

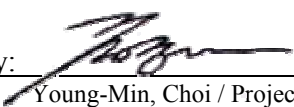
ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CERTIFICATION

Test Report No. : E062R-024
AGR No. : A061A-098
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 : Navigation (FM Transmitter)
FCC ID. : P3HXNS701
Model Name : XNS701
Serial number : N/A
Total page of Report : 15 pages (including this page)
Date of Incoming : February 01, 2006
Date of Issuing : February 23, 2006

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: 
Young-Min, Choi / Project Engineer
EMC Div.
ONETECH Corp.

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

CONTENTS

	PAGE
1. VERIFICATION OF COMPLIANCE.....	3
2. GENERAL INFORMATION.....	4
2.1 PRODUCT DESCRIPTION.....	4
2.2 MODEL DIFFERENCES.....	4
2.3 RELATED SUBMITTAL(S) / GRANT(S)	4
2.4 TEST SYSTEM DETAILS	4
2.5 TEST METHODOLOGY	4
2.6 TEST FACILITY	4
3. SYSTEM TEST CONFIGURATION.....	5
3.1 JUSTIFICATION	5
3.2 EUT EXERCISE SOFTWARE.....	5
3.3 CABLE DESCRIPTION	5
3.4 EQUIPMENT MODIFICATIONS	5
3.5 CONFIGURATION OF TEST SYSTEM	6
3.6 ANTENNA REQUIREMENT	6
4. PRELIMINARY TEST.....	6
4.1 AC POWER LINE CONDUCTED EMISSION TEST	6
4.2 RADIATED EMISSION TEST	6
5. FINAL RESULT OF MEASUREMENT	7
5.1 CONDUCTED EMISSION TEST.....	7
5.2 RADIATED EMISSION TEST (WITHIN THE PERMITTED 200 KHz BAND)	9
5.3 RADIATED EMISSION TEST (OUTSIDE OF THE SPECIFIED 200 KHz BAND).....	10
5.4 BANDWIDTH OF THE OPERATING FREQUENCY	11
6. FIELD STRENGTH CALCULATION	14
7. LIST OF TEST EQUIPMENT.....	15

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 : +82-2-3282-2261
- FCC ID : P3HXNS701
- MODEL NO/NAME : XNS701
- SERIAL NUMBER : N/A
- DATE : February 23, 2006

EQUIPMENT CLASS	DXX – Part 15 Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	Navigation (FM Transmitter)
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	Charter 7 and 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.

2. GENERAL INFORMATION

2.1 Product Description

The KI RYUNG ELECTRONICS CO., LTD., Model XNS701 (referred to as the EUT in this report) is a Navigation that has a function for transmitting of FM broadcasting frequency range and PC peripheral. This report covers 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)	7.3728 MHz, 7.6 MHz, 24.5535 MHz and 32.768 MHz
NUMBER OF LAYERS	8 Layers
POWER REQUIREMENT	DC 12~24V from an AC/DC Adaptor
EXTERNAL CONNECTOR	Audio In/Out, FM Out, GPS, SIRIUS, DC In

2.2 Model Differences

-. The difference(s) compared to the EUT is as follows: 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
XNS701	KI RYUNG ELECTRONICS CO., LTD.	P3HXNS701	Navigation (EUT)	-
LT 416	LEADER	N/A	Pattern Generator	EUT
SMS-015N	SUNGIL PRECISION	N/A	Speaker	EUT

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in chapter 7, 13 of 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, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on April 04, 2003. (Registration Number: 340658)

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 ELECTRONICS CO., LTD.	USE NAVI Rev.D	N/A
SUB BOARD	KI RYUNG ELECTRONICS CO., LTD.	USE_Sub Rev.D	N/A
GPS BOARD	KI RYUNG ELECTRONICS CO., LTD.	SNA-300 Rev.D	N/A
LCD	N/A	LTP400WQ-F01-00R	N/A
HDD	SEAGATE	ST64022 FX	N/A

3.2 EUT exercise Software

The EUT is included a FM transmitter designed to transmit function in the 88.1 ~ 107.9 MHz with 200 kHz step. During the testing, the EUT was set on audio setup with FM transmission and the transmitter function is activated. The audio input port on the EUT was connected to the audio generator and then the generator supplied audio signal with 1 kHz modulation to the EUT. The EUT transmitted the signal with maximum volume control.

3.3 Cable Description for the EUT

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
Audio In/Out	N	N	BOTH END	1.5	Pattern Generator
DC In	N	EUT END	EUT END	1.2	AC/DC Adaptor
FM Out	N	N	EUT END	1.2	-

3.4 Equipment Modifications

- None

3.5 Configuration of Test System

Line Conducted Test: The EUT was connected to AC/DC adaptor and AC/DC 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.

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:

FM transmitter antenna of the EUT is fixed inside the EUT, no consideration of replacement by the user.

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

Humidity Level : 42 %

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 -5.67 dB at 0.17 MHz under average mode

EUT : Navigation

Date: February 15, 2006

Operating Condition : Transmit RF signal.

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

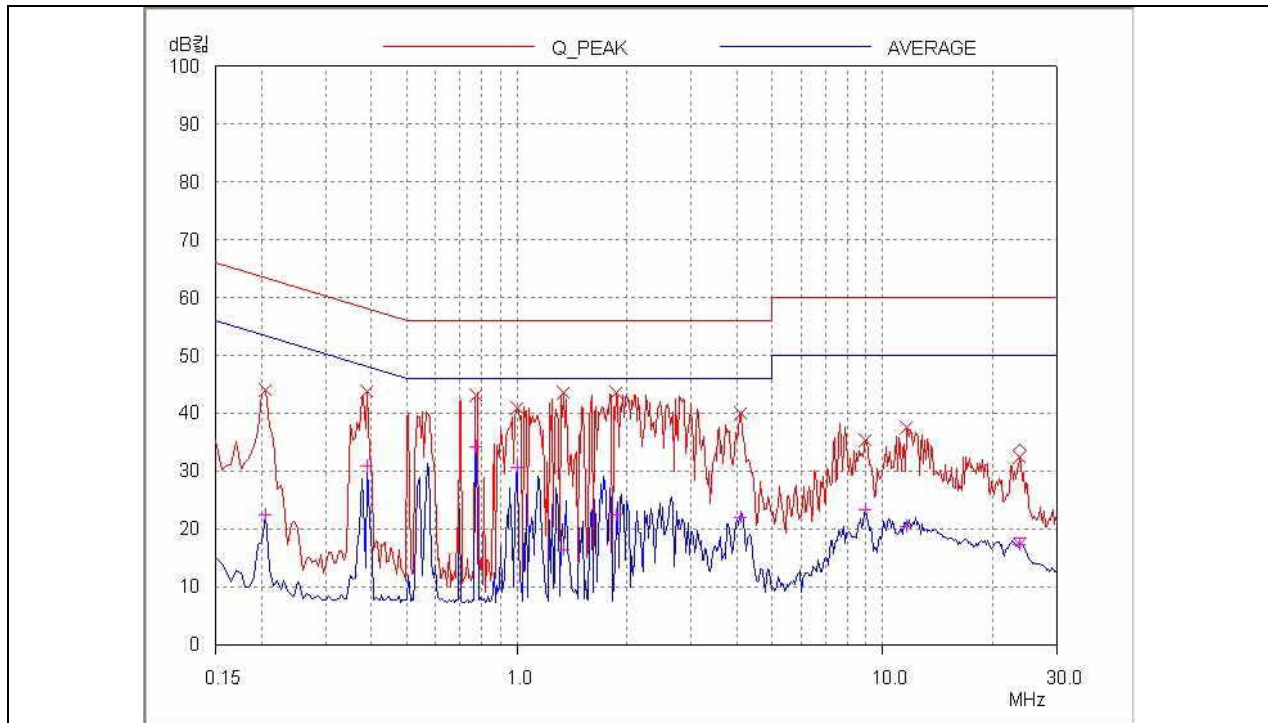
Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.17	N	56.89	64.72	-7.83
0.39	H	43.88	58.06	-14.18
0.70	N	42.77	56.00	-13.23
0.77	H	43.09	56.00	-12.91
1.34	H	43.49	56.00	-12.51
1.86	H	43.65	56.00	-12.35
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.17	N	49.05	54.72	-5.67
0.77	H	34.21	46.00	-11.79
1.34	H	16.32	46.00	-29.68
1.86	H	22.35	46.00	-23.65

Line Conducted Emission Tabulated Data

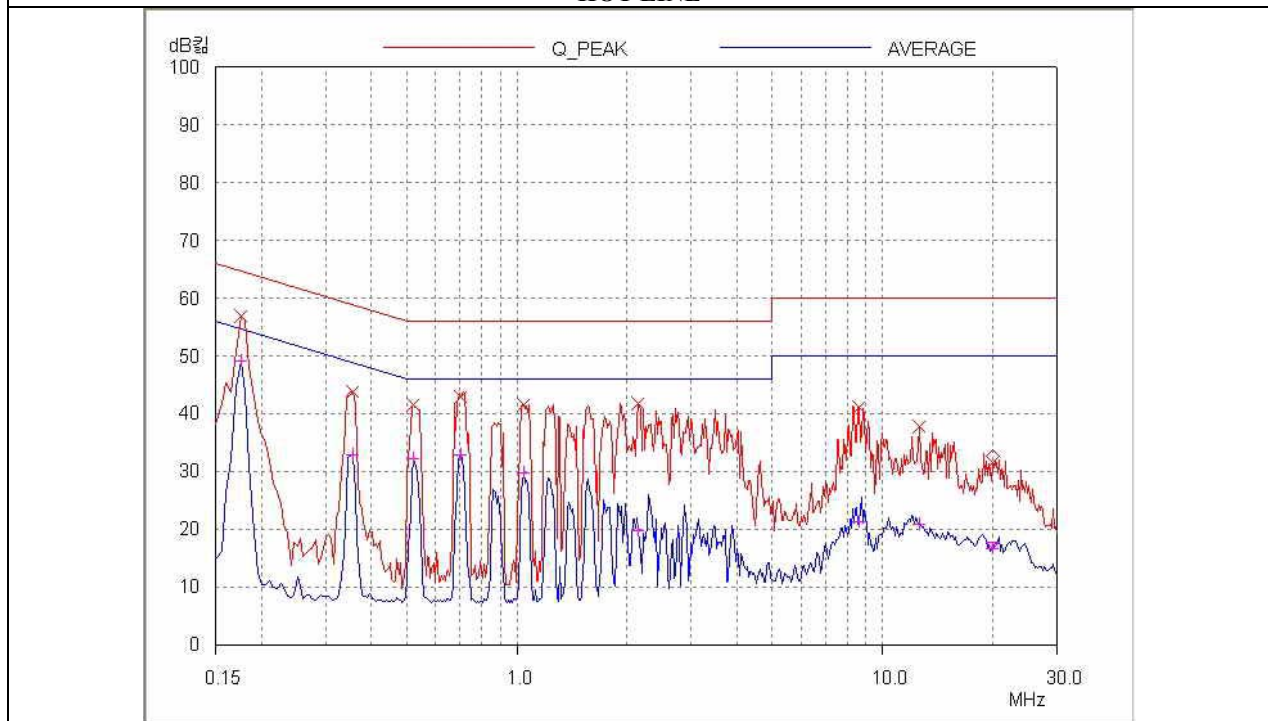
Remark : "H": Hot Line, "N": Neutral line

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

Tested by: Sue-Young, Lee/ Test Engineer



HOT LINE



NEUTRAL LINE

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

EMC-002 (Rev.0)

HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-705, Korea
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

EMC Testing Dept : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

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.

Humidity Level : 45 % Temperature: 18 °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 – 3.77 dB at 88.90 MHz

EUT : Navigation Date: February 13, 2006
 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	33.80	Peak	H	7.96	1.74	43.50	48.00	-4.50
88.10	30.80	Peak	V	7.96	1.74	40.50	48.00	-7.50
97.90	27.30	Peak	H	9.82	1.90	39.02	48.00	-8.98
97.90	26.80	Peak	V	9.82	1.90	38.52	48.00	-9.48
107.90	27.60	Peak	H	11.43	1.90	40.93	48.00	-7.07
107.90	26.30	Peak	V	11.43	1.90	39.63	48.00	-8.37

Radiated Emission Tabulated Data

Remark: Per 15.31(m), three channels (near top, near middle and near bottom) were tested because the EUT's frequency range is more than 10 MHz.



Tested by: Sue-Young, Lee/ 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.

Humidity Level : 45 % Temperature: 18 °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 -7.13 dB at 302.29 MHz

EUT : Navigation Date: February 13, 2006
 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	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dB/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
76.51	20.30	V	6.26	1.63	28.19	40.00	-11.81
126.90	17.66	V	13.90	2.14	33.70	43.52	-9.82
154.65	14.50	H	15.49	2.35	32.34	43.52	-11.18
202.48	15.36	H	16.70	2.82	34.88	43.52	-8.64
302.29	20.11	V	14.96	3.82	38.89	46.02	-7.13
325.63	14.50	H	14.72	4.01	33.23	46.02	-12.79



Tested by: Sue-Young, Lee/ Test Engineer

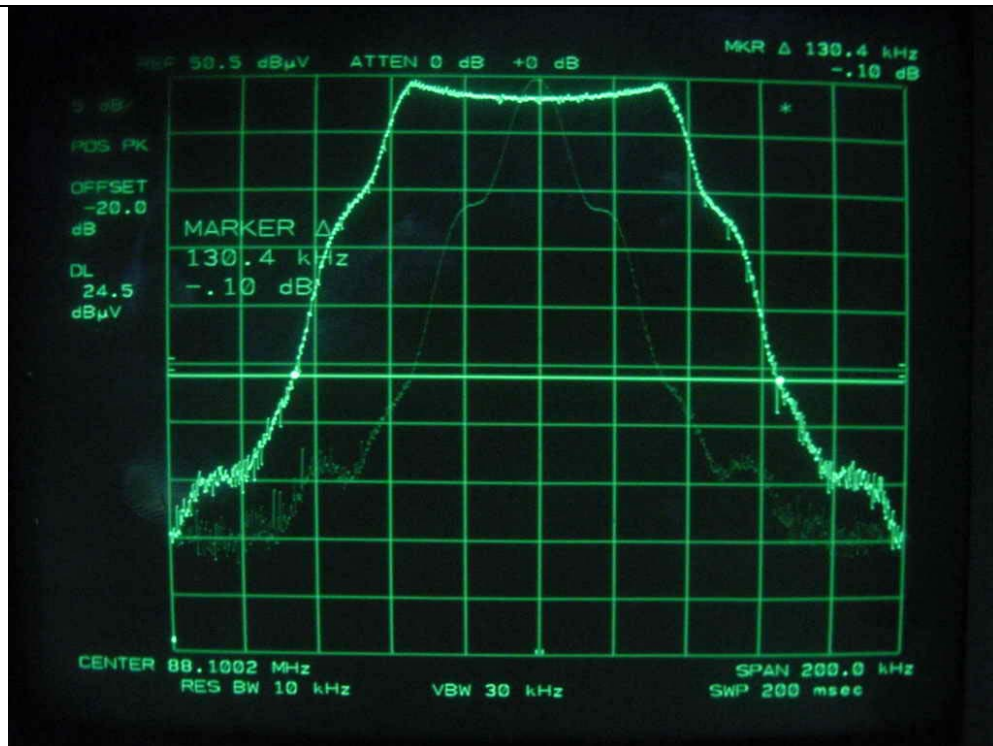
5.4 Bandwidth of the operating frequency

Humidity Level : 45 % Temperature: 18 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)
Result : PASSED

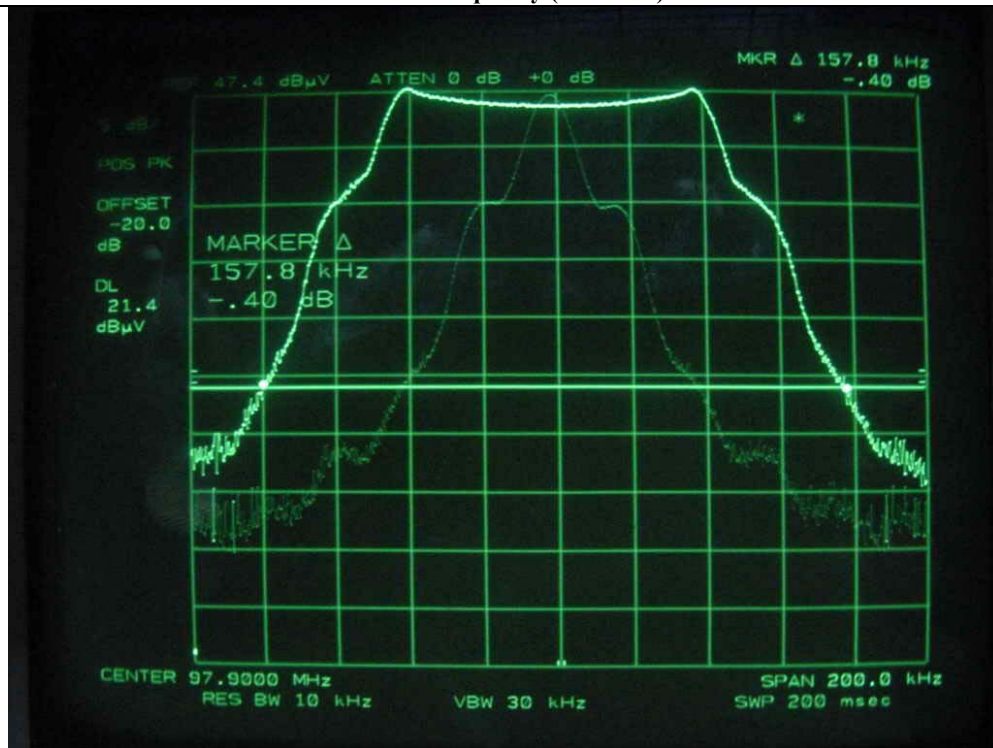
EUT : Navigation Date: February 13, 2006
Operating Condition : Transmit the RF signal.
Minimum Resolution
Bandwidth : 10 kHz
Remark : Refer to test data in next page.



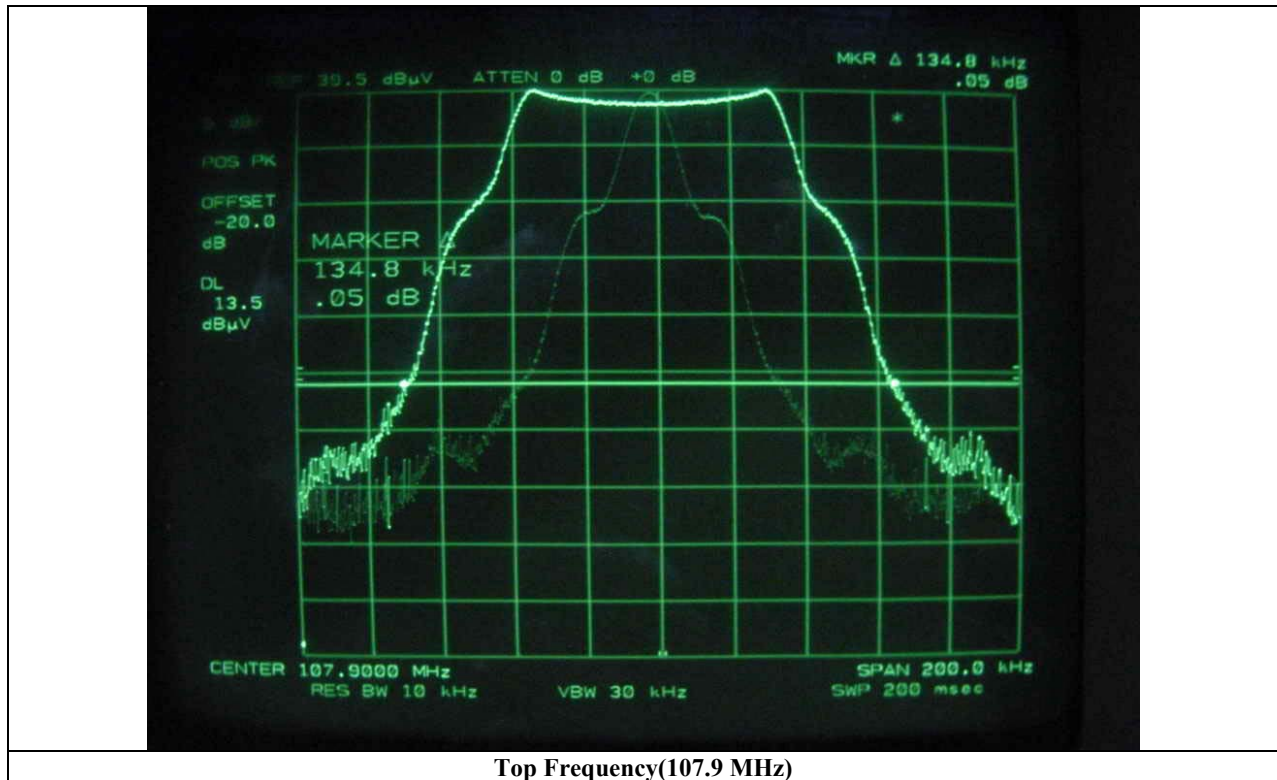
Tested by: Sue-Young, Lee/ Test Engineer



Bottom Frequency (88.1MHz)



Middle Frequency (97.9MHz)



Top Frequency(107.9 MHz)

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/05	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/05	12MONTH	
4.	Spectrum analyzer	HP	8568B	3109A05456	APR/05	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/05	12MONTH	■
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/05	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	APR/05	12MONTH	
8.	Biconical antenna	EMCO	3110	9003-1121	FEB/05	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/06		■
9.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/05	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/06		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/05	12MONTH	■
				9109-1869	JUL/05		
		Schwarzbeck	NSLK 8126	8126-404	AUG/05		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■