FCC Part 74 Subpart H

EMI TEST REPORT

of

E.U.T. : Wireless Headset System

FCC ID. : OND5615HS

MODEL : RF-5615

Working Frequency : 174.0-174.9 MHz

for

APPLICANT : EMKAY INNOVATIVE PRODUCTS, TAIWAN
ADDRESS : 53, PAO HSING RD., HSINTIEN CITY, TAIPEI, TAIWAN, R.O.C.

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 8 LANE 29, WENMIMG ROAD,
LOSHAN TSUN, KWEISHAN HSIANG,
TAOYUAN, TAIWAN, R.O.C.

Tel:(03)3280026-32
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Report Number : ET88R-07-021-01

TEST REPORT CIRTIFICATION

Applicant : EMKAY INNOVATIVE PRODUCTS, TAIWAN
53, PAO HSING RD., HSINTIEN CITY, TAIPEI, TAIWAN, R.O.C.

Manufacturer : EMKAY INNOVATIVE PRODUCTS, TAIWAN
53, PAO HSING RD., HSINTIEN CITY, TAIPEI, TAIWAN, R.O.C.

Description of EUT :

a) Type of EUT	: Wireless Headset System
b) Trade Name	: N/A
c) Model No.	: RF-5615
d) FCC ID	: OND5615HS
e) Working Frequency	: 174.0-174.9 MHz
f) Power Supply	: DC 2.5V

Regulation Applied : FCC Rules and Regulations Part 74 Subpart H (1997) & Part 15 Subpart B

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

Issued Date : JAN. 27, 2000

Test Engineer : Jeff Chuang
(Jeff Chuang)

Approve & Authorized Signer : Will Yauo
Will Yauo, Supervisor
EMI Test Site of ELECTRONICS
TESTING CENTER, TAIWAN

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1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Wireless Headset System
b) Trade Name : N/A
c) Model No. : RF-5615
d) FCC ID : OND5615HS
e) Working Frequency : 174.0-174.9 MHz
f) Power Supply : DC 2.5V

1.2 Characteristics of Device:

The EUT is a frequency modulation Wireless Headset System with following features :

Operation Frequency Range: 174.0 to 174.9MHz for headset unit, 210.0 to 210.9 MHz for Base unit. Type of Modulation: FM, 12KF3E for headset unit and 35KF3E for base unit

This wireless headset system is designed for two way communication, the headset unit with a microphone can modulate the voice to RF carrier and transmit it to the base unit, and the base unit receives the RF signals and demodulates the voice to send to any audio devices with an audio input terminal, for example a speaker or stereo. Also, the base unit has a microphone jet, to which a microphone can connect, and the user can use this to send a voice signal to the one who wears the headset. A special application is connecting the audio out to the line in jet of a sound card of a PC, so the voice recognition is avaible with a software.

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, 5 Lirn, Din Fu Tsun, Lin Kou, Taipei, 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 , 1997.

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
450.000-451.000	944.000-952.000

2.3 Requirements for Radio Equipment on Certification

(1) RF Output Power

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

(2) Modulation Characteristics

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

(3) Occupied Bandwidth

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

(4) Spurious Emissions at Antenna Terminals

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

(5) Field Strength of Spurious Emissions

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

(6) Frequencies Tolerance

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

2.4 Labeling Requirement

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

3. OUTPUT POWER MEASUREMENT

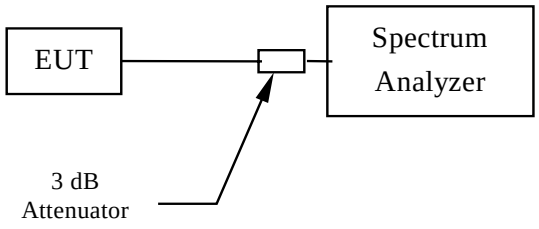
3.1 Provision Applicable

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

3.2 Measurement Procedure

The maximum peak output power was measured with a spectrum analyzer connected to the antenna terminal (conducted measurement) while EUT was operating in normal situation. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.

Figure 1 : Output power measurement configuration



3.3 Test Data

Operated mode : Normal Test Date : 2001 April 08
Temperature : 27 Humidity : 65

Frequency (MHz)	SA Reading (dBm)	Cable Loss (dB)	Attenuator (dB)	Result (dBm)	Output Power (mW)	Limit (mW)
174.500	-1.78	0.5	3	1.72	1.48	50

Please see Appendix 1 for plotted data.

3.3 Result Calculation

The measured result is calculated as following equation :

Result = Reading Cable Loss Attenuation of Attenuator

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

3.4 Output Power Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	R&S	ESBI	Oct. 10, 2000
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 2.

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 2, 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.

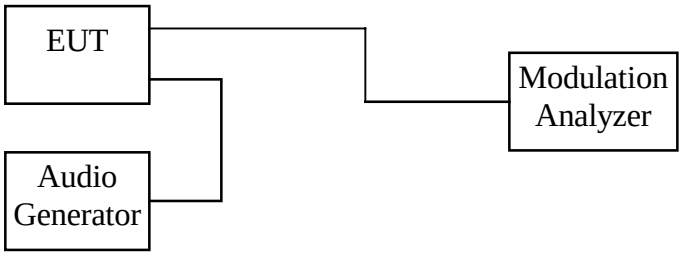
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

C) Frequency response of all circuits

1. Position the EUT as shown in figure 2.

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 2 : Modulation characteristic measurement configuration

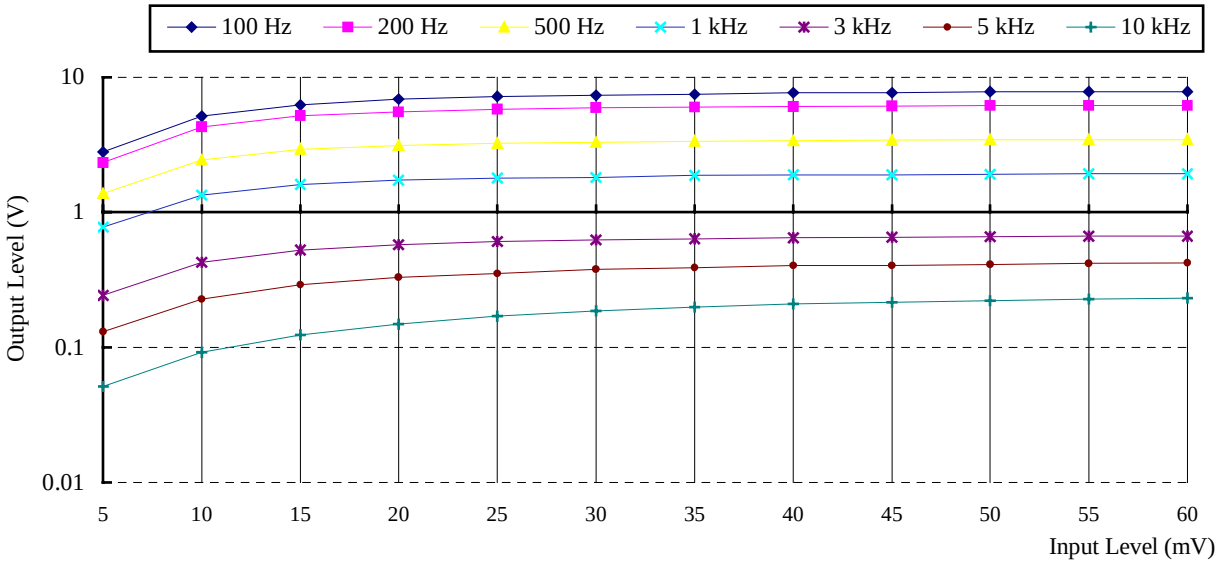


4.3 Measurement Instrument

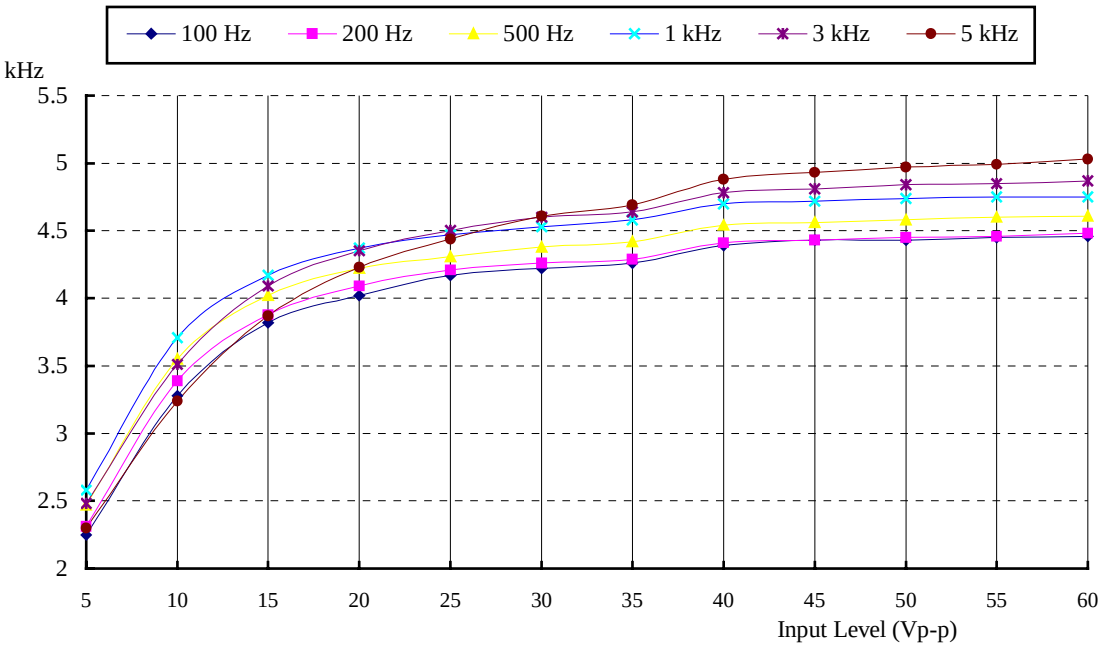
Equipment	Manufacturer	Model No.	Next Cal. Date
Modulation Analyzer	Hewlett-Packard	8901A	Dec. 01, 2000
Multifunction Synthesizer	Hewlett-Packard	8904A	Dec. 01, 2000
Oscillscope	Lecroy	9350A	Dec. 01, 2000

4.4 Measurement Result

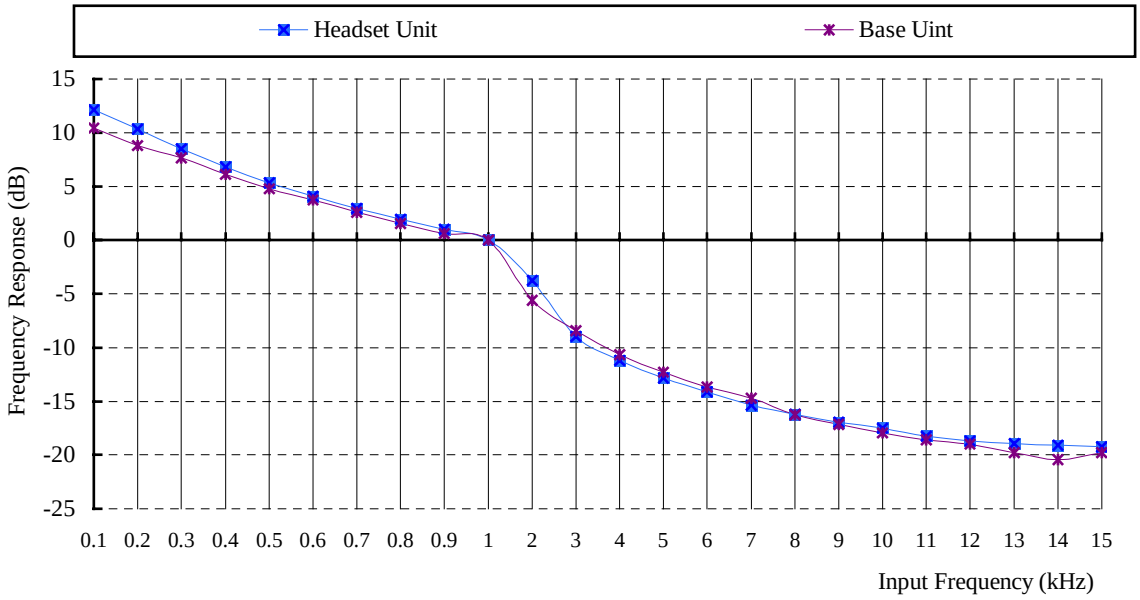
A). Frequency response



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.

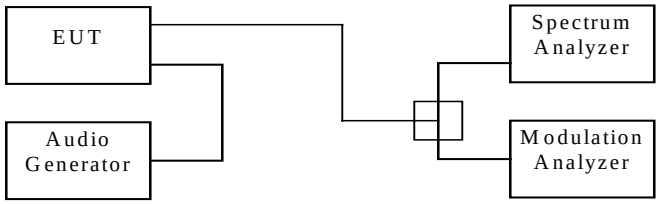
5.2 Measurement Method

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 3, 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 3 : Occupied bandwidth measurement configuration



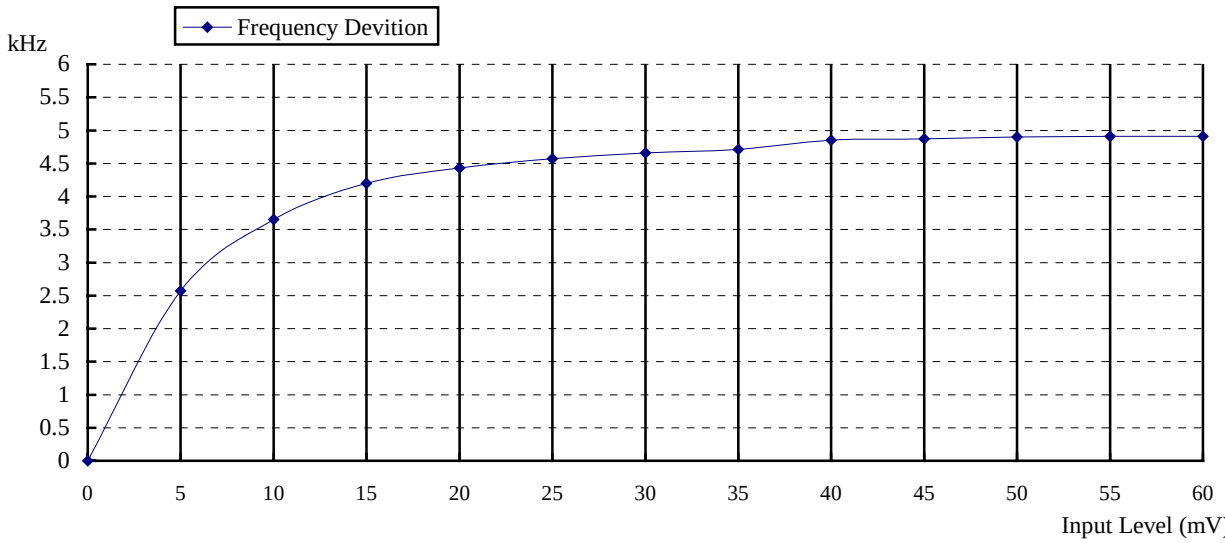
5.3 Occupied Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	R&S	ESBI	Oct. 01, 2000
Modulation Analyzer	Hewlett-Packard	8901A	Dec. 01, 2000
Multifunction Synthesizer	Hewlett-Packard	8904A	Dec. 01, 2000
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 5 mV, therefore the magnitude 16 dB greater than it is 31.6 mV.

5.4.2 Occupied Bandwidth Plotted

The 26 dB bandwidth is 15.5 kHz, please see Apendix 2.

Please see appendix 2 for plotted data.

6. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

6.1 Provisions Applicable

According to §2.1051, 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.

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.

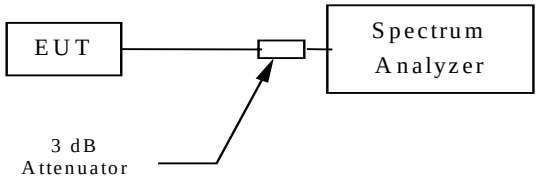
(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(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 configure per figure 4, adjusting the input voltage to produce the maximum power as measured in chapter 3.
2. Adjust the analyzer frequency span from 30 MHz to 1 GHz, record any frequency attenuated less than 20 dB relative to the permitted emission and then adjust the analyzer frequency span from 1 GHz to 2 GHz and record emissions frequency should be measured.
3. Adjust the analyzer for each frequency measured above on a 2 MHz frequency span and 1MHz resolution bandwidth. Record the highest value on spectrum analyzer.

Figure 4 : Conducted spurious emission measurement configuration



6.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	R&S	ESBI	Oct. 01, 2000
Plotter	Hewlett-Packard	7440A	N/A

6.3 Measurement Data

Operated mode : Normal
Temperature : 26
Test Date : 2001 April 10
Humidity : 65

Unmodulated carrier power is 1.72 dBm , or 1.5 mW (Conducted).
The limit of spurious or harmonics is 1.72-[43+10log(output power in W)], or -13dBm

Frequency (MHz)	SA Reading (dBm)	Cable Loss (dB)	Attenuator (dB)	Result (dBm)	Limit (dBm)	Margin (dB)
66.577	-62.0	0.5	3	-58.5	-13.0	-45.5
69.775	-73.6	0.5	3	-70.1	-13.0	-57.1
104.644	-70.5	0.5	3	-67.0	-13.0	-54.0
133.133	-74.0	0.5	3	-70.5	-13.0	-57.5
139.527	-62.2	0.5	3	-58.7	-13.0	-45.7
199.700	-81.4	0.5	3	-77.9	-13.0	-64.9
209.283	-84.2	0.5	3	-80.7	-13.0	-67.7
244.161	-71.6	0.5	3	-68.1	-13.0	-55.1
313.916	-78.3	0.5	3	-74.8	-13.0	-61.8
348.800	-80.3	0.5	3	-76.8	-13.0	-63.8
383.677	-74.8	0.5	3	-71.3	-13.0	-58.3
523.194	-85.8	0.5	3	-82.3	-13.0	-69.3
548.511	-87.9	0.5	3	-84.4	-13.0	-71.4
748.205	-80.0	0.5	3	-76.5	-13.0	-63.5
897.288	-88.0	0.5	3	-84.5	-13.0	-71.5
Above 1 GHz	---	---	---	---	---	---

Please see appendix 2 for plotted data.

7. FIELD STRENGTH OF EMISSION

7.1 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.

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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.

7.2 Measurement Procedure

1. Setup the configuration per figure 5 and 6 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 100 kHz 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 5 : Frequencies measured below 1 GHz configuration

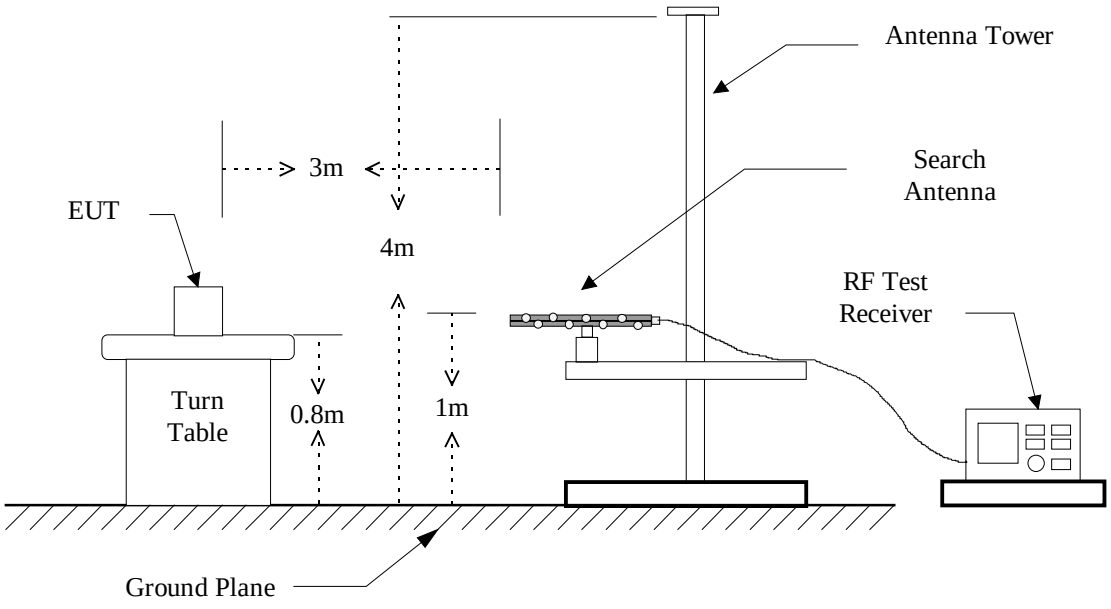
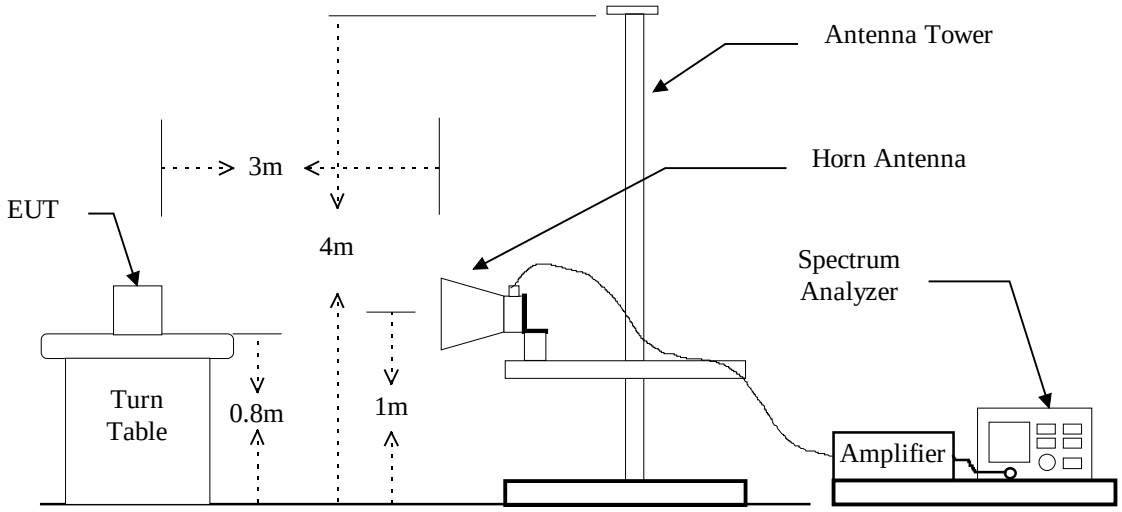


Figure 6 : Frequencies measured above 1 GHz configuration



7.3 Measuring Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Hewlett-Packard	8568B	Jan. 03, 2001
Quasi Peak Detector	Hewlett-Packard	85650A	Jan. 10, 2001
Pre-selector	Hewlett-Packard	85685A	Jan. 10, 2001
Spectrum Analyzer	Hewlett-Packard	84125C	Jan. 25, 2001
Horn Antenna	EMCO	3115	May 11, 2000
Log periodic Antenna	EMCO	3146	Nov. 03, 2000
Biconical Antenna	EMCO	3110	Nov. 03, 2000
Preamplifier	Hewlett-Packard	8449B	Jun. 21, 2000
Preamplifier	Hewlett-Packard	8447D	Sep. 19, 2000

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

7.4 Measuring Data

1. Tx portion

Operated mode : Normal Test Date : 2001 April 12
Temperature : 26 Humidity : 68

Unmodulated carrier output power is –18.3 dBm , or 0.015 mW (ERP).
The limit of spurious or harmonics is calculated as following :

-18.3-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain Corrected	Result (dBm)	Limit (dBm)	Margin (dB)
34.882	38.4	-66.3	-0.1	0	-66.4	-13	-53.4
139.528	33.8	-66.0	-0.6	0	-66.6	-13	-53.6
174.392	83.4	-17.6	-0.7	0	-18.3	50	-68.3
348.784	42.6	-61.6	-1.1	0	-62.7	-13	-49.7
523.176	43.9	-54.3	-1.0	0	-55.3	-13	-42.3
697.568	41.1	-53.5	-1.3	0	-54.8	-13	-41.8
871.960	33.8	-55.9	-2.0	0	-57.9	-13	-44.9
Above 1GHz	--	--	--	--	--	-13	--

Note :

1. Remark "--" means that the emission level is too weak to be detected.
2. 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.
3. Spurious or harmonics above 1 GHz is too low to be detected or attenuated more than 60 dB from limit value.

2. Rx portion

Operated mode : Normal Test Date : 2001 April 12

Temperature : 26 Humidity : 68

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
66.567	V	36.6	-16.4	20.2	40.0	-19.8	0	1.8
199.700	V	43.7	-7.1	36.6	43.5	-6.9	249	1.8
332.834	H	26.2	-7.9	18.3	46.0	-27.7	27	1.4
366.118	V	26.4	-7.5	18.9	46.0	-27.1	159	1.0

Emissions from Other Sources

Operated mode : Normal Test Date : 2001 April 12
Temperature : 26 Humidity : 68

Unmodulated carrier output power is –22.6 dBm , or 0.006 mW (ERP).

The limit of spurious or harmonics is calculated as following :

-22.6-[43+10log(carrier output power in W)], or -13dBm

Frequency (MHz)	Meter Reading (dBuV)	SG Reading (dBm)	Cable Loss (dB)	Antenna Gain Corrected	Result (dBm)	Limit (dBm)	Margin (dB)
42.063	50.7	-65.4	-0.1	0	-65.5	-13	-52.5
84.126	47.4	-69.9	-0.4	0	-70.3	-13	-57.3
168.252	39.5	-66.6	-0.6	0	-67.2	-13	-54.2
336.504	28.6	-51.8	-0.7	0	-52.5	-13	-39.5
462.693	33.2	-41.6	-0.7	0	-42.3	-13	-29.3
546.819	34.3	-38.4	-1.3	0	-39.7	-13	-26.7
673.008	32.7	-40.3	-1.3	0	-41.6	-13	-28.6
799.197	35.7	-33.6	-1.5	0	-35.1	-13	-22.1
883.014	37.3	-29.7	-1.6	0	-31.3	-13	-18.3
967.499	40.6	-25.4	-1.6	0	-27.0	-13	-14.0

Note :

1. 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.

b2. Rx Portion

Operated mode : Normal Test Date : 2001 April 12
Temperature : 26 Humidity : 67

Frequency (MHz)	Ant-Pol H/V	Reading (Peak) (dBuV)	Corrected Factor (dB)	Result @3m (Peak) (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
81.853	V	37.2	-14.8	22.4	40.0	-17.6	360	1.5
163.706	V	47.1	-9.3	37.8	43.5	-5.7	285	1.1
245.559	V	48.2	-4.2	44.0	46.0	-2.0	183	1.0
409.265	V	42.3	-6.1	36.2	46.0	-9.8	180	1.2
572.971	V	40.6	-5.3	35.3	46.0	-10.7	210	1.2
1227.742	H	59.3	-8.7	50.6	54.0	-3.4	0	1.5
1309.609	V	59.0	-8.3	50.7	54.0	-3.3	0	1.5
1391.444	V	60.0	-8.0	52.0	54.0	-2.0	0	1.5
1473.287	V	59.3	-7.6	51.7	54.0	-2.3	270	1.5
1718.873	V	58.1	-6.2	51.9	54.0	-2.1	95	1.5
2046.330	V	55.8	-4.4	51.4	54.0	-2.6	95	1.5
2209.946	V	43.7	-3.8	39.9	54.0	-14.1	95	1.5

The field strength of above table is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

where Corrected Factor

= Antenna FACTOR + Cable Loss + High Pass Filter Loss - Amplifier Gain

7.5 Radiated Measurement Photos

Please see setup photos in Exhibit F.

8. FREQUENCY STABILITY MEASUREMENT

8.1 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.

8.2 Measurement Procedure

A) Frequency stability versus environmental temperature

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. 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.

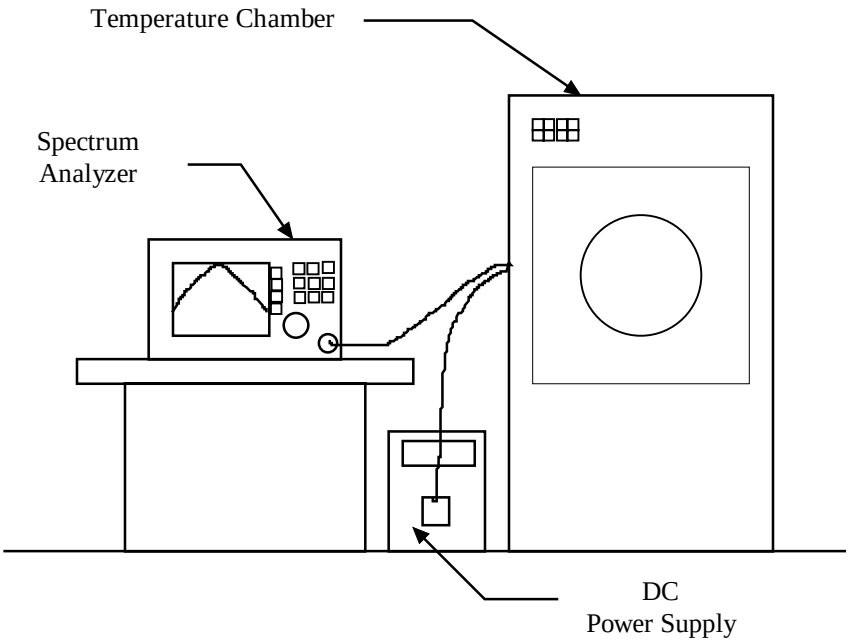
B) Frequency stability versus input voltage

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 7 : Frequency stability measurement configuration



8.3 Measurement Instrument

Equipment	Manufacturer	Model No.	Next Cal. Date
Spectrum Analyzer	Adventest	R3361A	Mar. 22, 2000
Temperature Chamber	ACS	EOS 200T	Jan. 10, 2001

8.4 Measurement Data

1. Frequency stability versus enviroment tempture

Reference Frequency : 174.3998 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.	174.3985	-0.00075	174.4043	0.00258	174.4032	0.00195
	New Batt.	174.3974	-0.00138	174.4031	0.00189	174.4030	0.00183
	New Batt.	174.4036	0.00218	174.3964	-0.00195	174.4056	0.00333
40	New Batt.	174.3956	-0.00241	174.4008	0.00057	174.3935	-0.00361
	New Batt.	174.3981	-0.00097	174.4058	0.00344	174.3984	-0.00080
	New Batt.	174.4030	0.00183	174.4062	0.00367	174.3989	-0.00052
30	New Batt.	174.4007	0.00052	174.3959	-0.00224	174.3940	-0.00333
	New Batt.	174.3989	-0.00052	174.3991	-0.00040	174.4001	0.00017
	New Batt.	174.3943	-0.00315	174.3978	-0.00115	174.4038	0.00229
20	New Batt.	174.3991	-0.00040	174.3933	-0.00373	174.4012	0.00080
	New Batt.	174.3969	-0.00166	174.4025	0.00155	174.4052	0.00310
	New Batt.	174.4046	0.00275	174.3964	-0.00195	174.3932	-0.00378
10	New Batt.	174.4037	0.00224	174.3941	-0.00327	174.3966	-0.00183
	New Batt.	174.3963	-0.00201	174.4016	0.00103	174.4015	0.00097
	New Batt.	174.3963	-0.00201	174.4029	0.00178	174.4063	0.00373
0	New Batt.	174.3947	-0.00292	174.3982	-0.00092	174.3949	-0.00281
	New Batt.	174.4060	0.00356	174.3953	-0.00258	174.3995	-0.00017
	New Batt.	174.3978	-0.00115	174.4031	0.00189	174.3993	-0.00029
-10	New Batt.	174.3996	-0.00011	174.3991	-0.00040	174.4036	0.00218
	New Batt.	174.3994	-0.00023	174.4015	0.00097	174.3948	-0.00287
	New Batt.	174.3988	-0.00057	174.4031	0.00189	174.4019	0.00120
-20	New Batt.	174.3980	-0.00103	174.3942	-0.00321	174.4048	0.00287
	New Batt.	174.4035	0.00212	174.3978	-0.00115	174.3964	-0.00195
	New Batt.	174.4065	0.00384	174.4030	0.00183	174.3975	-0.00132

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

Reference Frequency : 174.3998 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	174.3933	-0.00373	174.4004	0.00034	174.3965	-0.00189

9 CONDUCTED EMISSION MEASUREMENT

9.1 Standard Applicable

For intentional device, Line Conducted Emission Limits are in accordance to §15.207(a), any emissions level shall not exceed 48 dBuV.

9.2 Measurement Procedure

1. Setup the configuration per figure 3.

2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.

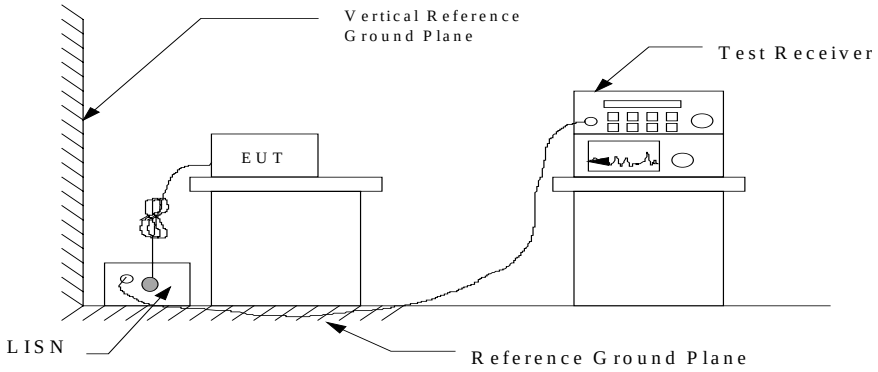
3. Record the 6 or 8 highest emissions relative to the limit.

4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.

5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.

6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



9.3 Conducted Emission Data

For the Headset Unit is operated with a battery, therefore it is exempted from conducted emission test.

9.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR

9.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test .

Equipment	Manufacturer	Model No.	Next Cal. Date
RF Test Receiver	Rohde and Schwarz	ESH3	Jan. 03, 2001
Spectrum Monitor	Rohde and Schwarz	EZM	N.C.R.
Line Impedance Stabilization network	Kyoritsu	KNW-407	Dec. 01, 2000
Plotter	Hewlett-Packard	7440A	N/A
Shielded Room	Riken	N/A	N.C.R.

9.6 Photos of Conduction Measuring Setup

Please see setup in Exhibit F

Appendix 1 Ouput Power Plotted Data

Appendix 2 Occupied Emission Bandwidth Plotted Data

Appendix 3 Spuriuos Emissions at Antenna Terminal

Appendix 4 Conducted Emissions Plotted Data