



SGS-CSTC Standards Technical Services Ltd.

No.198 Kezhu Road, Science Town Economic & Technology
Development District Guangzhou, China 510663 Telephone:
Telephone: +86 (0) 20 82155555
Fax: +86 (0) 20 82075059
Email: sgs_internet_operations@sgs.com
FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: SZEMO061202482ITF
Page: 1 of 18
FCC ID: UUIMS-5321CMP

FCC TEST REPORT

Application No. : SZEMO061202482IT
Applicant: Measurement Ltd
FCC ID: UUIMS-5321CMP
Fundamental Carrier Frequency : 88 MHz to 108MHz
Equipment Under Test (EUT):
Name: Car music Player
Model: MS-5321
Standards: FCC PART 15.239: 2006
Please refer to section 2 for further details.
Date of Receipt: 05 December 2006
Date of Test: 11 December 2006 to 05 February 2007
Date of Issue: 06 February 2007

Test Result :	PASS *
----------------------	---------------

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory 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	Stanadard Paragraph	Result
Radiated Emission	FCC PART 15 :2006	Section 15.239	PASS*
Occupied Bandwidth	FCC PART 15 :2006	Section 15.239	PASS

* The EUT passed the Radiated Emission test after modification.

1. Changed the C15 to 10pF for Tx.
2. Changed the L2 to 2.2 μ H for Tx



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 GENERAL DESCRIPTION OF E.U.T.	4
4.3 DESCRIPTION OF THE TRANSMITTER AND 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 TEST RESULTS	6
5.1 E.U.T. OPERATION	6
5.2 TEST INSTRUMENTS.....	6
5.3 TEST PROCEDURE & MEASUREMENT DATA	7
5.3.1 Radiated Emissions.....	7
5.3.2 Occupied Bandwidth.....	12
(2). FOR MIDDLE CHANNEL:107.3MHZ.....	17-18



4 General Information

4.1 Client Information

Applicant Name: Measurement Ltd
Applicant Address: Block A, 19/F., Prince Industrial Building, 106 King Fuk Street, San Po Kong, Kowloon, H.K.

4.2 General Description of E.U.T.

Product Name: Car music Player
Model: MS-5321
Power Supply: 12VDC
Power Cord: NA

4.3 Description of the Transmitter and Support Units

The EUT was tested as a single unit.

The transmitter have 7 channels between the 106.7MHz & 107.9MHz with 200KHz channel spacing can be in exchange for choice manually by software setup. The EUT used a permanently connected antenna printed at the PCB, the gain of the antenna is 0dBi.

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 Car music Player.

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.

- **VCCI**

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2005. Valid until September 28, 2008.

- **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.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 556682, Aug. 04, 2005

- **Industry Canada (IC)**

The 3m 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.: 6002.

5 Test Results

5.1 E.U.T. Operation

Input voltage: 12V DC.

Operating Environment:

Temperature: 24.0 °C

Humidity: 52 % RH

Atmospheric Pressure: 1012 mbar

EUT Operation: Test in transmitting mode:

1. For lowest channel: 106.7MHz.
2. For middle channel: 107.3MHz.
3. For highest channel: 107.9MHz.

5.2 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	28-04-2005	27-04-2007
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	22-09-2006	21-09-2007
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	20-05-2006	19-05-2007
5	Coaxial cable	SGS	N/A	SEL0027	20-05-2006	19-05-2007
6	BiConiLog Antenna	ETS-LINDGREN	3142C	00042673	03-08-2006	02-08-2007
7	EMI Test Receiver	Rohde & Schwarz	ESCI	100119	09-08-2006	08-08-2007
8	Loop Antenna	Emco	6502	00042963	30-05-2006	29-05-2007

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:	20 December 2006(Initial Test); 05 February 2007(Test after Modification)
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 7 channels in the 106.7MHz and 107.9MHz with 200KHz channel spacing can in exchange for choice,According to ANSI 63.4 chapter 12,the test fundamental frequency of the EUT is lowest channel 106.7MHz,middle channel 107.3MHz and highest channel 107.9MHz.

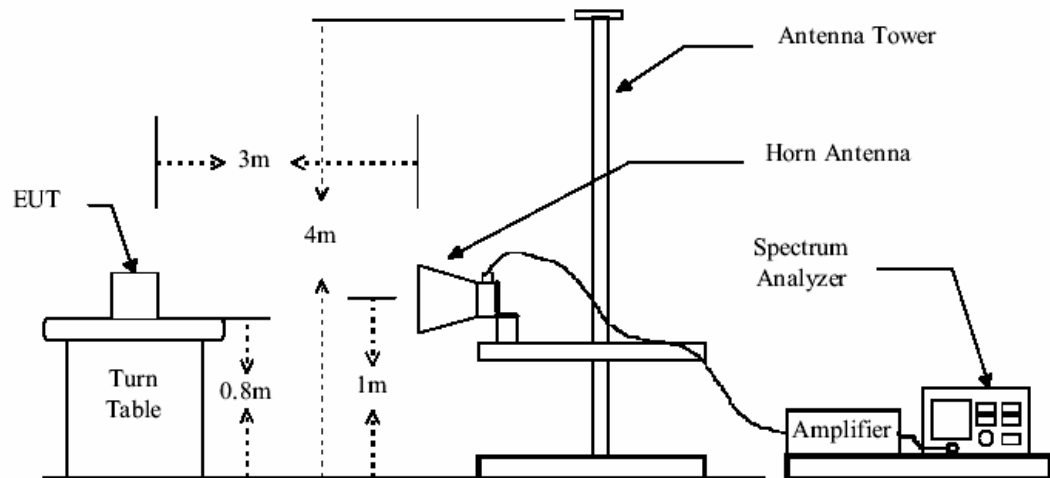
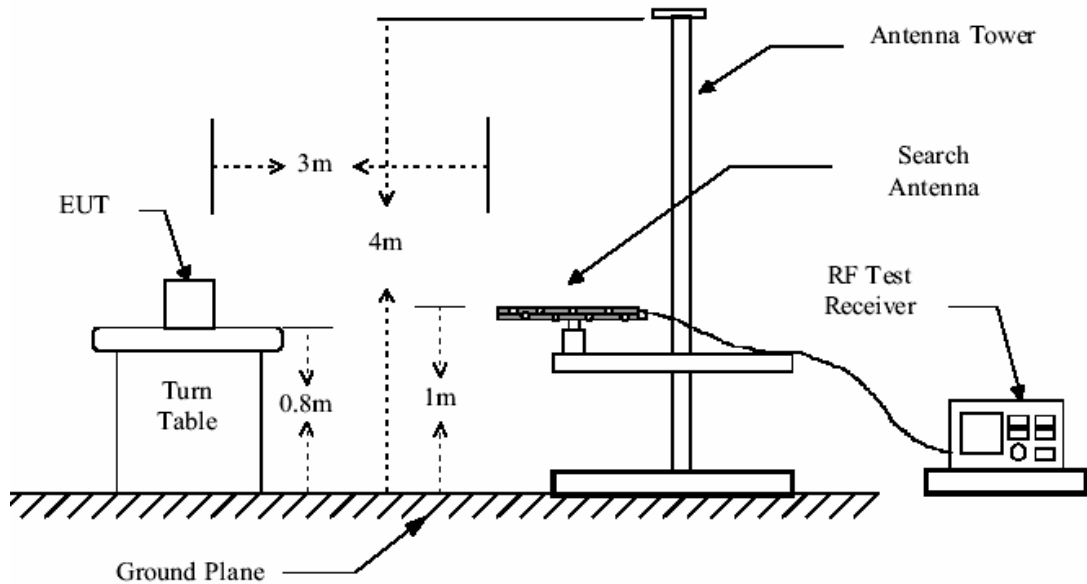
The limit for average field strength dBuV/m for the fundamental frequency = 48.0 dBuV/m.

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

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:





SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEMO061202482ITF

Page: 9 of 18

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

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

The following test results were performed on the EUT:

For **lowest channel ,106.7MHz:**

(1). Fundamental emission

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
106.7	40.9	39.6	68.0	27.1	28.4
Average Measurement					
106.7	38.6	37.8	48.0	9.4	10.2

(2). Harmonics & Spurious Emissions

Quasi-peak Measurement			
Test Frequency (MHz)	Measuring Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
	Horizontal		
211.225	35.15	43.5	8.35
318.475	41.79	46	4.21
426.700	33.95	46	12.05
532.000	36.68	46	9.32
639.250	33.80	46	12.20
Test Frequency (MHz)	Measuring Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
	Vertical		
91.300	30.63	43.5	12.87
211.225	25.46	43.5	18.04
318.475	30.90	46	15.10
424.750	27.71	46	18.29
532.000	33.31	46	12.69

Remark:

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

The following test results were performed on the EUT:

For **middle channel, 107.3MHz**:

(1). Fundamental emission

Peak Measurement					
Test Frequency (MHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
107.3	43.6	37.8	68.0	24.4	30.2
Average Measurement					
107.3	40.7	33.4	48.0	7.3	14.6

(2). Harmonics & Spurious Emissions

Quasi-peak Measurement			
Test Frequency (MHz)	Measuring Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
	Horizontal		
214.600	24.95	43.5	18.55
264.850	30.35	46	15.65
320.425	30.82	46	15.18
428.650	28.80	46	17.20
536.875	30.54	46	15.46
Test Frequency (MHz)	Measuring Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
	Vertical		
214.600	37.88	43.5	5.62
282.400	35.06	46	10.94
320.425	40.57	46	5.43
426.700	33.40	46	12.60

Remark:

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



SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEMO061202482ITF

Page: 11 of 18

The following test results were performed on the EUT:

For **highest channel, 107.9MHz**:

(1). Fundamental emission

Test Frequency (MHz)	Measuring Level (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
107.9	43.8	39.4	68.0	24.2	28.6
Average Measurement					
107.9	39.6	35.5	48.0	8.4	12.5

(2). Harmonics & Spurious Emissions

Quasi-peak Measurement			
Test Frequency (MHz)	Measuring Level (dBuV/m) Horizontal	Limits (dBuV/m)	Margin (dB)
214.150	35.80	43.5	-7.70
323.350	41.61	46	-4.39
430.600	32.08	46	-13.92
539.800	39.31	46	-6.69
646.075	32.74	46	-13.26
Test Frequency (MHz)	Measuring Level (dBuV/m) Vertical	Limits (dBuV/m)	Margin (dB)
214.150	26.23	43.5	-17.27
323.350	30.37	46	-15.63
430.600	27.59	46	-18.41
539.800	29.33	46	-16.67

Remark:

For this intentional radiator operates below 10 GHz, the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. The frequency will not be 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: 11 December 2006
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.
Method of measurement: Test the EUT in MP3 singal source input with maximum level mode.A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken. The vertical is set to 10dB per division. The horizontal scale is set to 2KHz per division.

(1). For lowest Channel:106.7MHz

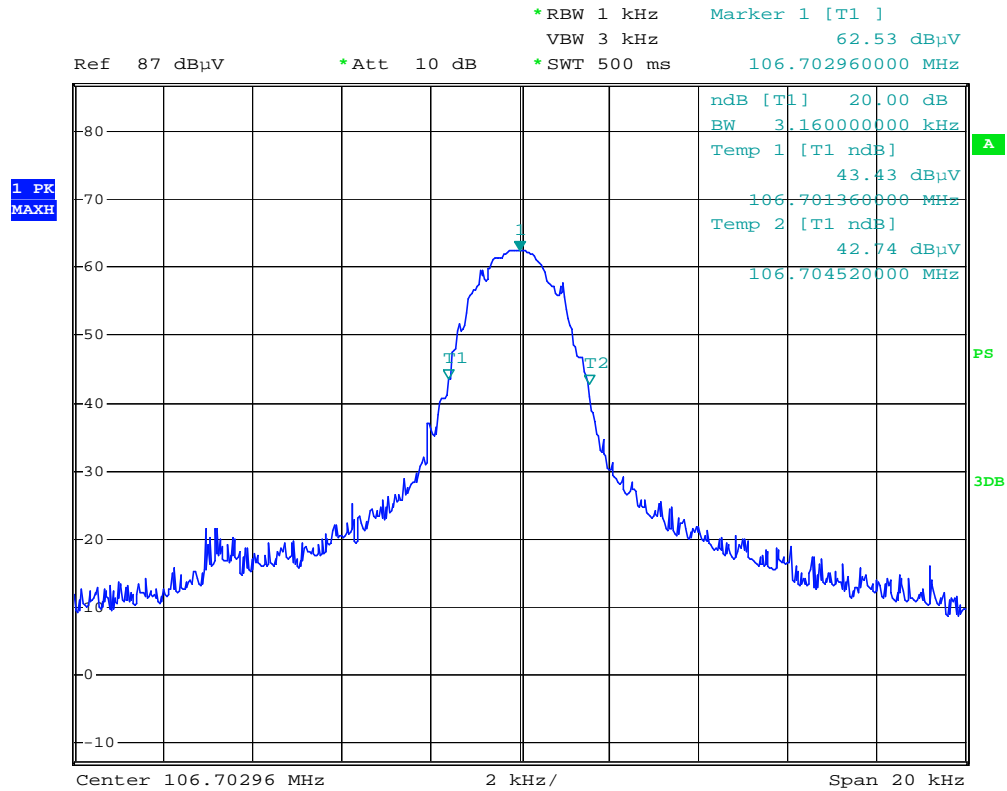


SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEMO061202482ITF

Page: 13 of 18

The occupied bandwidth as below:



N

Date: 11.DEC.2006 15:15:49



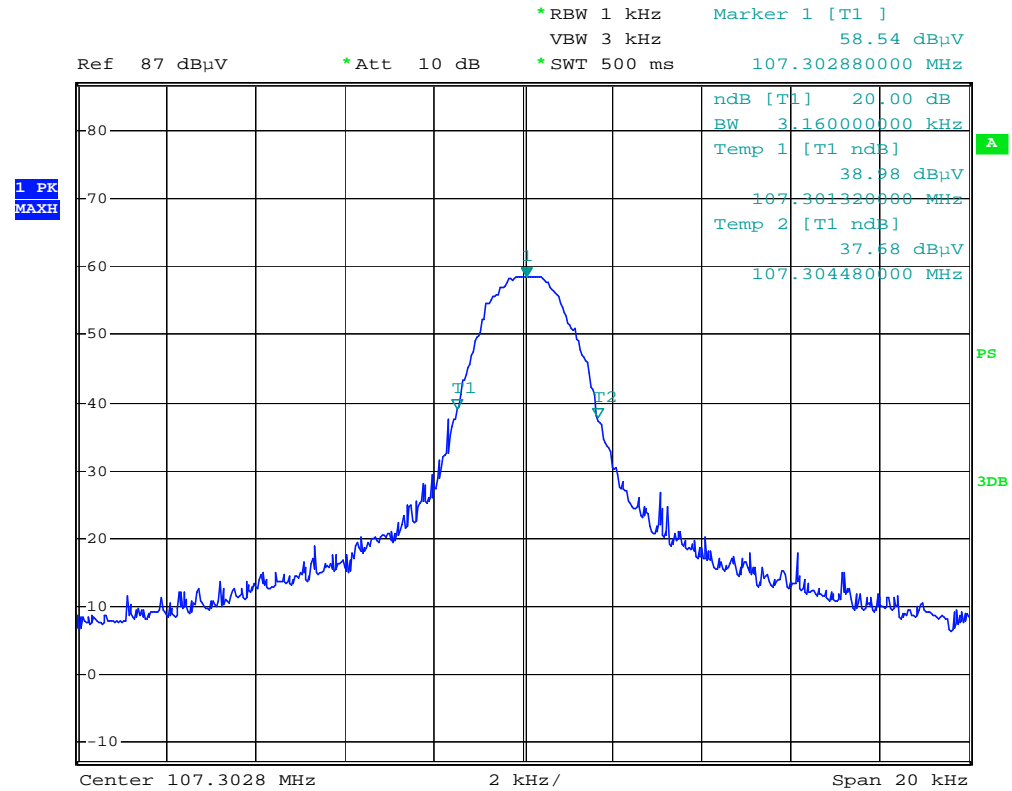
SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEMO061202482ITF

Page: 14 of 18

(2). For middle Channel:107.3MHz

The occupied bandwidth as below:



N

Date: 11.DEC.2006 15:17:02



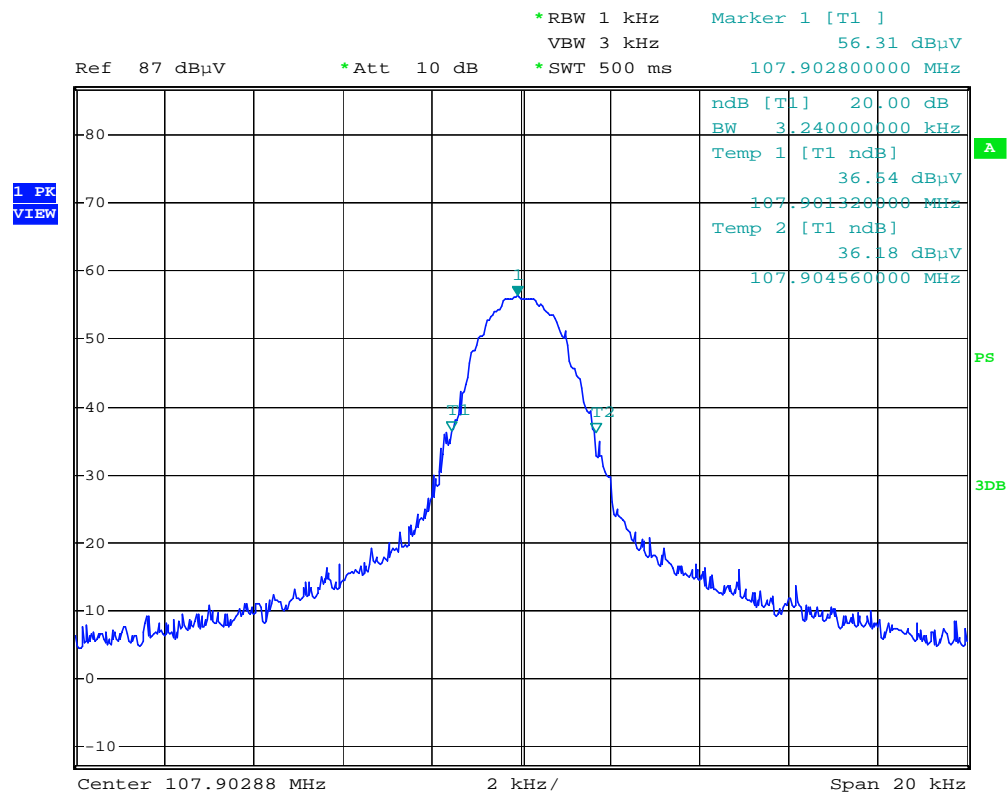
SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEMO061202482ITF

Page: 15 of 18

(3). For highest Channel:107.9MHz

The occupied bandwidth as below:



N

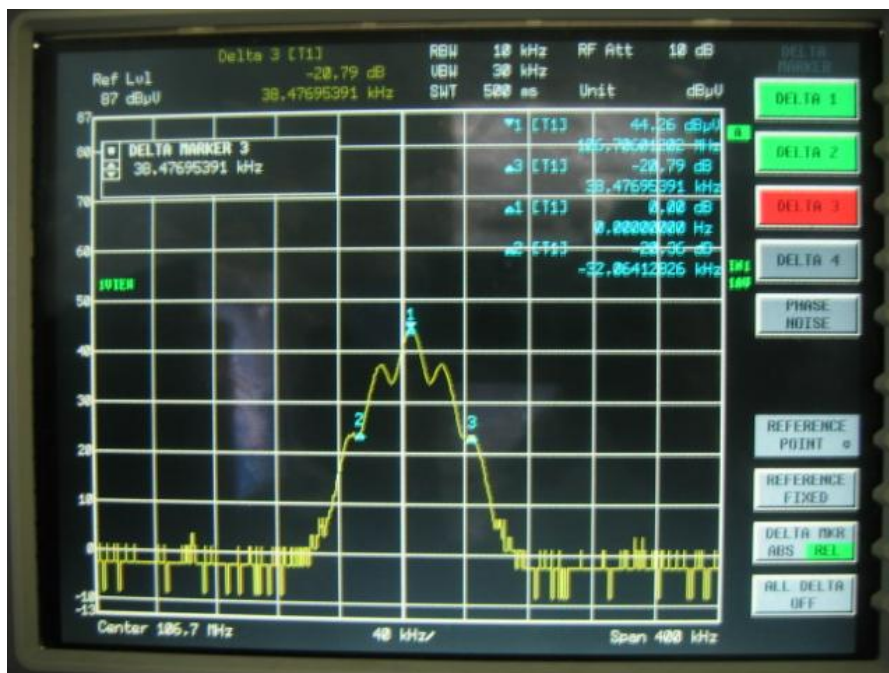
Date: 11.DEC.2006 15:18:21

The results: The unit does meet the FCC requirements.

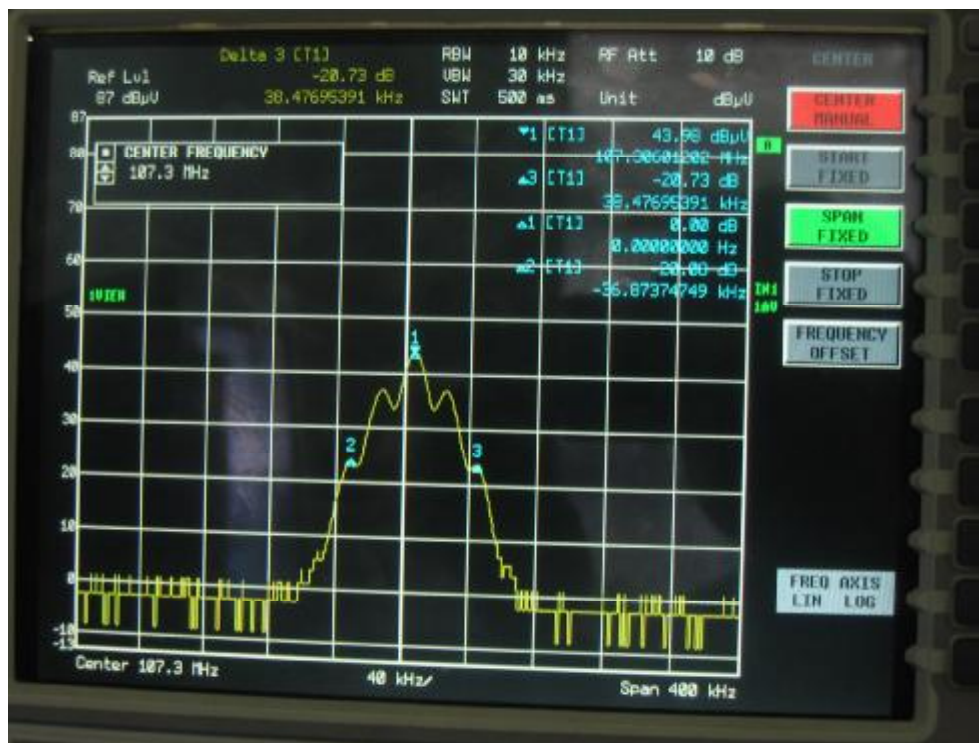
Appendix

Occupied Bandwidth use a average dector:

(1). For lowest Channel:106.7MHz



(2). For middle Channel:107.3MHz



(3). For highest Channel:107.9MHz

