Test Report

Product Name	Wireless Transmitter
Model No.	WM60
FCC ID	C5CWM60

Applicant	Phonic Corporation
Address	9F, No.59, Tung Hsing Rd., Taipei, Taiwan 110

Date of Receipt	Mar. 10, 2006
Issued Date	Nov. 13, 2006
Report No.	063L063FI

Test Report Certification

Issued Date: Nov. 13, 2006
Report No.: 063L063FI

Accredited by NIST (NVLAP)
NVLAP Lab Code: 200533-0

Product Name	Wireless Transmitter
Applicant	Phonic Corporation
Address	9F, No.59, Tung Hsing Rd., Taipei, Taiwan 110
Manufacturer	Phonic Corporation
Model No.	WM60
Working Voltage	External Adaptor, 12V DC
Trade Name	PHONIC
Applicable Standard	FCC CFR Title 47 Part 74 Subpart H, section 74.861
Test Result	Complied

NVLAP Lab Code: 200533-0

Test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

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Tested By : Tim Sung
(Tim Sung)

Approved By : George Chen
(George Chen)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless Transmitter
Trade Name	PHONIC
Model No.	WM60
Type	Single Channel Transmitter
FCC ID	C5CWM60
Frequency Range	614– 806 MHz
Channel Number	16
Type of Modulation	FM
Antenna Type	Integral
Bandwidth	24MHz

Note:

1. The EUT is a Wireless Transmitter
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 74 subpart H, section 74.861

1.2. Operational Description

The EUT is a Single Channel Wireless Transmitter with 16 selectable UHF channels preset. The device uses FM modulation for wireless transmission. The antenna is integrated with transmitter.

This wireless phone adopts the Microprocessor controlled PLL synthesized technology. It provides internal squelch and mute circuit mode that can resist unusual noise.

Test Mode	Mode 1: Transmitter

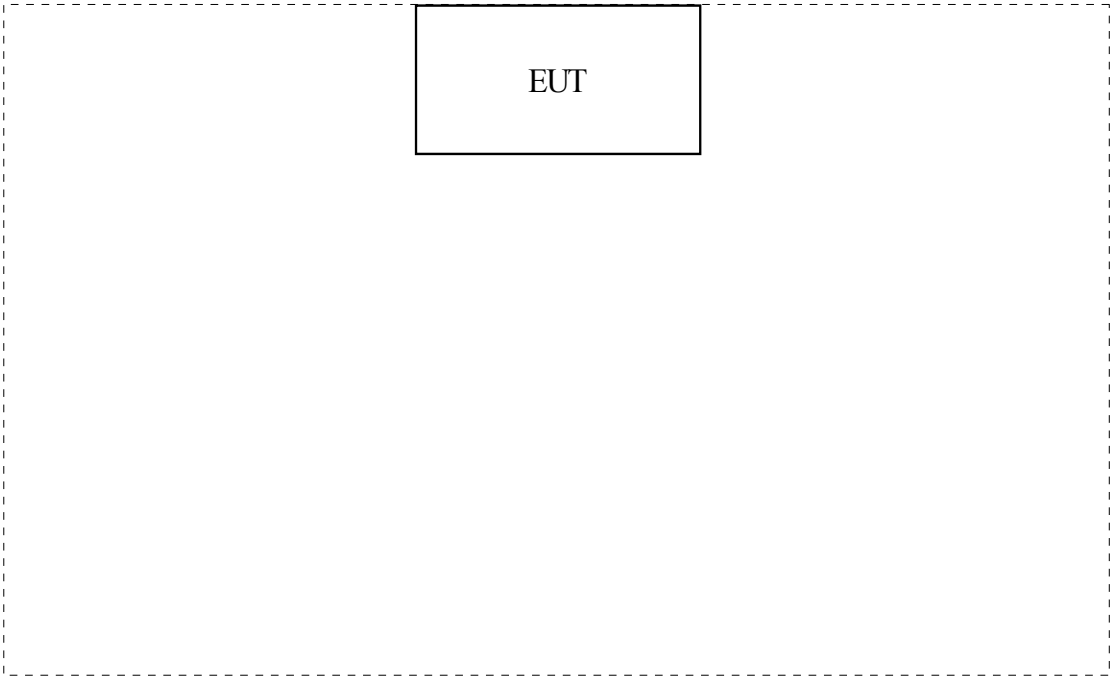
1.3. Tested System Datails

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A.	N/A	N/A

1.4. Configuration of Test System



1.5. EUT setup description

(1) Setup the EUT as shown in section 1.4

(2) Setup the test channel by controlling channel selector for testing.

(3) Verify that the EUT works correctly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

Accreditation on NVLAP
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation
Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

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2. Conducted Emission

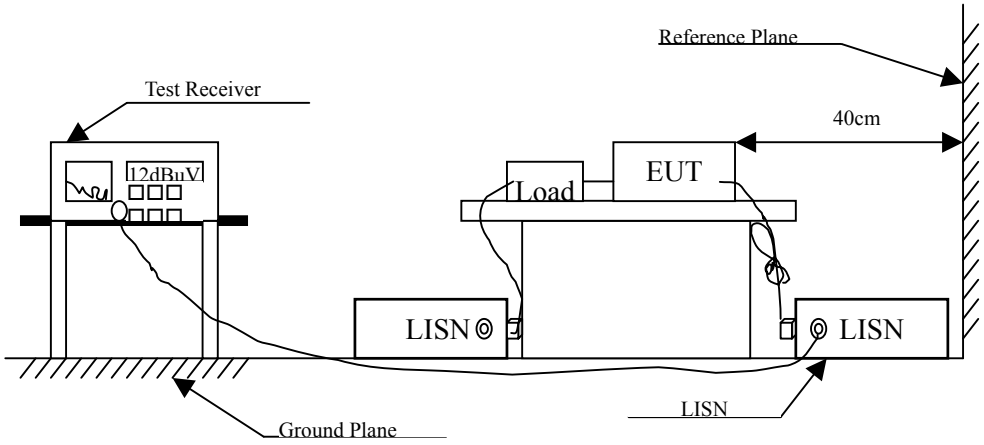
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2006	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2006	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2006	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2006	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : Wireless Transmitter
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmitter (614.175MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.162	0.492	38.480	38.972	-26.685	65.657
0.222	0.495	35.740	36.235	-27.708	63.943
0.372	0.300	29.520	29.820	-29.837	59.657
0.452	0.300	28.240	28.540	-28.831	57.371
0.542	0.300	27.020	27.320	-28.680	56.000
0.662	0.310	24.920	25.230	-30.770	56.000
Average					
0.162	0.492	14.830	15.322	-40.335	55.657
0.222	0.495	12.700	13.195	-40.748	53.943
0.372	0.300	14.190	14.490	-35.167	49.657
0.452	0.300	8.600	8.900	-38.471	47.371
0.542	0.300	12.830	13.130	-32.870	46.000
0.662	0.310	15.800	16.110	-29.890	46.000

Note:

1. All reading levels are quasi-peak and average value.
2. “ “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Wireless Transmitter
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 1: Transmitter (614.175MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.173	0.300	37.940	38.240	-27.103	65.343
0.243	0.300	35.120	35.420	-27.923	63.343
0.273	0.300	34.040	34.340	-28.146	62.486
0.313	0.300	32.440	32.740	-28.603	61.343
0.523	0.310	27.060	27.370	-28.630	56.000
0.643	0.310	24.800	25.110	-30.890	56.000
Average					
0.173	0.300	14.880	15.180	-40.163	55.343
0.243	0.300	13.910	14.210	-39.133	53.343
0.273	0.300	12.230	12.530	-39.956	52.486
0.313	0.300	15.280	15.580	-35.763	51.343
0.523	0.310	10.090	10.400	-35.600	46.000
0.643	0.310	9.730	10.040	-35.960	46.000

Note:

1. Channel frequency 614.175MHz is the worst case.
2. All reading levels are quasi-peak and average value.
3. " " means the worst emission level.
4. Measurement Level = Reading Level + Correct Factor

3. Carrier Output Power：FCC 2.1046 (a) ; 74.861 (e)(1)

The power of the measured unmodulated carrier power at output of the transmitter power amplifier (antenna input power) may not exceed the following:
50 mW： 54 – 72, 76 – 88 and 174 – 216 MHz band
250 mW：470 – 608 and 614 – 870 MHz band.

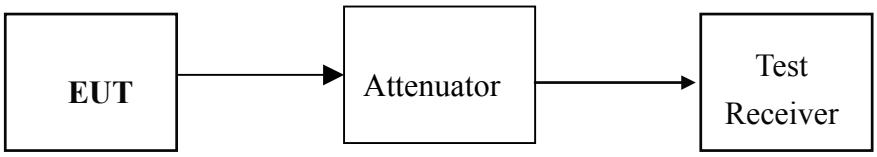
3.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No.	Last Cal.
X	Test receiver	R&S	ESI 26/838786/004	October, 2006

Note: 1. All equipments upon which needed to be calibrated are with calibration period of 1 year.
2. Mark “X” test instruments are used to measure the final test results.

3.2. Test setup



3.3. Test procedure

This transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a test receiver. Transmitter output power was measured with the test receiver in dBm. The power output at the transmitter antenna port was determined by assign the value of the attenuator to the test receiver reading.
Tests were performed with an unmodulated carrier at three frequencies (low , middle and high channels) and on all power levels , which can be set-up on the transmitters.

3.4. Limit

The maximum peak power shall be less 0.25Watt.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Carrier Output Power

Product : Wireless Transmitter
Test Item : Peak Power Output
Test Mode : Mode 1: Transmitter

Frequency (MHz)	Measurement	Required Limit	Result
614.175	17.24 dBm	0.25Watt	Pass

Frequency (MHz)	Measurement	Required Limit	Result
700.175	16.76 dBm	0.25Watt	Pass

Frequency (MHz)	Measurement	Required Limit	Result
804.800	14.26 dBm	0.25Watt	Pass

Note: The EUT has maximum peak power output at channel frequency 614.175MHz.

4. Conducted Spurious Emission：FCC 2.1051；74.861(e)(6)(iii)

Conducted spurious emissions are emissions at the antenna terminals on a frequency or frequencies that are outside a band sufficient to ensure transmission of information of required quality for the class of communication desired.

4.1. Test Equipment

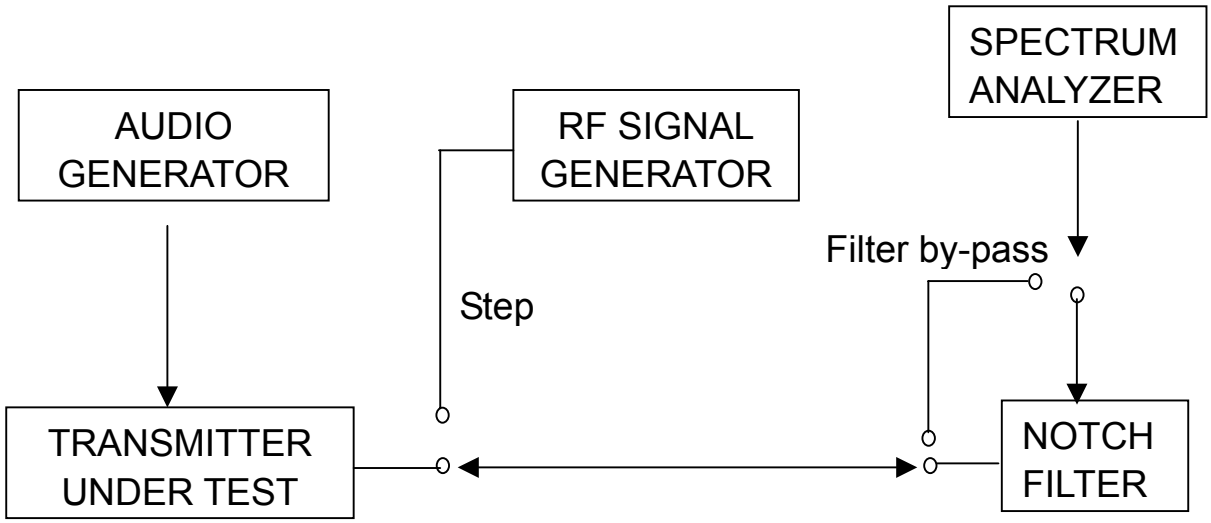
The following test equipments are used during the conducted spurious emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	Oct, 2006
X	Signal Generator	Anritsu	MG3962B/051202	May, 2006
X	Audio Analyzer	R&S	UPL/ 100104	Oct, 2006
X	Tunable bandeject filter	K&L Microwave Incorporated	D.C 0343/406	May, 2006

Note: 1. All instruments are calibrated every year.

2. The test instruments marked by “X” are used to measure the final test results.

4.2. Test setup



4.3. Test procedure

a) Connect the equipment as illustrated, with the notch filter by-passed.

b) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.

c) Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.

d) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

2) Video Bandwidth ≥ 3 times the resolution bandwidth.

3) Sweep Speed ≤2000 Hz per second.

4) Detector Mode = mean or average power.

e) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:

1) The lowest radio frequency generated in the equipment to the carrier frequency minus the test bandwidth 50KHz.

2) The carrier frequency plus the test bandwidth 50KHz to a frequency less than 2 times the carrier frequency.

f) Record the frequencies and levels of spurious emissions from step e).

g) Unkey the transmitter. Replace the transmitter under test with the signal generator and adjust the signal level to reproduce the frequencies and levels of every spurious emission recorded in step f).

Record the signal generator levels in dBm.

h) Insert the notch filter.

i) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

2) Video Bandwidth ≥3 times the resolution bandwidth.

3) Sweep Speed ≤2000 Hz per second.

4) Detector Mode = mean or average power.

j) Key the transmitter. Adjust the center frequency of the spectrum analyzerfor incremental coverage of the range from a frequency equal to 2 times the carrier frequency and to the tenth harmonic of the carrier frequency.

j) Key the transmitter. Adjust the center frequency of the spectrum analyzer for incremental overage of the range from a frequency equal to 2 times the carrier frequency and to the tenth harmonic of the carrier frequency.

k) Record the frequencies and levels of spurious emissions from step j).

l) Unkey the transmitter. Replace the transmitter under test with the signal generator and adjust the signal level to reproduce the frequencies and levels of every spurious emission recorded in step k). Record the signal generator levels in dBm.

m) The levels recorded in steps g) and l) are the absolute levels of conducted spurious emissions in dBm.

4.4. Limit

On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.

4.5. Uncertainty

± 1.27 dB

4.6. Test Result of Conducted Spurious Emission

Product : Wireless Transmitter
Test Item : Conducted Spurious Emission
Test Mode : Mode 1: Transmitter (Channel 614.175MHz)

Frequency	Measurement Level	Margin	Limit
MHz	dBm	dB	dBm
235	-47.12	34.12	-13
483	-49.53	36.53	-13
511	-49.55	36.55	-13
712	-40.12	27.12	-13
854	-42.88	29.88	-13
1124	-40.65	27.65	-13

Note:

1. The audio input level of 2500Hz sine wave to produce 50% of rated system deviation is 70mV and the input level 16 dB greater than that necessary to produce 50% of rated system deviation is 441mV.
2. Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

Product : Wireless Transmitter
Test Item : Conducted Spurious Emission
Test Mode : Mode 1: Transmitter (Channel 700.175MHz)

Frequency	Measurement Level	Margin	Limit
MHz	dBm	dB	dBm
267	-48.78	35.78	-13
429	-50.83	37.83	-13
612	-51.69	38.69	-13
778	-41.63	28.63	-13
882	-42.89	29.89	-13
1312	-42.61	29.61	-13

Note:

1. The audio input level of 2500Hz sine wave to produce 50% of rated system deviation is 73mV and the input level 16 dB greater than that necessary to produce 50% of rated system deviation is 460.5mV.
2. Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

Product : Wireless Transmitter
Test Item : Conducted Spurious Emission
Test Mode : Mode 1: Transmitter (Channel 804.8MHz)

Frequency	Measurement Level	Margin	Limit
MHz	dBm	dB	dBm
182	-50.12	37.12	-13
426	-51.11	38.11	-13
547	-52.93	39.93	-13
712	-42.35	29.35	-13
923	-43.11	30.11	-13
1237	-44.78	31.78	-13

Note:

1. The audio input level of 2500Hz sine wave to produce 50% of rated system deviation is 78mV and the input level 16 dB greater than that necessary to produce 50% of rated system deviation is 492mV.
2. Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

5. Radiated Emission：FCC 2.1053；74.861(e)(6)(iii)

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

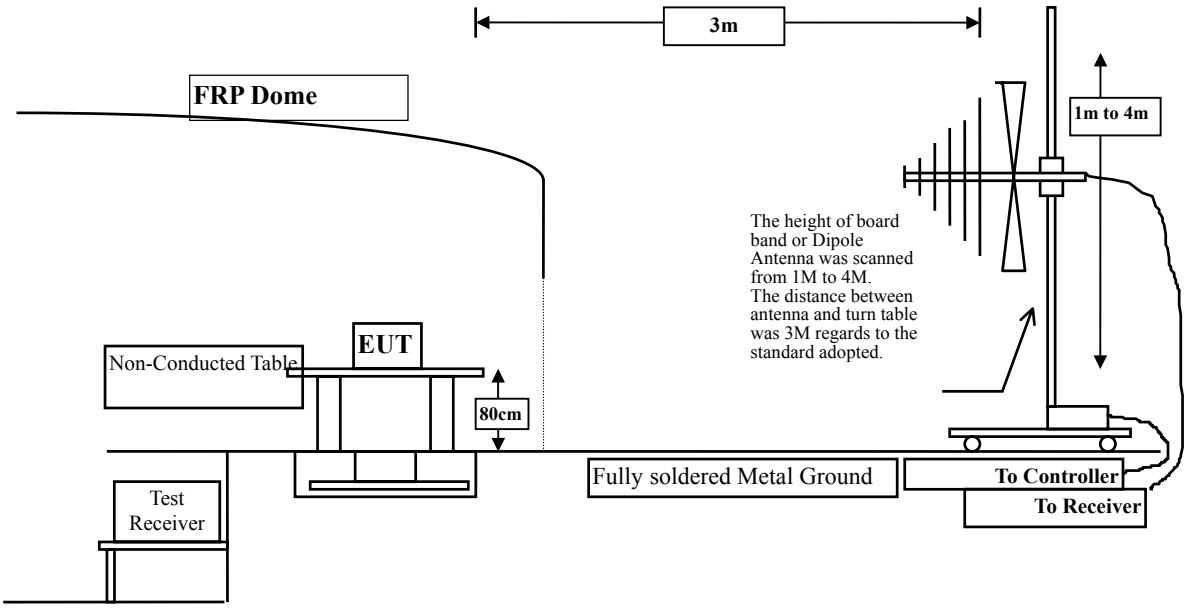
5.1. Test Equipment

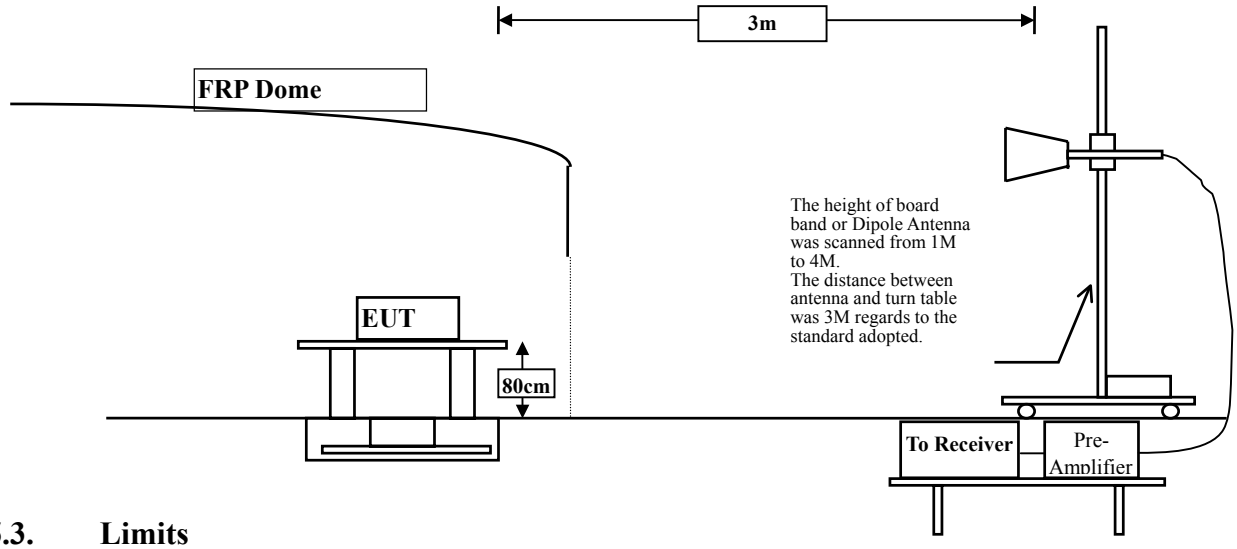
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1		Test Receiver	R & S	ESCS 30 / 825442/14	May, 2006
		Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2006
		Pre-Amplifier	HP	8447D/3307A01812	May, 2006
		Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2006
		Horn Antenna	EM	EM6917 / 103325	May, 2006
Site # 2		Test Receiver	R & S	ESCS 30 / 825442/17	May, 2006
		Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2006
		Pre-Amplifier	HP	8447D/3307A01814	May, 2006
		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2006
		Horn Antenna	EM	EM6917 / 103325	May, 2006
Site # 3	X	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2006
	X	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2006
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2006
	X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2006
	X	Horn Antenna	ETS	3115 / 0005-6160	July, 2006
	X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2006

Note: 1. All instruments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

5.2. Test Setup





5.3. Limits

On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.

5.4. Test Procedure

a) The EUT is placed on a turn table. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

b) Remove the transmitter and replace it with a substitution antenna.

c)Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained.

d) Repeat step c) with both antennas vertically polarized for each spurious frequency.

e) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps c) and d) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

f) The levels recorded in step e) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =10log10(TX power in watts/0.001) – the levels in step e)

5.5. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

5.6. Test Result of Radiated Emission

Product : Wireless Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (Channel 614.175MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBm	dBm	dB	dBm
Horizontal					
1228.225	-6.28	-36.39	-42.67	29.67	-13
1842.4	-8.91	-38.51	-47.42	34.42	-13
2456.575	-8.71	-43.4	-52.11	39.11	-13
3070.75	-9.48	-42.07	-51.55	38.55	-13
3684.925	-10.56	-45.62	-56.18	43.18	-13
4299.1	-10.49	-45.27	-55.76	42.76	-13
4913.275	-10.26	-40.57	-50.83	37.83	-13
5527.45	-10.59	-39.26	-49.85	36.85	-13
6141.625	-10.18	-39.98	-50.16	37.16	-13
Vertical					
1228.225	-6.28	-41.03	-47.31	34.31	-13
1842.4	-8.91	-44.64	-53.55	40.55	-13
2456.575	-8.71	-39.88	-48.59	35.59	-13
3070.75	-9.48	-36.78	-46.26	33.26	-13
3684.925	-10.56	-43.89	-54.45	41.45	-13
4299.1	-10.49	-42.26	-52.75	39.75	-13
4913.275	-10.26	-38.66	-48.92	35.92	-13
5527.45	-10.59	-37.91	-48.5	35.5	-13
6141.625	-10.18	-36.23	-46.41	33.41	-13

Note:

1. Channel frequency 614.175MHz is the worst case.
2. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
3. " " means this data is the worst emission level.
4. Measurement Level = Reading Level + Correct Factor
5. 43+10 log (P)=Measurement Level = Reading Level + Correct Factor

Product : Wireless Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (Channel 700.175MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBm	dBm	dB	dBm
Horizontal					
1400.45	-8.07	-35.19	-43.26	30.26	-13
2100.15	-8.55	-37.21	-45.76	32.76	-13
2800.35	-10.21	-44.29	-54.5	41.5	-13
3500.25	-10.4	-45.33	-55.73	42.73	-13
4201.6	-10.27	-49.14	-59.41	46.41	-13
4901.25	-10.56	-44.19	-54.75	41.75	-13
5601.15	-9.53	-43.51	-53.04	40.04	-13
6301.45	-8.16	-40.56	-48.72	35.72	-13
7001.35	-8.21	-43.61	-51.82	38.82	-13
Vertical					
1400.45	-8.07	-40.45	-48.52	35.52	-13
2100.15	-8.55	-43.58	-52.13	39.13	-13
2800.35	-10.21	-40.19	-50.4	37.4	-13
3500.25	-10.4	-34.59	-44.99	31.99	-13
4201.6	-10.27	-40.71	-50.98	37.98	-13
4901.25	-10.56	-44.29	-54.85	41.85	-13
5601.15	-9.53	-39.67	-49.2	36.2	-13
6301.45	-8.16	-36.99	-45.15	32.15	-13
7001.35	-8.21	-34.27	-42.48	29.48	-13

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " " means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. 43+10 log (P)=Measurement Level = Reading Level + Correct Factor

Product : Wireless Transmitter
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (Channel 804.8MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBm	dBm	dB	dBm
Horizontal					
1609.25	-8.07	-38.23	-46.3	33.3	-13
2414.55	-8.55	-40.25	-48.8	35.8	-13
3219.15	-10.21	-43.14	-53.35	40.35	-13
4023.65	-10.4	-42.53	-52.93	39.93	-13
4828.55	-10.27	-44.79	-55.06	42.06	-13
5633.47	-10.56	-45.12	-55.68	42.68	-13
6438.35	-9.53	-43.65	-53.18	40.18	-13
7243.15	-8.16	-44.12	-52.28	39.28	-13
8047.75	-8.21	-44.56	-52.77	39.77	-13
Vertical					
1609.25	-8.07	-40.15	-48.22	35.22	-13
2414.55	-8.55	-46.55	-55.1	42.1	-13
3219.15	-10.21	-40.12	-50.33	37.33	-13
4023.65	-10.4	-37.52	-47.92	34.92	-13
4828.55	-10.27	-43.29	-53.56	40.56	-13
5633.47	-10.56	-42.54	-53.1	40.1	-13
6438.35	-9.53	-38.66	-48.19	35.19	-13
7243.15	-8.16	-35.34	-43.5	30.5	-13
8047.75	-8.21	-39.11	-47.32	34.32	-13

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " " means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. 43+10 log (P)=Measurement Level = Reading Level + Correct Factor

6. Emission Masks(Occupied Bandwidth)：FCC 2.1049 (c) ;74.861(e)(6)(i)(ii)

6.1. Test Equipment

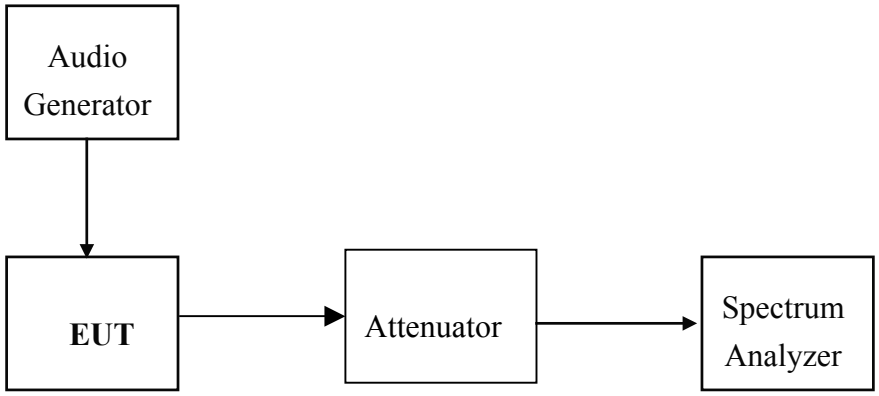
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Agilent	E4407B / US39440758	Oct, 2006
X	Modulation Analyzer	HP	8901A /2751A04974	Oct, 2006
X	Audio Analyzer	R&S	UPL/ 100104	Oct, 2006

Note: 1. All equipments upon which need to be calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

6.2. Test Procedure

Set the center frequency of the spectrum analyzer to the assigned transmitter frequency.
Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line. This is the 0 dB reference for the measurement.
Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation.
The input level shall be established at the frequency of maximum response of the audio modulating circuit.
The audio signal generator was adjusted to the frequency of 2.5kHz, 10kHz and 18kHz.



6.3. Limit

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;
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;

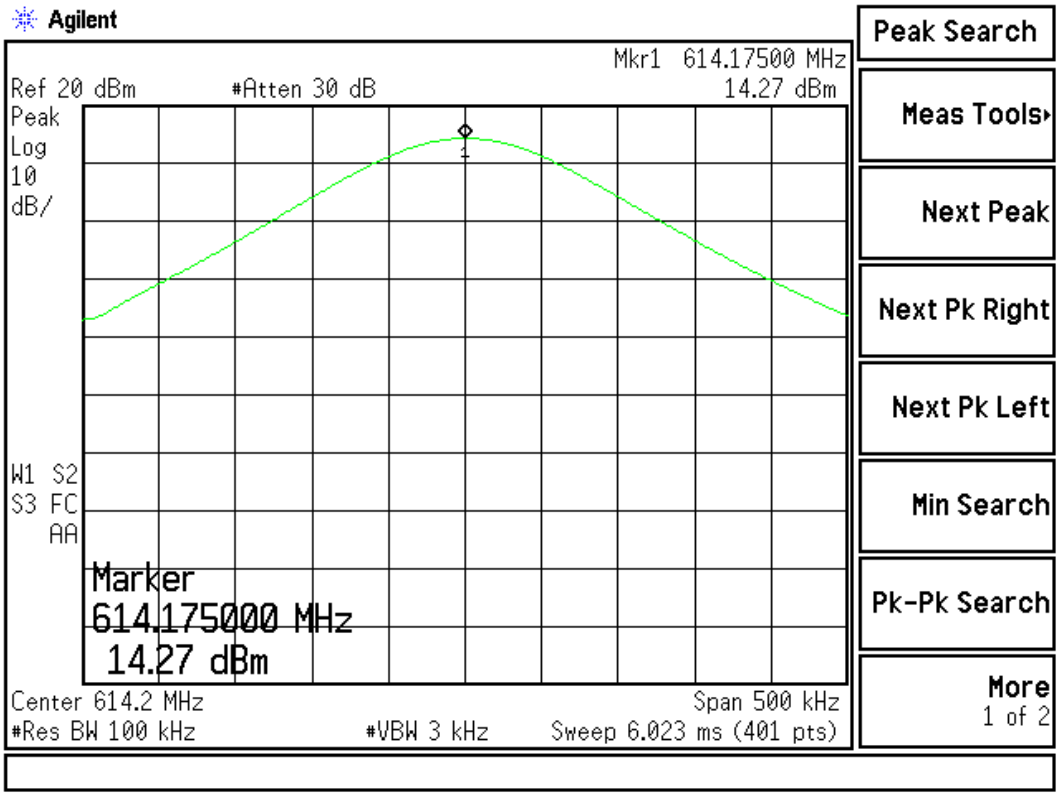
6.4. Uncertainty

± 1.27 dB

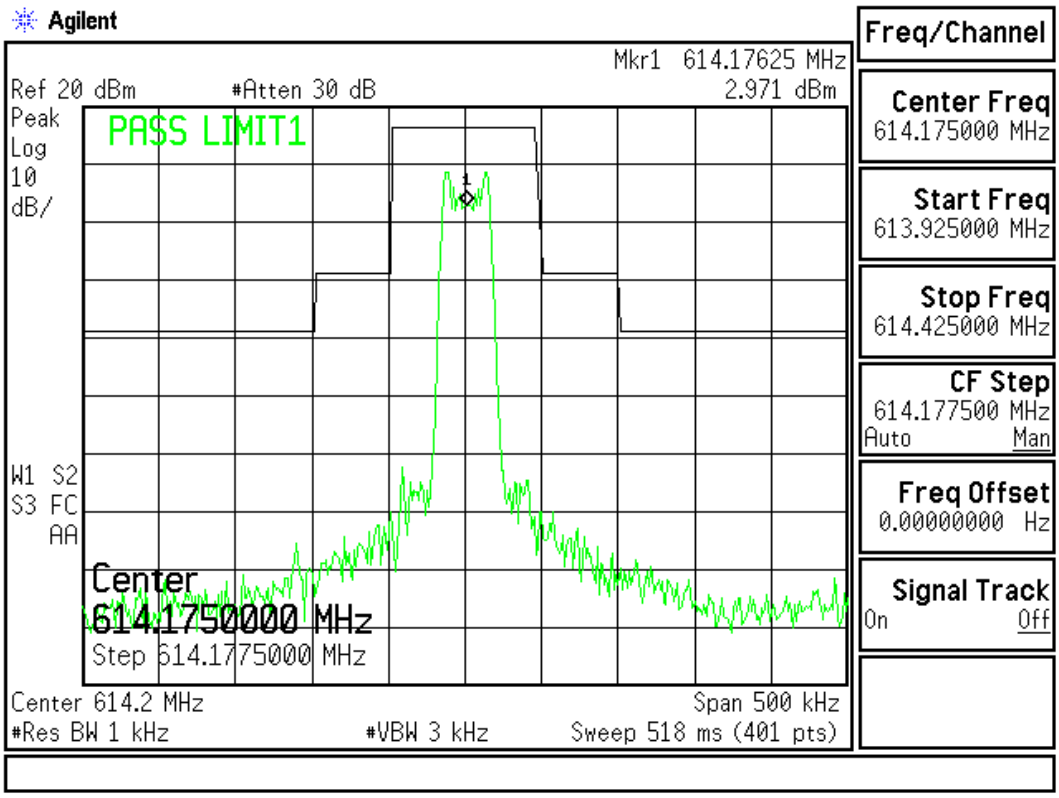
6.5. Test Result of Emission Masks(Occupied Bandwidth)

Product : Wireless Transmitter
Test Item : Occupied Bandwidth
Test Mode : Mode 1: Transmitter

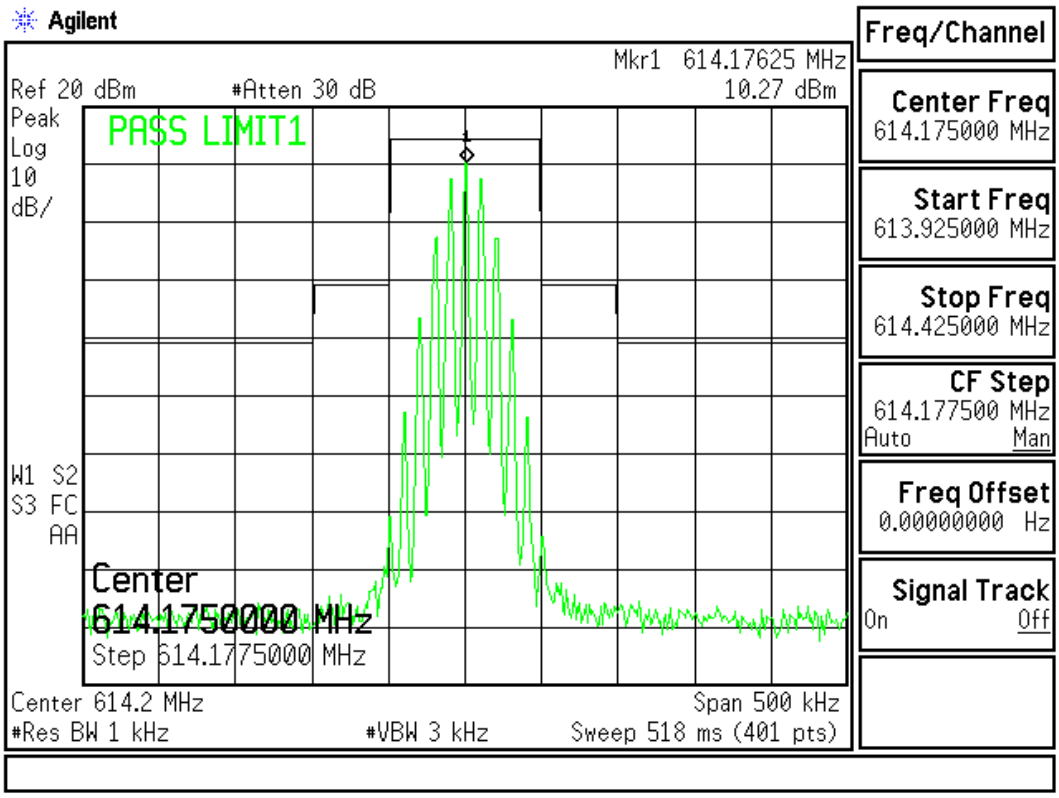
Unmodulated Carrier Frequency:



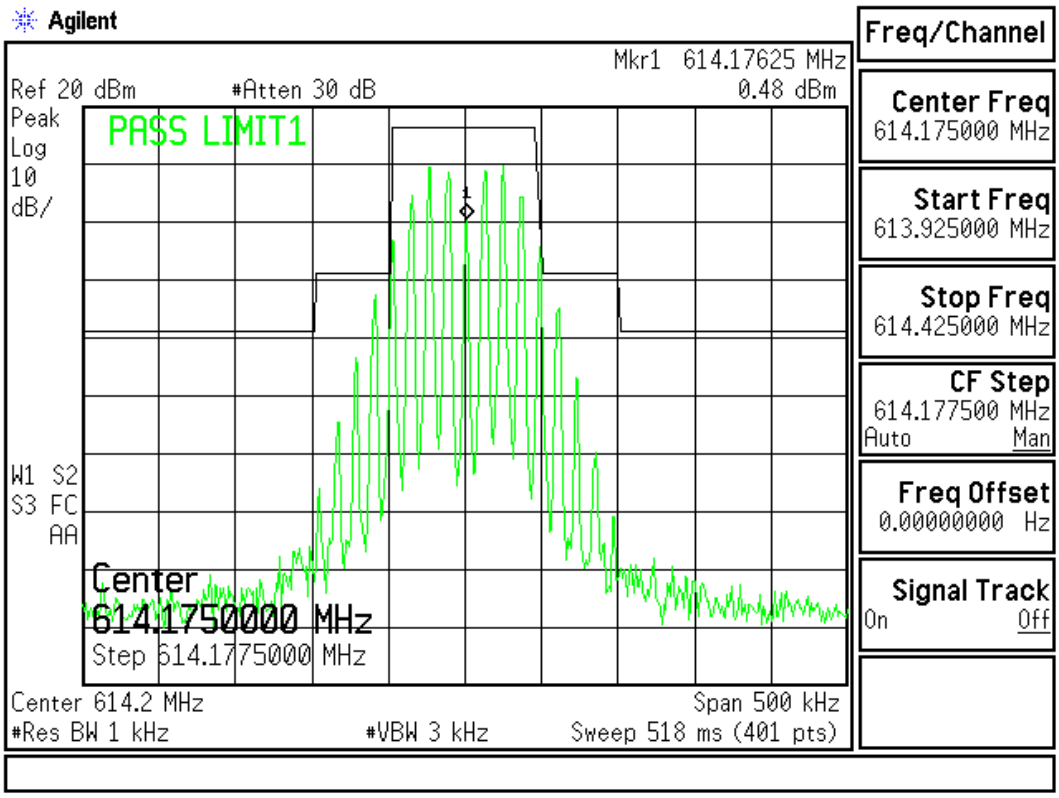
Audio Input Frequency: 2.5KHz



Audio Input Frequency: 10KHz



Audio Input Frequency: 18KHz



Note:

1 The test audio input level for this EUT is 280mV, which is the saturation input level of the wireless microphone transmitter

2 For spectrum mask measuremnt, we only show the data of the worst case, which is in channel 614.175MHz.

3 The occupied bandwidth's is calculated according to the well known Carson's FM bandwidth rule as follows:

Occupied Bandwidth (Bn) Bn = 2M + 2D

M = Maximum. Modulation Frequency = 18 kHz

D = Peak Frequency Deviation = 40 kHz (Please see plot on section 8.4)

Bn =(18KHz + 40KHz) x 2= 116 kHz

7. Frequency Stability vs. Temperature：FCC 2.1055 , 74.861 (e)

7.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Modulation Analyzer	HP	8901A /2751A04974	May, 2006

Note: 1. All equipments upon which need to be calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

7.2. Test Procedure

The equipment under test was placed in a temperature chamber and connected as for "Frequency Stability vs. Temperature Variation" test.

After the temperature stabilized the frequency output was recorded from the HP 8901A modulation analyzer.

7.3. Frequency tolerance of the transmitter limit : ±0.005%

7.4. Test Result of Frequency Stability vs. Temperature

614.175MHz

Temperature °C	-30	-20	-10	0	10	25	35	45	55
Frequency Error (kHz)	23.1	12.8	7.9	2.8	3.6	4.9	10.2	14.7	22.3

700.175MHz

Temperature °C	-30	-20	-10	0	10	25	35	45	55
Frequency Error (kHz)	19.9	16.6	6.8	4.7	4.8	6.3	7.9	13.9	21.9

804.800MHz

Temperature °C	-30	-20	-10	0	10	25	35	45	55
Frequency Error (kHz)	23.7	19.3	8.5	6.1	7.1	6.4	10.5	22.5	24.1

8. Frequency Stability vs. Voltage：FCC 2.1055 (d) ; 74.861 (e)

8.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Modulation Analyzer	HP	8901A /2751A04974	May, 2006

Note: 1. All equipments upon which need to be calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

8.2. Test Procedure

The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
The output frequency was recorded for each varied voltage.

8.3. Frequency tolerance of the transmitter limit : ±0.005%

8.4. Test Result of Frequency Stability vs. Voltage

614.175 MHz

Voltage (V)	93.5	110	126.5
Measured Frequency (KHz)	9.1	3.7	12.1

700.175 MHz

Voltage (V)	93.5	110	126.5
Measured Frequency (KHz)	10.2	4.6	12.5

804.800 MHz

Voltage (V)	93.5	110	126.5
Measured Frequency (KHz)	14.1	5.1	14.8

9. Moduation Limiting：FCC 2.1047 (b) ; 74.861(e)

Modulation limiting is the transmitter circuit's ability to limit the transmitter from producing deviations in excess of rated system deviation.

9.1. Test Equipment

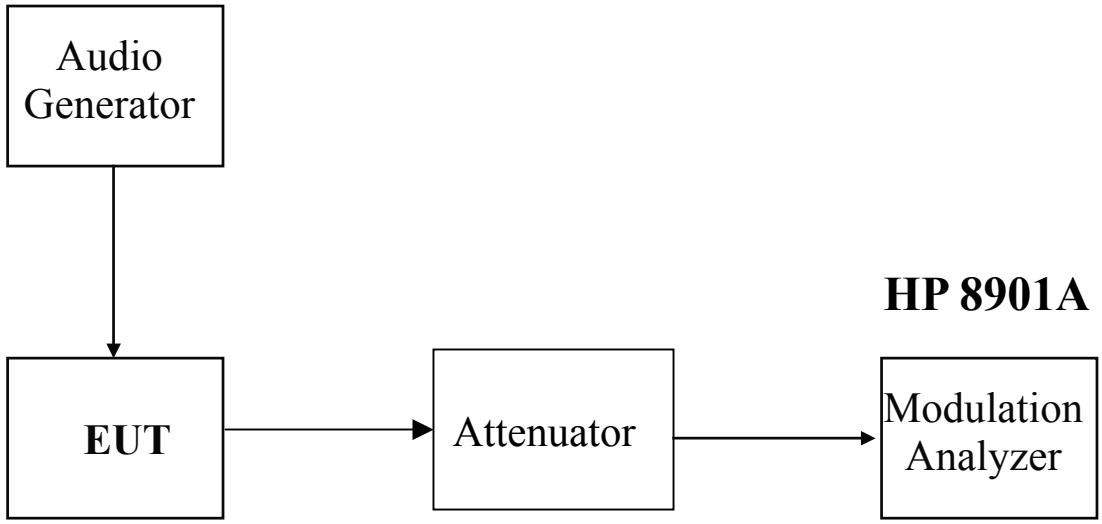
The following test equipments are used during the modulation limiting tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Modulation Analyzer	HP	8901A/1205A01034	Oct, 2006
X Audio Analyzer	R&S	UPL/ 100104	Oct, 2006

Note: 1. All equipments upon which need to be calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

9.2. Test Procedure

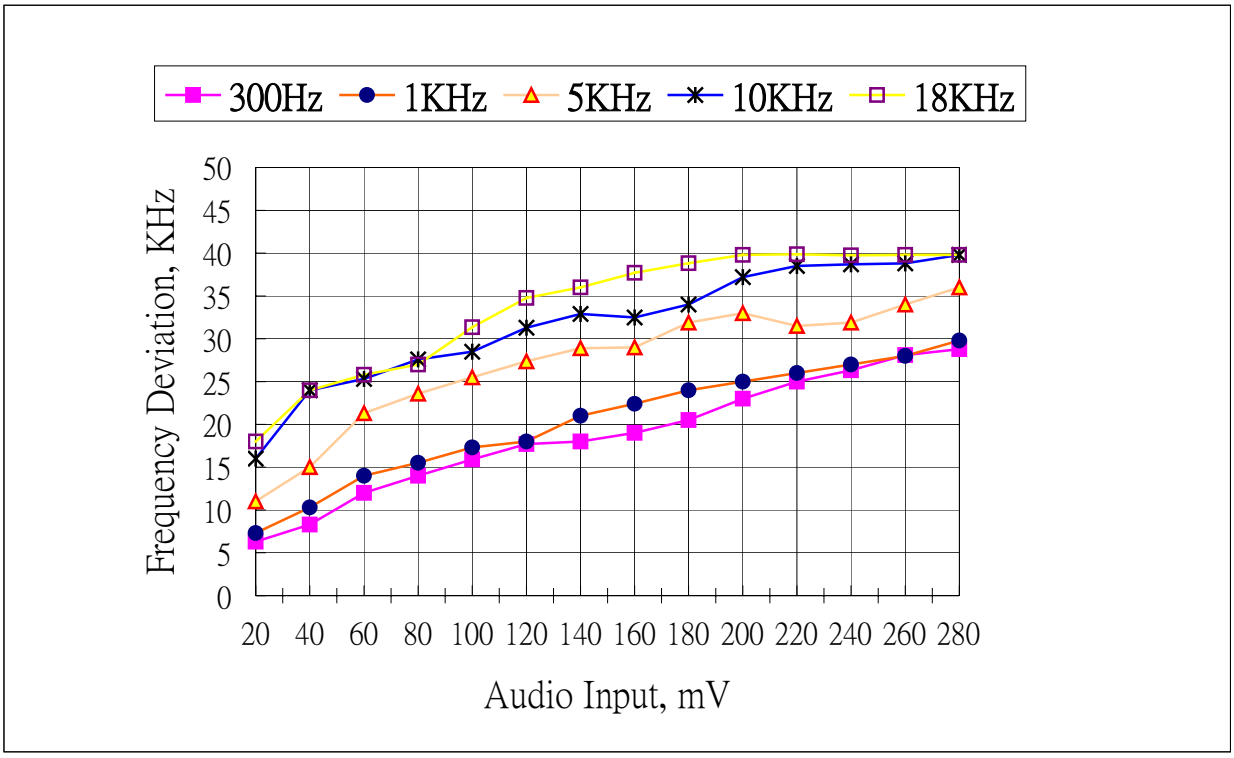
a) Audio generator was connected to the Transmitter of EUT, via an artificial mouth simulator.
b) Set the Modulation Analyzer to measure peak positive deviation.
c) The modulation response was measured for each of following frequencies: 1kHz, 5kHz, 10kHz and 18kHz.
d) Apply a 1000 Hz modulating signal to the transmitter from the audio generator, and adjust the level varied from from 30% modulation to at least 20dB higher than the saturation point.
e) Increase the level from the audio generator by 20 dB in one step
f) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.
g) With the level from the audio generator held constant at the level obtained in step e), slowly vary the audio frequency from 1KHz to 18KHz and observe the steady-state deviation. Record the maximum deviation.
h) Set the modulation analyzer to measure peak negative deviation and repeat steps d) through g).



9.3. Limits : ± 75 kHz

9.4. Test Results of Modulation limiting

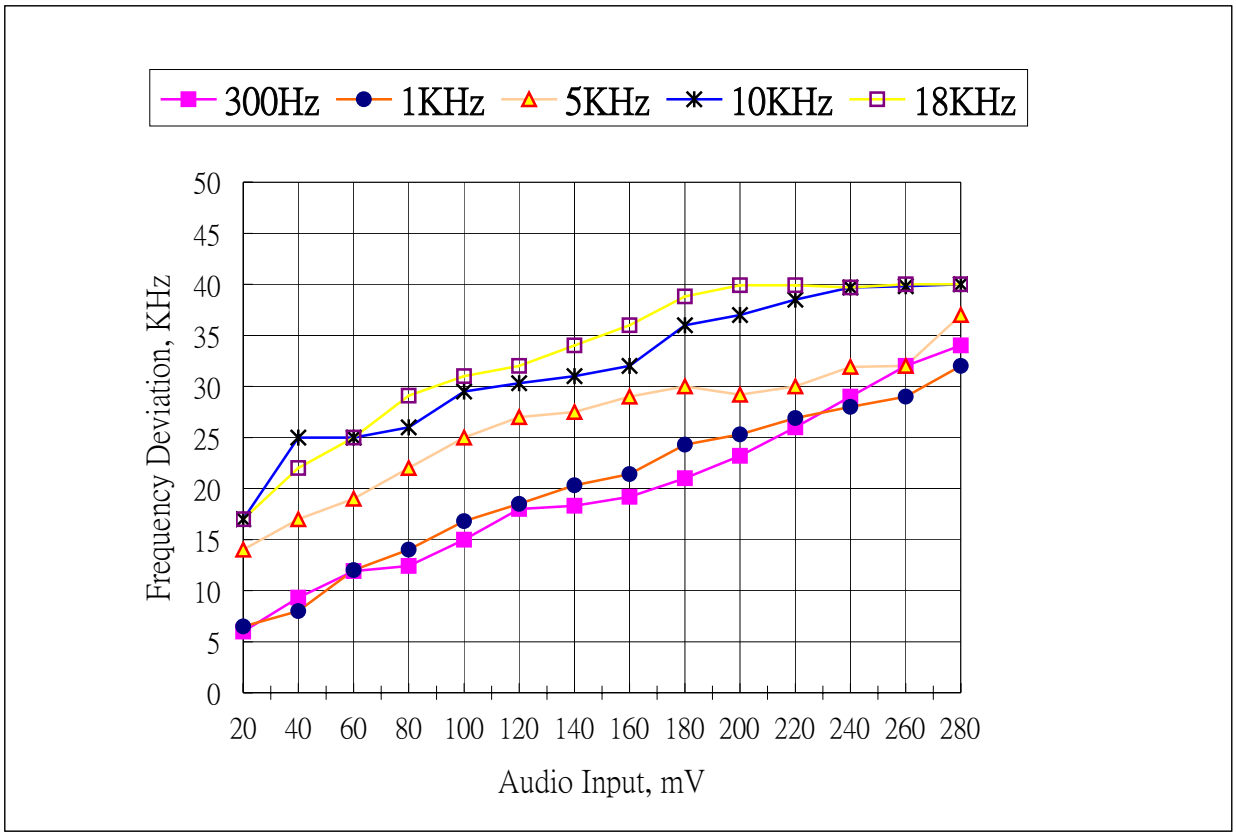
Positive Peaks：



Note:

1. The test audio input level for this EUT is 280mV, which is the saturation input level of the wireless microphone transmitter.
2 The maximum peak frequency deviation is 40KHz.

Negative Peaks：



Note:

1 The test audio input level for this EUT is 280mV, which is the saturation input level of the wireless

2. For modulating limiting test, we only show the data of the worst case, which is in channel 614.175MHz.

10. Audio Frequency Response：FCC 2.1047 (a)

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.

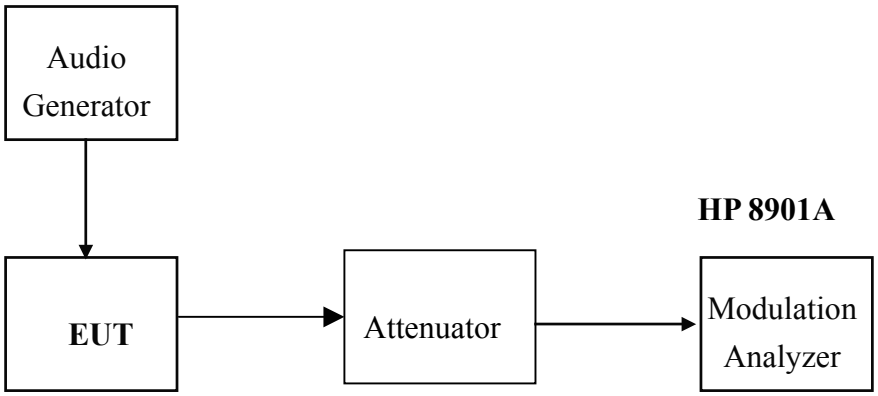
10.1. Test Equipment

The following test equipments are used during the modulation limiting tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Modulation Analyzer	HP	8901A/1205A01034	Oct, 2006
X Audio Analyzer	R&S	UPL/ 100104	Oct, 2006

Note: 1. All equipments upon which need to be calibrated are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

10.2. Test Setup



10.3. Test Procedure

a) Connect the equipment as belows.
b) Set the modulation analyzer to measure peak positive deviation. Set the audio bandwidth for ≤50 Hz to ≥15,000 Hz. Turn the de-emphasis function off.
c) Adjust the transmitter for full rated system deviation.
d) Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
e) Set the modulation analyzer to measure rms deviation and record the deviation reading as DEV_{ref}.

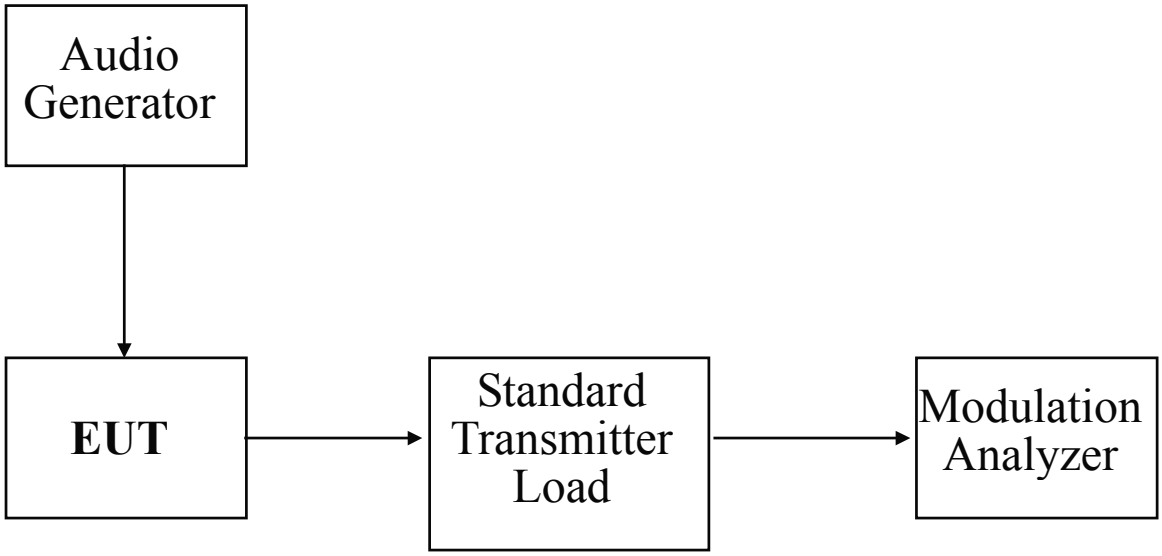
f) Set the audio generator to the desired test frequency between 50 Hz and 15000 Hz.

g) Record the modulation analyzer deviation reading as DEV_{Freq}.

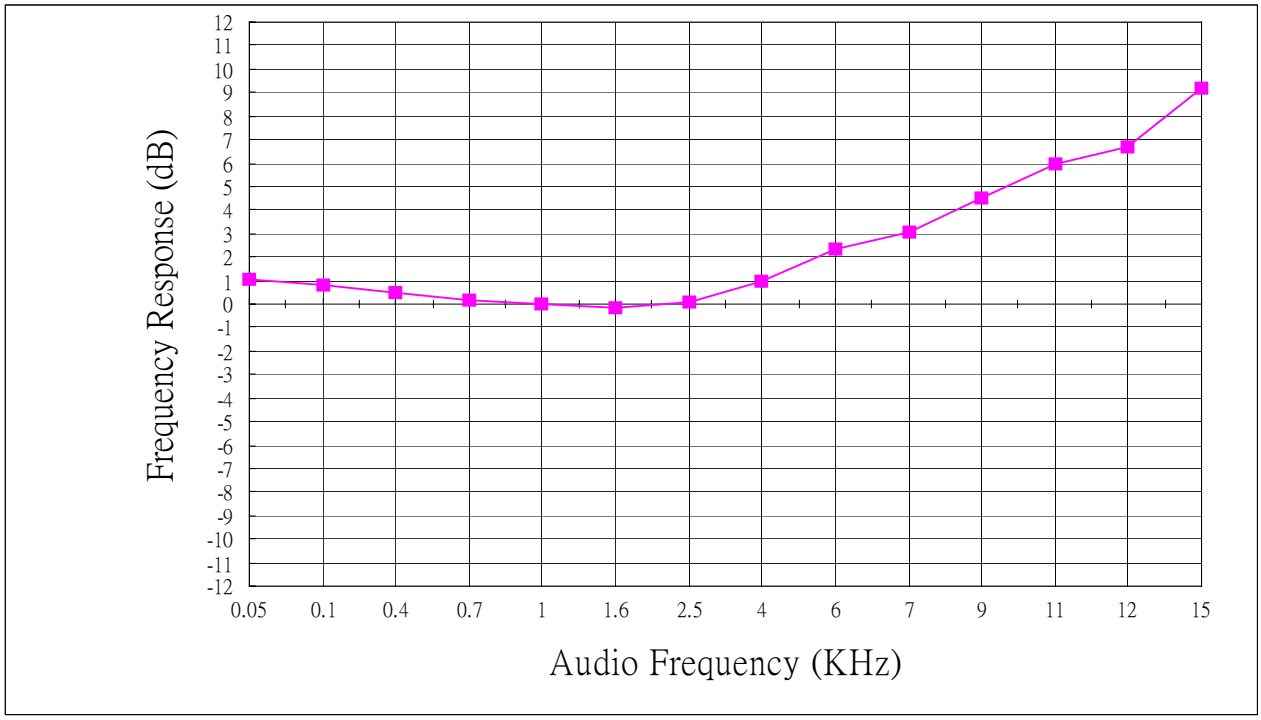
h) Calculate the audio frequency response at the present frequency as:

Audio Frequency Response = 20 log [DEV_{Freq} / DEV_{ref}].

10.4.



10.5. Test Results of Audio Frequency Response



11. EMI Reduction Method During Compliance Testing

No modification was made during testing.