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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMO080501441RFT
Page: 1 of 16
FCC ID:WAD-AT1800

TEST REPORT

Application No. : GLEMO080501441RF
Applicant: Zhongshan K-mate General Elec. Co., Ltd.
FCC ID: WAD-AT1800
Fundamental Frequency : 88.1MHz to 107.9MHz
Equipment Under Test (EUT):
EUT Name: Audio Transmitter
Model No.: AT1800
Standards: FCC PART 15C: 2007
Date of Receipt: May 19, 2008
Date of Test: May 19, 2008 to July 09, 2008
Date of Issue: July 10, 2008

Test Result :	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details..

Authorized Signature:

Stephen Guo
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Radiated Emission (30MHz to 1000MHz)	FCC PART 15 :2007	Section 15.239	PASS
Occupied Bandwidth	FCC PART 15 :2007	Section 15.215	PASS

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION	4
4.1 CLIENT INFORMATION	4
4.2 DETAILS OF E.U.T.	4
4.3 DESCRIPTION OF SUPPORT UNITS	4
4.4 STANDARDS APPLICABLE FOR TESTING	4
4.5 TEST LOCATION	4
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER	4
4.7 TEST FACILITY	5
5 EQUIPMENTS USED DURING TEST	6
6 TEST RESULTS	7
6.1 E.U.T. TEST CONDITIONS	7
6.2 RADIATED EMISSIONS	8
6.3 OCCUPIED BANDWIDTH	13-19

4 General Information

4.1 Client Information

Applicant Name: Zhongshan K-mate General Elec. Co., Ltd.
Applicant Address: 3F B1 Building FuwanNanRoad, Zhongshan, China

4.2 Details of E.U.T.

EUT Name: Audio Transmitter
Item No.: AT1800
Power Supply: DC 12V
Power Cord: N/A

4.3 Description of 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.

4.4 Standards Applicable for Testing

The customer requested FCC tests for the EUT.

The standard used was FCC PART 15, SUBPART C: 2007 (Section 15.239&Section 15.215);

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

No tests were sub-contracted.

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.

- **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.

5 Equipments Used during Test

RE in Chamber						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	28-01-2008	28-01-2009
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2007	04-12-2008
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2007	12-08-2008
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2007	12-08-2008
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2007	12-08-2008
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2007	05-12-2008
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	11-03-2008	11-03-2009
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	11-03-2008	11-03-2009
EMC0075	310N Amplifier	Sonama	310N	272683	10-09-2007	10-09-2008
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	10-08-2007	10-08-2008

General used equipment						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0050-EMC0053	Temperature, & Humidity	ZHENGZHOU BO YANG	WSB	N/A	05-12-2007	05-12-2008
EMC0006	DMM	Fluke	73	70681569	27-09-2007	27-09-2008
EMC0007	DMM	Fluke	73	70671122	27-09-2007	27-09-2008

6 Test Results

6.1 E.U.T. test conditions

Power supply: DC 12V (Vehicle used)

Requirements: 15.31(e) :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. For battery operated equipment, the equipment tests shall be performed using a new battery.

Type of antenna: Integral

Operating Environment:

Temperature: 22-25.0 °C

Humidity: 48-55% RH

Atmospheric Pressure: 1001-1010 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top. 1 near middle and 1 near bottom

The EUT have 199 channels between the 88.1MHz & 107.9MHz with 100KHz channel

Test EUT in transmitting mode with:
 Lowest channel: 88.1MHz;Middle channel: 98.1MHz;Highest channel:107.9MHz.



6.2 Radiated Emissions

Test Requirement:	FCC Part15 C Section 15.239
Test Method:	Based on FCC Part 15 C Section 15.239
Test Date:	Jul 05, 2008
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 (above 1GHz)
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 limit for average field strength dBuV/m for the fundamental frequency = 48.0 dB μ V/m.

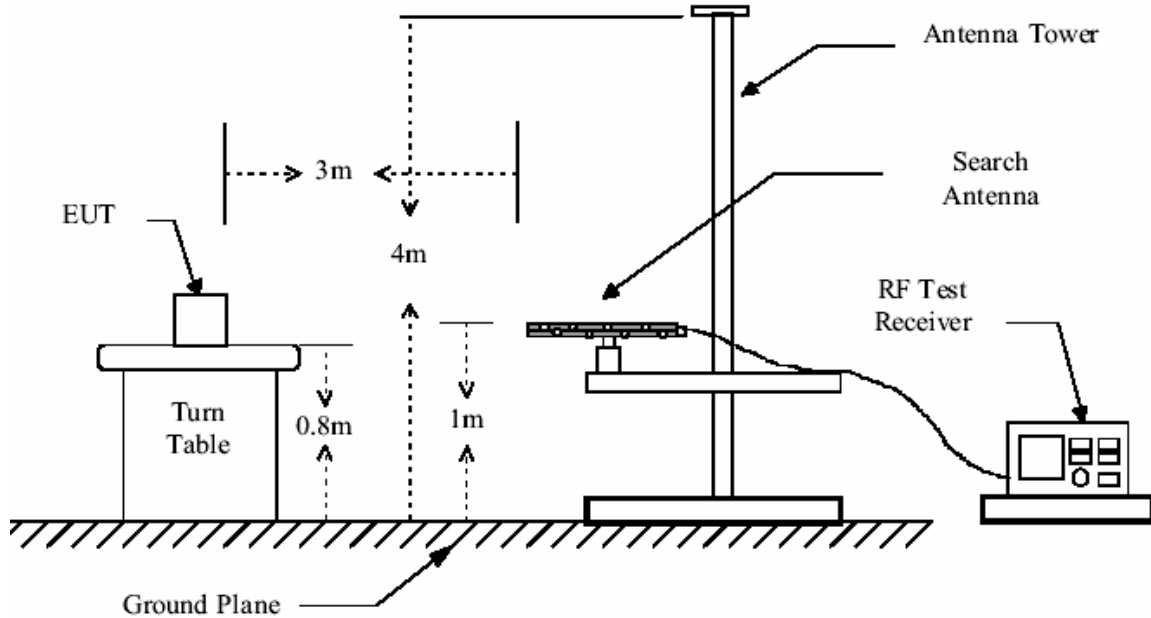
And the limit for peak field strength dBuV/m for the fundamental frequency = 68.0 dB μ V/m

Test Procedure:

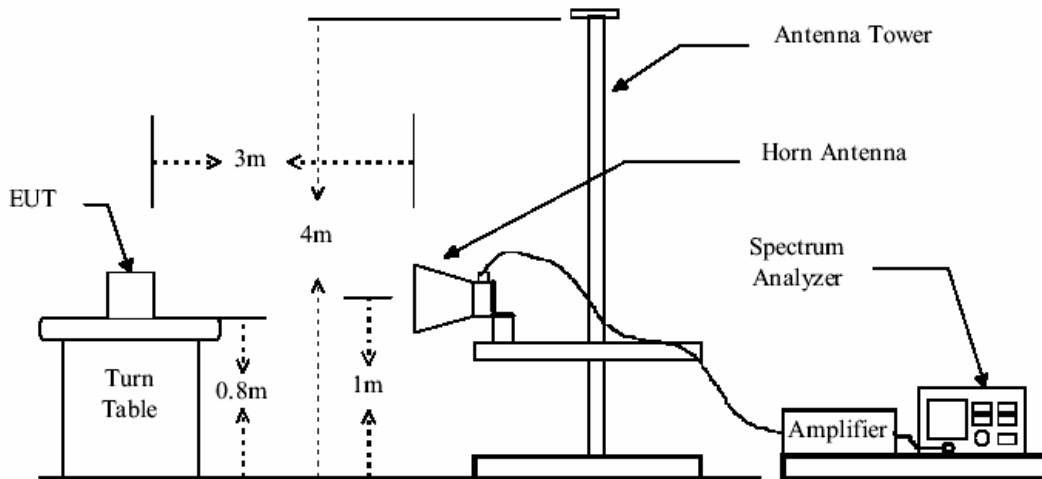
The procedure used was ANSI Standard C63.4-2003. According to 15.33, the receive was scanned from 30MHz to 1.1GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured 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:

- 1) 30MHz to 1GHz emissions:



- 2) Above 1GHz emissions:





SGS-CSTC Standards Technical Services Ltd.

Report No.: GLEMO080501441RFT

Page: 10 of 14

FCC ID:WAD-AT1800

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	52.31	9.82	0.55	25.18	37.50	68.00	-30.50	PEAK
88.100	49.56	9.82	0.55	25.18	34.75	48.00	-13.25	AVERAGE
30.000	31.04	24.20	0.60	25.50	30.34	40.00	-9.66	QP
133.790	36.89	13.87	1.30	25.10	26.96	43.50	-16.54	QP
186.170	38.36	11.59	1.60	24.73	26.81	43.50	-16.69	QP
215.270	33.24	13.10	1.70	24.53	23.51	43.50	-19.99	QP
312.270	29.93	17.56	2.12	24.48	25.13	46.00	-20.87	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	51.45	8.56	0.55	25.18	35.37	68.00	-32.63	PK
88.100	49.45	8.56	0.55	25.18	33.37	48.0	-14.63	AV
30.000	24.79	24.40	0.60	25.50	24.29	40.00	-15.71	QP
69.770	35.96	8.49	1.00	25.10	20.34	40.00	-19.66	QP
123.120	27.15	13.63	1.30	25.10	16.98	43.50	-26.52	QP
299.660	27.14	14.46	2.10	24.40	19.30	46.00	-26.70	QP
457.770	28.74	16.12	2.68	25.54	22.00	46.00	-24.00	QP

Remark:

For this intentional radiator operates below 10 GHz, the spectrum was investigated to the tenth harmonic of the highest fundamental frequency.

No any other emission can be found or too weak to report.



SGS-CSTC Standards Technical Services Ltd.

Report No.: GLEMO080501441RFT

Page: 11 of 14

FCC ID:WAD-AT1800

The following test results were performed on the EUT:

For **middle channel ,98.1MHz:**

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
98.100	57.59	11.42	0.59	25.12	44.49	68.00	-23.51	PEAK
98.100	53.56	11.42	0.59	25.12	38.49	48.00	-9.51	AVERAGE
30.970	30.22	23.86	0.62	25.46	29.24	40.00	-10.76	QP
66.860	40.62	9.49	1.00	25.10	26.01	40.00	-13.99	QP
106.630	38.38	12.32	1.20	25.10	26.81	43.50	-16.69	QP
128.940	38.75	14.10	1.30	25.10	29.05	43.50	-14.45	QP
186.170	40.32	11.59	1.60	24.73	28.78	43.50	-14.72	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
98.100	58.48	11.42	0.59	25.12	46.53	68.00	-21.47	PEAK
98.100	54.76	11.42	0.59	25.12	40.02	48.00	-7.98	AVERAGE
30.970	30.28	23.31	0.62	25.46	28.75	40.00	-11.25	QP
67.830	40.49	9.09	1.00	25.10	25.47	40.00	-14.53	QP
135.730	32.44	13.25	1.30	25.10	21.90	43.50	-21.60	QP
618.790	33.95	19.70	3.10	25.78	30.98	46.00	-15.02	QP

Remark:

For this intentional radiator operates below 10 GHz, the spectrum was investigated to the tenth harmonic of the highest fundamental frequency.

No any other emission can been found or too weak to report.



SGS-CSTC Standards Technical Services Ltd.

Report No.: GLEMO080501441RFT

Page: 12 of 14

FCC ID:WAD-AT1800

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	51.24	12.43	0.59	25.10	39.17	68.00	-28.83	PEAK
107.900	46.24	12.43	0.59	25.10	34.17	48.00	-13.83	AVERAGE
33.880	30.07	22.94	0.68	25.34	28.35	40.00	-11.65	QP
67.830	42.65	9.32	1.00	25.10	27.88	40.00	-12.12	QP
136.700	39.16	13.74	1.30	25.10	29.10	43.50	-14.40	QP
357.860	33.13	17.04	2.30	24.77	27.70	46.00	-18.30	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	53.21	12.43	0.59	25.10	41.17	68.00	-26.83	PEAK
107.900	48.65	12.43	0.59	25.10	36.56	48.00	-12.35	AVERAGE
30.970	37.72	23.31	0.62	25.46	36.18	40.00	-3.82	QP
71.710	39.38	8.22	1.00	25.10	23.50	40.00	-16.50	QP
641.100	40.15	19.59	3.20	25.76	37.18	46.00	-8.82	QP
947.620	39.36	22.36	4.00	24.80	40.92	46.00	-5.08	QP

Remark:

For this intentional radiator operates below 10 GHz, the spectrum was investigated to the tenth harmonic of the highest fundamental frequency.

No any other emission can been found or too weak to report.

TEST RESULTS: The unit does meet the FCC requirements.

6.3 Occupied Bandwidth

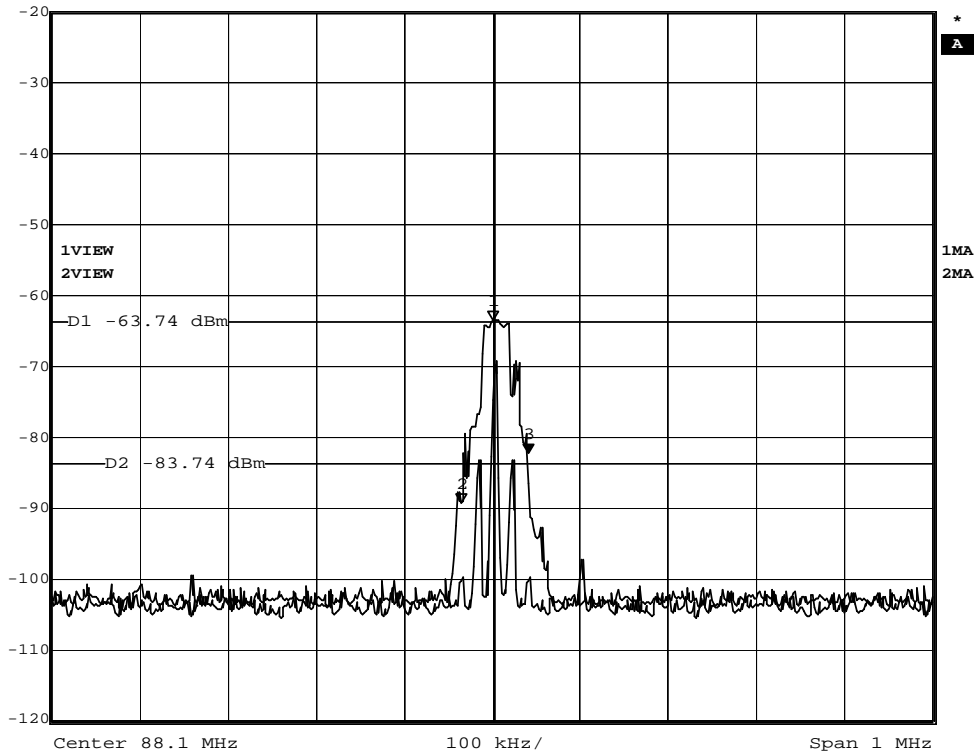
Test Requirement:	FCC Part 15 C
Test Method:	Based on FCC Part15 C Section 15.239. Operation within the band 88.1MHz – 107.9MHz
Test Date:	27 May 2008 (initial test); 08 July 2008(final test)
Requirements:	(a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.
Test procedure:	<p>1.Play typical song as audio input source:</p> <p>(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).</p> <p>(2)Set the RBW=3KHz, VBW=10KHz,Sweep time= Auto for the Spectrum Analyzer setting.</p> <p>(3)Record and report the plot as below:</p> <p>2.Play Gauss white noise as audio input source:</p> <p>(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).</p> <p>(2)Set the RBW=3KHz, VBW=10KHz,Sweep time= Auto for the Spectrum Analyzer setting.</p> <p>(3)Record and report the plot as below:</p>

1.Play typical song

(1). For lowest Channel:88.1MHz

The occupied bandwidth as below:

UNCAL	Marker 3 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-82.32 dBm	VBW	10 kHz		
-20 dBm	88.14108216 MHz	SWT	115 ms	Unit	dBm



Low Frequency is 88.0649MHz, High Frequency is 88.1410MHz

20dB bandwidth of the emission is 76.1 kHz.

Plot Remark:

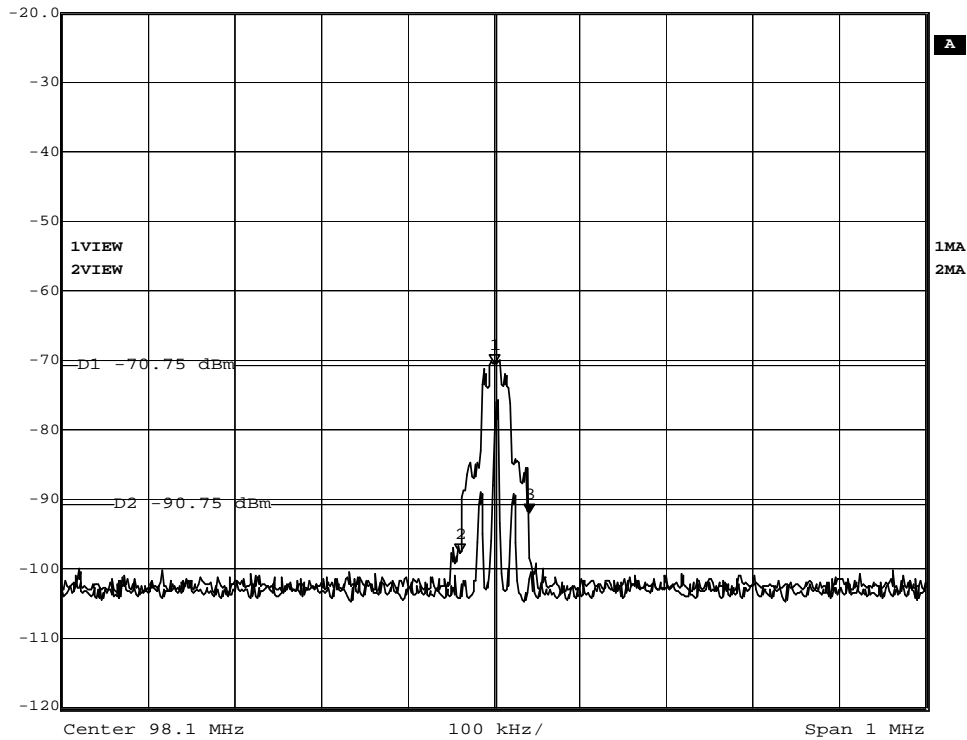
Outside track: modulated signal.

Inside track: unmodulated carrier.

(2). For middle Channel: 98.1MHz

The occupied bandwidth as below:

UNCAL	Marker 3 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-92.18 dBm	VBW	10 kHz		
-20 dBm	98.14108216 MHz	SWT	115 ms	Unit	dBm



Low Frequency is 98.0609MHz, High Frequency is 98.1411MHz

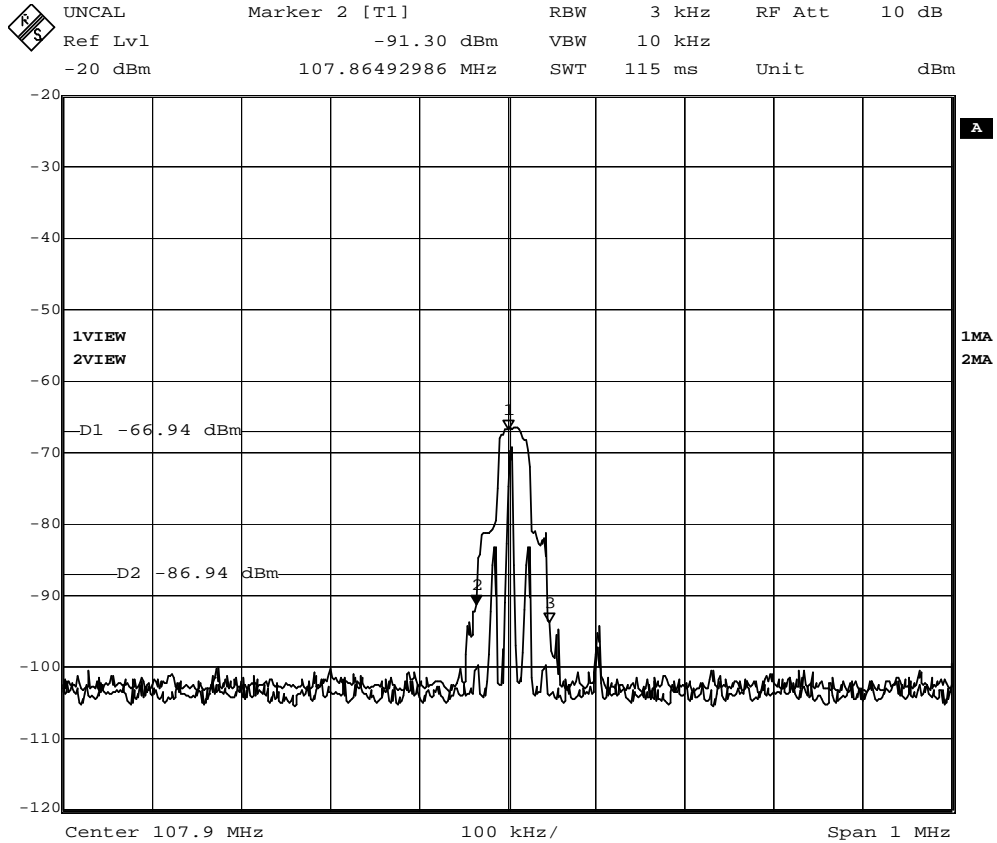
20dB bandwidth of the emission is 80.2 kHz.

Outside track: modulated signal.

Inside track: unmodulated carrier.

(3). For highest Channel:107.9MHz

The occupied bandwidth as below:



Low Frequency is 107.8709 MHz, High Frequency is 107.9471MHz

20dB bandwidth of the emission is 76.2 kHz.

Outside track: modulated signal.

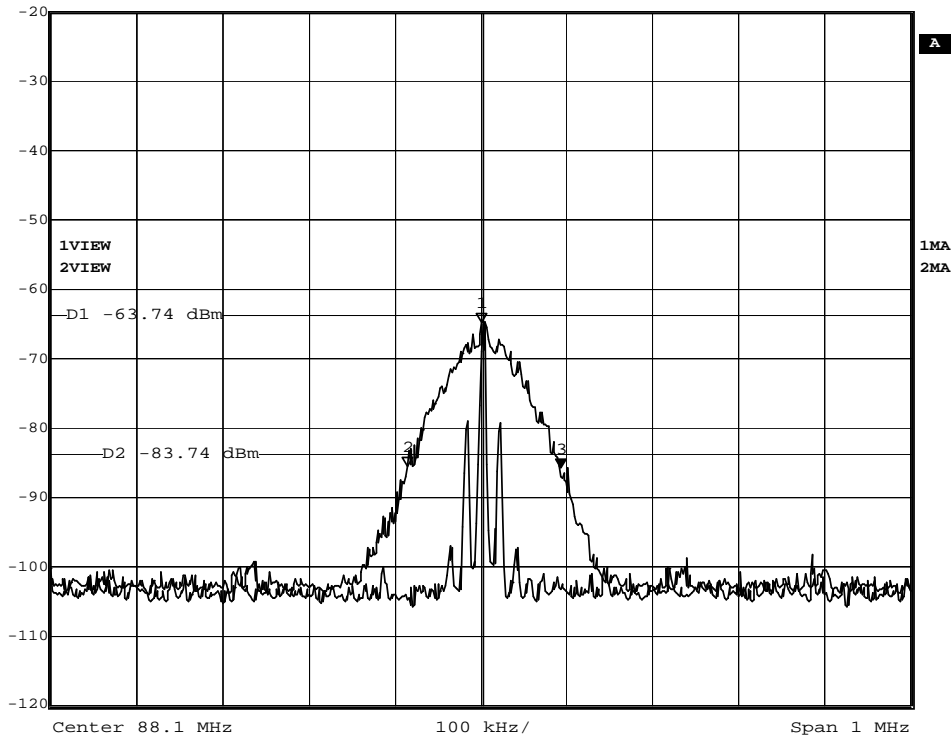
Inside track: unmodulated carrier

1. Play Gauss white noise

(1). For lowest Channel: 88.1 MHz

The occupied bandwidth as below:

UNCAL	Marker 3 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-85.94 dBm	VBW	10 kHz		
-20 dBm	88.19318637 MHz	SWT	115 ms	Unit	dBm



Low Frequency is 88.0120 MHz, High Frequency is 88.1932 MHz

20 dB bandwidth of the emission is 181.2 kHz.

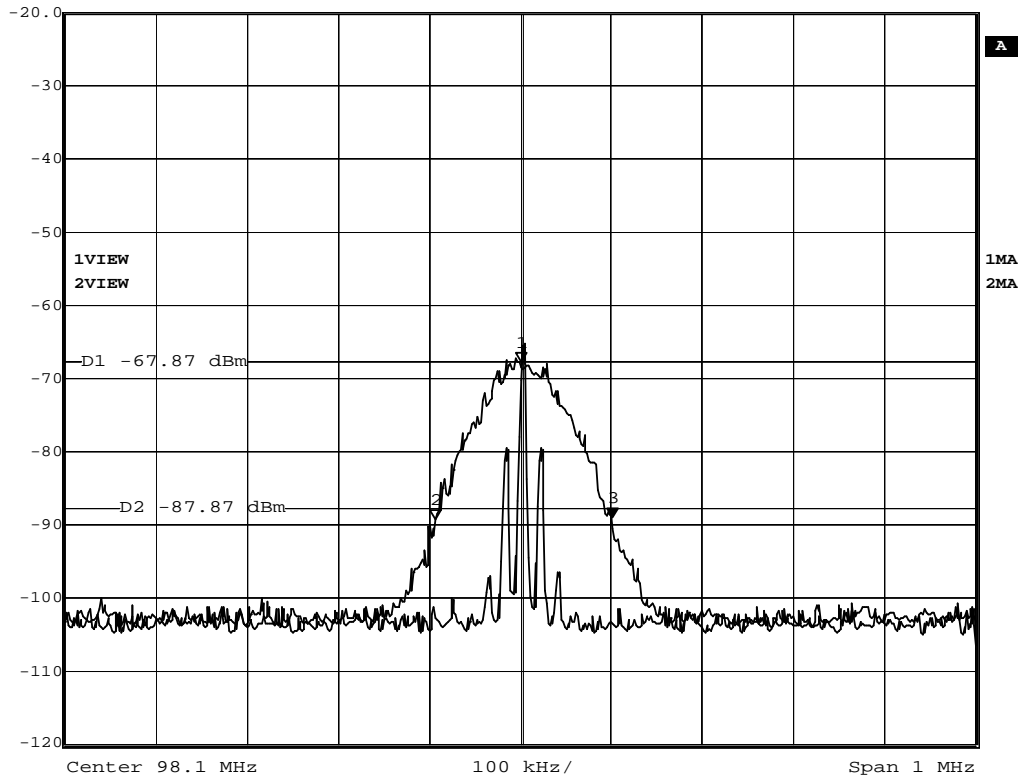
Outside track: modulated signal.

Inside track: unmodulated carrier

(2). For middle Channel: 98.1MHz

The occupied bandwidth as below:

UNCAL	Marker 3 [T1]	RBW	3 kHz	RF Att	10 dB
Ref Lvl	-89.21 dBm	VBW	10 kHz		
-20 dBm	98.20120240 MHz	SWT	115 ms	Unit	dBm



Date: 28.MAY.2008 13:21:30

Low Frequency is 98.0068 MHz, High Frequency is 98.2012MHz

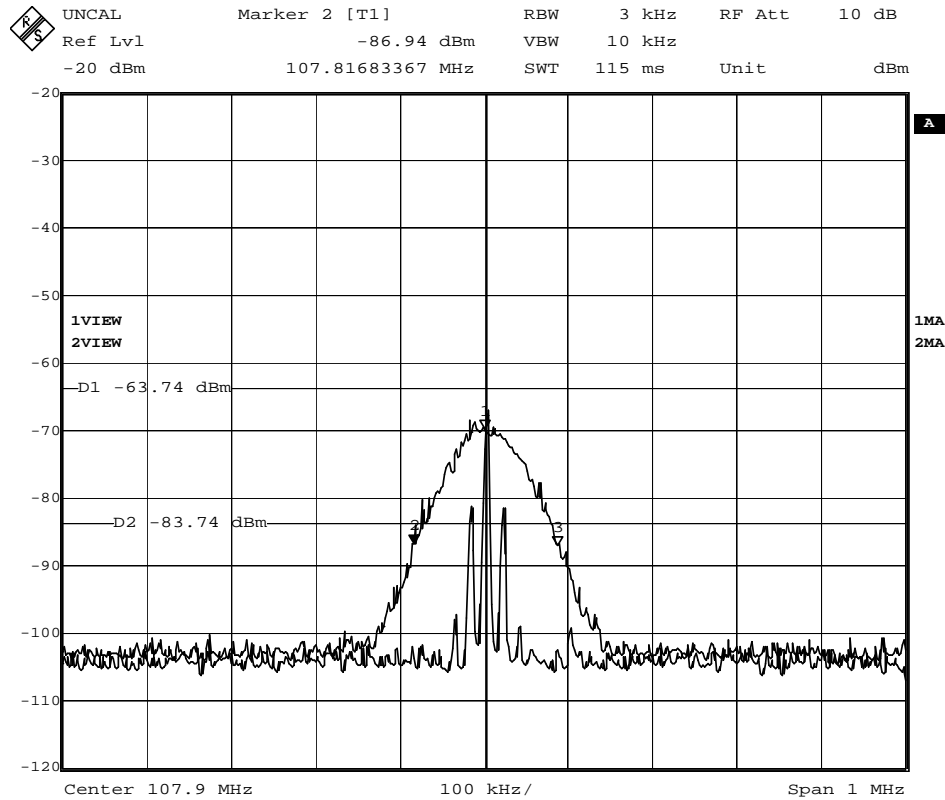
20dB bandwidth of the emission is 194.4 kHz.

Outside track: modulated signal.

Inside track: unmodulated carrier

(3). For highest Channel:107.9MHz

The occupied bandwidth as below:



Low Frequency is 107.8168 MHz, High Frequency is 107.9871MHz

20dB bandwidth of the emission is 170.3 kHz.

Outside track: modulated signal.

Inside track: unmodulated carrier

The results: The unit does meet the FCC requirements.