FCC Part 74 Subpart H
EMI TEST REPORT

of

E.U.T. : Wireless Microphone Systems
FCC ID. : M5X-707HE
MODEL : ACT-707HE
Working Frequency : 614MHz-806MHz

for

APPLICANT : MIPRO Electronics Co., Ltd.
ADDRESS : 814 Pei-Kang Road, Chia-Yi, Taiwan

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 34, LIN 5, DING FU TSUN, LINKOU HSIANG
TAIPEI HSIEN, TAIWAN, R.O.C.

Tel:(02)226023052 Fax:(02)26010910
http://www.etc.org.tw ; e-mail : etcemi@seed.net.tw

Report Number : ET91R-12-074-03

TEST REPORT CIRTIFICATION

Applicant	: MIPRO Electronics Co., Ltd.. 814 Pei-Kang Road, Chia-Yi, Taiwan
Manufacturer	: MIPRO Electronics Co., Ltd.. 814 Pei-Kang Road, Chia-Yi, Taiwan
Description of EUT	:

a) Type of EUT	: Wireless Microphone Systems
b) Trade Name	: MIPRO
c) Model No.	: ACT-707HE
d) FCC ID	: M5X-707HE
e) Working Frequency	: 614MHz-806MHz
f) Power Supply	: DC 3V Batteries

Regulation Applied : FCC Rules and Regulations Part 74 Subpart H (2001)

I HEREBY CERTIFY THAT; The data shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Issued Date : Jan. 28, 2003

Test Engineer : Vincent Chang

(Vincent Chang)

Approve & Authorized Signer : Will Yauo

Will Yauo, Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

Table of Contents Page

1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT	: Wireless Microphone Systems
b) Trade Name	: MIPRO
c) Model No.	: ACT-707HE
d) FCC ID	: M5X-707HE
e) Working Frequency	: 614MHz-806MHz
f) Power Supply	: DC 3V Batteries

1.2 Characteristics of Device:

1. Operating Frequency: 614MHz -806MHz
2. When microphone is switched on:
   When the power is switched on, the indicator will flash briefly indicating normal operation.
3. During Usage:
   The AF LED indicator on the receiver will illuminate according to the audio signal strength from the microphone.
4. When the microphone is not in use:
   Make sure that you turn off the microphone after use to extend the battery life. Remove the battery from the battery compartment if microphone is not to be used again for some time. If a rechargeable battery was used, take it out and recharge it .

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4. and section 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, and 2.1055 of Part 2 of CFR 47

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No. 34, Lin 5, Ding Fu Tsun, Linkou Hsiang, Taipei Hsien, Taiwan, R.O.C.

This site has been fully described in a report submitted to your office, and accepted in a letter dated Feb. 10, 2000.

2. REQUIREMENTS OF PROVISIONS

2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Frequencies Available

According to sec. 74.802 of Part 74, the following frequencies are available for low power auxiliary station :

Frequencies (MHz)

26.100-26.480	455.000-456.000
54.000-72.000	470.000-488.000
76.000-88.000	488.000-494.000
161.625-161.775	614.000-806.000
174.000-216.000	450.000-451.000
944.000-952.000	

2.3 Requirements for Radio Equipment on Certification

(1) RF Output Power

For transmitters, the power output shall be measured at the RF output terminals.

(2) Modulation Characteristics

For Voice Modulated Communication Equipment, a curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.

(3) Occupied Bandwidth

For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

(4) Spurious Emissions at Antenna Terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminal when properly loaded with a suitable artificial antenna.

(5) Field Strength of Spurious Emissions

Measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation.

(6) Frequencies Tolerance

a) The frequency stability shall be measured with variation of ambient temperature. b) The frequency stability shall be measured with variation of primary supply voltage.

2.4 Labeling Requirement

Each equipment for which a type acceptance application is filed on or after May 1,1981, shall bear an identification plate or label pursuant to §2.925（Identification of equipment） and §2.926（FCC identifier）.

3. OUTPUT POWER MEASUREMENT

3.1 Provision Applicable

According to §74.861(e)(1)(i), the output power shall not exceed 50 milliwatts.

3.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively, adjusting the input voltage to produce the maximum power as measured in chapter 3.
2. Adjust the analyzer for each frequency measured in chapter 6 on a 1 MHz frequency span and 1MHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360°, and record the highest value indicated on spectrum analyzer as reference value.
4. Repeat step 3 until all frequencies need to be measured were complete.
5. Repeat step 4 with search antenna in vertical polarized orientations.
6. Replace the EUT with a tuned dipole antenna (horn antenna for above 1 GHz) relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a identical value derived from step 3 on spectrum analyzer. Record this value for result calculated.
7. Repeat step 6 until all frequencies need to be measured were complete.
8. Repeat step 7 with both dipole antenna (horn antenna for above 1 GHz) and search antenna in vertical polarized orientations.

Figure 2 : Frequencies measured below 1 GHz configuration

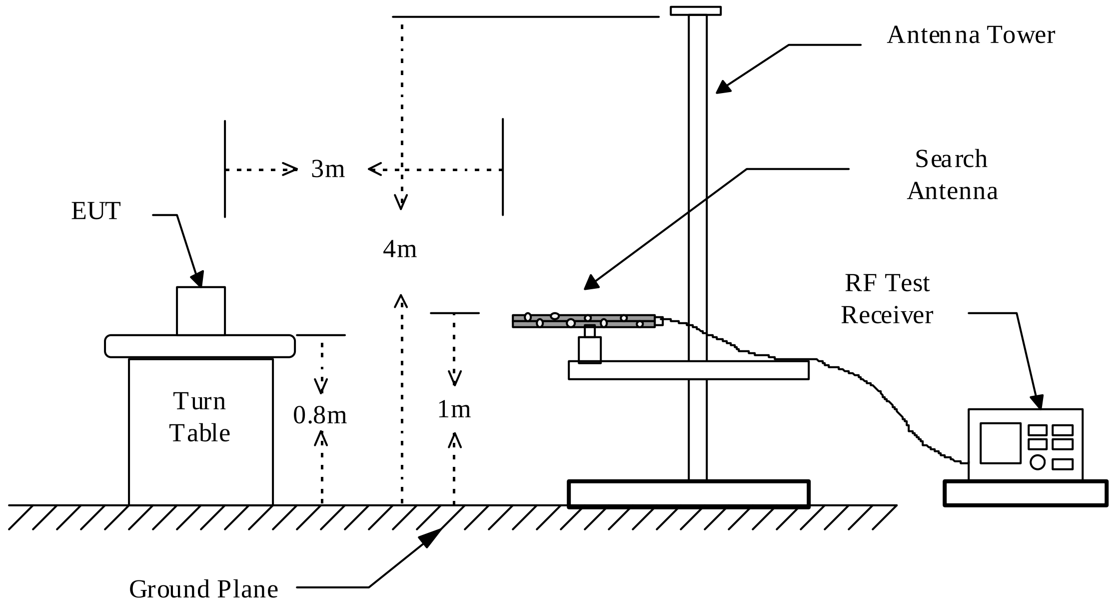
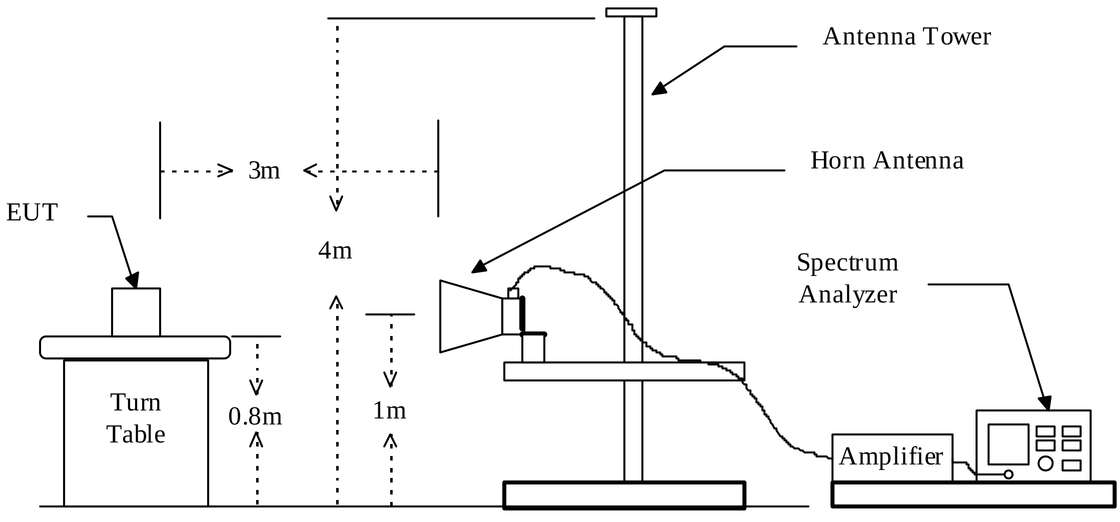


Figure 1 : Frequencies measured above 1 GHz configuration



3.3 Test Data

A. Channel Low (ERP)

Operated mode : 6A Test Date : Dec. 21, 2002
Temperature : 25 ℃ Humidity : 65 %

Frequency (MHz)	Meter Reading (dB μV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
625.2511	85.0	14.4	2.3	---	12.1	16.2	50.0

B. Channel Mid (ERP)

Operated mode : 7C Test Date : Dec. 21, 2002
Temperature : 25 ℃ Humidity : 65 %

Frequency (MHz)	Meter Reading (dB μV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
740.248	85.3	14	2.4	---	11.2	13.2	50.0

C. Channel High (ERP)

Operated mode : 8A Test Date : Dec. 21, 2002
Temperature : 25 ℃ Humidity : 65 %

Frequency (MHz)	Meter Reading (dB μV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
801.979	79.8	12.2	2.6	---	9.6	9.8	50.0

Note: For measured frequency below 1GHz, a tuned dipole antenna is used.

3.4 Result Calculation

Result calculation is as following :

Result ＝ SG Reading ＋Cable Loss ＋Antenna Gain Corrected

Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.

$$mW = \log^{-1}\left[\frac{Result(dBm)}{10}\right]$$

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
EMI Test Receiver	R&S	ESBI	05/25/2003
Plotter	HP	7440A	N/A

4. MODULATION CHARACTERISTICS

4.1 Provisions Applicable

According to §2.1047 (a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be measured.

4.2 Measurement Method

A) Frequency response of audio circuits

1. Position the EUT as shown in figure 3.

2. Vary the modulating frequency from 100 Hz to 5000 Hz with varying the input voltage from 0V to maximum permitted input voltage, and observe the change in output.

B) Modulation Limit

1. Position the EUT as shown in figure 3, adjust the audio input frequency to 100 Hz and the input level from 0V to maximum permitted input voltage with recording each carrier frequency deviation responding to respective input level.

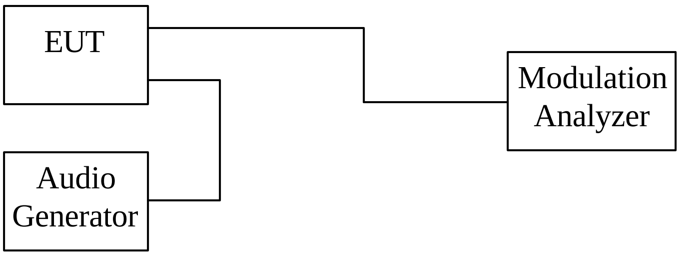
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

C) Frequency response of all circuits

1. Position the EUT as shown in figure 3.

2. Vary the modulating frequency from 100 Hz to 15000 Hz with constant input voltage (derived from 5.4(a) of this test report), and observe the change in output.

Figure 3 : Modulation characteristic measurement configuration

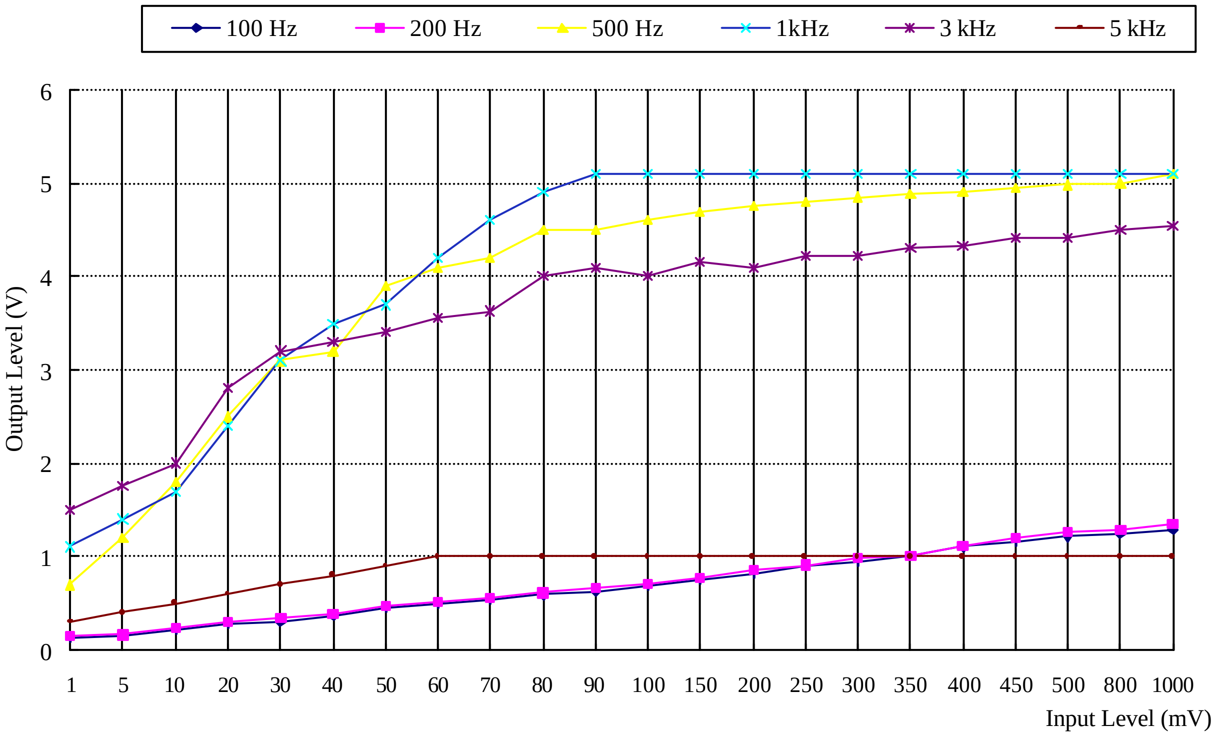


4.3 Measurement Instrument

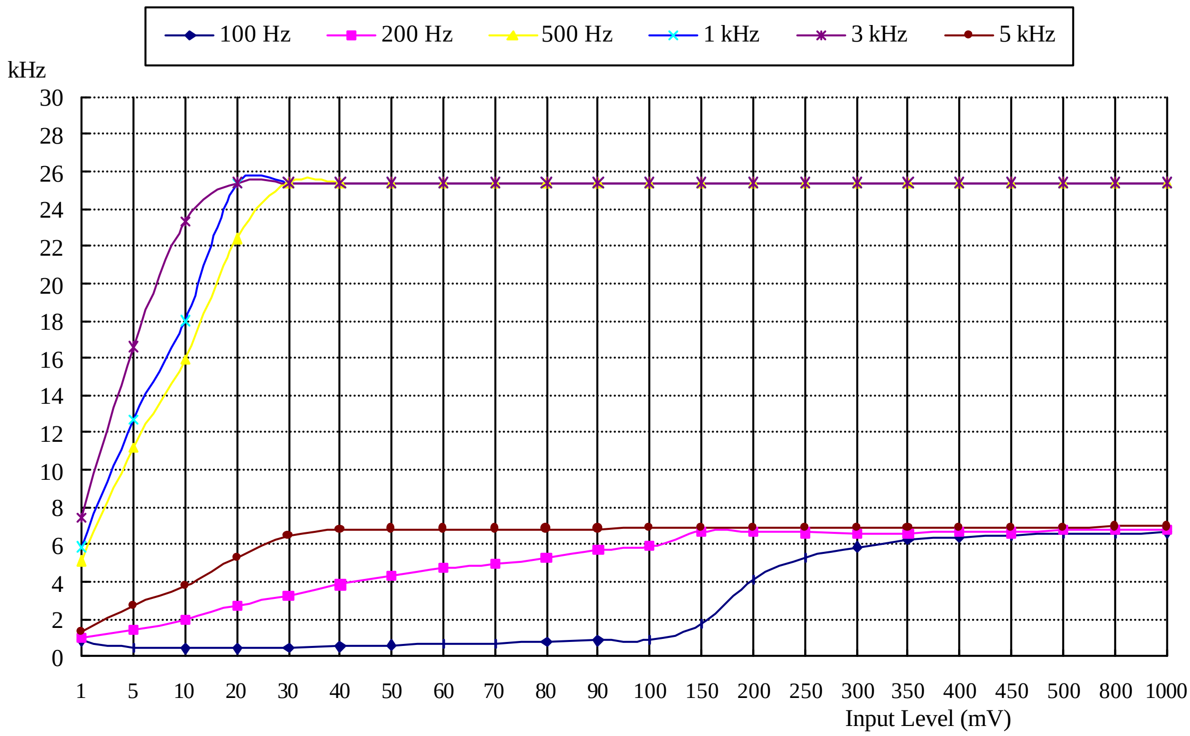
Equipment	Manufacturer	Model No.	Next Cal. Date
Modulation Analyzer	Hewlett-Packard	8901A	12/01/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Oscillscope	Lecroy	9350A	05/26/2003

4.4 Measurement Result

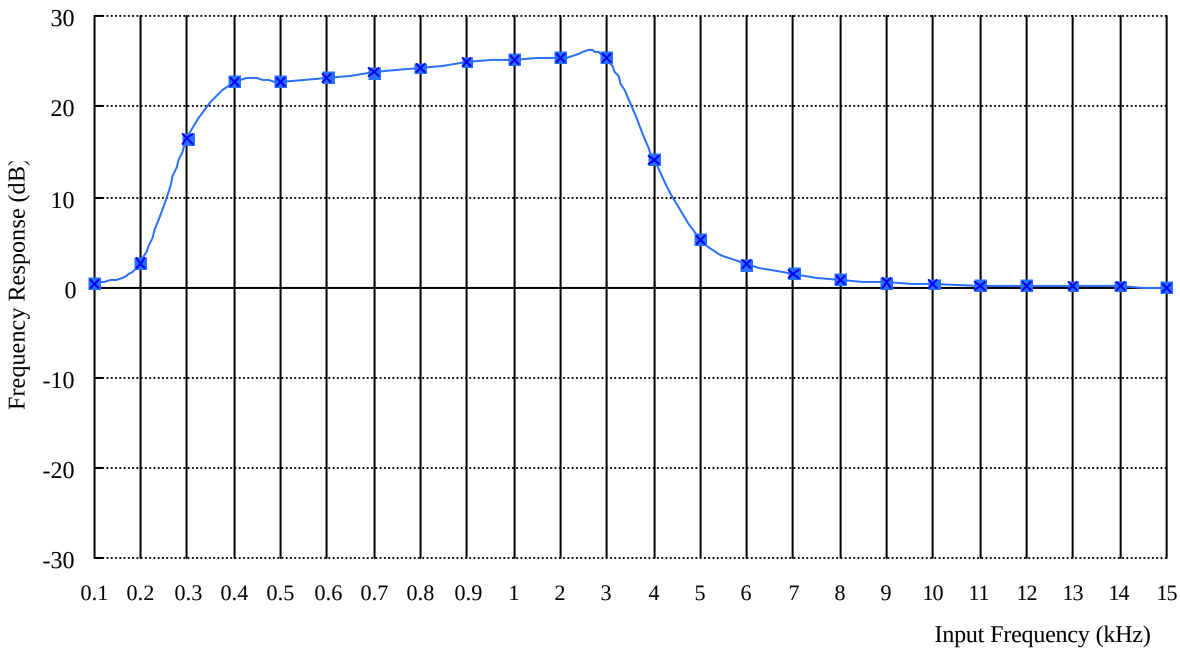
A). Frequency response



B). Modulation Limit



C). Frequency response of all circuits



5. OCCUPIED BANDWIDTH OF EMISSION

5.1 Provisions Applicable

According to §2.1049 (c)(1), For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.
According to §74.861(e)(5), the frequency emission bandwidth shall not exceed 200 kHz.

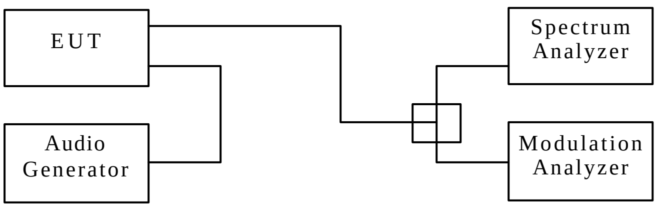
5.2 Measurement Method

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT as shown in figure 4, and Install new batteries in the EUT. Turn on the EUT ant set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Apply a 2.5 kHz modulation signal to EUT and measure the frequencies of the modulated signal from the EUT where it is the specified number of dB below the reference level set in step 2. This is the occupied bandwidth specified.

Figure 4 : Occupied bandwidth measurement configuration

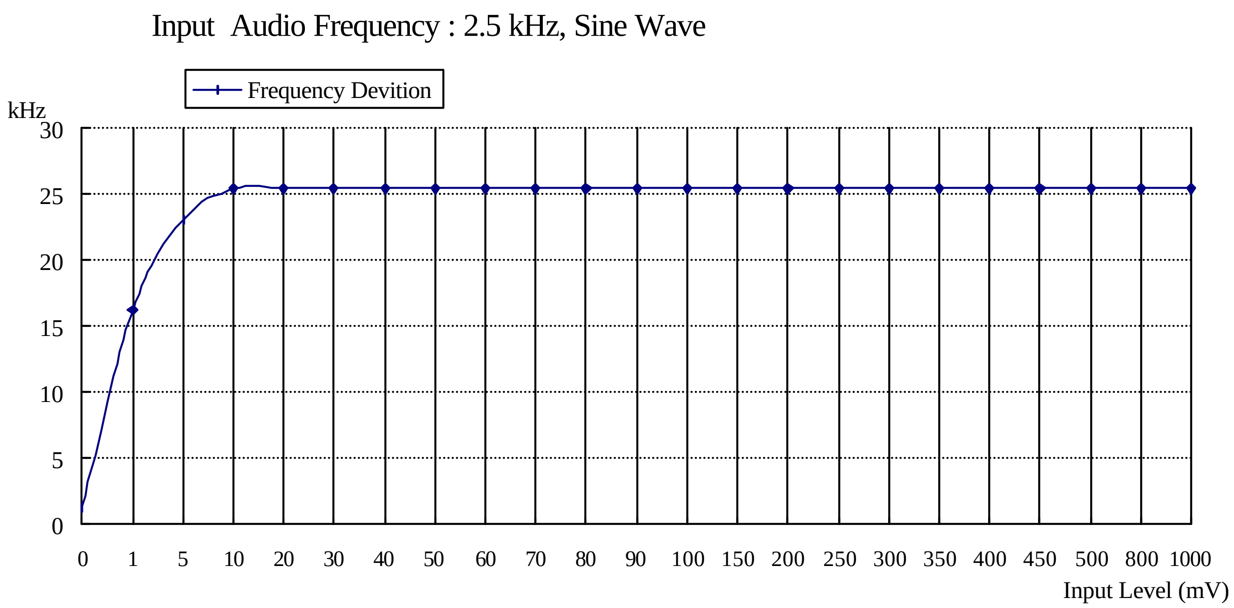


5.3 Occupied Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	R&S	ESBI	05/25/2003
Modulation Analyzer	Hewlett-Packard	8901A	12/01/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Plotter	Hewlett-Packard	7440A	N/A

5.4 Bandwidth Measured

5.4.1 Input Level Derived



The Level input to produce 50 % modulation is 20 mV, therefore the magnitude 16 dB greater than it is 126 mV.

5.4.2 Occupied Bandwidth Plotted

The Channel Low 26 dB Bandwidth is 75.8KHz.
The Channel Mid 26 dB Bandwidth is 70.2KHz.
The Channel High 26 dB Bandwidth is 72.7KHz.

Please see appendix 1 for plotted data.

6. FIELD STRENGTH OF EMISSION

6.1 Provisions Applicable

According to §2.1053, measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation. Information submitted shall include the relative radiated power of spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from a halfwave dipole antenna.

According to §74.861(e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the follwing sceedule:

(i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(iii) on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth shall be attenuated below the unmodulated carrier by at least 43 plus 10 Log(output power in watts) dB.

6.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively, adjusting the input voltage to produce the maximum power as measured in chapter 3.
2. Adjust the analyzer for each frequency measured in chapter 6 on a 1 MHz frequency span and 1MHz resolution bandwidth.
3. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0◦ to 360◦, and record the highest value indicated on spectrum analyzer as reference value.
4. Repeat step 3 until all frequencies need to be measured were complete.
5. Repeat step 4 with search antenna in vertical polarized orientations.
6. Replace the EUT with a tuned dipole antenna (horn antenna for above 1 GHz) relative to each frequency in horizontally polarized orientation and as the same polarized orientation with search antenna. Connect the tuned dipole antenna to a standard signal generator (SG) via a low loss cable. Power on the SG and tune the right frequency in measuring as well as set SG at a appreciated output level. Rise and lower the search antenna to get the highest value on spectrum analyzer, and then hold this position. Adjust the SG output to get a identical value derived from step 3 on spectrum analyzer. Record this value for result calculated.

7. Repeat step 6 until all frequencies need to be measured were complete.
8. Repeat step 7 with both dipole antenna (horn antenna for above 1 GHz) and search antenna in vertical polarized orientations.

6.3 Measuring Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	01/25/2003
Quasi Peak Detector	Hewlett-Packard	85650A	01/25/2003
Pre-selector	Hewlett-Packard	85685A	01/25/2003
Spectrum Analyzer	Hewlett-Packard	8564E	05/16/2003
Horn Antenna	EMCO	3115	05/14/2003
Log periodic Antenna	EMCO	3146	11/05/2003
Biconical Antenna	EMCO	3110B	11/05/2003
Preamplifier	Hewlett-Packard	8449B	05/10/2003
Preamplifier	Hewlett-Packard	8447D	09/29/2003

Measuring instrument setup in frequency band measured is as following :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz

6.4 Measuring Data

A. Channel Low

Operated mode : 6A Test Date : Dec. 21, 2002
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is –9.4 dBm , or 0.11 mW (ERP).

The limit of spurious or harmonics is calculated as following :

-9.4-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV) H	V	SG Reading (dBm) H	V	Antenna Gain	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
1240.502	---	---	---	---	---	---	---	---	-13.0	---
1860.753	---	---	---	---	---	---	---	---	-13.0	---
2481.004	---	---	---	---	---	---	---	---	-13.0	---
3101.255	---	---	---	---	---	---	---	---	-13.0	---
3721.506	---	---	---	---	---	---	---	---	-13.0	---
4341.757	---	---	---	---	---	---	---	---	-13.0	---
4962.008	---	---	---	---	---	---	---	---	-13.0	---
5582.259	---	---	---	---	---	---	---	---	-13.0	---
6202.510	---	---	---	---	---	---	---	---	-13.0	---

Note :

1. Remark “---“ means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :

   Result ＝ SG Reading ＋Cable Loss ＋Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.
4. Spurious or harmonics above 1 GHz is too low to be detected or attenuated more than 60 dB from limit value.

B. Channel Mid

Operated mode : 7C   Test Date : Dec. 21, 2002
Temperature : 25℃   Humidity : 65%

Unmodulated carrier output power is –13.3 dBm , or 0.05 mW (ERP).

The limit of spurious or harmonics is calculated as following :

-11.6-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV) H	Meter Reading (dBuV) V	SG Reading (dBm) H	SG Reading (dBm) V	Antenna Gain	Cable Loss (dB)	Result (dBm) H	Result (dBm) V	Limit (dBm)	Margin (dB)
1480.496	---	---	---	---	---	---	---	---	-13.0	---
2220.744	---	---	---	---	---	---	---	---	-13.0	---
2960.992	---	---	---	---	---	---	---	---	-13.0	---
3701.240	---	---	---	---	---	---	---	---	-13.0	---
4441.488	---	---	---	---	---	---	---	---	-13.0	---
5181.736	---	---	---	---	---	---	---	---	-13.0	---
5921.984	---	---	---	---	---	---	---	---	-13.0	---
6662.232	---	---	---	---	---	---	---	---	-13.0	---
7402.480	---	---	---	---	---	---	---	---	-13.0	---

Note :

1. Remark "---" means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :

   Result ＝ SG Reading ＋Cable Loss ＋Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.
4. Spurious or harmonics above 1 GHz is too low to be detected or attenuated more than 60 dB from limit value.

C. Channel High

Operated mode : 8A Test Date : Dec. 21, 2002
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is –13.3 dBm , or 0.05 mW (ERP).

The limit of spurious or harmonics is calculated as following :

-11.6-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV) H	Meter Reading (dBuV) V	SG Reading (dBm) H	SG Reading (dBm) V	Antenna Gain	Cable Loss (dB)	Result (dBm) H	Result (dBm) V	Limit (dBm)	Margin (dB)
1604.004	---	---	---	---	---	---	---	---	-13.0	---
2406.006	---	---	---	---	---	---	---	---	-13.0	---
3208.008	---	---	---	---	---	---	---	---	-13.0	---
4010.010	---	---	---	---	---	---	---	---	-13.0	---
4812.012	---	---	---	---	---	---	---	---	-13.0	---
5614.014	---	---	---	---	---	---	---	---	-13.0	---
6416.016	---	---	---	---	---	---	---	---	-13.0	---
7218.018	---	---	---	---	---	---	---	---	-13.0	---
8020.020	---	---	---	---	---	---	---	---	-13.0	---

Note :

1. Remark "---" means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :

   Result ＝ SG Reading ＋Cable Loss ＋Antenna Gain Corrected

   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.
4. Spurious or harmonics above 1 GHz is too low to be detected or attenuated more than 60 dB from limit value.

D. Emission mask plots

Please see appendix 2 for plotted data.

7. FREQUENCY STABILITY MEASUREMENT

7.1 Provisions Applicable

According to §2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from -30°C to +50°C centigrade, and according to §2.1055 (d)(2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to §74.861(e)(4), the frequency tolerance of the transmitter shall be 0.005 percent.

7.2 Measurement Procedure

A) Frequency stability versus environmental temperature

1. Setup the configuration per figure 5 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.

2. Turn on EUT and set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. Set the temperature of chamber to 50°C. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

4. Repeat step 2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measurement frequencies.

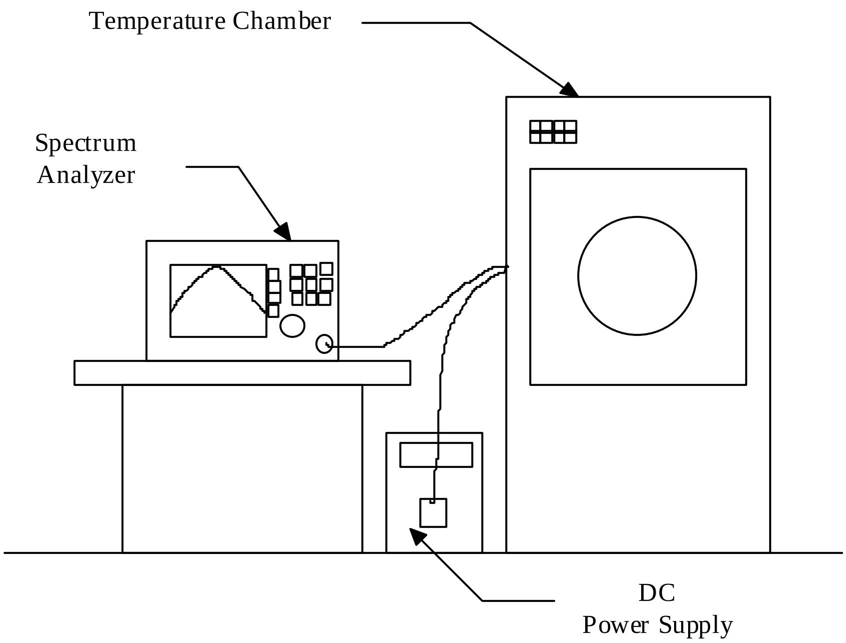
B) Frequency stability versus input voltage

1. Setup the configuration per figure 7 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.

2. Set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

3. For battery operated only device, supply the EUT primary voltage at the battery operating end point which is specified by the manufacturer and record the frequency.

Figure 5 : Frequency stability measurement configuration



7.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	HP	8564E	05/16/2003
Temperature Chamber	ACS	EOS 200T	01/17/2003

7.4 Measurement Data

A1. Frequency stability versus enviroment tempture

Reference Frequency : 625.251 MHz	Limit：0.005%						
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	625.2404	-0.00170	625.2342	-0.00268	625.2596	0.00137
	New Batt.	625.2564	0.00087	625.2500	-0.00016	625.2417	-0.00149
	New Batt.	625.2624	0.00183	625.2670	0.00257	625.2691	0.00289
40	New Batt.	625.2730	0.00352	625.2595	0.00136	625.2294	-0.00345
	New Batt.	625.2417	-0.00148	625.2541	0.00050	625.2617	0.00171
	New Batt.	625.2479	-0.00050	625.2450	-0.00095	625.2595	0.00135
30	New Batt.	625.2491	-0.00031	625.2728	0.00349	625.2285	-0.00360
	New Batt.	625.2571	0.00098	625.2674	0.00262	625.2626	0.00186
	New Batt.	625.2726	0.00345	625.2542	0.00052	625.2466	-0.00071
20	New Batt.	625.2441	-0.00111	625.2486	-0.00039	625.2633	0.00196
	New Batt.	625.2374	-0.00218	625.2727	0.00348	625.2301	-0.00334
	New Batt.	625.2610	0.00160	625.2719	0.00334	625.2402	-0.00173
10	New Batt.	625.2339	-0.00274	625.2516	0.00009	625.2407	-0.00164
	New Batt.	625.2493	-0.00026	625.2271	-0.00382	625.2600	0.00144
	New Batt.	625.2344	-0.00266	625.2500	-0.00016	625.2692	0.00291
0	New Batt.	625.2557	0.00075	625.2680	0.00272	625.2697	0.00299
	New Batt.	625.2461	-0.00078	625.2332	-0.00284	625.2528	0.00028
	New Batt.	625.2286	-0.00359	625.2511	0.00002	625.2642	0.00211
-10	New Batt.	625.2679	0.00271	625.2477	-0.00053	625.2413	-0.00156
	New Batt.	625.2299	-0.00337	625.2377	-0.00212	625.2309	-0.00321
	New Batt.	625.2511	0.00001	625.2511	0.00002	625.2686	0.00281
-20	New Batt.	625.2465	-0.00072	625.2275	-0.00376	625.2375	-0.00215
	New Batt.	625.2390	-0.00191	625.2743	0.00372	625.2503	-0.00011
	New Batt.	625.2390	-0.00192	625.2410	-0.00160	625.2349	-0.00257

A2. Frequency stability versus end-point supplied voltage (2Vdc)

Reference Frequency : 625.251 MHz	Limit：0.005%						
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	625.2595	0.00135	625.2713	0.00325	625.2615	0.00168

B1. Frequency stability versus enviroment tempture

Reference Frequency : 740.248 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	740.2737	0.00348	740.2258	-0.00300	740.2628	0.00200
	New Batt.	740.2419	-0.00083	740.2306	-0.00234	740.2281	-0.00268
	New Batt.	740.2659	0.00242	740.2594	0.00154	740.2511	0.00042
40	New Batt.	740.2600	0.00163	740.2692	0.00286	740.2450	-0.00041
	New Batt.	740.2710	0.00311	740.2226	-0.00343	740.2711	0.00312
	New Batt.	740.2513	0.00045	740.2320	-0.00216	740.2197	-0.00382
30	New Batt.	740.2553	0.00098	740.2722	0.00327	740.2718	0.00322
	New Batt.	740.2739	0.00350	740.2505	0.00034	740.2747	0.00361
	New Batt.	740.2356	-0.00168	740.2406	-0.00100	740.2534	0.00073
20	New Batt.	740.2532	0.00070	740.2311	-0.00229	740.2401	-0.00107
	New Batt.	740.2561	0.00109	740.2395	-0.00115	740.2378	-0.00138
	New Batt.	740.2451	-0.00040	740.2668	0.00254	740.2274	-0.00279
10	New Batt.	740.2436	-0.00059	740.2269	-0.00285	740.2595	0.00156
	New Batt.	740.2214	-0.00360	740.2293	-0.00253	740.2665	0.00250
	New Batt.	740.2252	-0.00308	740.2505	0.00034	740.2733	0.00342
0	New Batt.	740.2671	0.00259	740.2681	0.00272	740.2597	0.00159
	New Batt.	740.2596	0.00157	740.2497	0.00023	740.2336	-0.00194
	New Batt.	740.2318	-0.00219	740.2487	0.00010	740.2314	-0.00225
-10	New Batt.	740.2462	-0.00024	740.2271	-0.00282	740.2324	-0.00211
	New Batt.	740.2707	0.00306	740.2248	-0.00314	740.2369	-0.00150
	New Batt.	740.2365	-0.00156	740.2670	0.00257	740.2352	-0.00173
-20	New Batt.	740.2724	0.00330	740.2276	-0.00276	740.2337	-0.00193
	New Batt.	740.2473	-0.00010	740.2482	0.00003	740.2326	-0.00208
	New Batt.	740.2502	0.00029	740.2760	0.00378	740.2258	-0.00300

B2. Frequency stability versus end-point supplied voltage (2Vdc)

Reference Frequency : 740.248 MHz		Limit：0.005%					
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	740.2265	-0.00291	740.2297	-0.00248	740.2500	0.00027

C1. Frequency stability versus enviroment tempture

Reference Frequency : 801.979 MHz Limit：0.005%							
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	801.9877	0.00108	801.9737	-0.00066	802.0085	0.00368
	New Batt.	801.9937	0.00183	802.0033	0.00303	801.9759	-0.00039
	New Batt.	801.9900	0.00138	801.9889	0.00124	802.0085	0.00367
40	New Batt.	801.9574	-0.00269	801.9729	-0.00076	802.0031	0.00301
	New Batt.	801.9671	-0.00149	801.9693	-0.00121	801.9867	0.00096
	New Batt.	801.9660	-0.00162	801.9590	-0.00249	801.9554	-0.00294
30	New Batt.	801.9957	0.00209	801.9683	-0.00133	801.9638	-0.00190
	New Batt.	802.0017	0.00283	801.9689	-0.00126	801.9688	-0.00127
	New Batt.	801.9689	-0.00126	801.9972	0.00227	801.9803	0.00016
20	New Batt.	801.9499	-0.00363	802.0073	0.00353	801.9654	-0.00170
	New Batt.	801.9973	0.00228	801.9628	-0.00202	801.9762	-0.00035
	New Batt.	801.9666	-0.00155	801.9906	0.00145	801.9860	0.00087
10	New Batt.	801.9786	-0.00005	801.9907	0.00146	801.9663	-0.00159
	New Batt.	801.9541	-0.00310	801.9853	0.00078	801.9521	-0.00335
	New Batt.	802.0077	0.00358	801.9947	0.00195	801.9808	0.00022
0	New Batt.	801.9683	-0.00133	801.9536	-0.00316	801.9578	-0.00264
	New Batt.	801.9531	-0.00323	801.9954	0.00204	801.9924	0.00167
	New Batt.	801.9799	0.00011	801.9754	-0.00045	801.9679	-0.00138
-10	New Batt.	802.0045	0.00317	801.9945	0.00193	801.9579	-0.00263
	New Batt.	802.0071	0.00351	801.9930	0.00174	801.9522	-0.00334
	New Batt.	801.9533	-0.00320	801.9712	-0.00098	801.9495	-0.00367
-20	New Batt.	801.9998	0.00260	801.9614	-0.00220	801.9758	-0.00039
	New Batt.	802.0007	0.00270	801.9583	-0.00258	801.9802	0.00015
	New Batt.	801.9809	0.00024	801.9539	-0.00313	801.9751	-0.00048

A2. Frequency stability versus end-point supplied voltage (2Vdc)

Reference Frequency : 801.979 MHz Limit：0.005%							
Enviroment Tempture (℃)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	802.0054	0.00329	801.9907	0.00146	801.9717	-0.00091

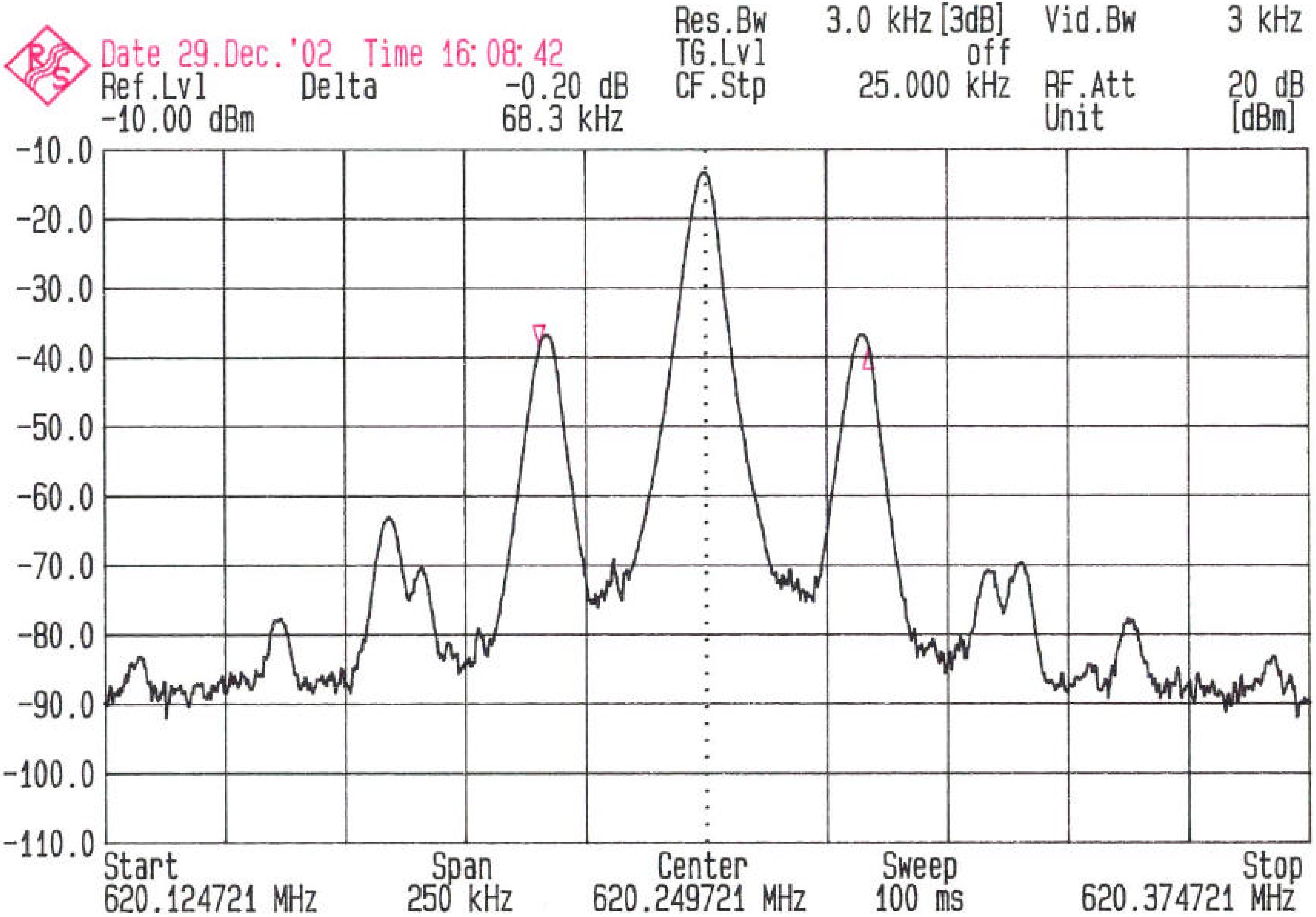
8 CONDUCTED EMISSION MEASUREMENT

8.1 Standard Applicable

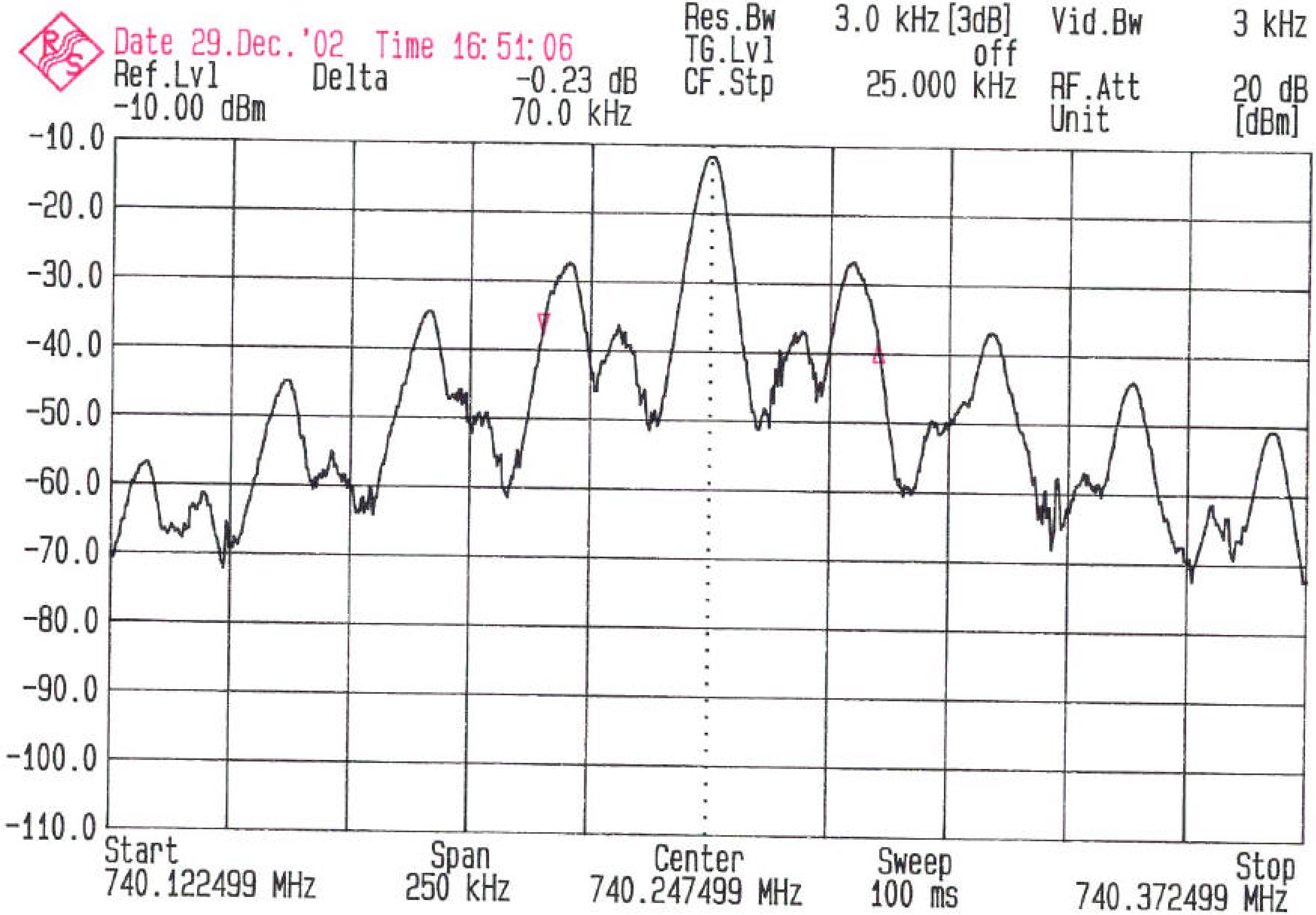
This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to §15.207 (c), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

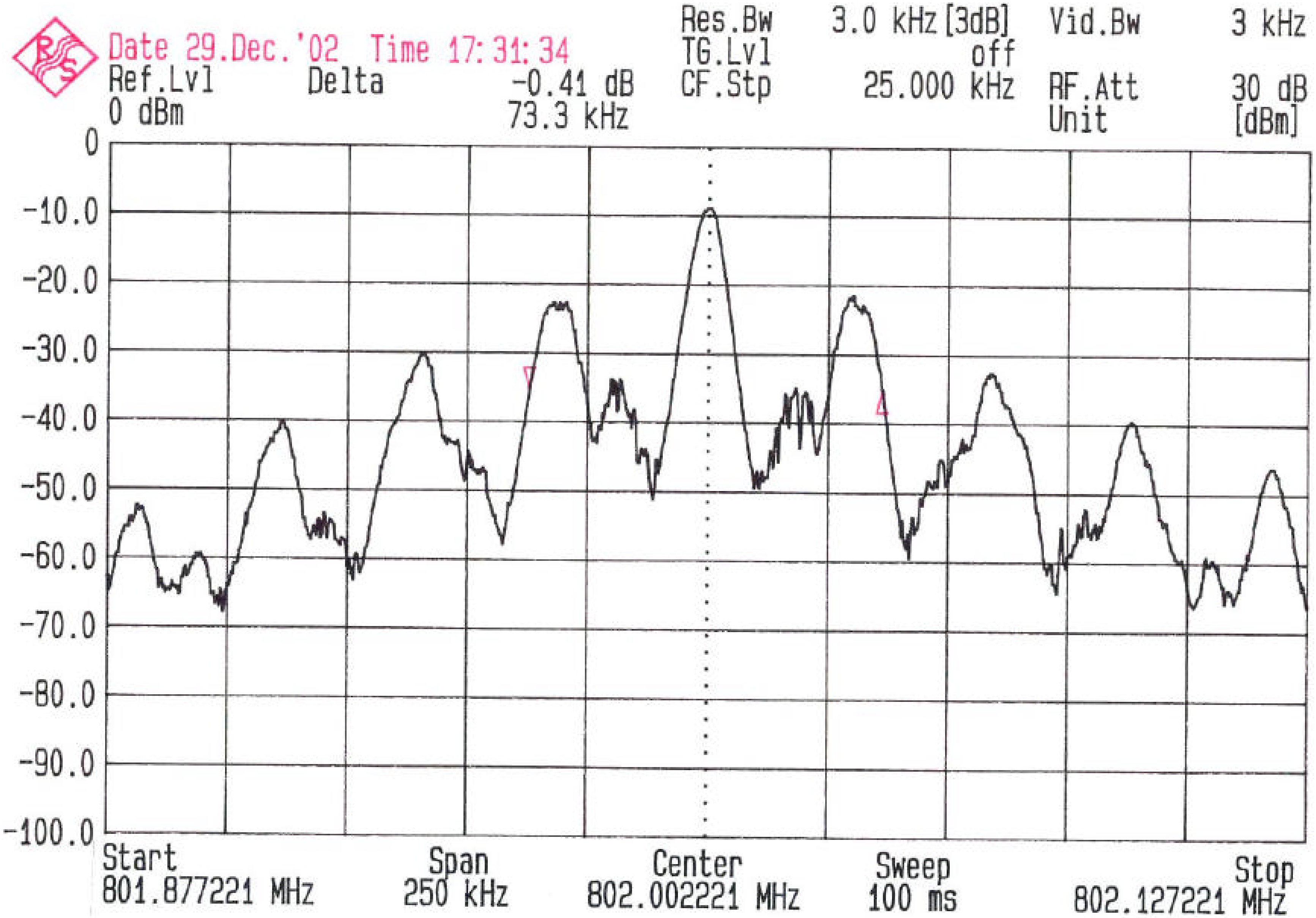
For intentional device, Line Conducted Emission Limits are in accordance to §15.207(a)

Appendix 1 : Occupied Emission Bandwidth Plotted Data

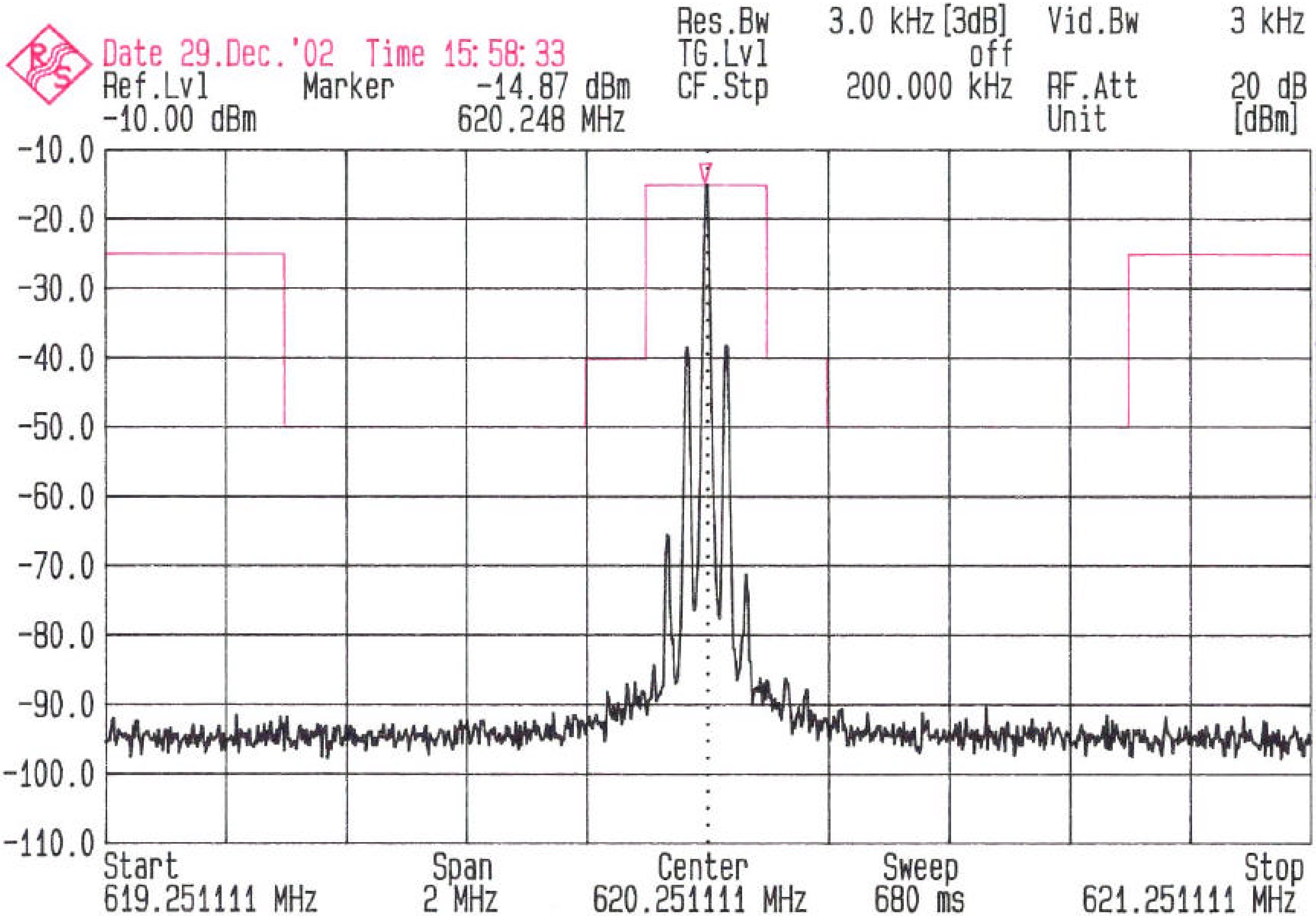


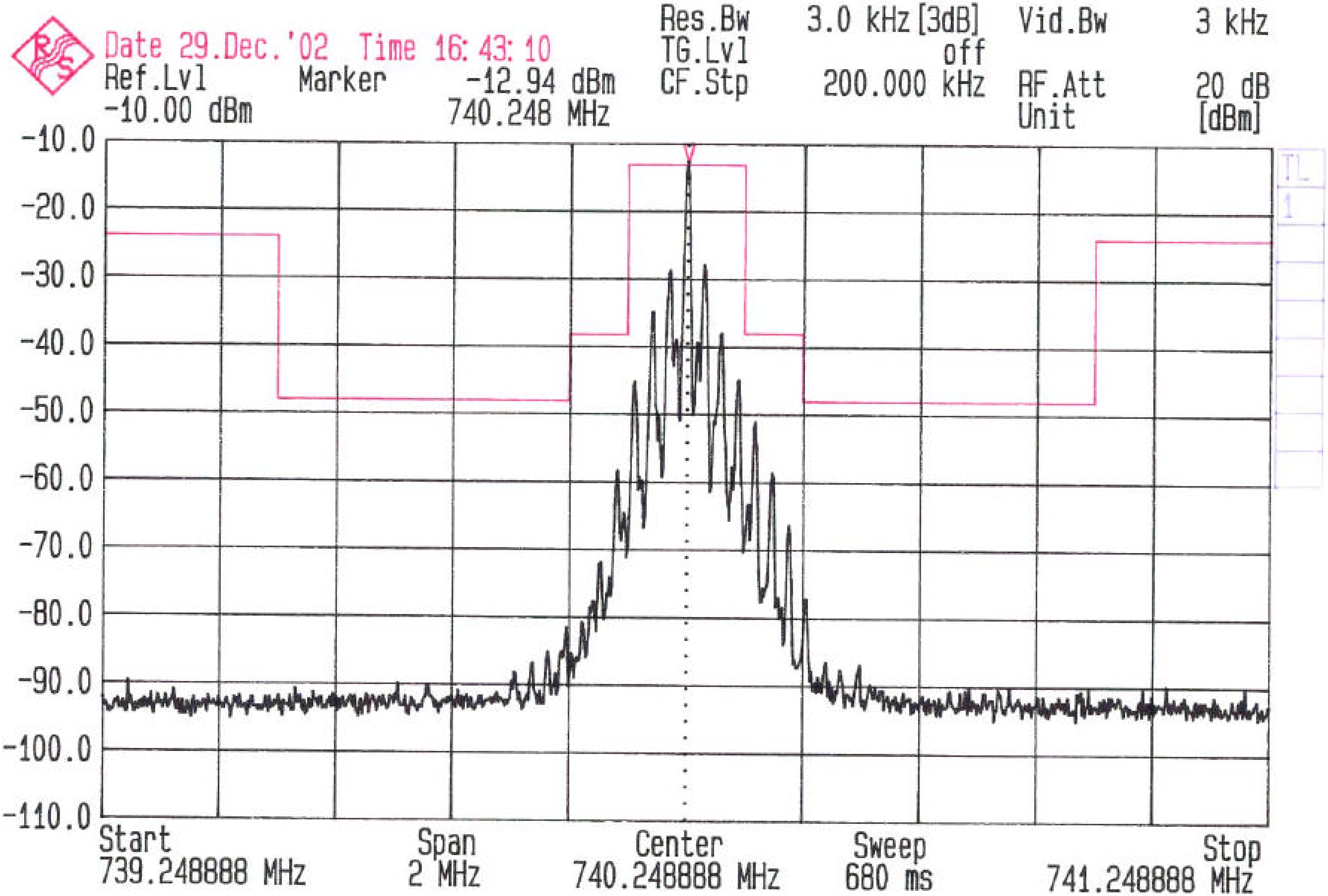
Date 29.Dec.'02 Time 16:08:42
Res.Bw 3.0 kHz [3dB]
Vid.Bw 3 kHz
TG.Lvl off
Ref.Lvl -10.00 dBm
Delta -0.20 dB
68.3 kHz
CF.Stp 25.000 kHz
RF.Att 20 dB
Unit [dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Start 620.124721 MHz
Span 250 kHz
Center 620.249721 MHz
Sweep 100 ms
Stop 620.374721 MHz

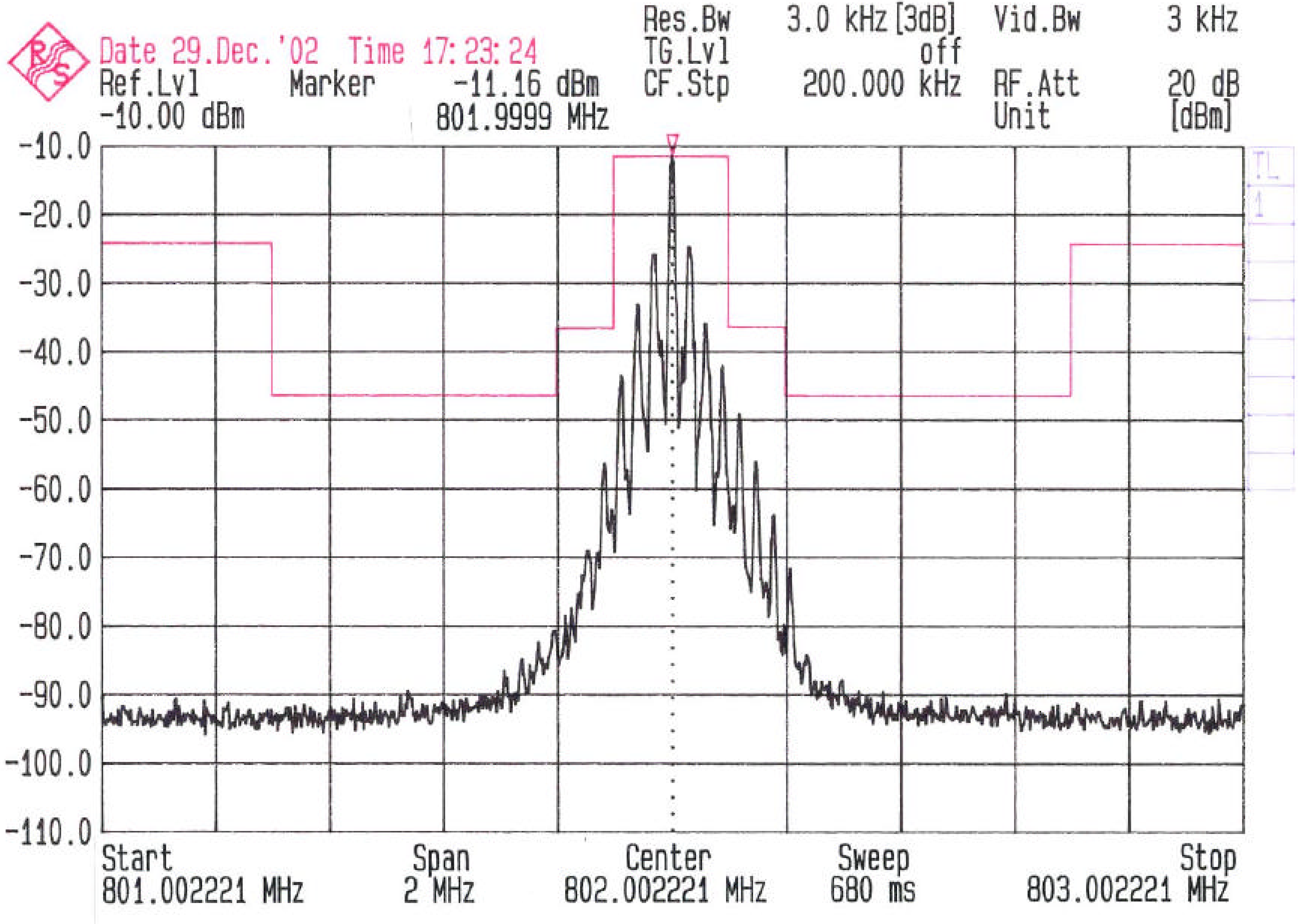

Date 29.Dec.'02 Time 16:51:06
Ref.Lvl
-10.00 dBm
Delta
-0.23 dB
70.0 kHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 25.000 kHz
Vid.Bw 3 kHz
RF.Att 20 dB
Unit [dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Start
740.122499 MHz
Span
250 kHz
Center
740.247499 MHz
Sweep
100 ms
Stop
740.372499 MHz


Date 29.Dec.'02 Time 17:31:34
Ref.Lvl
0 dBm
Delta
-0.41 dB
73.3 kHz
Res.Bw
TG.Lvl
CF.Stp
3.0 kHz [3dB]
off
25.000 kHz
Vid.Bw
RF.Att
Unit
3 kHz
30 dB
[dBm]
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Start
801.877221 MHz
Span
250 kHz
Center
802.002221 MHz
Sweep
100 ms
Stop
802.127221 MHz

Appendix 2 : Emission Mask Plotted Data


Date 29.Dec.'02 Time 15:58:33
Res.Bw 3.0 kHz [3dB]
Vid.Bw 3 kHz
TG.Lvl off
Ref.Lvl
-10.00 dBm
Marker
-14.87 dBm
620.248 MHz
CF.Stp 200.000 kHz
RF.Att 20 dB
Unit [dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
TL
1
Start
619.251111 MHz
Span
2 MHz
Center
620.251111 MHz
Sweep
680 ms
Stop
621.251111 MHz


Date 29.Dec.'02 Time 16:43:10
Ref.Lvl
-10.00 dBm
Marker
-12.94 dBm
740.248 MHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 200.000 kHz
Vid.Bw 3 kHz
RF.Att 20 dB
Unit [dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
TL
1
Start
739.248888 MHz
Span
2 MHz
Center
740.248888 MHz
Sweep
680 ms
Stop
741.248888 MHz


Date 29.Dec.'02 Time 17:23:24
Res.Bw 3.0 kHz [3dB]
Vid.Bw 3 kHz
TG.Lvl off
Ref.Lvl -10.00 dBm
Marker -11.16 dBm 801.9999 MHz
CF.Stp 200.000 kHz
RF.Att 20 dB
Unit [dBm]
TL
1
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Start 801.002221 MHz
Span 2 MHz
Center 802.002221 MHz
Sweep 680 ms
Stop 803.002221 MHz