

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CERTIFICATION

Test Report No. : E077R-061

AGR No. : A076A-181R1

Applicant : KI RYUNG ELECTRONICS CO., LTD.
Address : 219-6, Gasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea

Manufacturer : KI RYUNG ELECTRONICS CO., LTD.
Address : 219-6, Gasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea

Type of Equipment : Digital Satellite Radio (FM Transmitter)

FCC ID. : P3HSP5

Model Name : SP5

Serial number : N/A

Total page of Report : 32 pages (including this page)

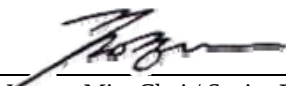
Date of Incoming : June 29, 2007

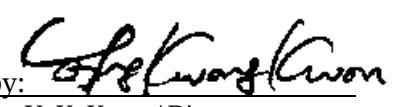
Date of Issuing : July 23, 2007

SUMMARY

The equipment complies with the regulation of *FCC CRF 47 PART 15, SUBPART C, SECTION 15.239*.

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by: 
Joon-Min, Choi / Senior Engineer
EMC Div.
ONETECH Corp.

Reviewed by: 
Y. K. Kwon / Director
EMC Div.
ONETECH Corp.

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1. VERIFICATION OF COMPLIANCE

- APPLICANT : KI RYUNG ELECTRONICS CO., LTD.
- ADDRESS : 219-6, Gasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea
- CONTACT PERSON : Mr. Won-Kyu, Choi / Q.C. Assistant Manager
- TELEPHONE NO : +82-2-3282-2264
- FCC ID : P3HSP5
- MODEL NAME : SP5
- BRAND NAME : SIRIUS
- SERIAL NUMBER : N/A
- DATE : July 23, 2007

EQUIPMENT CLASS	DXX – Part 15 Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	Digital Satellite Radio (FM Transmitter)
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	Charter 13 of ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SECTION 15.239
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.
- The above equipment has external transmitting antenna, so the EUT shall be installed into at small, medium and large size vehicles and the cars were tested at in situ testing for getting compliance with the requirement, section 15.239, but the test was performed by another test lab. Please refer to another test report, which was issued by another test lab.

2. GENERAL INFORMATION

2.1 Product Description

The KI RYUNG ELECTRONICS CO., LTD., Model SP5 (referred to as the EUT in this report) is a Digital Satellite Radio that has the FM transmitter from 88.1 MHz to 107.9 MHz for audio signal of FM radio receiver. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. or CRY. FREQ.(FREQ.>=1MHz)	16.0 MHz and 17 MHz
POWER REQUIREMENT	DC 5.2V, 1.5A from an AC/DC Adaptor or DC 5.2V, 1.5A from a Car Adaptor
TX FREQUENCY RANGE	88.1 MHz ~ 107.9 MHz (range into 200 KHz Step)
NUMBER OF LAYERS	2 Layers: Cradle Board, 6 Layers: Main Board
EXTERNAL CONNECTOR	DC In, Antenna In, Audio Out, FM Out

2.2 Model Differences

-. None

2.3 Related Submittal(s) / Grant(s)

-. Original submittal only

2.4 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
SP5	Ki Ryung Electronics	P3HSP5	Digital Satellite Radio (EUT)	-
EGH12-52015SPA	Shenzhen City Hongben Electronic	N/A	AC/DC Adaptor	EUT
SMIQ O3B	R&S	N/A	Signal Generator	-
9303-800	Seavey Engineering	N/A	Antenna	EUT
PNB 12400	Newmax	N/A	Battery	EUT

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-080, Korea. Description details of test facilities were submitted to the Commission on August 30, 2005. (Registration Number: 340658)

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HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 dong, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-705, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	KI RYUNG	SP5 DV3 REV E1	N/A
Cradle Board	N/A	UPA-SV3 VER:B.0	N/A

3.2 Mode of operation during the test

The Model, SP5 is included a FM transmitter designed to operate on function in the 88.1 ~ 107.9 MHz. The EUT does not have an audio input port, so the internal 1 kHz modulation signal which was generated by satellite signal generator was transmitted with maximum audio level during the test.

3.3 Cable Description for the EUT

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
DC In	N	N	EUT END	1.2	Car Battery or AC/DC Adaptor
ANT In	N	N	EUT END	3.0	GPS ANT
Audio Out	N	N	EUT END	1.0	10K Ohm terminal
FM Out	N	Y (ANTENNA END)	EUT END	5.0	External FM Antenna

3.4 Equipment Modifications

-. None

3.5 Configuration of Test System

Line Conducted Test: The EUT was connected to adaptor and the power line of adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter open area test site.

Occupied Bandwidth Measurement:

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer.

Tuning Range Measurement:

This measurement is performed with the search coil located close to the EUT enough to get a full-scale of the modulated carrier on the spectrum analyzer.

In situ Radiated Emission Test:

According to the FCC Policy, the EUT shall be installed in small, medium, and large size vehicles because of external antenna on the EUT.

3.6 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The external FM antenna which shall be supplied by the responsible party shall be used according to user's guide.

4. PRELIMINARY TEST**4.1 AC Power line Conducted Emission Test**

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmit the RF Signal continuously	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmit the RF Signal continuously	X

5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Conducted Emission Test

5.1.1 Operating Condition: Used AC/DC Adaptor (With External FM Antenna)

Humidity Level : 35 % Temperature: 21 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.207 (a)
 Type of Test : Low Power Communication Device Transmitter
 Result : PASSED BY -3.21 dB at 2.86 MHz under peak mode

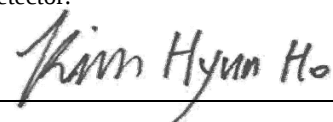
EUT : Digital Satellite Radio Date: July 17, 2007
 Operating Condition : Transmit the RF signal.
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.30	H	52.21	60.11	-7.90
0.45	H	50.79	56.78	-5.99
0.99	H	50.19	56.00	-5.81
2.86	H	52.79	56.00	-3.21
3.07	N	48.30	56.00	-7.70
4.79	H	52.03	56.00	-3.97
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.30	H	38.74	50.11	-11.37
0.45	H	35.47	46.78	-11.31
0.99	H	32.19	46.00	-13.81
2.86	H	32.97	46.00	-13.03
3.07	N	23.63	46.00	-22.37
4.79	H	32.27	46.00	-13.73

Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

See next page for an overview sweep performed with peak and average detector.



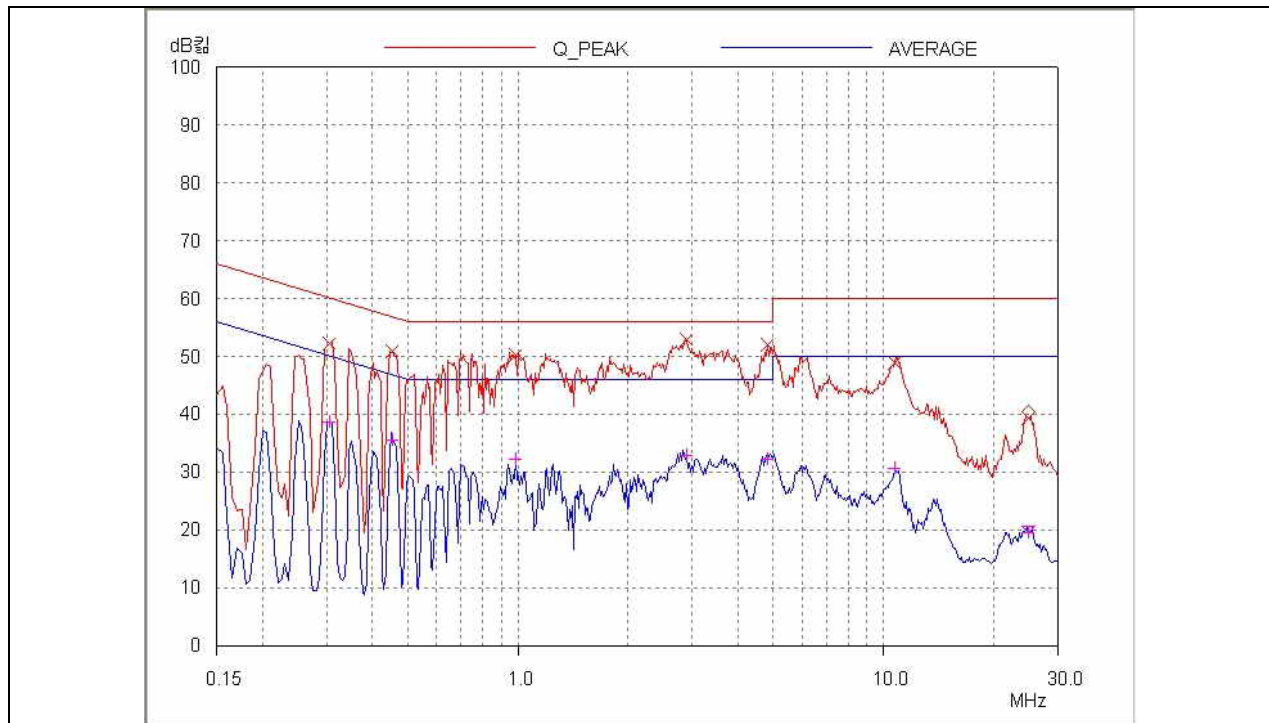
Tested by: Hyun-Ho, Kim / Test Engineer

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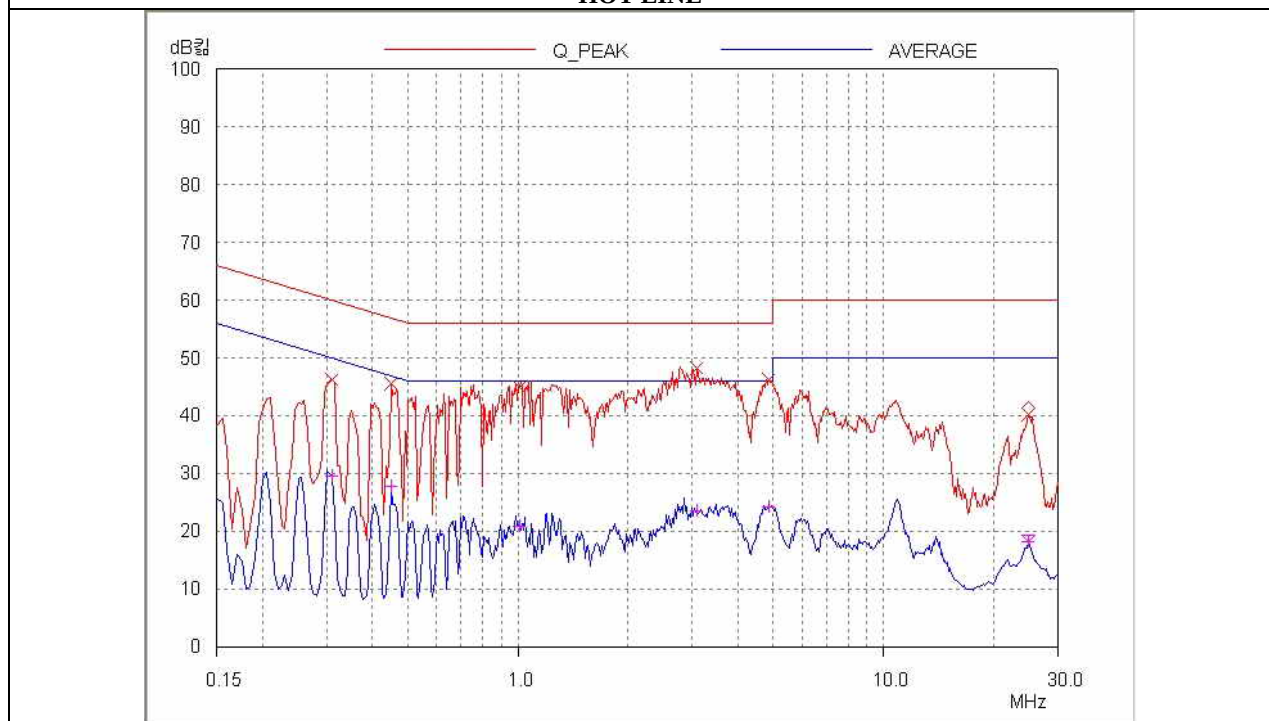
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HOT LINE



NEUTRAL LINE

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5.1.2 Operating Condition: Used AC/DC Adaptor (Without External FM Antenna)

Humidity Level : 35 % Temperature: 21 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.207 (a)
 Type of Test : Low Power Communication Device Transmitter
 Result : PASSED BY -4.70 dB at 2.84 MHz and 4.82 MHz under peak mode

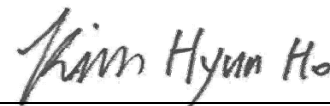
EUT : Digital Satellite Radio Date: July 17, 2007
 Operating Condition : Transmit the RF signal.
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.31	H	54.22	59.97	-5.75
0.76	H	50.33	56.00	-5.67
2.76	N	45.54	56.00	-10.46
2.84	H	51.30	56.00	-4.70
4.82	H	51.30	56.00	-4.70
4.90	N	45.76	56.00	-10.24
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.31	H	38.05	49.97	-11.92
0.76	H	30.15	46.00	-15.85
2.76	N	24.52	46.00	-21.48
2.84	H	29.87	46.00	-16.13
4.82	H	32.60	46.00	-13.40
4.90	N	23.72	46.00	-22.28

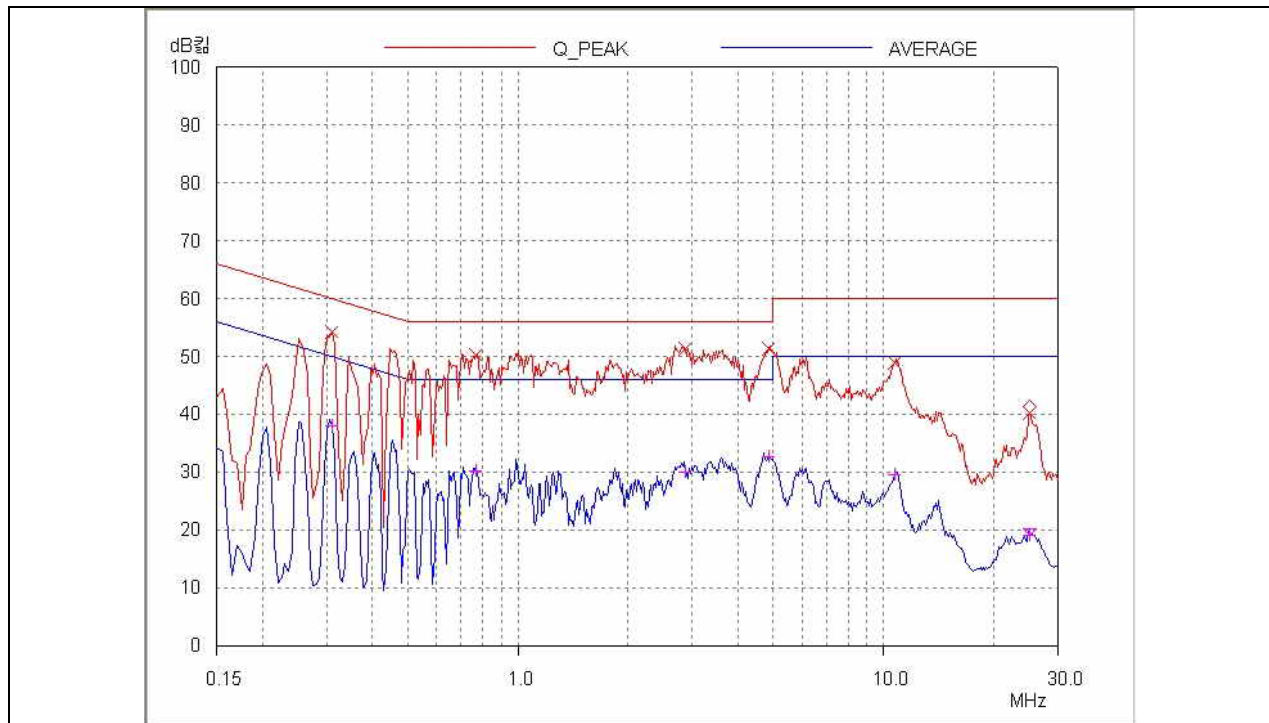
Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

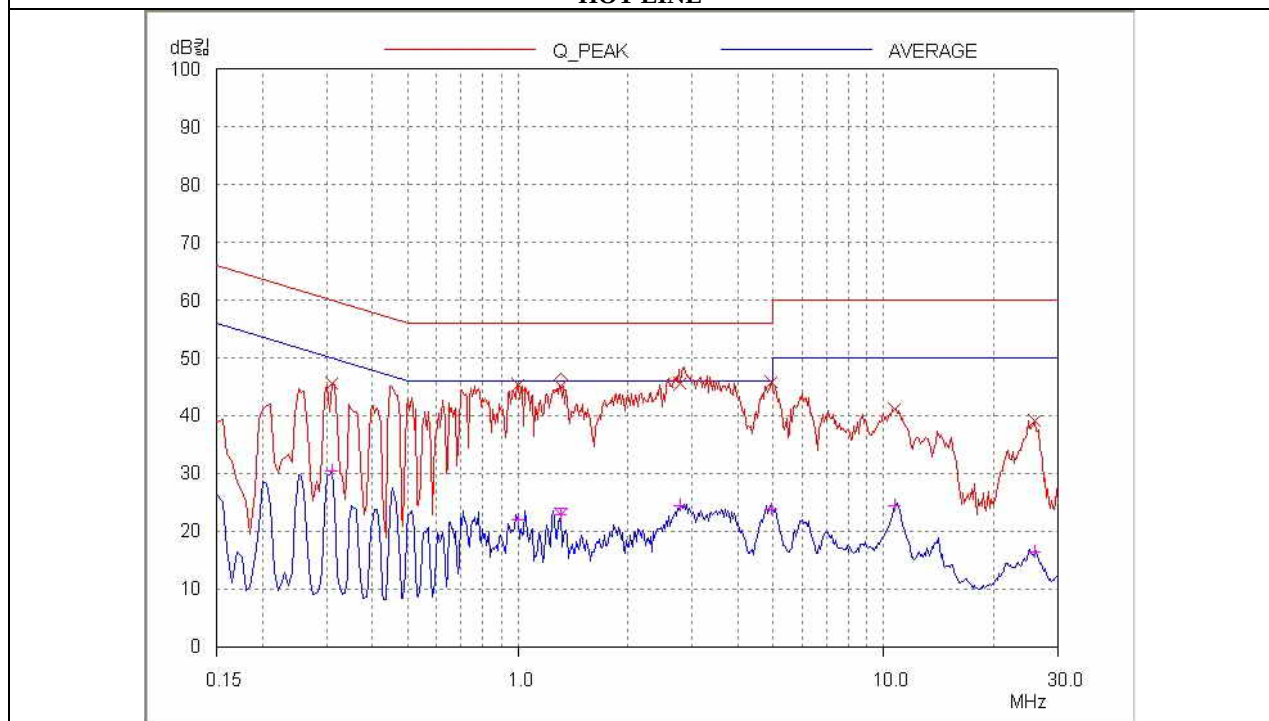
See next page for an overview sweep performed with peak and average detector.



Tested by: Hyun-Ho, Kim / Test Engineer



HOT LINE



NEUTRAL LINE

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5.2 Radiated Emission Test (Within the permitted 200 kHz band)

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

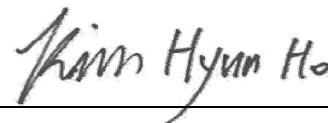
5.2.1 Operating Condition: Used AC/DC Adaptor (With External FM Antenna)

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -3.12 dB at 97.90 MHz under average detector mode

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal.
Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.10	38.40	Peak	H	8.19	2.36	48.95	68.00	-19.05
	33.50	Peak	V	8.19	2.36	44.05	68.00	-23.95
	34.20	Average	H	8.19	2.36	44.75	48.00	-3.25
	29.30	Average	V	8.19	2.36	39.85	48.00	-8.15
97.90	36.20	Peak	H	9.98	2.40	48.58	68.00	-19.42
	40.10	Peak	V	9.98	2.40	52.48	68.00	-15.52
	32.50	Average	H	9.98	2.40	44.88	48.00	-3.12
	26.20	Average	V	9.98	2.40	38.58	48.00	-9.42
107.90	35.30	Peak	H	11.39	2.48	49.17	68.00	-18.83
	25.10	Peak	V	11.39	2.48	38.97	68.00	-29.03
	29.50	Average	H	11.39	2.48	43.37	48.00	-4.63
	20.50	Average	V	11.39	2.48	34.37	48.00	-13.63

Radiated Emission Tabulated Data



Tested by: Hyun-Ho, Kim / Test Engineer

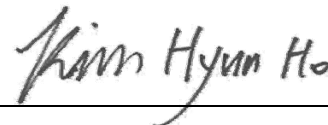
5.2.2 Operating Condition: Used AC/DC Adaptor (Without External FM Antenna)

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -2.63 dB at 107.90 MHz under average detector mode

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal.
Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.10	30.50	Peak	H	8.19	2.36	41.05	68.00	-26.95
	30.40	Peak	V	8.19	2.36	40.95	68.00	-27.05
	25.30	Average	H	8.19	2.36	35.85	48.00	-12.15
	25.30	Average	V	8.19	2.36	35.85	48.00	-12.15
97.90	30.30	Peak	H	9.98	2.40	42.68	68.00	-25.32
	33.20	Peak	V	9.98	2.40	45.58	68.00	-22.42
	24.30	Average	H	9.98	2.40	36.68	48.00	-11.32
	27.30	Average	V	9.98	2.40	39.68	48.00	-8.32
107.90	30.50	Peak	H	11.39	2.48	44.37	68.00	-23.63
	36.20	Peak	V	11.39	2.48	50.07	68.00	-17.93
	23.10	Average	H	11.39	2.48	36.97	48.00	-11.03
	31.50	Average	V	11.39	2.48	45.37	48.00	-2.63

Radiated Emission Tabulated Data



Tested by: Hyun-Ho, Kim / Test Engineer

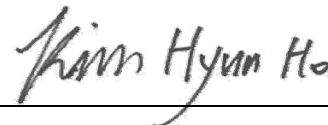
5.2.3 Operating Condition: Used Car Battery (With External FM Antenna)

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -4.52 dB at 97.90 MHz under average detector mode

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal.
Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.10	36.40	Peak	H	8.19	2.36	46.95	68.00	-21.05
	35.30	Peak	V	8.19	2.36	45.85	68.00	-22.15
	31.40	Average	H	8.19	2.36	41.95	48.00	-6.05
	29.20	Average	V	8.19	2.36	39.75	48.00	-8.25
97.90	37.00	Peak	H	9.98	2.40	49.38	68.00	-18.62
	33.20	Peak	V	9.98	2.40	45.58	68.00	-22.42
	31.10	Average	H	9.98	2.40	43.48	48.00	-4.52
	28.00	Average	V	9.98	2.40	40.38	48.00	-7.62
107.90	35.30	Peak	H	11.39	2.48	49.17	68.00	-18.83
	38.00	Peak	V	11.39	2.48	51.87	68.00	-16.13
	29.40	Average	H	11.39	2.48	43.27	48.00	-4.73
	24.30	Average	V	11.39	2.48	38.17	48.00	-9.83

Radiated Emission Tabulated Data



Tested by: Hyun-Ho, Kim / Test Engineer

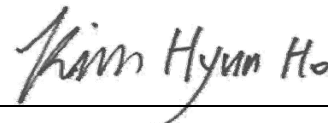
5.2.4 Operating Condition: Used Car Battery (Without External FM Antenna)

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -6.03 dB at 107.90 MHz under average detector mode

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal.
Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.10	26.20	Peak	H	8.19	2.36	36.75	68.00	-31.25
	29.30	Peak	V	8.19	2.36	39.85	68.00	-28.15
	21.40	Average	H	8.19	2.36	31.95	48.00	-16.05
	23.50	Average	V	8.19	2.36	34.05	48.00	-13.95
97.90	33.10	Peak	H	9.98	2.40	45.48	68.00	-22.52
	32.30	Peak	V	9.98	2.40	44.68	68.00	-23.32
	27.00	Average	H	9.98	2.40	39.38	48.00	-8.62
	27.90	Average	V	9.98	2.40	40.28	48.00	-7.72
107.90	28.20	Peak	H	11.39	2.48	42.07	68.00	-25.93
	34.00	Peak	V	11.39	2.48	47.87	68.00	-20.13
	22.40	Average	H	11.39	2.48	36.27	48.00	-11.73
	28.10	Average	V	11.39	2.48	41.97	48.00	-6.03

Radiated Emission Tabulated Data



Tested by: Hyun-Ho, Kim / Test Engineer

5.3 Radiated Emission Test (Outside of the specified 200 kHz band)

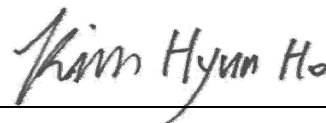
The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

5.3.1 Operating Condition: Used AC/DC Adaptor

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209 (a)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -10.59 dB at 116.30 MHz

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal.
Frequency range : 30MHz – 1000MHz
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Distance : 3 Meter
Remark : Other emissions

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
108.66	17.40	V	11.49	2.49	31.38	43.52	-12.14
111.90	12.30	H	11.92	2.54	26.76	43.52	-16.76
116.30	17.80	V	12.50	2.63	32.93	43.52	-10.59
122.00	11.00	V	13.13	2.68	26.81	43.52	-16.71
202.84	7.30	V	16.53	3.42	27.25	43.52	-16.27
300.20	10.20	V	14.02	3.60	27.82	46.02	-18.20
It was not observed any emissions up to 10 th harmonic frequencies of fundamental frequency except above test data.							



Tested by: Hyun-Ho, Kim / Test Engineer

5.3.2 Operating Condition: Used Car BatteryHumidity Level : 48 %Temperature: 20 °CLimits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209 (a)Type of Test : Low Power Communication Device TransmitterResult : PASSED BY -11.65 dB at 250.20 MHz

EUT : Digital Satellite Radio

Date: July 17, 2007

Operating Condition : Transmit the RF signal.

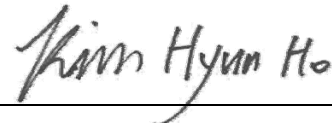
Frequency range : 30MHz – 1000MHz

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Remark : Other emissions

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
56.20	11.20	H	8.91	1.65	21.76	40.00	-18.24
122.00	10.30	H	13.13	2.68	26.11	43.52	-17.41
135.00	13.80	H	14.09	2.60	30.49	43.52	-13.03
183.00	12.10	H	15.84	2.90	30.84	43.52	-12.68
250.20	13.50	H	17.56	3.31	34.37	46.02	-11.65
300.30	9.50	H	14.02	3.60	27.12	46.02	-18.90
It was not observed any emissions up to 10 th harmonic frequencies of fundamental frequency except above test data.							



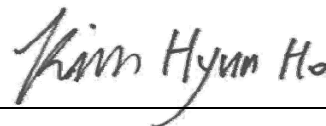
Tested by: Hyun-Ho, Kim / Test Engineer

5.4 Bandwidth of the operating frequency

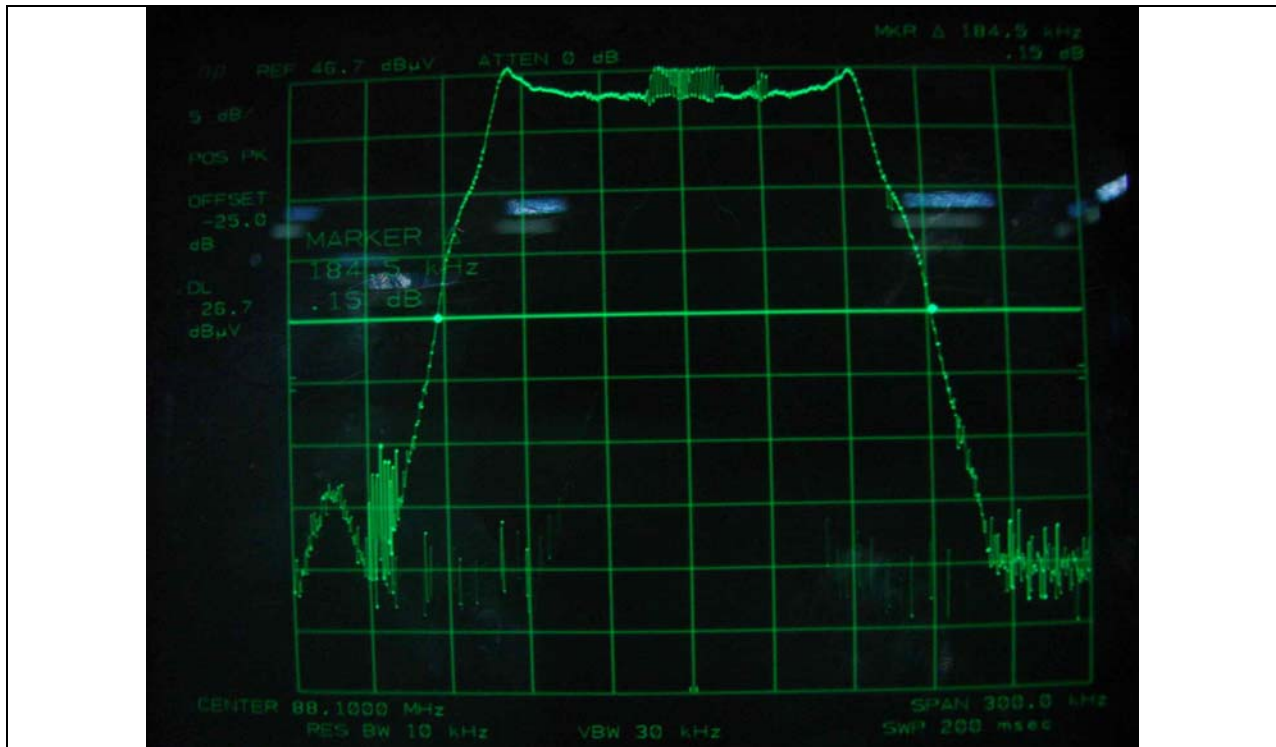
Humidity Level : 48 % Temperature: 20 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)
 Result : PASSED

EUT : Digital Satellite Radio Date: July 17, 2007
 Operating Condition : Transmit the RF signal.
 Minimum Resolution
 Bandwidth : 10 kHz

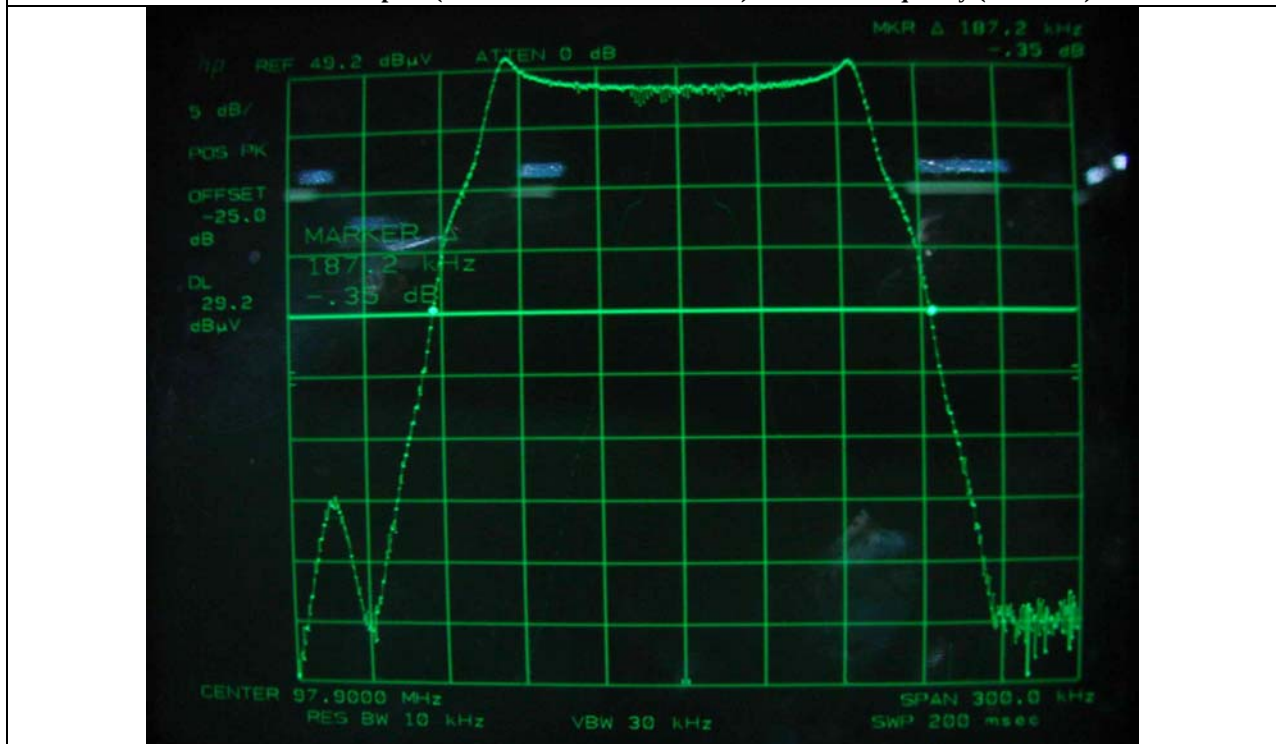
Operating Condition	Frequency (MHz)	Measured Value (kHz)	Limit (kHz)	Margin (kHz)
Used AC/DC Adaptor (With External FM Antenna)	88.1	184.5	200	-15.5
	97.9	187.2		-12.8
	107.9	186.9		-13.1
Used AC/DC Adaptor (Without External FM Antenna)	88.1	184.5		-15.5
	97.9	186.3		-13.7
	107.9	186.3		-13.7
Used Car Battery (With External FM Antenna)	88.1	184.8		-15.2
	97.9	186.3		-13.7
	107.9	185.1		-14.9
Used Car Battery (Without External FM Antenna)	88.1	184.8		-15.2
	97.9	185.7		-14.3
	107.9	186.6		-13.4



Tested by: Hyun-Ho, Kim / Test Engineer



Used AC/DC Adaptor (With External FM Antenna) - Bottom Frequency (88.1MHz)



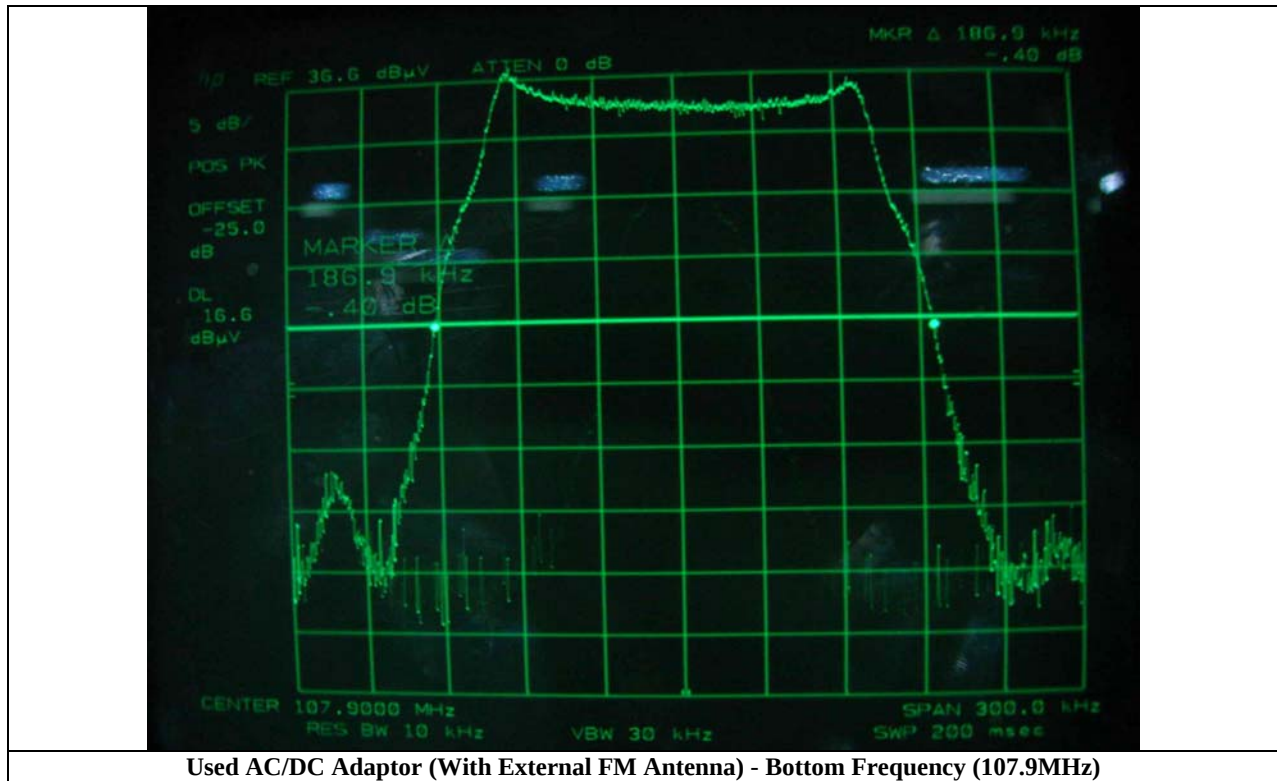
Used AC/DC Adaptor (With External FM Antenna) - Middle Frequency (97.9MHz)

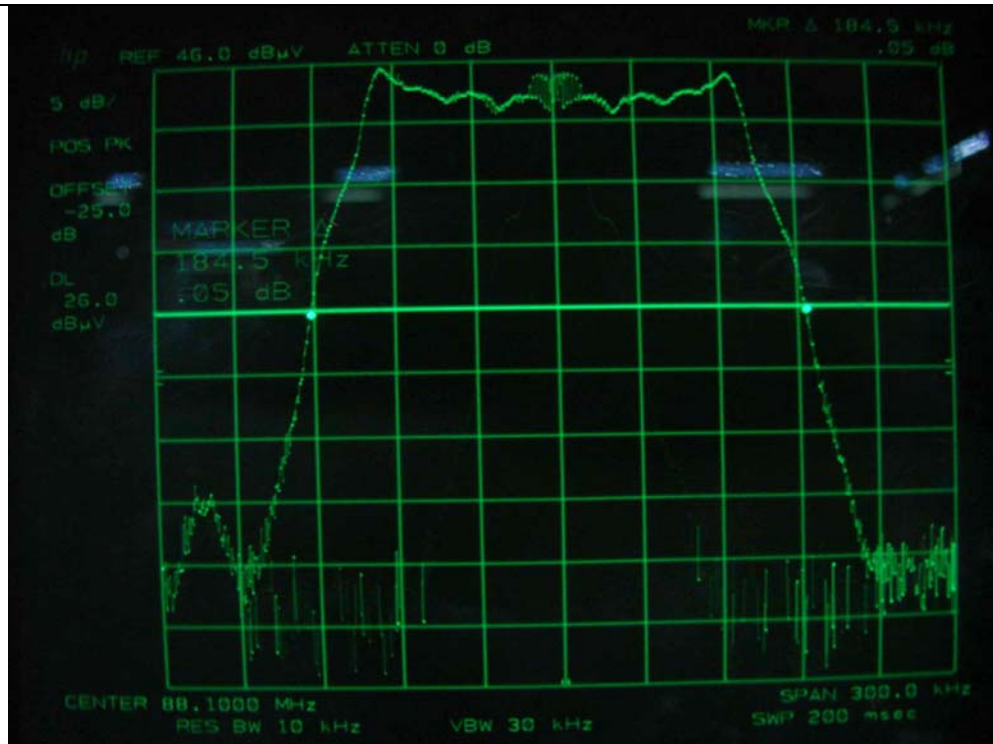
It should not be reproduced except in full, without the written approval of ONETECH.

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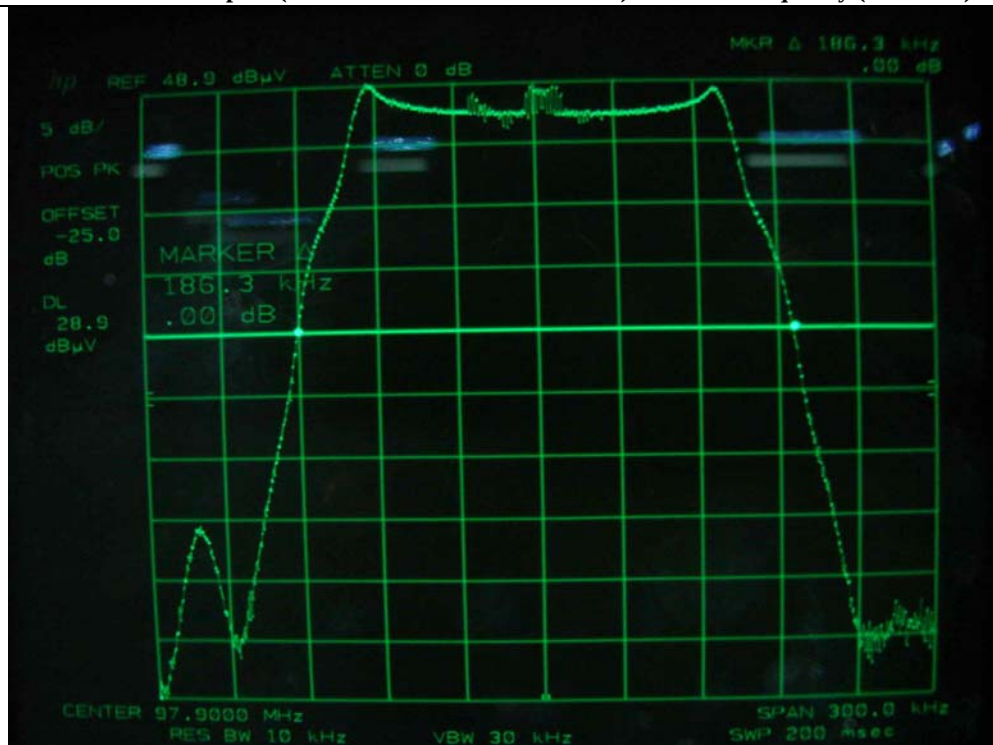
HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 dong, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-705, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

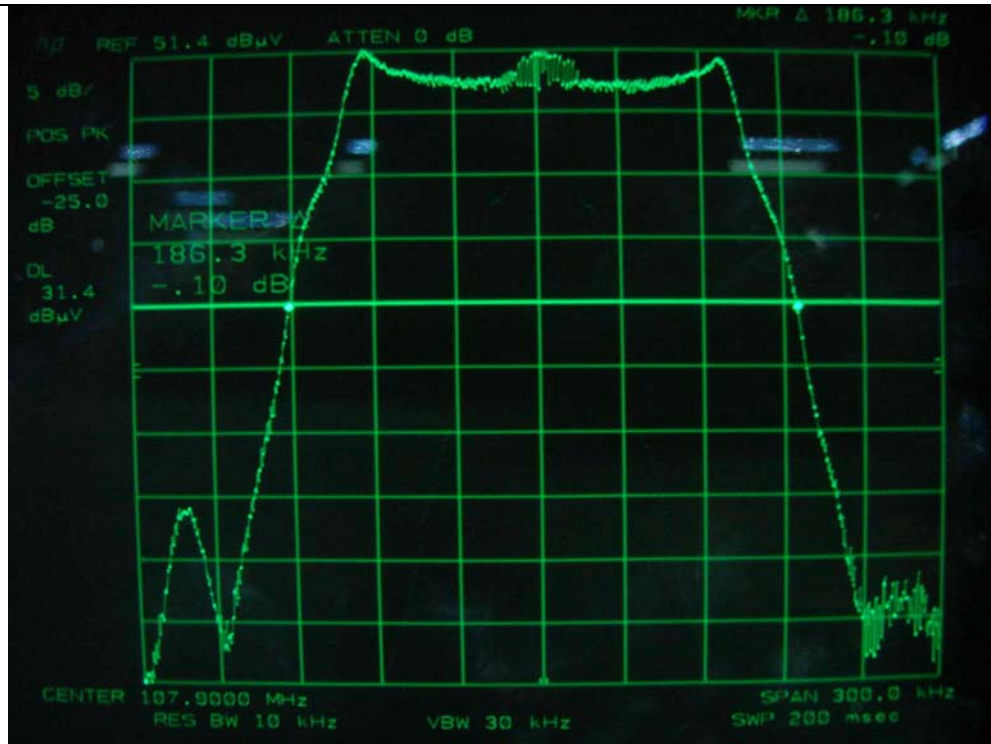




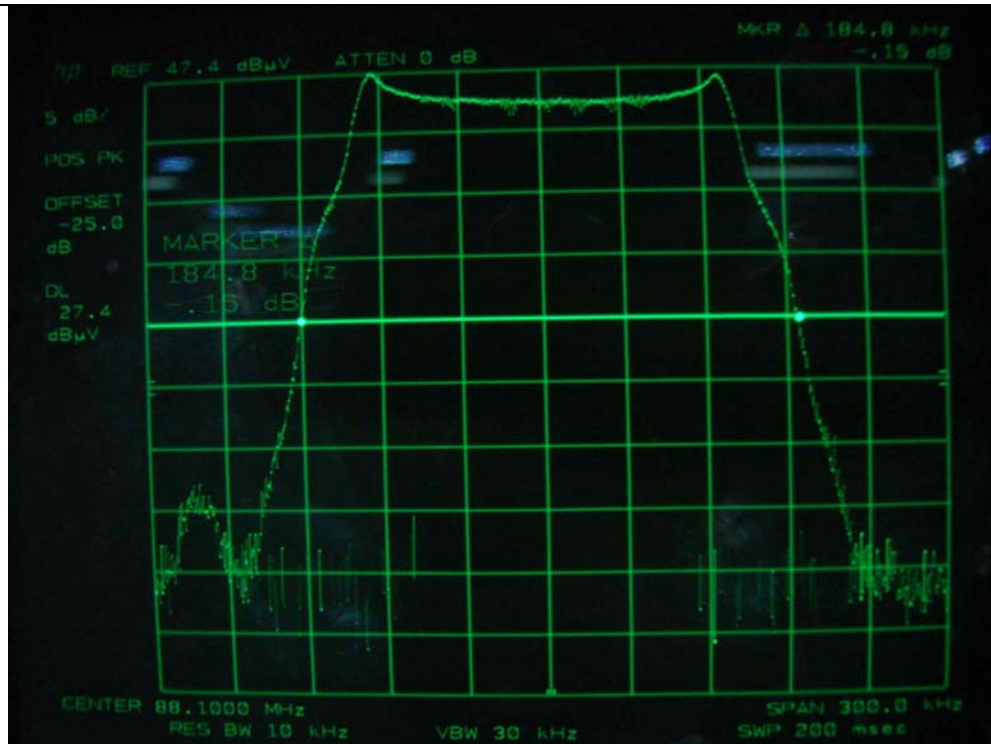
Used AC/DC Adaptor (Without External FM Antenna) - Bottom Frequency (88.1MHz)



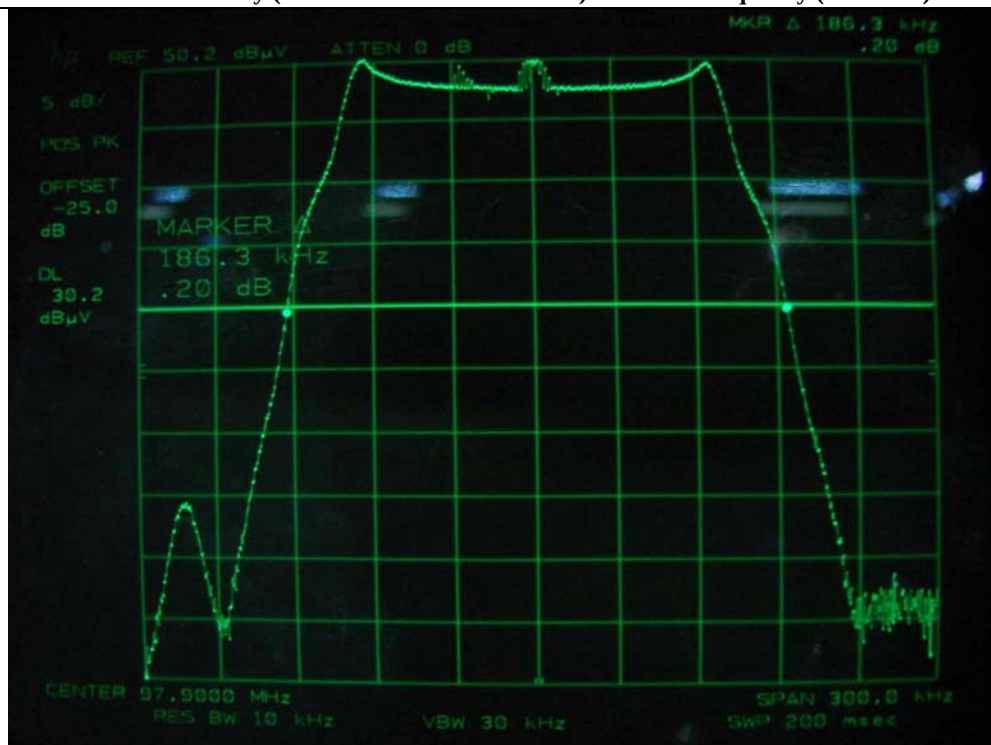
Used AC/DC Adaptor (Without External FM Antenna) - Middle Frequency (97.9MHz)



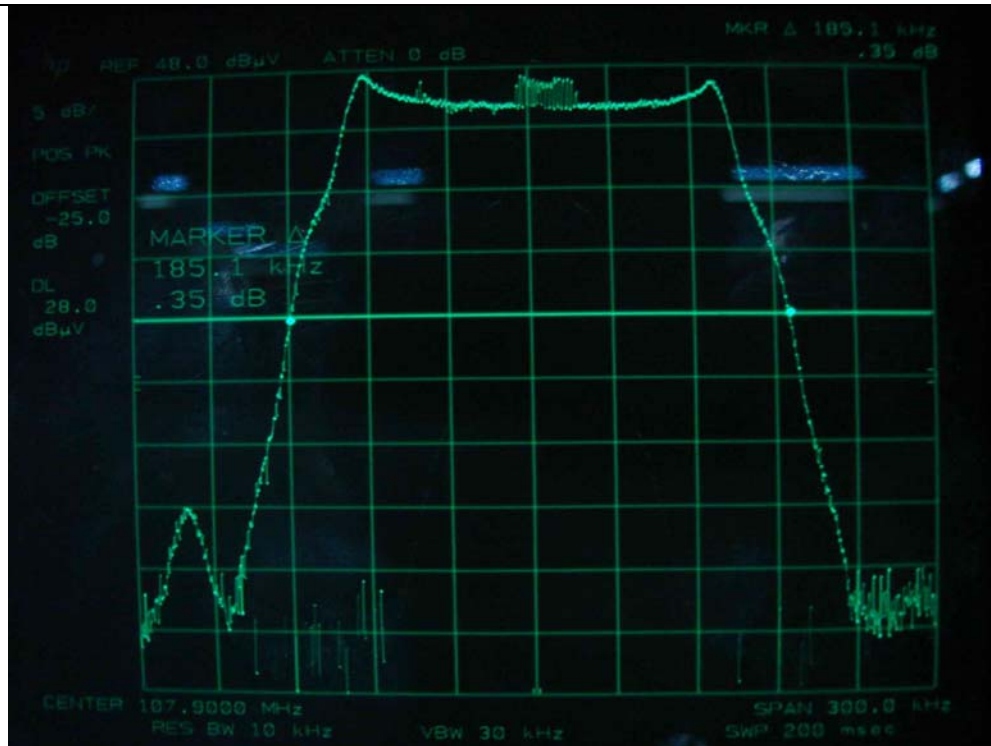
Used AC/DC Adaptor (Without External FM Antenna) - Bottom Frequency (107.9MHz)



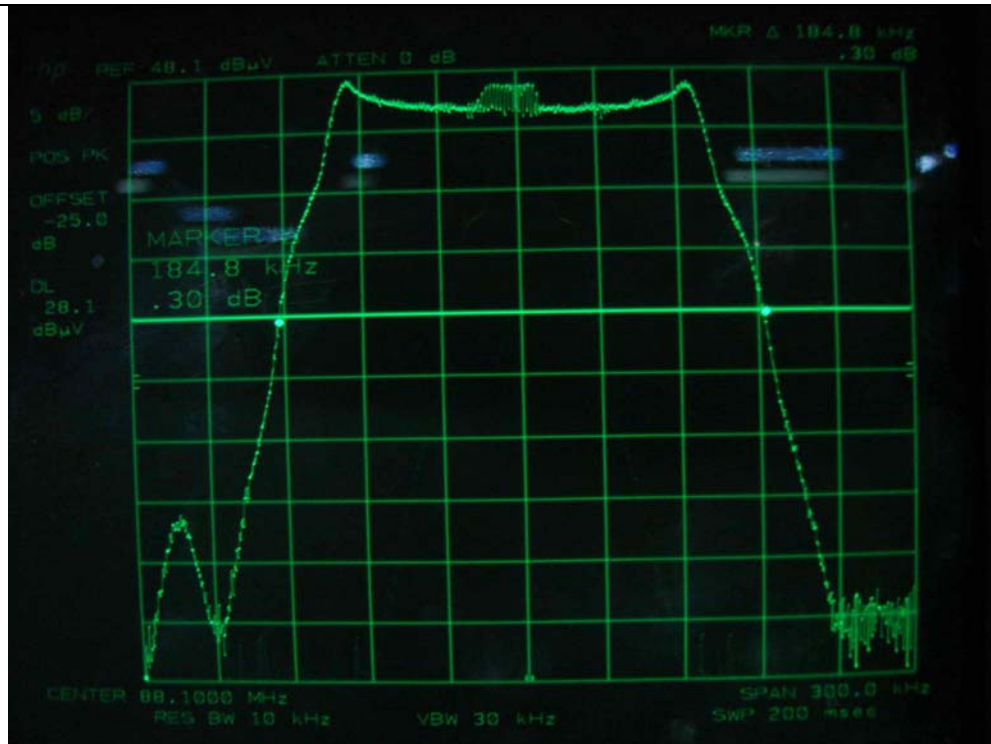
Used Car Battery (With External FM Antenna) - Bottom Frequency (88.1MHz)



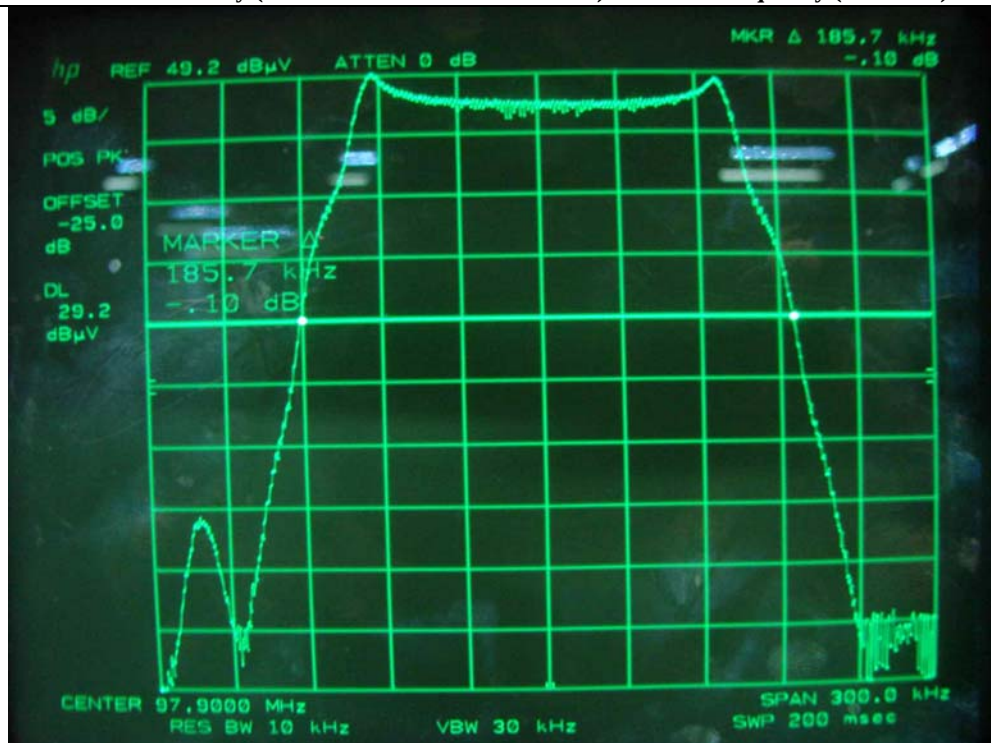
Used Car Battery (With External FM Antenna) - Middle Frequency (97.9MHz)



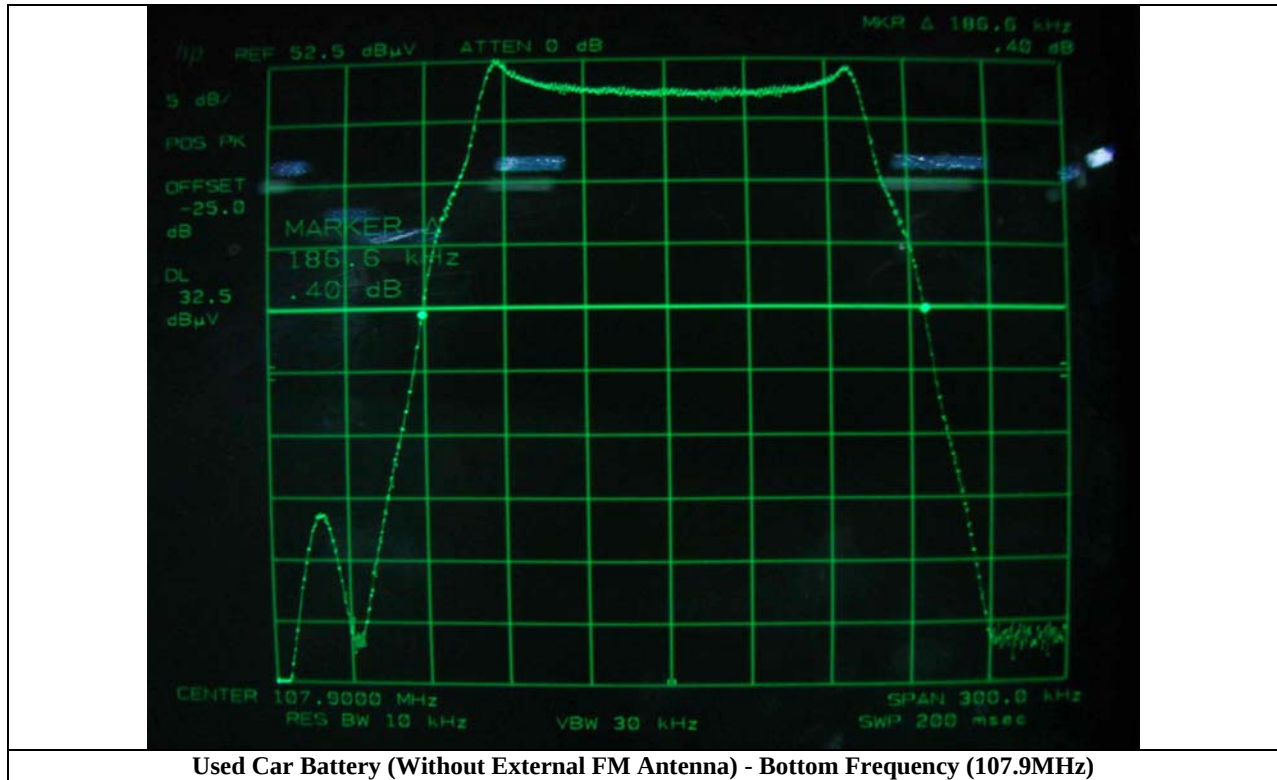
Used Car Battery (With External FM Antenna) - Bottom Frequency (107.9MHz)



Used Car Battery (Without External FM Antenna) - Bottom Frequency (88.1MHz)



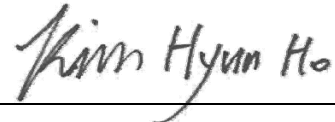
Used Car Battery (Without External FM Antenna) - Middle Frequency (97.9MHz)



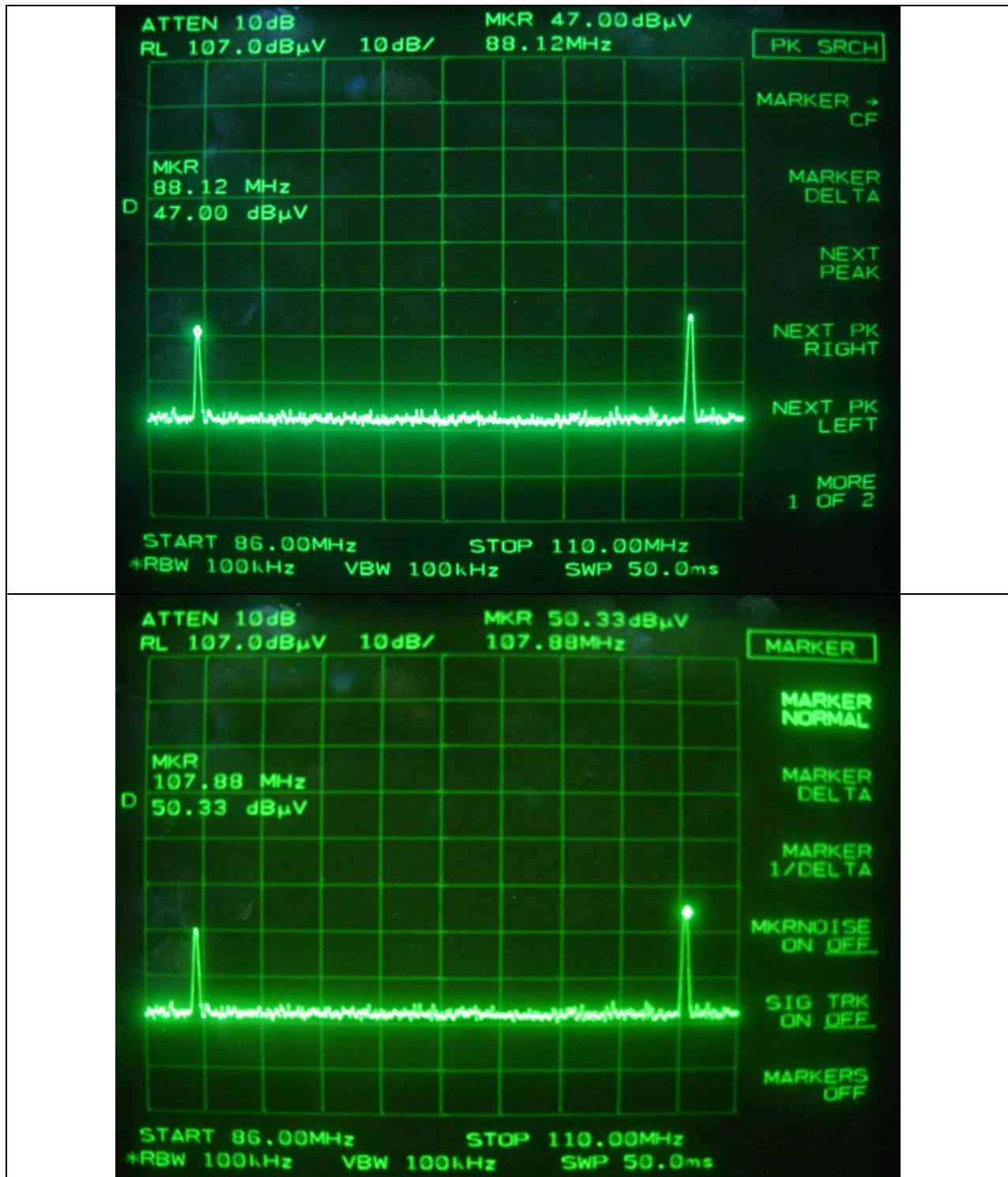
5.5 Tuning Range of the operating frequency

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)
Result : PASSED

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : The lowest and highest frequency was adjusted by manual using up/down button on the side of the EUT and the spectrum was in max hold mode for capturing the spectrum.
Test Result : Met the requirement. Refer to test data in next page.



Tested by: Hyun-Ho, Kim / Test Engineer



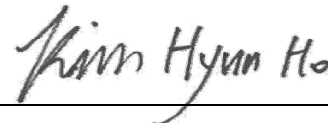
5.6 Radiated Emission Test (For Satellite receiver part)

5.6.1 Operating Condition: Used AC/DC Adaptor

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239(b)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -9.67 dB at 22700 MHz

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal
Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
4540	11.67	Peak	H	30.68	0.67	43.02	74.00	-30.98
	11.17		V			42.52	74.00	-31.48
9080	11.00	Peak	H	37.45	1.00	49.45	74.00	-24.55
	11.83		V			50.28	74.00	-23.72
13620	15.67	Peak	H	40.51	2.50	58.68	74.00	-15.32
	15.83		V			58.84	74.00	-15.16
18160	13.67	Peak	H	36.84	6.83	57.34	74.00	-16.66
	13.00		V			56.67	74.00	-17.33
22700	13.67	Peak	H	38.49	12.17	64.33	74.00	-9.67
	13.17		V			63.83	74.00	-10.17



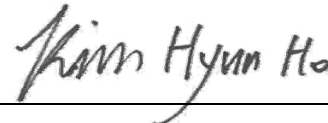
Tested by: Hyun-Ho, Kim / Test Engineer

5.6.2 Operating Condition: Used Car Battery

Humidity Level : 48 % Temperature: 20 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239(b)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY -10.14 dB at 22700 MHz

EUT : Digital Satellite Radio Date: July 17, 2007
Operating Condition : Transmit the RF signal
Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	(dBuV/m)	(dB)
4540	10.30	Peak	H	30.68	0.67	41.65	74.00	-32.35
	11.20		V			42.55	74.00	-31.45
9080	10.30	Peak	H	37.45	1.00	48.75	74.00	-25.25
	11.40		V			49.85	74.00	-24.15
13620	15.40	Peak	H	40.51	2.50	58.41	74.00	-15.59
	15.70		V			58.71	74.00	-15.29
18160	13.30	Peak	H	36.84	6.83	56.97	74.00	-17.03
	13.01		V			56.68	74.00	-17.32
22700	13.20	Peak	H	38.49	12.17	63.86	74.00	-10.14
	12.80		V			63.46	74.00	-10.54



Tested by: Hyun-Ho, Kim / Test Engineer

6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS10	827864/005	DEC/06	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/07	12MONTH	■
3.	Spectrum analyzer	HP	8566B	2516A01677	JUN/07	12MONTH	■
4.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 202	AUG/06	12MONTH	
5.	Biconical antenna	EMCO	3110	9003-1121	JUN/07	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/07		■
6.	Log Periodic antenna	Schwarzbeck	9108-A(494)	62281001	FEB/07	12MONTH	
7.	LISN	EMCO	3825/2	9109-1867	JUN/07	12MONTH	■
				9109-1869	JUN/07		
		Schwarzbeck	NSLK 8126	8126-404	JUL/07		■
8.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
9.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
10.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■
11.	RF Amplifier	HP	8447D	2727A04987	JUN/07	12MONTH	■
12.	Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D294	JUL/07	24MONTH	■
13.	Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170178	N/A	N/A	■
14.	Portable Spectrum Analyzer	HP	83051A	3950M00201	JUN/07	12MONTH	■
15.	Microwave System Preamplifier	Agilent	8564E	3650A00756	JUN/07	12MONTH	■
16.	Power Supply	HP	87421A	3611A01672	JUN/07	12MONTH	■