

## FCC CFR47 PART 74 SUBPART H

## CERTIFICATION

## TEST REPORT

## FOR

Relacart Electronics Co., Ltd.

Wireless Microphone Systems

Model No.: UB-200

Prepared for : Relacart Electronics Co., Ltd.  
Address : No.10 Fu Xing Road, Ping Shi Industrial Zone, Enping City,  
Guangdong, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.  
Address : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,  
Bao'an District, Shenzhen, Guangdong, China

Date of receipt of test sample : December 17,2011  
Number of tested samples : 1  
Report Number : LCS1112173540F  
Date of Test : December 17,2011 - January 13, 2012  
Date of Report : January 13, 2012

**TEST REPORT**  
**FCC CFR 47 PART 74 SUBPART H****Report Reference No. .... : LCS1112173540F**

Date of issue ..... : January 13, 2012

**Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.**Address ..... : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,  
Bao'an District, Shenzhen, Guangdong, ChinaTesting location/ procedure ..... : Full application of Harmonised standards ☒  
Partial application of Harmonised standards ☐  
Other standard testing method ☐**Applicant's name ..... : Relacart Electronics Co., Ltd.**Address ..... : No.10 Fu Xing Road, Ping Shi Industrial Zone, Enping City,  
Guangdong, China**Test specification**

Standard ..... : FCC CFR 47 PART 74 SUBPART H, ANSI C63.4-2009

**Test Report Form No..... : LCSEMC-1.0**

TRF Originator ..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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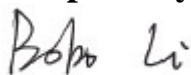
**Test item description. .... : Wireless Microphone Systems**

Trade Mark ..... : RELACART

Manufacturer..... : Relacart Electronics Co., Ltd.

Model/Type reference..... : UB-200

Ratings ..... : DC 3V, (Frequency Range:618.750-651.650MHz )

Result ..... : **Positive****Compiled by:**

Bobo Li/ File administrators

**Supervised by:**

Vito Cao/ Technique principal

**Approved by:**

Gavin Liang/ Manager

## EMC -- TEST REPORT

**Test Report No. : LCS1112173540F**January 13, 2012

Date of issue

Type / Model..... : UB-200

EUT..... : Wireless Microphone Systems

**Applicant..... : Relacart Electronics Co., Ltd.**Address..... : No.10 Fu Xing Road, Ping Shi Industrial Zone, Enping City,  
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Telephone..... : 0750-7181209

Fax..... : 0750-7181212

Contact..... : SHARON WU /Sales Manager

**Manufacturer..... : Relacart Electronics Co., Ltd.**Address..... : No.10 Fu Xing Road, Ping Shi Industrial Zone, Enping City,  
Guangdong, China

Telephone..... : 0750-7181209

Fax..... : 0750-7181212

Contact..... : SHARON WU /Sales Manager

**Factory..... : /**

Address..... : /

Telephone..... : /

Fax..... : /

Contact..... : /

**Test Result:****Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## TABLE OF CONTENTS

Test Report Description	Page
<b>1. GENERAL INFORMATION .....</b>	<b>6</b>
1.1 Description of Device (EUT).....	6
1.2 Description of Test Facility .....	6
1.3 Statement of the measurement uncertainty .....	6
1.4 Measurement Uncertainty .....	6
<b>2. TEST METHODOLOGY .....</b>	<b>7</b>
2.1 Frequencies Available .....	7
2.2 EUT Configuration .....	7
2.3 EUT Exercise .....	7
2.4 General Test Procedures .....	7
2.4 Description Of Test Modes .....	8
2.5. Connection Diagram of Test System .....	8
<b>3. SUMMARY OF TEST RESULTS .....</b>	<b>9</b>
<b>4. §74.861(E)(1)(II) – OUTPUT POWER MEASUREMENT .....</b>	<b>10</b>
4.1 Standard Applicable .....	10
4.2 Test Equipment .....	10
4.3 Block Diagram of Test Setup .....	10
4.4 Test Procedure .....	10
4.5 Test Results .....	10
<b>5. §74.861(E)(3) – MODULATION CHARACTERISTICS .....</b>	<b>11</b>
5.1 Standard Applicable .....	11
5.2 Test Equipment .....	11
5.3 Block Diagram of Test Setup .....	11
5.4 Test Procedure .....	11
5.5 Test Results .....	12
<b>6. §74.861(E)(5)/(E)(6) - OCCUPIED BANDWIDTH OF EMISSION / EMISSION MASK .....</b>	<b>13</b>
6.1 Standard Applicable .....	13
6.2 Test Equipment .....	13
6.3 Block Diagram of Test Setup .....	13
6.4 Test Procedure .....	13
6.5 Test Results .....	14
<b>7. §74.861 (E)(6) / 15.209 – RADIATED SPURIOUS EMISSION .....</b>	<b>18</b>
7.1 Standard Applicable .....	18
7.2 Test Equipment .....	18
7.3 Block Diagram of Test Setup .....	18
7.4 Test Procedure .....	19
7.5 Test Results .....	19
<b>8. §2.1051 / 74.861(E)(6)- SPURIOUS EMISSION AT ANTENNA TERMINAL .....</b>	<b>22</b>
8.1 Standard Applicable .....	22
8.2 Test Equipment .....	22
8.3 Block Diagram of Test Setup .....	22
8.4 Test Procedure .....	22
8.5 Test Results .....	22
<b>9. §74.86(E)(4) - FREQUENCY STABILITY MEASUREMENT .....</b>	<b>28</b>
9.1 Standard Applicable .....	28
9.2 Test Equipment .....	28

9.3 Block Diagram of Test Setup.....	28
9.4 Test Procedure .....	29
9.5 Test Results.....	30
<b>10. MANUFACTURER/ APPROVAL HOLDER DECLARATION .....</b>	<b>32</b>

## 1. GENERAL INFORMATION

### 1.1 Description of Device (EUT)

EUT	: Wireless Microphone Systems
Model Number	: UB-200
Power Supply	: DC 3V
Frequency Range	: 618.750-651.650MHz

### 1.2 Description of Test Facility

Site Description	
EMC Lab.	: Accredited by CNAS, June 04, 2010 The Certificate Registration Number. is L4595. Accredited by FCC, July 14, 2011 The Certificate Registration Number. is 899208. Accredited by Industry Canada, May. 02, 2011 The Certificate Registration Number. is 9642A-1

### 1.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

### 1.4 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
		200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
Conduction Uncertainty	:	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance	:	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)

- (1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 Part 74 Subpart H.

### 2.1 Frequencies Available

According to sec. 74.802 of Part 74, the following frequencies are available for low power auxiliary station :

Frequency(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	494.000-608.000
	174.000-216.000	614.000-806.000
	450.000-451.000	944.000-952.000

### 2.2 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 2.3 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, and 2.1055 of Part 2 of CFR 47.

### 2.4 General Test Procedures

#### 2.4.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

#### 2.4.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4

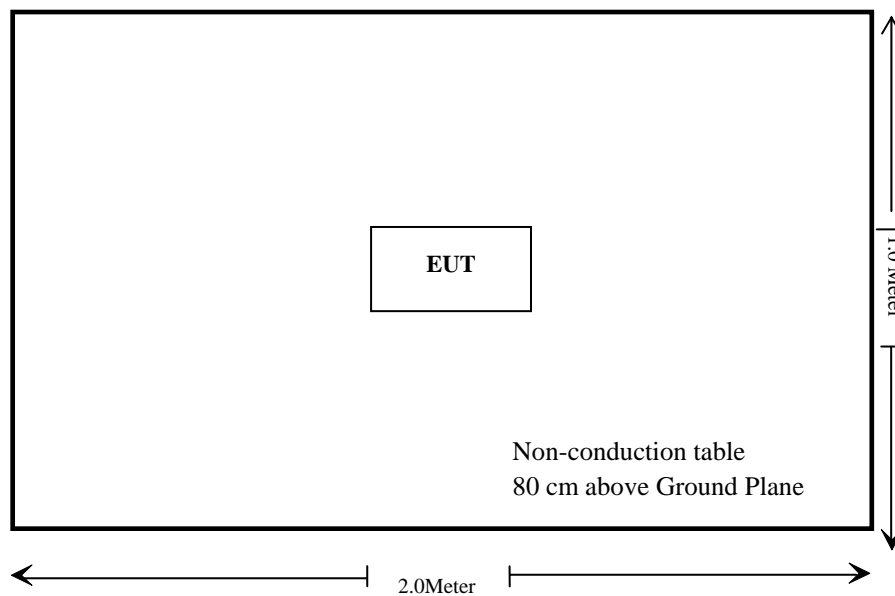
## 2.4 Description Of Test Modes

The EUT has been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

Then, the worst case is FM Channel Low (618.75MHz), Mid (635.450MHz) and High (651.650MHz) these were chosen for full testing.

## 2.5. Connection Diagram of Test System





### 3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§74.861(e)(1)(ii)	Output Power Measurement	Compliant
§74.861(e)(3)	Modulation Characteristics	Compliant
§74.861(e)(5)	Occupied Bandwidth Emission	Compliant
§74.861(e)(6)	Field Strength of Emission	Compliant
§74.861(e)(6)(f)	Spurious Emission at Antenna Port	Compliant
§74.86(e)(4)	Frequency Stability	Compliant
§15.209	Unintentional Radiated Emission	Compliant
§2.1093, §1.1307(b)(1)	RF Exposure Requirement	N/A
§15.207	AC Line Conducted Emission	N/A

## 4. §74.861(E)(1)(II) – OUTPUT POWER MEASUREMENT

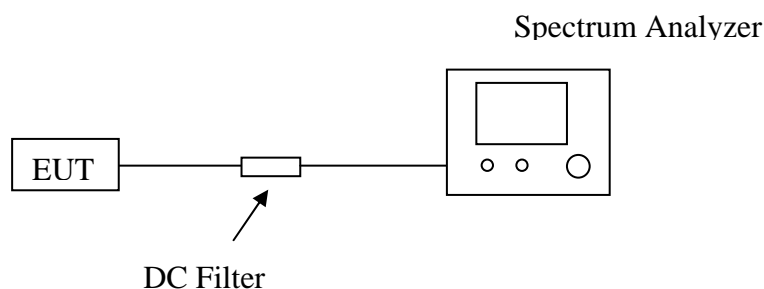
### 4.1 Standard Applicable

According to §74.861(e)(1)(ii), for low power auxiliary station operating in the 614-806MHz band, the power of the measured unmodulated carrier power and the output of the transmitter power amplifier (antenna input power) may not exceed 250mW.

### 4.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	Power Sensor	Agilent	E9327A	US40441788	2011-06	2012-06
3	Power Meter	Agilent	E4416A	QB41292714	2011-06	2012-06
4	DC Filter	MPE	23872C	N/A	2011-06	2012-06

### 4.3 Block Diagram of Test Setup



### 4.4 Test 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 100 kHz and VBW to 100 kHz.

### 4.5 Test Results

<b>Operation Mode: TX</b>			<b>Test Date: 12-29-2011</b>		
<b>Temperature: 23°C</b>			<b>Humidity: 50 % RH</b>		
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (mW)	Result
Low	618.750	11.67	14.69	250	Pass
Mid	635.450	11.67	14.69	250	Pass
High	651.650	11.50	14.13	250	Pass

## 5. §74.861(E)(3) – MODULATION CHARACTERISTICS

### 5.1 Standard Applicable

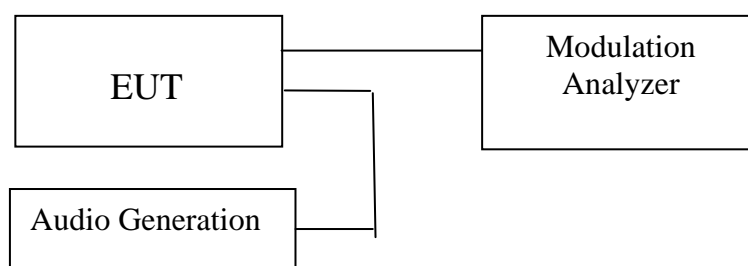
According to FCC 2.1047 (a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100Hz to 5000Hz shall be measured. For equipment required to have an audio low-pass filter, the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be measured.

According to §74.861(e)(3), any form of modulation may be used. A maximum deviation of  $\pm 75$  kHz is permitted when frequency modulation is employed.

### 5.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
1	Analyzer, Modulation	HP	8901A	2026A00847	2011-06	2012-06
2	Generator, Function	Agilent	33220A	MY43004878	2011-06	2012-06

### 5.3 Block Diagram of Test Setup



### 5.4 Test Procedure

#### 5.4.1 Modulation Limit

5.4.1.1 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.

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

#### 5.4.2 Frequency response of all circuits

5.4.2.1 Position the EUT as shown in 5.3.

5.4.2.2 Vary the modulating frequency from 100 Hz to 15000 Hz with constant input voltage, and observe the change in output.

## 5.5 Test Results

The plot(s) of modulation characteristic is presented hereinafter as reference.

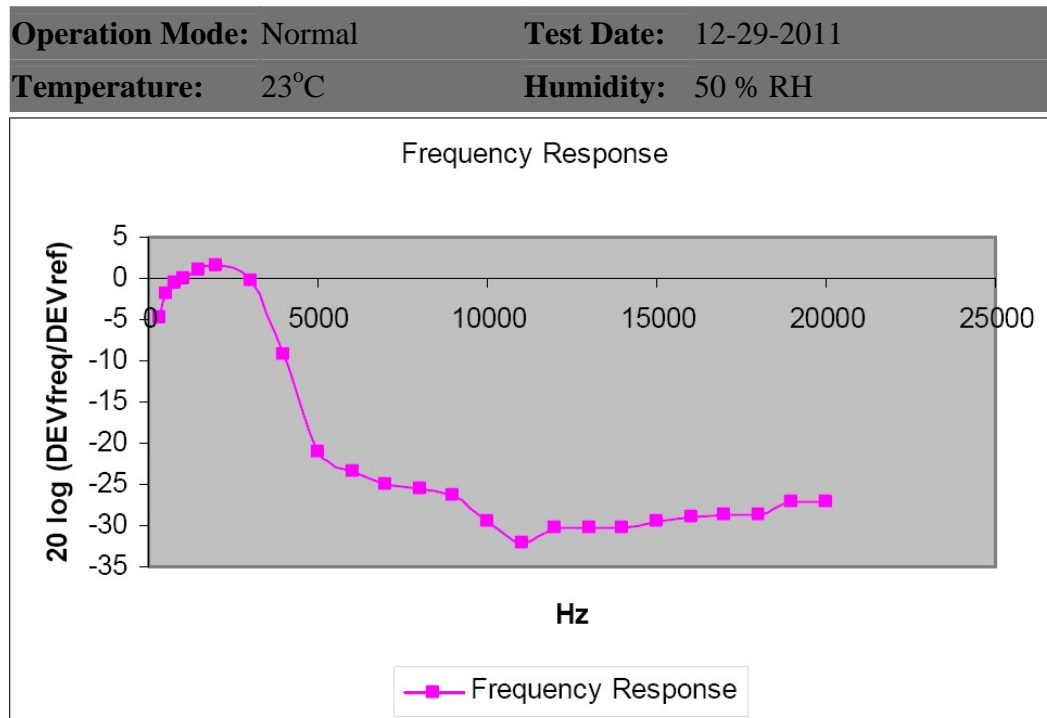


Fig.1

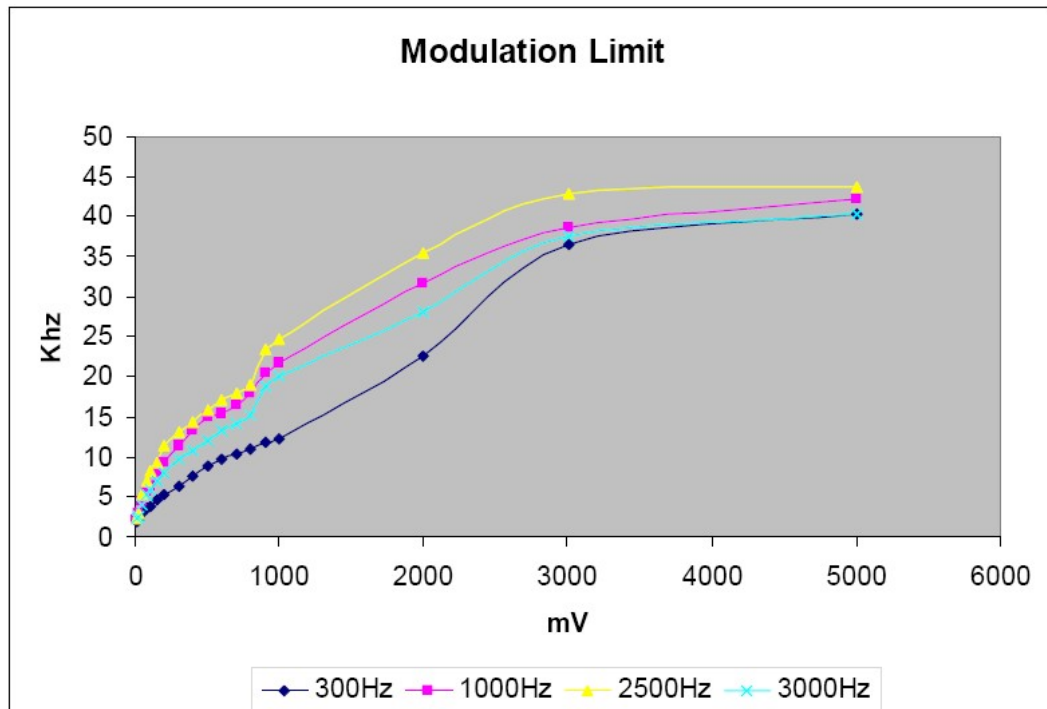


Fig.2

## 6. §74.861(E)(5)/(E)(6) - OCCUPIED BANDWIDTH OF EMISSION / EMISSION MASK

### 6.1 Standard Applicable

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

According to §74.861(e)(5) & §74.861(e)(6):

(1) the operating bandwidth shall not exceed 200 kHz.

(2)(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;

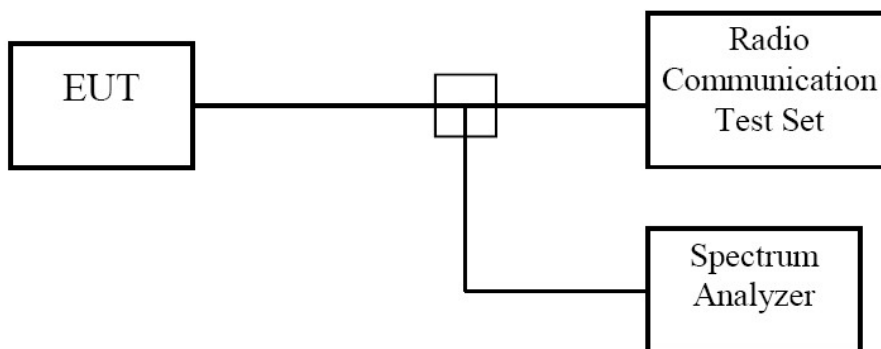
(ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;

(iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least  $43+10\log_{10}$  (mean output power in watts) dB.

### 6.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Rohde & Schwarz	ESCI	1166.5950.03	2011-06	2012-06

### 6.3 Block Diagram of Test Setup



### 6.4 Test Procedure

6.4.1 Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

6.4.2 Position the EUT as shown in 6.3, and Install new batteries in the EUT. Turn on the EUT and 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.

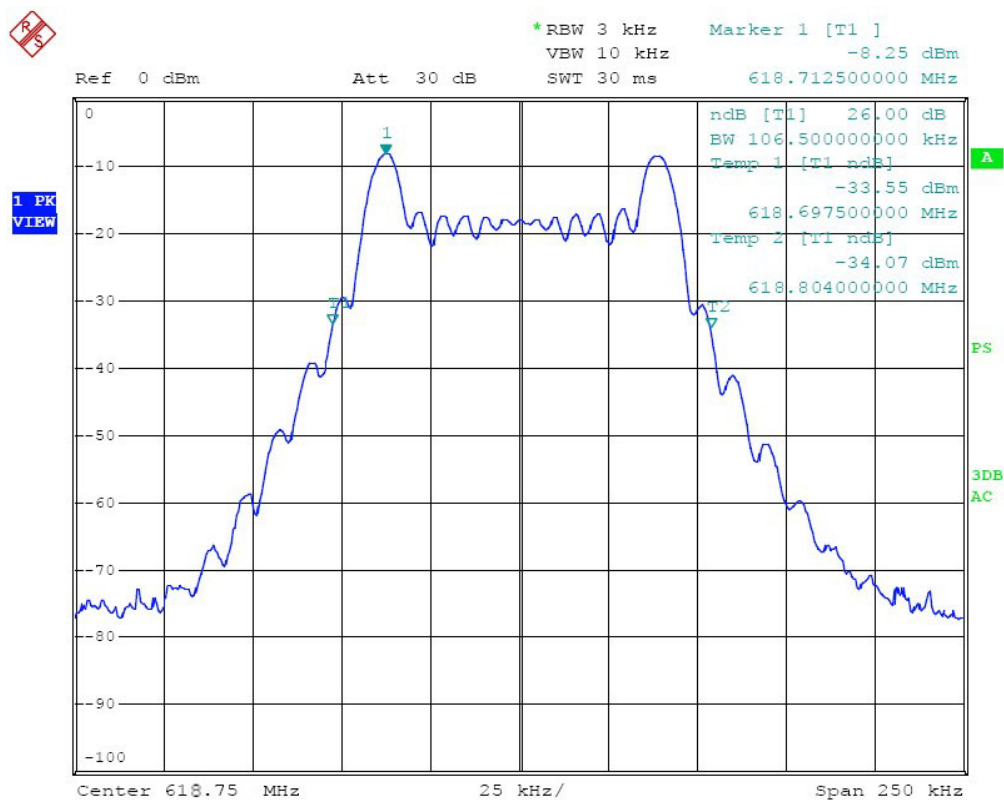
6.4.3 Apply a 2.5 kHz modulation signal to EUT and measure the frequencies of the modulated signal from the EUT where it is the specified number of dB below the reference level set in step 6.4.2. This is the occupied bandwidth specified.

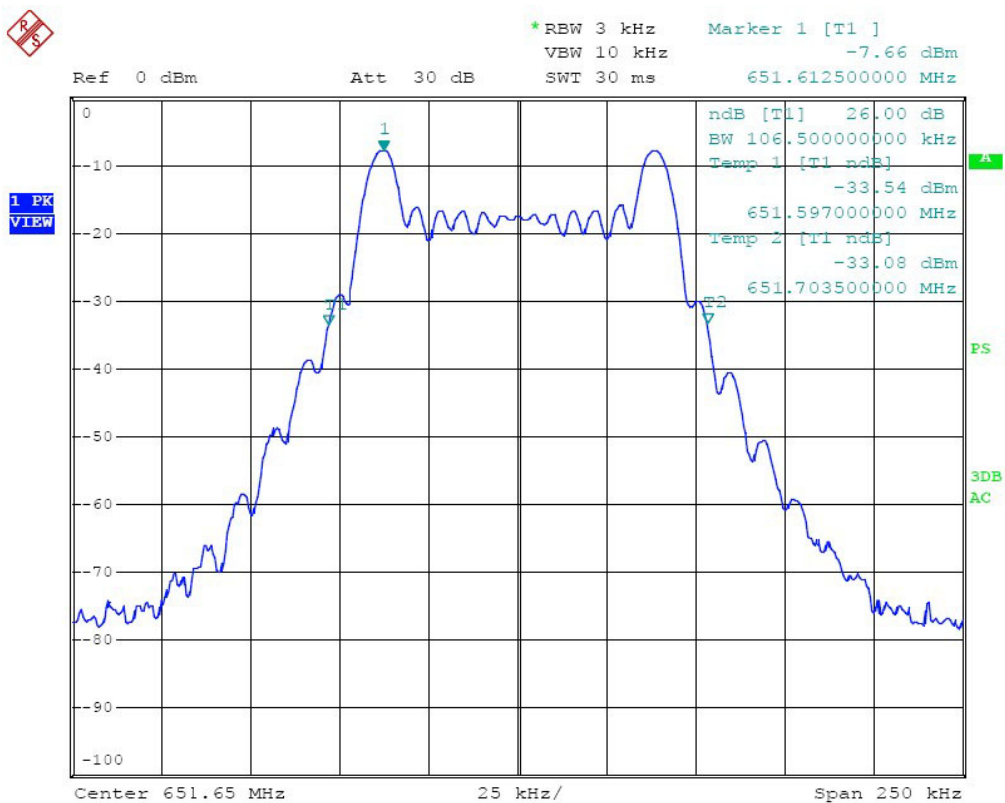
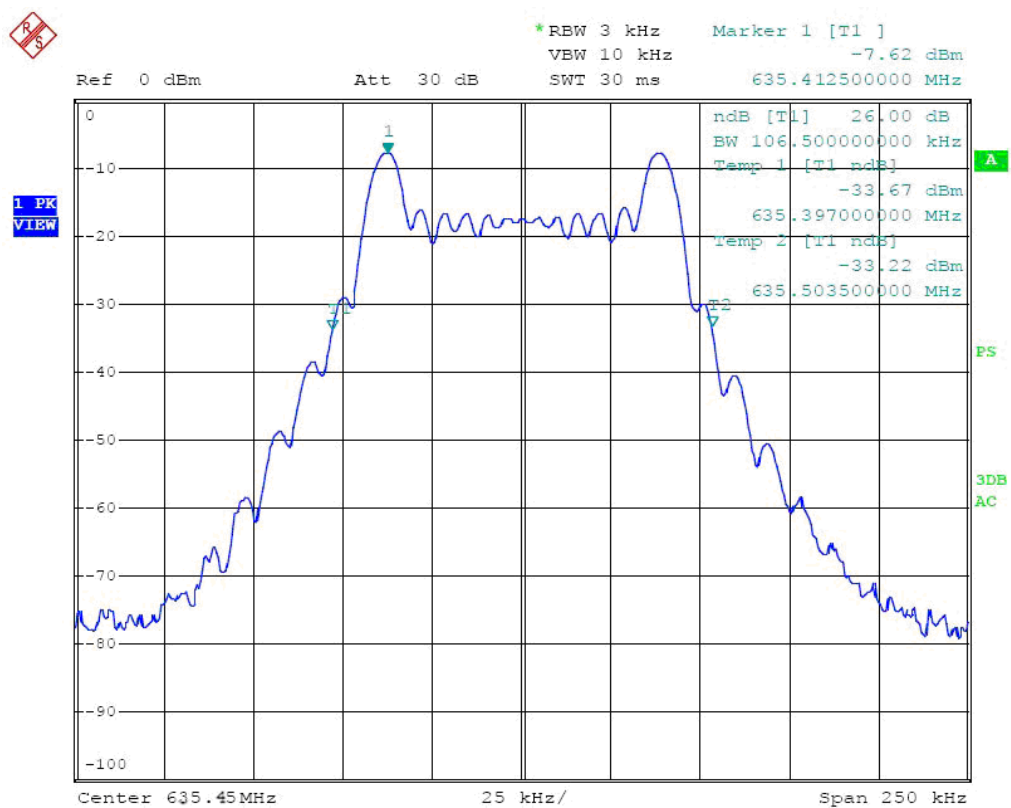
## 6.5 Test Results

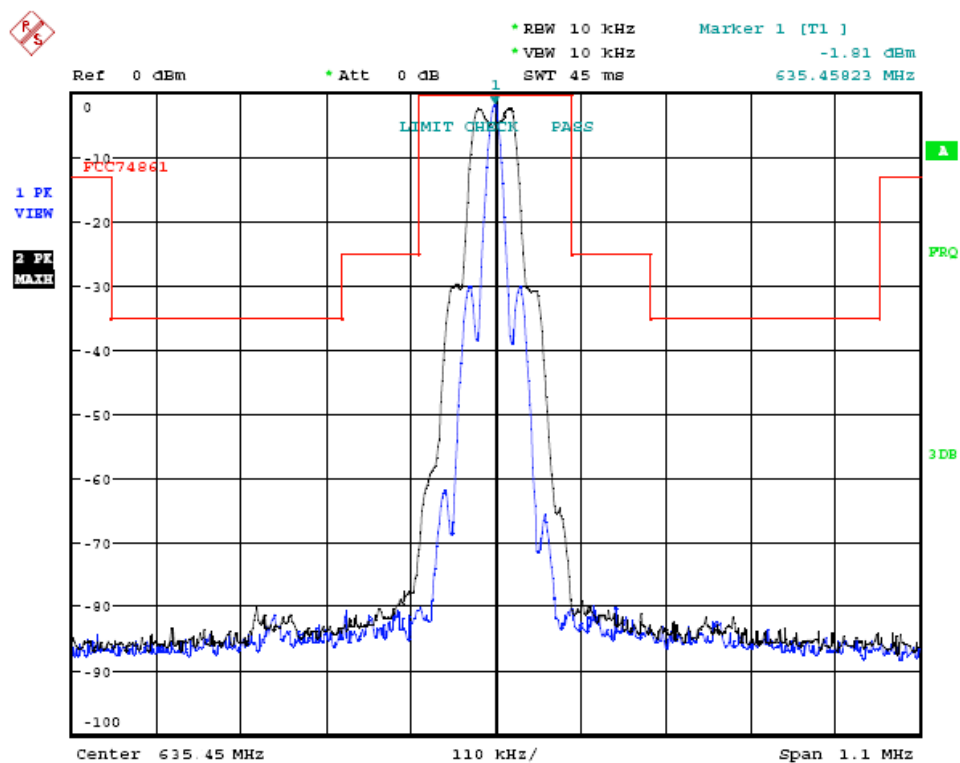
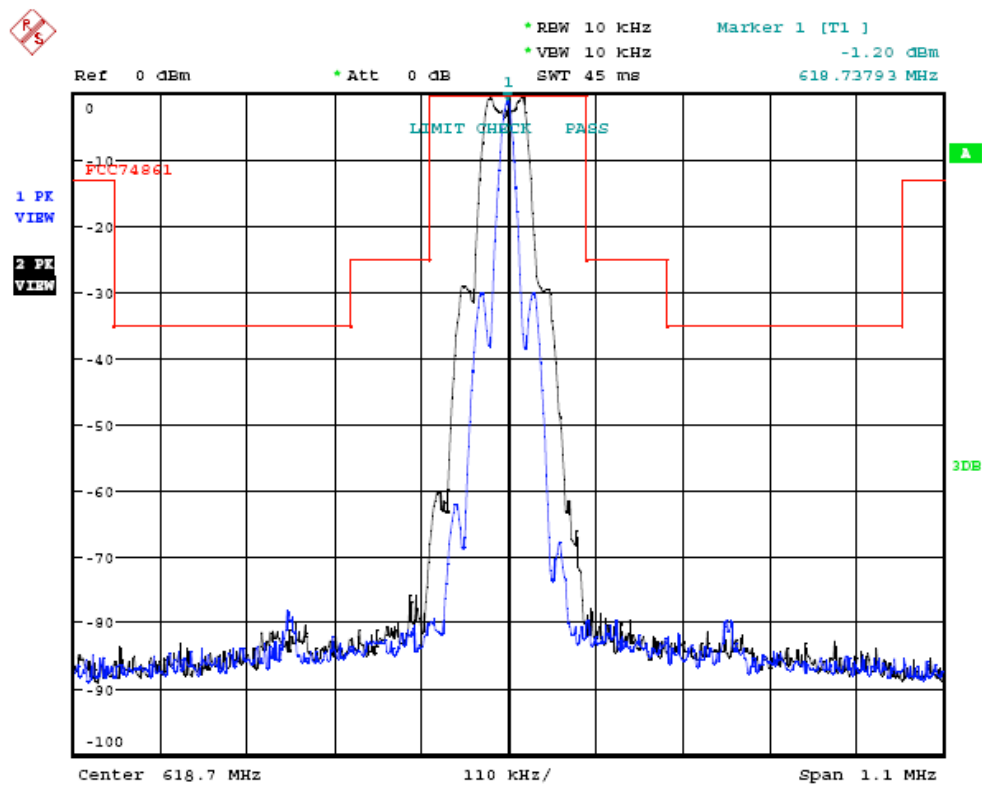
<b>Operation Mode:</b> TX		<b>Test Date:</b> 12-29-2011		
<b>Temperature:</b> 23°C		<b>Humidity:</b> 50 % RH		
Channel	Frequency (MHz)	26dB Bandwidth (kHz)	Limit (kHz)	Result
LOW	618.75	106.5	200	Pass
Mid	635.45	106.5	200	Pass
High	651.65	106.5	200	pass

The test data graph please refer to the following page.

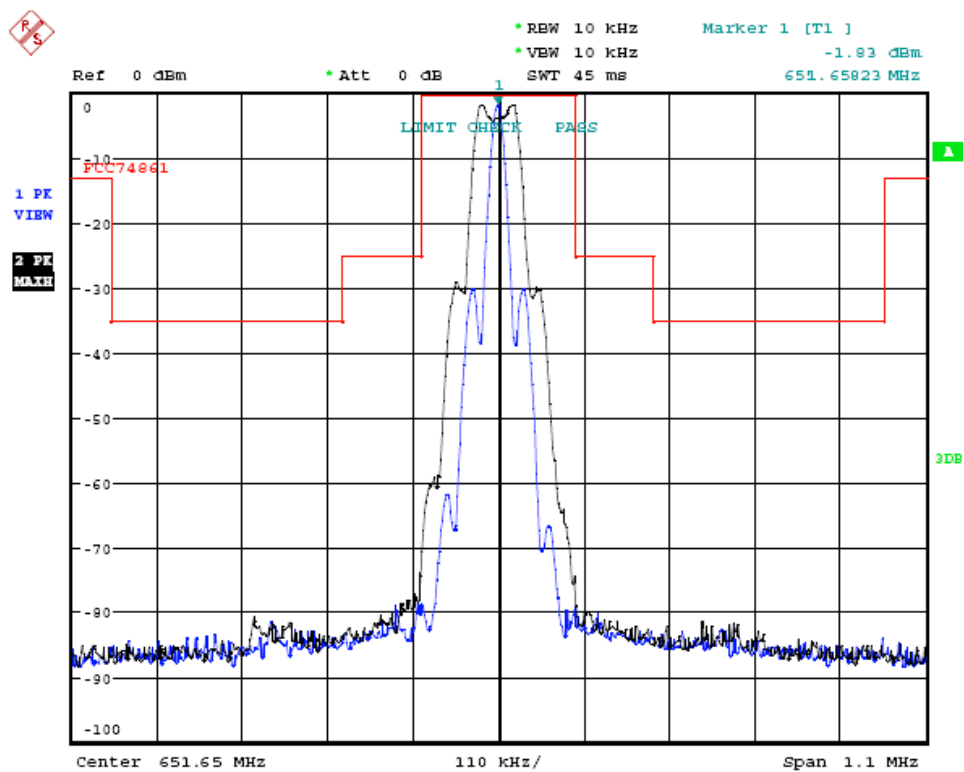
### OCCUPIED BANDWIDTH OF EMISSION:





**EMISSION MASK:**





## 7. §74.861 (E)(6) / 15.209 – RADIATED SPURIOUS EMISSION

### 7.1 Standard Applicable

According to FCC2.1053, measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediated 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 half wave dipole antenna.

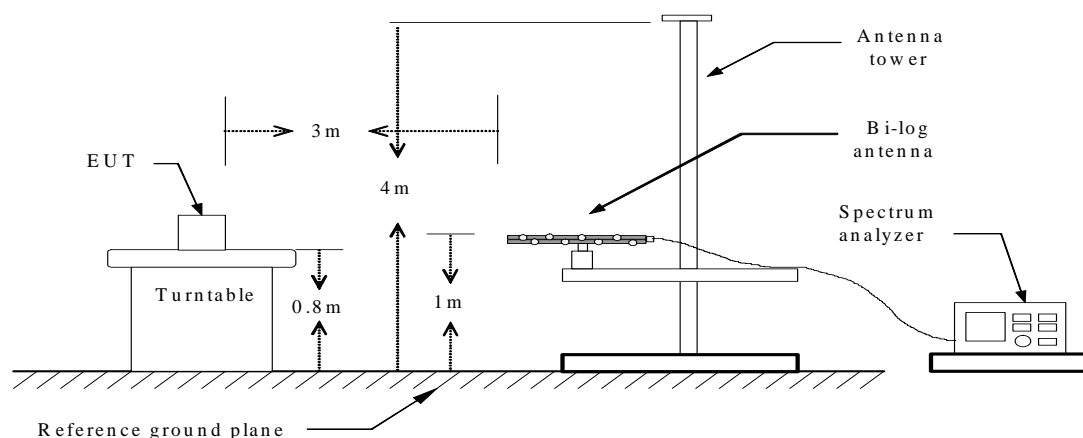
According to FCC74.861 (e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

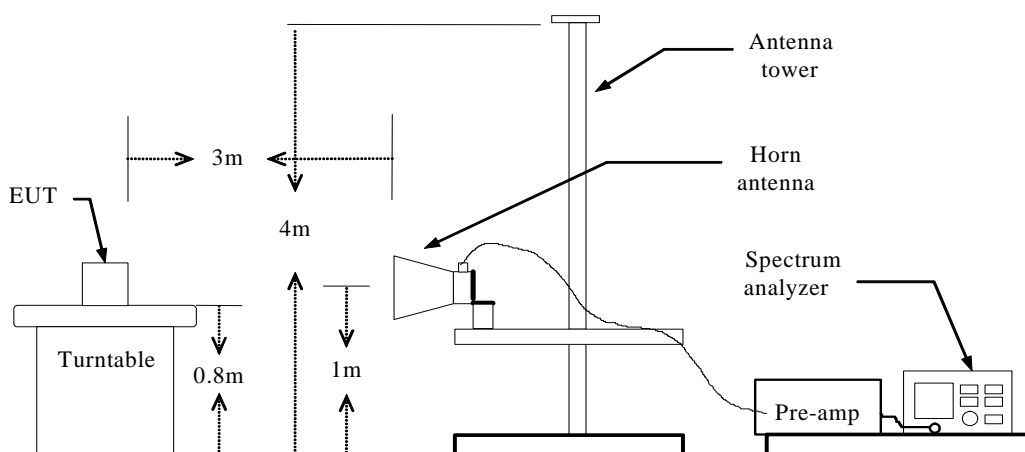
1. on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.
2. on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.
3. on any frequency removed from the operating frequency by more than 250 percent up to and the authorized bandwidth shall be attenuated below the un-modulated carrier by at least 43 plus 10 Log (output power in watts)dB.

### 7.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	2011-06	2012-06
3	Antenna	Schwarzbeck	VULB9163	142	2011-06	2012-06
4	Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	2011-06	2012-06
5	DC Filter	MPE	23872C	N/A	2011-06	2012-06

### 7.3 Block Diagram of Test Setup



**Below 1 GHz****Above 1 GHz****7.4 Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

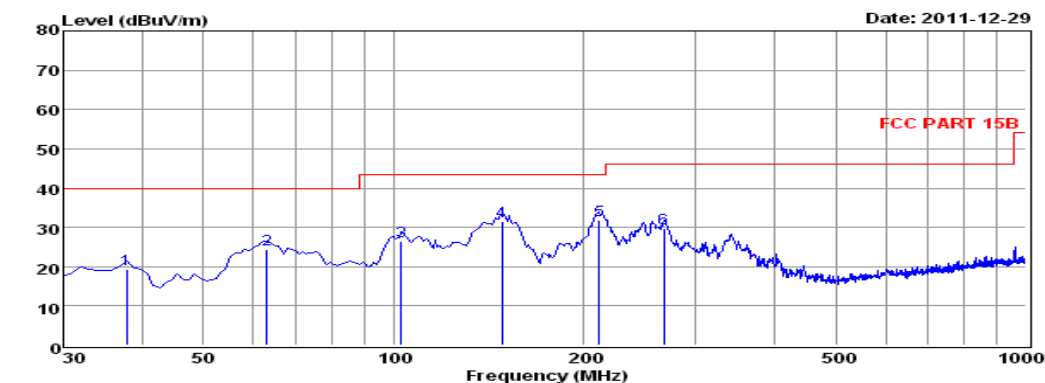
The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \lg (\text{TXpwr in Watts}/0.001)$  – the absolute level.

Spurious attenuation limit in dB =  $43 + 10 \text{ Log}_{10} (\text{power out in Watts})$ .

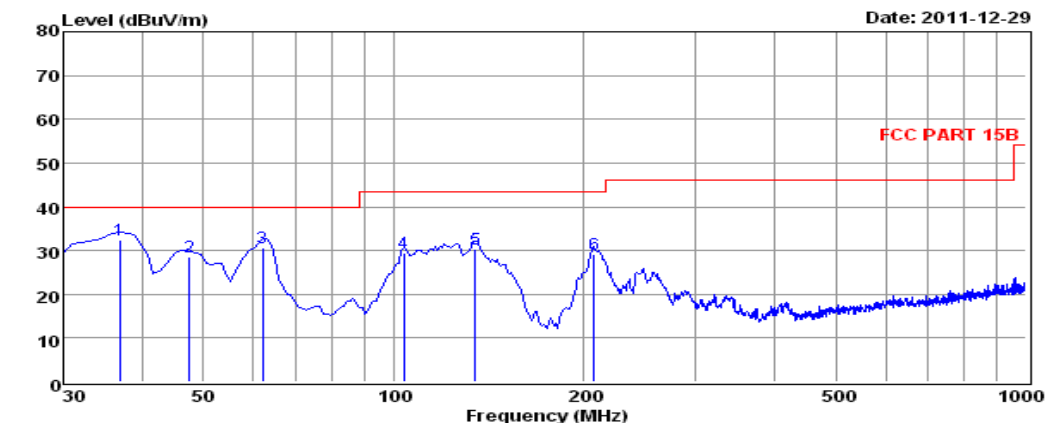
**7.5 Test Results**



Env. /Ins: 24°C/56%  
 EUT: Wireless Microphone Systems  
 M/N: UB-200  
 Power Rating: DC 3V  
 Test Mode: TX  
 Operator: Willis  
 Memo:  
 pol: HORIZONTAL

	Freq.	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	37.76	36.14	0.38	13.01	30.13	19.40	40.00	-20.60	QP
2	62.98	42.59	0.48	11.51	30.16	24.42	40.00	-15.58	QP
3	102.75	43.29	0.60	12.91	30.20	26.60	43.50	-16.90	QP
4	148.34	52.52	0.86	8.25	30.20	31.43	43.50	-12.07	QP
5	211.39	50.20	0.93	10.93	30.19	31.87	43.50	-11.63	QP
6	267.65	46.64	1.00	12.29	30.17	29.76	46.00	-16.24	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.  
 3. The emission levels that are 20dB below the official limit are not reported.



Env. /Ins: 24°C/56%  
 EUT: Wireless Microphone Systems  
 M/N: UB-200  
 Power Rating: DC 3V  
 Test Mode: TX  
 Operator: Willis  
 Memo:  
 pol: VERTICAL

	Freq.	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	36.79	49.27	0.41	12.76	30.13	32.31	40.00	-7.69	QP
2	47.46	44.82	0.35	13.40	30.14	28.43	40.00	-11.57	QP
3	62.01	48.52	0.48	11.89	30.16	30.73	40.00	-9.27	QP
4	103.72	46.34	0.61	12.82	30.20	29.57	43.50	-13.93	QP
5	134.76	51.08	0.74	8.58	30.20	30.20	43.50	-13.30	QP
6	207.51	47.55	0.86	10.81	30.20	29.02	43.50	-14.48	QP

Note: 1. All readings are Quasi-peak values.  
 2. Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.  
 3. The emission levels that are 20dB below the official limit are not reported.

**Operation Mode:** TX **Test Date:** 12-29-2011**Temperature:** 23°C **Humidity:** 50 % RH

Indicated		Table	Test Antenna		Substituted			Antenna Gain Correction	Cable Loss dB	Absolute Level dBm	Limit dBm	Margin dB
Frequency MHz	Reading dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V					
Low Channel												
1237.5	59.3	60	1.1	V	1237.5	-44.5	V	9.1	1.24	-36.64	-13	23.64
1856.25	56.2	0	1.5	V	1856.25	-47.6	V	9.1	1.94	-40.44	-13	27.44
2475	48.8	60	1.1	H	2475	-55.1	H	9.1	2.38	-48.38	-13	35.38
3093.75	45.8	0	1.5	H	3093.75	-56.3	H	9.1	2.53	-49.73	-13	36.73
3712.5	44.7	90	1.1	V	3712.5	-57.6	V	10.2	3.45	-50.85	-13	37.85
4331.25	42.7	90	1.1	H	4331.25	-60.2	H	10.2	3.57	-53.57	-13	40.57
Middle Channel												
1270.9	57.3	60	1.1	H	1270.9	-47.6	H	9.1	1.24	-39.74	-13	26.74
1906.35	56.8	60	1.1	V	1906.35	-47.7	V	9.1	1.94	-40.54	-13	27.54
2541.8	48.6	0	1.5	H	2541.8	-53.5	H	9.1	2.38	-46.78	-13	33.78
3177.25	45.3	0	1.5	V	3177.25	-56.4	V	9.1	2.53	-49.83	-13	36.83
3812.7	44.3	90	1.1	H	3812.7	-57.1	H	10.2	3.45	-50.35	-13	37.35
4448.15	43.6	90	1.1	V	4448.15	-58.3	V	10.2	3.57	-51.67	-13	38.67
High Channel												
1303.3	59.7	60	1.1	H	7416	-44.3	H	9.1	1.24	-36.44	-13	23.44
1954.95	58.1	60	1.1	V	7416	-45.6	V	9.1	1.94	-38.44	-13	25.44
2606.6	45.5	0	1.5	V	6590	-56.2	V	9.1	2.38	-49.48	-13	36.48
3258.25	45.0	0	1.5	H	6610	-56.9	H	9.1	2.53	-50.33	-13	37.33
3909.9	44.6	90	1.1	V	3020	-57.5	V	10.2	3.45	-50.75	-13	37.75
4561.55	43.4	90	1.1	H	3840	-58.1	H	10.2	3.57	-51.47	-13	38.47

## 8. §2.1051 / 74.861(E)(6)- SPURIOUS EMISSION AT ANTENNA

### TERMINAL

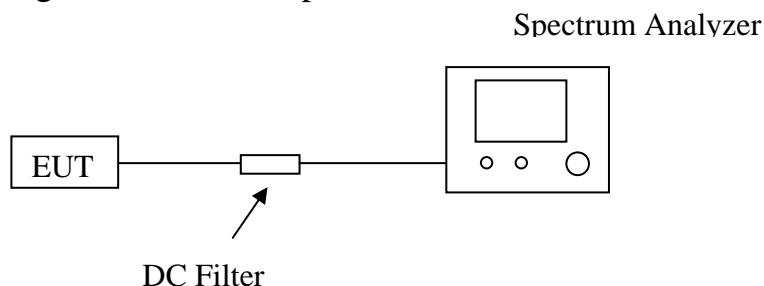
#### 8.1 Standard Applicable

According to §2.1051, the radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

#### 8.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2011-06	2012-06
3	DC Filter	MPE	23872C	N/A	2011-06	2012-06

#### 8.3 Block Diagram of Test Setup



#### 8.4 Test Procedure

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

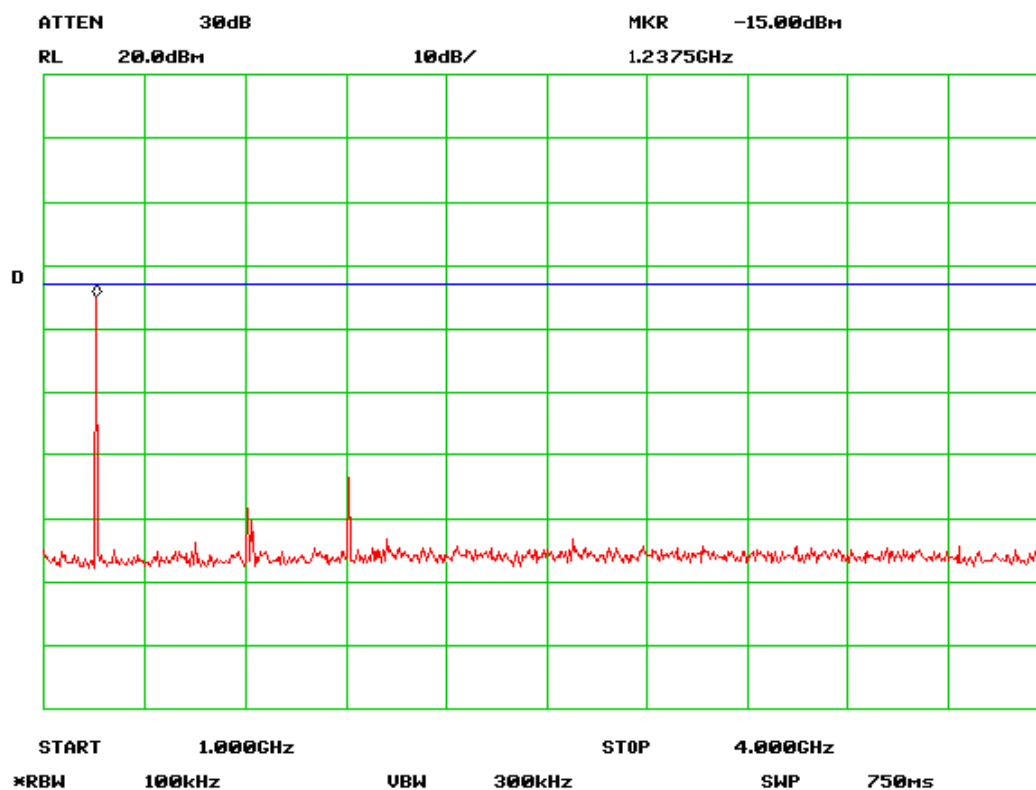
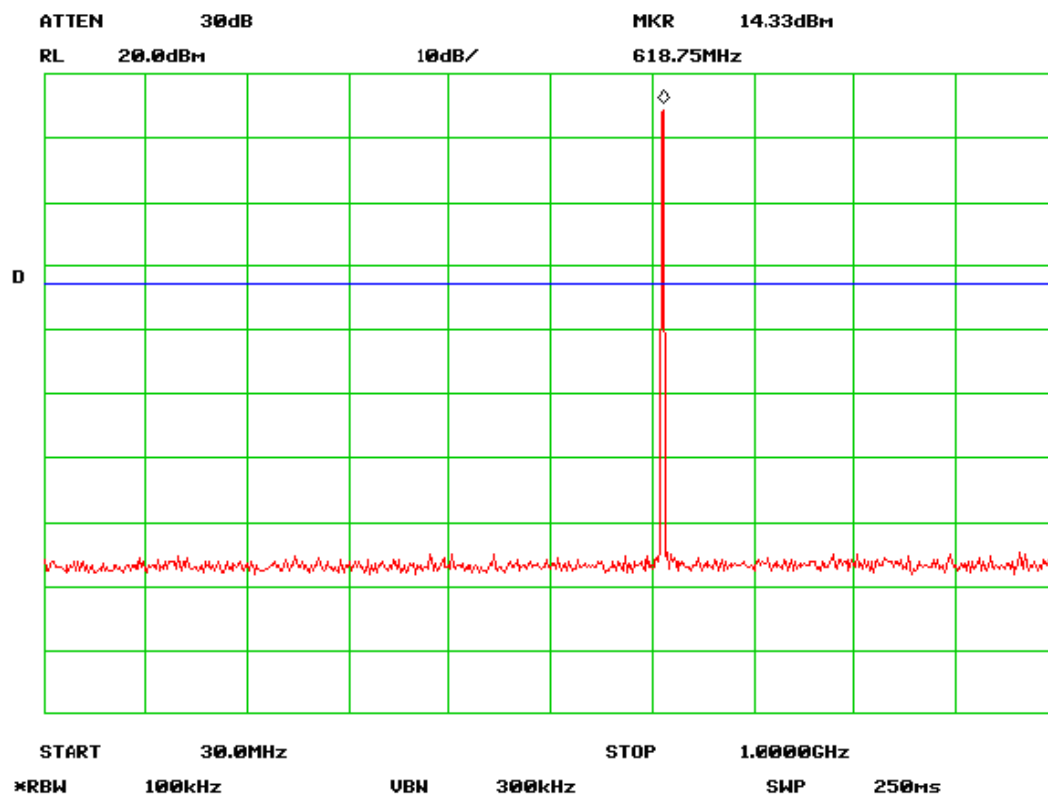
The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 300 KHz.

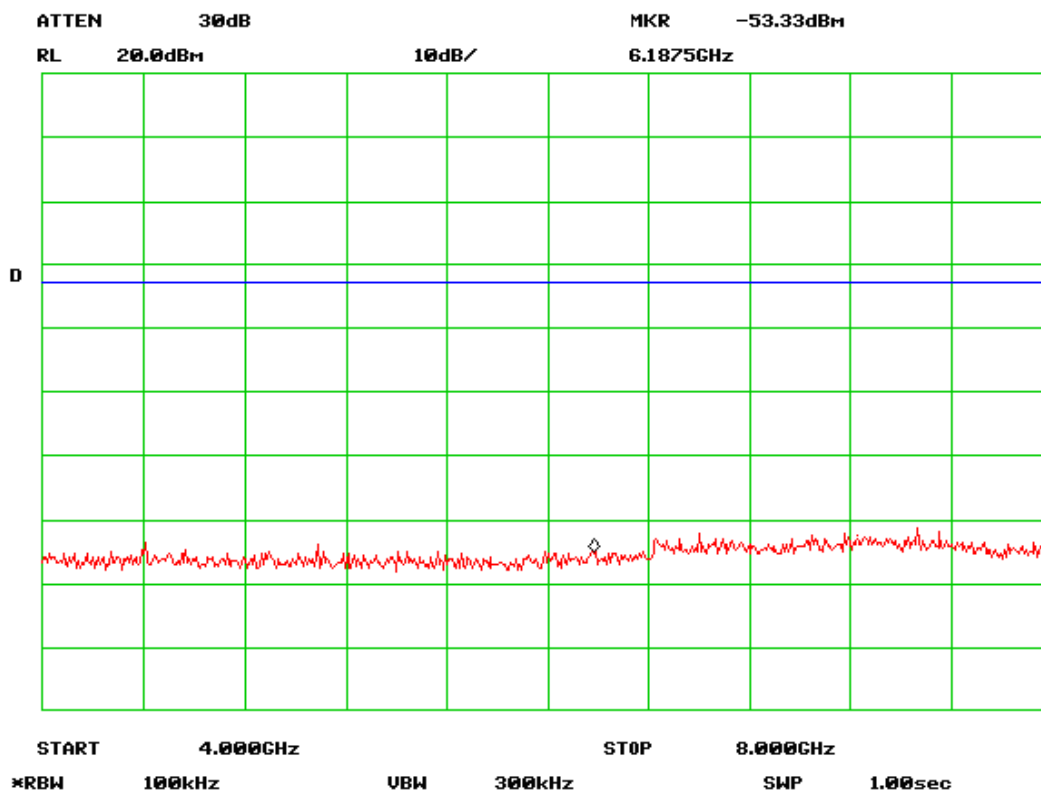
Measurements are made over the 30MHz to 8GHz range with the transmitter set to the lowest, middle, and highest channels.

#### 8.5 Test Results

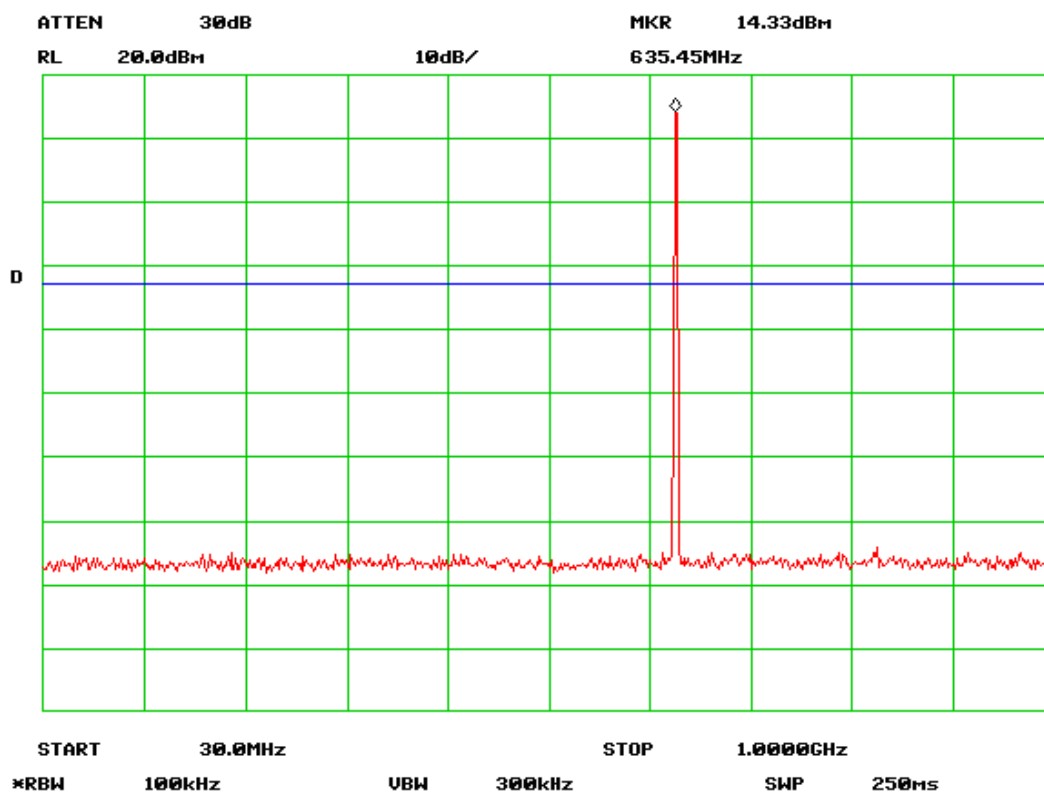
*No non-compliance noted*

*The test data graph please refer to the following page.*

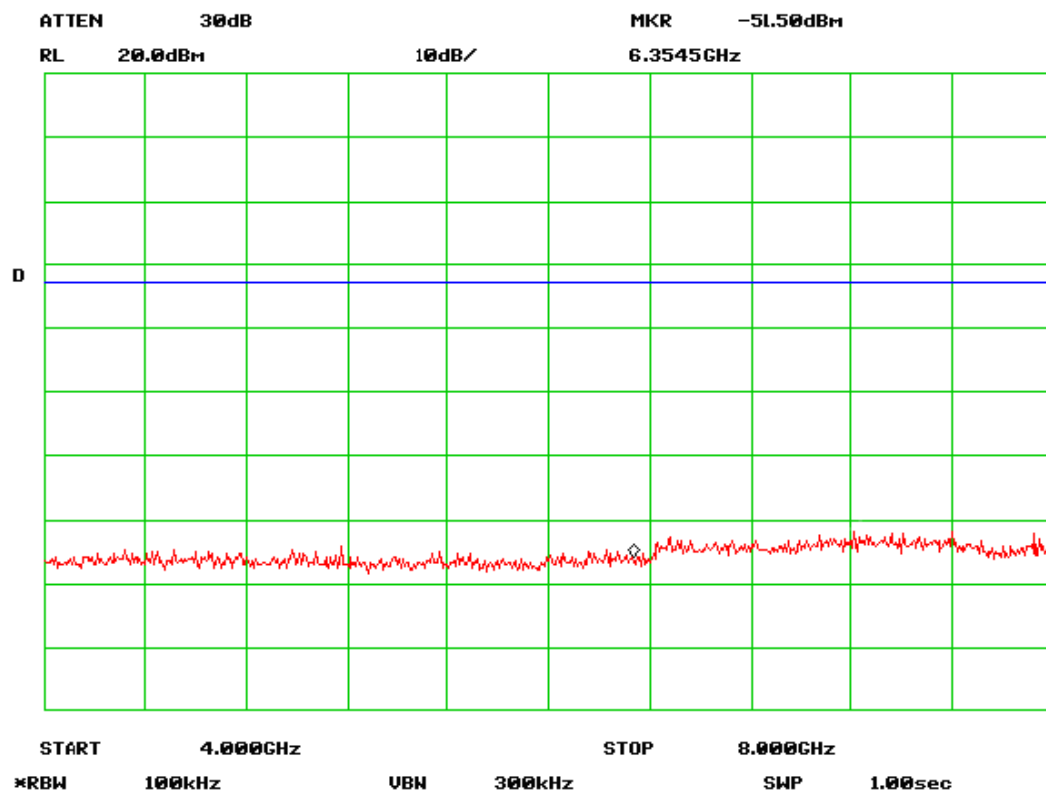
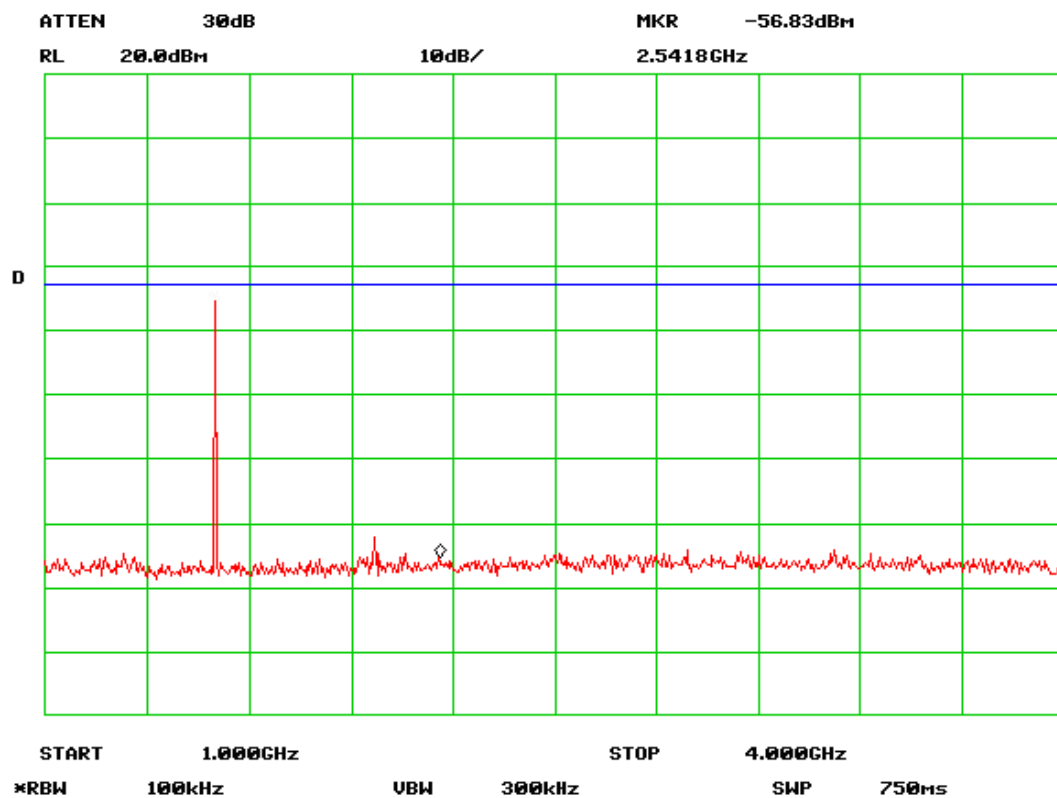
**CH Low**

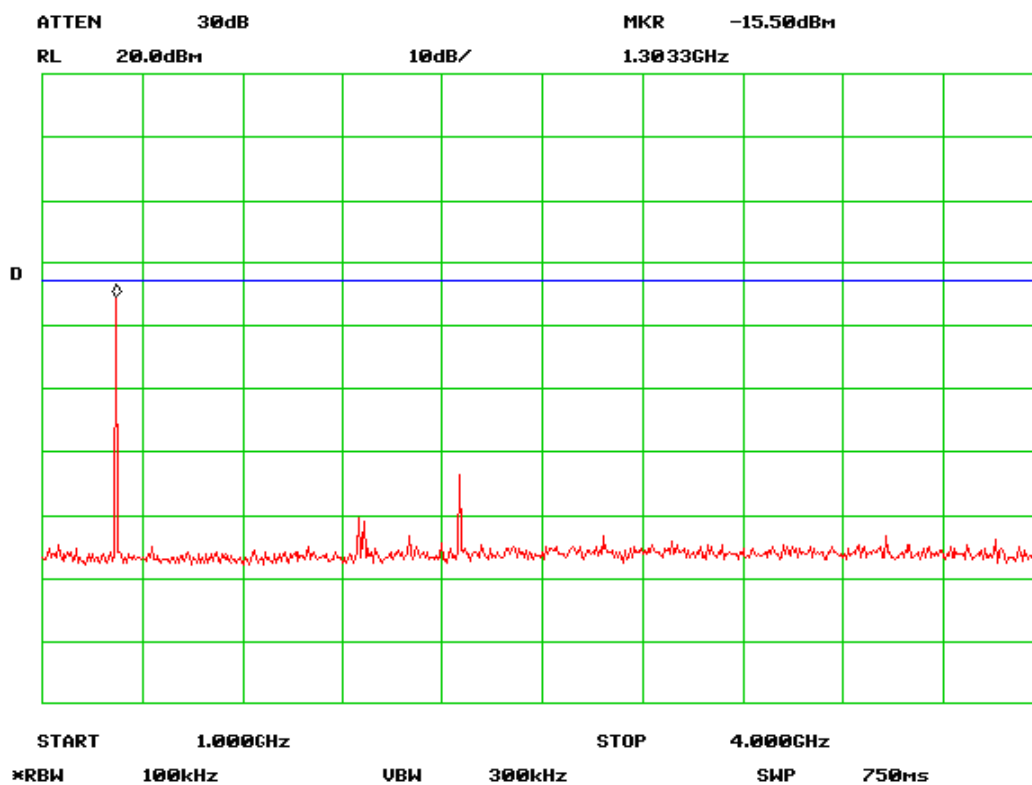
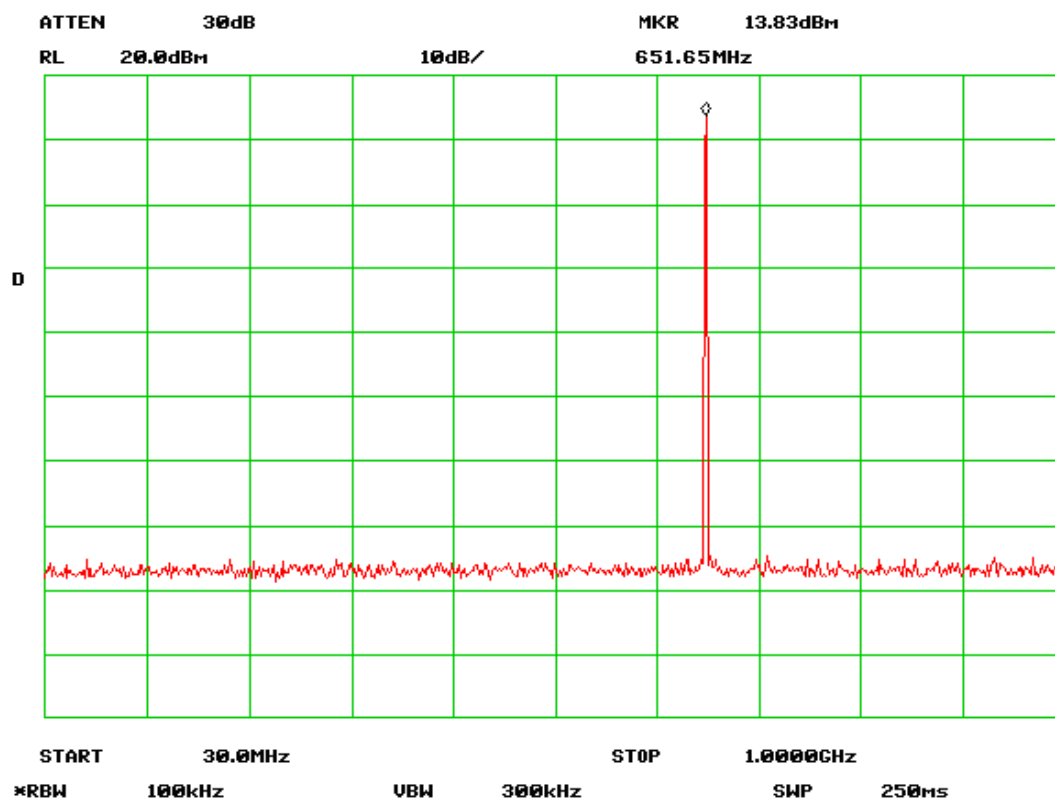


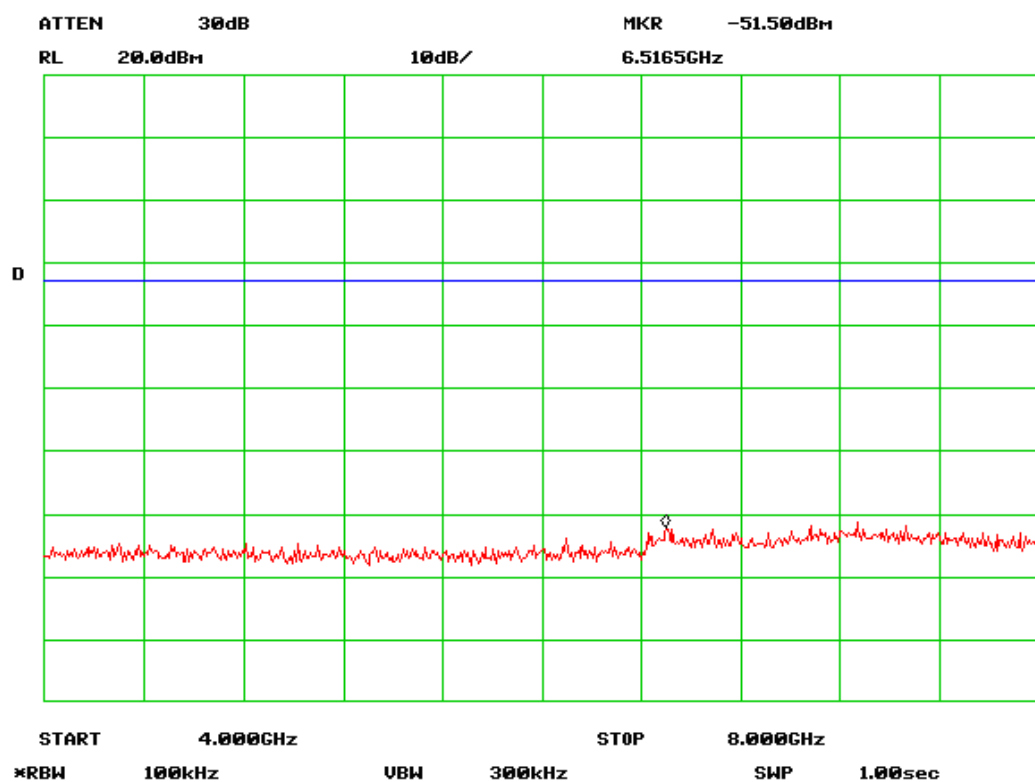
### CH Mid







**CH High**



## 9. §74.86(E)(4) - FREQUENCY STABILITY MEASUREMENT

### 9.1 Standard Applicable

According to FCC 2.1055(a)(1), the frequency stability shall be measure with variation of ambient temperature from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ , and according to FCC 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 FCC 74.861, the frequency tolerance of the transmitter shall be 0.005 percent.

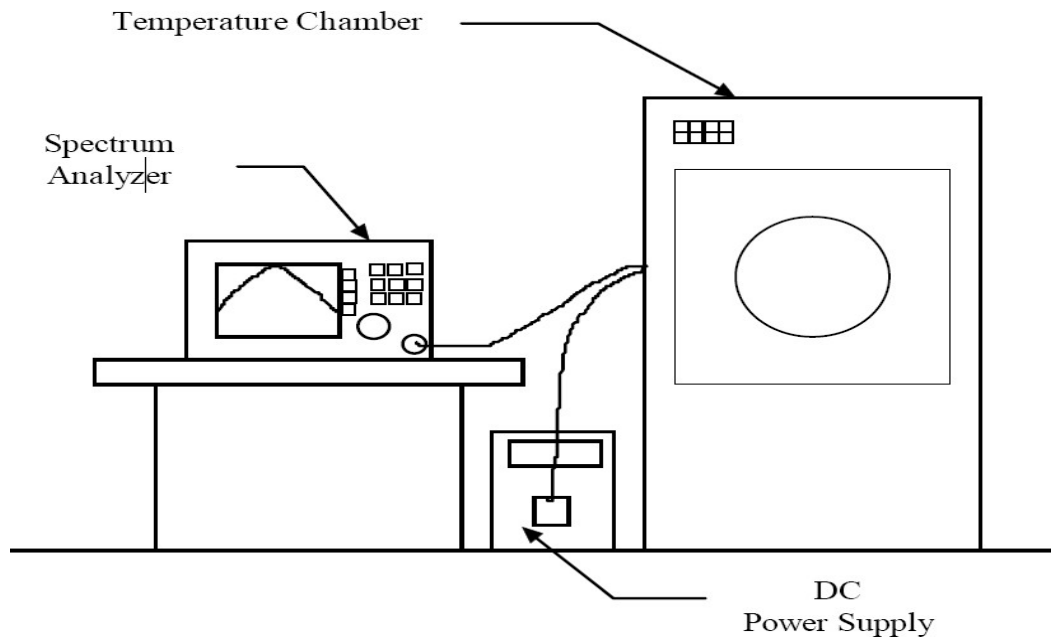
According to FCC74.861 (e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

1. 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.
2. 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.
3. on any frequency removed from the operating frequency by more than 250 percent up to and the authorized bandwidth shall be attenuated below the un-modulated carrier by at least 43 plus 10 Log (output power in watts)dB.

### 9.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2011-06
2	Temperature Chamber	MALLIER	MCT-2X-M	/	2011-06	2011-06

### 9.3 Block Diagram of Test Setup



## 9.4 Test Procedure

### 9.4.1 Frequency stability versus environmental temperature

9.4.1.1. Setup the configuration per figure 9.3 for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used.

9.4.1.2. Turn on EUT and set Spectrum Analyzer center frequency to the right frequency needs to be measured.

Then set Spectrum Analyzer RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

9.4.1.3 Set the temperature of chamber to 50°C. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

9.4.1.4 Repeat step 9.4.1.2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measurement frequencies.

### 9.4.2 Frequency stability versus input voltage

9.4.2.1 Frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 25°C shall be used. Install new batteries in the EUT.

9.4.2.2 Set Spectrum Analyzer center frequency to the right frequency needs to be measured. Then set Spectrum Analyzer RBW to 30 kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.

9.4.2.3 For non hand carried, battery operated device, supply the EUT primary voltage with 85 and 115 percent of the nominal value and record the frequency.

## 9.5 Test Results

**Operation Mode:** TX

**Test Date:** 12-29-2011

**Temperature:** 25°C

**Humidity:** 50 % RH

Test Frequency at low channel (618.75MHz) is worst case.

**Frequency stability versus environment temperature**

Reference Frequency: 618.75MHz, Limit: 0.005%							
Environment	Power	Frequency measured with time elapsed					
Temperature (°C )	Supply (V)	2 minute		5 minute		10minute	
		Freq (MHz)	Error %	Freq (MHz)	Error %	Freq (MHz)	Error %
50	3	618.75091	-0.00009	618.74094	-0.00006	618.75095	-0.00005
40	3	618.75091	-0.00009	618.74093	-0.00007	618.75094	-0.00006
30	3	618.75066	0.00066	618.75051	0.00051	618.75062	0.00062
20	3	618.75079	0.00079	618.75057	0.00057	618.75064	0.00064
10	3	618.75030	0.00030	618.75022	0.00022	618.75037	0.00037
0	3	618.75038	0.00038	618.75031	0.00031	618.75045	0.00045
-10	3	618.75006	0.00005	618.74993	-0.00007	618.75024	0.00024
-20	3	618.75033	0.00033	618.75021	0.00021	618.75038	0.00038
-30	3	618.75029	0.00029	618.75027	0.00017	618.75033	0.00033

**Frequency stability versus supplied voltage (85% - 115%).**

Reference Frequency: 618.75MHz, Limit: 0.005%							
Environment	Power	Frequency measured with time elapsed					
Supply	Temperature	2 minute		5 minute		10minute	
(V)	(°C)	Freq (MHz)	Error %	Freq (MHz)	Error %	Freq (MHz)	Error %
3.45	25	618.75091	-0.00009	618.74094	-0.00006	618.75095	-0.00005
3	25	618.75091	-0.00009	618.74093	-0.00007	618.75094	-0.00006
2.55	25	618.75066	0.00066	618.75051	0.00051	618.75062	0.00062

## 10. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

UT-200	UH-200	--
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Belong to the tested device:

Product description : Wireless Microphone Systems

Model name : UB-200

No additional models were tested.

----- END Of REPORT -----