FCC Part 74 Subpart H

EMI TEST REPORT

of

E.U.T. : Wireless Handheld Transmitter Microphone
FCC ID. : JEBQF-16
Model : QF-16
Working Frequency : 174MHz-216MHz

for

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

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 34. LIN 5. DINGFU TSUEN, LINKOU SHIANG
TAIPEI COUNTY, TAIWAN, 24442, R.O.C.

Tel:(02)226023052 Fax:(02)26010910
http://www.etc.org.tw ; e-mail:r00@etc.org.tw

Report Number : 07-07-RBF-053-01

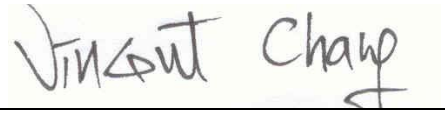
TEST REPORT CERTIFICATION

Applicant	: MASCOT ELECTRIC CO., LTD. No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien Taiwan
Manufacture	: MASCOT ELECTRIC CO., LTD. No. 85 Chang Hsing First Street, Tai-tzu Village, Jen-Te Hsian, Tainan Hsien Taiwan
Description of EUT	:
a) Type of EUT	: Wireless Handheld Transmitter Microphone
b) Trade Name	: MASCOT
c) Model No.	: QF-16
d) FCC ID	: JEBQF-16
e) Working Frequency	: 174MHz-216MHz
f) Power Supply	: DC 3V

Regulation Applied : FCC Rules and Regulations Part 74 Subpart H (2006)

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.

Date Test Item Received : *Jun. 07, 2007*
Date Test Campaign Completed : *Jul. 11, 2007*
Date of Issue : *Jul. 17, 2007*

TEST ENGINEER : : 
(Vincent Chang)

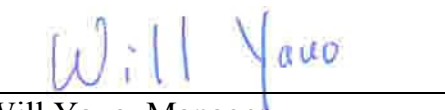
Approve & Authorized : : 
Will Yauo, Manager
EMC Dept. II of ELECTRONICS TESTING CENTER, TAIWAN

Table of Contents Page

1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Wireless Handheld Transmitter Microphone
b) Trade Name : MASCOT
c) Model No. : QF-16
d) FCC ID : JEBQF-16
e) Working Frequency : 174MHz-216MHz
f) Power Supply : DC 3V

1.2 Characteristics of Device:

1. Operating Frequency: 174MHz -216MHz
2. The handheld microphone operates in VHF band frequency with quartz-locked control. Squelch circuit design for external noise-free reception. Use 1.5V x 2 AA size batteries for low operating cost.
3. The emission designator is 54K0F3E. The calculation is (2M+2DK), K=1 and (2 x 12 + 2 x 15) = 54 kHz, so the emission designator is 54K0F3E.

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in chapter 13 of ANSI C63.4 (2003) 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 Oct. 20, 2005.

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

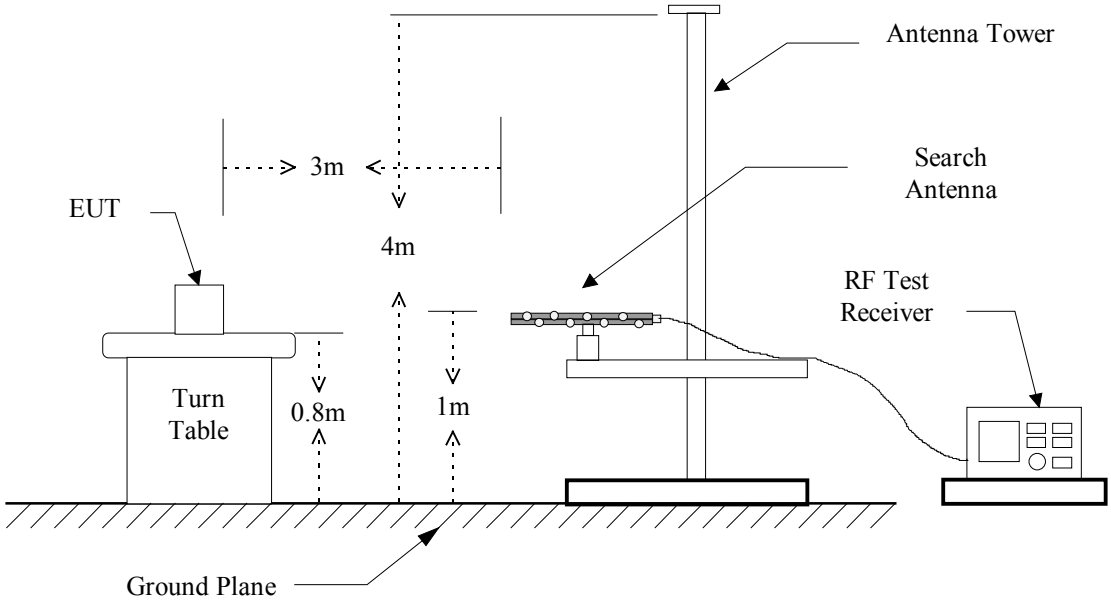
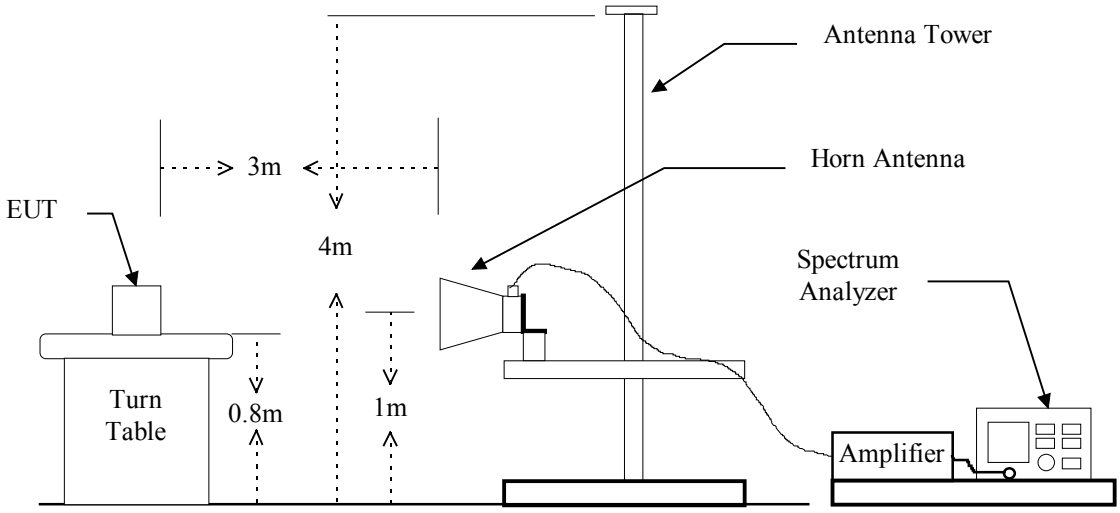


Figure 1 : Frequencies measured above 1 GHz configuration



3.3 Test Data

a. Channel Low (ERP)

Operation Mode : 174.1 MHz Test Date : 2007/06/25
Temperature : 21 °C Humidity : 69 %

Frequency (MHz)	Meter Reading (dB μ V/m)	SG Reading (dBm)	Antenna Gain (dB)	Cable Loss (dB)	Result (dBm)	Output Power (mW)	Limit (dBm)
174.100	73.0	2.3	---	1.0	1.3	1.348	24.0

Note: For measured frequency below 1GHz, a tuned dipole antenna is used.

b. Channel Middle (ERP)

Operation Mode : 192.6 MHz Test Date : 2007/06/25
Temperature : 21 °C Humidity : 69 %

Frequency (MHz)	Meter Reading (dB μ V/m)	SG Reading (dBm)	Antenna Gain (dB)	Cable Loss (dB)	Result (dBm)	Output Power (mW)	Limit (dBm)
192.600	71.0	5.6	---	1.1	4.5	2.818	24.0

Note: For measured frequency below 1GHz, a tuned dipole antenna is used.

c. Channel High (ERP)

Operation Mode : 215.870 MHz Test Date : 2007/06/25
Temperature : 21 °C Humidity : 69 %

Frequency (MHz)	Meter Reading (dB μ V/m)	SG Reading (dBm)	Antenna Gain (dB)	Cable Loss (dB)	Result (dBm)	Output Power (mW)	Limit (dBm)
215.870	70.0	0.6	---	1.3	-0.7	0.851	24.0

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	ESCI	12/24/2007
Dipole Antenna	EMCO	3121C	06/05/2008
Signal generator	HP	8656B	11/20/2007

4. MODULATION CHARACTERISTICS

4.1 Provisions Applicable

According to § 2.1047 (a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be measured.

4.2 Measurement Method

A) Frequency response of audio circuits

1. Position the EUT as shown in figure 3.

2. Vary the modulating frequency from 100 Hz to 5000 Hz with varying the input voltage from 0V to maximum permitted input voltage, and observe the change in output.

B) Modulation Limit

1. Position the EUT as shown in figure 3, adjust the audio input frequency to 100 Hz and the input level from 0V to maximum permitted input voltage with recording each carrier frequency deviation responding to respective input level.

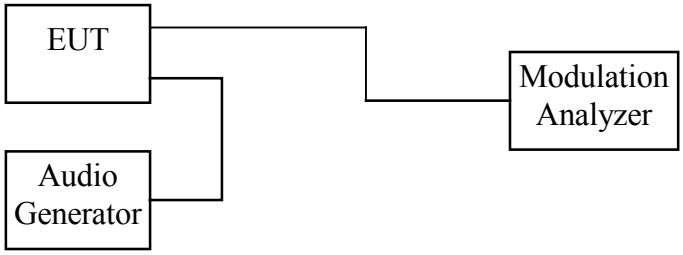
2. Repeat step 1 with changing the input frequency for 200, 500, 1000, 3000, and 5000 Hz in sequence.

C) Frequency response of all circuits

1. Position the EUT as shown in figure 3.

2. Vary the modulating frequency from 100 Hz to 15000 Hz with constant input voltage (derived from 5.4(a) of this test report), and observe the change in output.

Figure 3 : Modulation characteristic measurement configuration

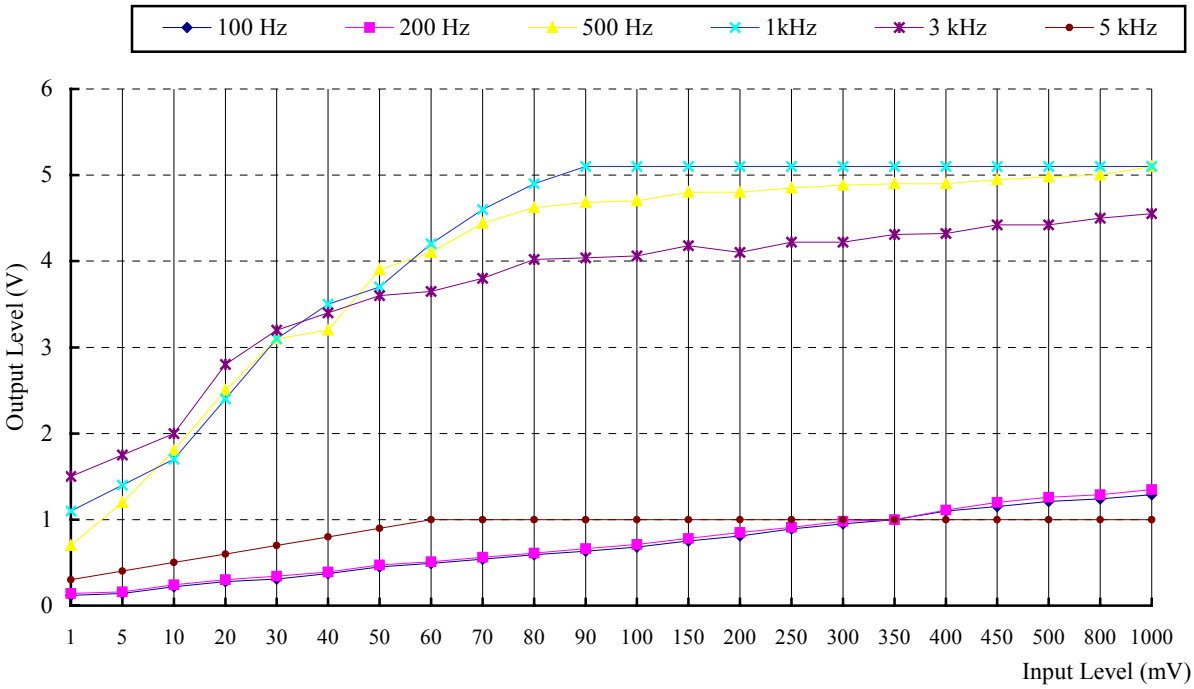


4.3 Measurement Instrument

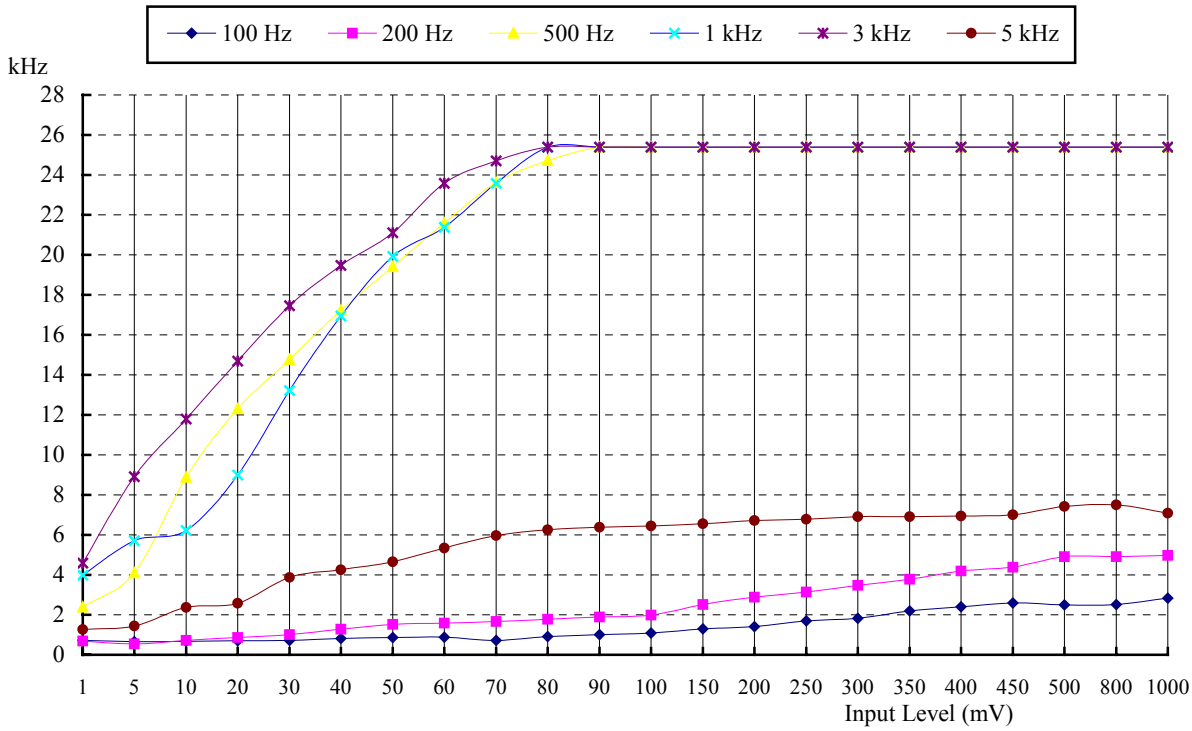
Equipment	Manufacturer	Model No.	Next Cal. Date
Radio Communication Test Set	Marconi	2955B	06/25/2008
Spectrum Analyzer	Rohde & Schwarz	FSP40	08/07/2007

4.4 Measurement Result

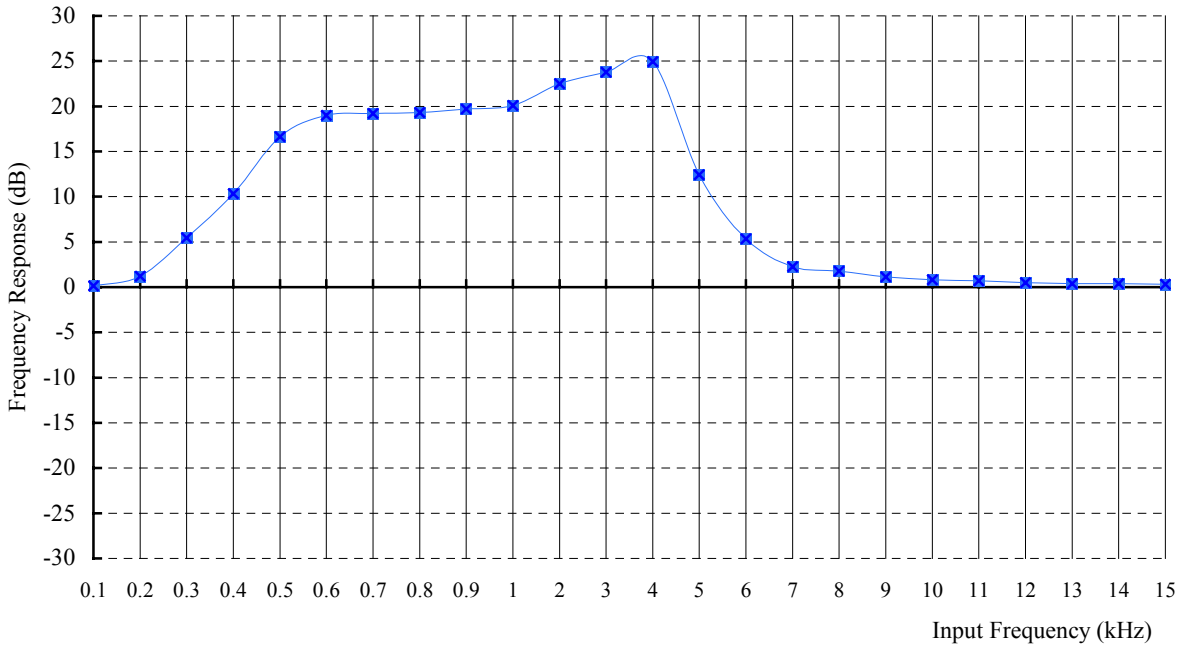
A). Frequency response



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.

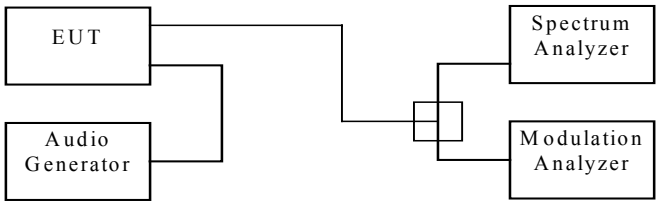
5.2 Measurement Method

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



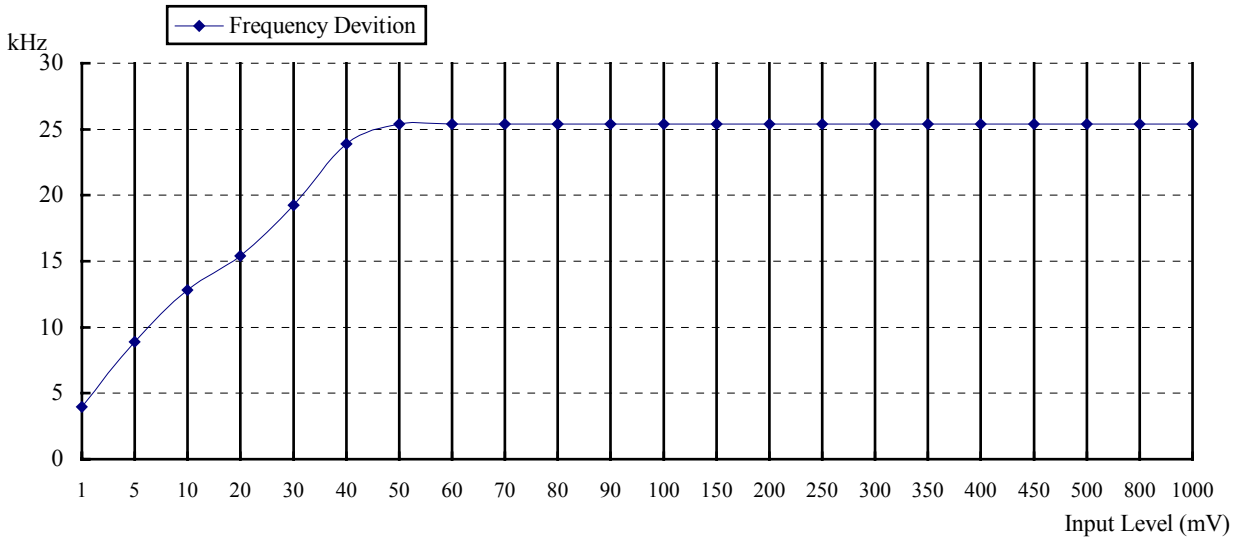
5.3 Occupied Bandwidth Test Equipment

Equipment	Manufacturer	Model No.	Next Cal. Date
Radio Communication Test Set	Marconi	2955B	06/25/2008
Spectrum Analyzer	Rohde & Schwarz	FSP40	08/07/2007

5.4 Bandwidth Measured

5.4.1 Input Level Derived

Input Audio Frequency : 2.5 kHz, Sine Wave

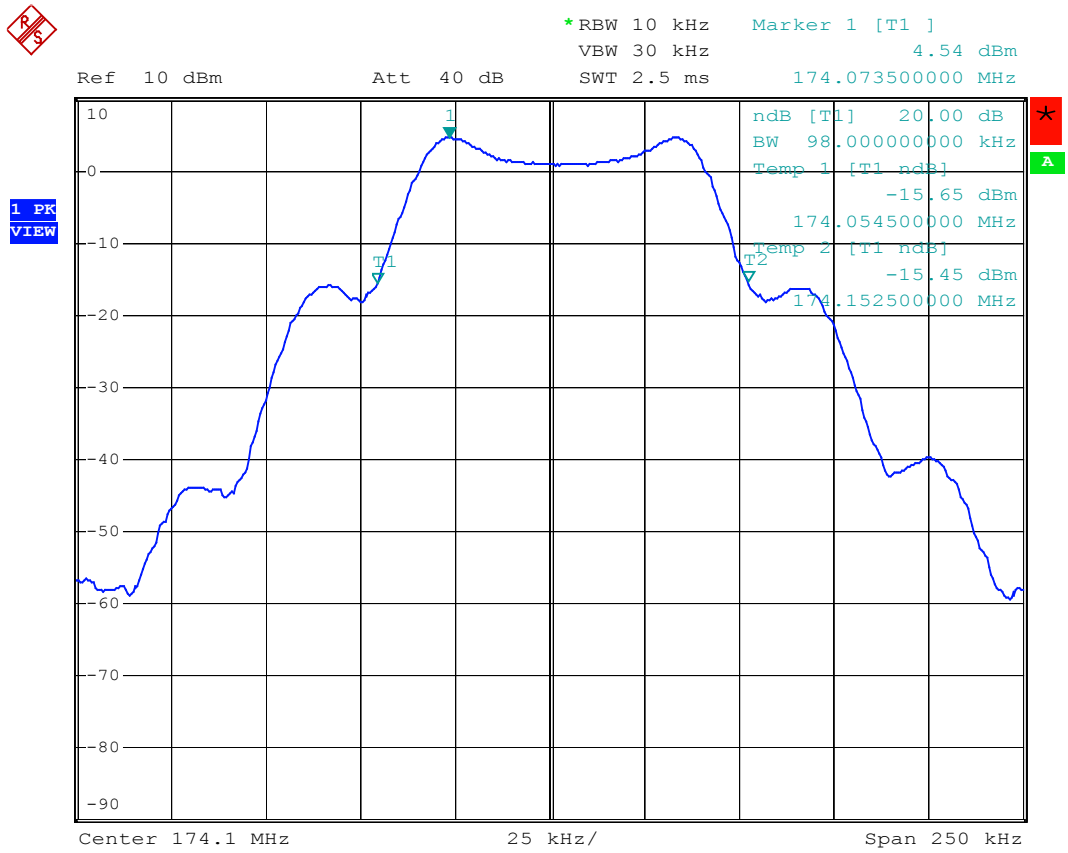


The Level input to produce 50% modulation is 32 mV, therefore the magnitude 16 dB greater than it is 201.9 mV.

5.4.2 Occupied Bandwidth Plotted

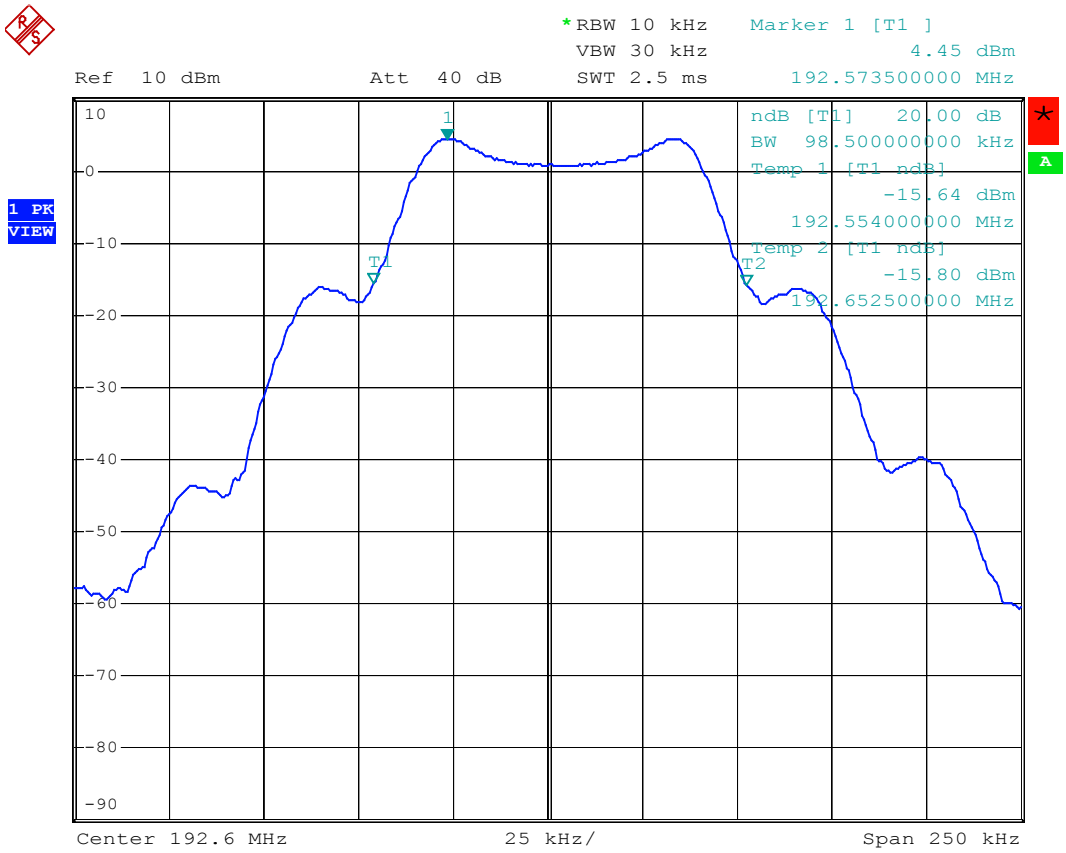
Please See Next Page.

a. 174.100 MHz **The Channel Low 26 dB Bandwidth is** **98.0 KHz**



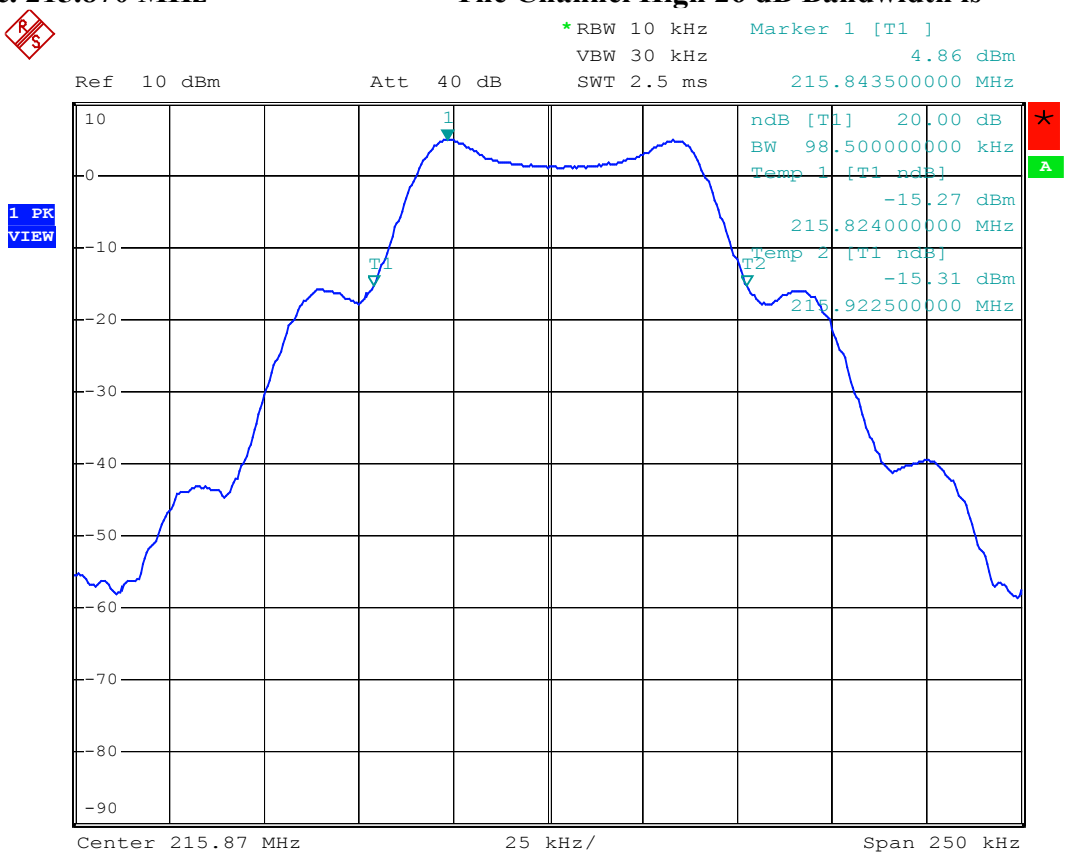
Date: 25.JUN.2007 13:09:19

b. 192.600 MHz **The Channel Middle 26 dB Bandwidth is** **98.5 KHz**



Date: 25.JUN.2007 13:08:30

c. 215.870 MHz **The Channel High 26 dB Bandwidth is** **98.5 KHz**



Date: 25.JUN.2007 13:07:57

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. Due
Spectrum Analyzer	Rohde & Schwarz	FSP40	08/07/2007
RF Test Receiver	Rohde & Schwarz	ESCI	12/24/2007
RF Test Receiver	Rohde & Schwarz	ESBI	07/22/2007
Horn Antenna	EMCO	3115	04/25/2008
Log periodic Antenna	EMCO	3146	08/13/2007
Line Impedance Stabilization network	EMCO	3825/2	10/08/2007
Horn Antenna	EMCO	3116	04/26/2008
Preamplifier	Hewlett-Packard	8449B	09/13/2007
Preamplifier	Hewlett-Packard	8447D	08/06/2007
Spectrum Analyzer	Hewlett-Packard	8564E	08/08/2007

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 : TX Test Date : Jun. 25, 2007
Temperature : 25 °C Humidity : 65 %

Unmodulated carrier output power is 1.3 dBm , or 1.348 mW (ERP)
The limit of spurious or harmonics is calculated as following :
1.3 -[43+10log(carrier output power in W)], or -13dBm

Freq. (MHz)	Meter Reading (dBμV) H	V	SG Reading (dBm) H	V	Antnna Gain	Antnna Gain Corr'	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
348.200	33.2	35.7	-46.8	-41.7	1.7	---	1.5	-46.6	-41.5	-13.0	---
522.300	---	---	---	---	1.3	---	2.0	---	---	-13.0	---
696.400	---	---	---	---	0.7	---	2.3	---	---	-13.0	---
870.500	---	---	---	---	1.1	---	2.9	---	---	-13.0	---
1044.600	---	---	---	---	5.0	-2.0	1.3	---	---	-13.0	---
1218.700	---	---	---	---	6.4	-2.0	1.3	---	---	-13.0	---
1392.800	---	---	---	---	8.2	-2.0	1.3	---	---	-13.0	---
1566.900	---	---	---	---	9.1	-2.0	1.3	---	---	-13.0	---
1741.000	---	---	---	---	9.2	-2.0	1.3	---	---	-13.0	---

Note : 1. Remark "---" means that the emission level is too weak to be detected.

2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :
   Result ＝SG Reading - Cable Loss +Antenna Gain +Antenna Gain Corrected
   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.
4. Spurious or harmonics above 1 GHz is too low to be detected or attenuated more than 60 dB from limit value.

B. Channel Middle

Operated mode : TX Test Date : Jun. 25, 2007
Temperature : 25 °C Humidity : 65 %

Unmodulated carrier output power is 4.5 dBm , or 2.818 mW (ERP)
The limit of spurious or harmonics is calculated as following :
4.5 -[43+10log(carrier output power in W)], or -13dBm

Freq. (MHz)	Meter Reading (dBμV) H	V	SG Reading (dBm) H	V	Antnna Gain	Antnna Gain Corr'	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
385.200	33.7	35.4	-43.8	-40.2	1.2	---	1.7	-44.3	-40.7	-13.0	---
577.800	---	---	---	---	0.5	---	2.2	---	---	-13.0	---
770.400	---	---	---	---	0.9	---	2.6	---	---	-13.0	---
963.000	---	---	---	---	1.2	---	2.8	---	---	-13.0	---
1155.600	---	---	---	---	6.0	-2.0	1.3	---	---	-13.0	---
1348.200	---	---	---	---	7.8	-2.0	1.3	---	---	-13.0	---
1540.800	---	---	---	---	9.1	-2.0	1.3	---	---	-13.0	---
1733.400	---	---	---	---	9.3	-2.0	1.3	---	---	-13.0	---
1926.000	---	---	---	---	9.4	-2.0	1.3	---	---	-13.0	---

Note : 1. Remark "---" means that the emission level is too weak to be detected.

2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :
   Result ＝SG Reading - Cable Loss +Antenna Gain +Antenna Gain Corrected
   Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.
5. 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 : TX Test Date : Jun. 25, 2007
Temperature : 25 °C Humidity : 65 %

Unmodulated carrier output power is -0.7 dBm , or 0.851 mW (ERP)
The limit of spurious or harmonics is calculated as following :
-0.7 -[43+10log(carrier output power in W)], or -13dBm

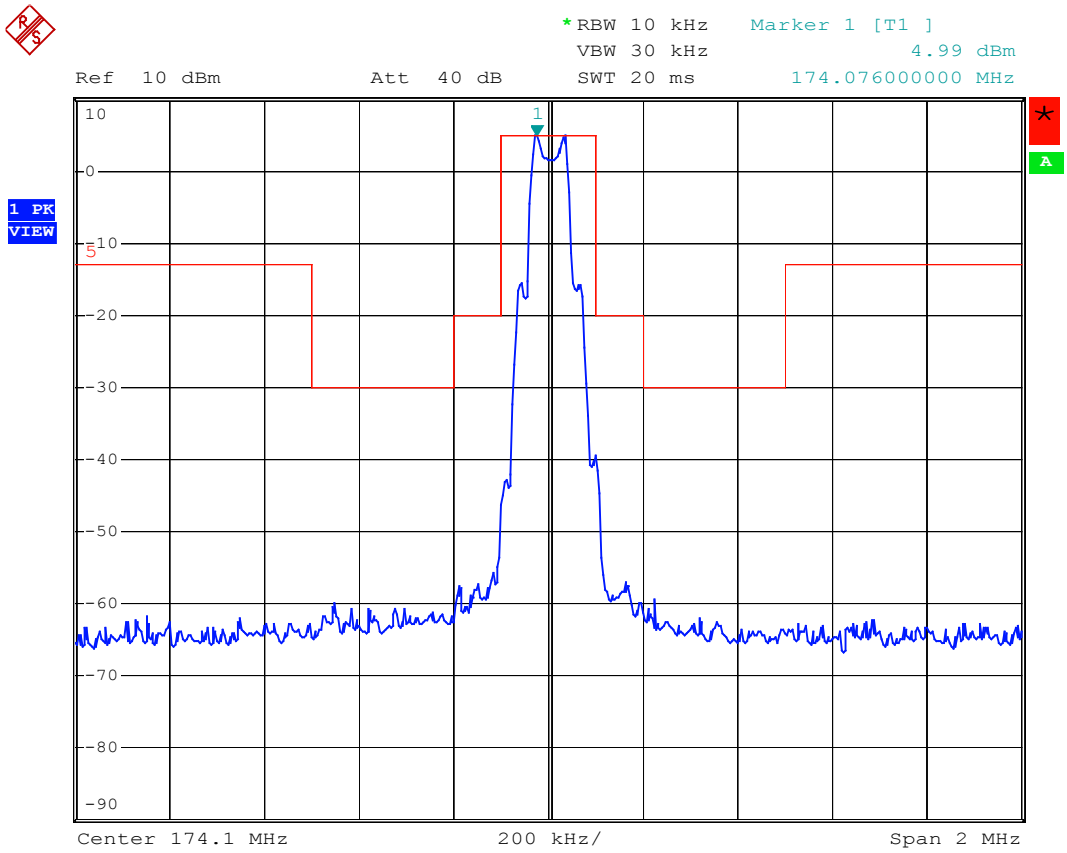
Freq. (MHz)	Meter Reading (dBμV) H	V	SG Reading (dBm) H	V	Antnna Gain	Antnna Gain Corr'	Cable Loss (dB)	Result (dBm) H	V	Limit (dBm)	Margin (dB)
431.740	32.6	33.0	-45.7	-41.5	1.5	---	1.8	-46.0	-41.8	-13.0	---
647.610	---	---	---	---	0.7	---	2.4	---	---	-13.0	---
863.480	---	---	---	---	1.1	---	2.7	---	---	-13.0	---
1079.350	---	---	---	---	5.3	-2.0	1.3	---	---	-13.0	---
1295.220	---	---	---	---	7.3	-2.0	1.3	---	---	-13.0	---
1511.090	---	---	---	---	9.1	-2.0	1.3	---	---	-13.0	---
1726.960	---	---	---	---	9.3	-2.0	1.3	---	---	-13.0	---
1942.830	---	---	---	---	9.5	-2.0	1.3	---	---	-13.0	---
2158.700	---	---	---	---	9.4	-2.0	1.3	---	---	-13.0	---

Note : 1. Remark "---" means that the emission level is too weak to be detected.
2. For measured frequency below 1GHz, a tuned dipole antenna is used.
3. Result calculation is as following :
Result ＝SG Reading - Cable Loss +Antenna Gain +Antenna Gain Corrected
Antenna Gain Corrected : is used for antenna other than dipole to convert radiated power to ERP.
4. Spurious or harmonics above 1 GHz is too low to be detected or attenuated more than 60 dB from limit value.

D. Emission mask plots

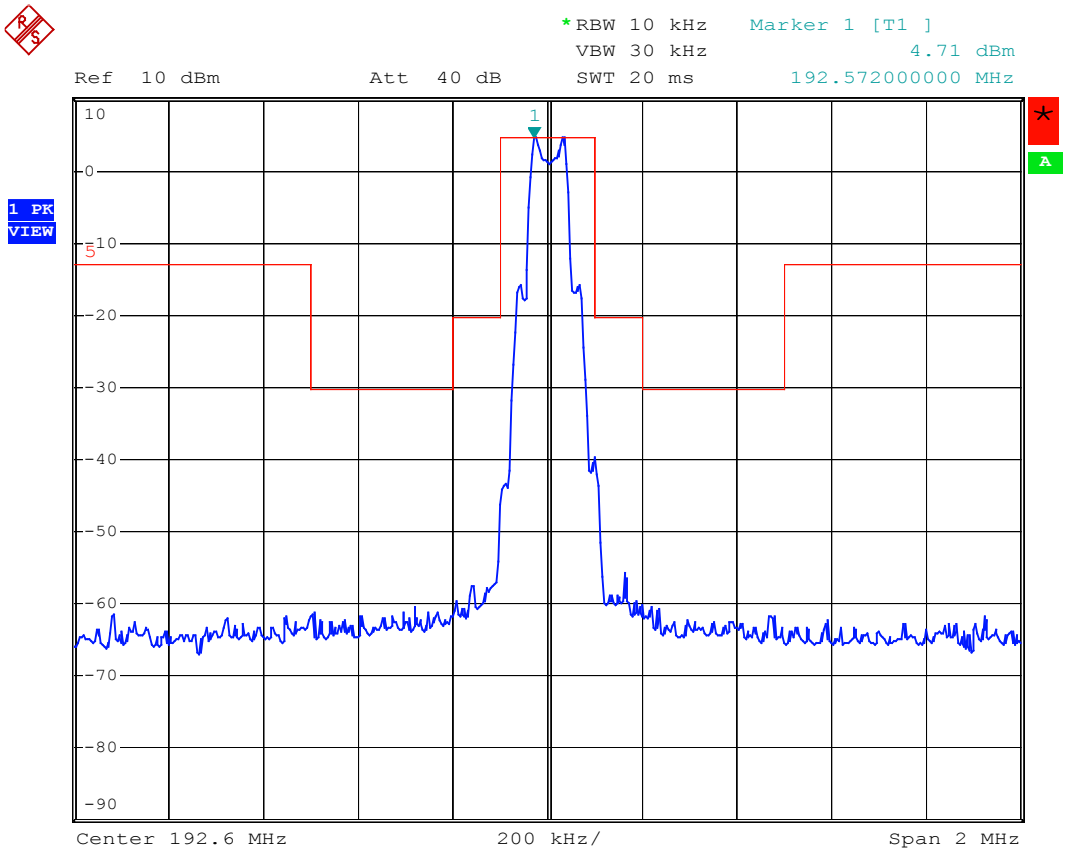
Please see the following pages for plotted data.

a. 174.100 MHz **Channel Low**



Date: 25.JUN.2007 12:56:59

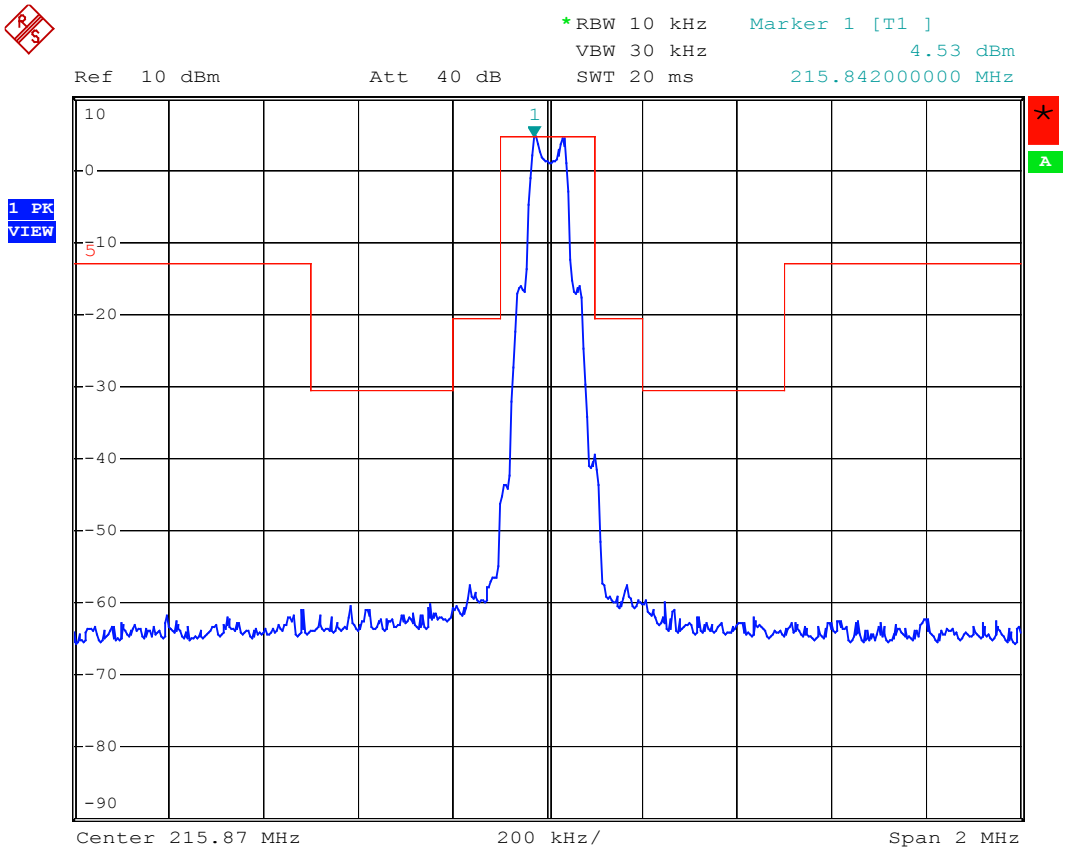
b. 192.600 MHz **Channel Middle**



Date: 25.JUN.2007 13:01:47

c. 215.870 MHz

Channel High



Date: 25.JUN.2007 13:06:26

6.5 Field Strength Calculation

The field strength 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

6.7 Radiated Measurement 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.

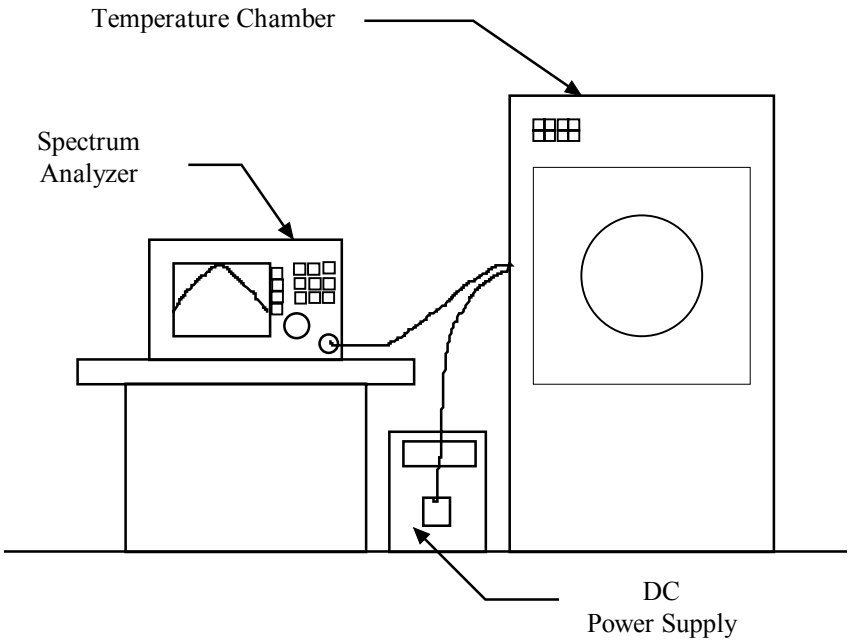
B) Frequency stability versus input voltage

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	08/08/2007
Temperature Chamber	MALLIER	MCT-2X-M	11/26/2007

7.4 Measurement Data

A1. Frequency stability versus enviroment tempture

Reference Frequency :174.100 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.	174.1022	0.00128	174.1037	0.00211	174.0944	-0.00322
40		174.0966	-0.00194	174.1000	-0.00003	174.0960	-0.00232
30		174.1054	0.00311	174.0963	-0.00211	174.0979	-0.00122
20		174.1021	0.00120	174.0988	-0.00071	174.0958	-0.00241
10		174.0952	-0.00273	174.1028	0.00159	174.0971	-0.00165
0		174.0979	-0.00123	174.0933	-0.00383	174.0934	-0.00377
-10		174.1005	0.00027	174.0982	-0.00103	174.1000	-0.00001
-20		174.1034	0.00196	174.1045	0.00259	174.0976	-0.00138
-30		174.1040	0.00229	174.0953	-0.00268	174.0973	-0.00153

A2. Frequency stability versus end-point supplied voltage (1.2Vdc)

Reference Frequency : 174.100 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	174.1016	0.00093	174.0955	-0.00256	174.0983	-0.00096

B1. Frequency stability versus enviroment tempture

Reference Frequency : 192.600 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.	192.5991	-0.00045	192.6055	0.00283	192.5965	-0.00183
40		192.5983	-0.00087	192.5976	-0.00126	192.6064	0.00331
30		192.5980	-0.00102	192.6070	0.00363	192.6021	0.00110
20		192.6060	0.00311	192.5993	-0.00038	192.6058	0.00300
10		192.6070	0.00362	192.6065	0.00337	192.6008	0.00042
0		192.6052	0.00272	192.5937	-0.00328	192.6051	0.00265
-10		192.6057	0.00296	192.6048	0.00251	192.6062	0.00323
-20		192.5994	-0.00029	192.6017	0.00087	192.5994	-0.00029
-30		192.5930	-0.00365	192.6034	0.00174	192.6034	0.00176

B2. Frequency stability versus end-point supplied voltage (1.2Vdc)

Reference Frequency : 192.600 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	192.6050	0.00260	192.5930	-0.00365	192.5953	-0.00245

C1. Frequency stability versus enviroment tempture

Reference Frequency : 215.870 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.	215.8623	-0.00356	215.8727	0.00127	215.8720	0.00094
40		215.8680	-0.00093	215.8622	-0.00360	215.8672	-0.00128
30		215.8662	-0.00177	215.8765	0.00301	215.8692	-0.00036
20		215.8740	0.00187	215.8658	-0.00194	215.8727	0.00123
10		215.8668	-0.00150	215.8636	-0.00298	215.8628	-0.00336
0		215.8687	-0.00058	215.8664	-0.00169	215.8780	0.00373
-10		215.8672	-0.00132	215.8665	-0.00162	215.8681	-0.00087
-20		215.8743	0.00200	215.8729	0.00132	215.8776	0.00351
-30		215.8624	-0.00352	215.8719	0.00086	215.8782	0.00380

C2. Frequency stability versus end-point supplied voltage (1.2Vdc)

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	215.8721	0.00098	215.8730	0.00140	215.8772	0.00335

8 CONDUCTED EMISSION MEASUREMENT

8.1 Description

This EUT is excused from investigation of conducted emission, for it is powered by DC 3V battery only. According to §15.207 (d), 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.