FCC Part 74 Subpart H

EMI TEST REPORT

of

E.U.T. : Wireless Handheld Transmitter Microphone

FCC ID. : JEBUF-18

MODEL : UF-18

Working Frequency : 790MHz-806MHz

for

APPLICANT : WA GOL INDUSTRIAL CO., LTD.
ADDRESS : No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien, Taiwan, R.O.C.

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 : ET92R-05-064-01

TEST REPORT CIRTIFICATION

Applicant : WA GOL INDUSTRIAL CO., LTD.
No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien, Taiwan, R.O.C.

Manufacturer : WA GOL INDUSTRIAL CO., LTD.
No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien, Taiwan, R.O.C.

Description of EUT :

a) Type of EUT	: Wireless Handheld Transmitter Microphone
b) Trade Name	: MASCOT
c) Model No.	: UF-18
d) FCC ID	: JEBUF-18
e) Working Frequency	: 790MHz-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 : May 28 2003

Test Engineer : Vincent Chang
(Vincent Chang)

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 Handheld Transmitter Microphone
b) Trade Name : MASCOT
c) Model No. : UF-18
d) FCC ID : JEBUF-18
e) Working Frequency : 790MHz-806MHz
f) Power Supply : DC 3V Batteries

1.2 Characteristics of Device:

1. Operating Frequency: 790MHz -806MHz
2. The handheld microphone operates in UHF band frequency with PLL synthesized control. UHF 64 preprogrammed selectable frequencies to avoid interference. Uni-directional dynamic or uni-directional condenser capsules with different characters for various choices. Use 1.5V x 2 AA size batteries for low operating cost.
3. The emission designator is 161KF3E. The calculation is (2M+2DK), K=1 and (2 x 32.768 + 2 x 48) = 161.5kHz, so the emission designator is 161KF3E.

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)(ii), the output power shall not exceed 250 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

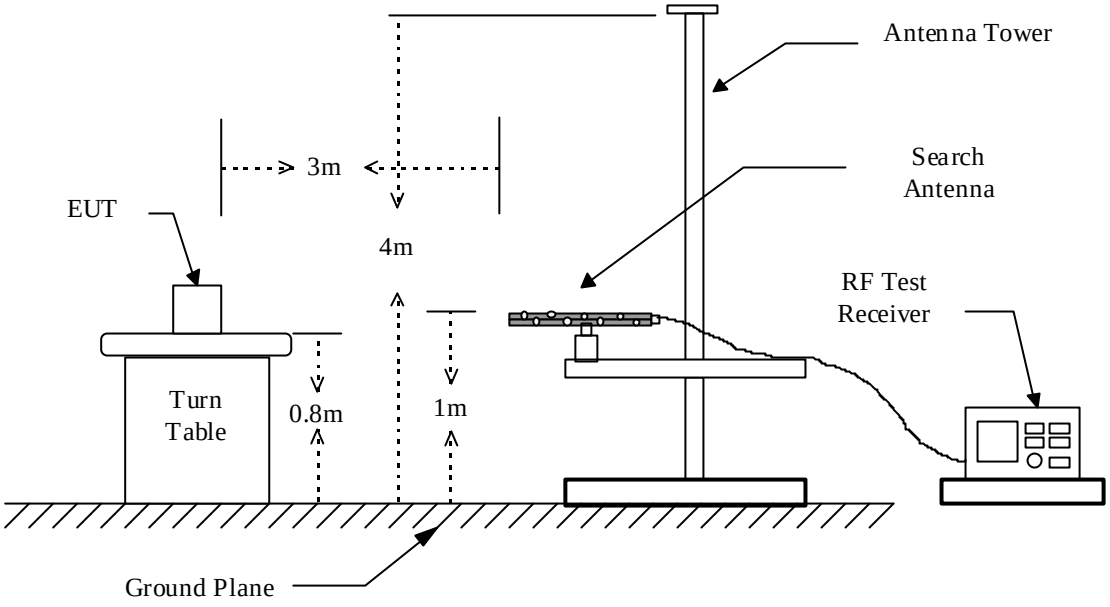
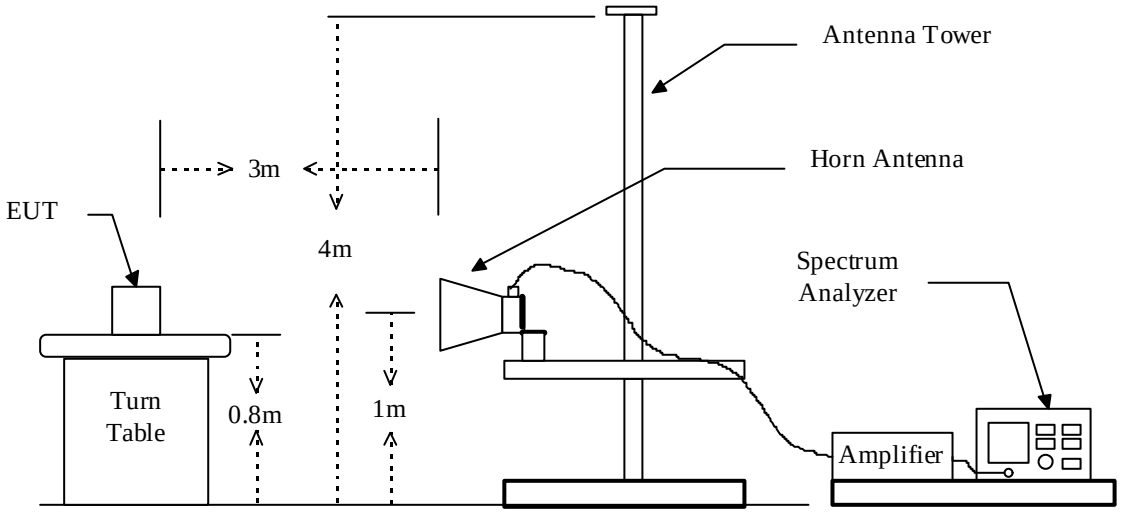


Figure 1 : Frequencies measured above 1 GHz configuration



3.3 Test Data

A. Channel Low (ERP)

Operated mode : 790.348 MHz Test Date : May 22, 2003
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)
790.348	72.0	2.1	2.6	---	-0.5	0.891	250.0

B. Channel Mid (ERP)

Operated mode : 797.749 MHz Test Date : May 22, 2003
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)
797.749	71.6	1.8	2.6	---	-0.8	0.832	250.0

C. Channel High (ERP)

Operated mode : 805.737 MHz Test Date : May 22, 2003
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)
805.737	70.8	1.0	2.6	---	-1.6	0.692	250.0

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.

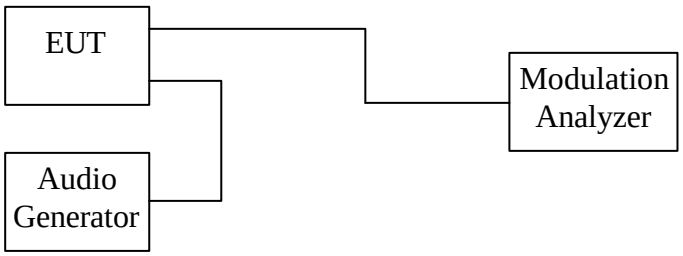
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

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

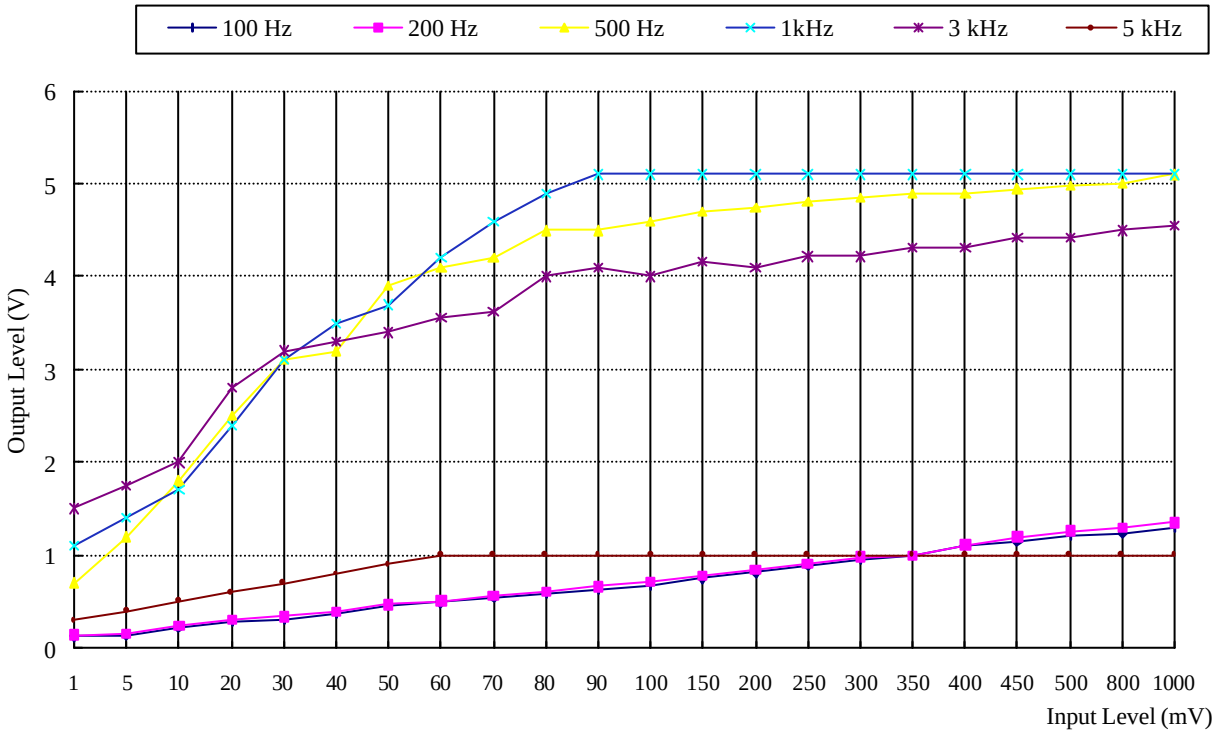


4.3 Measurement Instrument

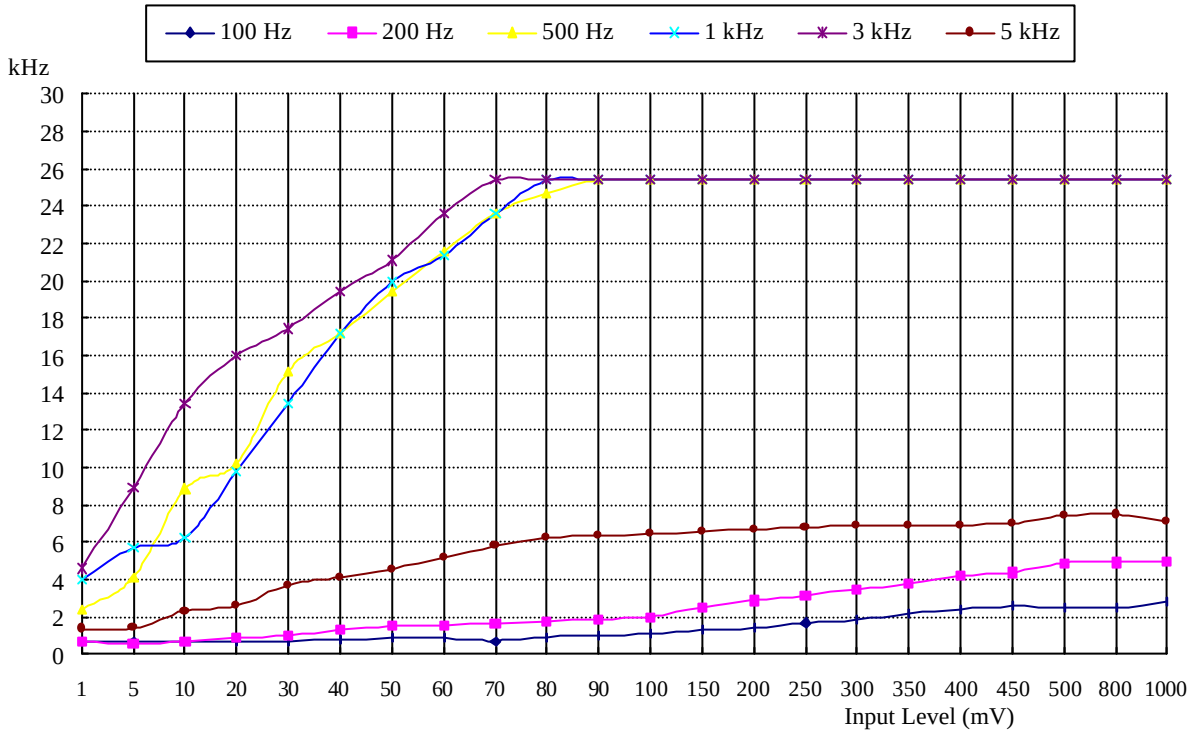
Equipment	Manufacturer	Model No.	Next Cal. Date
Modulation Analyzer	Hewlett-Packard	8901A	12/01/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Oscillscope	Lecroy	9350A	05/26/2003

4.4 Measurement Result

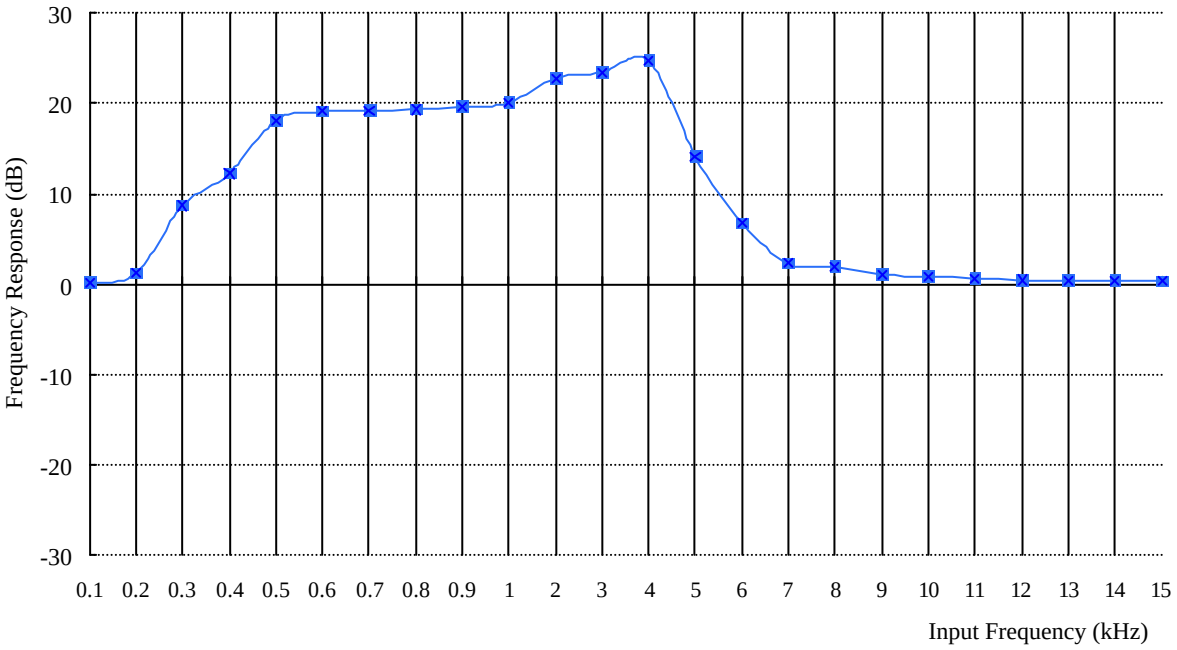
A). Frequency response



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.

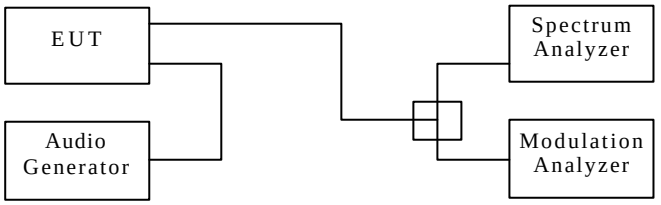
5.2 Measurement Method

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



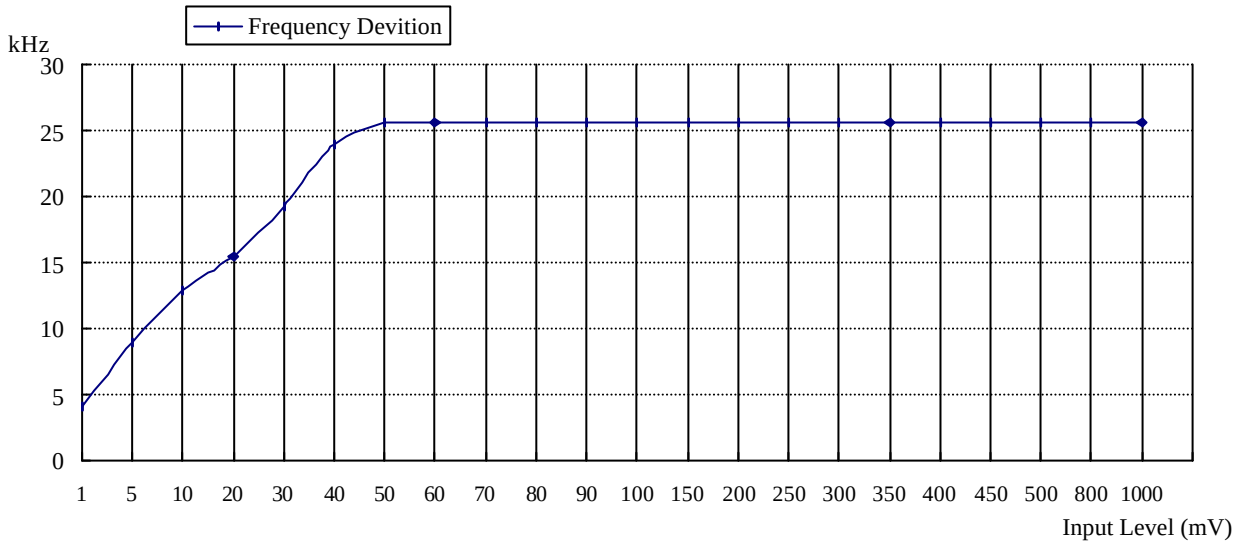
5.3 Occupied Bandwidth Test Equipment

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

Input Audio Frequency : 2.5 kHz, Sine Wave



The Level input to produce 50 % modulation is 20 mV, therefore the magnitude 16 dB greater than it is 796 mV.

5.4.2 Occupied Bandwidth Plotted

The Channel Low 26 dB Bandwidth is 82.7KHz.
The Channel Mid 26 dB Bandwidth is 80.5KHz.
The Channel High 26 dB Bandwidth is 79.1KHz.

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	01/25/2004
Quasi Peak Detector	Hewlett-Packard	85650A	01/25/2004
Pre-selector	Hewlett-Packard	85685A	01/25/2004
Spectrum Analyzer	Hewlett-Packard	8564E	05/16/2004
Horn Antenna	EMCO	3115	05/14/2004
Log periodic Antenna	EMCO	3146	11/05/2003
Biconical Antenna	EMCO	3110B	11/05/2003
Preamplifier	Hewlett-Packard	8449B	05/10/2004
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 : 790.348 MHz Test Date : May 22, 2003
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is –0.5 dBm , or 0.891 mW (ERP).
The limit of spurious or harmonics is calculated as following :

-0.5-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV) H	V	SG Reading (dBm) H	V	Amp. Gain (dBm)	Antenna Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
1580.784	64.83	65.33	-12.00	-11.17	36.90	9.18	-2.0	-1.33	-43.05	-42.22	-13.0	-29.22
2371.138	53.50	61.17	-17.50	-12.50	36.38	9.32	-2.0	-1.75	-48.27	-43.29	-13.0	-30.29
3161.476	53.83	61.14	-15.17	-8.33	36.18	9.70	-2.0	-1.75	-45.40	-38.56	-13.0	-25.56
3951.855	---	51.00	---	-15.17	35.54	9.54	-2.0	-2.16	---	-45.33	-13.0	-32.33
4742.226	---	55.33	---	-14.00	35.52	10.90	-2.0	-2.16	---	-42.78	-13.0	-29.78
5532.597	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6322.968	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
7113.339	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
7903.480	---	---	---	---	---	---	-2.0	---	---	---	-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 – Amp. Gain + Antenna Gain + Antenna Gain Corrected + Cable Loss

   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 : 797.749 MHz Test Date : May 22, 2003
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is –0.8 dBm , or 0.8317 mW (ERP).
The limit of spurious or harmonics is calculated as following :

-0.8-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV) H	V	SG Reading (dBm) H	V	Amp. Gain (dBm)	Antenna Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
1595.554	64.11	64.67	-12.42	-11.83	36.90	9.18	-2.0	-1.33	-43.47	-42.88	-13.0	-29.88
2393.335	54.18	61.83	-16.15	-11.00	36.34	9.26	-2.0	-1.75	-46.98	-41.83	-13.0	-28.83
3191.041	54.55	60.33	-16.62	-8.84	36.16	9.70	-2.0	-1.75	-45.08	-39.05	-13.0	-26.05
3988.747	---	52.00	---	-15.50	35.40	9.50	-2.0	-2.16	---	-45.56	-13.0	-32.56
4786.453	---	56.17	---	-12.00	35.52	10.9	-2.0	-2.16	---	-40.84	-13.0	-23.84
5584.159	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6381.865	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
7179.354	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
7977.490	---	---	---	---	---	---	-2.0	---	---	---	-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 – Amp. Gain + Antenna Gain + Antenna Gain Corrected + Cable Loss

   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 : 805.737 MHz Test Date : May 22, 2003
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is –1.6 dBm , or 0.6918 mW (ERP).
The limit of spurious or harmonics is calculated as following :

-1.6-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV) H	V	SG Reading (dBm) H	V	Amp. Gain (dBm)	Antenna Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
1611.523	63.90	64.50	-12.93	-12.00	36.90	9.18	-2.0	-1.33	-43.98	-43.05	-13.0	-30.05
2417.276	54.18	63.17	-11.90	-10.16	36.34	9.26	-2.0	-1.75	-42.73	-40.99	-13.0	-27.99
3223.004	54.28	62.67	-16.89	-6.50	36.16	9.70	-2.0	-1.75	-47.10	-36.71	-13.0	-23.71
4028.732	---	53.50	---	-14.00	35.40	9.50	-2.0	-2.16	---	-44.06	-13.0	-31.06
4834.526	---	54.83	---	-13.34	35.58	10.9	-2.0	-2.16	---	-42.18	-13.0	-29.18
5040.096	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6445.824	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
7251.552	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
8057.370	---	---	---	---	---	---	-2.0	---	---	---	-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 – Amp. Gain + Antenna Gain + Antenna Gain Corrected + Cable Loss

   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 Exhibit F-Test Setup Photos

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.

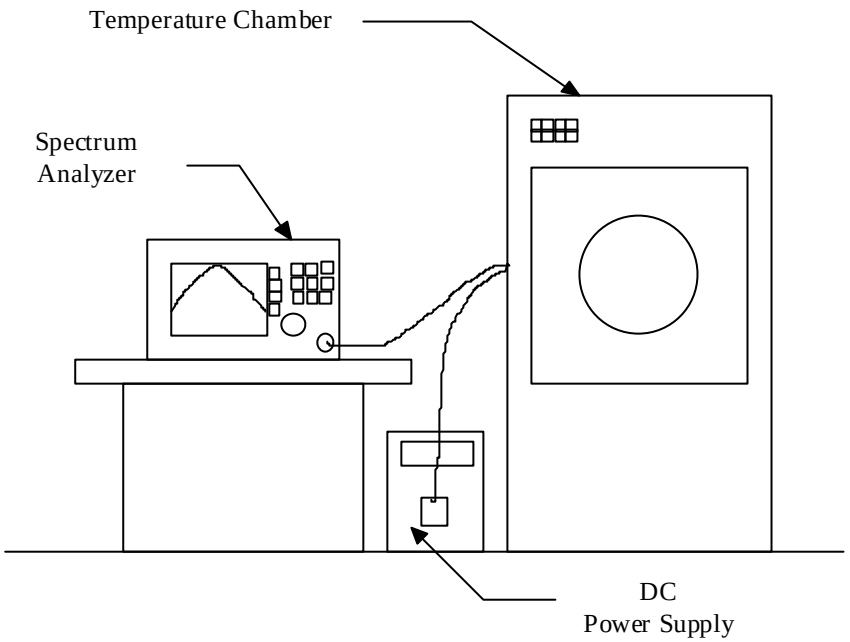
B) Frequency stability versus input voltage

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	05/16/2004
Temperature Chamber	ACS	EOS 200T	01/17/2004

7.4 Measurement Data

A1. Frequency stability versus enviroment tempture

Reference Frequency : 790.348 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.	790.3519	0.00049	790.3777	0.00376	790.3525	0.00057
	New Batt.	790.3288	-0.00243	790.3315	-0.00209	790.3481	0.00001
	New Batt.	790.3719	0.00302	790.3255	-0.00285	790.3386	-0.00119
40	New Batt.	790.3271	-0.00264	790.3607	0.00161	790.3357	-0.00156
	New Batt.	790.3241	-0.00302	790.3506	0.00033	790.3535	0.00070
	New Batt.	790.3528	0.00061	790.3290	-0.00240	790.3577	0.00123
30	New Batt.	790.3386	-0.00119	790.3638	0.00200	790.3261	-0.00277
	New Batt.	790.3522	0.00053	790.3647	0.00211	790.3490	0.00013
	New Batt.	790.3467	-0.00016	790.3642	0.00205	790.3503	0.00029
20	New Batt.	790.3420	-0.00076	790.3424	-0.00071	790.3603	0.00156
	New Batt.	790.3479	-0.00001	790.3577	0.00123	790.3593	0.00143
	New Batt.	790.3666	0.00235	790.3184	-0.00375	790.3478	-0.00003
10	New Batt.	790.3693	0.00270	790.3286	-0.00245	790.3398	-0.00104
	New Batt.	790.3643	0.00206	790.3459	-0.00027	790.3403	-0.00097
	New Batt.	790.3182	-0.00377	790.3528	0.00061	790.3675	0.00247
0	New Batt.	790.3274	-0.00261	790.3615	0.00171	790.3376	-0.00132
	New Batt.	790.3310	-0.00215	790.3481	0.00001	790.3186	-0.00372
	New Batt.	790.3588	0.00137	790.3430	-0.00063	790.3534	0.00068
-10	New Batt.	790.3599	0.00151	790.3592	0.00142	790.3202	-0.00352
	New Batt.	790.3311	-0.00214	790.3380	-0.00127	790.3771	0.00368
	New Batt.	790.3262	-0.00276	790.3736	0.00324	790.3541	0.00077
-20	New Batt.	790.3409	-0.00090	790.3232	-0.00314	790.3542	0.00078
	New Batt.	790.3305	-0.00221	790.3413	-0.00085	790.3499	0.00024
	New Batt.	790.3380	-0.00127	790.3177	-0.00383	790.3246	-0.00296

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

Reference Frequency : 790.348 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	790.3393	-0.00110	790.3665	0.00234	790.3626	0.00185

B1. Frequency stability versus enviroment tempture

Reference Frequency : 797.749 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.	797.7707	0.00272	797.7664	0.00218	797.7767	0.00347
	New Batt.	797.7366	-0.00155	797.7383	-0.00134	797.7718	0.00286
	New Batt.	797.7390	-0.00125	797.7563	0.00092	797.7292	-0.00248
40	New Batt.	797.7619	0.00162	797.7457	-0.00041	797.7656	0.00208
	New Batt.	797.7552	0.00078	797.7580	0.00113	797.7255	-0.00295
	New Batt.	797.7667	0.00222	797.7246	-0.00306	797.7264	-0.00283
30	New Batt.	797.7398	-0.00115	797.7556	0.00083	797.7737	0.00310
	New Batt.	797.7232	-0.00323	797.7510	0.00025	797.7638	0.00186
	New Batt.	797.7211	-0.00350	797.7641	0.00189	797.7307	-0.00229
20	New Batt.	797.7315	-0.00219	797.7289	-0.00252	797.7657	0.00209
	New Batt.	797.7783	0.00367	797.7773	0.00355	797.7763	0.00342
	New Batt.	797.7754	0.00331	797.7677	0.00234	797.7713	0.00280
10	New Batt.	797.7602	0.00140	797.7377	-0.00142	797.7589	0.00124
	New Batt.	797.7795	0.00382	797.7623	0.00167	797.7583	0.00117
	New Batt.	797.7253	-0.00297	797.7547	0.00071	797.7441	-0.00061
0	New Batt.	797.7243	-0.00310	797.7265	-0.00282	797.7301	-0.00237
	New Batt.	797.7478	-0.00015	797.7295	-0.00244	797.7309	-0.00227
	New Batt.	797.7733	0.00305	797.7657	0.00209	797.7728	0.00298
-10	New Batt.	797.7763	0.00342	797.7680	0.00238	797.7638	0.00186
	New Batt.	797.7382	-0.00135	797.7612	0.00153	797.7306	-0.00231
	New Batt.	797.7474	-0.00020	797.7244	-0.00308	797.7366	-0.00155
-20	New Batt.	797.7495	0.00006	797.7186	-0.00381	797.7421	-0.00086
	New Batt.	797.7752	0.00328	797.7418	-0.00090	797.7519	0.00036
	New Batt.	797.7262	-0.00286	797.7525	0.00044	797.7423	-0.00084

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

Reference Frequency : 797.749 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	797.7385	-0.00132	797.7689	0.00249	797.7473	-0.00021

C1. Frequency stability versus enviroment tempture

Reference Frequency : 805.737 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.	805.7453	0.00103	805.7131	-0.00297	805.7570	0.00248
	New Batt.	805.7655	0.00354	805.7229	-0.00175	805.7385	0.00019
	New Batt.	805.7108	-0.00325	805.7384	0.00017	805.7473	0.00128
40	New Batt.	805.7284	-0.00107	805.7202	-0.00209	805.7223	-0.00182
	New Batt.	805.7205	-0.00205	805.7408	0.00047	805.7674	0.00377
	New Batt.	805.7238	-0.00164	805.7588	0.00271	805.7496	0.00156
30	New Batt.	805.7141	-0.00284	805.7081	-0.00359	805.7181	-0.00235
	New Batt.	805.7453	0.00103	805.7167	-0.00252	805.7262	-0.00134
	New Batt.	805.7177	-0.00240	805.7093	-0.00344	805.7304	-0.00082
20	New Batt.	805.7627	0.00319	805.7263	-0.00133	805.7261	-0.00135
	New Batt.	805.7342	-0.00035	805.7421	0.00063	805.7615	0.00304
	New Batt.	805.7066	-0.00377	805.7573	0.00252	805.7313	-0.00071
10	New Batt.	805.7536	0.00206	805.7125	-0.00304	805.7168	-0.00251
	New Batt.	805.7657	0.00356	805.7265	-0.00130	805.7152	-0.00271
	New Batt.	805.7160	-0.00261	805.7148	-0.00276	805.7461	0.00113
0	New Batt.	805.7184	-0.00231	805.7332	-0.00047	805.7571	0.00249
	New Batt.	805.7467	0.00120	805.7454	0.00104	805.7273	-0.00120
	New Batt.	805.7673	0.00376	805.7256	-0.00141	805.7435	0.00081
-10	New Batt.	805.7142	-0.00283	805.7240	-0.00161	805.7627	0.00319
	New Batt.	805.7355	-0.00019	805.7547	0.00220	805.7479	0.00135
	New Batt.	805.7299	-0.00088	805.7239	-0.00163	805.7186	-0.00228
-20	New Batt.	805.7595	0.00279	805.7339	-0.00038	805.7662	0.00362
	New Batt.	805.7231	-0.00173	805.7622	0.00313	805.7118	-0.00313
	New Batt.	805.7146	-0.00278	805.7673	0.00376	805.7375	0.00006

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

Reference Frequency : 805.737 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	805.7627	0.00319	805.7653	0.00351	805.7062	-0.00382

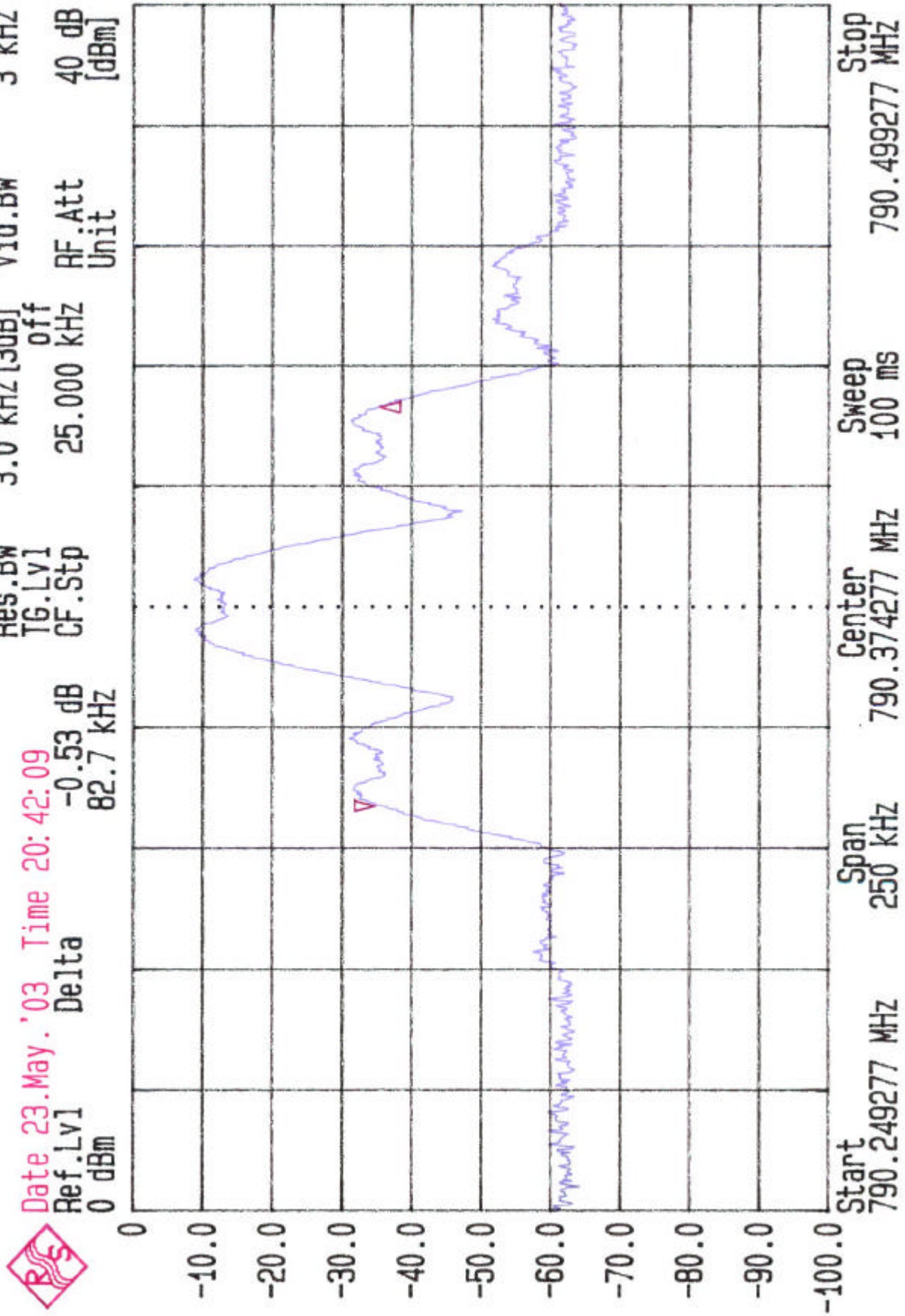
8 CONDUCTED EMISSION MEASUREMENT

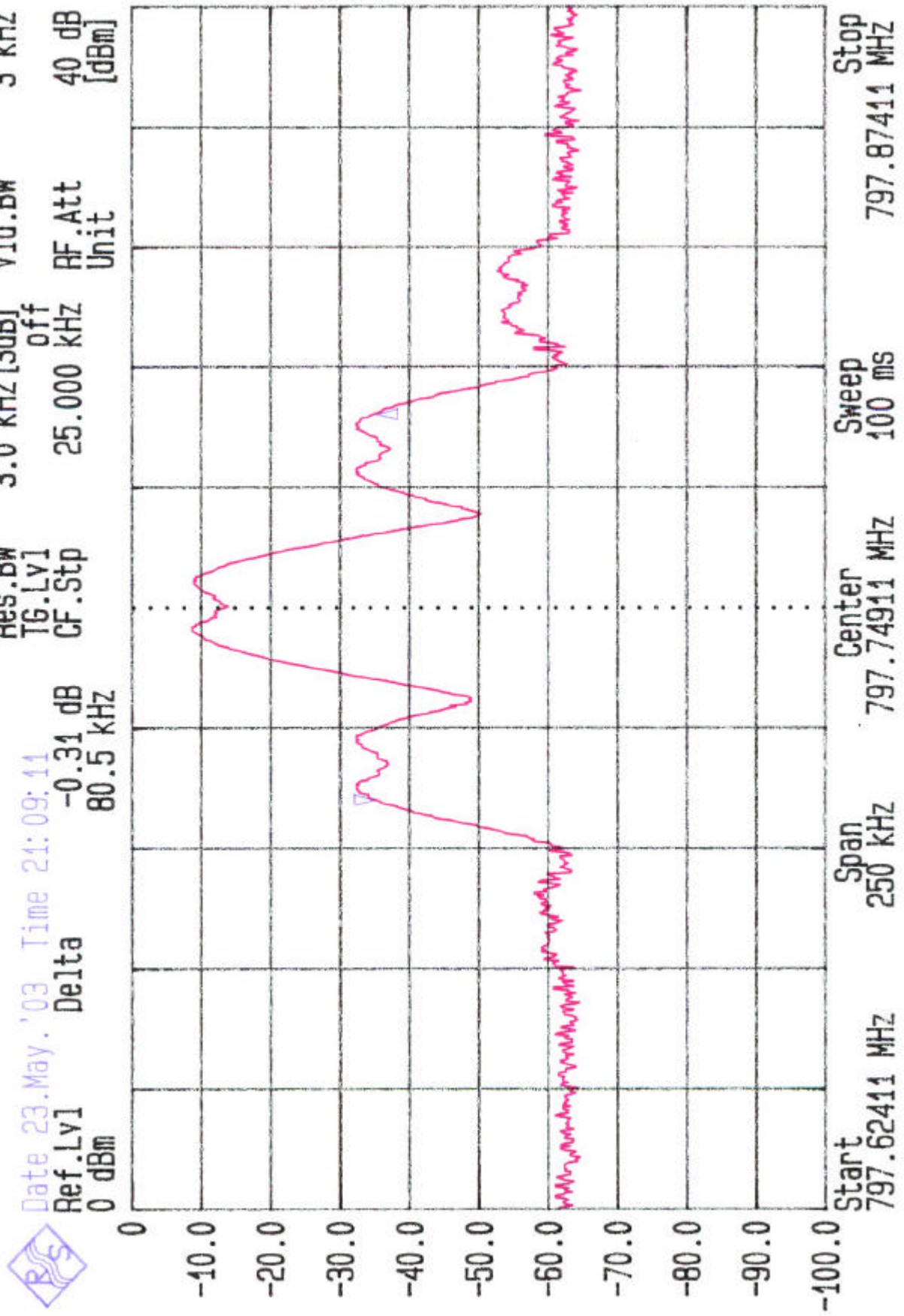
8.1 Standard Applicable

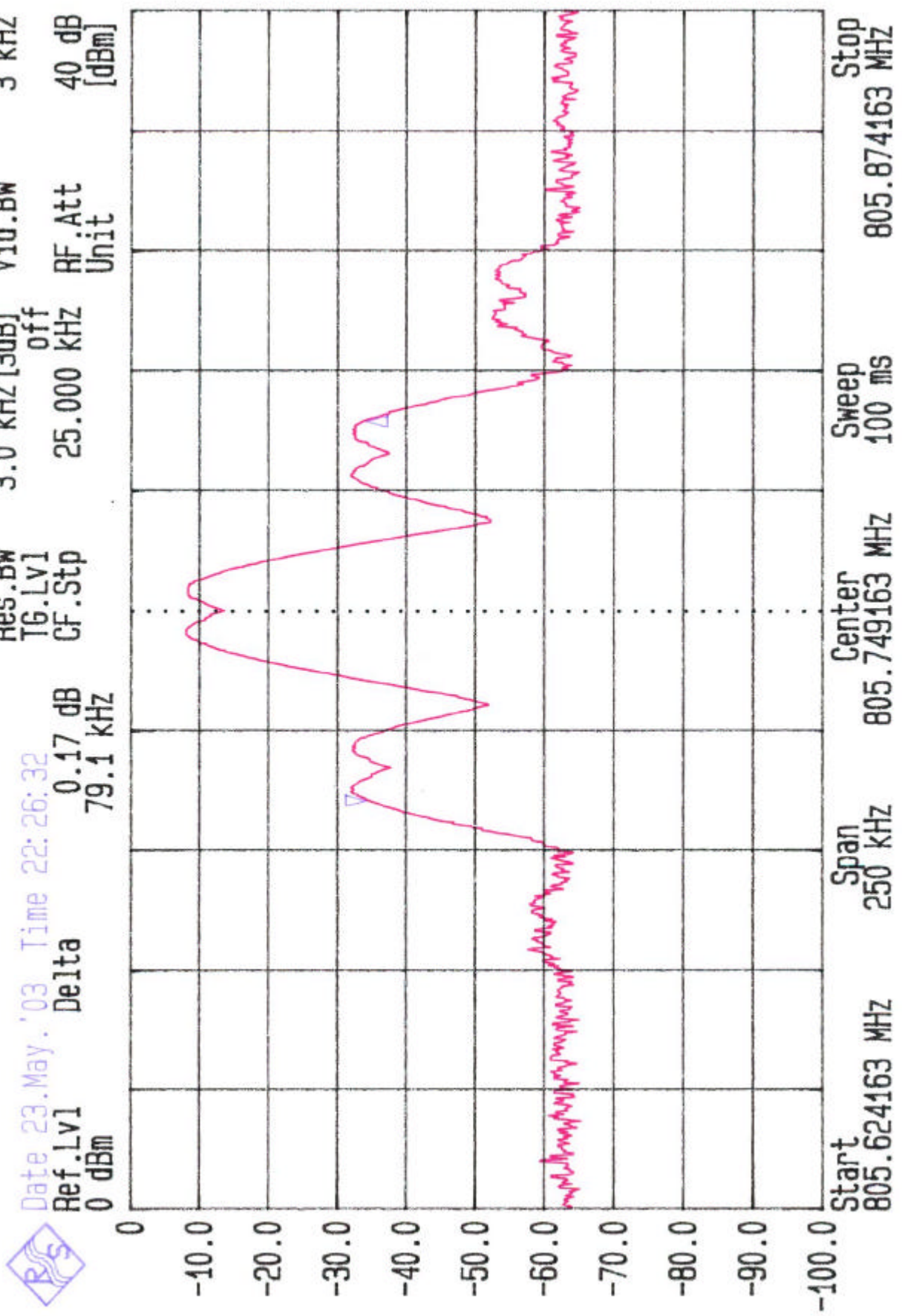
This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to § 15.207 (c), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC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

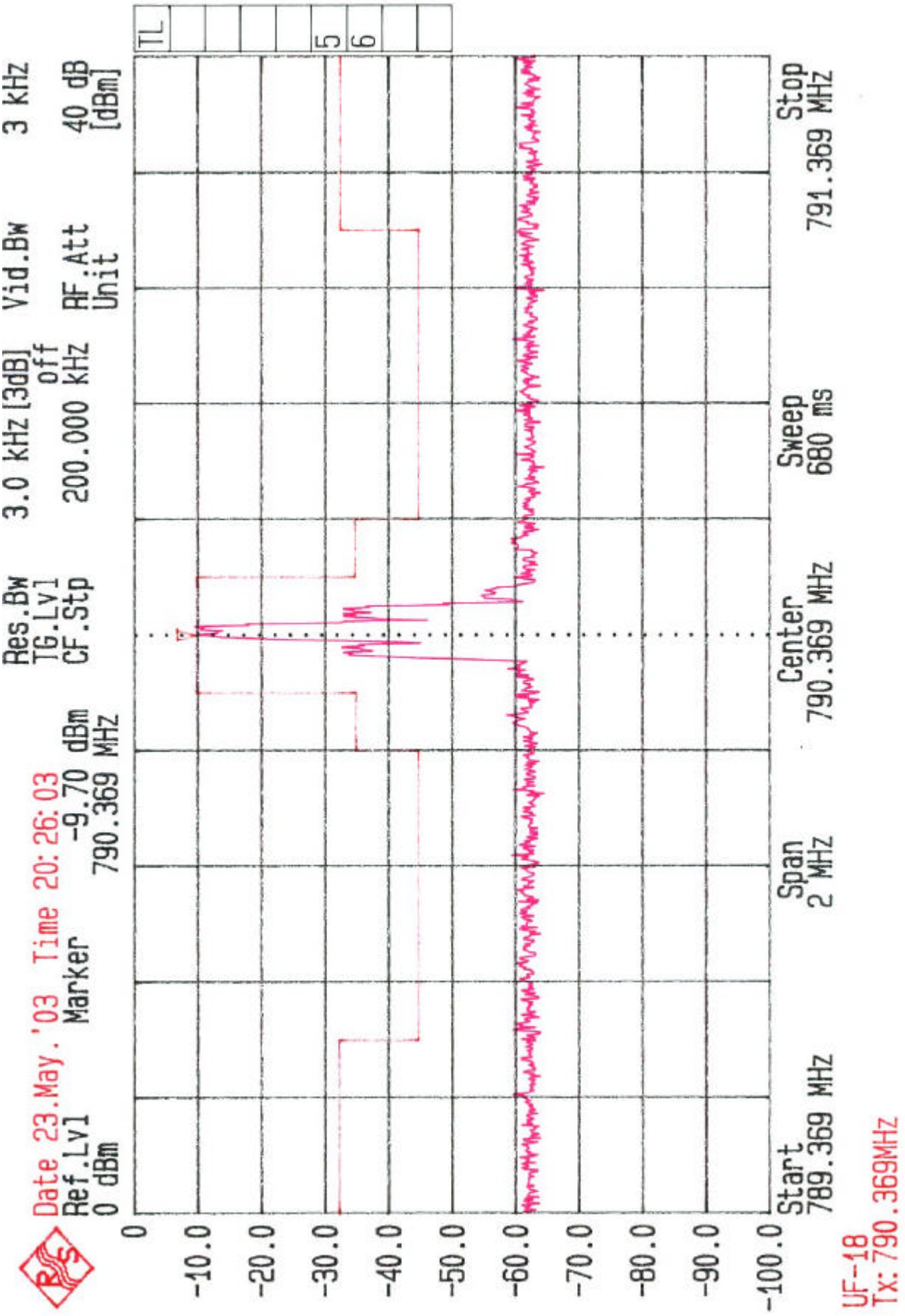
Appendix 1 : Occupied Emission Bandwidth Plotted Data

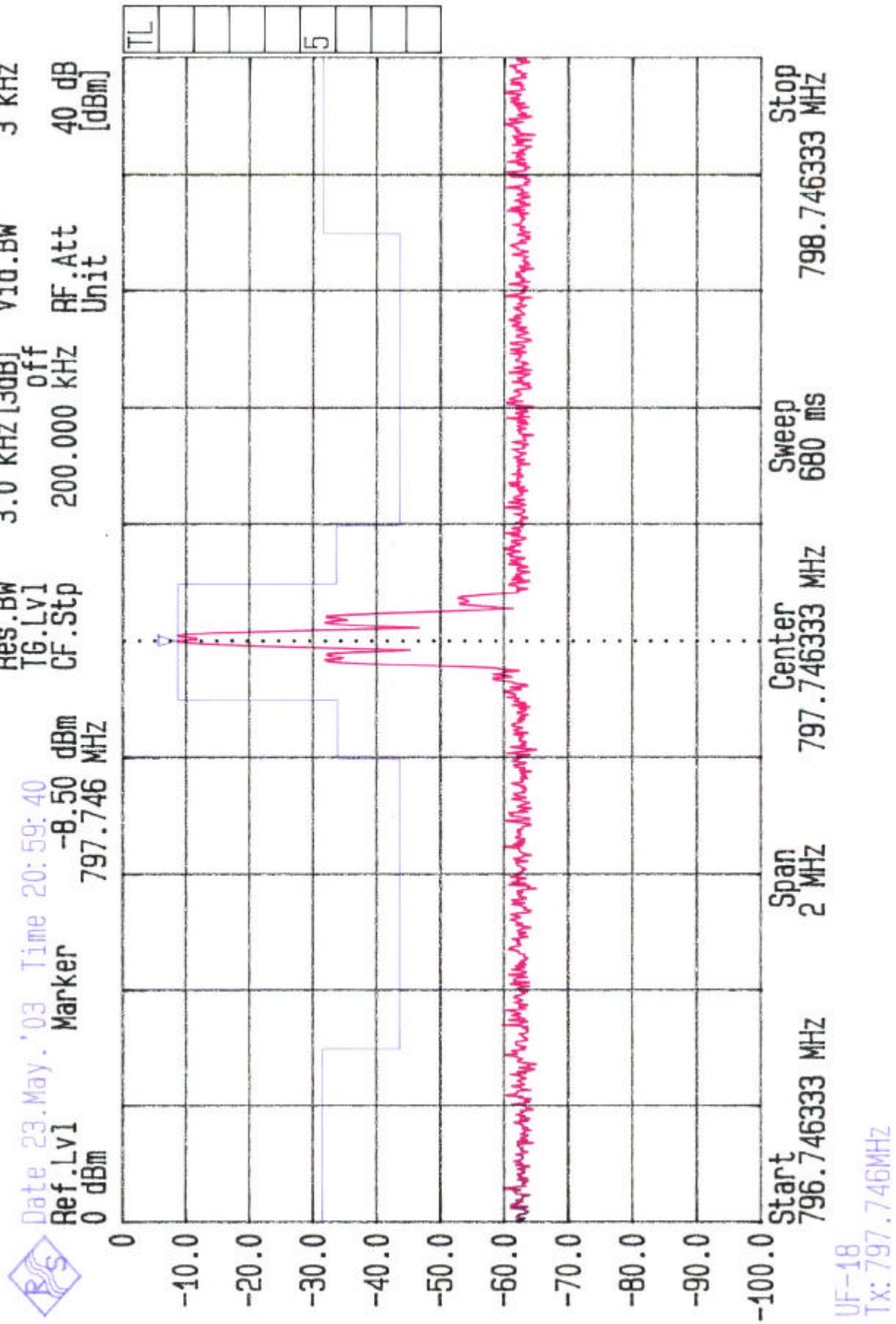

Date 23.May.'03 Time 20:42:09
Ref.Lvl
0 dBm
Delta
-0.53 dB
82.7 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
40 dB
Unit
[dBm]
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Start
790.249277 MHz
Span
250 kHz
Center
790.374277 MHz
Sweep
100 ms
Stop
790.499277 MHz

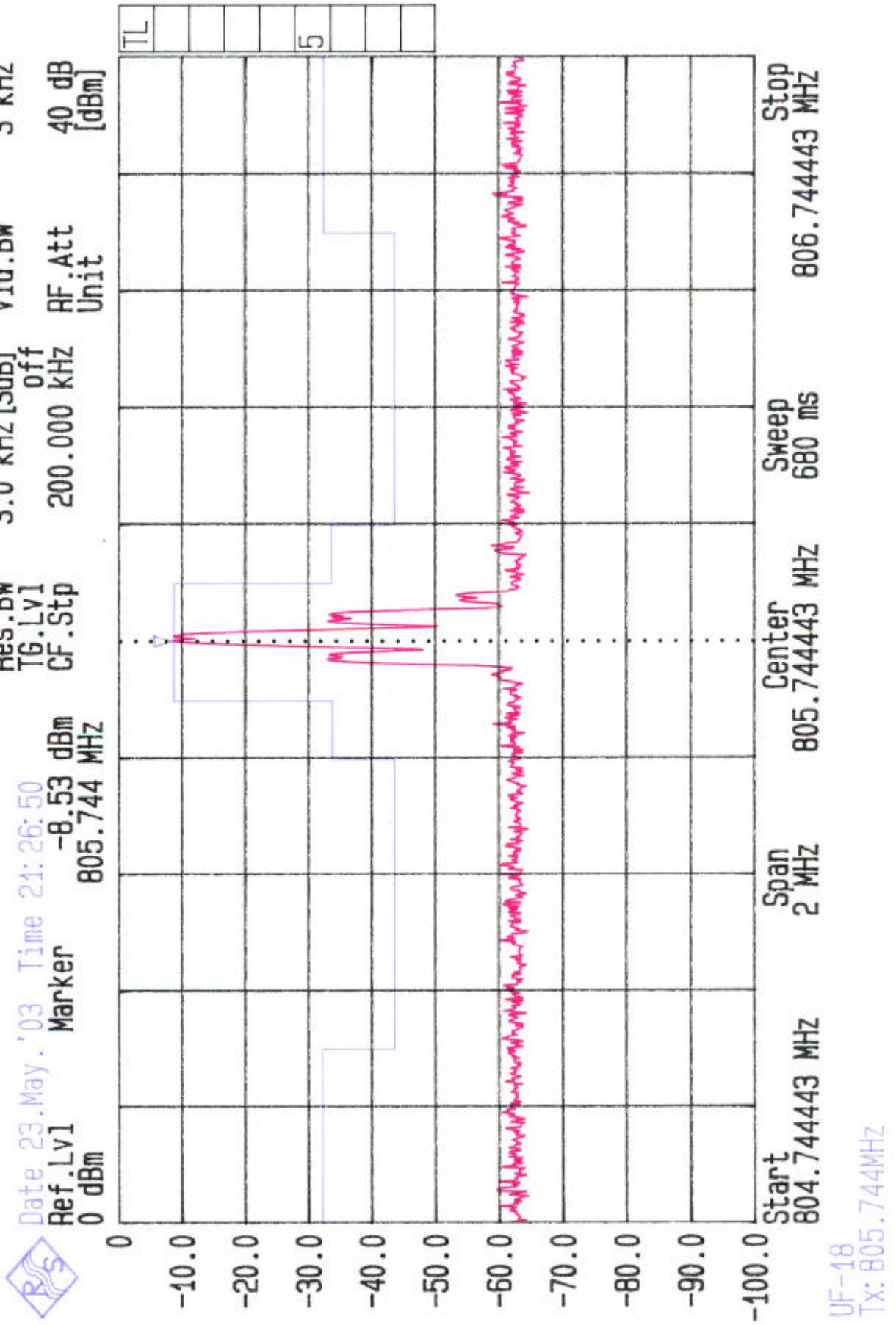

Date 23.May.'03 Time 21:09:11
Ref.Lvl
0 dBm
Delta
-0.31 dB
80.5 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
40 dB
Unit
[dBm]
Start
797.62411 MHz
Span
250 kHz
Center
797.74911 MHz
Sweep
100 ms
Stop
797.87411 MHz
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0


Date 23.May.'03 Time 22:26:32
Ref.Lvl
0 dBm
Delta
0.17 dB
79.1 kHz
Res.Bw
TG.Lvl
CF.Stp
3.0 kHz [3dB]
off
25.000 kHz
Vid.Bw
RF.Att
Unit
3 kHz
40 dB
[dBm]
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Start
805.624163 MHz
Span
250 kHz
Center
805.749163 MHz
Sweep
100 ms
Stop
805.874163 MHz

Appendix 2 : Emission Mask Plotted Data


Date 23.May.'03 Time 20:26:03
Ref.Lvl
0 dBm
Marker
-9.70 dBm
790.369 MHz
Res.Bw
3.0 kHz
TG.Lvl
off
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
40 dB
Unit
[dBm]
TL
5
6
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Start
789.369 MHz
Span
2 MHz
Center
790.369 MHz
Sweep
680 ms
Stop
791.369 MHz
UF-18
Tx: 790.369MHz


Ref.Lvl
0 dBm
Marker
-8.50 dBm
797.746 MHz
Res.Bw
3.0 kHz
TG.Lvl
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
40 dB
Unit
[dBm]
Start
796.746333 MHz
Span
2 MHz
Center
797.746333 MHz
Sweep
680 ms
Stop
798.746333 MHz
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Date 23.May.'03 Time 20:59:40
UF-18
Tx: 797.746MHz


Res.Bw 3.0 kHz
TG.Lvl 3dB
CF.Stp 200.000 kHz
Vid.Bw 3 kHz
RF.Att 40 dB
Unit [dBm]
Ref.Lvl
0 dBm
Marker
-8.53 dBm
805.744 MHz
Date 23.May.'03 Time 21:26:50
Start
804.744443 MHz
Span
2 MHz
Center
805.744443 MHz
Sweep
680 ms
Stop
806.744443 MHz
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
UF-18
Tx: 805.744MHz