FCC Part 74 Subpart H

EMI TEST REPORT

of

E.U.T. : Wireless Amplifier Systems

FCC ID. : M5X-101ACT

MODEL : MT-101ACT

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.

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Report Number : ET91R-12-073-01

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 Amplifier Systems
b) Trade Name	: MIPRO
c) Model No.	: MT-101ACT
d) FCC ID	: M5X-101ACT
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. 30, 2003

Test Engineer : Mic chen
(Mic Chen)

Approve & Authorized Signer : Will Yauo
Will Yauo, Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

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1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT	: Wireless Amplifier Systems
b) Trade Name	: MIPRO
c) Model No.	: MT-101ACT
d) FCC ID	: M5X-101ACT
e) Working Frequency	: 614MHz-806MHz
f) Power Supply	: DC 3V Batteries

1.2 Characteristics of Device:

1. Operating Frequency: 620 MHz (CH Low), 751 MHz (CH Mid), 801 MHz (CH High)
2. Type of Emission : 54KF3E.

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

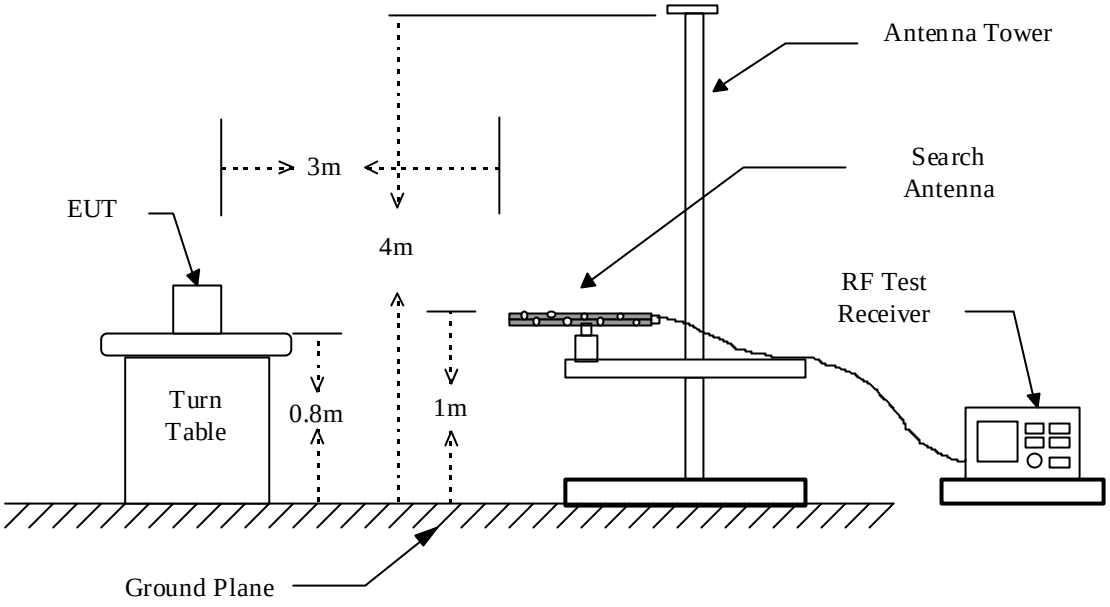
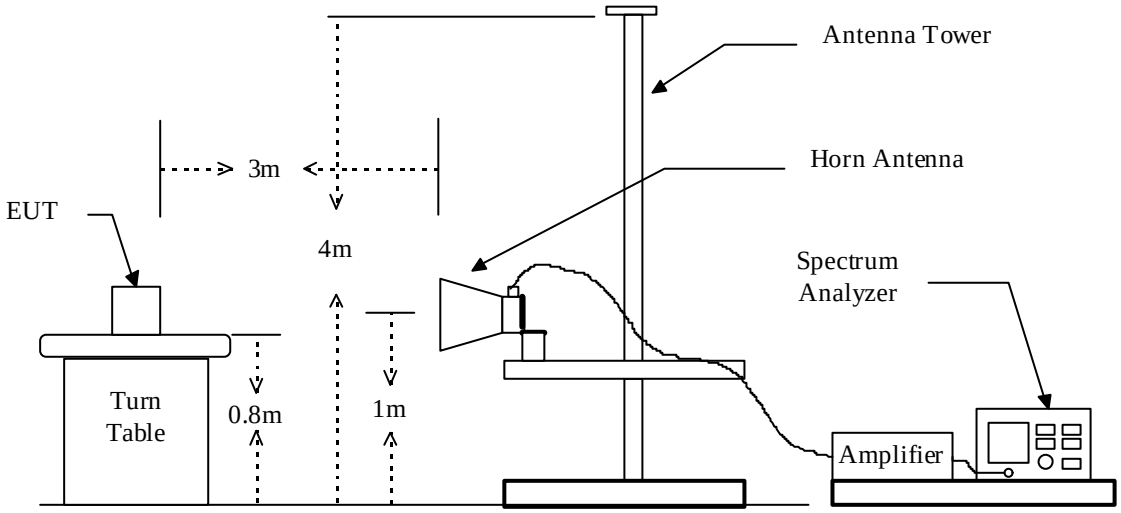


Figure 1 : Frequencies measured above 1 GHz configuration



3.3 Test Data

A. Channel Low (ERP)

Operated mode : 6A
Test Date : Dec. 22, 2002
Temperature : 23 ℃
Humidity : 60 %

Frequency (MHz)	Meter Reading (dB μV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
620.233	83.32	12.72	2.3	---	10.42	11.0	50.0

B. Channel Mid (ERP)

Operated mode : 7C
Test Date : Dec. 22, 2002
Temperature : 23 ℃
Humidity : 60 %

Frequency (MHz)	Meter Reading (dB μV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
751.981	80.35	10.45	2.5	---	7.95	6.24	50.0

C. Channel High (ERP)

Operated mode : 8A
Test Date : Dec. 22, 2002
Temperature : 23 ℃
Humidity : 60 %

Frequency (MHz)	Meter Reading (dB μV/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
801.994	72.30	4.7	2.6	---	2.1	1.62	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.

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

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.

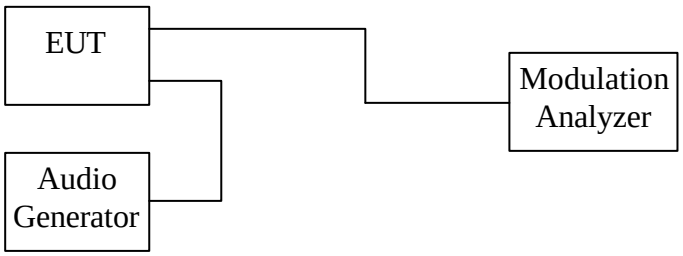
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

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

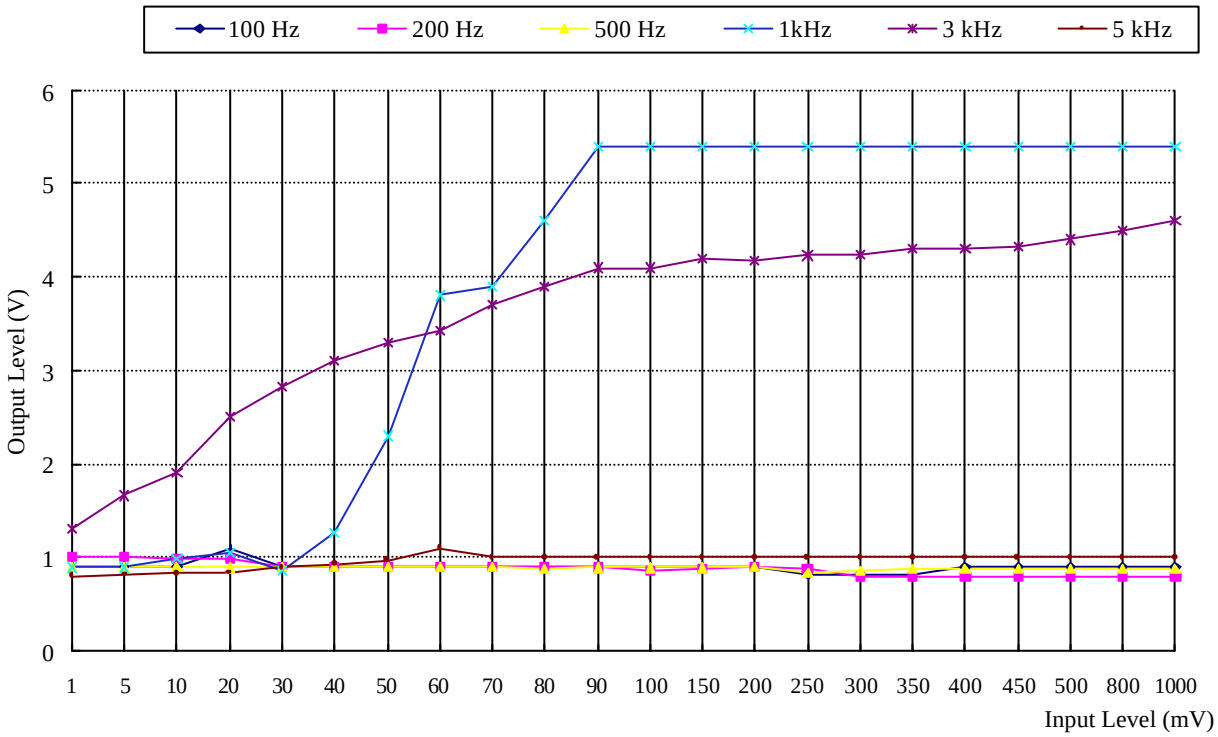


4.3 Measurement Instrument

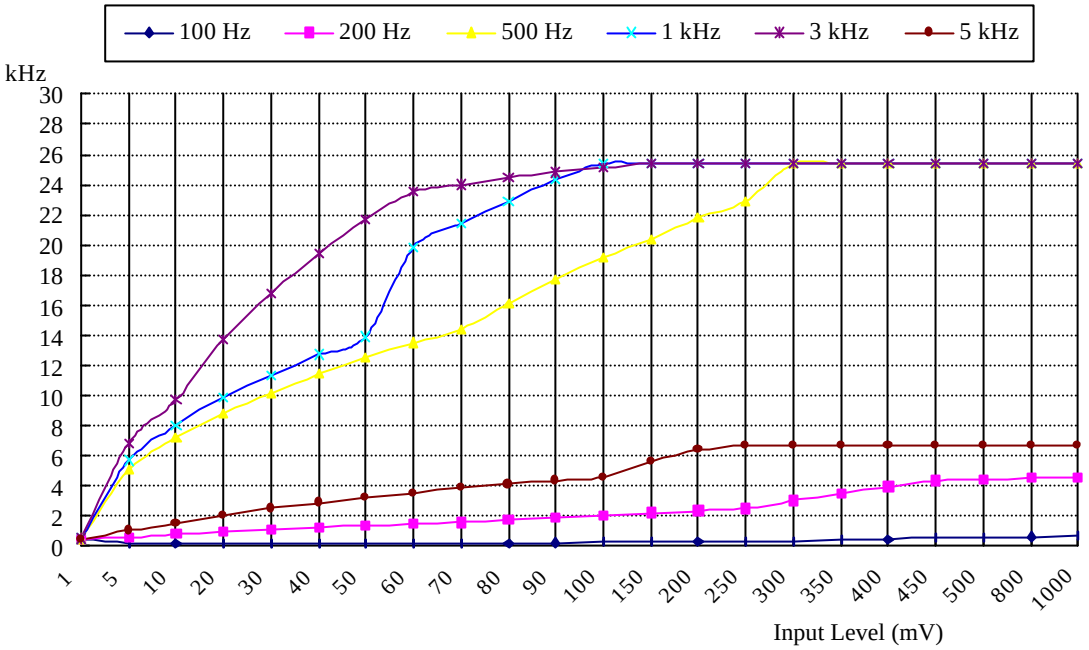
Equipment	Manufacturer	Model No.	Next Cal. Date
Radio Communications Test Set	IFR	2955B	09/12/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Oscillscope	Lecroy	9350A	05/26/2003

4.4 Measurement Result

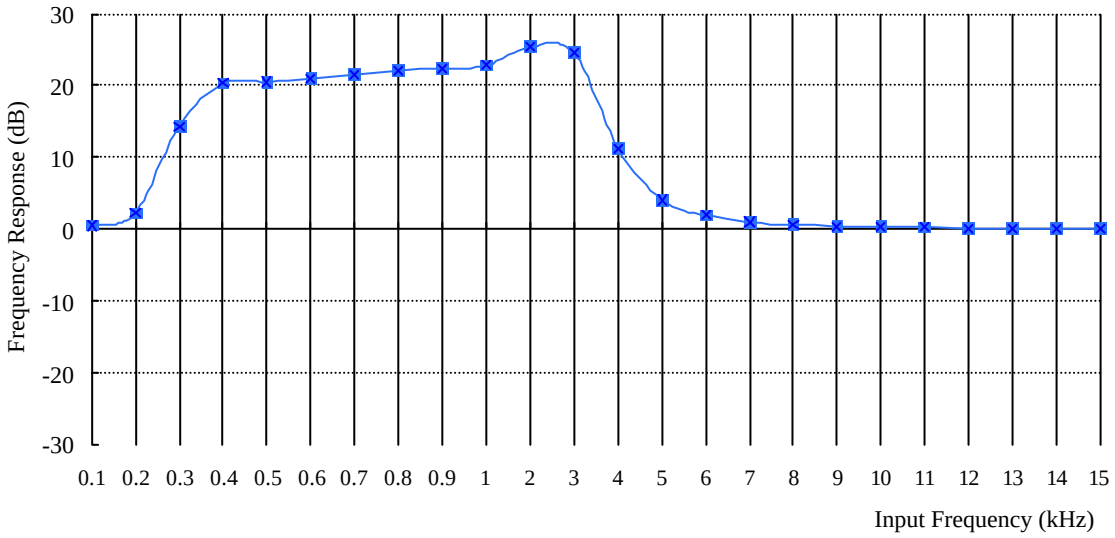
A). Frequency response



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.

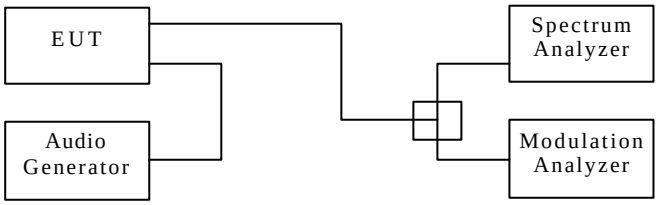
5.2 Measurement Method

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



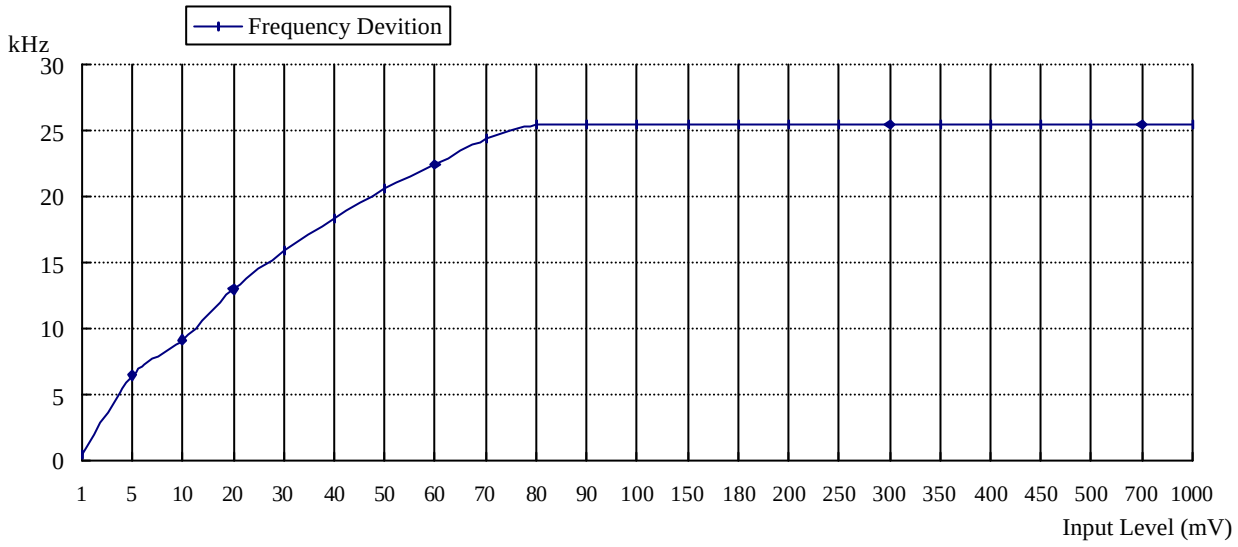
5.3 Occupied Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	R&S	ESBI	05/25/2003
Radio Communications Test Set	IFR	2955B	09/12/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Plotter	Hewlett-Packard	7440A	N/A

5.4 Bandwidth Measured

5.4.1 Input Level Derived

Input Audio Frequency : 2.5 kHz, Sine Wave



The Level input to produce 50 % modulation is 40 mV, therefore the magnitude 16 dB greater than it is 252 mV.

5.4.2 Occupied Bandwidth Plotted

The Channel Low 26 dB Bandwidth is 108KHz.
The Channel Mid 26 dB Bandwidth is 120.5KHz.
The Channel High 26 dB Bandwidth is 127.5KHz.

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	01/10/2003
Quasi Peak Detector	Hewlett-Packard	85650A	01/10/2003
Pre-selector	Hewlett-Packard	85685A	01/10/2003
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. 22, 2002
Temperature : 23℃
Humidity : 60%

Unmodulated carrier output power is 10.42 dBm , or 11.0 mW (ERP).

The limit of spurious or harmonics is calculated as following :

10.42-[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)
1240.4	52.7	54.7	-56.0	-57.5	6.4	1.3	-48.3	-49.8	-13.0	-35.3
1860.8	59.7	62.2	-49.8	-45.4	9.4	1.8	-38.6	-34.2	-13.0	-21.2
2481.0	53.7	54.0	-55.8	-55.0	9.2	1.8	-44.8	-44.0	-13.0	-31.0
3101.2	53.0	56.5	-52.2	-49.2	9.7	1.8	-40.7	-37.7	-13.0	-24.3
3721.6	---	63.5	---	-40.2	9.6	2.2	---	-28.4	-13.0	-15.4
4342.0	---	---	---	---	---	---	---	---	-13.0	---
4961.3	---	---	---	---	---	---	---	---	-13.0	---
5582.5	---	---	---	---	---	---	---	---	-13.0	---
6202.4	---	50.8	---	-51.2	12.0	2.6	---	-36.6	-13.0	-23.6

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. 22, 2002
Temperature : 23℃
Humidity : 60%

Unmodulated carrier output power is 7.95 dBm , or 6.24 mW (ERP).

The limit of spurious or harmonics is calculated as following :

7.95-[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)
1504.0	53.0	57.0	-61.7	-54.7	9.1	1.3	-51.3	-44.3	-13.0	-31.3
2256.0	64.8	68.0	-42.6	-42.1	9.3	1.8	-31.5	-31.0	-13.0	-18.0
3008.0	56.8	62.3	-46.9	-44.7	9.7	1.8	-35.4	-33.2	-13.0	-20.2
3760.0	65.0	61.5	-38.8	-42.2	9.6	2.2	-27.0	-30.4	-13.0	-14.0
4511.9	53.7	54.3	-51.9	-48.9	10.9	2.2	-38.8	-35.8	-13.0	-22.8
5264.1	---	---	---	---	---	---	---	---	-13.0	---
6016.1	51.8	52.2	-48.9	-50.6	11.9	2.6	-34.4	-36.1	-13.0	-21.4
6768.3	---	---	---	---	---	---	---	---	-13.0	---
7520.	---	51.2	---	-49.4	11.5	2.9	---	-35.0	-13.0	-22.0

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. 22, 2002
Temperature : 23℃
Humidity : 60%

Unmodulated carrier output power is 2.1 dBm , or 1.62 mW (ERP).

The limit of spurious or harmonics is calculated as following :

2.1-[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)
1603.988	56.5	54.5	-57.2	-58.9	9.8	1.3	-46.1	-47.8	-13.0	-33.1
2405.982	52.2	---	-57.3	---	9.2	1.8	-46.3	---	-13.0	-33.3
3207.972	---	---	---	---	---	---	---	---	-13.0	---
4009.970	53.3	61.2	-47.1	-42.9	9.8	2.2	-35.1	-30.9	-13.0	-17.9
4811.964	48.8	---	-54.5	---	10.9	2.2	-41.4	---	-13.0	-28.4
5613.958	55.3	58.0	-46.3	-44.3	11.5	2.6	-32.2	-30.2	-13.0	-17.2
6415.952	---	---	---	---	---	---	---	---	-13.0	---
7217.946	---	---	---	---	---	---	---	---	-13.0	---
8019.940	---	---	---	---	---	---	---	---	-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.

6.5 Radiated Measurement Photos

Please See Setup Photos in Exhibit-F

Please See Setup Photos in Exhibit-F

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.

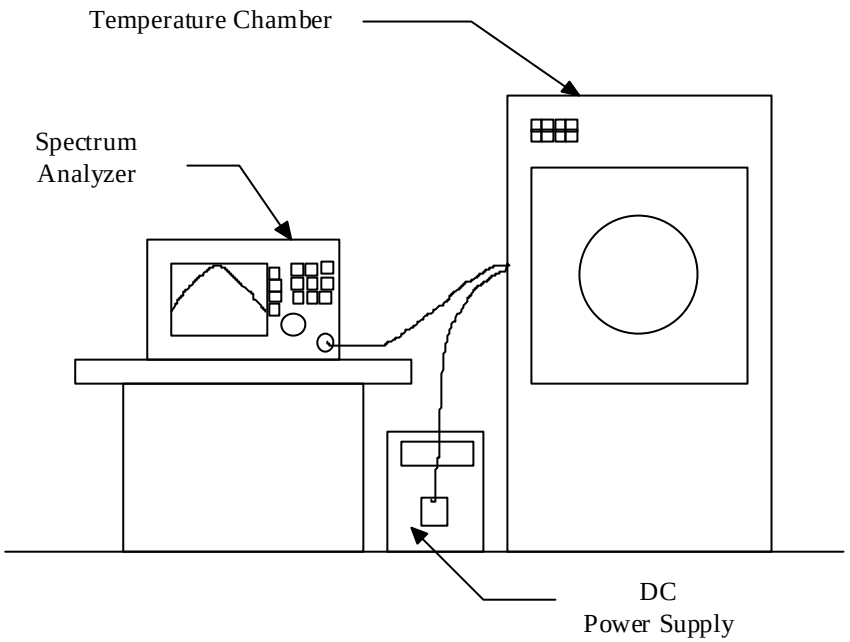
B) Frequency stability versus input voltage

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 : 620.2470 MHz		Limit：0.005%					
Enviroment	Power	Frequency measured with time elapsed					
Tempture	Supplied	2 minute		5 minute		10 minute	
(℃)	(Vdc)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	620.2562	0.00149	620.2425	-0.00072	620.2557	0.00140
	New Batt.	620.2655	0.00298	620.2302	-0.00271	620.2281	-0.00305
	New Batt.	620.2325	-0.00234	620.2606	0.00219	620.2315	-0.00250
40	New Batt.	620.2459	-0.00017	620.2343	-0.00205	620.2572	0.00165
	New Batt.	620.2444	-0.00042	620.2468	-0.00003	620.2620	0.00241
	New Batt.	620.2574	0.00168	620.2542	0.00116	620.2379	-0.00147
30	New Batt.	620.2340	-0.00210	620.2529	0.00094	620.2240	-0.00371
	New Batt.	620.2586	0.00187	620.2337	-0.00215	620.2675	0.00331
	New Batt.	620.2626	0.00251	620.2574	0.00167	620.2233	-0.00382
20	New Batt.	620.2563	0.00150	620.2336	-0.00216	620.2583	0.00182
	New Batt.	620.2704	0.00378	620.2452	-0.00029	620.2259	-0.00340
	New Batt.	620.2676	0.00332	620.2396	-0.00119	620.2462	-0.00014
10	New Batt.	620.2629	0.00257	620.2496	0.00042	620.2490	0.00033
	New Batt.	620.2254	-0.00348	620.2307	-0.00262	620.2593	0.00198
	New Batt.	620.2305	-0.00266	620.2624	0.00249	620.2238	-0.00374
0	New Batt.	620.2284	-0.00300	620.2254	-0.00348	620.2338	-0.00213
	New Batt.	620.2622	0.00245	620.2299	-0.00275	620.2679	0.00337
	New Batt.	620.2386	-0.00135	620.2536	0.00106	620.2491	0.00034
-10	New Batt.	620.2405	-0.00104	620.2396	-0.00120	620.2330	-0.00226
	New Batt.	620.2672	0.00326	620.2612	0.00229	620.2357	-0.00183
	New Batt.	620.2375	-0.00154	620.2350	-0.00194	620.2256	-0.00345
-20	New Batt.	620.2434	-0.00057	620.2545	0.00122	620.2490	0.00032
	New Batt.	620.2273	-0.00318	620.2403	-0.00109	620.2369	-0.00163
	New Batt.	620.2453	-0.00028	620.2461	-0.00014	620.2589	0.00192

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

Reference Frequency : 620.247 MHz		Limit：0.005%					
Enviroment	Power	Frequency measured with time elapsed					
Tempture	Supplied	2 minute		5 minute		10 minute	
(℃)	(Vdc)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	620.2457	-0.00021	620.2403	-0.00108	620.2431	-0.00063

B1. Frequency stability versus enviroment tempture

Reference Frequency : 751.9990 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.	751.9842	-0.00197	752.0015	0.00033	752.0168	0.00237
	New Batt.	752.0223	0.00309	752.0217	0.00302	752.0024	0.00046
	New Batt.	752.0101	0.00148	751.9766	-0.00298	752.0021	0.00041
40	New Batt.	752.0222	0.00309	752.0144	0.00204	752.0196	0.00273
	New Batt.	751.9957	-0.00043	751.9853	-0.00182	752.0189	0.00264
	New Batt.	752.0081	0.00122	751.9704	-0.00380	751.9846	-0.00191
30	New Batt.	751.9736	-0.00338	751.9937	-0.00070	751.9773	-0.00288
	New Batt.	751.9963	-0.00036	752.0223	0.00309	751.9960	-0.00040
	New Batt.	752.0088	0.00130	751.9847	-0.00190	752.0019	0.00039
20	New Batt.	752.0163	0.00230	751.9995	0.00007	752.0087	0.00129
	New Batt.	752.0216	0.00300	752.0241	0.00334	752.0091	0.00135
	New Batt.	752.0209	0.00291	751.9725	-0.00353	752.0237	0.00328
10	New Batt.	752.0087	0.00128	751.9812	-0.00237	752.0131	0.00187
	New Batt.	752.0182	0.00255	751.9727	-0.00350	751.9937	-0.00070
	New Batt.	752.0196	0.00274	751.9922	-0.00090	751.9984	-0.00007
0	New Batt.	752.0074	0.00112	751.9827	-0.00217	751.9784	-0.00274
	New Batt.	751.9927	-0.00083	752.0116	0.00167	751.9863	-0.00169
	New Batt.	751.9707	-0.00376	751.9846	-0.00192	752.0083	0.00124
-10	New Batt.	751.9786	-0.00271	752.0051	0.00081	752.0131	0.00187
	New Batt.	751.9858	-0.00175	752.0017	0.00036	752.0207	0.00289
	New Batt.	751.9883	-0.00142	752.0267	0.00369	751.9943	-0.00062
-20	New Batt.	751.9851	-0.00185	752.0191	0.00267	752.0243	0.00336
	New Batt.	752.0056	0.00088	752.0129	0.00184	752.0266	0.00367
	New Batt.	752.0030	0.00054	752.0199	0.00278	752.0154	0.00218

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

Reference Frequency : 751.9990 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	751.9940	-0.00067	751.9888	-0.00135	752.0110	0.00160

C1. Frequency stability versus enviroment tempture

Reference Frequency : 801.9940 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.	802.0137	0.00245	802.0027	0.00109	801.9649	-0.00363
	New Batt.	801.9747	-0.00240	801.9918	-0.00028	802.0054	0.00142
	New Batt.	802.0048	0.00135	801.9999	0.00073	801.9878	-0.00078
40	New Batt.	801.9702	-0.00297	801.9993	0.00066	801.9862	-0.00097
	New Batt.	802.0038	0.00122	801.9812	-0.00160	801.9907	-0.00042
	New Batt.	801.9913	-0.00034	802.0204	0.00330	801.9837	-0.00128
30	New Batt.	801.9689	-0.00312	801.9667	-0.00340	801.9760	-0.00225
	New Batt.	802.0240	0.00374	801.9672	-0.00334	801.9929	-0.00014
	New Batt.	801.9651	-0.00361	802.0190	0.00312	801.9702	-0.00297
20	New Batt.	801.9992	0.00064	801.9734	-0.00257	802.0006	0.00083
	New Batt.	801.9749	-0.00238	801.9664	-0.00344	802.0197	0.00321
	New Batt.	801.9677	-0.00328	801.9664	-0.00344	801.9904	-0.00045
10	New Batt.	801.9759	-0.00226	802.0186	0.00307	801.9739	-0.00251
	New Batt.	802.0078	0.00173	801.9998	0.00072	801.9727	-0.00266
	New Batt.	802.0196	0.00319	802.0232	0.00364	802.0222	0.00351
0	New Batt.	802.0070	0.00162	801.9652	-0.00359	802.0207	0.00333
	New Batt.	801.9676	-0.00329	801.9700	-0.00299	802.0132	0.00239
	New Batt.	802.0021	0.00101	801.9966	0.00032	802.0126	0.00233
-10	New Batt.	801.9909	-0.00039	802.0170	0.00287	801.9739	-0.00250
	New Batt.	802.0232	0.00364	802.0016	0.00095	801.9933	-0.00009
	New Batt.	801.9850	-0.00112	802.0214	0.00341	801.9674	-0.00331
-20	New Batt.	801.9956	0.00020	802.0078	0.00172	801.9733	-0.00258
	New Batt.	801.9818	-0.00152	801.9799	-0.00176	802.0098	0.00197
	New Batt.	802.0192	0.00314	802.0132	0.00240	801.9950	0.00012

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

Reference Frequency : 801.9940 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	801.9893	-0.00059	801.9998	0.00072	801.9906	-0.00043

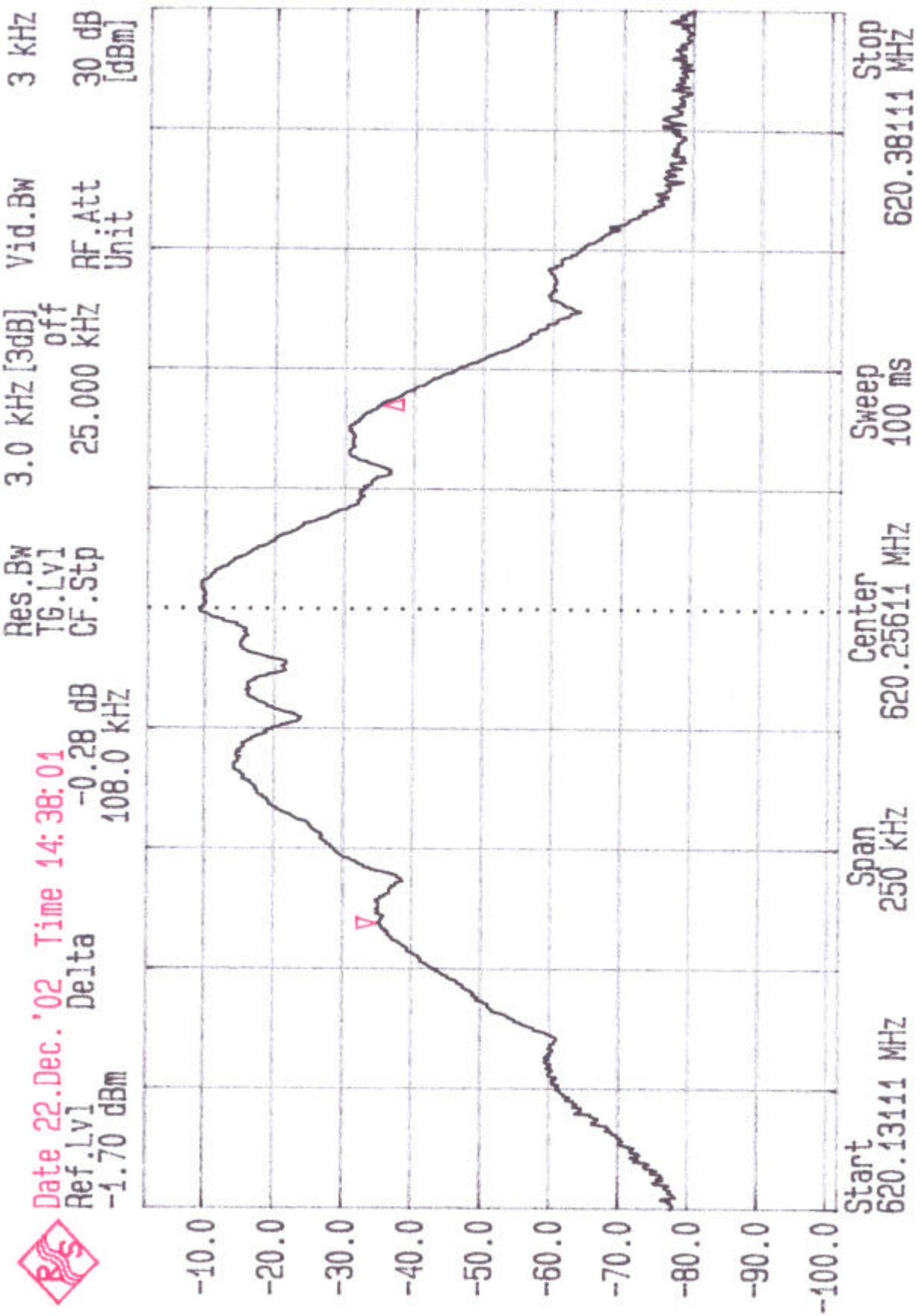
8 CONDUCTED EMISSION MEASUREMENT

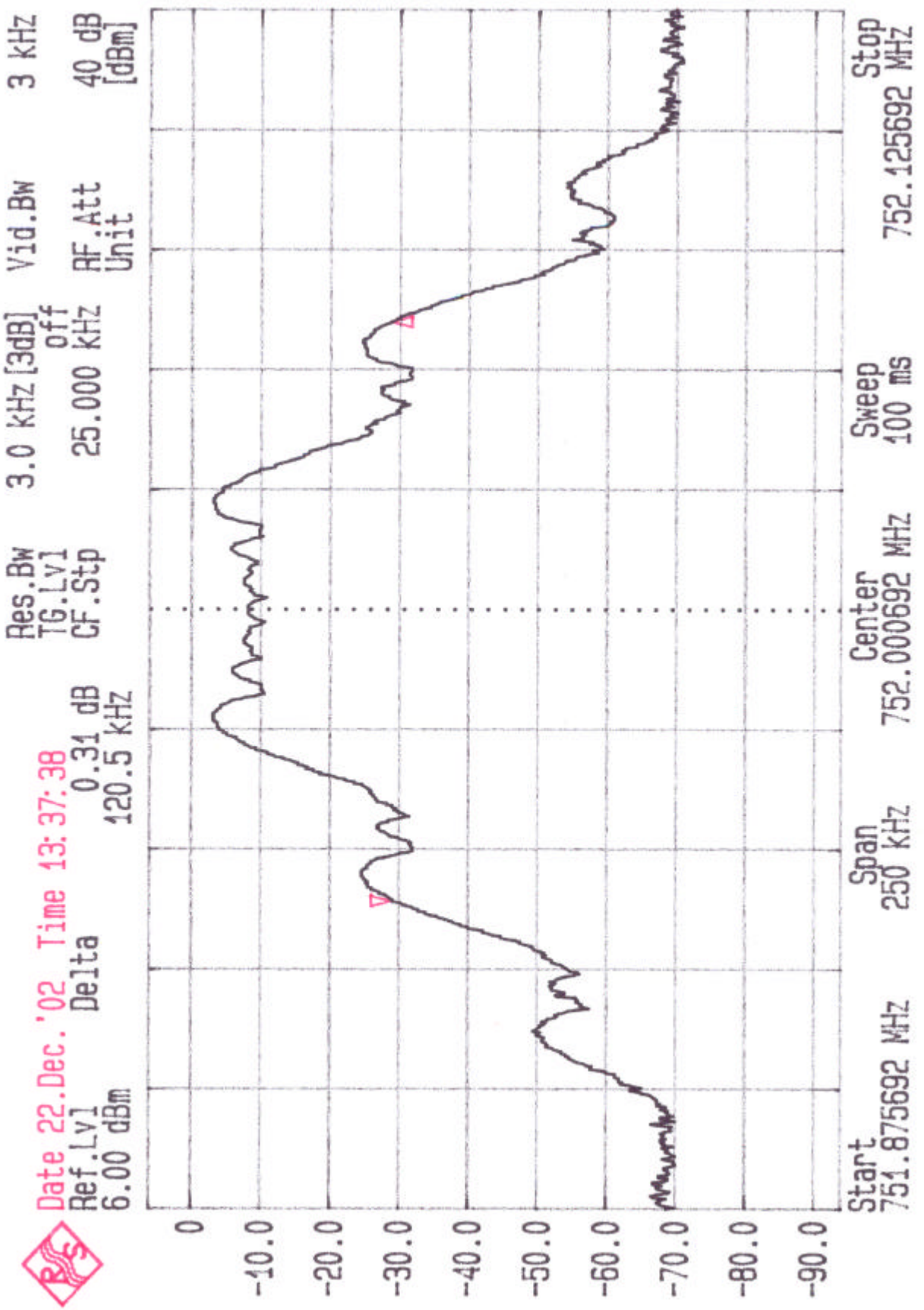
8.1 Standard Applicable

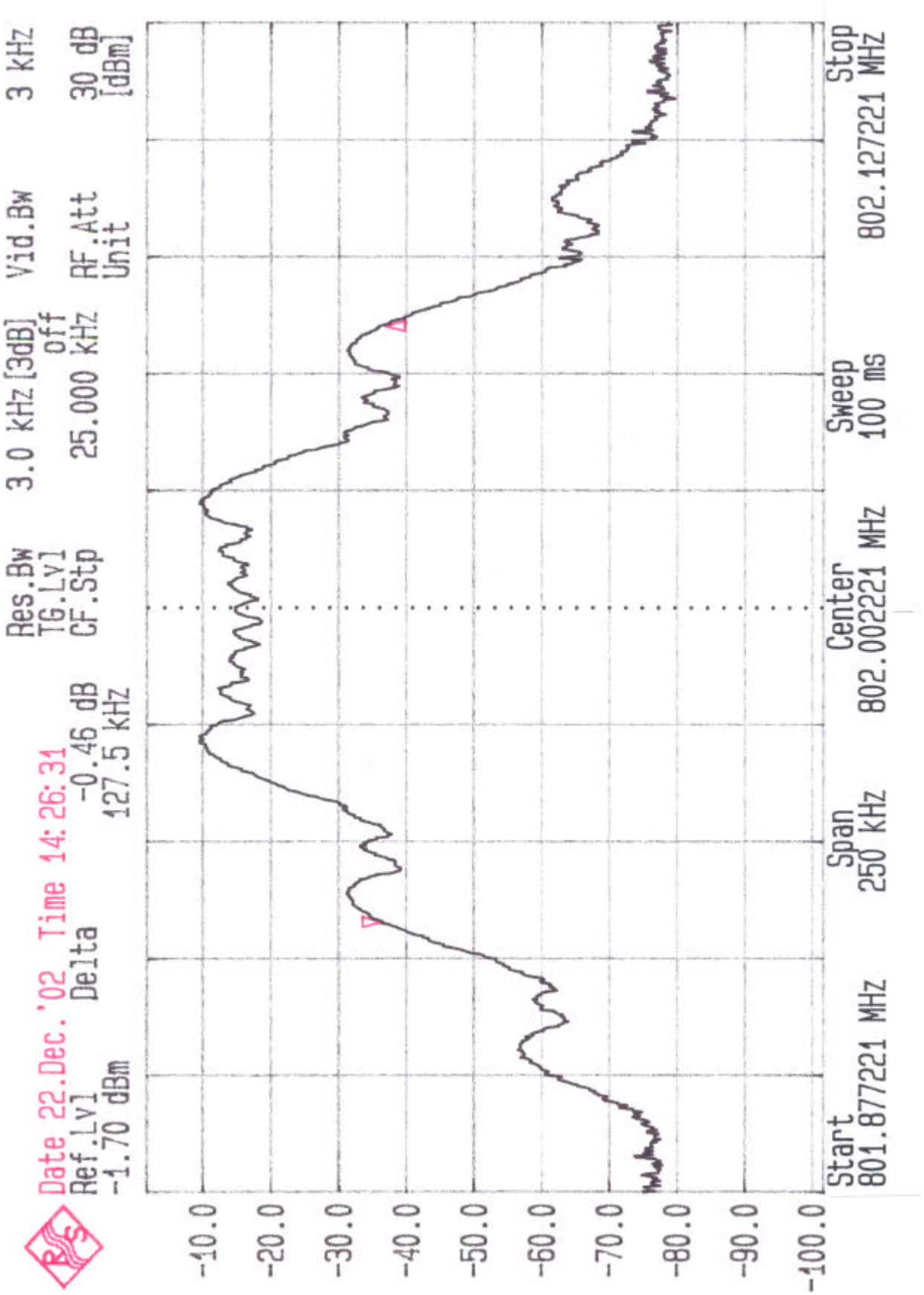
This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to § 15.207 (c), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC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

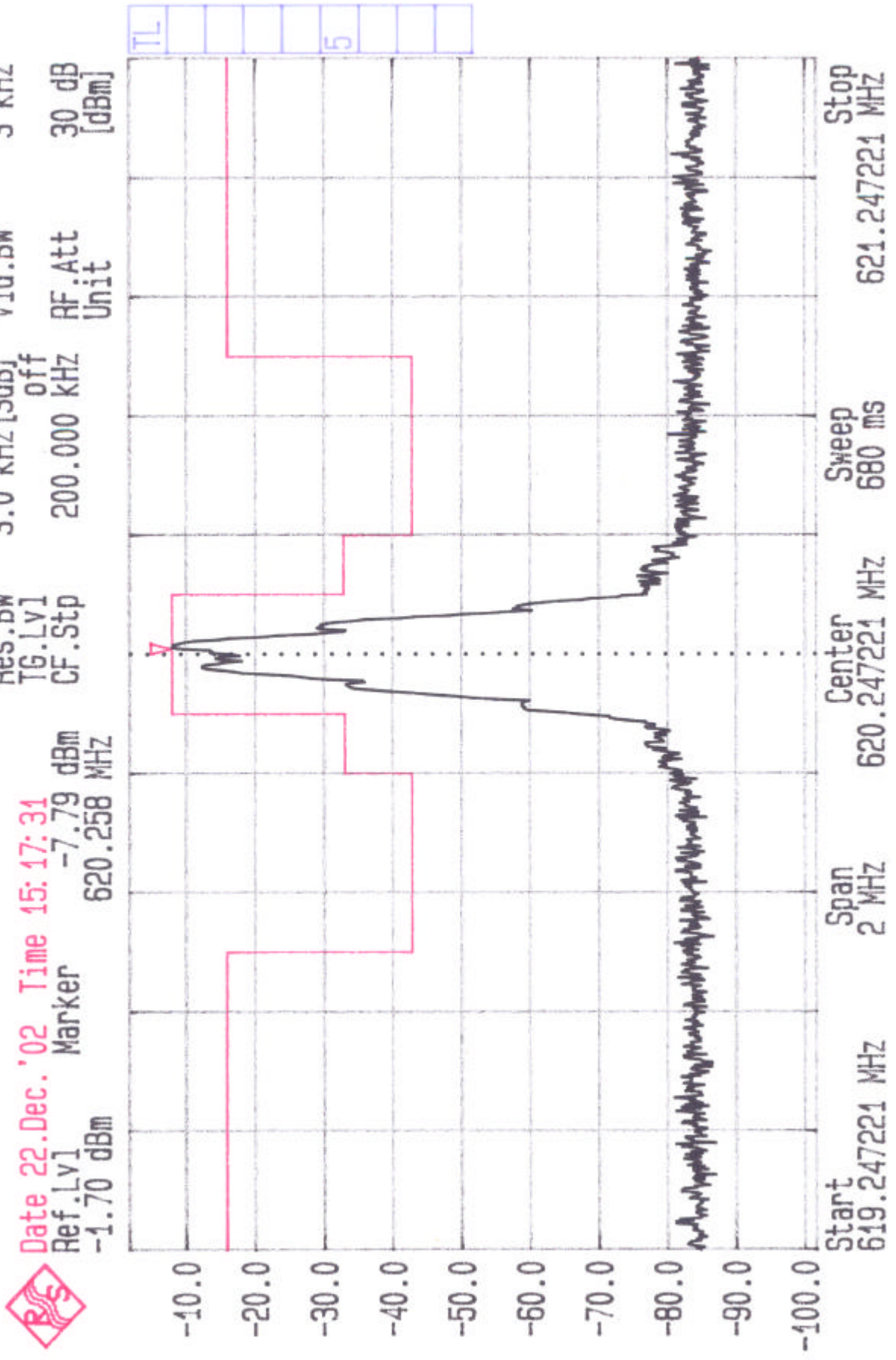
Appendix 1 : Occupied Emission Bandwidth Plotted Data

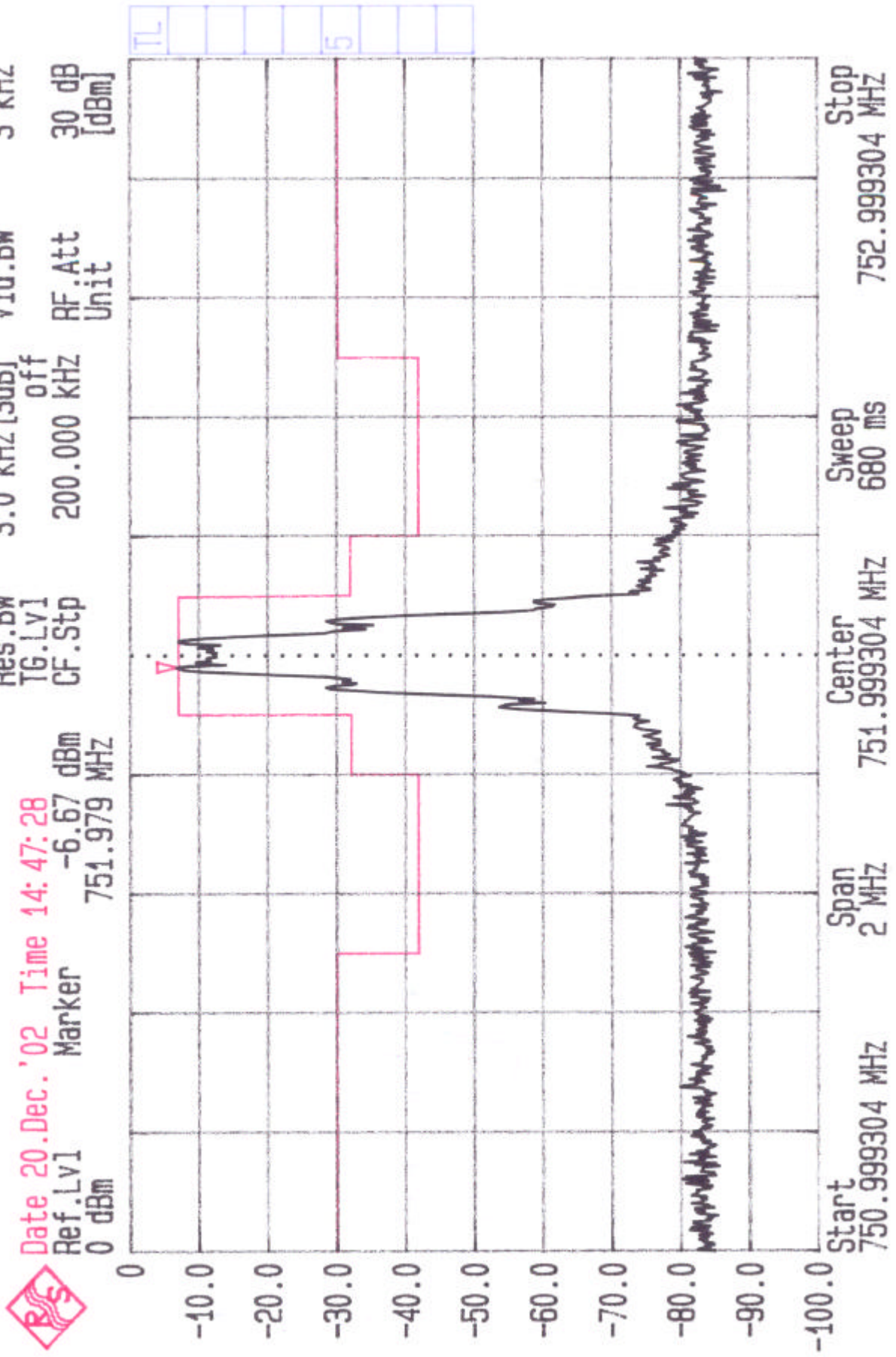

Date 22.Dec.'02 Time 14:38:01
Ref.Lvl
-1.70 dBm
Delta
-0.28 dB
108.0 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
30 dB
Unit
[dBm]
Start
620.13111 MHz
Span
250 kHz
Center
620.25611 MHz
Sweep
100 ms
Stop
620.38111 MHz
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0

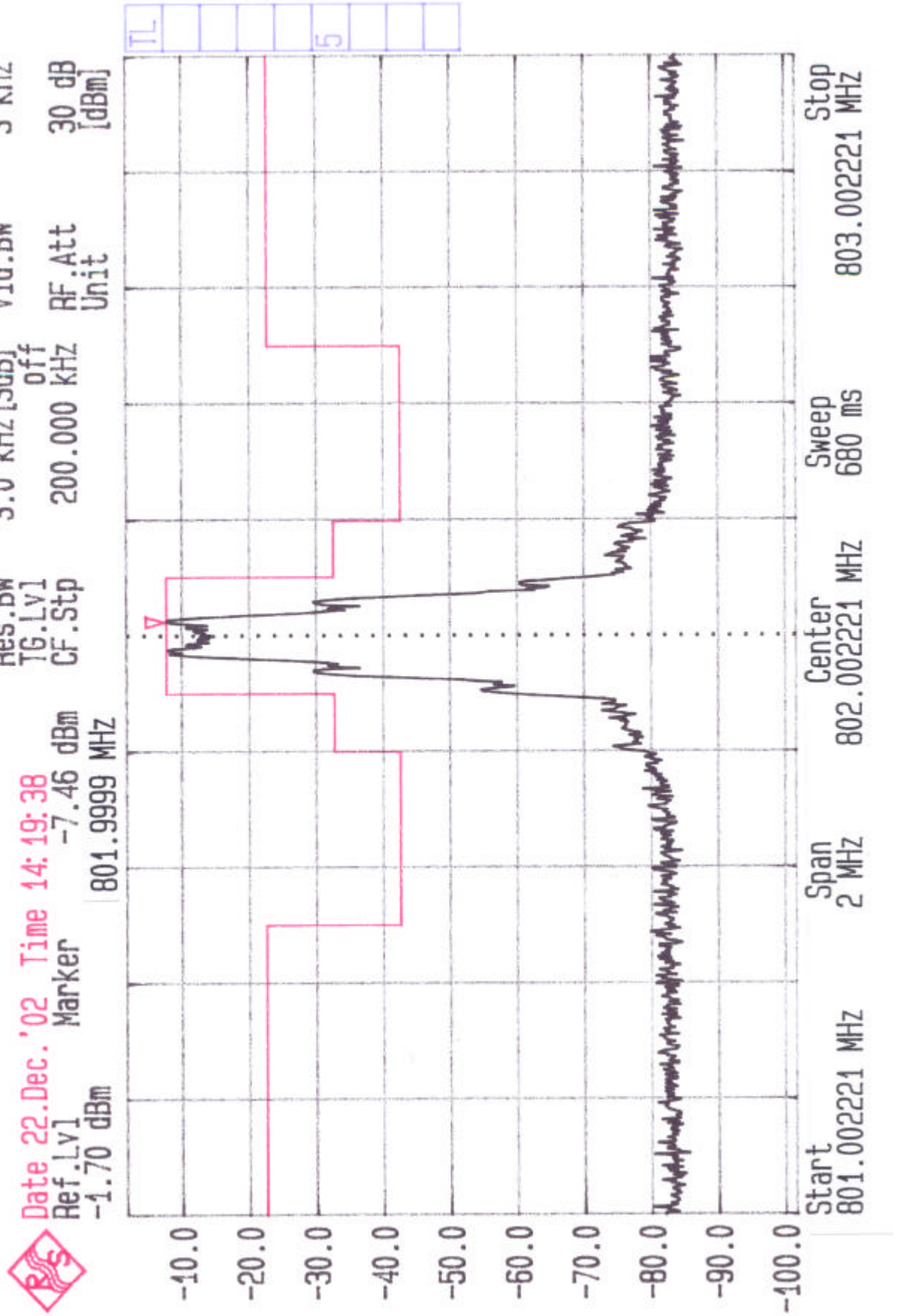

Date 22.Dec. '02 Time 13:37:38
Ref.Lvl
6.00 dBm
Delta
0.31 dB
120.5 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
40 dB
Unit
[dBm]
Start
751.875692 MHz
Span
250 kHz
Center
752.000692 MHz
Sweep
100 ms
Stop
752.125692 MHz
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0


Date 22.Dec.'02 Time 14:26:31
Ref.Lvl
-1.70 dBm
Delta
-0.46 dB
127.5 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
30 dB
Unit
[dBm]
Start
801.877221 MHz
Span
250 kHz
Center
802.002221 MHz
Sweep
100 ms
Stop
802.127221 MHz
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0

Appendix 2 : Emission Mask Plotted Data


Date 22.Dec.'02 Time 15:17:31
Ref.Lvl
-1.70 dBm
Marker
-7.79 dBm
620.258 MHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
30 dB
Unit
[dBm]
Start
619.247221 MHz
Span
2 MHz
Center
620.247221 MHz
Sweep
680 ms
Stop
621.247221 MHz
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0


Date 20.Dec.'02 Time 14:47:28
Ref.Lvl
0 dBm
Marker
-6.67 dBm
751.979 MHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 200.000 kHz
Vid.Bw 3 kHz
RF.Att 30 dB
Unit [dBm]
Start 750.999304 MHz
Span 2 MHz
Center 751.999304 MHz
Sweep 680 ms
Stop 752.999304 MHz
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0


Date 22.Dec.'02 Time 14:19:38
Ref.Lvl
-1.70 dBm
Marker
801.9999 MHz
-7.46 dBm
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
30 dB
Unit
[dBm]
Start
801.002221 MHz
Span
2 MHz
Center
802.002221 MHz
Sweep
680 ms
Stop
803.002221 MHz
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0