EMI TEST REPORT

of

E.U.T. : Wireless Handheld Transmitter Microphone

FCC ID. : JEBUT-18A

MODEL : UT-18

Working Frequency : 682.375MHz-697.125MHz

for

APPLICANT : MASCOT ELECTRIC CO., LTD.
ADDRESS : No. 85 Chang Hsing First Street, Tai-Tzu Village, Jen-Te Hsian, Tainan Hsien, Taiwan, R.O.C. 717

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-07-076-02

TEST REPORT CIRTIFICATION

Applicant : MASCOT ELECTRIC CO., LTD.
No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien, Taiwan, R.O.C. 717

Manufacturer : MASCOT ELECTRIC CO., LTD.
No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien, Taiwan, R.O.C. 717

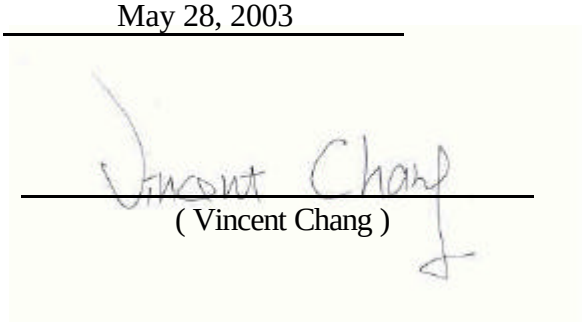
Description of EUT :

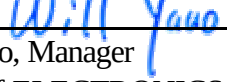
a) Type of EUT	: Wireless Handheld Transmitter Microphone
b) Trade Name	: MASCOT
c) Model No.	: UT-18
d) FCC ID	: JEBUT-18A
e) Working Frequency	: 682.375MHz-697.125MHz
f) Power Supply	: DC 3V Batteries

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)

Approve & Authorized Signer : 
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.	: UT-18
d) FCC ID	: JEBUT-18A
e) Working Frequency	: 682.375MHz-697.125MHz
f) Power Supply	: DC 3V Batteries

1.2 Characteristics of Device:

1. Operating Frequency: 682.375MHz-697.125MHz
2. The bodypack transmitter operates in UHF band frequency with PLL synthesized control. UHF 64 preprogrammed selectable frequencies to avoid interference. Uni-directional condenser capsules with different characters for various choices. Use 1.5V x 2 AA size dry or rechargeable 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

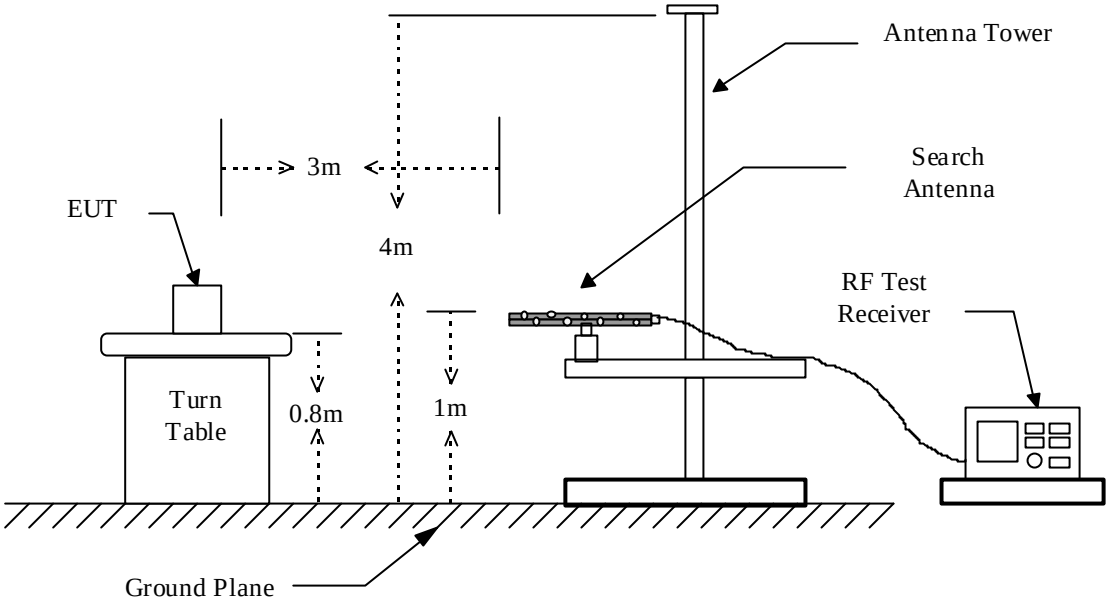
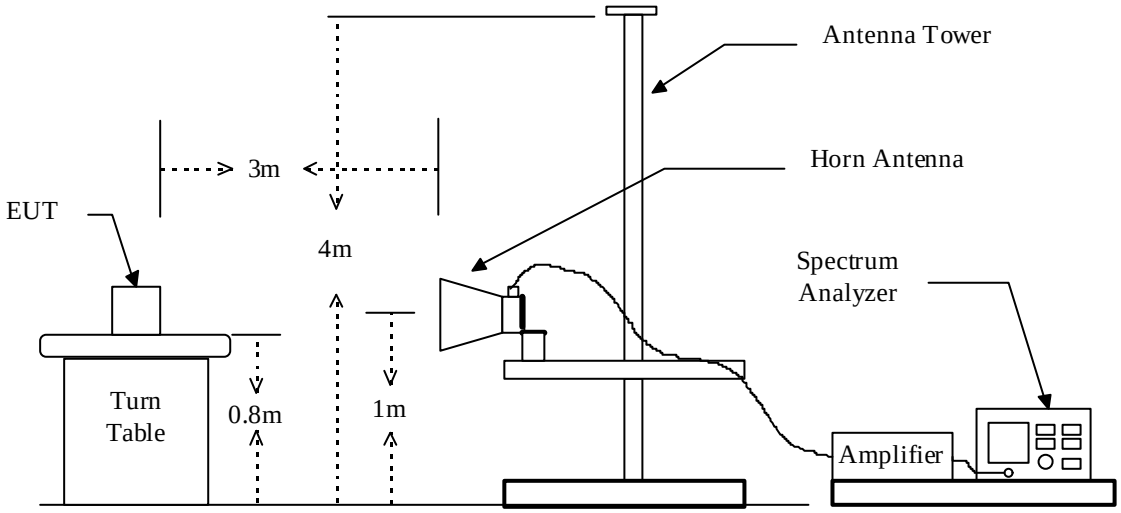


Figure 1 : Frequencies measured above 1 GHz configuration



3.3 Test Data

A. Channel Low (ERP)

Operated mode : 682.375 MHz Test Date : Aug. 03, 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)
682.375	70.7	4.4	-3.0	---	1.4	1.38	250.0

B. Channel Mid (ERP)

Operated mode : 690.125 MHz Test Date : Aug. 03, 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)
690.125	71.2	5.1	-3.1	---	2.0	1.58	250.0

C. Channel High (ERP)

Operated mode : 697.125 MHz Test Date : Aug. 03, 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)
697.125	70.0	4.2	-3.2	---	1.0	1.26	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	05/25/2004
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.

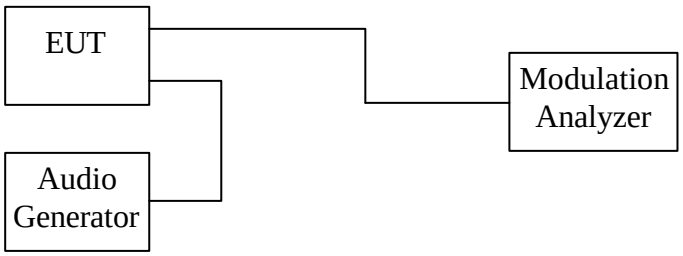
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

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

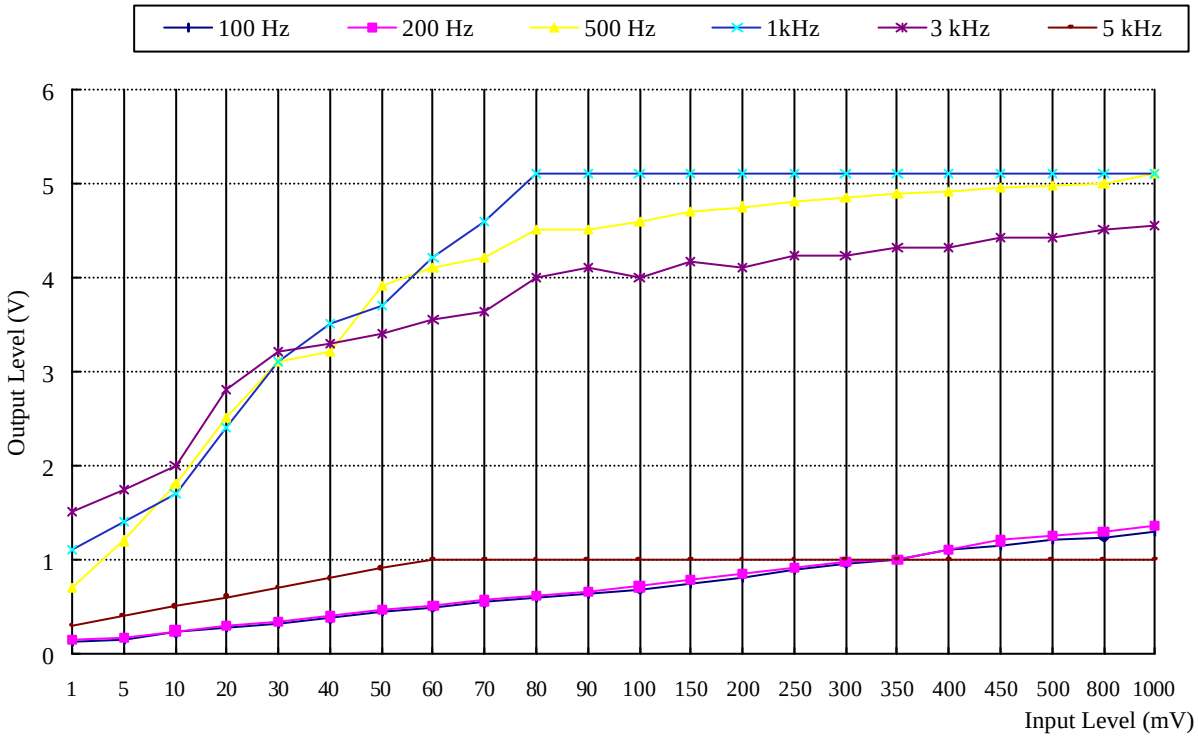


4.3 Measurement Instrument

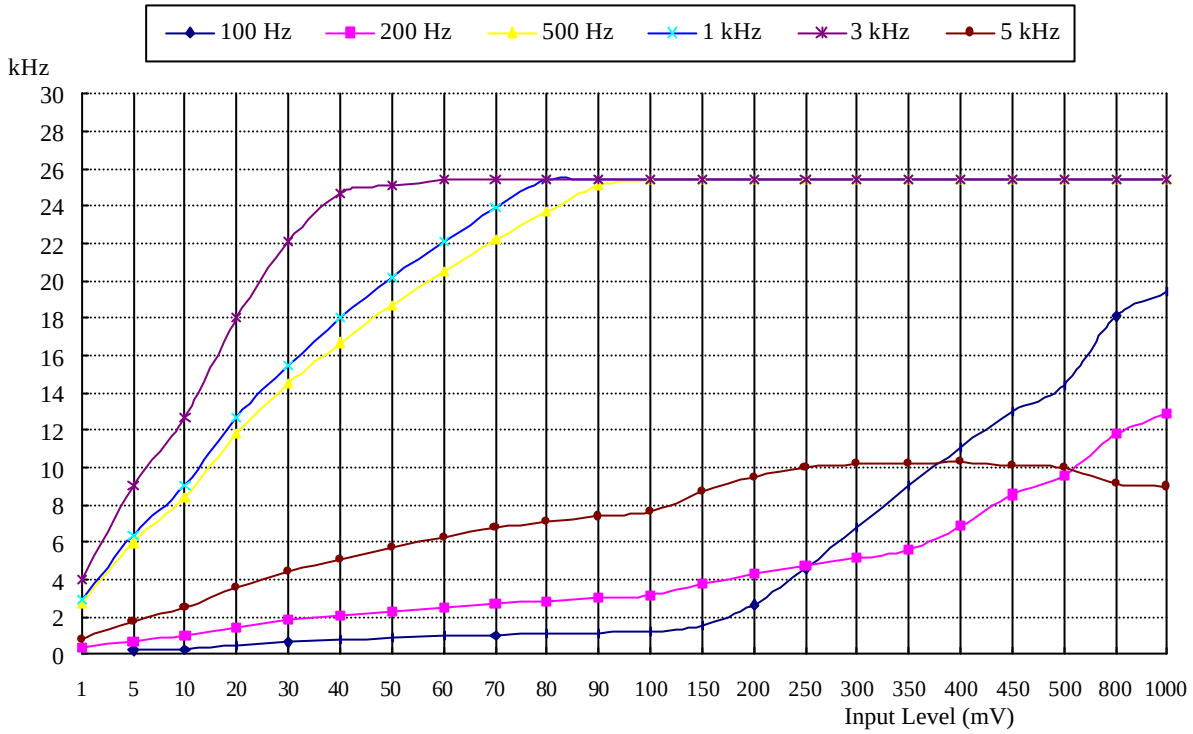
Equipment	Manufacturer	Model No.	Next Cal. Date
Modulation Analyzer	Hewlett-Packard	8901A	12/01/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Oscillscope	Lecroy	9350A	05/26/2004

4.4 Measurement Result

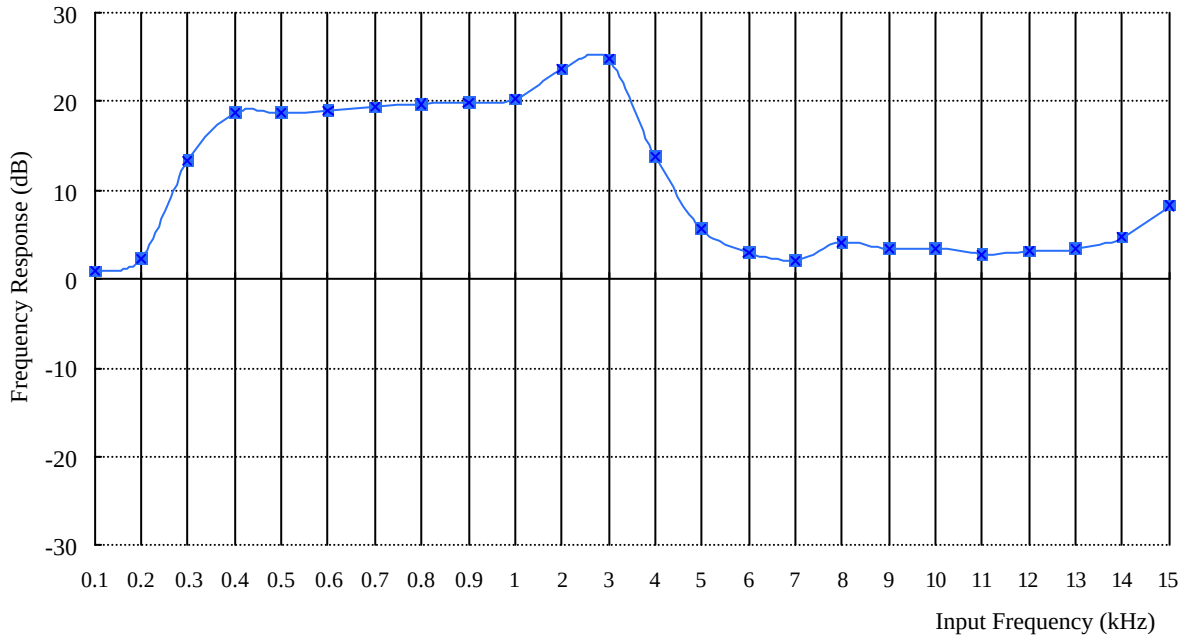
A). Frequency response



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.

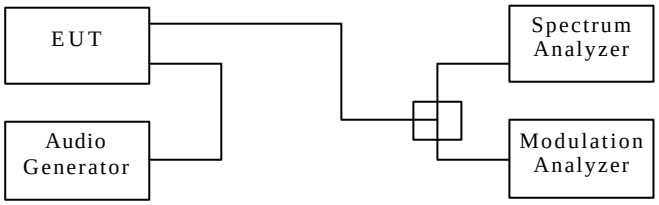
5.2 Measurement Method

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



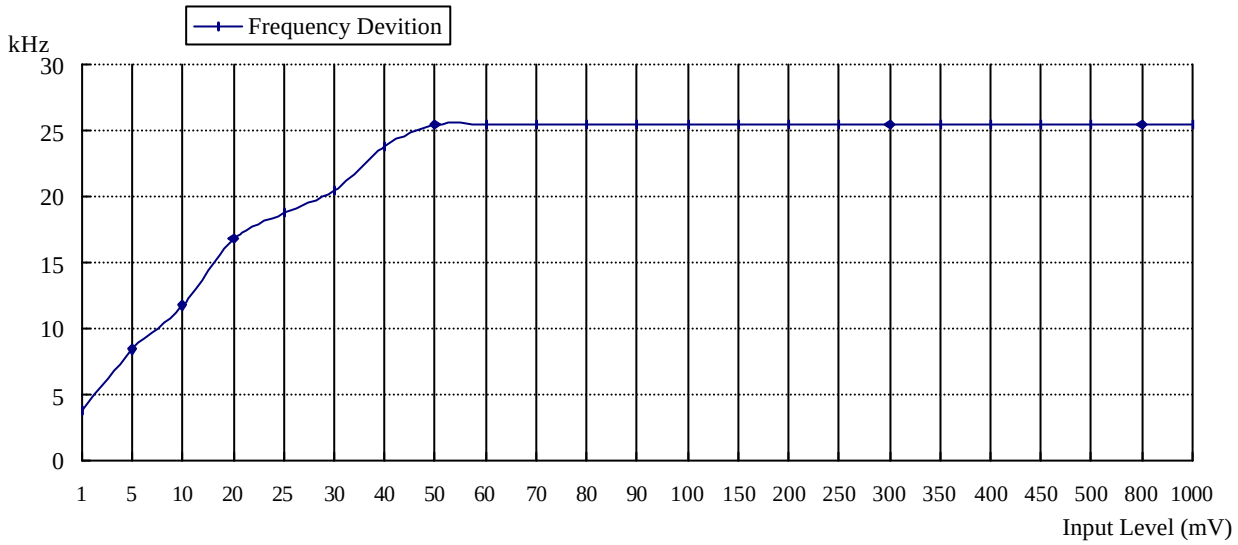
5.3 Occupied Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	R&S	ESBI	05/25/2004
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 25 mV, therefore the magnitude 16 dB greater than it is 995 mV.

5.4.2 Occupied Bandwidth Plotted

The Channel Low 26 dB Bandwidth is 142.2 KHz.
The Channel Mid 26 dB Bandwidth is 129.7 KHz.
The Channel High 26 dB Bandwidth is 121.6 KHz.

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 : 682.375 MHz Test Date : Aug. 03, 2003
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is 1.4 dBm , or 1.38 mW (ERP).
The limit of spurious or harmonics is calculated as following :

1.4-[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)
1364.750	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2047.125	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2729.500	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
3411.875	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4094.250	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4776.625	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
5459.000	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6141.375	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6823.750	---	---	---	---	---	---	-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 : 690.125 MHz Test Date : Aug. 03, 2003
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is 2.0 dBm , or 1.6 mW (ERP).
The limit of spurious or harmonics is calculated as following :
2.0-[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)
1380.250	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2070.375	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2760.500	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
3450.625	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4140.750	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4830.875	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
5521.000	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6211.125	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6901.250	---	---	---	---	---	---	-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 : 697.125 MHz Test Date : Aug. 03, 2003
Temperature : 25℃ Humidity : 65%

Unmodulated carrier output power is 1.0 dBm , or 1.27 mW (ERP).
The limit of spurious or harmonics is calculated as following :
1.0-[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)
1394.250	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2091.375	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2788.500	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
3485.625	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4182.750	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4879.875	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
5577.000	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6274.125	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6971.250	---	---	---	---	---	---	-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℃to +50℃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℃to 25℃. Otherwise, an environmental chamber set for a temperature of 20℃ 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℃. 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℃decreased per stage until the lowest temperature -30℃ is measured, record all measurement frequencies.

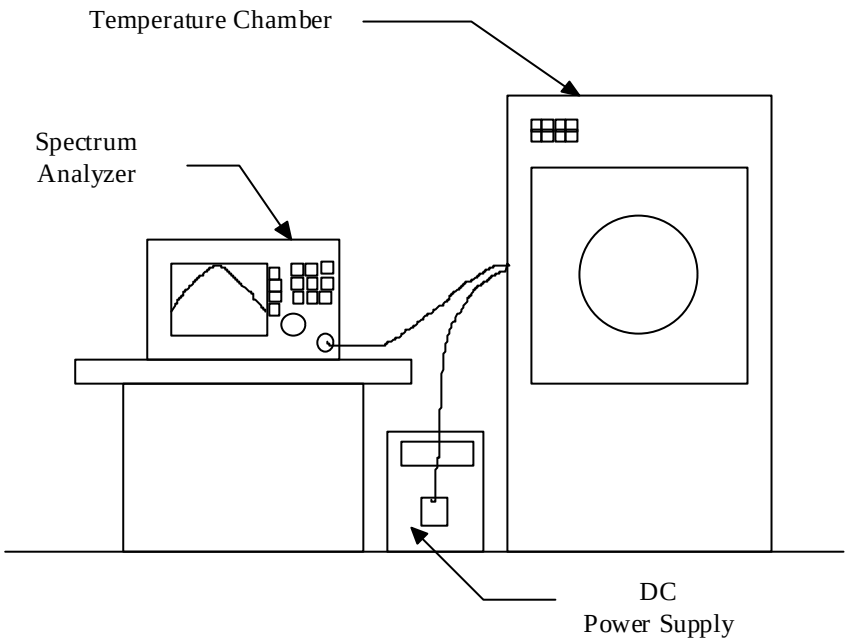
B) Frequency stability versus input voltage

1. Setup the configuration per figure 7 for frequencies measured at ambient temperature if it is within 15℃to 25℃. Otherwise, an environmental chamber set for a temperature of 20℃ 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 : 682.375 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.	682.3733	-0.00025	682.3727	-0.00034	682.3728	-0.00032
40	New Batt.	682.3729	-0.00031	682.3749	-0.00002	682.3759	0.00014
30	New Batt.	682.3741	-0.00013	682.3734	-0.00024	682.3726	-0.00035
20	New Batt.	682.3767	0.00025	682.3776	0.00038	682.3756	0.00008
10	New Batt.	632.0197	0.00334	632.0136	0.00237	631.9784	-0.00320
0	New Batt.	682.3735	-0.00021	682.3730	-0.00029	682.3731	-0.00028
-10	New Batt.	682.3730	-0.00029	682.3765	0.00021	682.3745	-0.00008
-20	New Batt.	682.3743	-0.00010	682.3742	-0.00011	682.3766	0.00024
-30	New Batt.	682.3774	0.00036	682.3736	-0.00021	682.3731	-0.00028

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

Reference Frequency : 682.375 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	682.3734	-0.00024	682.3735	-0.00022	682.3746	-0.00006

B1. Frequency stability versus enviroment tempture

Reference Frequency : 690.125 MHz		Limit：0.005%					
Enviroment Tempture (°C)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	690.1244	-0.00008	690.1257	0.00011	690.1266	0.00024
40	New Batt.	690.1275	0.00037	690.1266	0.00024	690.1224	-0.00037
30	New Batt.	690.1235	-0.00022	690.1252	0.00002	690.1232	-0.00027
20	New Batt.	690.1246	-0.00006	690.1234	-0.00023	690.1237	-0.00019
10	New Batt.	690.1245	-0.00007	690.1257	0.00010	690.1254	0.00006
0	New Batt.	690.1272	0.00032	690.1242	-0.00012	690.1247	-0.00005
-10	New Batt.	690.1271	0.00030	690.1270	0.00029	690.1260	0.00015
-20	New Batt.	690.1231	-0.00028	690.1258	0.00011	690.1273	0.00034
-30	New Batt.	690.1242	-0.00012	690.1273	0.00033	690.1242	-0.00012

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

Reference Frequency : 690.125 MHz		Limit：0.005%					
Enviroment Tempture (°C)	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	690.1267	0.00024	690.1243	-0.00010	690.1266	0.00023

C1. Frequency stability versus enviroment tempture

Reference Frequency : 697.125 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.	697.1253	0.00004	697.1267	0.00025	697.1274	0.00035
40	New Batt.	697.1245	-0.00007	697.1238	-0.00017	697.1258	0.00012
30	New Batt.	697.1244	-0.00008	697.1243	-0.00011	697.1275	0.00036
20	New Batt.	697.1253	0.00005	697.1257	0.00010	697.1245	
10	New Batt.	697.1271	0.00030	697.1250	0.00000	697.1253	0.00004
0	New Batt.	697.1250	0.00000	697.1266	0.00023	697.1229	-0.00030
-10	New Batt.	697.1223	-0.00038	697.1245	-0.00007	697.1275	0.00036
-20	New Batt.	697.1242	-0.00012	697.1225	-0.00036	697.1249	-0.00002
-30	New Batt.	697.1232	-0.00026	697.1260	0.00015	697.1255	0.00008

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

Reference Frequency : 697.125 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	697.1270	0.00029	697.1237	-0.00019	697.1272	0.00032

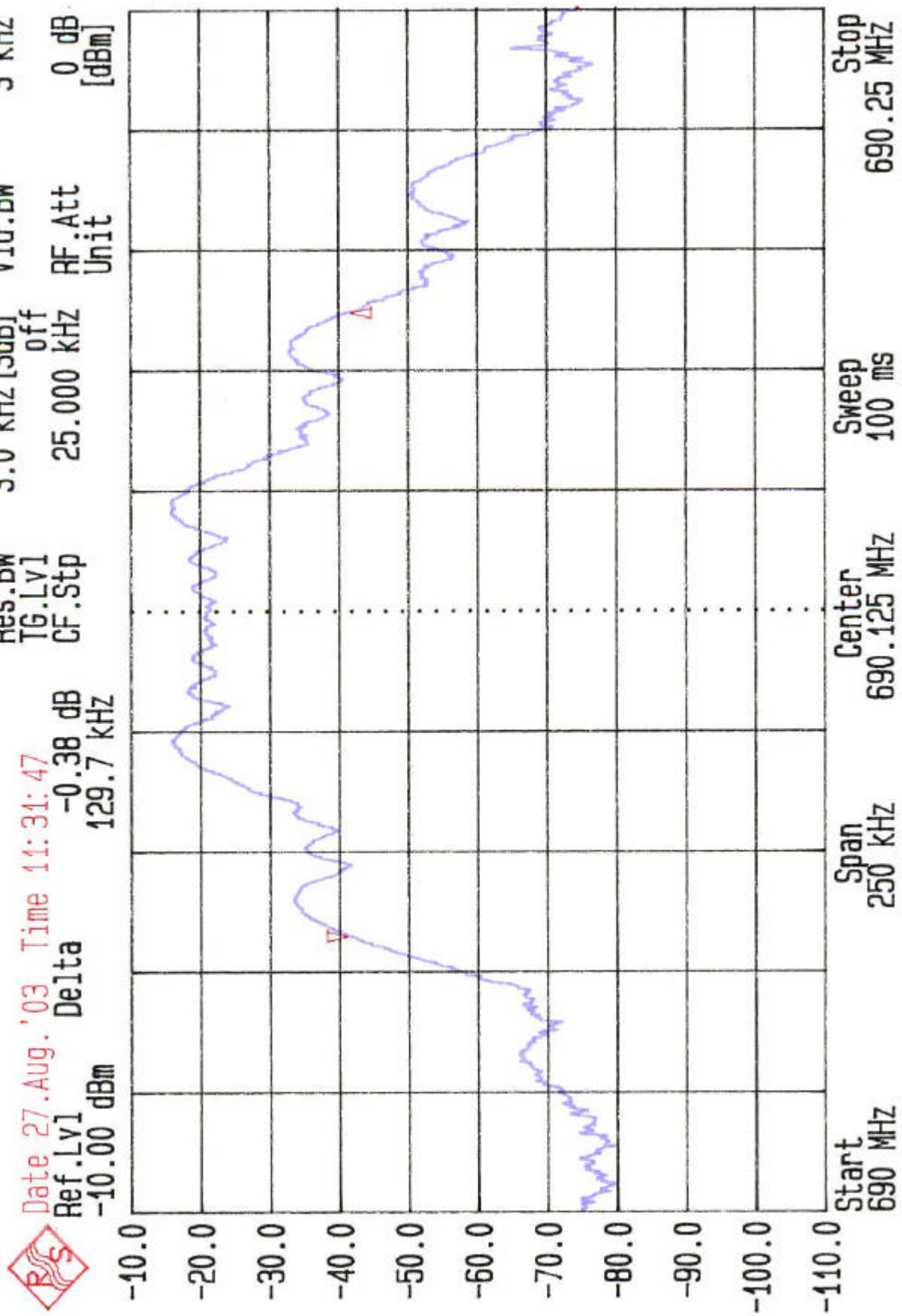
8 CONDUCTED EMISSION MEASUREMENT

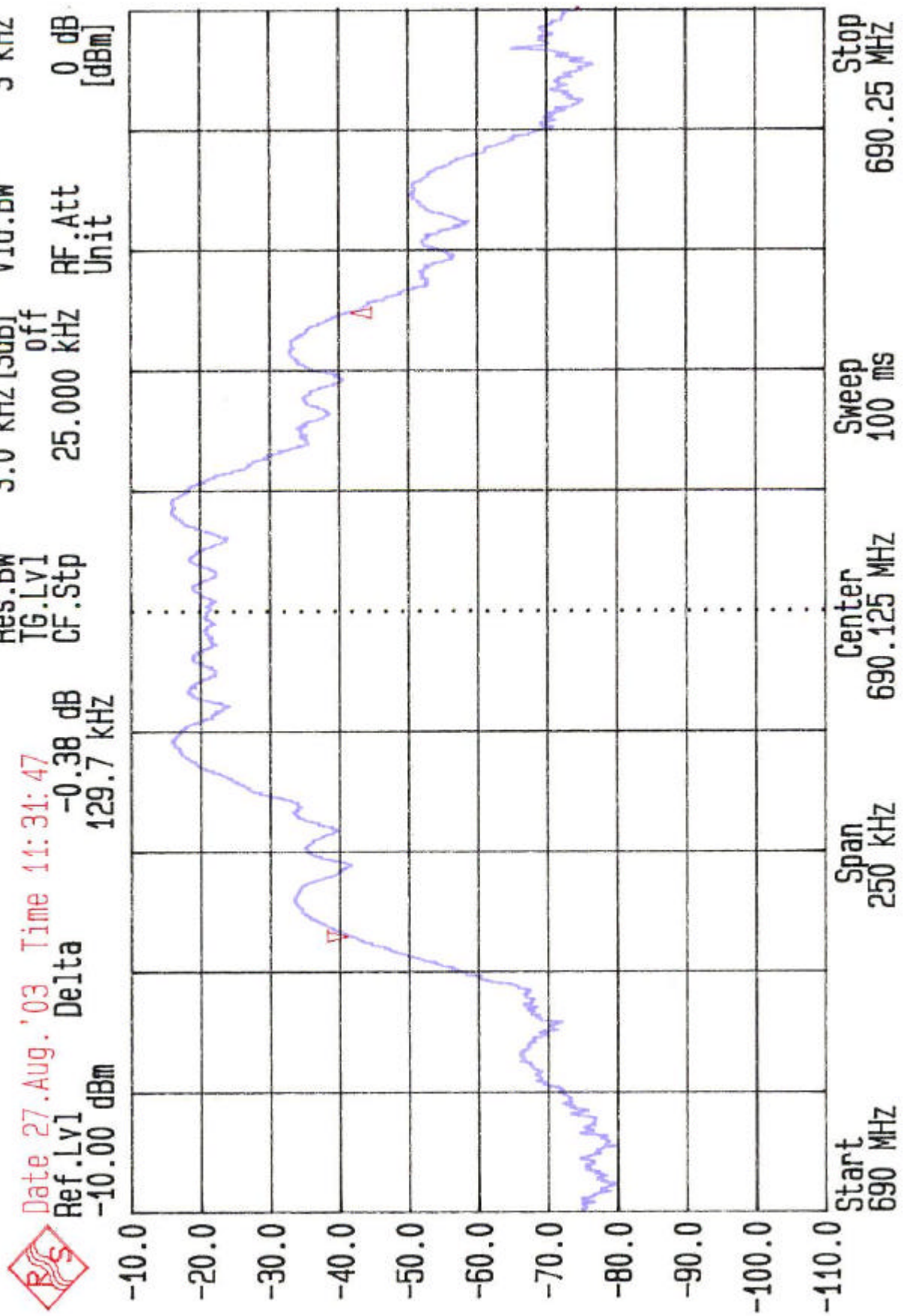
8.1 Standard Applicable

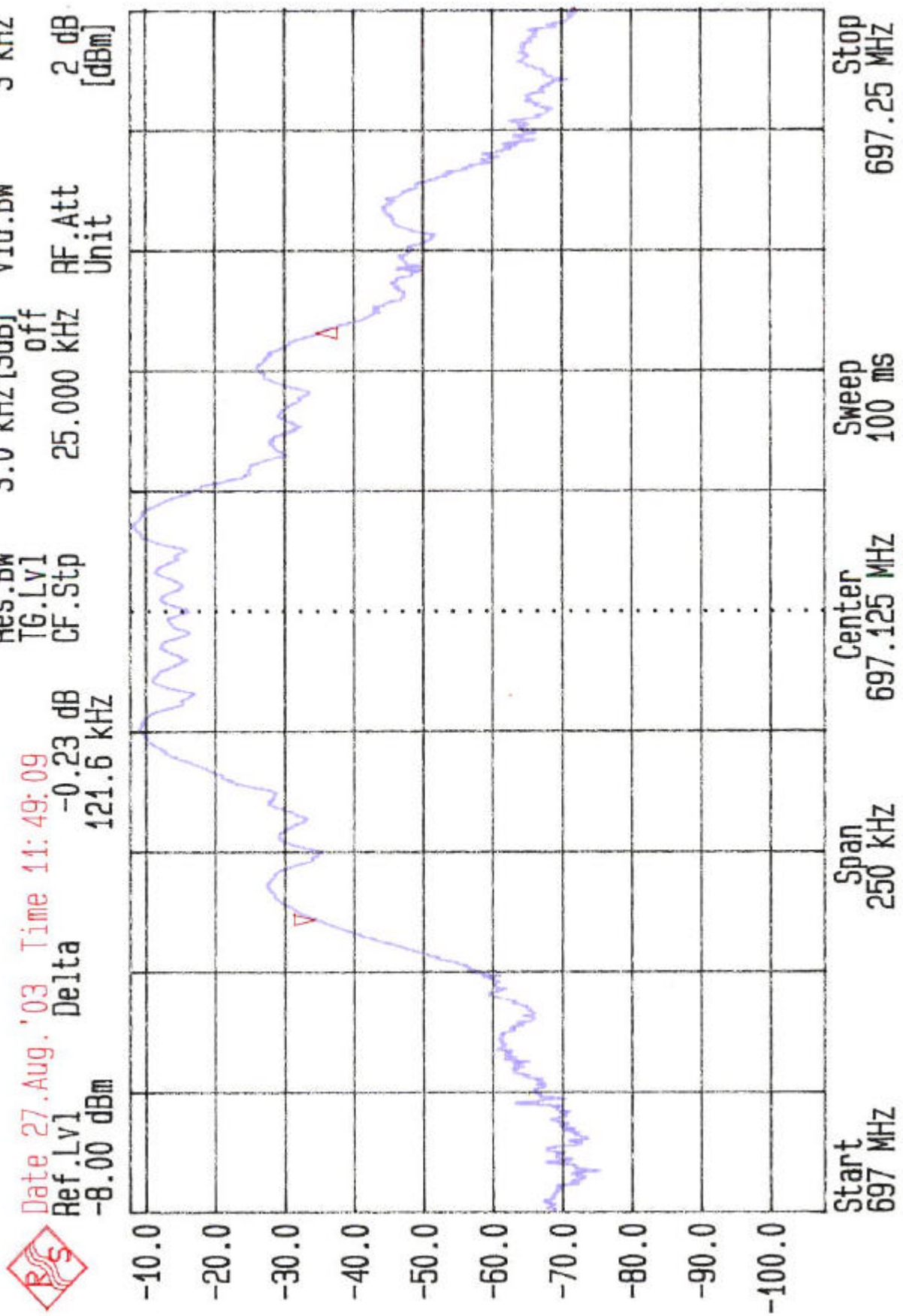
This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to § 15.207 (c), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC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

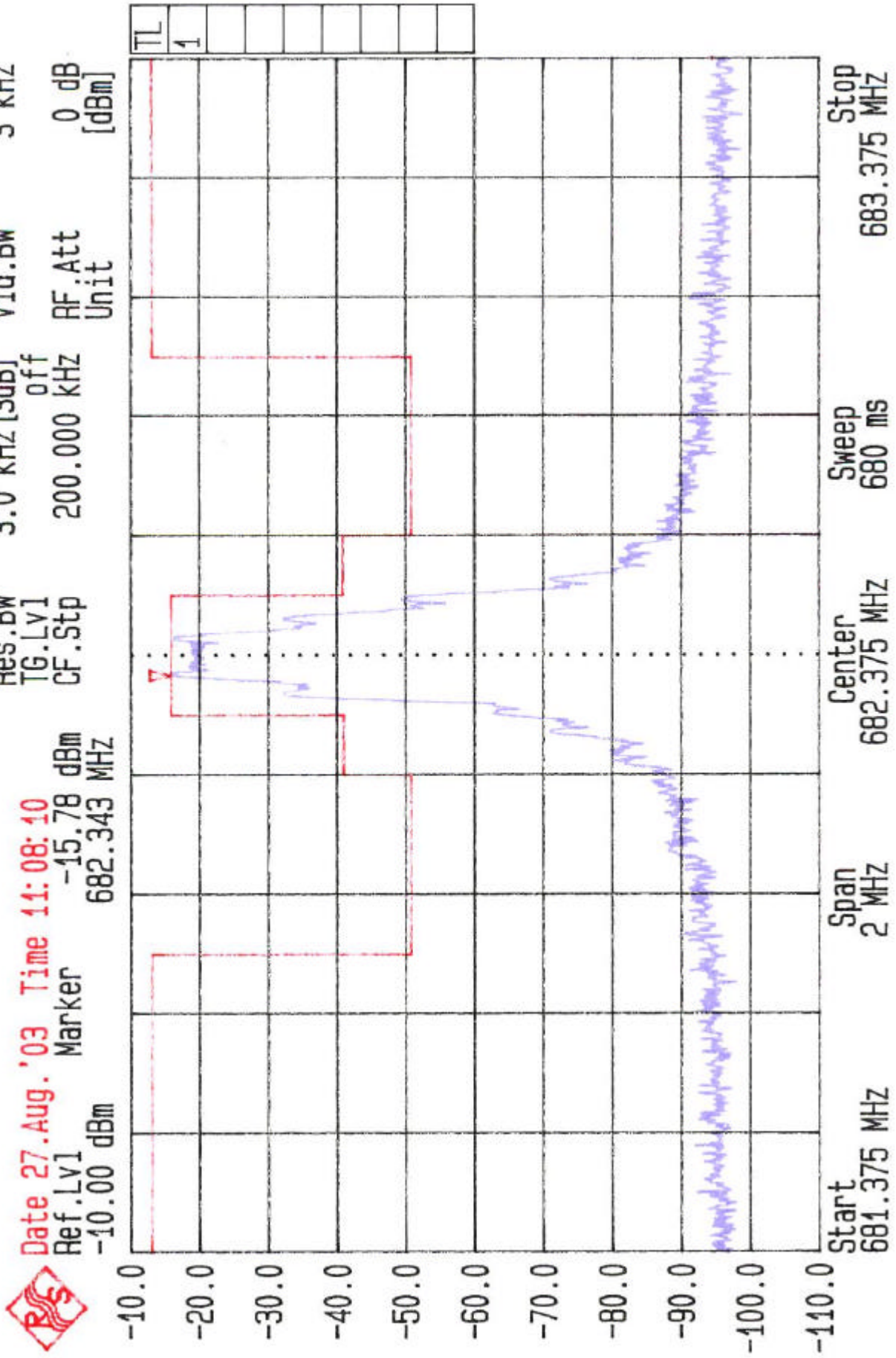
Appendix 1 : Occupied Emission Bandwidth Plotted Data

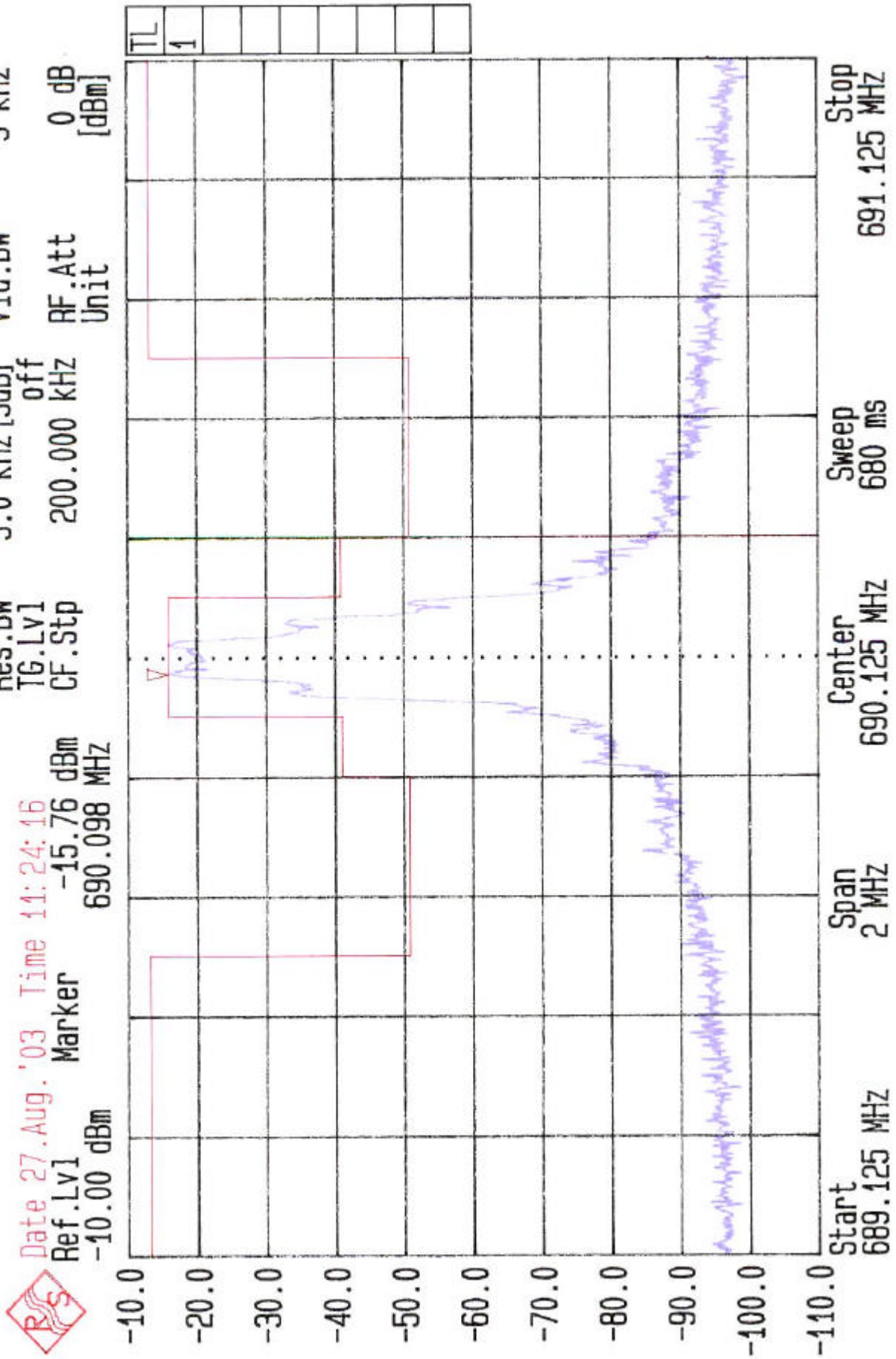

Date 27.Aug.'03 Time 11:31:47
Ref.Lvl
-10.00 dBm
Delta
-0.38 dB
129.7 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
0 dB
Unit
[dBm]
Start
690 MHz
Span
250 kHz
Center
690.125 MHz
Sweep
100 ms
Stop
690.25 MHz
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0

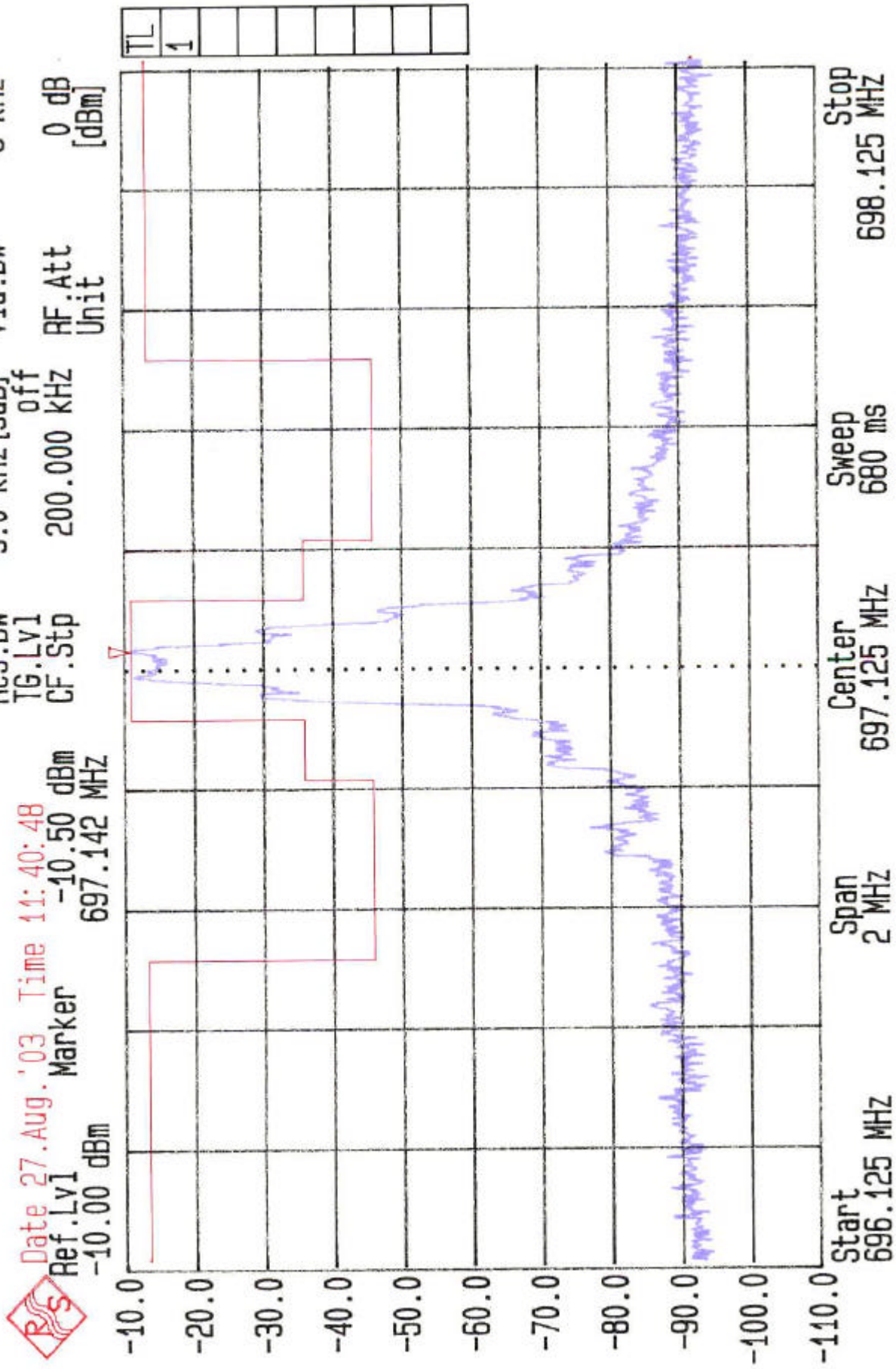

Date 27.Aug.'03 Time 11:31:47
Ref.Lvl
-10.00 dBm
Delta
-0.38 dB
129.7 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
0 dB
Unit
[dBm]
Start
690 MHz
Span
250 kHz
Center
690.125 MHz
Sweep
100 ms
Stop
690.25 MHz
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0


Date 27.Aug.'03 Time 11:49:09
Ref.Lvl
-8.00 dBm
Delta
-0.23 dB
121.6 kHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
25.000 kHz
Vid.Bw
3 kHz
RF.Att
2 dB
Unit
[dBm]
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Start
697 MHz
Span
250 kHz
Center
697.125 MHz
Sweep
100 ms
Stop
697.25 MHz

Appendix 2 : Emission Mask Plotted Data


Date 27.Aug. '03 Time 11:08:10
Ref.Lvl
-10.00 dBm
Marker
-15.78 dBm
682.343 MHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
0 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
681.375 MHz
Span
2 MHz
Center
682.375 MHz
Sweep
680 ms
Stop
683.375 MHz


Date 27.Aug.'03 Time 11:24:16
Ref.Lvl
-10.00 dBm
Marker
-15.76 dBm
690.098 MHz
Res.Bw
3.0 kHz
TG.Lvl
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
0 dB
Unit
[dBm]
Start
689.125 MHz
Span
2 MHz
Center
690.125 MHz
Sweep
680 ms
Stop
691.125 MHz
TL
1
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0


Date 27.Aug.'03 Time 11:40:48
Ref.Lvl
-10.00 dBm
Marker
-10.50 dBm
697.142 MHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
200.000 kHz
Vid.Bw
3 kHz
RF.Att
0 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
696.125 MHz
Span
2 MHz
Center
697.125 MHz
Sweep
680 ms
Stop
698.125 MHz