



Report No.: 101123 rev.02 US  
FCC ID: RJE-169202-00  
Client: Monster, LLC

023



NVLAP LAB CODE: 200413-0

June 22, 2006

**Test Record**

**Product Verification**  
**According to FCC Part 15 Subparts C**

**for**

**Monster, LLC**  
**MODEL: RJE-169202-00**

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provided all pages are copied.**

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## Revision History

| Revision | Date          | Description of Changes                               | Author       |
|----------|---------------|------------------------------------------------------|--------------|
| 0.1      | 22 June, 2006 | Initial document                                     | S. Sohn      |
| 0.2      | 10 July 2006  | Corrected page 6<br>3.1 Brief Description of the EUT | M.Chechelnik |

## Introduction – Test Plan

This report describes the results of all measurements made on portable FM transmitter which falls under the class of intentional radiator by the FCC Part 15 Subpart C Rules and Regulations.

This EUT is designated:

**Wireless Audio FM Transmitter for personal use.**

Model :

**RJE-169202-00**

| Description of tests                                              | Reference<br>FCC prt.15 | Comments                                                                                 |
|-------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------|
| Radiated Emissions                                                | 15.209                  | Test and limit specified in FCC prt.15, Clause 15.209                                    |
| Field Strength of Fundamental and Emissions within permitted band | 15.239                  | Limit specified in FCC prt.15, Clause 15.239<br>Limit:0.25 mV/m @ 3m ;w/average detector |
| Emission bandwidth; Occupied channel bandwidth                    | 15.239                  | Limit specified in FCC prt.15, Clause 15.239<br>Limit:200 kHz                            |

## 1.0 CERTIFICATION OF TEST DATA

### Verification statement.

The data, data evaluation and equipment configuration represented herein are a true and accurate representation of the test sample (EUT), and characteristics and measurements obtained as of the dates and the times of the test under the conditions specified and to the methods of FCC Part 15, Subpart C “Intentional Radiators” and Part 2 “Frequency Allocations and radio Treaty Matters; General Rules and regulations”

The test results provided with this report, indicate that the equipment tested:  
WIRELESS AUDIO FM TRANSMITTER FOR PERSONAL USE.

MODEL : 169202-00 is compliant with the following Rules and Regulations

- A. 47 Code of Federal Regulations, Part 15 Subpart C
- B. 47 Code of Federal Regulations, Part 2
- C. ANSI C63.4: 2003

Tests performed by:



Sandra Sohn  
EMC Test Engineer

Report prepared by:



Sandra Sohn  
EMC Test Engineer

Test Record Approved By:



Mike Chechelnik  
Director of EMC Lab

## **2.0 GENERAL INFORMATION**

### **2.1 Client Information**

Company Name: Monster, LLC

Contact: Claude Nelson

Company Address: 7251 West Lake Mead Blvd. Suite 342  
Las Vegas, NV 89128

Phone: (877) 800-8989

### **2.2 Administrative Data**

Device tested: Audio FM Transmitter For Personal Use

Model: RJE-169202-00

Equipment category: Intentional Radiators

Accessories: N/A

Expository Statement: This device is intended for vehicular use.

Purpose of test: Compliance to FCC Rules and Regulations, Part 15,  
Subpart C

Date of test: 06/19/06 - 06/22/06

Place of the test: JMR Electronics, Inc.  
Compliance Engineering Laboratory  
20400 Plummer Street  
Chatsworth, CA 91311  
Phone: (818) 993-4801

### **3.0 Description of Equipment Under Test (EUT)**

#### **3.1 Brief Description of the EUT**

The EUT is a portable FM Transmitter which is designed to connect to a personal MP3 player and allow reception of the transmitted signal using a standard FM radio. Whenever the operating frequency is changed by user, frequency changes upwards or downwards in fixed 200 kHz steps.

Pressing switch will increment the frequency to the next channel.

There is no ON/OFF switch for this product. Circuit goes ON when product is plugged to automobile cigarette lighter outlet. Power consumption of FM transmitter IC is 20ma typical at 5v.

Wires connecting to MP3 player are used as the antenna. Alteration of antenna by user is not possible.

The EUT was configured on a table top. device and was tested with standard MP3 player connected. The modulation frequency was provided by external Test Oscillator HP 651B.

|                                |                          |
|--------------------------------|--------------------------|
| <b>Operating frequencies :</b> | 88.1-107.9 MHz.          |
| <b>Clock frequencies :</b>     | 7.6 MHz                  |
| <b>Power Supply :</b>          | External 12V DC battery. |

#### **3.2 Test Run**

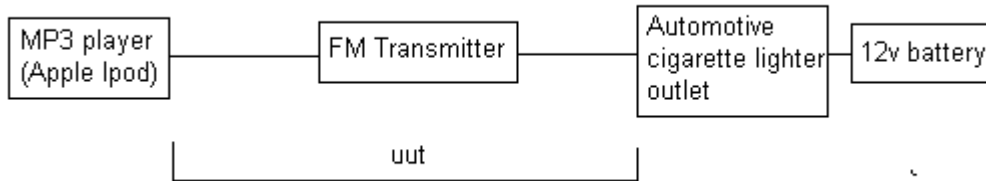
- 1) The EUT was connected through Stubby cigarette lighter connector to the 12VDC battery.  
Apple Ipod, as a standard MP3 player, was connected to the appropriate input/output of the EUT;
- 2) For tests required modulation of EUT fundamental frequency, Test Oscillator HP 651B had been connected directly via clip leads to the input connector of the EUT

For test purposes the following three channels were selected for measurements :

|          |          |           |
|----------|----------|-----------|
| 88.1 MHz | 98.1 MHz | 107.9 MHz |
|----------|----------|-----------|

Each channel had generated its frequency continuously for the duration of the testing. The above mentioned set-up allowed the article to perform sufficiently for the test purposes and required time.

### 3.3 Block Diagram of the Test Setup



### 3.4 Support Equipment List:

| No | Equipment              | Model | S/N (last 6) | Notes      |
|----|------------------------|-------|--------------|------------|
| 1  | HP Test Oscillator     | 651B  | 1230A08435   |            |
| 2  | MP3 player             | A1112 | 5F507SL9RS9  | Apple Ipod |
| 3  | Standard 12VDC battery | N/A   | N/A          |            |

### 3.5 Cabling Configuration

#### Power Cords:

|          |                         |
|----------|-------------------------|
| Unit     | HP 651B Test Oscillator |
| MFG      | Standard                |
| Shielded | No                      |
| Length   | 2 m                     |

#### I / O Cables External:

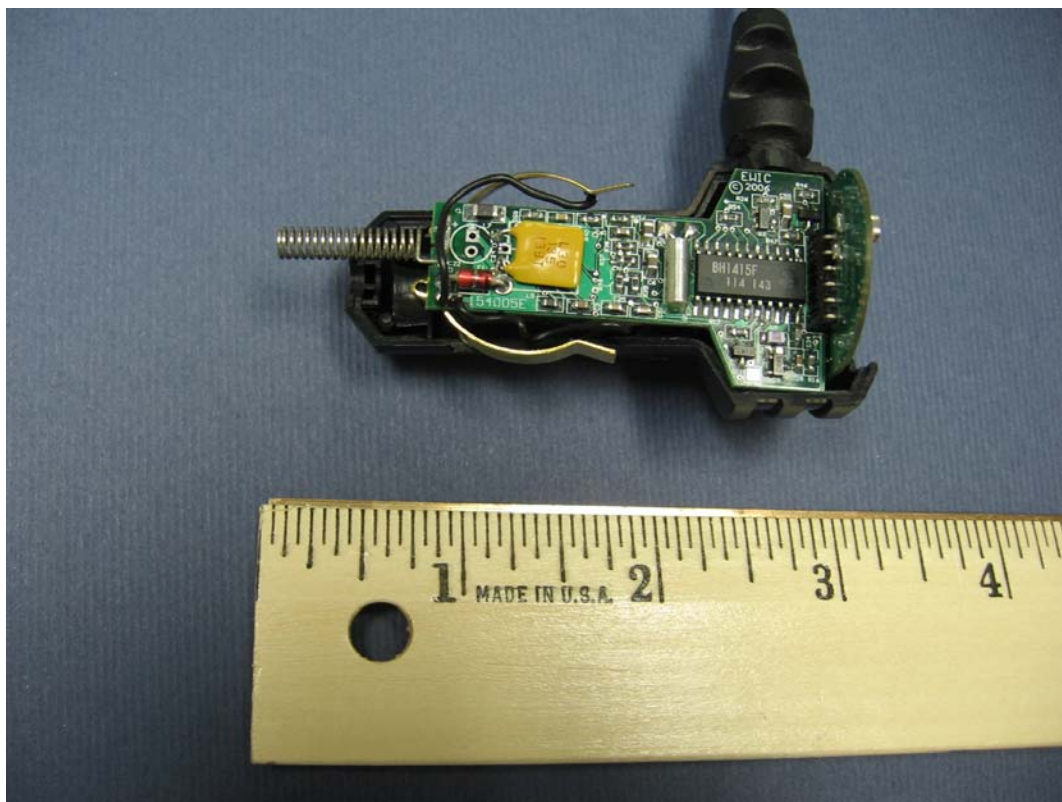
|            |                                                 |
|------------|-------------------------------------------------|
| Connection | AUX In of the EUT to Out, 50 Ohm of the HP 651B |
| Cable      | Generic 50 Ohm RF cable                         |
| Shielded?  | Yes                                             |
| Connector  | BNC, Jack                                       |

Length 0.3 m

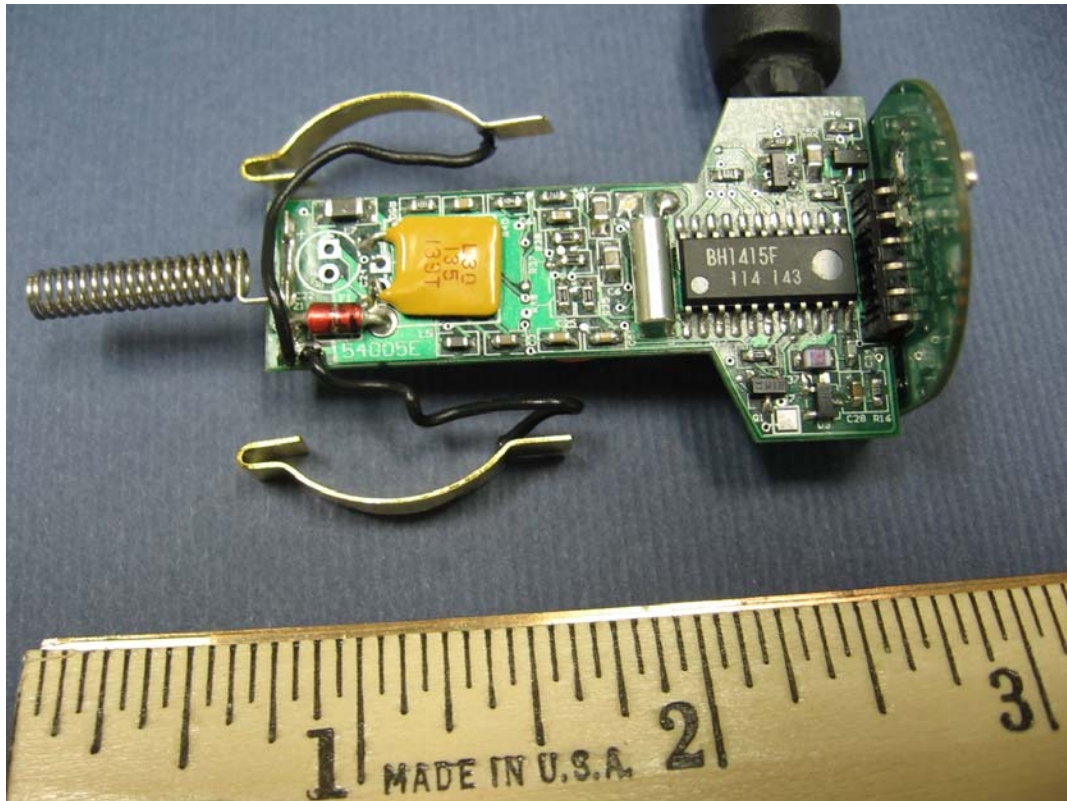
### 3.6 Photos of the EUT



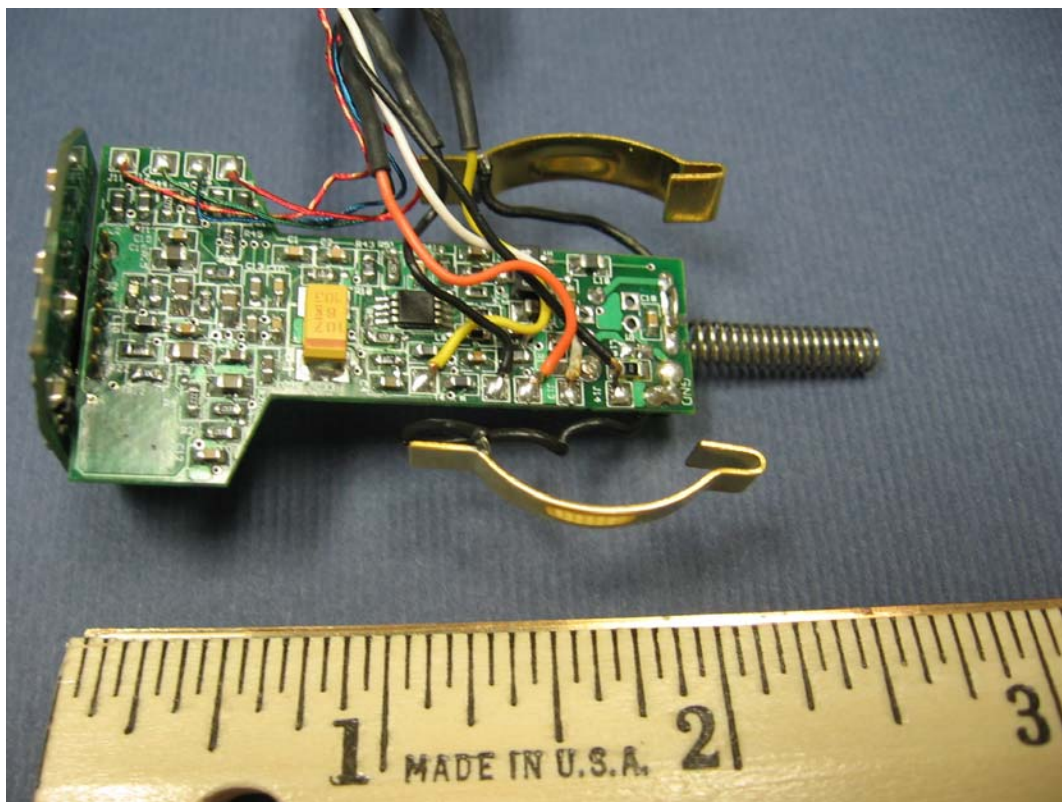
**EUT: AUDIO FM TRANSMITTER.  
MODEL : RJE-169202-00**



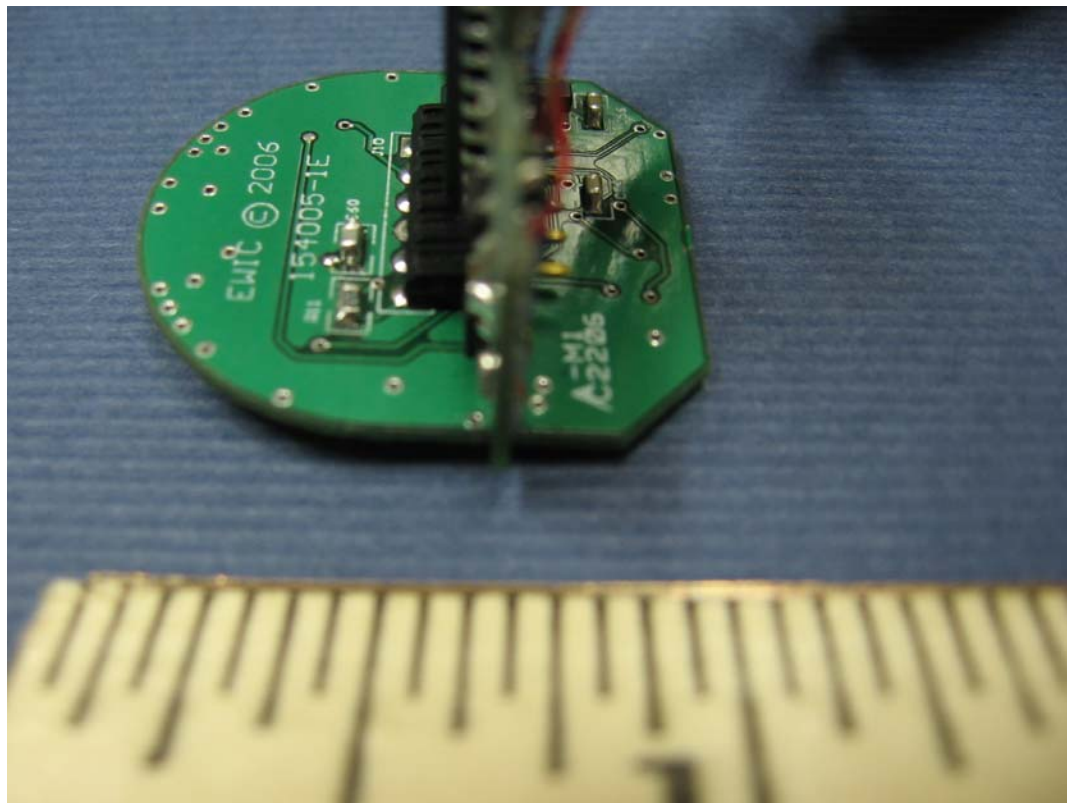
**EUT: AUDIO FM TRANSMITTER.**  
**MODEL : RJE-169202-00**  
**FM Modulator**  
**Open enclosure**



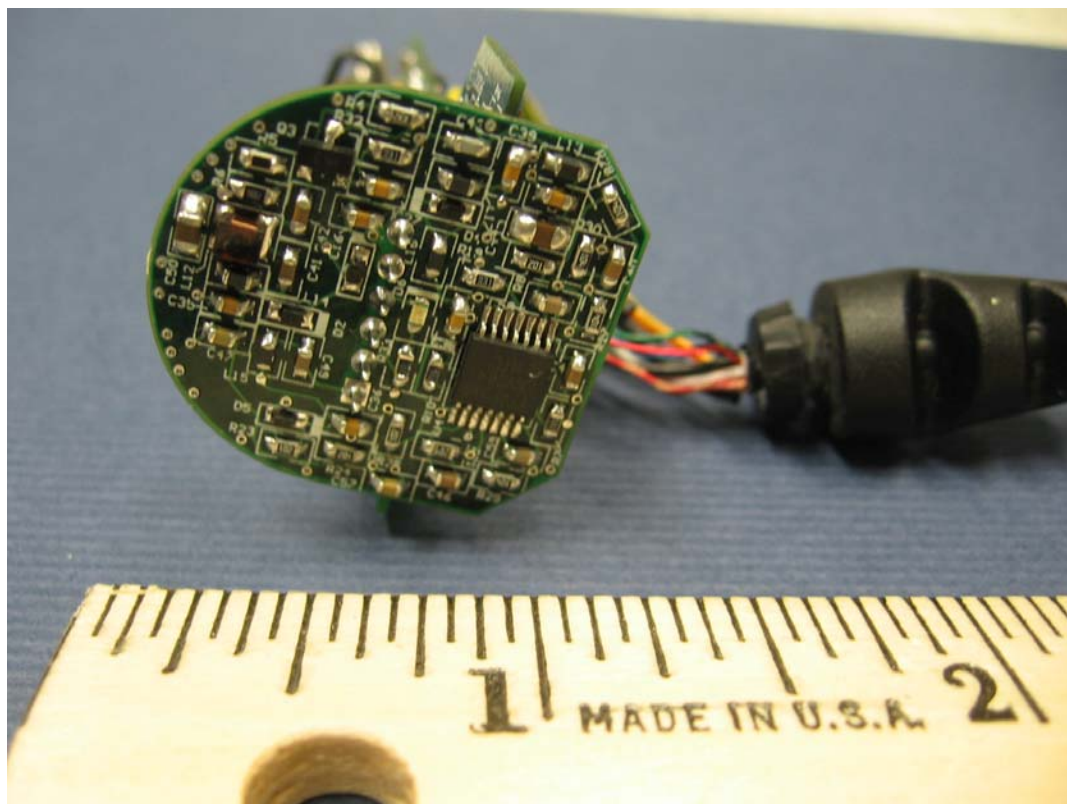
**EUT: AUDIO FM TRANSMITTER.**  
**MODEL : RJE-169202-00**  
**FM Modulator**  
**PCB components side**



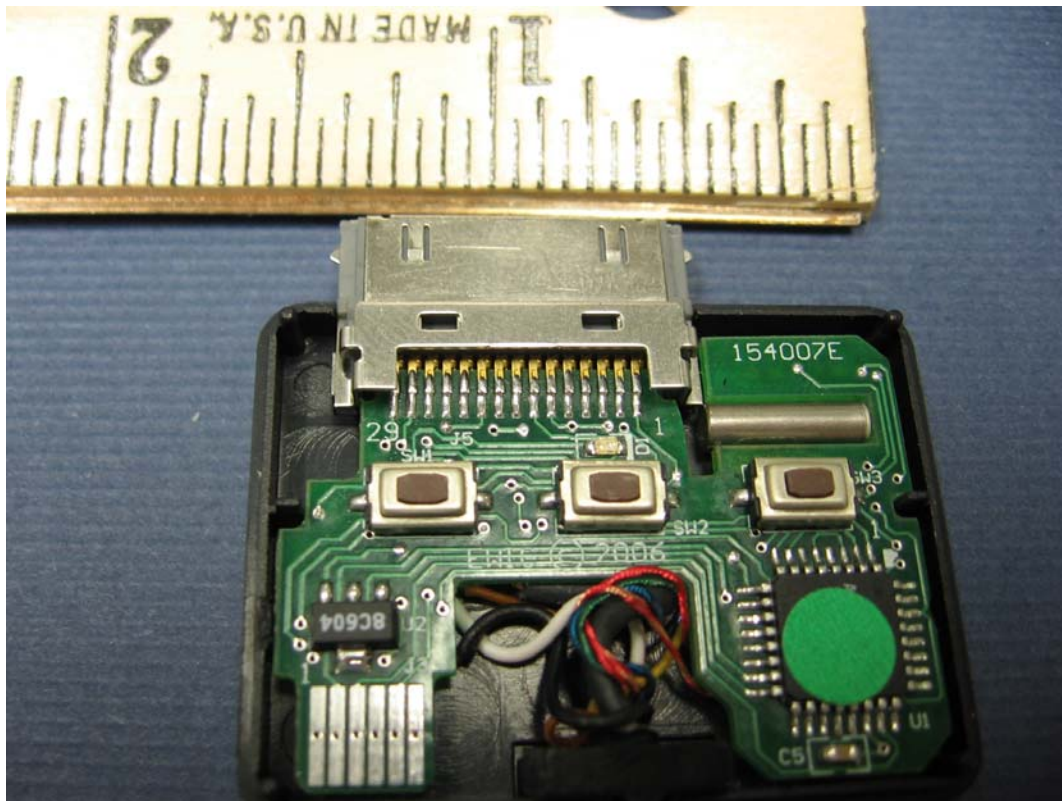
**EUT: AUDIO FM TRANSMITTER.**  
**MODEL : RJE-169202-00**  
**FM Modulator**  
**PCB solder side**



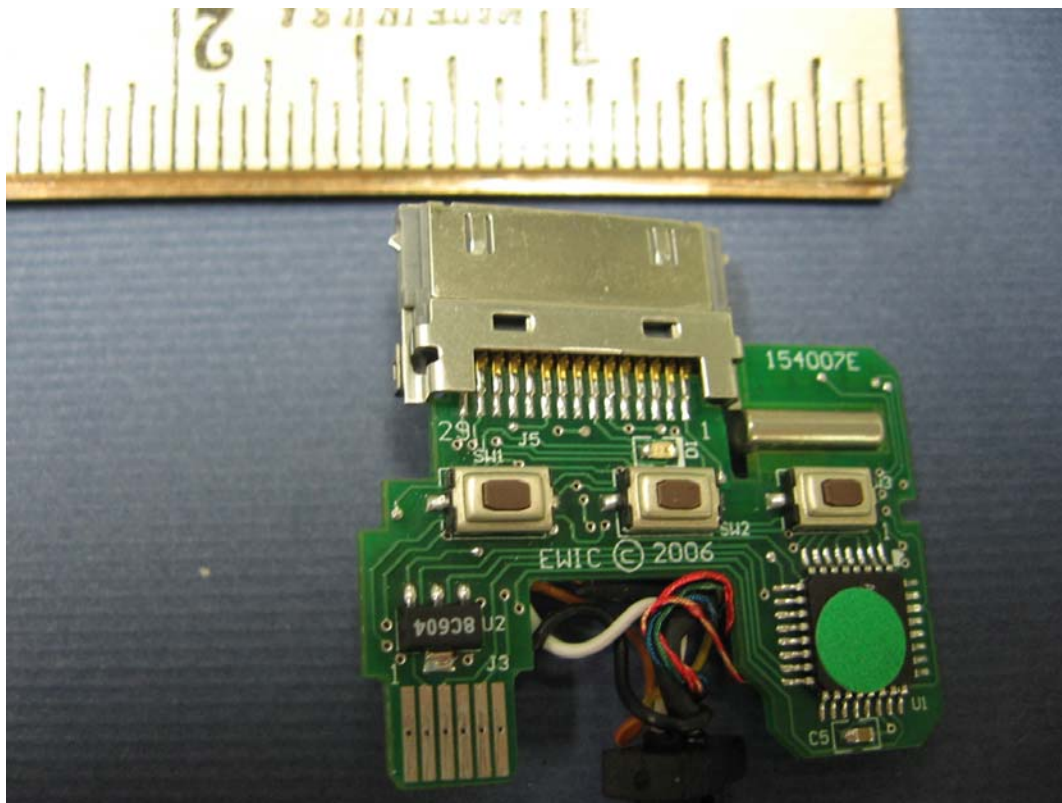
**EUT: AUDIO FM TRANSMITTER.  
MODEL : RJE-169202-00  
FM Modulator  
PCB components side**



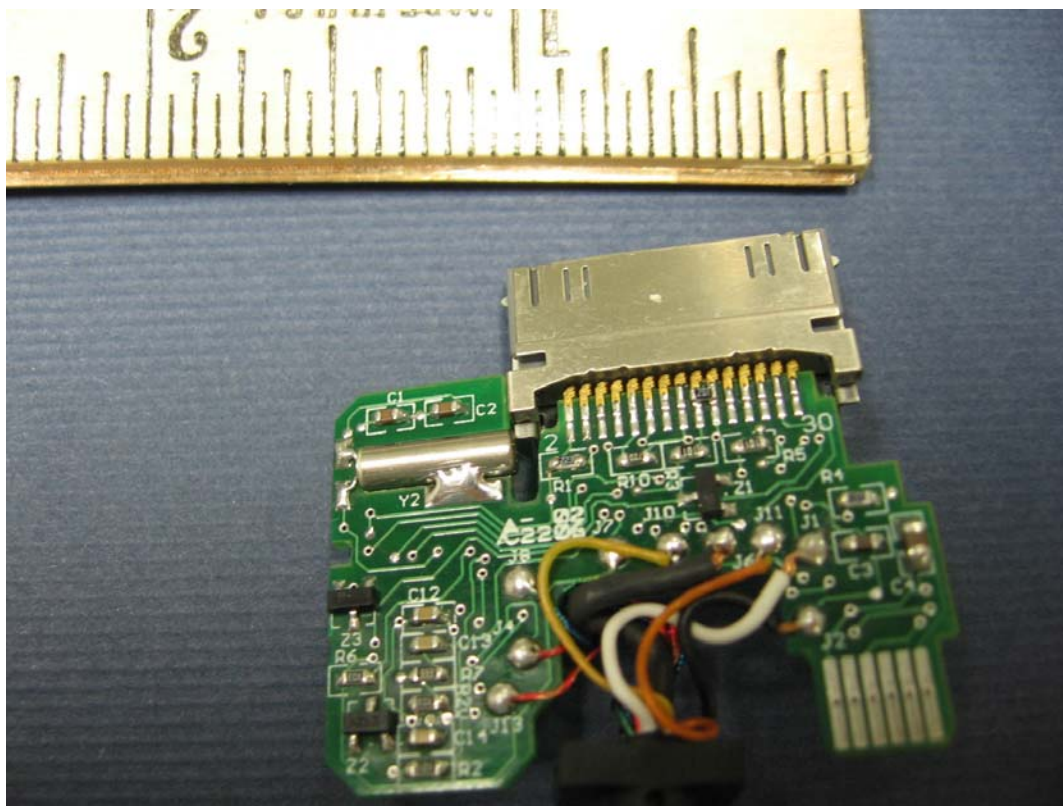
**EUT: AUDIO FM TRANSMITTER.**  
**MODEL : RJE-169202-00FM Modulator**  
**PCB solder side**



**EUT: AUDIO FM TRANSMITTER.  
MODEL : RJE-169202-00  
FM Modulator connector  
Open covers**



**EUT: AUDIO FM TRANSMITTER.**  
**MODEL : RJE-169202-00**  
**FM Modulator connector**  
**PCB components side view**



**EUT: AUDIO FM TRANSMITTER.**  
**MODEL : RJE-169202-00**  
**FM Modulator connector**  
**PCB solder side view**



**EUT: AUDIO FM TRANSMITTER.  
MODEL: RJE-169202-00**

**ANTENNA**

**3.7 EUT Modifications**

**N/A**

**3.8 Photographs of EUT Modifications**

**N/A**

#### 4.0 Test equipment used

| Device                            | Model No.        | Serial No. | Last Cal. | Next Cal |
|-----------------------------------|------------------|------------|-----------|----------|
| Cable 1                           | 8214             | CBL-006    | 06/21/06  | 06/21/07 |
| Analyzer                          | HP85462A         | 3325A00120 | 04/11/06  | 04/11/07 |
| Cable 2                           | 8268             | CBL-002    | 06/21/06  | 06/21/07 |
| Preselector                       | HP85460A         | 3330A00117 | 04/11/06  | 04/11/07 |
| Qpeak Adapter                     | HP85462 Internal | Internal   | 04/11/06  | 04/11/07 |
| Pre-Amplifier                     | None             |            |           |          |
| Tower 1                           | EMCO 1050        | 9310-1786  | N/A       | N/A      |
| Turntable 1                       | EMCO 1060        | 9409-1753  | N/A       | N/A      |
| Bilog Antenna                     | CBL6112B         | 2604       | 08/08/05  | 08/08/06 |
| DRG Horn Antenna                  | SAS-200/571      | 175        | 10/18/05  | 10/18/06 |
| Log-Periodic Antenna              | CBL6111          | 11167      | 11/01/05  | 11/01/06 |
| Cable1                            | RG-214/U         | CBL-001    | 06/21/06  | 06/21/07 |
| Shielded Semi-Anechoic Chamber    | RANTEC           | N/A        | N/A       | N/A      |
| Digital Oscilloscope              | DL1520           | 26WZ0171   | 12/16/05  | 12/16/06 |
| Temperature and Humidity Recorder | Dickson TH8-24C  | 5097755    | 09/18/05  | 09/18/06 |

## **5.0 Field Strength of Fundamental and Emissions within permitted band.**

Test Requirements: FCC Part 15 : Subclause 15.239  
Test Method: ANSI C63.4: 2003

**Limit :** The maximum Field Strength authorized within 200 kHz  
is 250 uV/m @ 3m

**Mode of operation:** with and without modulation.

The test facility consists of a shielded semi-anechoic chamber with attached shielded control room. The semi-anechoic chamber is approximately 18 feet wide by 28 feet long by 19 feet high. A hybrid absorber combines high performance anechoic polyurethane foam with a ferrite tile base to achieve high levels of absorption and power dissipation capability.

The EUT had been placed at the 0.8 m height on the non-conducting table. Transmitter had been turned ON without modulation and worked at the frequencies of the selected channels.

All data was obtained via a HP 85876A EMI measurement software package using an HP 85462A Receiver which is compliant to CISPR 16. The EUT was configured in various geometric patterns to find the geometric configuration and EUT attitude that produced the largest RF power.

After determination of the maximum emissions configuration the distance of the EUT to the scanning antenna was set to 3 meters.

At each of three selected channels 88.1 MHz, 98.1MHz, and 107.9 MHz  
Field Strength of Emissions had been measured.

**Measurements expanded uncertainty equals 3.7 dB with 95% confidence level.**

**Field Level (dBuV)=Measured Value(dBuV) +Antenna Factor(dB)+Cable Loss (dB)**

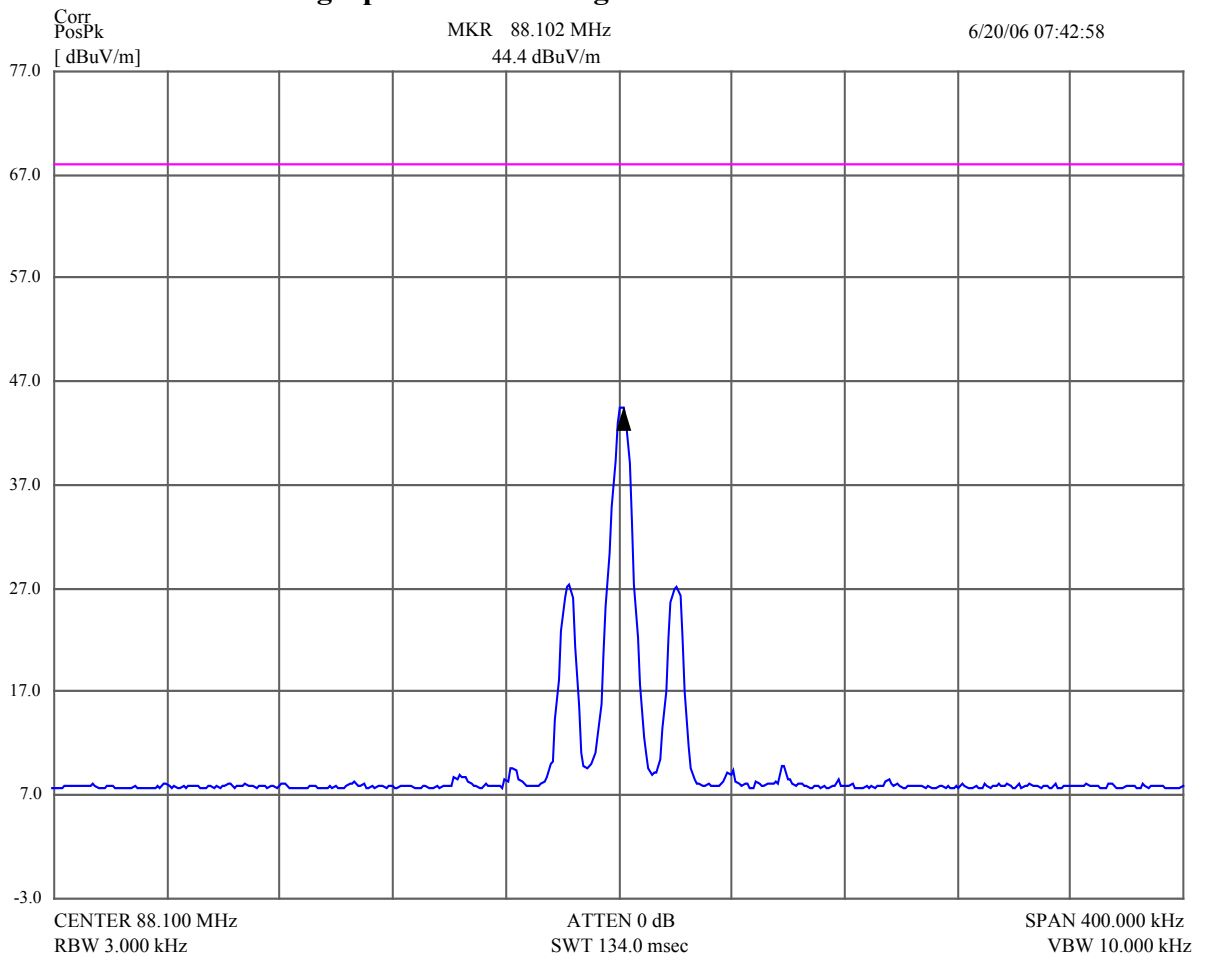
## 5.1. Channel 88.1 MHz

### 5.1.1 no modulation

#### Peak value data

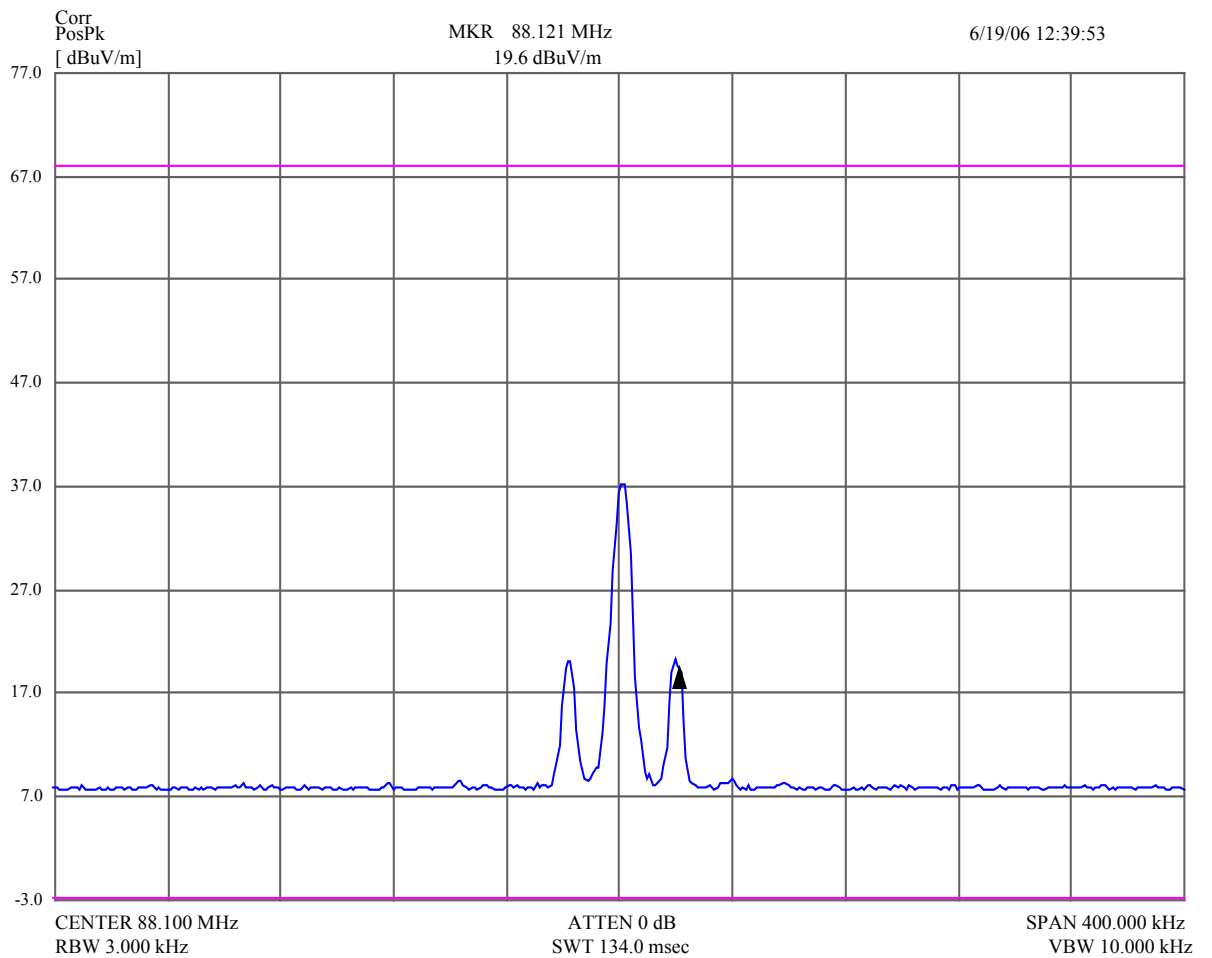
| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 88.082000        | 27.15          | 68.00              | -40.85          | Horz | 213       | 352          | PASS   |
| 88.102000        | 44.41          | 68.00              | -23.59          | Horz | 213       | 352          | PASS   |
| 88.121000        | 27.02          | 68.00              | -40.98          | Horz | 213       | 352          | PASS   |

#### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 88.082000        | 19.95          | 68.00              | -48.05          | Vert | 299       | 275          | PASS   |
| 88.102000        | 37.09          | 68.00              | -30.91          | Vert | 299       | 275          | PASS   |
| 88.121000        | 19.64          | 68.00              | -48.36          | Vert | 299       | 275          | PASS   |

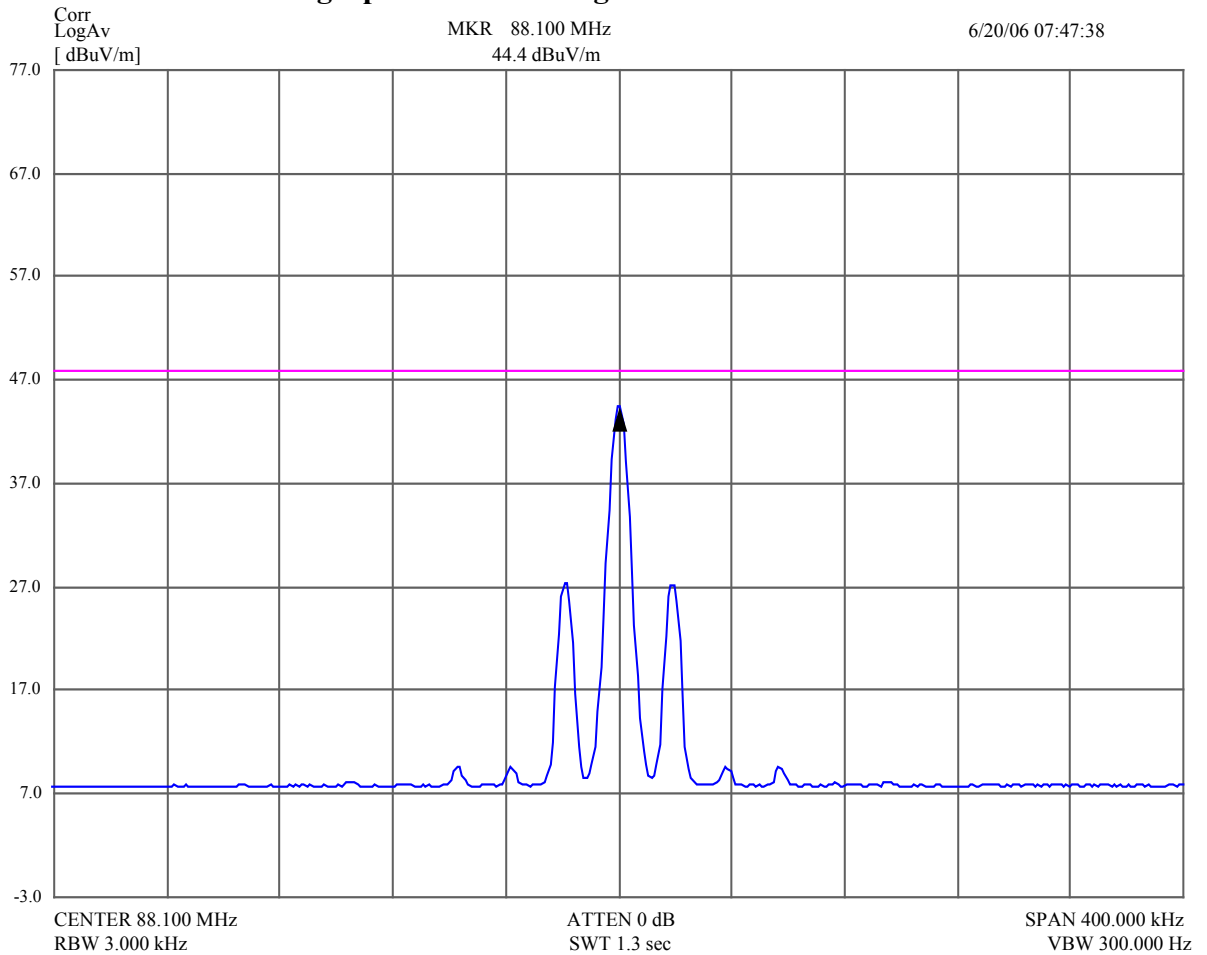
### Receiver graph of Field Strength of Emissions at 3 m



### Average value data

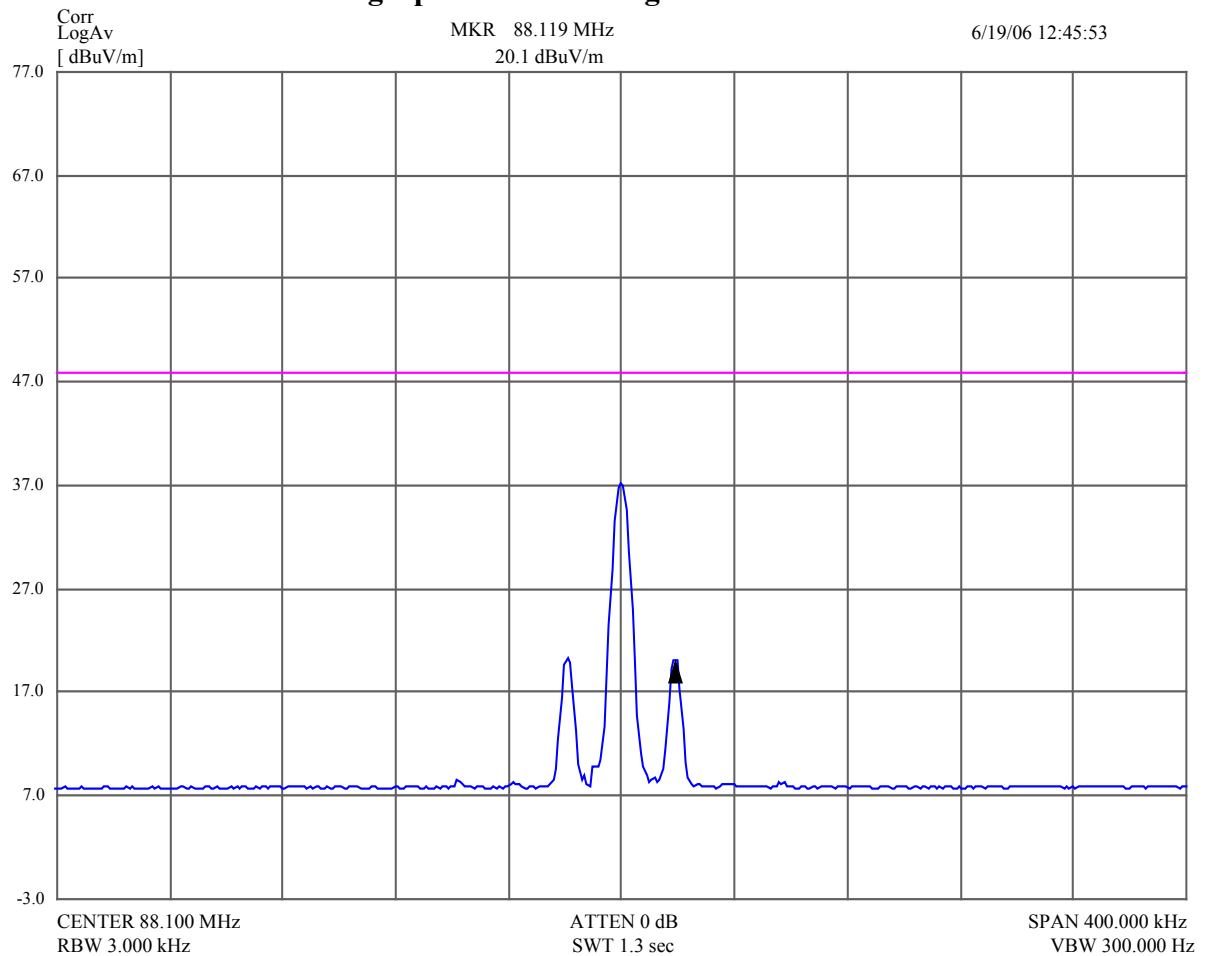
| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 88.081000        | 27.32         | 48.00             | -20.68           | Horz | 213       | 352          | PASS   |
| 88.100000        | 44.37         | 48.00             | -3.63            | Horz | 213       | 352          | PASS   |
| 88.119000        | 27.10         | 48.00             | -20.90           | Horz | 213       | 352          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 88.081000        | 20.15         | 48.00             | -27.85           | Vert | 299       | 275          | PASS   |
| 88.100000        | 37.20         | 48.00             | -10.80           | Vert | 299       | 275          | PASS   |
| 88.119000        | 20.08         | 48.00             | -27.92           | Vert | 299       | 275          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m

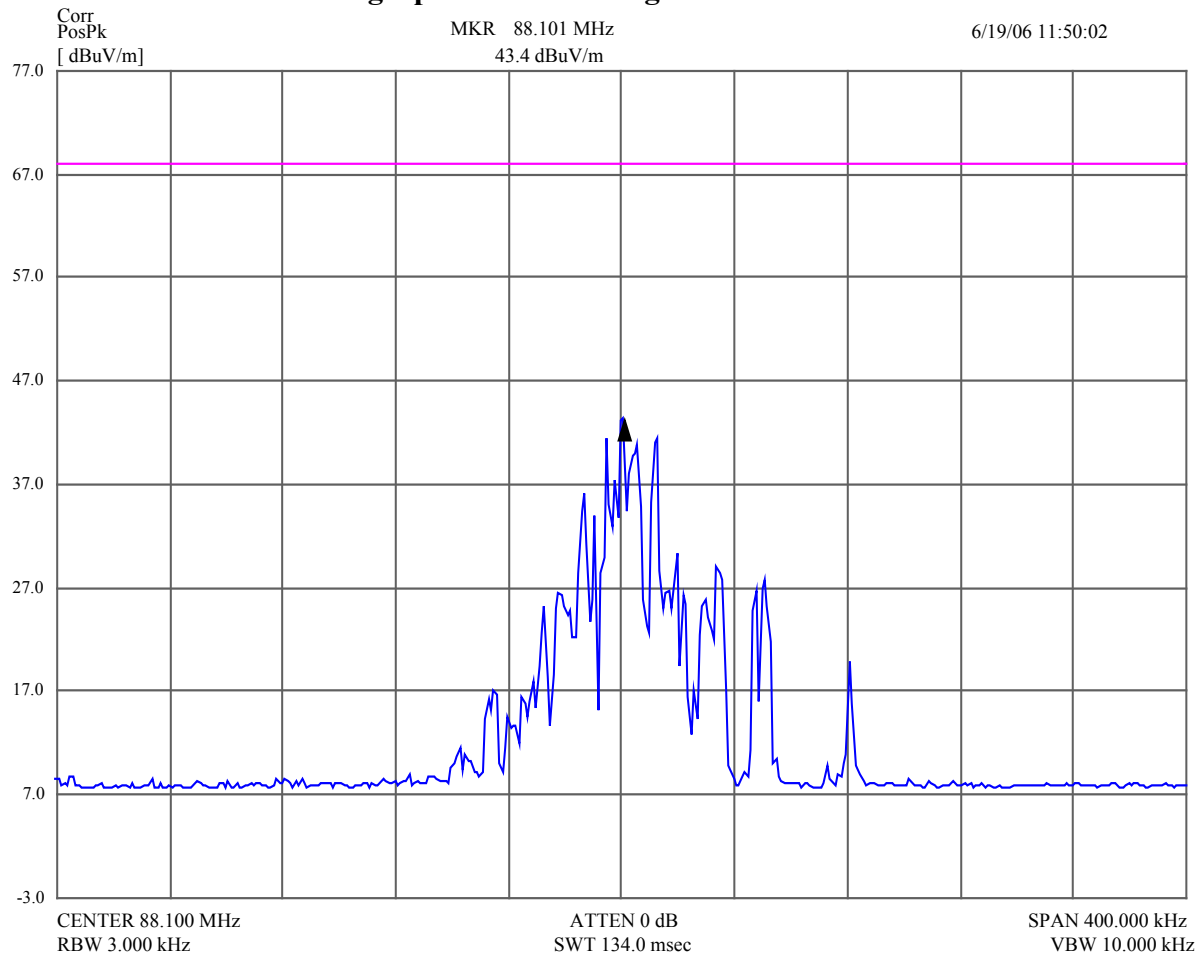


## 5.1.2 with modulation

### Peak value data

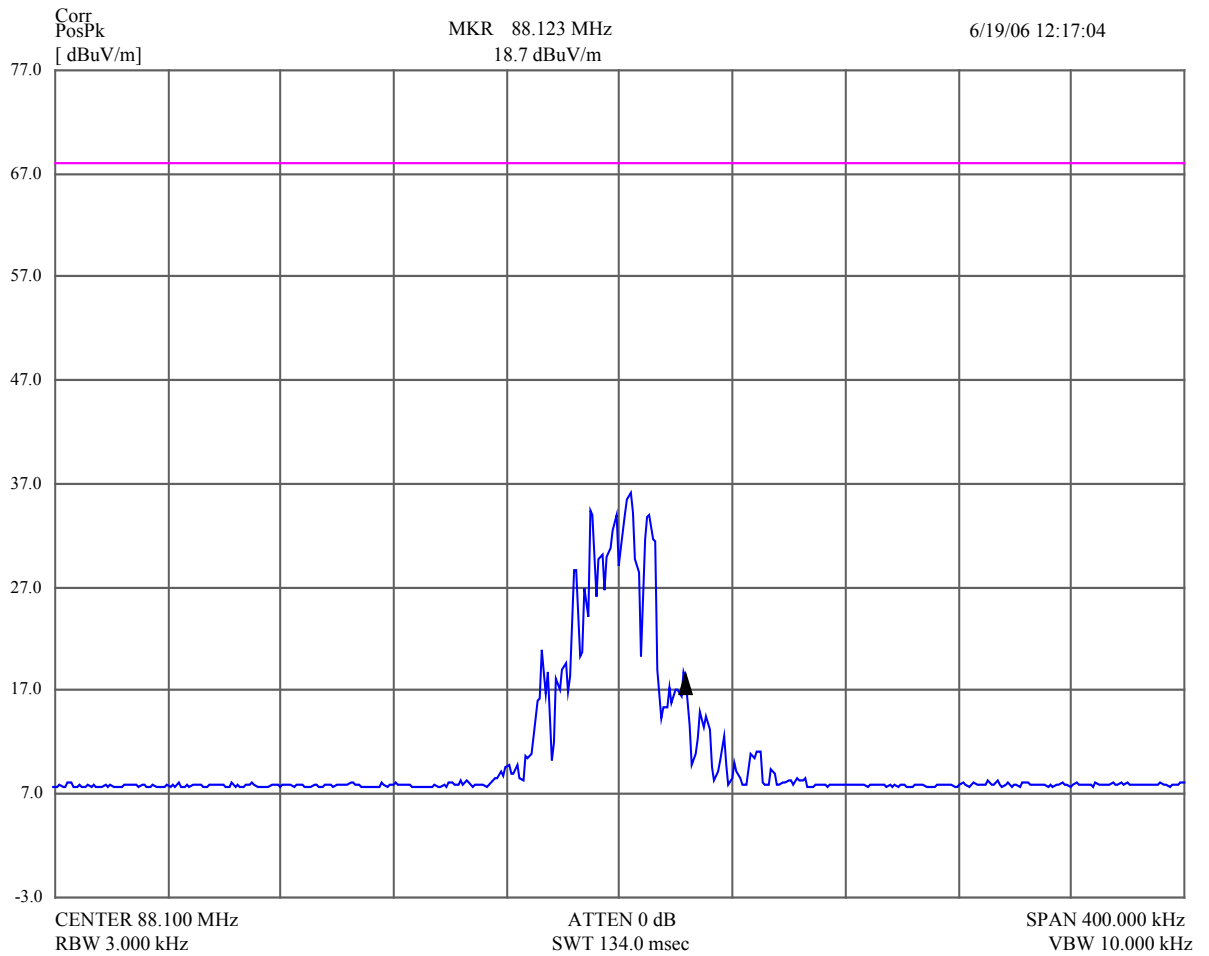
| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 88.087000        | 36.06          | 68.00              | -31.94          | Horz | 213       | 352          | PASS   |
| 88.101000        | 43.40          | 68.00              | -24.60          | Horz | 213       | 352          | PASS   |
| 88.112000        | 40.90          | 68.00              | -27.10          | Horz | 213       | 352          | PASS   |
| 88.134000        | 28.99          | 68.00              | -39.01          | Horz | 213       | 352          | PASS   |
| 88.150000        | 26.88          | 68.00              | -41.12          | Horz | 213       | 352          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 88.084000        | 28.47          | 68.00              | -39.53          | Vert | 299       | 275          | PASS   |
| 88.090000        | 34.36          | 68.00              | -33.64          | Vert | 299       | 275          | PASS   |
| 88.104000        | 36.04          | 68.00              | -31.96          | Vert | 299       | 275          | PASS   |
| 88.123000        | 18.74          | 68.00              | -49.26          | Vert | 299       | 275          | PASS   |

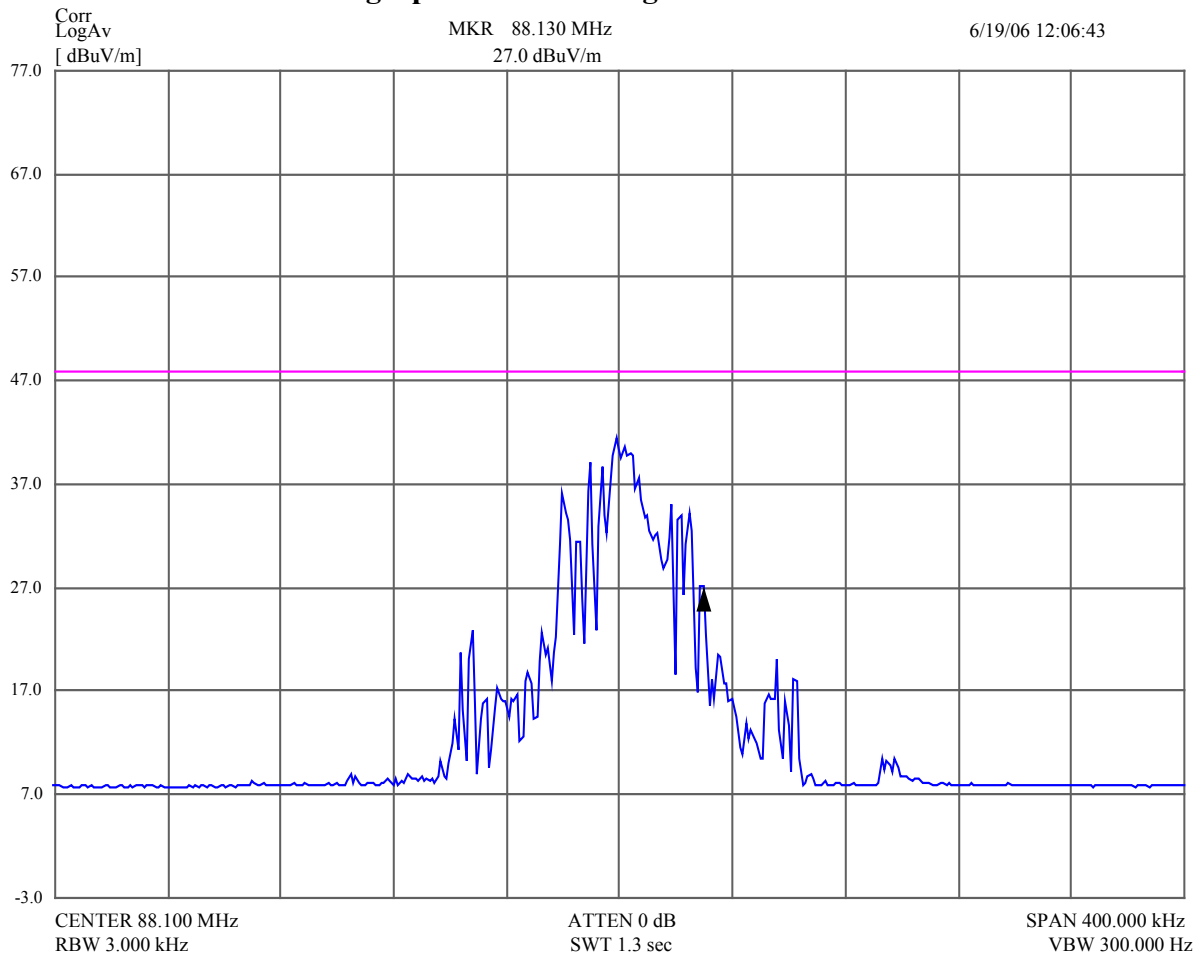
### Receiver graph of Field Strength of Emissions at 3 m



### Average value data

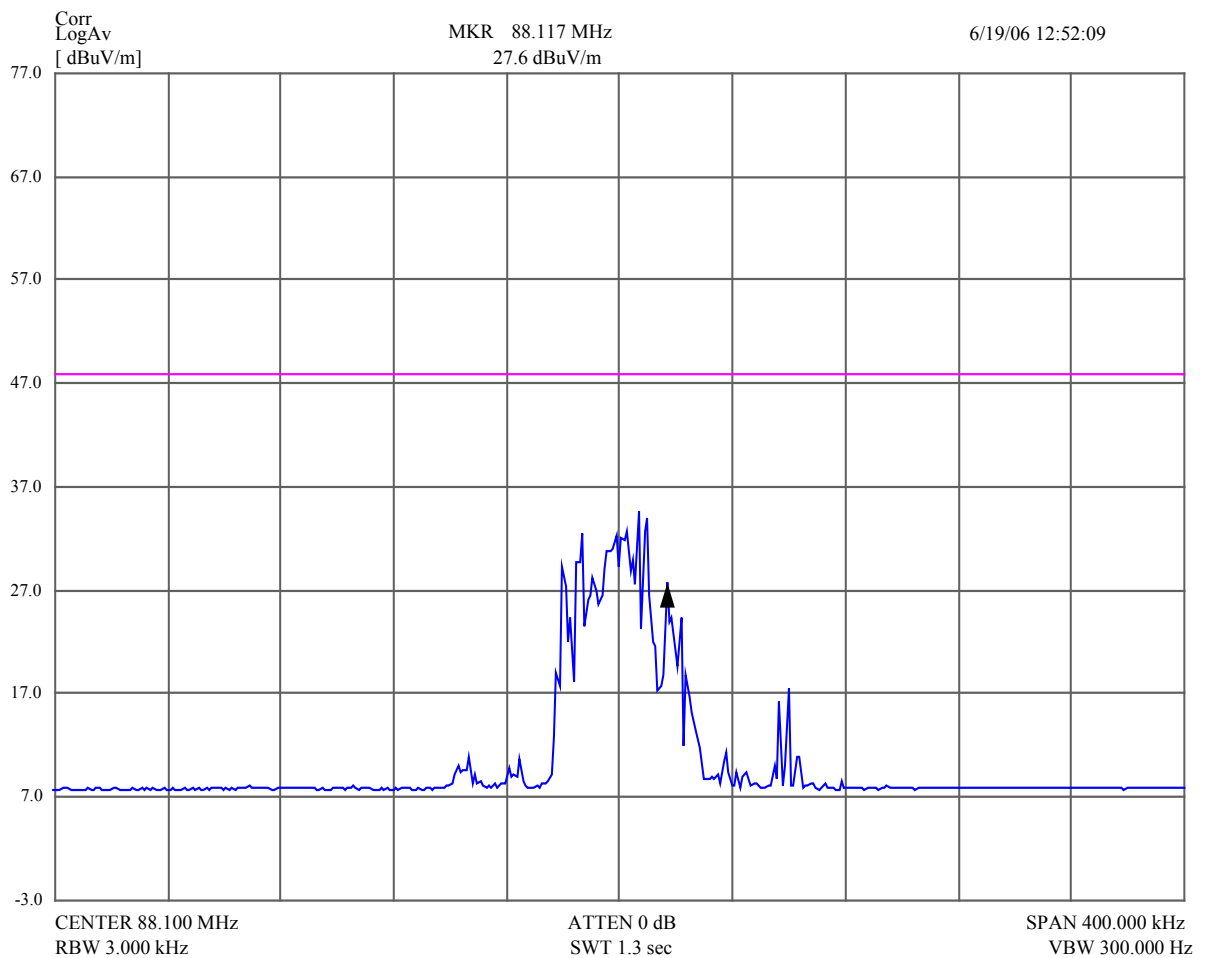
| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 88.080000        | 36.04         | 48.00             | -11.96           | Horz | 213       | 352          | PASS   |
| 88.090000        | 39.00         | 48.00             | -9.00            | Horz | 213       | 352          | PASS   |
| 88.099000        | 41.35         | 48.00             | -6.65            | Horz | 213       | 352          | PASS   |
| 88.119000        | 34.94         | 48.00             | -13.06           | Horz | 213       | 352          | PASS   |
| 88.130000        | 27.04         | 48.00             | -20.96           | Horz | 213       | 352          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 88.080000        | 29.27         | 48.00             | -18.73           | Vert | 299       | 275          | PASS   |
| 88.091000        | 28.17         | 48.00             | -19.83           | Vert | 299       | 275          | PASS   |
| 88.099000        | 32.24         | 48.00             | -15.76           | Vert | 299       | 275          | PASS   |
| 88.107000        | 34.45         | 48.00             | -13.55           | Vert | 299       | 275          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



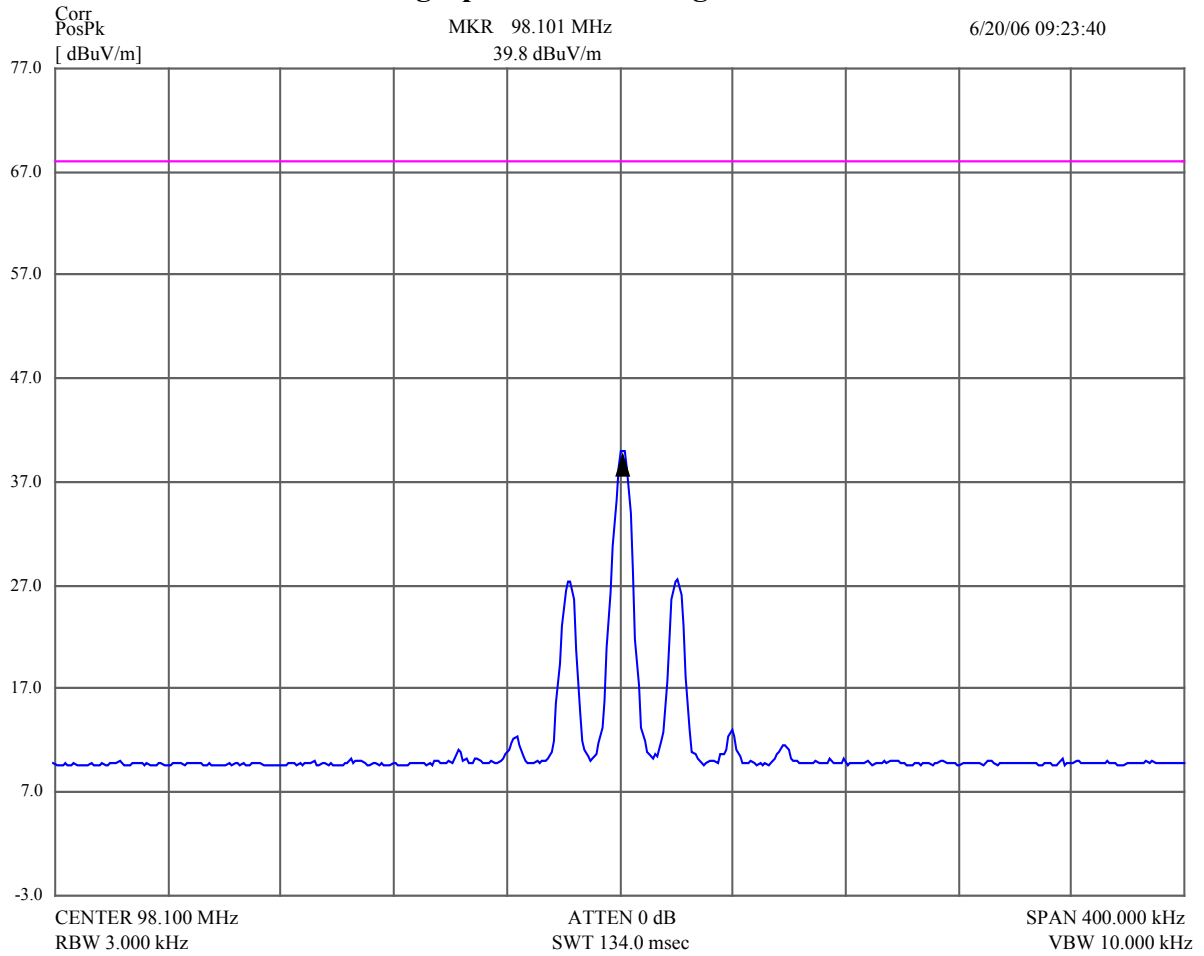
5.2. Channel 98.1 MHz

5.2.1 no modulation

Peak value data

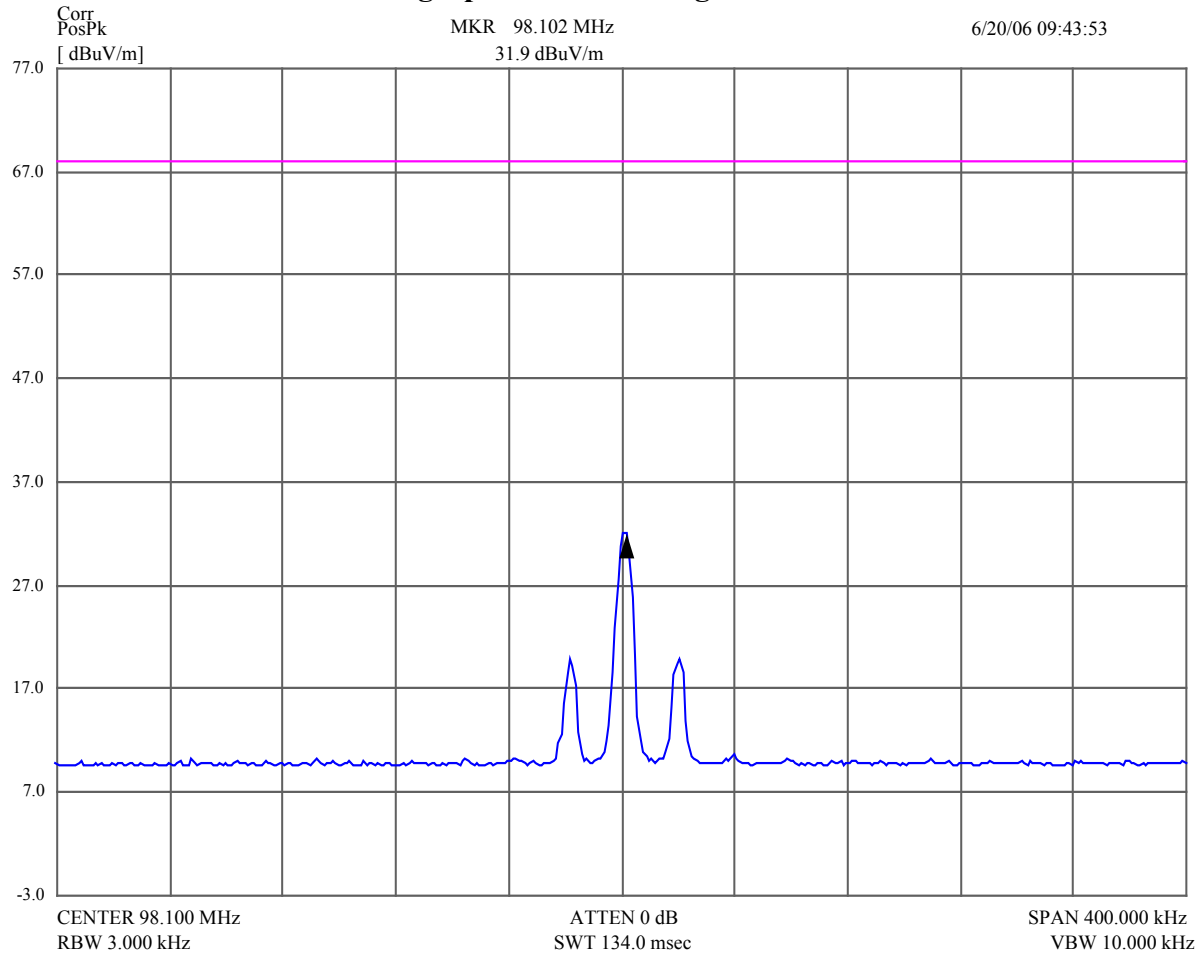
| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 98.082000        | 27.30          | 68.00              | -40.70          | Horz | 266       | 352          | PASS   |
| 98.102000        | 39.79          | 68.00              | -28.21          | Horz | 266       | 352          | PASS   |
| 98.120000        | 27.34          | 68.00              | -40.66          | Horz | 266       | 352          | PASS   |

### Receiver graph of Field Strength of Emission at 3 m



| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 98.081000        | 19.50          | 68.00              | -48.50          | Vert | 361       | 281          | PASS   |
| 98.100000        | 31.94          | 68.00              | -36.06          | Vert | 361       | 281          | PASS   |
| 98.119000        | 19.30          | 68.00              | -48.70          | Vert | 361       | 281          | PASS   |

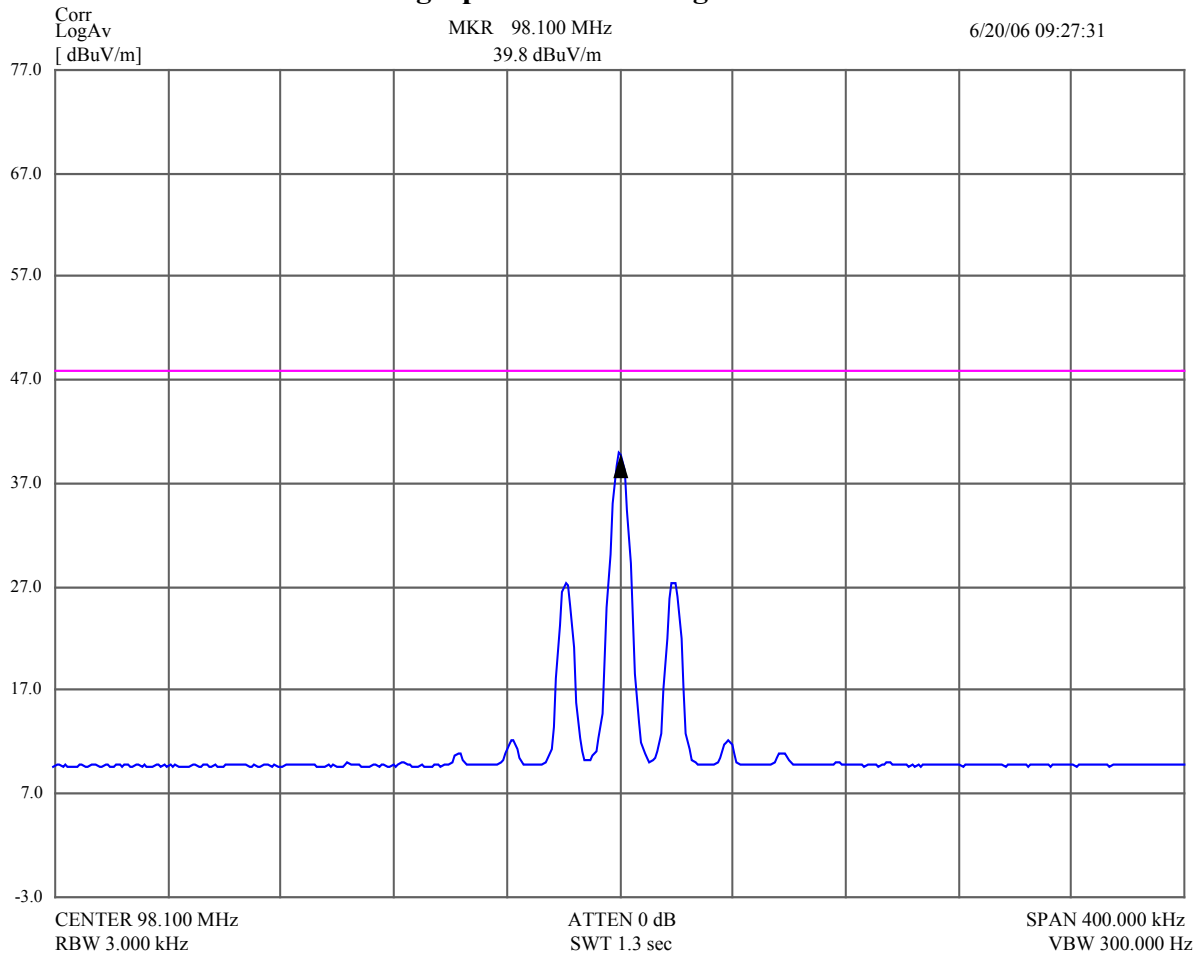
### Receiver graph of Field Strength of Emission at 3 m



### Average value data

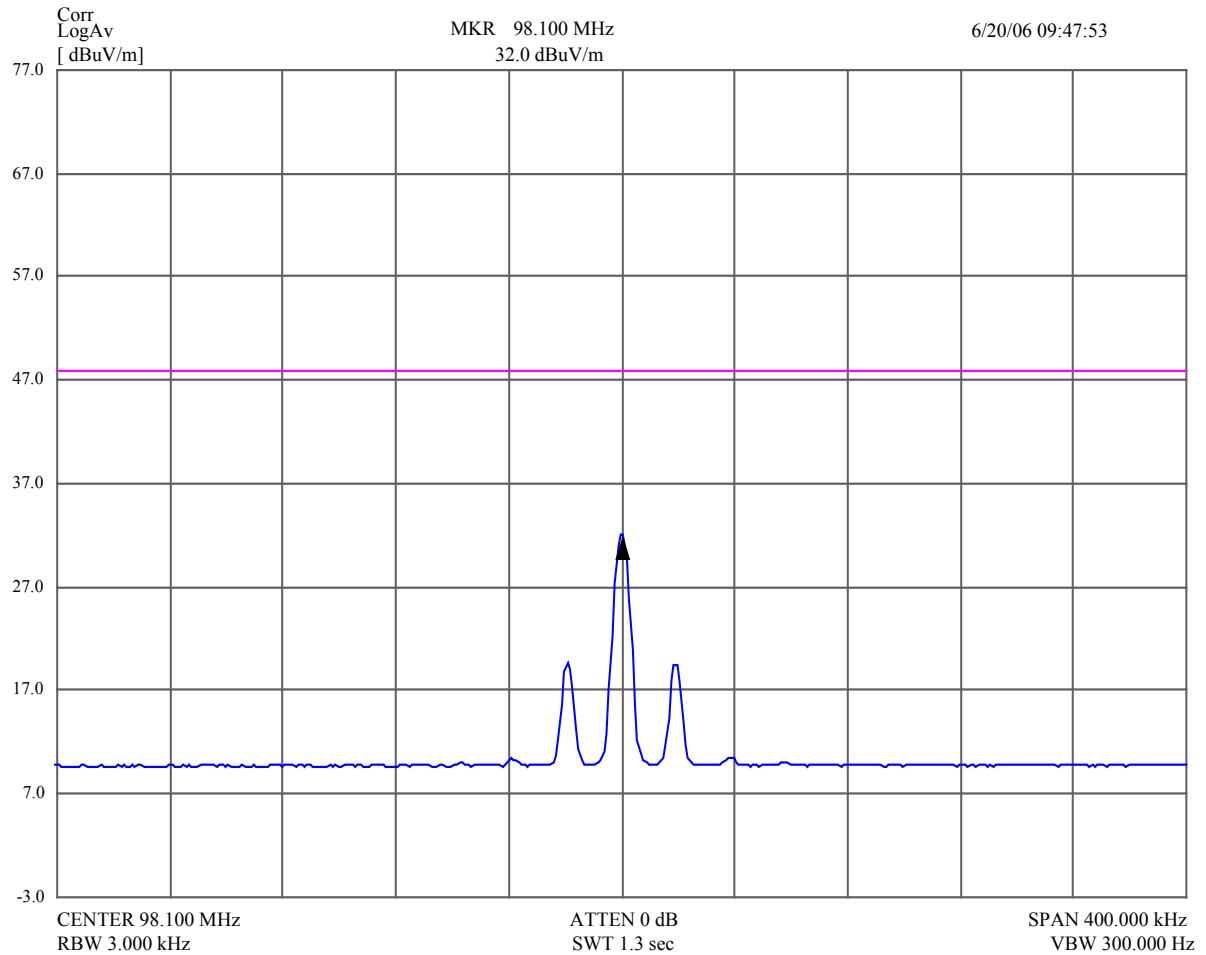
| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 98.081000        | 27.26         | 48.00             | -20.74           | Horz | 266       | 352          | PASS   |
| 98.100000        | 39.79         | 48.00             | -8.21            | Horz | 266       | 352          | PASS   |
| 98.119000        | 27.29         | 48.00             | -20.71           | Horz | 266       | 352          | PASS   |

### Receiver graph of Field Strength of Emission at 3 m



| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 98.081000        | 19.50         | 48.00             | -28.50           | Vert | 361       | 281          | PASS   |
| 98.100000        | 31.96         | 48.00             | -16.04           | Vert | 361       | 281          | PASS   |
| 98.120000        | 19.40         | 48.00             | -28.60           | Vert | 361       | 281          | PASS   |

### Receiver graph of Field Strength of Emission at 3 m



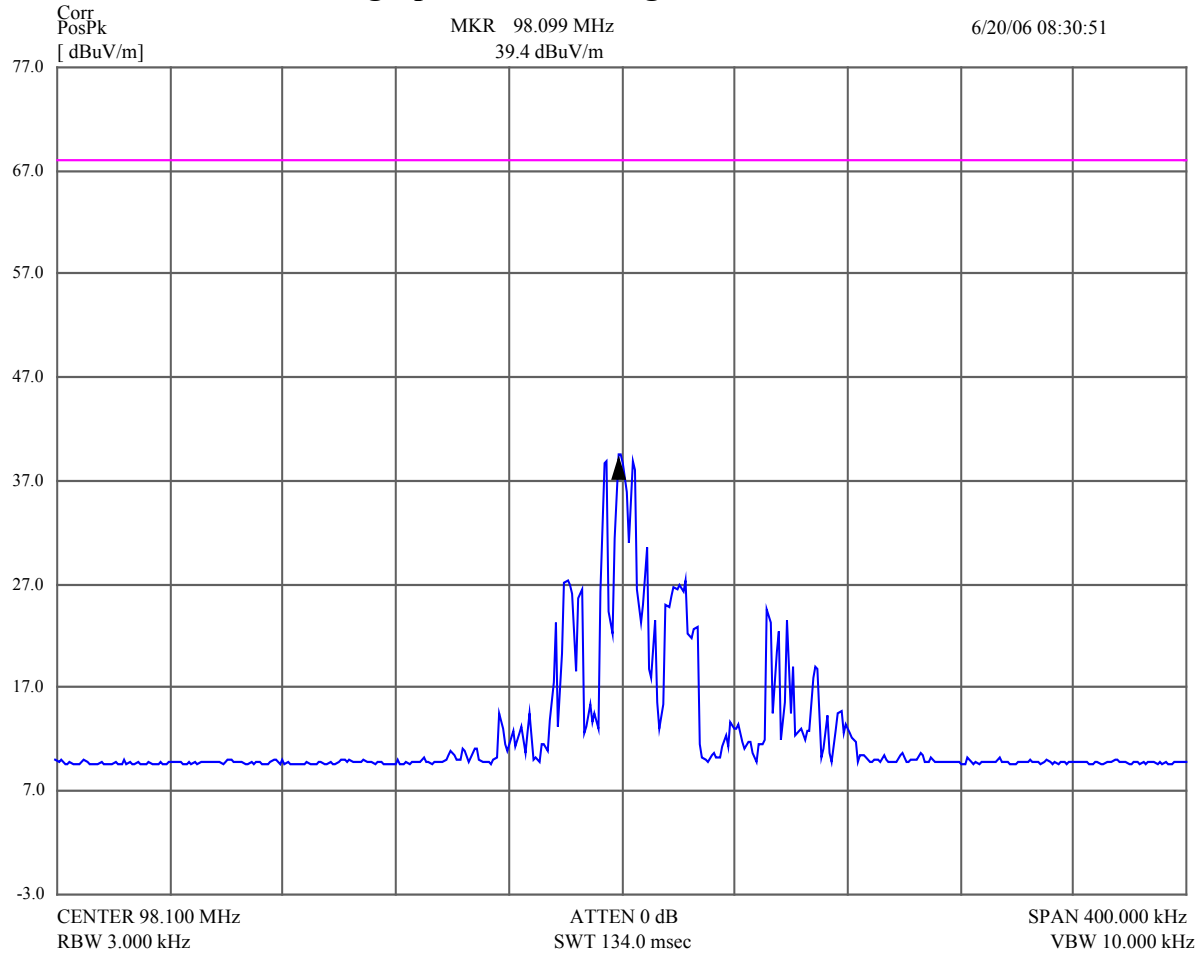
### 5.2.2 with modulation

#### Peak value data

| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 98.080000        | 27.07          | 68.00              | -40.93          | Horz | 230       | 352          | PASS   |
| 98.100000        | 39.45          | 68.00              | -28.55          | Horz | 230       | 352          | PASS   |

|           |       |       |        |      |     |     |      |
|-----------|-------|-------|--------|------|-----|-----|------|
| 98.109000 | 30.53 | 68.00 | -37.47 | Horz | 230 | 352 | PASS |
| 98.123000 | 27.17 | 68.00 | -40.83 | Horz | 230 | 352 | PASS |

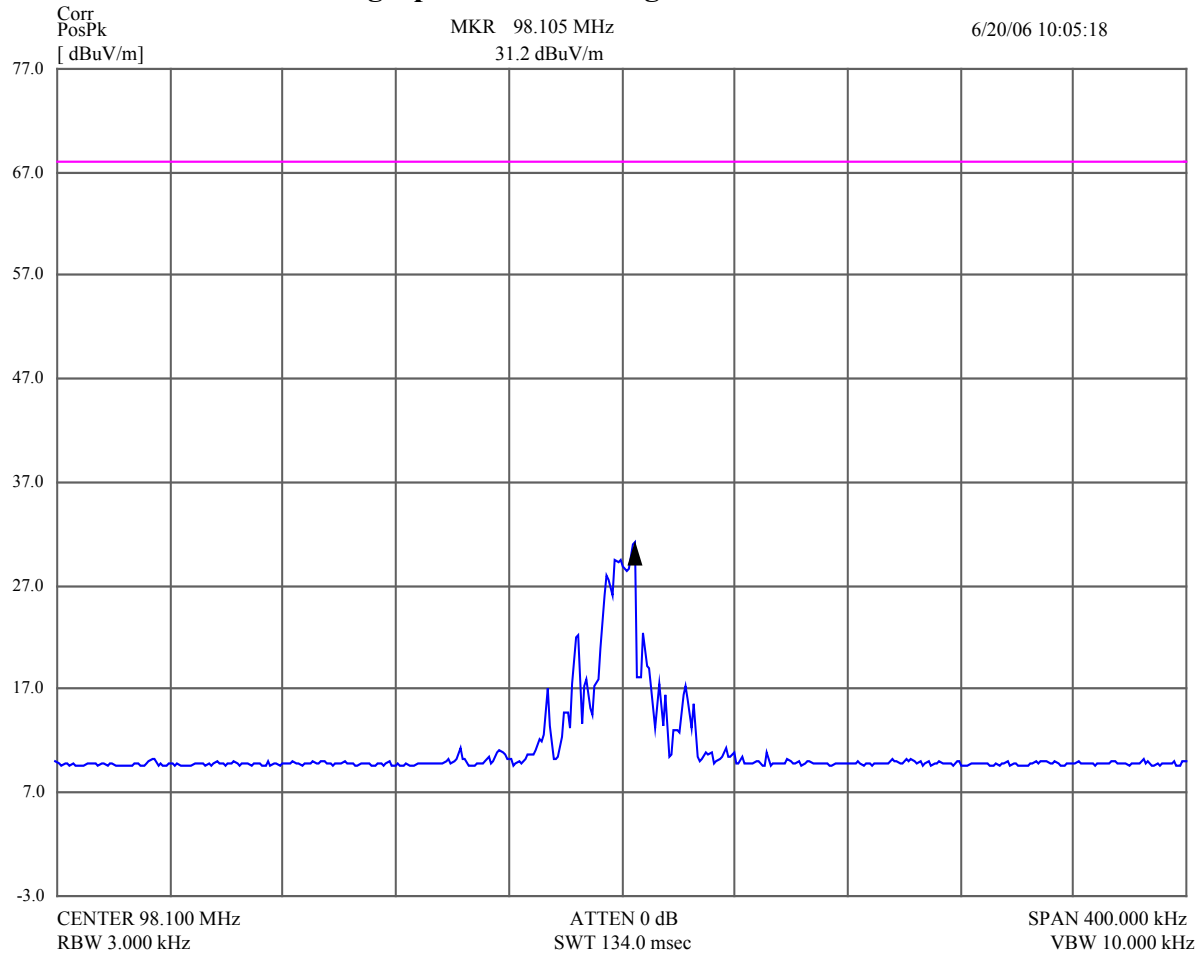
### Receiver graph of Field Strength of Emissions at 3 m



### Peak value data

| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 98.084000        | 21.84          | 68.00              | -46.16          | Vert | 361       | 281          | PASS   |
| 98.098000        | 29.49          | 68.00              | -38.51          | Vert | 361       | 281          | PASS   |
| 98.105000        | 31.21          | 68.00              | -36.79          | Vert | 361       | 281          | PASS   |
| 98.108000        | 22.38          | 68.00              | -45.62          | Vert | 361       | 281          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m

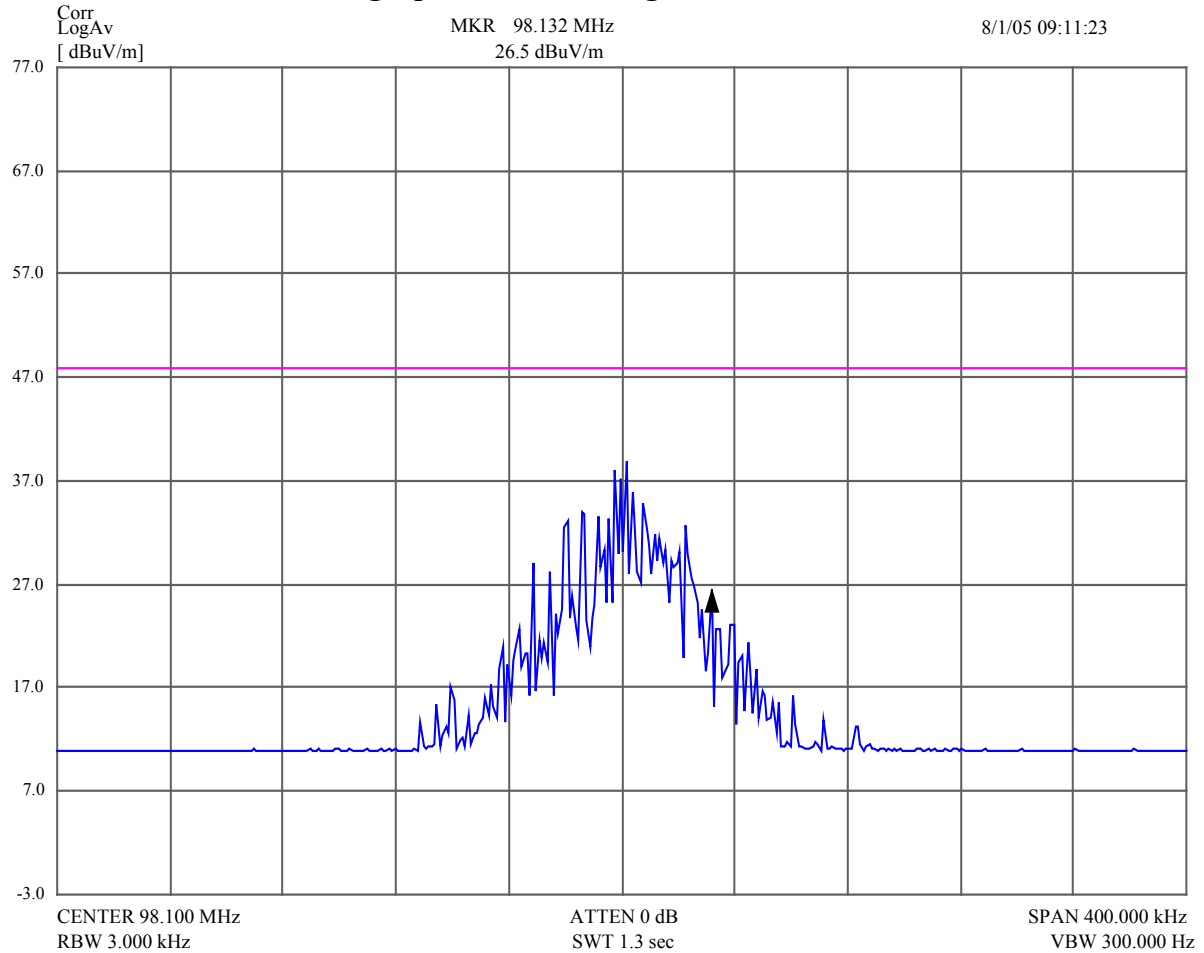


### Average value data

| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 98.069000        | 28.97         | 48.00             | -19.03           | Horz | 271       | 251          | PASS   |
| 98.080000        | 32.50         | 48.00             | -15.50           | Horz | 271       | 251          | PASS   |
| 98.092000        | 33.51         | 48.00             | -14.49           | Horz | 271       | 251          | PASS   |
| 98.102000        | 38.79         | 48.00             | -9.21            | Horz | 271       | 251          | PASS   |

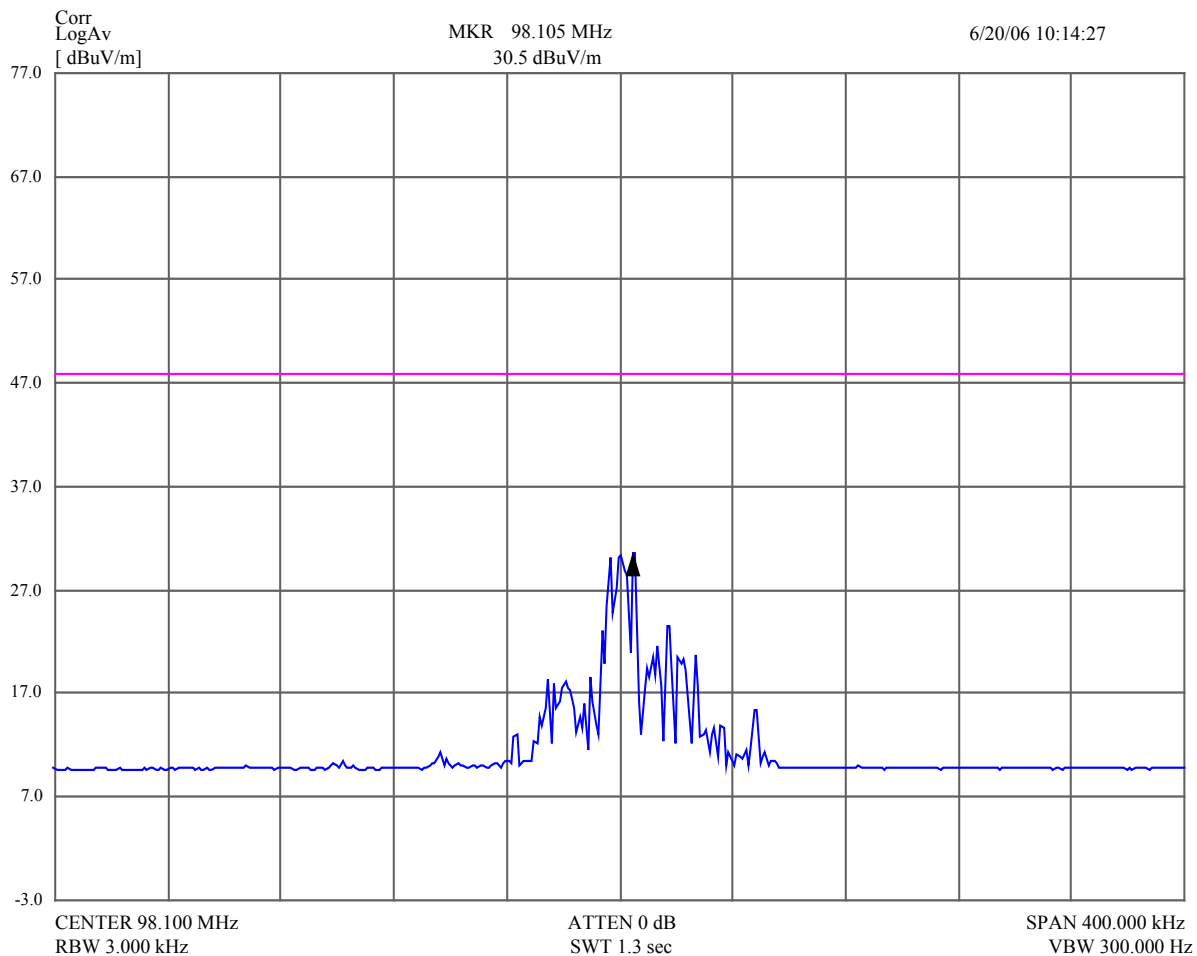
|           |       |       |        |      |     |     |      |
|-----------|-------|-------|--------|------|-----|-----|------|
| 98.123000 | 32.56 | 48.00 | -15.44 | Horz | 271 | 251 | PASS |
| 98.132000 | 26.49 | 48.00 | -21.51 | Horz | 271 | 251 | PASS |

### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 98.097000        | 30.03         | 48.00             | -17.97           | Vert | 361       | 281          | PASS   |
| 98.106000        | 30.57         | 48.00             | -17.43           | Vert | 361       | 281          | PASS   |
| 98.117000        | 23.32         | 48.00             | -24.68           | Vert | 361       | 281          | PASS   |
| 98.127000        | 20.72         | 48.00             | -27.28           | Vert | 361       | 281          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



### 5.3. Channel 107.9 MHz

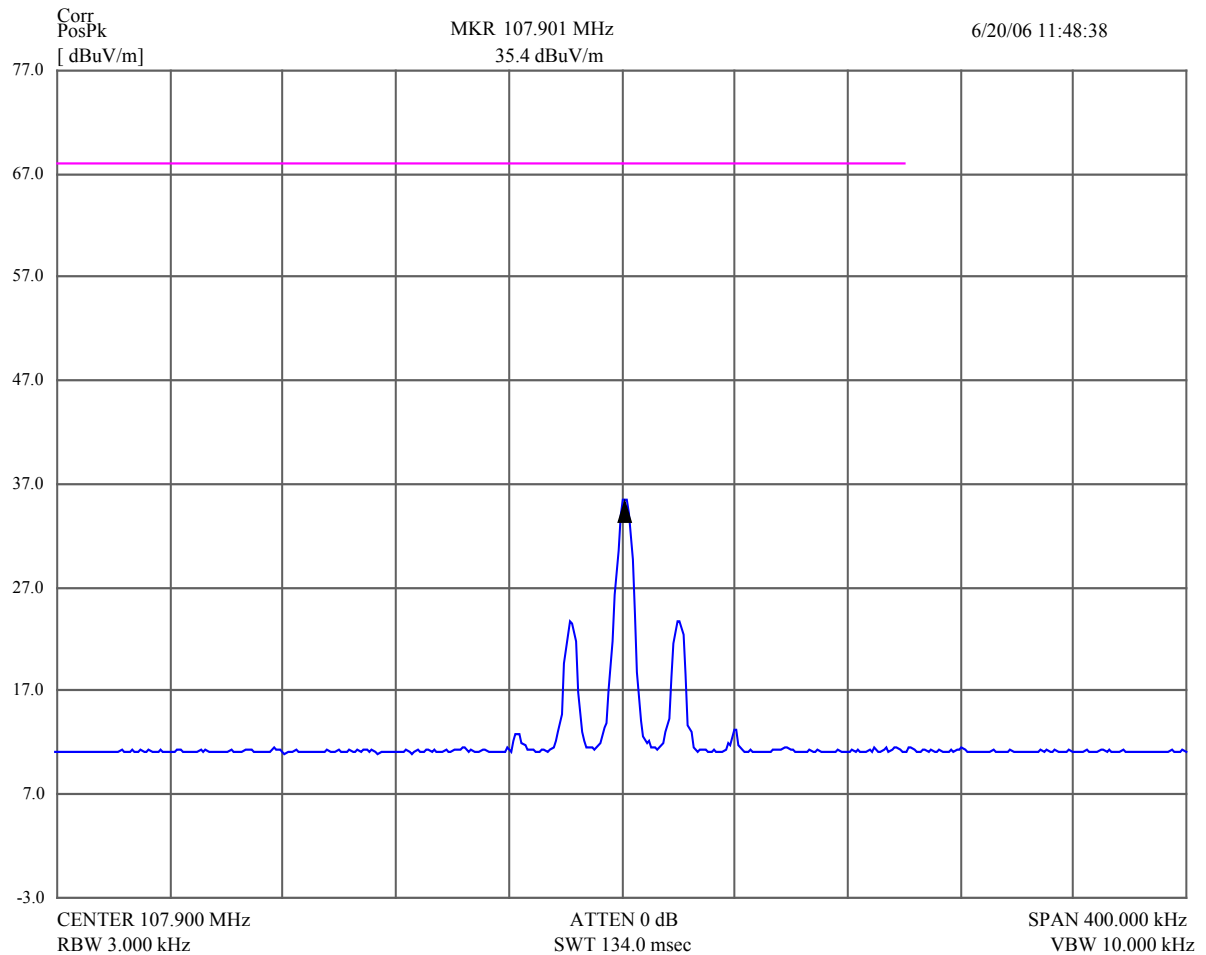
### 5.3.1 no modulation

### Peak value data

| Frequency | Peak   | Peak Lmt | DelLim-Pk | Pol | Hgt | Angle | Status |
|-----------|--------|----------|-----------|-----|-----|-------|--------|
| MHz       | dBuV/m | dBuV/m   | dB        |     | cm  | deg   |        |

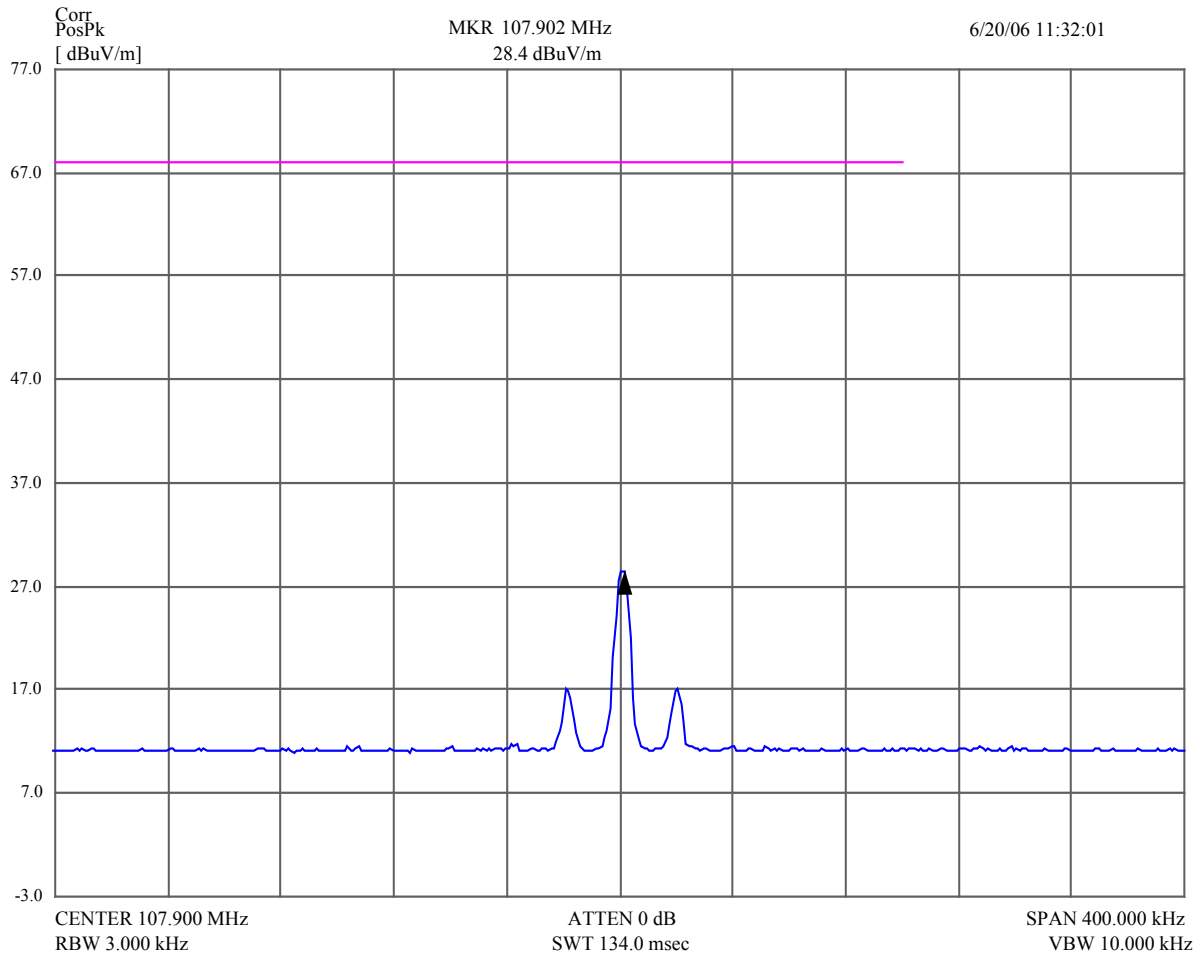
|            |       |       |        |      |     |     |      |
|------------|-------|-------|--------|------|-----|-----|------|
| 107.883000 | 23.46 | 68.00 | -44.54 | Horz | 268 | 352 | PASS |
| 107.902000 | 35.43 | 68.00 | -32.57 | Horz | 268 | 352 | PASS |
| 107.920000 | 23.57 | 68.00 | -44.43 | Horz | 268 | 352 | PASS |

### Receiver graph of Field Strength of Emissions at 3 m



### Receiver graph of Field Strength of Emissions at 3 m

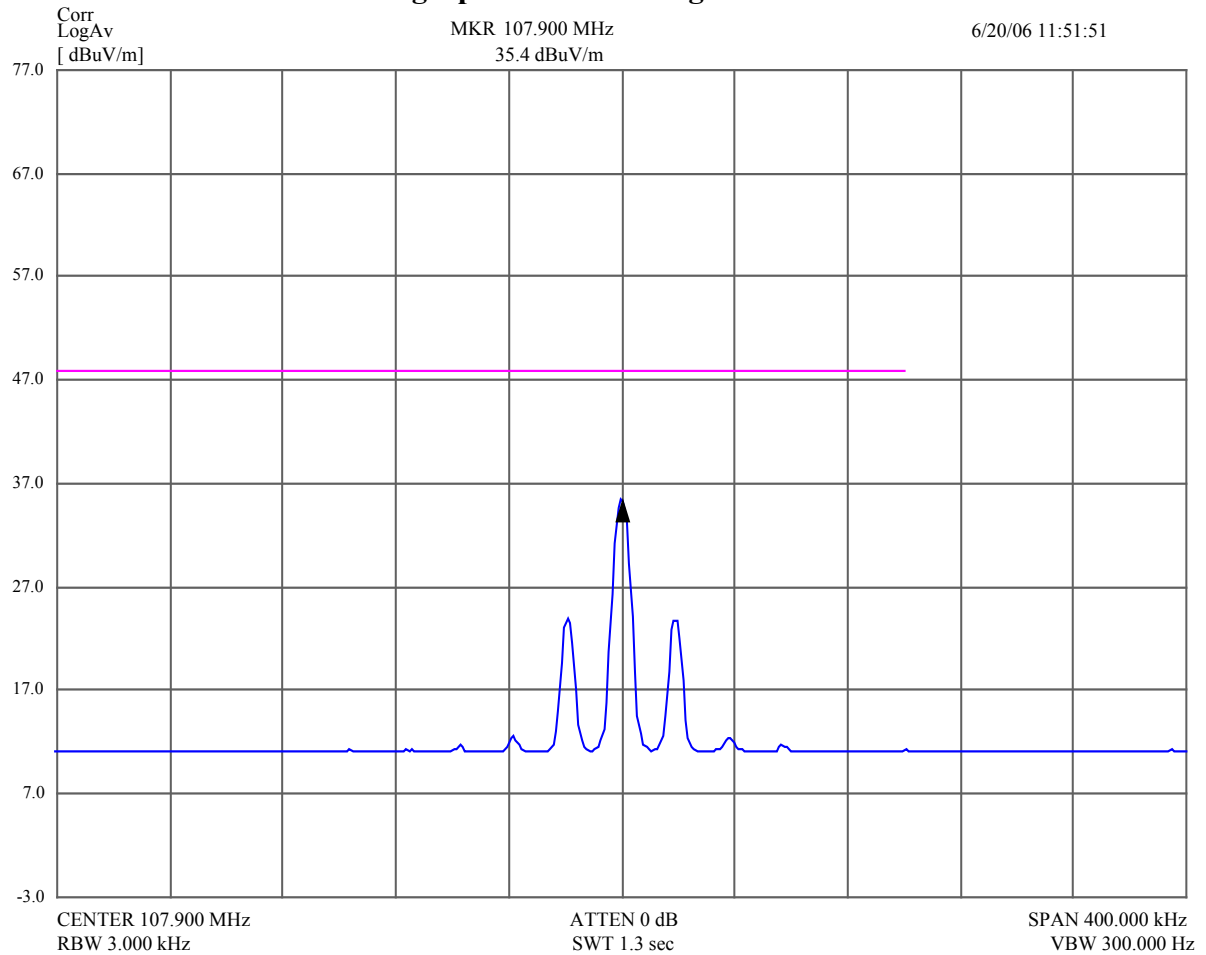
| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 107.881000       | 16.91          | 68.00              | -51.09          | Vert | 318       | 260          | PASS   |
| 107.902000       | 28.35          | 68.00              | -39.65          | Vert | 318       | 260          | PASS   |
| 107.920000       | 16.77          | 68.00              | -51.23          | Vert | 318       | 260          | PASS   |



### Average value data

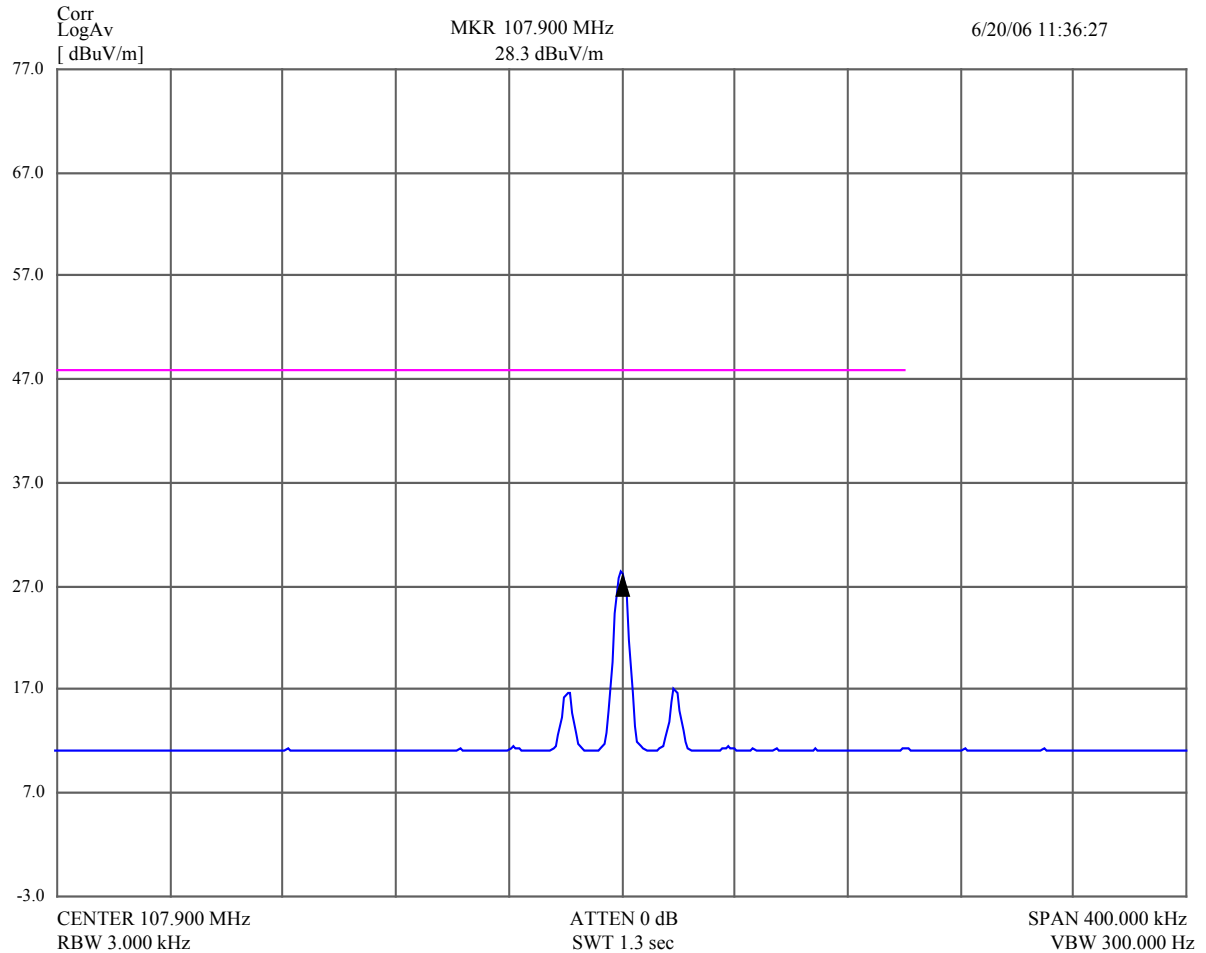
| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 107.881000       | 23.76         | 48.00             | -24.24           | Horz | 268       | 352          | PASS   |
| 107.900000       | 35.41         | 48.00             | -12.59           | Horz | 268       | 352          | PASS   |
| 107.920000       | 23.69         | 48.00             | -24.31           | Horz | 268       | 352          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 107.881000       | 16.66         | 48.00             | -31.34           | Vert | 318       | 260          | PASS   |
| 107.900000       | 28.32         | 48.00             | -19.68           | Vert | 318       | 260          | PASS   |
| 107.919000       | 17.05         | 48.00             | -30.95           | Vert | 318       | 260          | PASS   |

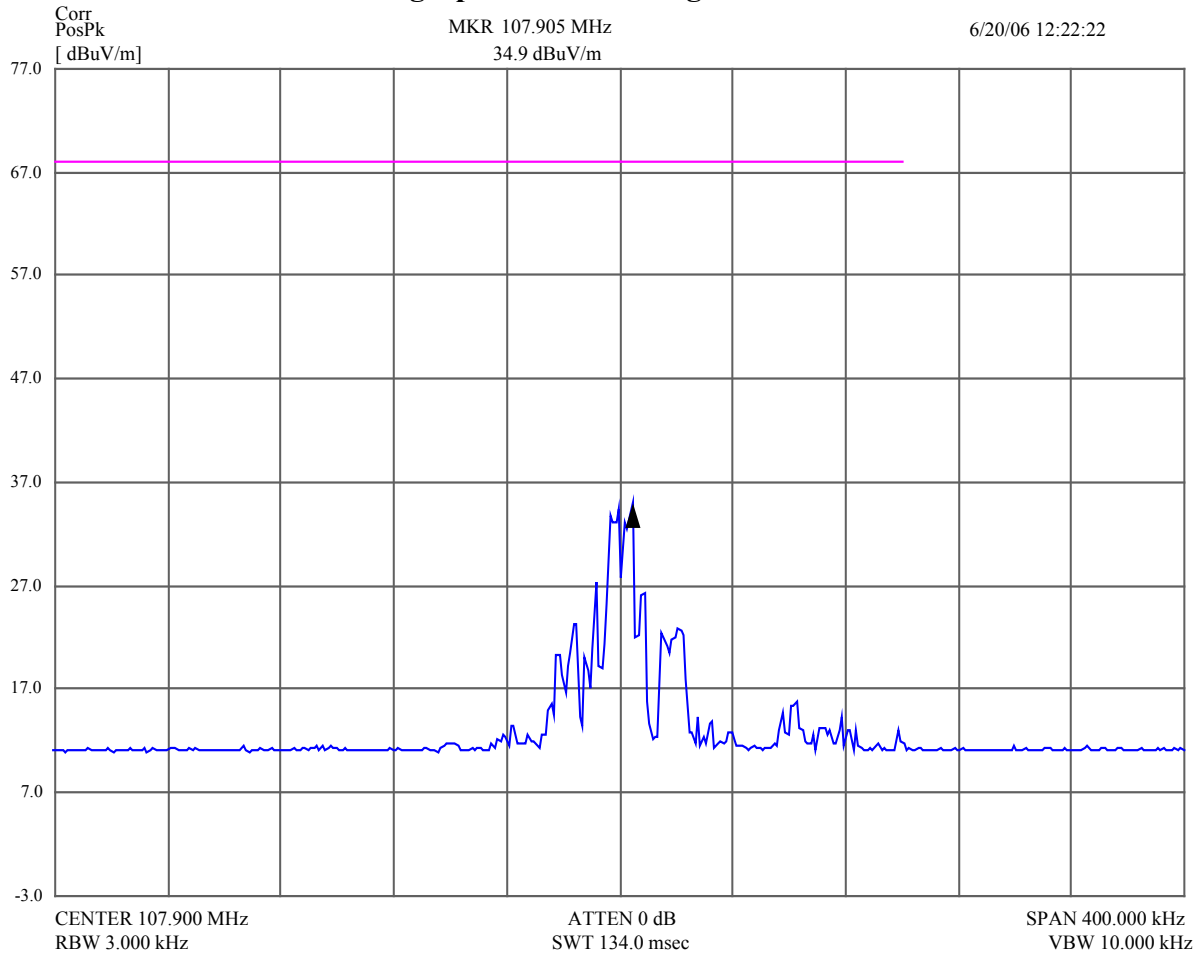
### Receiver graph of Field Strength of Emissions at 3 m



### 5.3.2 with modulation

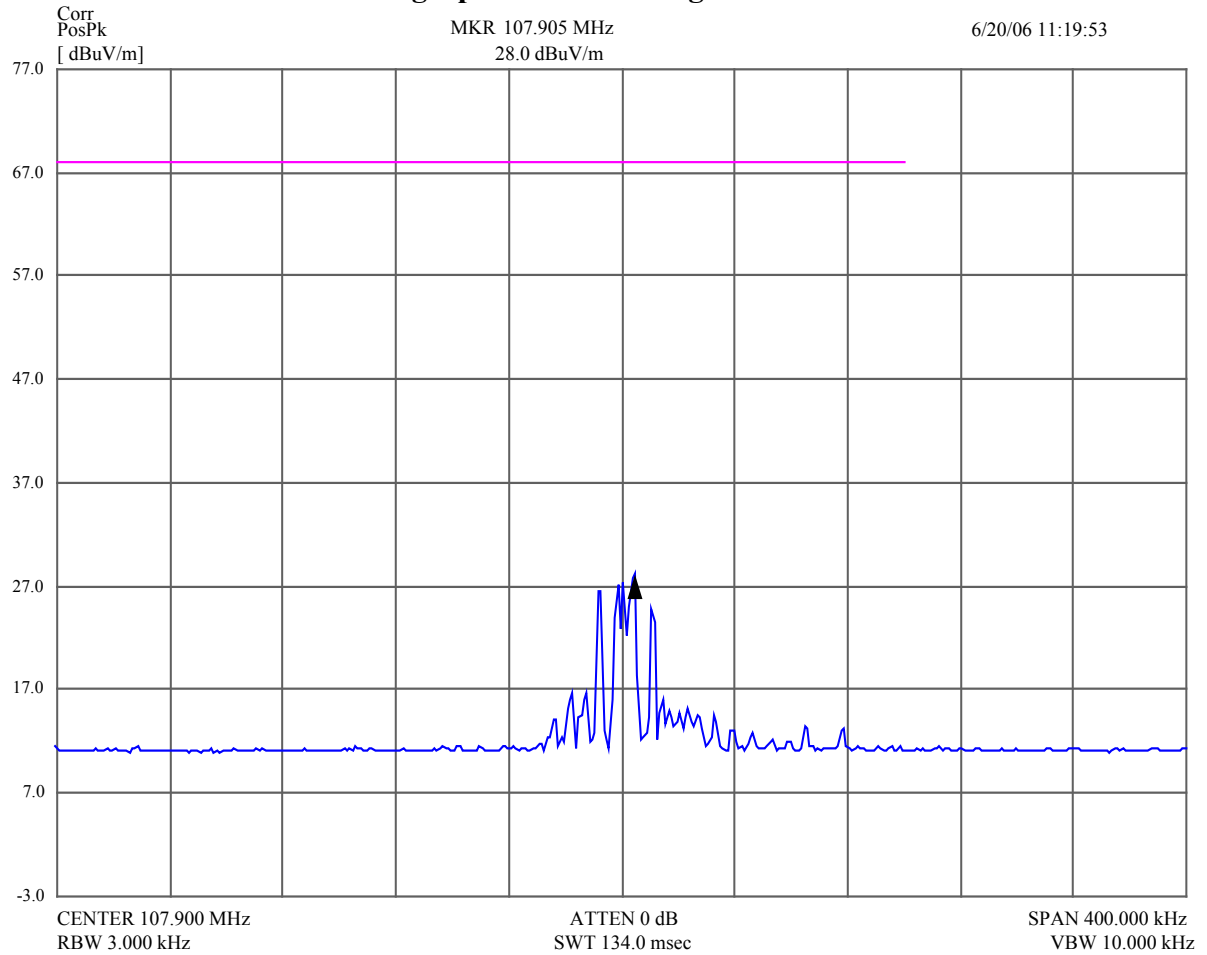
| Peak value data  |                |                    |                 |      |           |              |        |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
| 107.892000       | 27.20          | 68.00              | -40.80          | Horz | 268       | 352          | PASS   |
| 107.897000       | 33.67          | 68.00              | -34.33          | Horz | 268       | 352          | PASS   |
| 107.905000       | 34.94          | 68.00              | -33.06          | Horz | 268       | 352          | PASS   |
| 107.909000       | 26.11          | 68.00              | -41.89          | Horz | 268       | 352          | PASS   |

Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Peak<br>dBuV/m | Peak Lmt<br>dBuV/m | DelLim-Pk<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|----------------|--------------------|-----------------|------|-----------|--------------|--------|
| 107.883000       | 16.50          | 68.00              | -51.50          | Vert | 318       | 260          | PASS   |
| 107.892000       | 26.37          | 68.00              | -41.63          | Vert | 318       | 260          | PASS   |
| 107.905000       | 28.05          | 68.00              | -39.95          | Vert | 318       | 260          | PASS   |
| 107.912000       | 23.50          | 68.00              | -44.50          | Vert | 318       | 260          | PASS   |

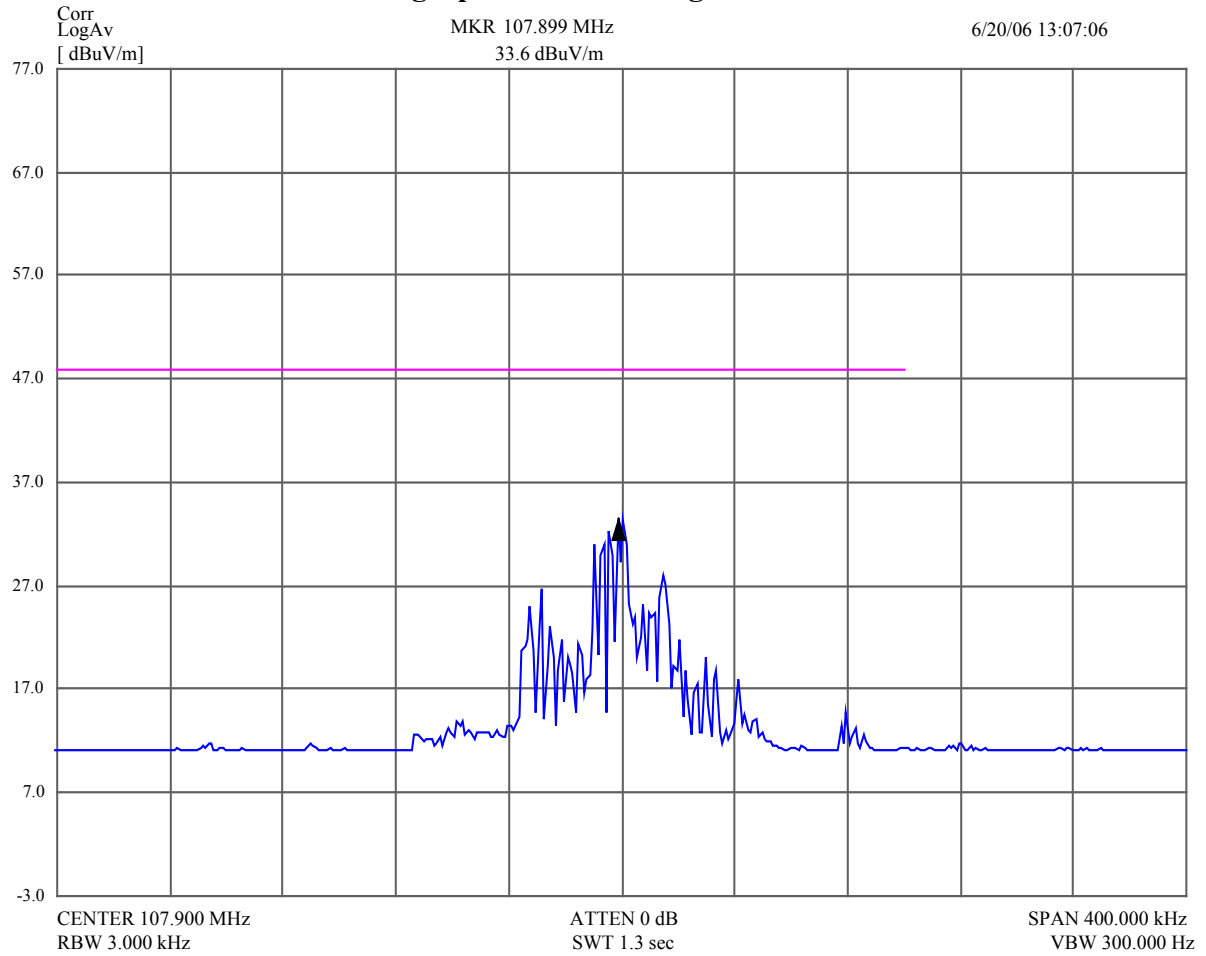
### Receiver graph of Field Strength of Emissions at 3 m



### Average value data

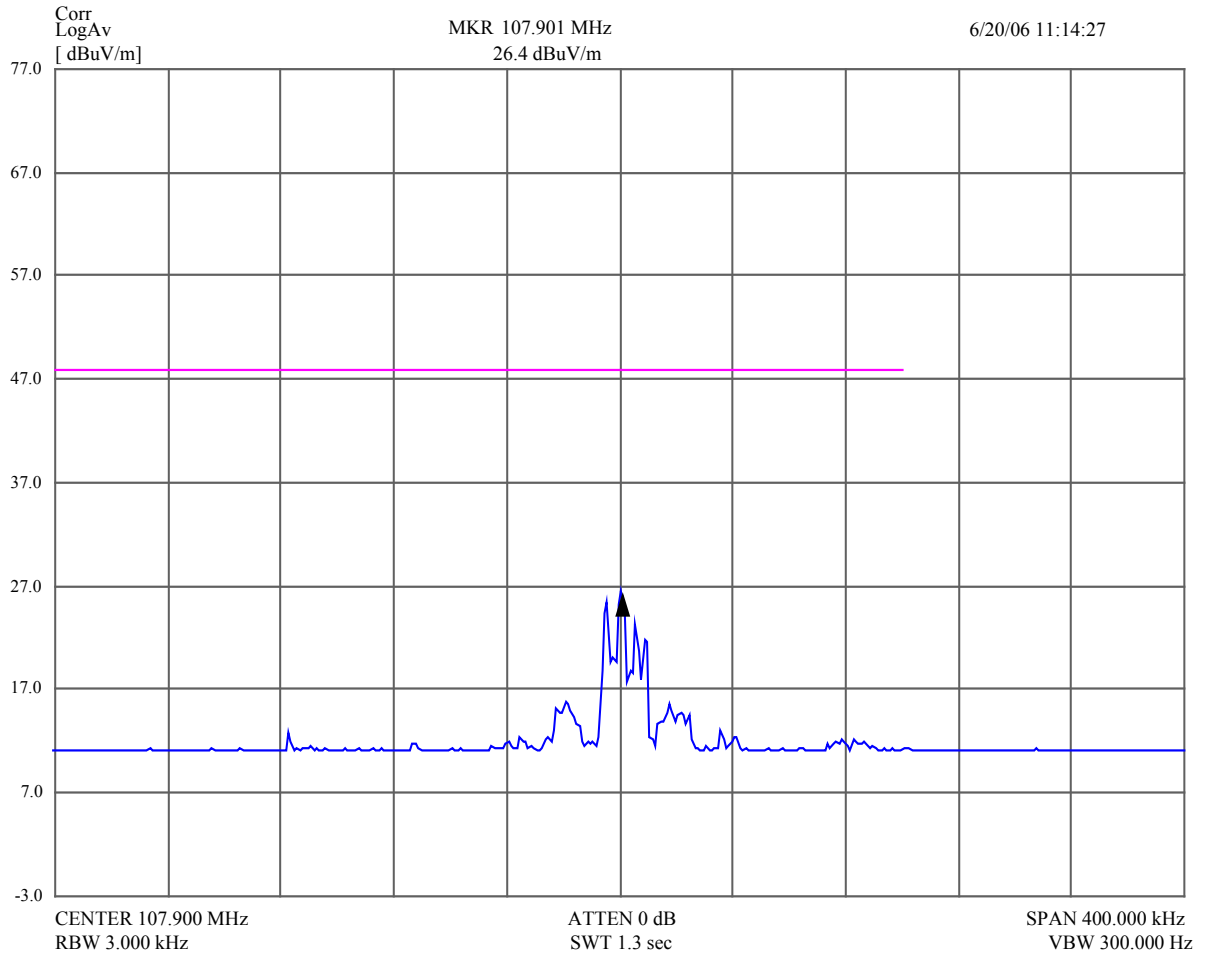
| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | Dellim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 107.872000       | 26.64         | 48.00             | -21.36           | Horz | 268       | 352          | PASS   |
| 107.891000       | 30.95         | 48.00             | -17.05           | Horz | 268       | 352          | PASS   |
| 107.899000       | 33.57         | 48.00             | -14.43           | Horz | 268       | 352          | PASS   |
| 107.915000       | 28.00         | 48.00             | -20.00           | Horz | 268       | 352          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



| Frequency<br>MHz | Avg<br>dBuV/m | Avg Lmt<br>dBuV/m | DelLim-Avg<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|---------------|-------------------|------------------|------|-----------|--------------|--------|
| 107.881000       | 15.69         | 48.00             | -32.31           | Vert | 318       | 260          | PASS   |
| 107.901000       | 26.37         | 48.00             | -21.63           | Vert | 318       | 260          | PASS   |
| 107.909000       | 21.67         | 48.00             | -26.33           | Vert | 318       | 260          | PASS   |
| 107.918000       | 15.55         | 48.00             | -32.45           | Vert | 318       | 260          | PASS   |

### Receiver graph of Field Strength of Emissions at 3 m



#### 5.4 Photographs of Test Set-Up



## 6.0 Radiated Emissions.

Test Requirements: FCC Part 15 : Subclause 15.209  
Test Method: ANSI C63.4: 2003  
**Limit :** FCC Part 15 : Subclause 15.209  
**Mode of operation:** normal

The test facility consists of a shielded semi-anechoic chamber with attached shielded control room. The semi-anechoic chamber is approximately 18 feet wide by 28 feet long by 19 feet high. A hybrid absorber combines high performance anechoic polyurethane foam with a ferrite tile base to achieve high levels of absorption and power dissipation capability.

The EUT had been placed at the 0.8 m height on the non-conducting table. Transmitter had been turned ON without modulation and worked at the frequencies of the selected channels.

All data was obtained via a HP 85876A EMI measurement software package using an HP 85462A Receiver which is compliant to CISPR 16. The EUT was configured in various geometric patterns to find the geometric configuration and EUT attitude that produced the largest RF power.

After determination of the maximum emissions configuration the distance of the EUT to the scanning antenna was set to 3 meters.

At each of three selected channels 88.1 MHz, 98.1MHz, and 107.9 MHz radiated emissions had been measured.

**Measurements expanded uncertainty equals 3.7 dB with 95% confidence level.**

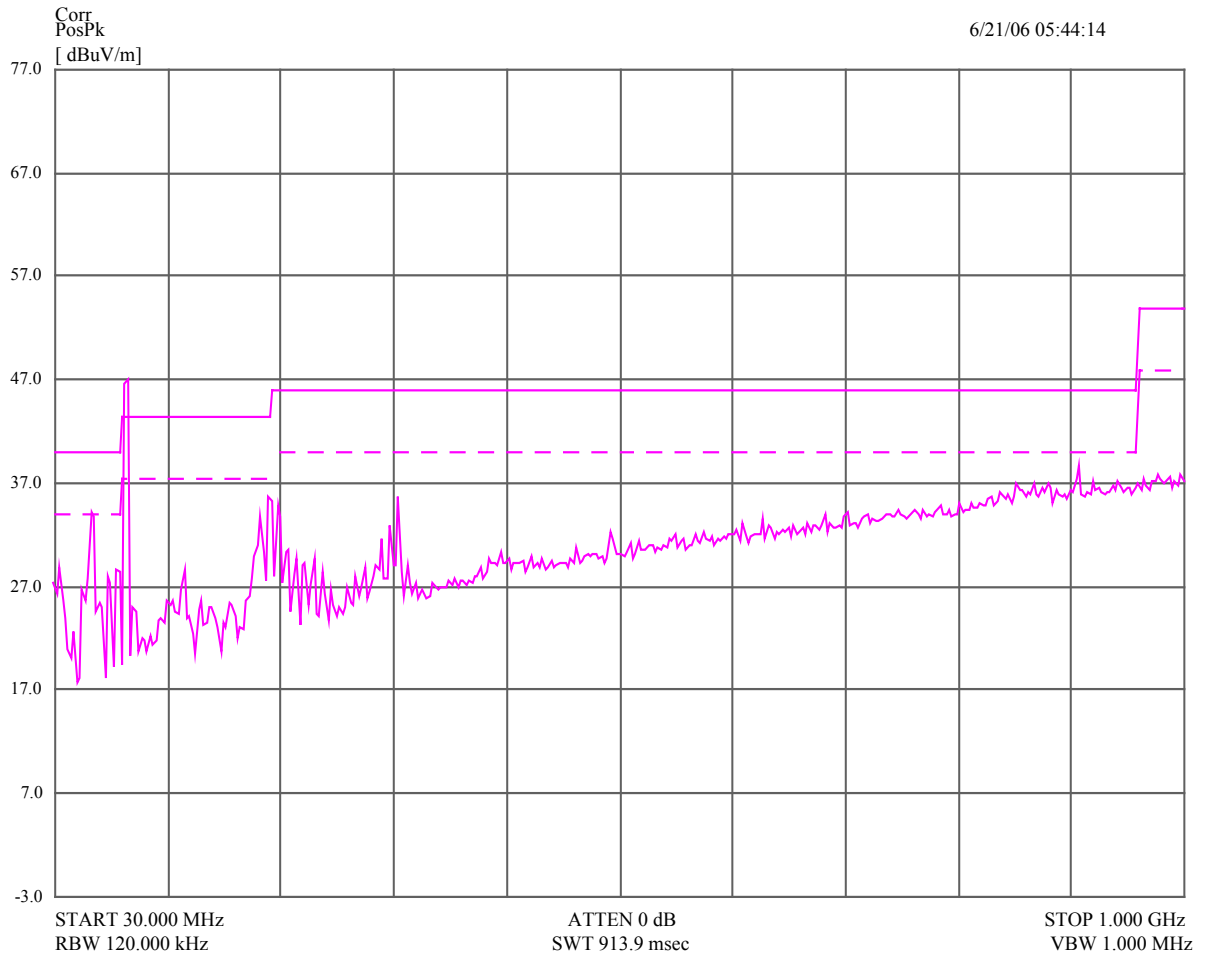
**Field Level (dBuV)=Measured Value (dBuV)+Antenna Factor (dB)+Cable Loss (dB)**

## 6.1. Channel 88.1 MHz

| Frequency<br>MHz | QP<br>dBuV/m | QP Lmt<br>dBuV/m | DelLim-QP<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|--------------|------------------|-----------------|------|-----------|--------------|--------|
| 51.596248        | 27.85        | 40.00            | -12.15          | Horz | 347       | 8            | PASS   |
| 58.980500        | 35.21        | 40.00            | -4.79           | Horz | 361       | 8            | PASS   |
| 58.996752        | 27.73        | 40.00            | -12.27          | Vert | 152       | 91           | PASS   |
| 202.750000       | 31.34        | 43.50            | -12.16          | Horz | 144       | 322          | PASS   |
| 210.111744       | 25.14        | 43.50            | -18.36          | Vert | 94        | 282          | PASS   |
| 210.122496       | 35.80        | 43.50            | -7.70           | Horz | 144       | 321          | PASS   |
| 217.484992       | 35.49        | 46.00            | -10.51          | Horz | 151       | 138          | PASS   |
| 313.331264       | 29.45        | 46.00            | -16.55          | Horz | 95        | 312          | PASS   |
| 319.997504       | 33.62        | 46.00            | -12.38          | Horz | 112       | 313          | PASS   |
| 639.994496       | 33.00        | 46.00            | -13.00          | Vert | 191       | 300          | PASS   |

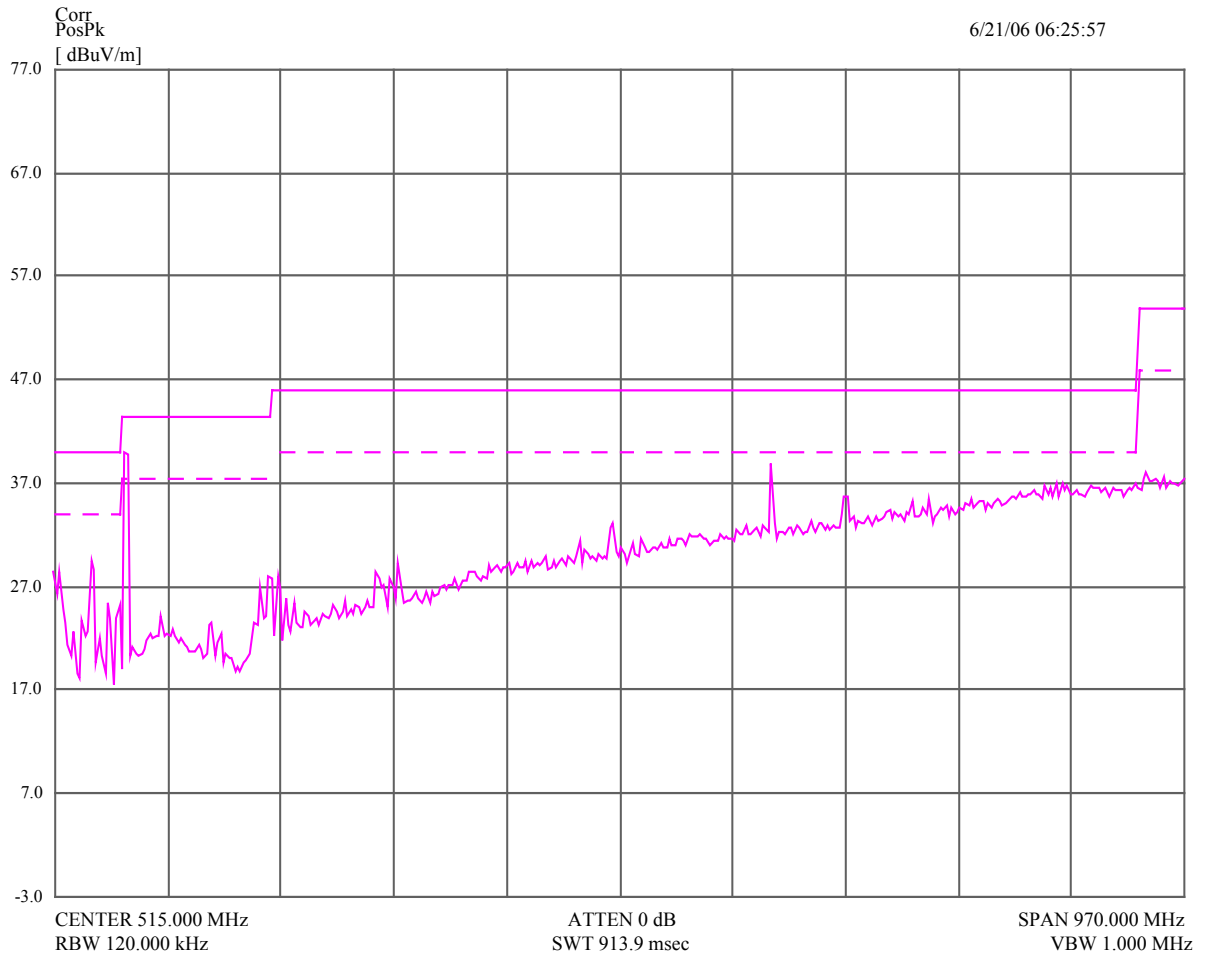
## Receiver graph of Radiated Emissions at 3 m

Horizontal



Vertical

6/21/06 06:25:57

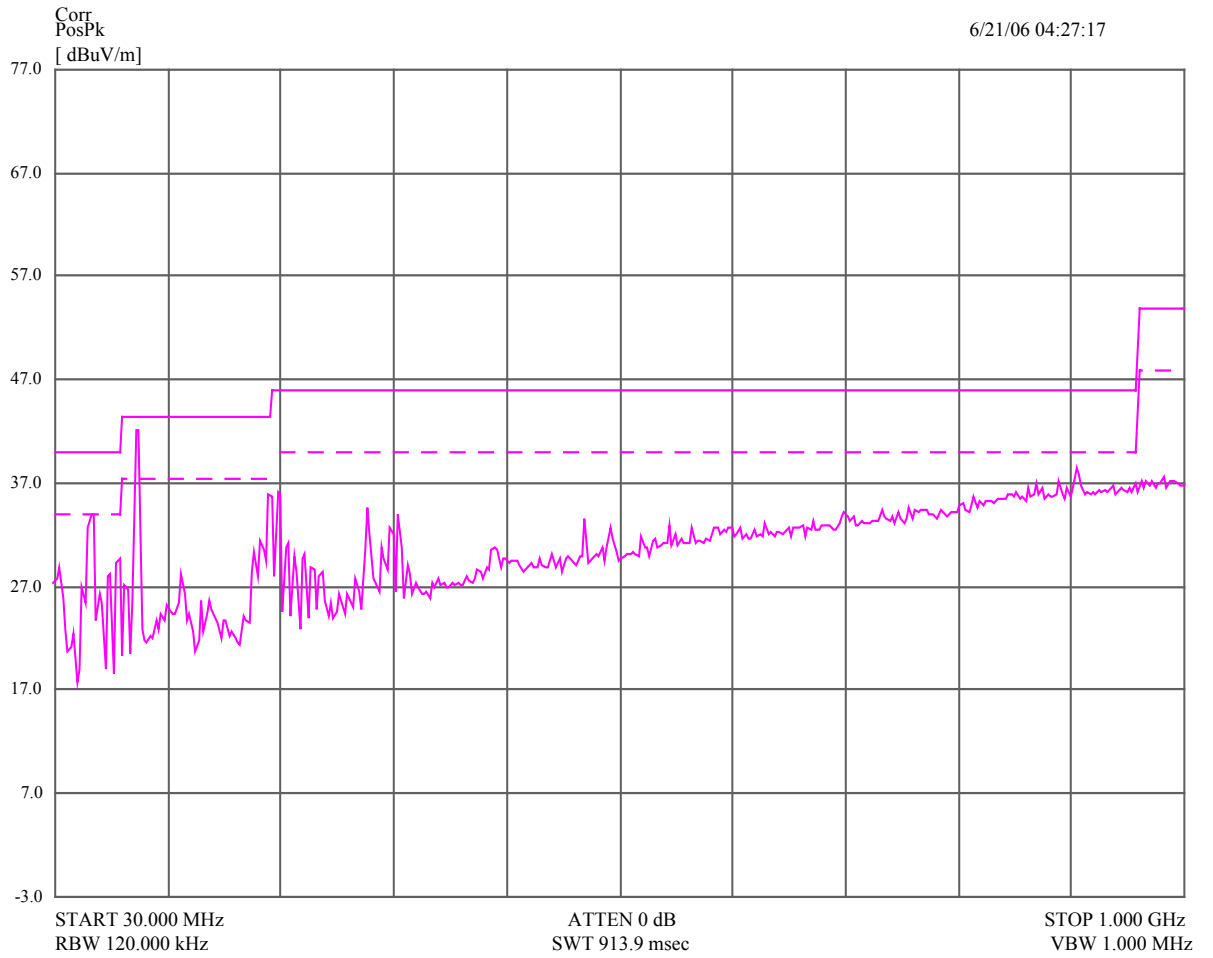


## 6.2. Channel 98.1 MHz

| Frequency<br>MHz | QP<br>dBuV/m | QP Lmt<br>dBuV/m | DelLim-QP<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|--------------|------------------|-----------------|------|-----------|--------------|--------|
| 51.607248        | 27.99        | 40.00            | -12.01          | Horz | 361       | 8            | PASS   |
| 58.979752        | 35.23        | 40.00            | -4.77           | Horz | 361       | 8            | PASS   |
| 58.995500        | 29.45        | 40.00            | -10.55          | Vert | 247       | 71           | PASS   |
| 210.125744       | 35.82        | 43.50            | -7.68           | Horz | 161       | 320          | PASS   |
| 217.497504       | 35.47        | 46.00            | -10.53          | Horz | 140       | 131          | PASS   |
| 294.288736       | 31.88        | 46.00            | -14.12          | Horz | 106       | 310          | PASS   |
| 319.997504       | 35.38        | 46.00            | -10.62          | Horz | 111       | 126          | PASS   |
| 320.018752       | 26.58        | 46.00            | -19.42          | Vert | 95        | 84           | PASS   |
| 639.992512       | 31.51        | 46.00            | -14.49          | Vert | 240       | 253          | PASS   |

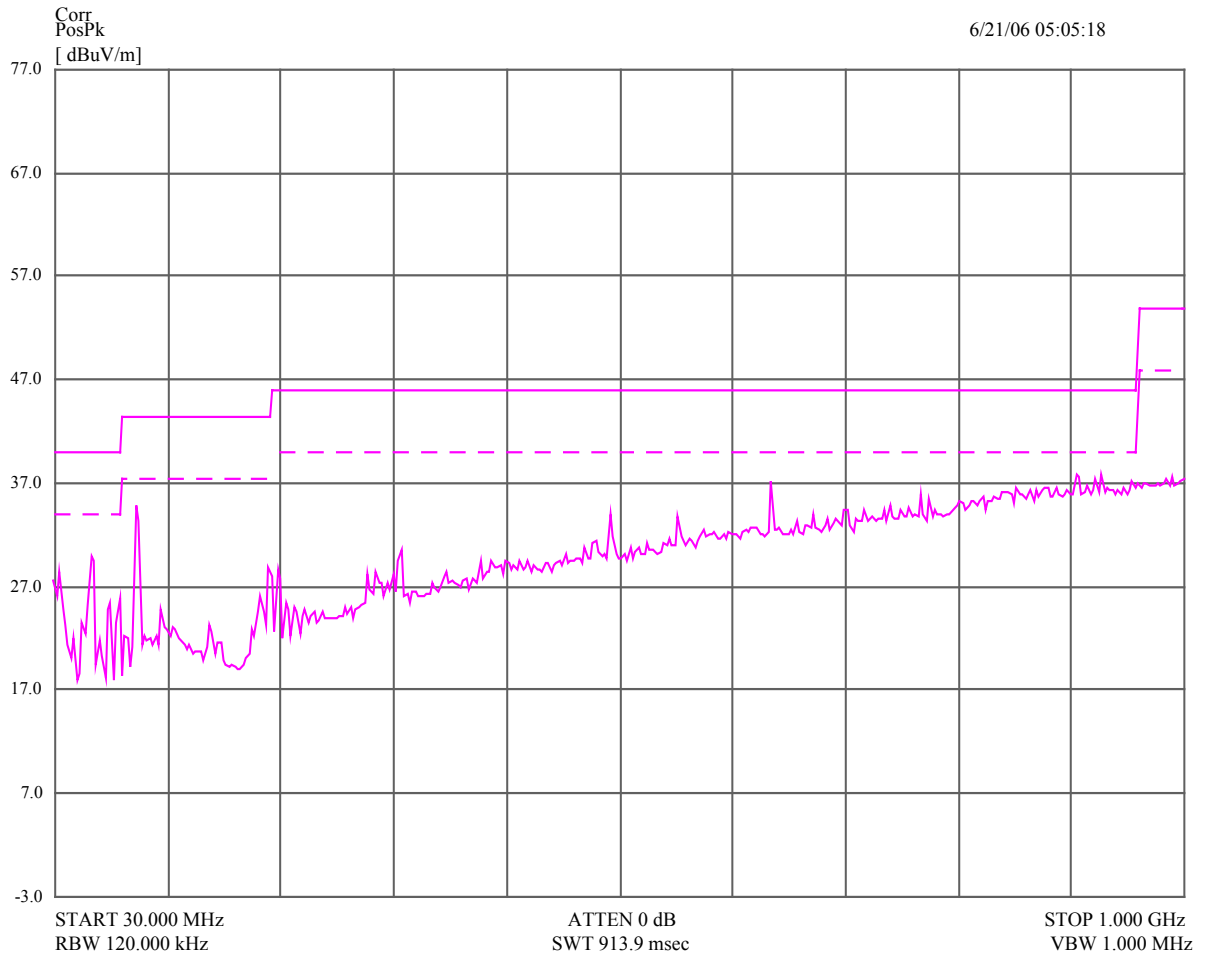
## Receiver graph of Radiated Emissions at 3 m

Horizontal



Vertical

6/21/06 05:05:18

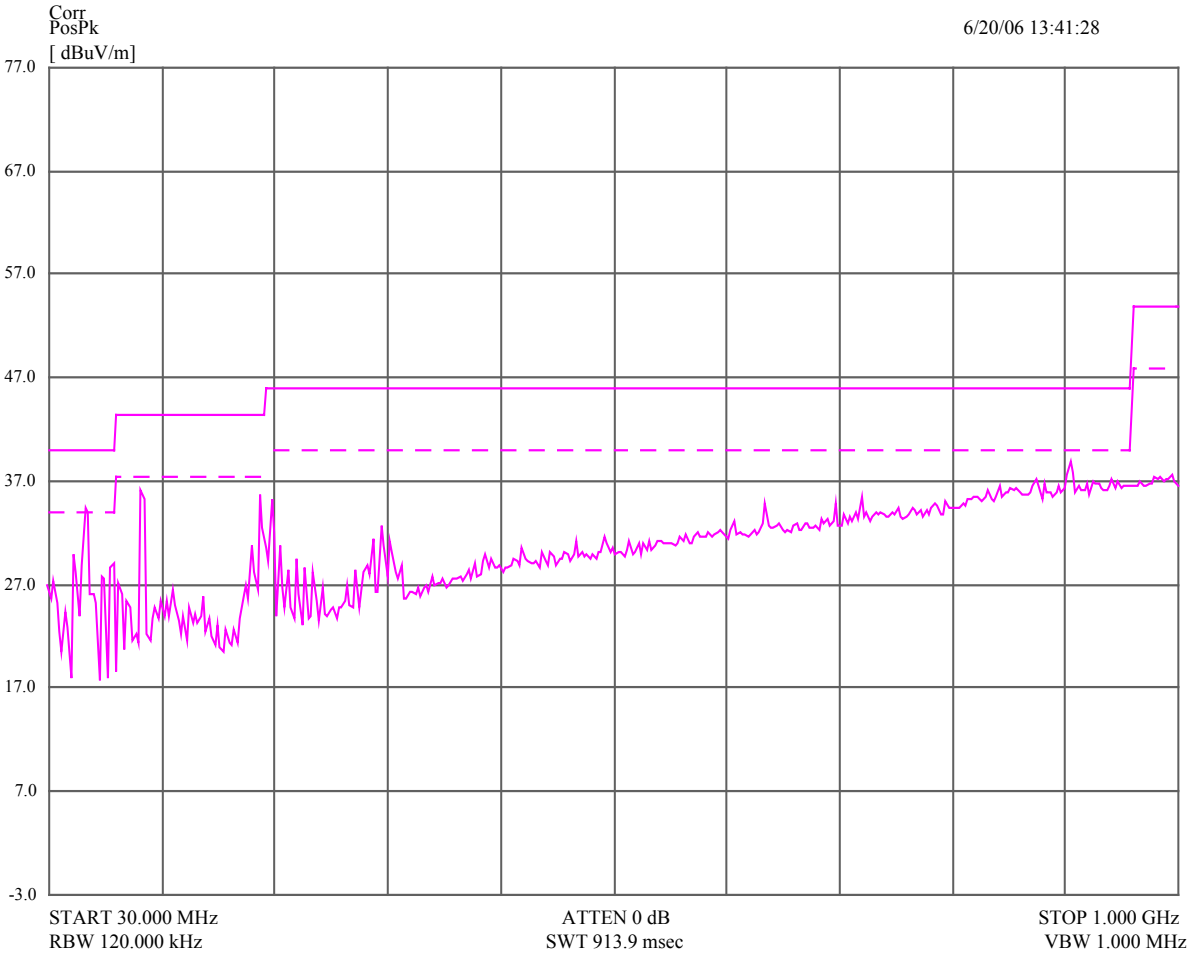


### 6.3. Channel 107.9 MHz

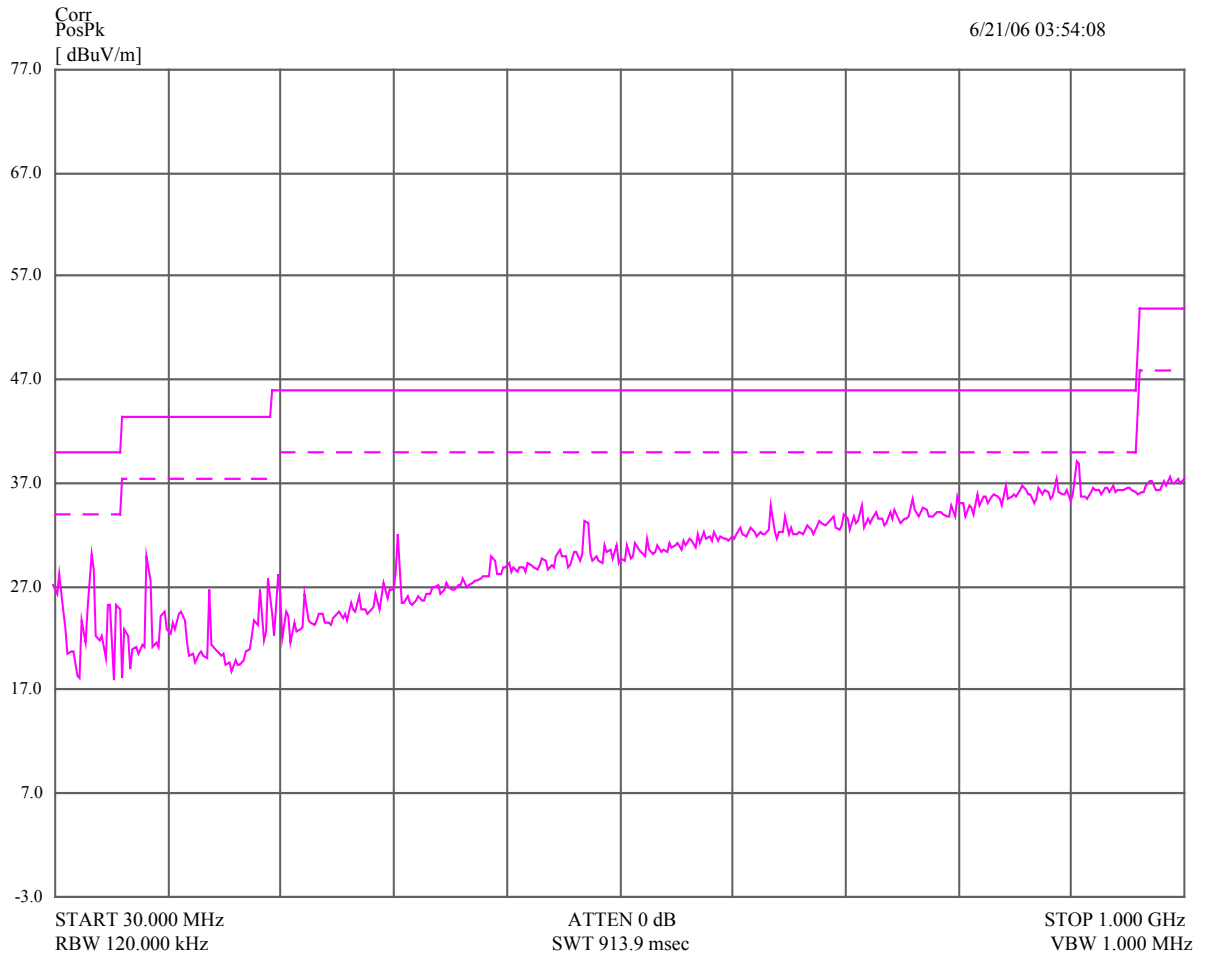
| Frequency<br>MHz | QP<br>dBuV/m | QP Lmt<br>dBuV/m | DelLim-QP<br>dB | Pol  | Hgt<br>cm | Angle<br>deg | Status |
|------------------|--------------|------------------|-----------------|------|-----------|--------------|--------|
| 51.595248        | 27.94        | 40.00            | -12.06          | Horz | 361       | 8            | PASS   |
| 58.968000        | 35.30        | 40.00            | -4.70           | Horz | 359       | 8            | PASS   |
| 58.982000        | 29.45        | 40.00            | -10.55          | Vert | 295       | 287          | PASS   |
| 73.713752        | 25.53        | 40.00            | -14.47          | Horz | 361       | 8            | PASS   |
| 202.737504       | 31.06        | 43.50            | -12.44          | Horz | 156       | 315          | PASS   |
| 210.111248       | 35.75        | 43.50            | -7.75           | Horz | 151       | 322          | PASS   |
| 217.483744       | 35.51        | 46.00            | -10.49          | Horz | 160       | 128          | PASS   |
| 319.994240       | 39.24        | 46.00            | -6.76           | Horz | 95        | 121          | PASS   |
| 320.009248       | 30.44        | 46.00            | -15.56          | Vert | 151       | 50           | PASS   |

### Receiver graph of Radiated Emissions at 3 m

Horizontal



Vertical



#### 6.4 Photographs of Test Set-Up



## 6.0 Occupied channel bandwidth

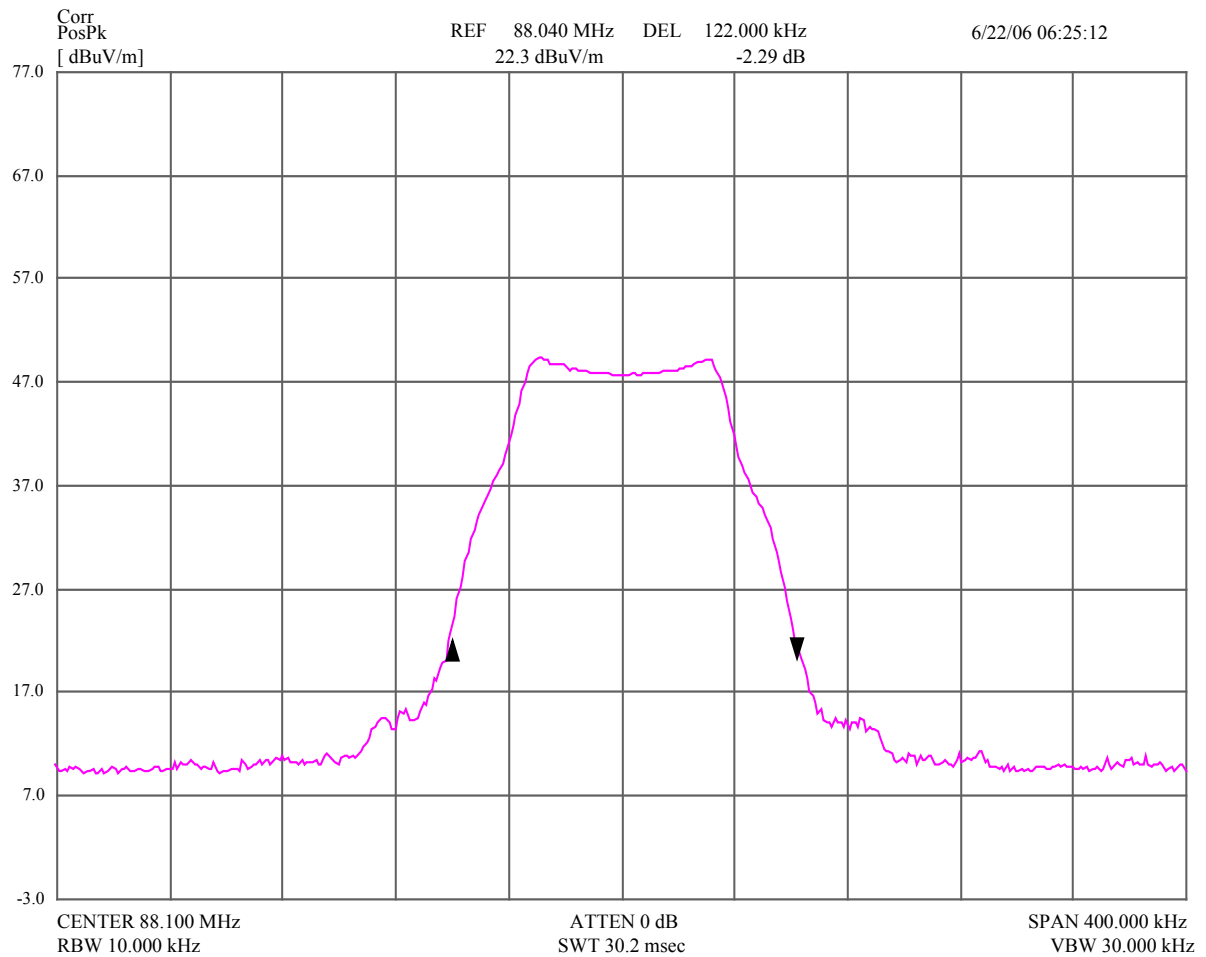
|                    |                                |
|--------------------|--------------------------------|
| Test Requirements: | FCC Part 15 : Subclause 15.239 |
| Test Method:       | ANSI C63.4: 2003               |
| FCC Part 2 :       | Subclause 2.1049 © (1)         |
| Limit :            | 200 kHz                        |

The channel Bandwidth (BW) is defined as the minimum declared bandwidth within which the transmitter's necessary bandwidth can be contained.

1. The Transmitter was adjusted to work at the selected channels –88.1 MHz, 98.1 MHz and 107.9 MHz. All measurements were conducted by the HP 85462A Spectrum Analyzer;
2. The test Signal generator HP651B was connected to the audio input of the EUT. The fundamental frequency is modulated by 1.3 kHz sinewave with input level equals to the limiting threshold 720mV p-p.
3. The Channel BW was measured at an amplitude level reduced from the reference level by the 26 dB. :
4. For the setup, the additional wires were directly connected at the input of EUT and the filters were added before the input of EUT to isolate the external noises from the signal. Please see the detail photo for the setup.

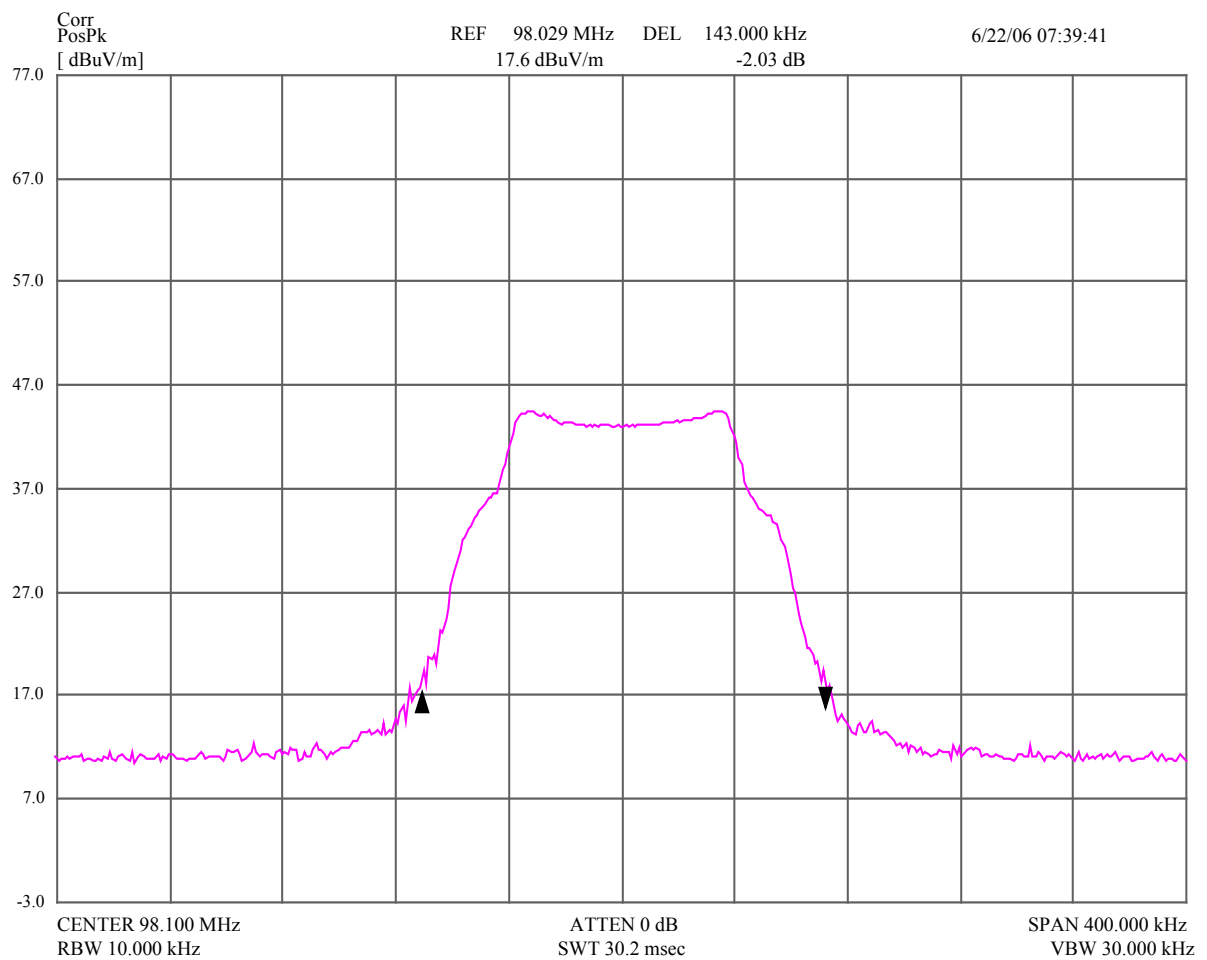
**Measurements expanded uncertainty equals 3.7 dB with 95% confidence level.**

### 7.1. Channel 88.1 MHz



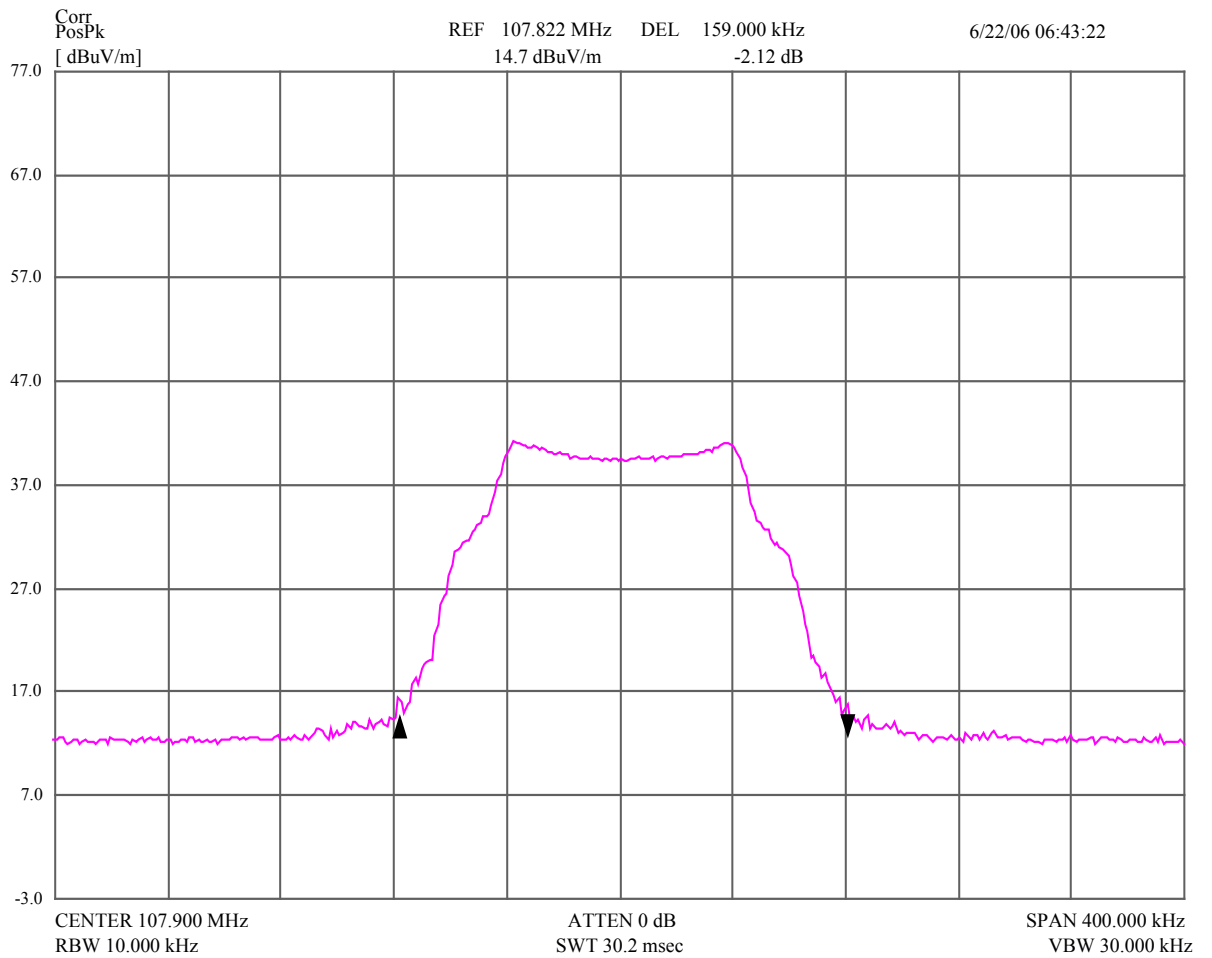
**The plot shows the 26 dB bandwidth equals 122 kHz**

## 7.2. Channel 98.1 MHz



**The plot shows the 26 dB bandwidth equals 143 kHz**

### 7.3. Channel 107.9 MHz



The plot shows the 26 dB bandwidth equals 159 kHz

#### 7.4 Photographs of Test Set-Up



Appendix A.

United States Department of Commerce  
National Institute of Standards and Technology



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**Certificate of Accreditation to ISO/IEC 17025:1999**

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NVLAP LAB CODE: 200413-0

**JMR Compliance Engineering**

Chatsworth, CA

*is recognized by the National Voluntary Laboratory Accreditation Program for conformance with criteria set forth in  
NIST Handbook 150:2001 and all requirements of ISO/IEC 17025:1999.  
Accreditation is granted for specific services, listed on the Scope of Accreditation, for:*

**ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**

2006-04-01 through 2007-03-31

*Effective dates*



A handwritten signature in cursive script, reading "C. D. Larson".

*For the National Institute of Standards and Technology*