

EMI TEST REPORT

of

E.U.T. : Wireless Handheld Transmitter
Microphone

FCC ID. : JEBUF-18A

MODEL : UF-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

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Report Number : ET92R-07-076-01

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

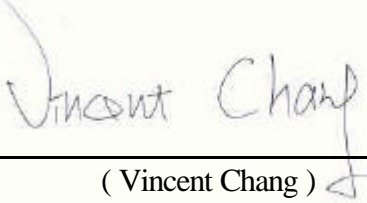
Description of EUT :

- a) Type of EUT : Wireless Handheld Transmitter Microphone
- b) Trade Name : MASCOT
- c) Model No. : UF-18
- d) FCC ID : JEBUF-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 : Sep. 04 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. : UF-18
- d) FCC ID : JEBUF-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 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 $(2 \times 32.768 + 2 \times 48) = 161.5\text{kHz}$, 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 independent sideband transmitter, when modulated 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

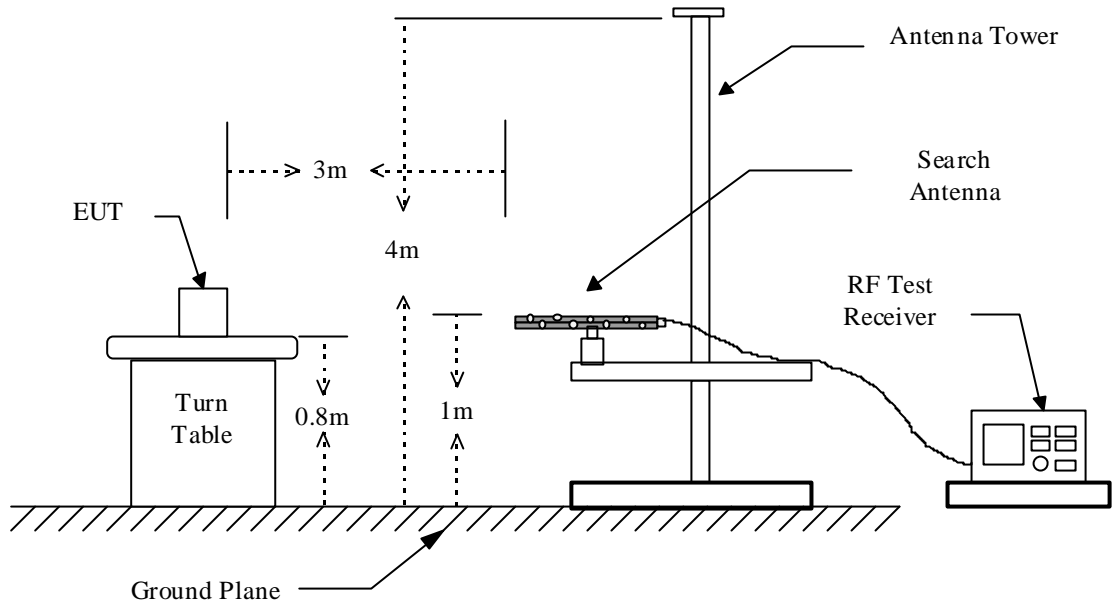
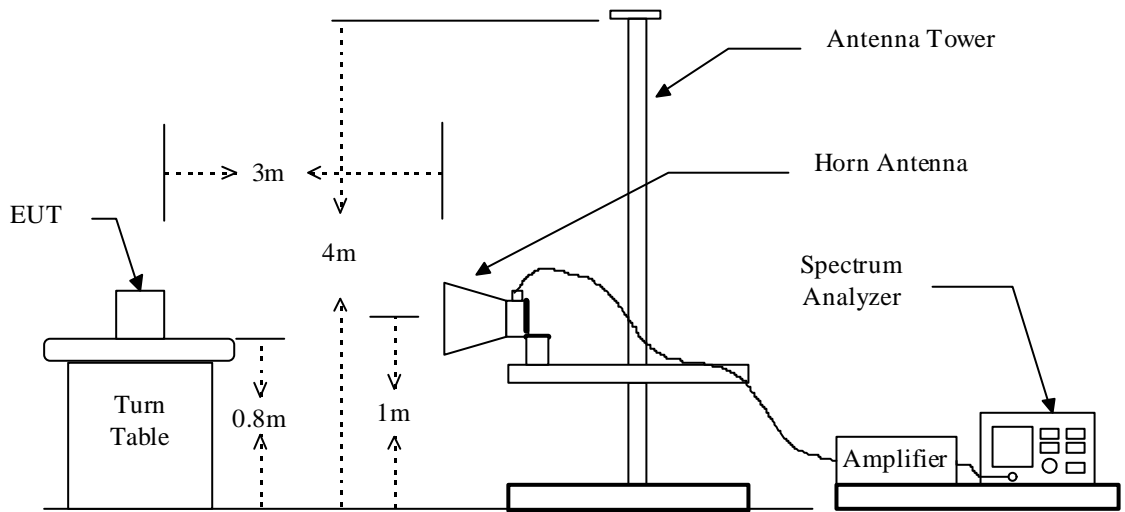


Figure 1 : Frequencies measured above 1 GHz configuration



3.3 Test Data

A. Channel Low (ERP)

Operated mode : 682.375 MHz
Temperature : 25

Test Date : Aug. 03, 2003
Humidity : 65 %

Frequency (MHz)	Meter Reading (dB μ V/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
682.375	68.4	-0.9	-2.6	---	-3.5	0.45	250.0

B. Channel Mid (ERP)

Operated mode : 690.125 MHz
Temperature : 25

Test Date : Aug. 03, 2003
Humidity : 65 %

Frequency (MHz)	Meter Reading (dB μ V/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
690.125	68.9	-0.6	-2.6	---	-3.2	0.48	250.0

C. Channel High (ERP)

Operated mode : 697.125 MHz
Temperature : 25

Test Date : Aug. 03, 2003
Humidity : 65 %

Frequency (MHz)	Meter Reading (dB μ V/m)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain	Result (dBm)	Output Power (mW)	Limit (mW)
697.125	65.2	-1.2	-2.6	---	-3.8	0.42	250.0

Note: For measured frequency below 1 GHz, 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.

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

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.

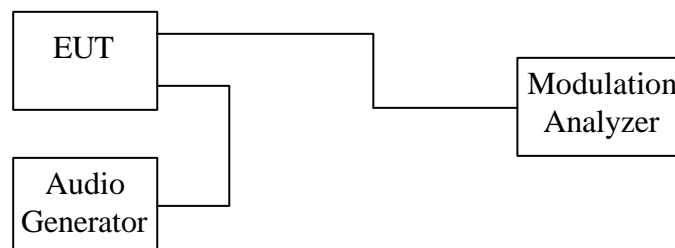
B) Modulation Limit

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

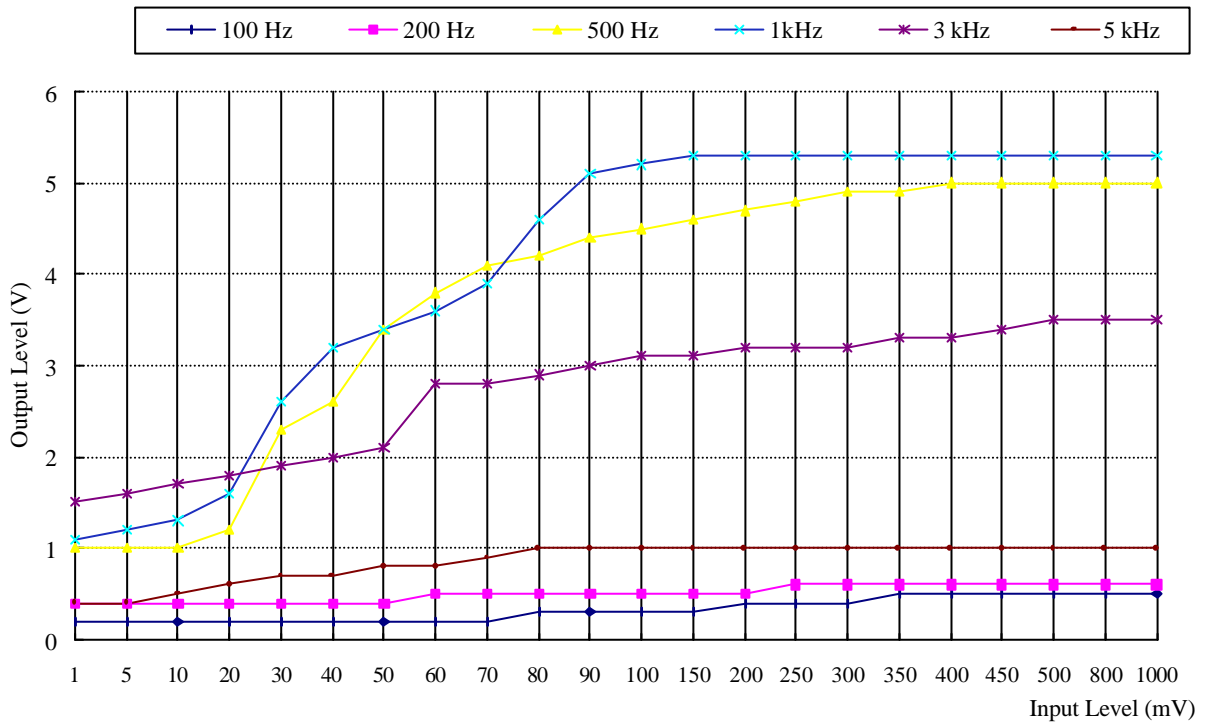


4.3 Measurement Instrument

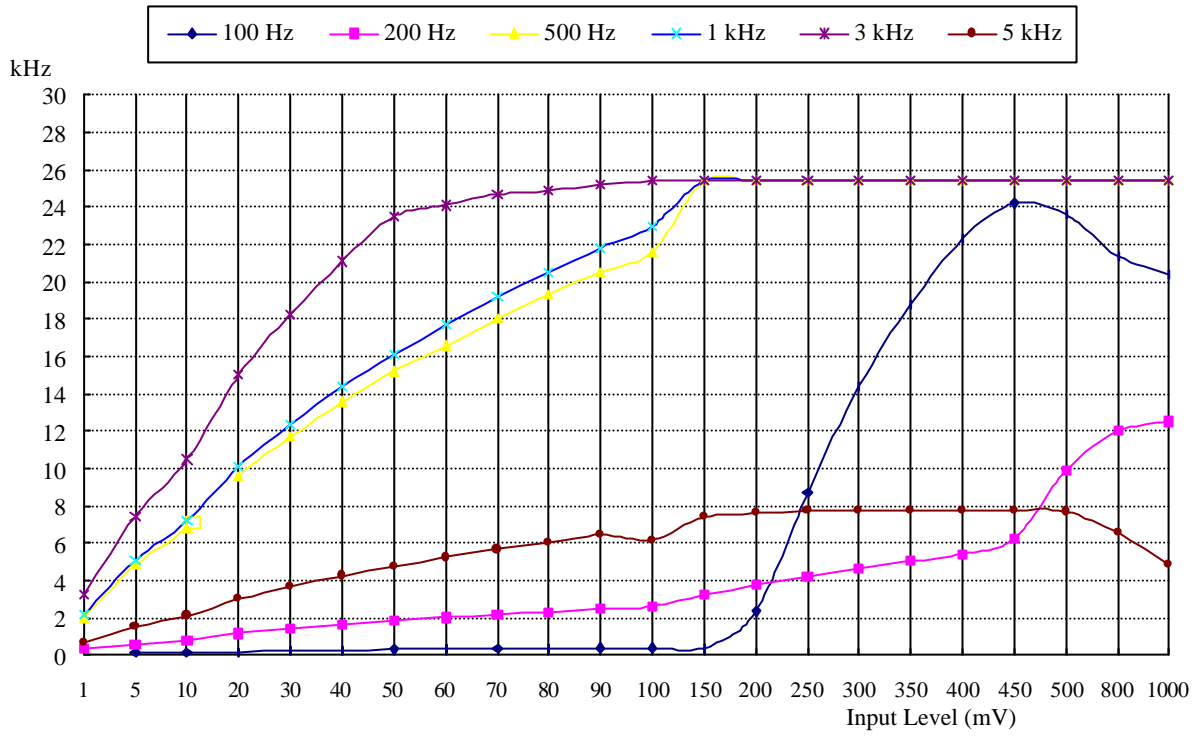
Equipment	Manufacturer	Model No.	Next Cal. Date
Modulation Analyzer	Hewlett-Packard	8901A	12/01/2003
Multifunction Synthesizer	Hewlett-Packard	8904A	12/07/2003
Oscilloscope	Lecroy	9350A	05/26/2004

4.4 Measurement Result

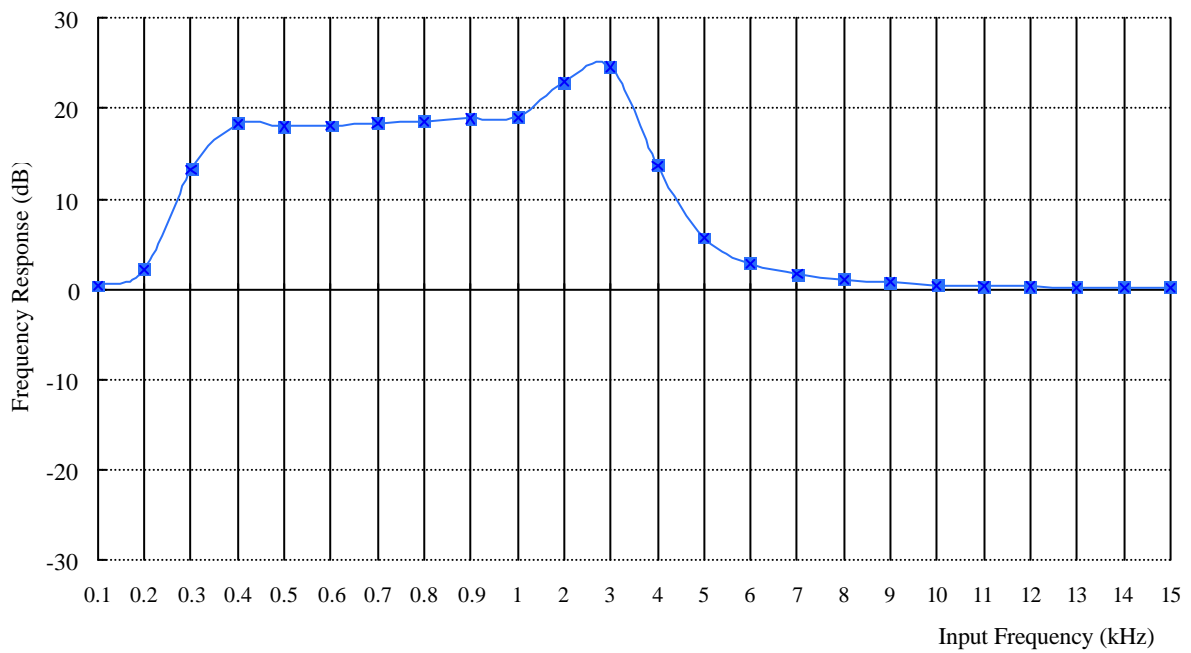
A). Frequency response



B). Modulation Limit



C). Frequency response of all circuits



5. OCCUPIED BANDWIDTH OF EMISSION

5.1 Provisions Applicable

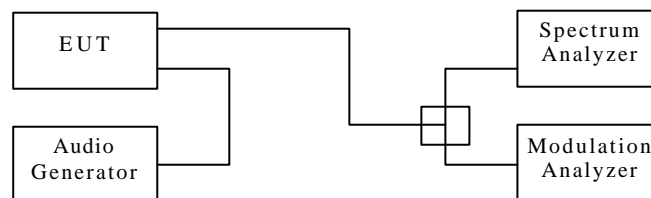
According to § 2.1049 (c)(1), For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, when modulateed by a 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

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

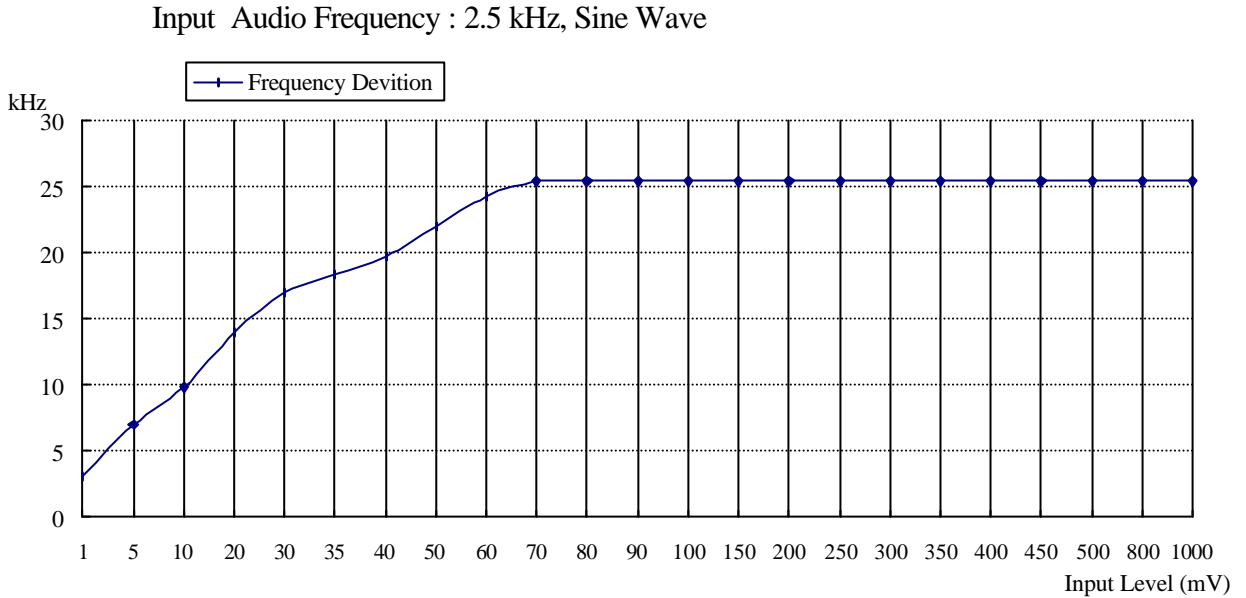


5.3 Occupied Bandwidth Test Equipment

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



The Level input to produce 50 % modulation is 35 mV, therefore the magnitude 16 dB greater than it is 1393 mV.

5.4.2 Occupied Bandwidth Plotted

The Channel Low 26 dB Bandwidth is 118.6KHz.
 The Channel Mid 26 dB Bandwidth is 110.8KHz.
 The Channel High 26 dB Bandwidth is 105.5KHz.

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 following schedule:

- (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
Temperature : 25

Test Date : Aug. 03, 2003
Humidity : 65%

Unmodulated carrier output power is -3.5 dBm , or 0.44mW (ERP).

The limit of spurious or harmonics is calculated as following :

$$-3.5-[43+10\log(\text{carrier output power in W})], \text{ or } -13\text{dBm}$$

Frequency (MHz)	Meter Reading (dBUV)		SG Reading (dBm)		Amp. Gain (dBm)	Anten na Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm)		Limit (dBm)	Margin (dB)
	H	V	H	V					H	V		
1364.746	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2047.117	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2729.488	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
3411.859	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4094.230	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4776.601	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
5458.972	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6141.343	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6823.714	---	---	---	---	---	---	-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 :

$$\text{Result} = \text{SG Reading} - \text{Amp. Gain} + \text{Antenna Gain} + \text{Antenna Gain Corrected} + \text{Cable Loss}$$

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
 Temperature : 25

Test Date : Aug. 03, 2003
 Humidity : 65%

Unmodulated carrier output power is -3.2 dBm , or 0.47 mW (ERP).

The limit of spurious or harmonics is calculated as following :

$$-3.2-[43+10\log(\text{carrier output power in W})], \text{ or } -13\text{dBm}$$

Frequency (MHz)	Meter Reading (dBuV)		SG Reading (dBm)		Amp. Gain (dBm)	Anten na Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm)		Limit (dBm)	Margin (dB)
	H	V	H	V					H	V		
1380.250	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2070.350	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
2760.450	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
3450.550	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4140.650	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
4830.750	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
5520.850	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6210.950	---	---	---	---	---	---	-2.0	---	---	---	-13.0	---
6901.050	---	---	---	---	---	---	-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 :

$$\text{Result} = \text{SG Reading} - \text{Amp. Gain} + \text{Antenna Gain} + \text{Antenna Gain Corrected} + \text{Cable Loss}$$

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
Temperature : 25

Test Date : Aug. 03, 2003
Humidity : 65%

Unmodulated carrier output power is -3.8 dBm , or 0.41 mW (ERP).

The limit of spurious or harmonics is calculated as following :

$$-3.8-[43+10\log(\text{carrier output power in W})], \text{ or } -13\text{dBm}$$

Frequency (MHz)	Meter Reading (dBuV)		SG Reading (dBm)		Amp. Gain (dBm)	Anten na Gain	Antenna Gain Corr'	Cable Loss (dB)	Result (dBm)		Limit (dBm)	Margin (dB)
	H	V	H	V					H	V		
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 :

$$\text{Result} = \text{SG Reading} - \text{Amp. Gain} + \text{Antenna Gain} + \text{Antenna Gain Corrected} + \text{Cable Loss}$$

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.

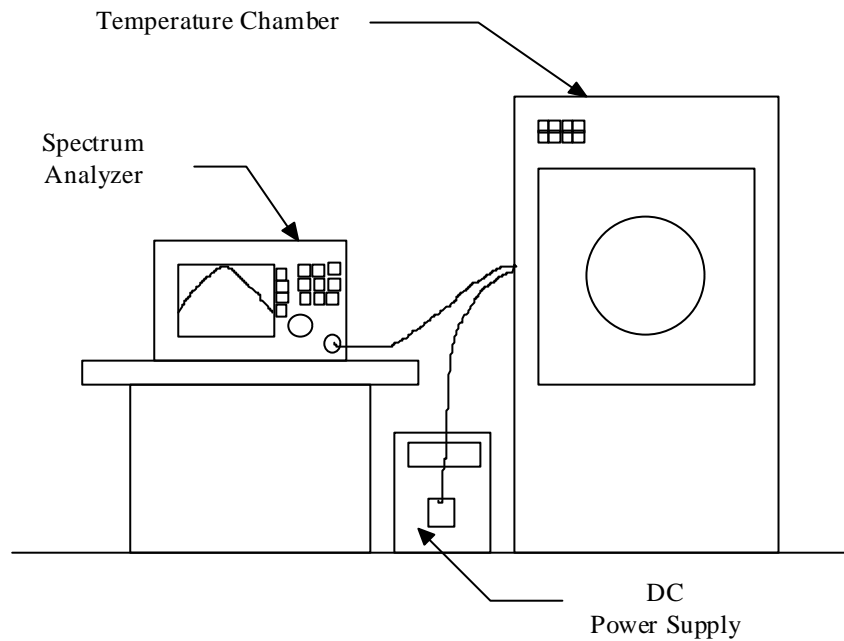
B) Frequency stability versus input voltage

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 environment temperature

Reference Frequency : 682.375 MHz		Limit : 0.005%					
Environment Temperature ()	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute (MHz) (%)		5 minute (MHz) (%)		10 minute (MHz) (%)	
50	New Batt.	682.3823	0.00106	682.3547	-0.00298	682.3776	0.00039
40	New Batt.	682.3880	0.00191	682.3506	-0.00357	682.3981	0.00339
30	New Batt.	682.3622	-0.00188	682.3829	0.00116	682.3493	-0.00377
20	New Batt.	682.3583	-0.00245	682.3545	-0.00300	682.3733	-0.00026
10	New Batt.	682.3886	0.00199	682.3786	0.00053	682.3825	0.00110
0	New Batt.	682.3962	0.00311	682.3768	0.00027	682.3530	-0.00323
-10	New Batt.	682.3966	0.00317	682.3802	0.00076	682.3920	0.00249
-20	New Batt.	682.3493	-0.00376	682.3622	-0.00188	682.3830	0.00117
-30	New Batt.	682.3759	0.00013	682.3744	-0.00008	682.3759	0.00014

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

Reference Frequency : 682.375 MHz		Limit : 0.005%					
Environment Temperature ()	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute (MHz) (%)		5 minute (MHz) (%)		10 minute (MHz) (%)	
25	End-Point	682.3563	-0.00274	682.3606	-0.00212	682.3760	0.00015

B1. Frequency stability versus environment temperature

Reference Frequency : 690.125 MHz		Limit : 0.005%					
Environment Temperature ()	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	690.1259	0.00013	690.1252	0.00003	690.1278	0.00040
40	New Batt.	690.1031	-0.00317	690.1217	-0.00049	690.1089	-0.00234
30	New Batt.	690.1158	-0.00134	690.1300	0.00072	690.1391	0.00204
20	New Batt.	690.1140	-0.00160	690.1370	0.00173	690.1045	-0.00297
10	New Batt.	690.1151	-0.00143	690.1373	0.00178	690.1026	-0.00324
0	New Batt.	690.1063	-0.00271	690.1121	-0.00187	690.1483	0.00338
-10	New Batt.	690.1486	0.00342	690.1367	0.00170	690.1016	-0.00339
-20	New Batt.	690.1378	0.00186	690.1243	-0.00010	690.1283	0.00047
-30	New Batt.	690.1261	0.00016	690.1273	0.00033	690.1226	-0.00035

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

Reference Frequency : 690.125 MHz		Limit : 0.005%					
Environment Temperature ()	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	690.1495	0.00356	690.1156	-0.00136	690.1215	-0.00051

C1. Frequency stability versus environment temperature

Reference Frequency : 697.125 MHz		Limit : 0.005%					
Environment Temperature ()	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	New Batt.	697.1336	0.00124	697.1286	0.00051	697.1301	0.00073
40	New Batt.	697.1289	0.00056	697.1085	-0.00237	697.1058	-0.00275
30	New Batt.	697.1333	0.00119	697.1252	0.00003	697.1503	0.00363
20	New Batt.	697.1505	0.00366	697.1516	0.00381	697.1244	-0.00009
10	New Batt.	697.1027	-0.00319	697.1245	-0.00007	697.1095	-0.00222
0	New Batt.	697.1318	0.00097	697.1151	-0.00142	697.1206	-0.00064
-10	New Batt.	697.1026	-0.00322	697.1340	0.00129	697.1092	-0.00226
-20	New Batt.	697.1183	-0.00097	697.1154	-0.00137	697.1007	-0.00348
-30	New Batt.	697.1260	0.00015	697.1260	0.00014	697.1248	-0.00002

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

Reference Frequency : 697.125 MHz		Limit : 0.005%					
Environment Temperature ()	Power Supplied (Vdc)	Frequency measured with time elapsed					
		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
25	End-Point	697.1421	0.00246	697.1401	0.00216	697.1224	-0.00038

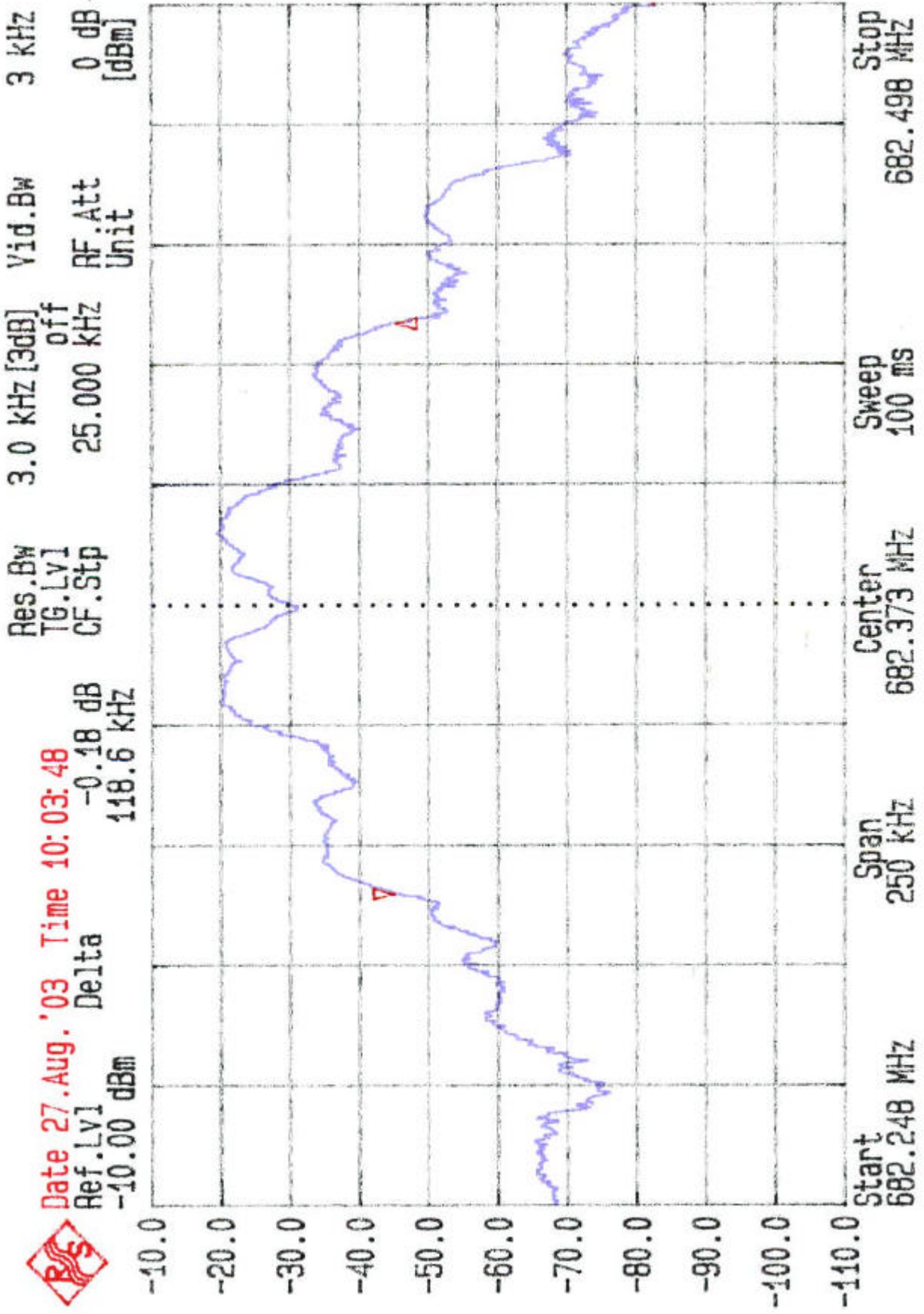
8 CONDUCTED EMISSION MEASUREMENT

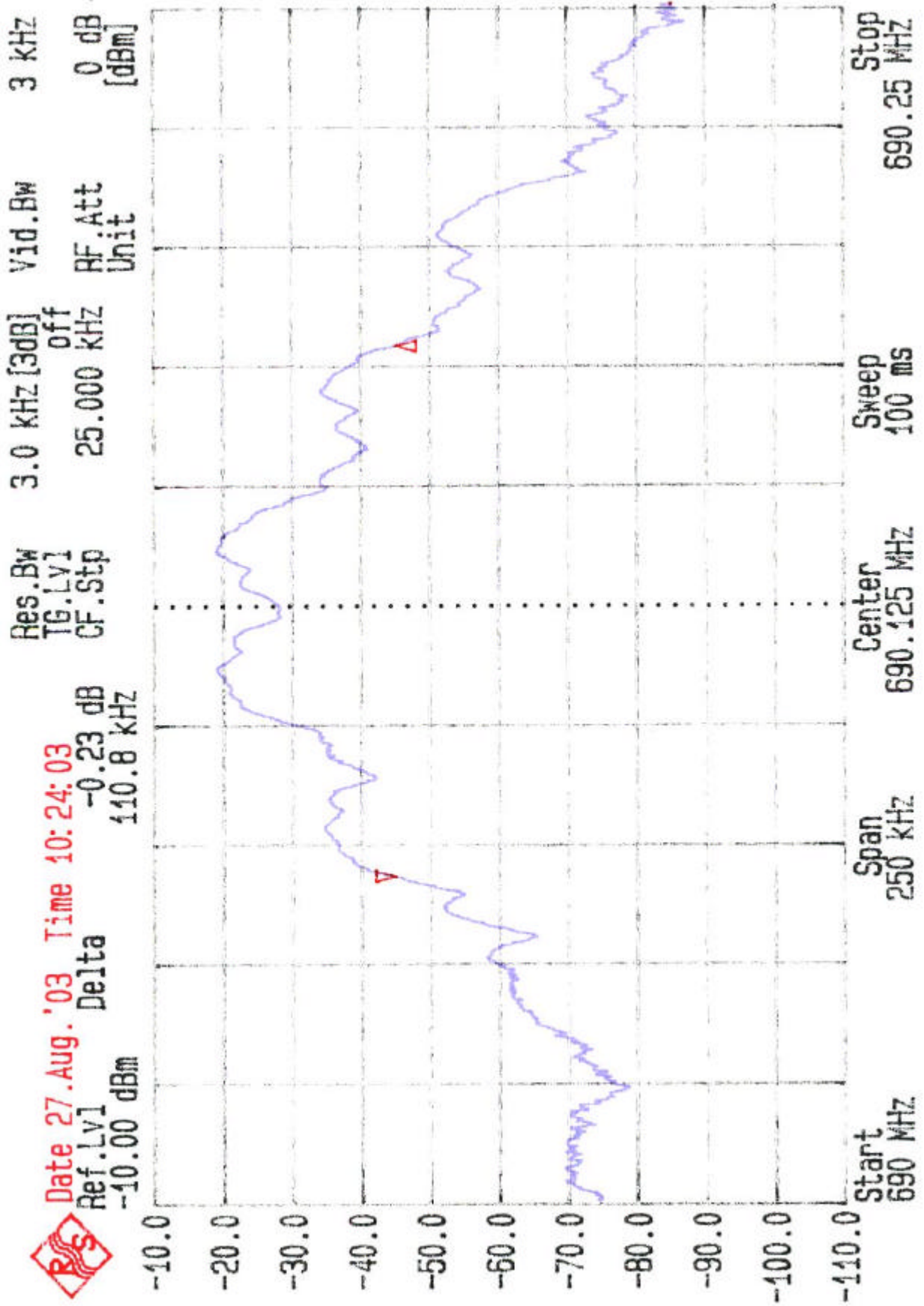
8.1 Standard Applicable

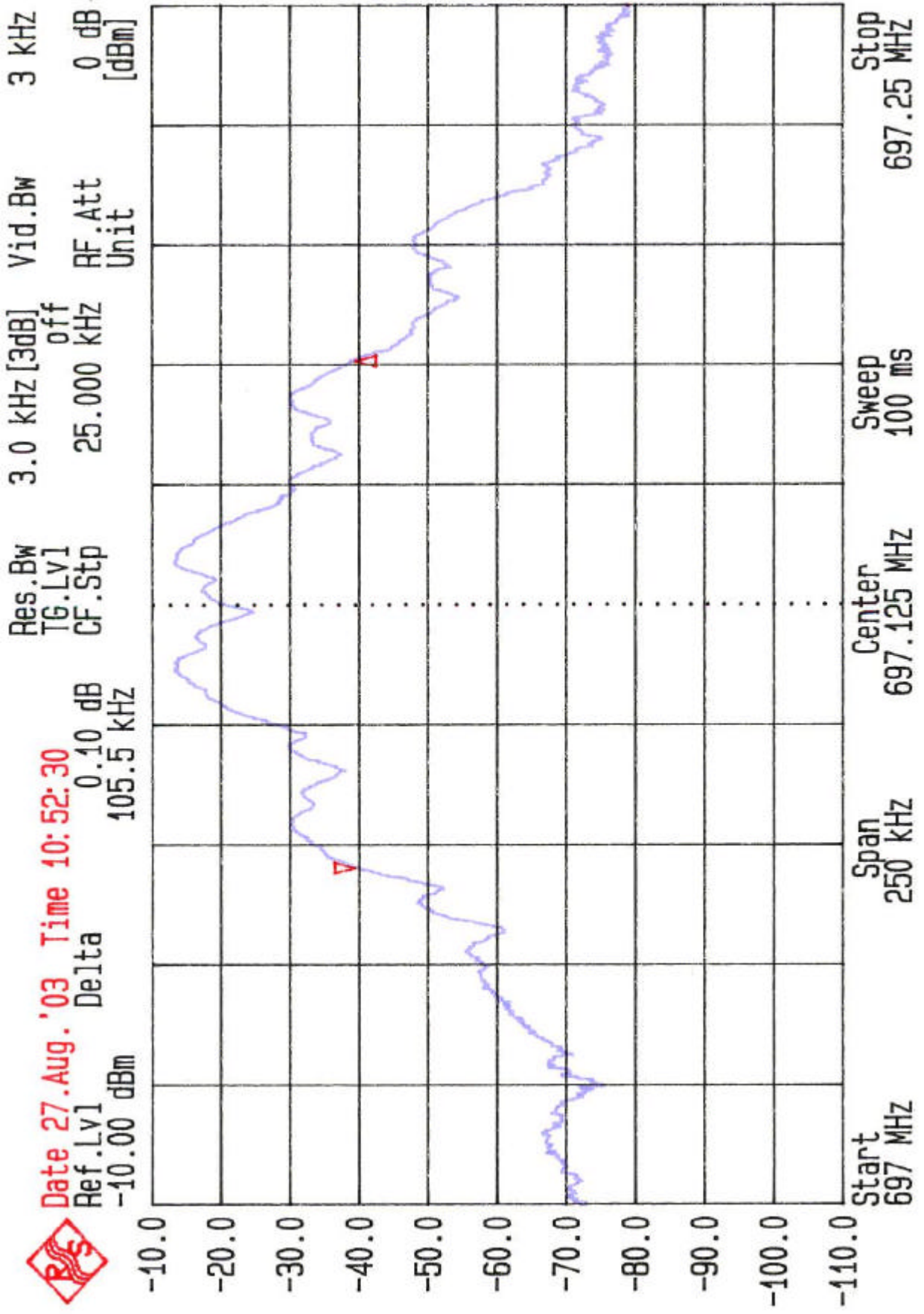
This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to § 15.207 (c), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC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







Appendix 2 : Emission Mask Plotted Data

