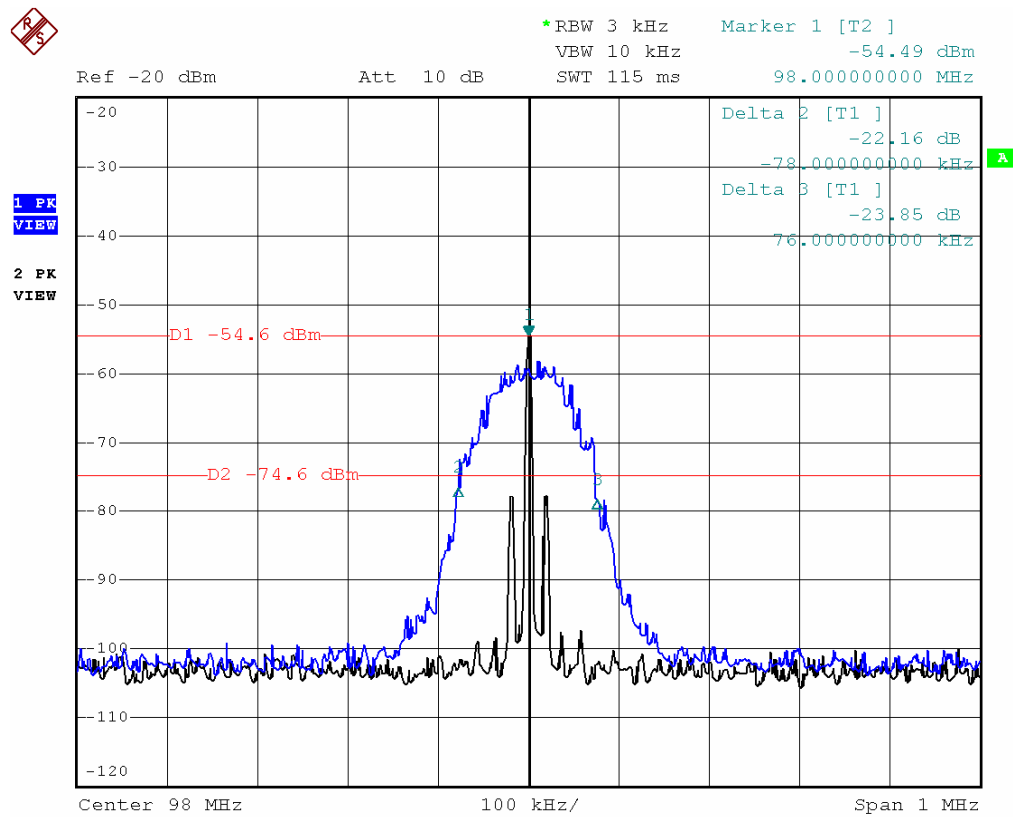
Black track: modulated signal.

Blue track: unmodulated carrier.



(2). For middle Channel: 98MHz

The occupied bandwidth as below:



Date: 1.MAR.2007 14:16:22

20dB bandwidth of the emission is 154.0 kHz

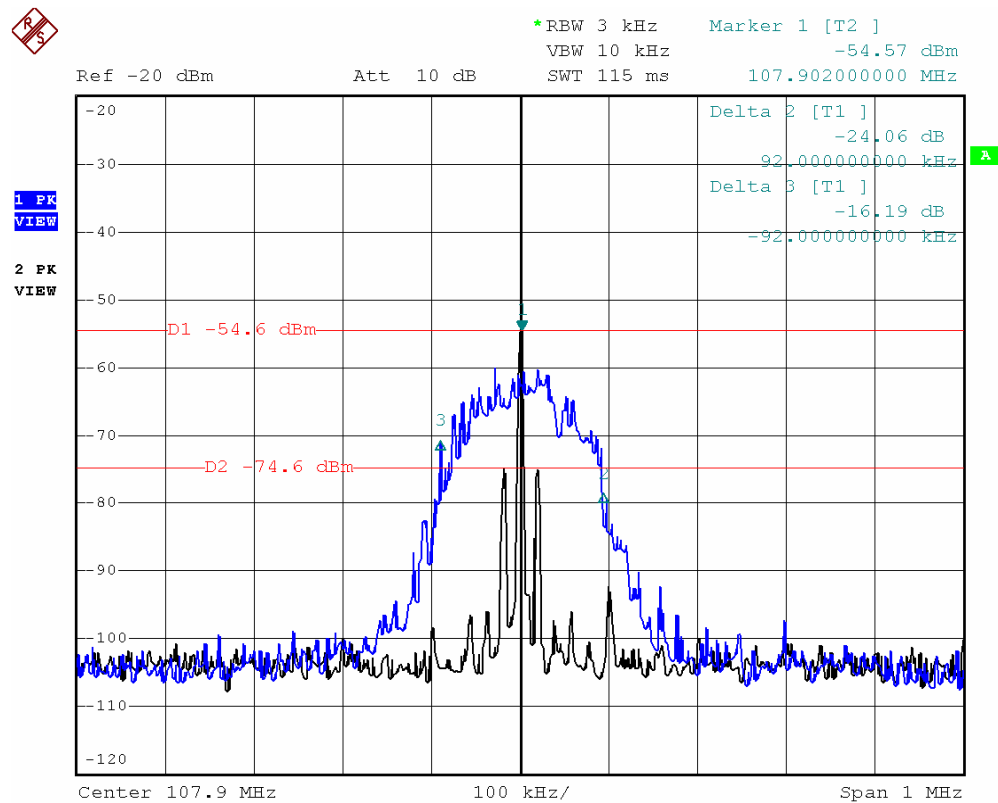
Blue track: modulated signal.

Black track: unmodulated carrier.



(3). For highest Channel:107.9MHz

The occupied bandwidth as below:



Date: 1.MAR.2007 14:12:45

20dB bandwidth of the emission is 184.0 kHz

Blue track: modulated signal.

Black track: unmodulated carrier.

The results: The unit does meet the FCC requirements.