



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CERTIFICATION

**Test Report No.** : E056R-083

**Applicant** : HANA Micron Inc.  
**Address** : #902 Ssangyong IT Twin-Tower 1, 442-17, Sangdaewon1-Dong, Joongwon-Gu,  
Seongnam-City, Gyeonggi-Do, 462-807, Korea

**Manufacturer** : HANA Micron Inc.  
**Address** : #902 Ssangyong IT Twin-Tower 1, 442-17, Sangdaewon1-Dong, Joongwon-Gu,  
Seongnam-City, Gyeonggi-Do, 462-807, Korea

**Type of Equipment** : Host MP3 Player bullet Cradle (FM Transmitter)

**FCC ID.** : QH7-BULLET-CRADLE

**Model Name** : HFT-100

**Multiple Model Name** : HFT-100W, HFT-100B, HFT-100S, HFT-100R

**Serial number** : N/A

**Total page of Report** : 14 pages (including this page)


**Date of Incoming** : April 22, 2005

**Date of Issuing** : June 30, 2005

## 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.

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ONETECH Corp.

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ONETECH Corp.



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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : HANA Micron Inc.
- ADDRESS : #902 Ssangyong IT Twin-Tower 1, 442-17, Sangdaewon1-Dong, Joongwon-Gu,  
Seongnam-City, Gyeonggi-Do, 462-807, Korea
- CONTACT PERSON : Mr. Woo-Ki, Song / Director
- TELEPHONE NO : +82-31-608-5536
- BRAND NAME : Aiva / Bullet
- FCC ID : QH7-BULLET-CRADLE
- MODEL NO/NAME : HFT-100
- SERIAL NUMBER : N/A
- DATE : June 30, 2005

EQUIPMENT CLASS	DDX – Part 15 Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	Host MP3 Player bullet Cradle (FM Transmitter) - Intentional Radiator
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

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- 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 HANA Micron Inc., Model HFT-100 (referred to as the EUT in this report) is Host MP3 Player bullet Cradle that has a FM transmitter from 106.7 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)	12 MHz
POWER REQUIREMENT	DC 5V, 1.2A from AC/DC Adaptor
TX FREQUENCY RANGE	106.7 MHz ~ 107.9 MHz
NUMBER OF LAYERS	4 Layers
EXTERNAL CONNECTOR	External UFD, Audio In, DC In

### 2.2 Model Differences

-. The difference(s) compared to the EUT is as follows:

	Model Name	Model Differences
Basic Model	HFT-100	-
Multiple Model	HFT-100W, HFT-100B, HFT-100S, HFT-100R	Only type designation except for the color of the EUT.

### 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
HFT-100	HANA Micron Inc.	QH7-BULLET-CRADLE	Host MP3 Player bullet Cradle(EUT)	-
SR-0512SP	Seorim Electronics	N/A	AC/DC Adaptor	EUT
HHMP-1000	HANA Micron Inc.	QH7-MP3P-BULLET	Host MP3 Player	EUT
N/A	N/A	N/A	Earphone	Host MP3 Player
LT 416	LEADER	N/A	Pattern Generator	EUT

### 2.5 Test Methodology

The radiated testing was performed according to the procedures in chapter 7, 13 of ANSI C63.4: 2003 and 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 426-1 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on



# ONETECH

*Testing & Evaluation Lab.*

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FCC ID. : QH7-BULLET-CRADLE

Report No. : E056R-083

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April 04, 2003. (Registration Number: 340658)

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FCC-003 (Rev.0)

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(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

**EMC Testing Dept** : 426-1 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-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
Cradle Board	N.A	HHMP-1000 Cradle Rev 0.4	N/A
FM Module	D & A Corp.	TX-M201 / 202 Rev 2	N/A

#### 3.2 EUT exercise Software

The Model, HFT-100 is included a FM transmitter designed to operate on function in the 106.7 ~ 107.9 MHz. The EUT has audio input port, so the input port was connected to a pattern generator and the generator supplied the audio signal with 1 kHz modulation and then the EUT was transmitted with maximum audio level.

107.9 MHz was measured as the highest output power. Data from this channel was determined to be worst case.

#### 3.3 Cable Description

Product Name	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
Host MP3 Player bullet Cradle(EUT)	Y	-	1.5(P)
AC/DC Adaptor	N	N	1.5(P), 1.5(D)
Host MP3 Player	N/A	N/A	-
Earphone	N/A	N	1.2(D)
Pattern Generator	N	-	1.5(P)

\* The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

#### 3.4 Noise Suppression Parts on Cable

Product Name	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Host MP3 Player bullet Cradle(EUT)	N	N/A	Y	EUT END
AC/DC Adaptor	N	N/A	Y	EUT END
Host MP3 Player	N	N/A	N	N/A
Earphone	N	N/A	Y	BOTH END
Pattern Generator	N	N/A	Y	BOTH END

#### 3.5 Equipment Modifications

- None



### 3.6 Configuration of Test System

**Line Conducted Test:** The power of the EUT was supplied by AC/DC adapter and the adapter 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.

### 3.7 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 : 49 %Temperature: 24 °CLimits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.207 (a)Type of Test : Low Power Communication Device TransmitterResult : PASSED BY -15.12 dB at 4.60 MHz

EUT : Host MP3 Player bullet Cradle

Date: June 25, 2005

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	
0.39	N	41.34	58.06	-16.72
1.13	N	40.40	56.00	-15.60
1.78	H	38.50	56.00	-17.50
3.00	H	39.88	56.00	-16.12
4.50	N	38.56	56.00	-17.44
4.60	H	40.88	56.00	-15.12
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	

Line Conducted Emission Tabulated Data

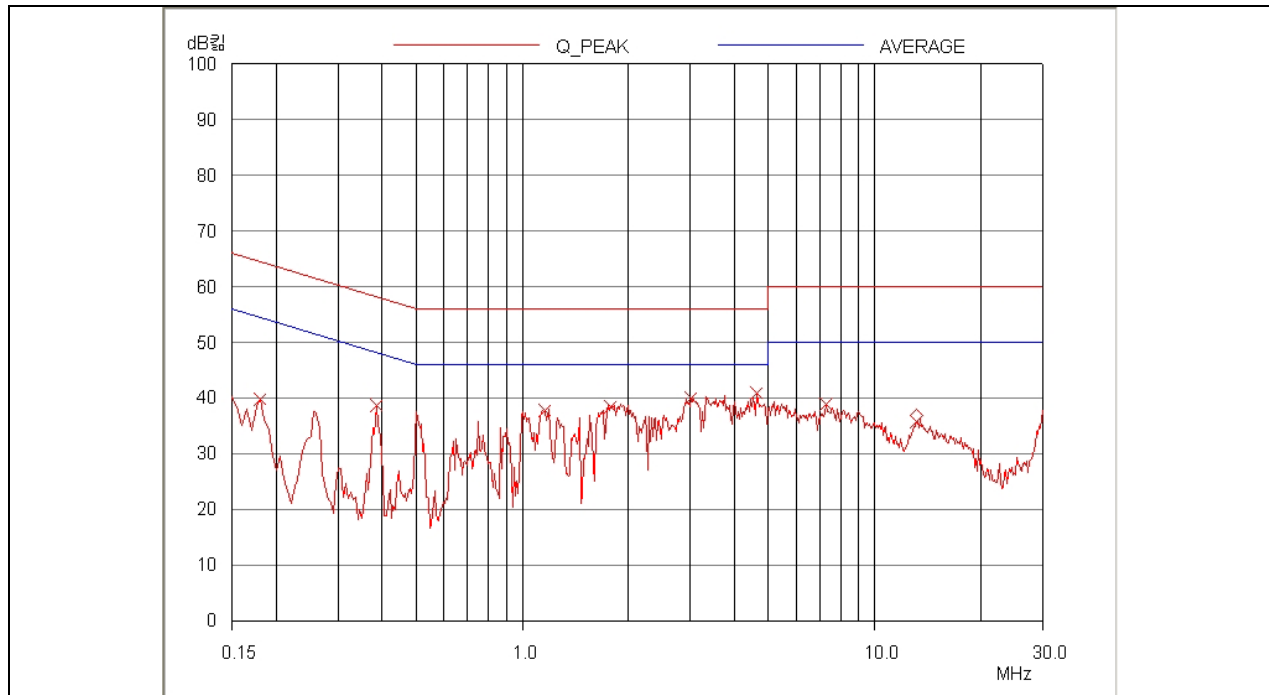
Remark : "H": Hot Line, "N": Neutral line

Average mode was not measured, because peak values were under the Average limit.

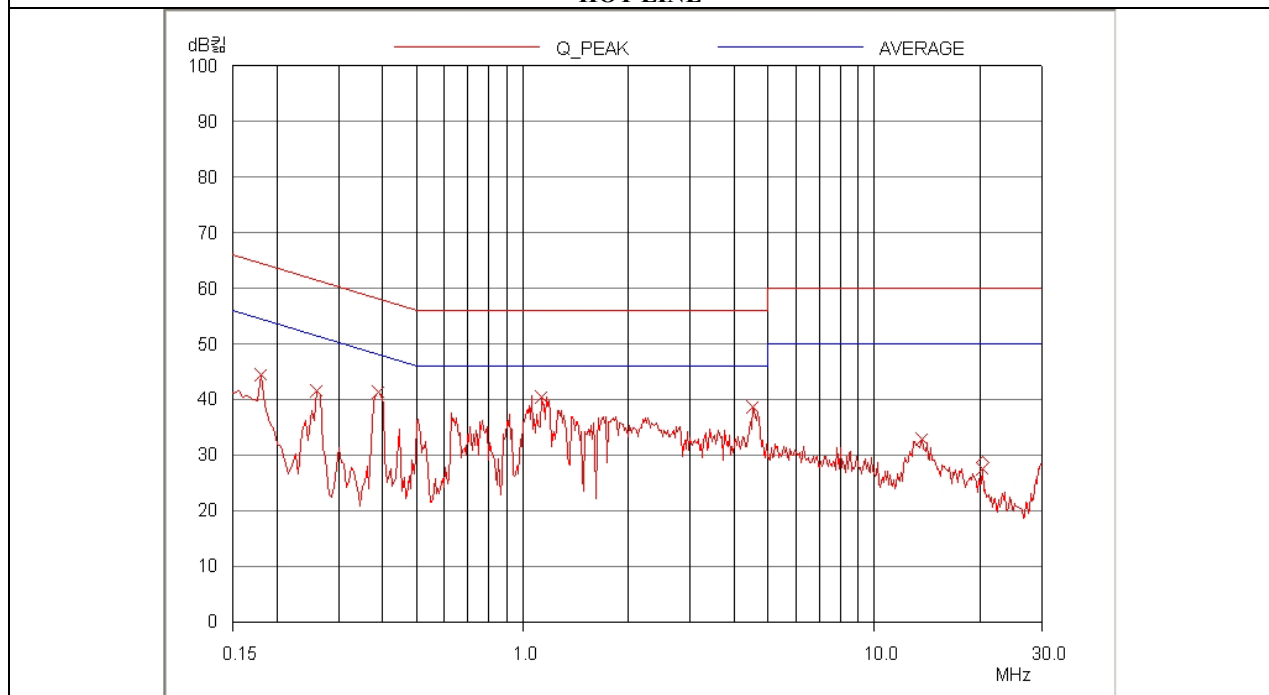
See next page for an overview sweep performed with peak detector.

**Tested by: Ki-Hong, Nam / Test Engineer**





## HOT LINE



## NEUTRAL LINE

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**5.1 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 : 39 % Temperature: 22 °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 – 3.13 dB at 107.90 MHz

EUT : Host MP3 Player bullet Cradle Date: June 07, 2005  
 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)		
106.70	29.70	Peak	V	11.10	1.90	42.70	48.00	-5.30
106.70	31.70	Peak	H	11.10	1.90	44.70	48.00	-3.30
107.90	29.70	Peak	V	11.27	1.90	42.87	48.00	-5.13
107.90	31.70	Peak	H	11.27	1.90	44.87	48.00	-3.13

Radiated Emission Tabulated Data

Remark: Per 15.31(m), because the EUT's frequency range is between 1 MHz to 10 MHz, two channels (near top and near bottom) were tested.

Average detector mode was not measured, because peak emission values were under average limit.

Tested by: Ki-Hong, Nam / Test Engineer



## 5.2 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 : 39 % Temperature: 22 °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 -6.05dB at 749.90MHz

EUT : Host MP3 Player bullet Cradle Date: June 07, 2005  
 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. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
104.62	20.80	H	10.81	1.90	33.51	43.52	-10.01
127.10	19.60	H	13.60	2.14	35.34	43.52	-8.18
225.40	15.60	V	16.62	3.01	35.23	46.02	-10.79
251.60	12.10	V	16.96	3.41	32.47	46.02	-13.55
393.10	10.90	H	15.31	4.37	30.58	46.02	-15.44
627.22	12.90	H	18.99	5.52	37.41	46.02	-8.61
726.10	9.70	V	20.92	6.66	37.28	46.02	-8.74
749.90	11.80	H	21.27	6.90	39.97	46.02	-6.05

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Tested by: Ki-Hong, Nam / Test Engineer



## 5.3 Bandwidth of the operating frequency

Humidity Level : 39 % Temperature: 22 °C  
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)  
Result : PASSED

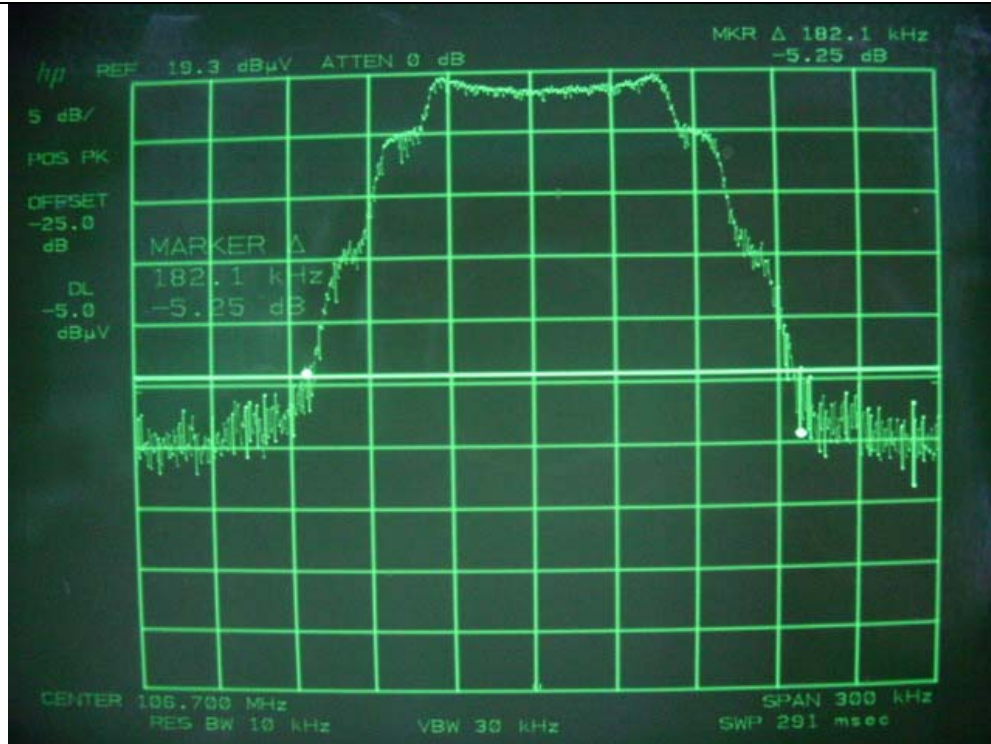
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EUT : Host MP3 Player bullet Cradle Date: June 07, 2005  
Operating Condition : Transmit the RF signal.  
Minimum Resolution  
Bandwidth : 10 kHz  
Remark : Refer to test data in next page.

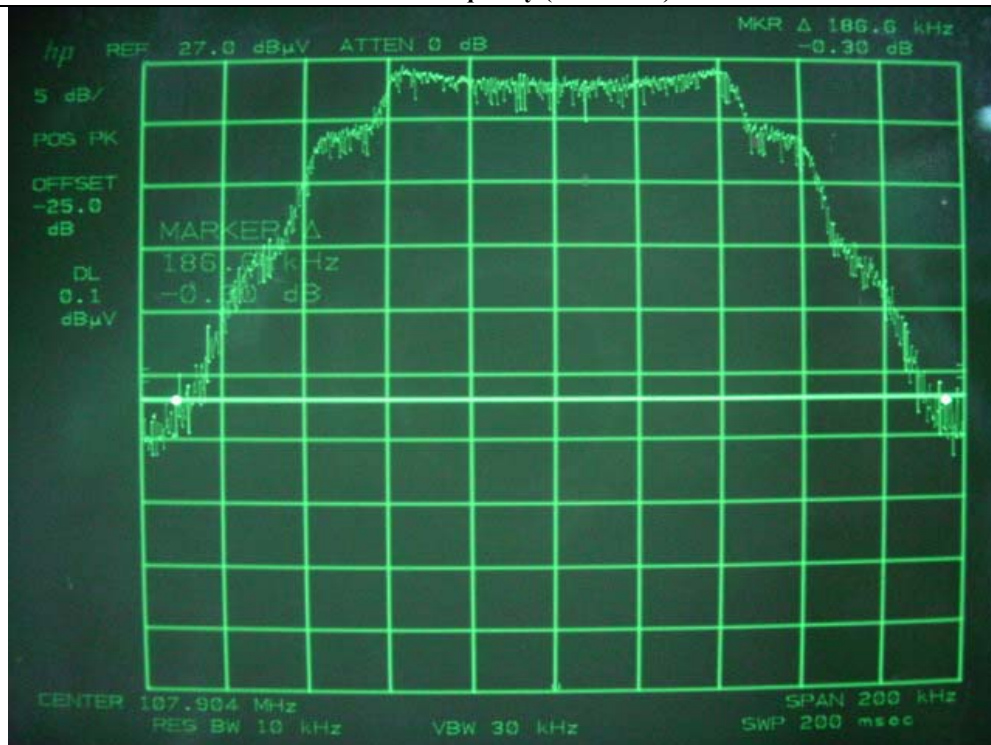
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Bottom Frequency (106.7MHz)



Middle Frequency (107.9MHz)



## 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)

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= 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/04	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/04	12MONTH	
4.	Spectrum analyzer	HP	85680B	3001A04955	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	FEB/05	12MONTH	
8.	Biconical antenna	EMCO	3110	9003-1121	FEB/05	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/05		■
9.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/05	12MONTH	
				9109-3217	MAY/04		
		Schwarzbeck	9108-A(494)	62281001	JAN/05		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/04	12MONTH	
				9109-1869	OCT/04		■
		Schwarzbeck	NSLK 8128	8126-216	JUN/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	■