TEST REPORT

Report No.:	**EM201300965**	**Application No.:**	**ZJ00036309**
Client:	Ningbo Soundking Electronics and Sound Co.,LTD		
Address:	Chengxin Road 818#, Yinzhou Investment Industry Park, Ningbo China		
Sample Description:	Wireless Microphone		
Model:	EW001		
Adding Model:	/		
FCC ID	2ABYOEW001		
Test Specification:	FCC PART 74H:2010		
Test Date:	2013-12-06 to 2014-03-10		
Issue Date:	2014-03-10		
Test Result:	*Pass.*		

Prepared By:	**Reviewed By:**	**Approved By:**
Lynn Xiao / Test Engineer	Jane Cao / Test Engineer	Gavin Wu / Manager
Date:2014-03-10	Date:2014-03-10	Date:2014-03-10

Other Aspects:

/

Abbreviations: *ok / P = passed; fail / F = failed; n.a. / N = not applicable*

The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.

DIRECTIONS OF TEST

1. This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.

2. 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.

3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.

Table of Contents

1. TEST RESULT SUMMARY

FCC PART 74H:2010			
Item	**Test requirement**	**Limit / Severity**	**Result**
Carrier radiated power	FCC Part 2.1046	74.861 e) 1) 54–72, 76–88 & 174–216 MHz bands, 50mW 470–608 and 614–806 MHz bands, 250mW	PASS
Radiated Spurious Emission	FCC Part 2.1053	74.861 d) 3) < 43+10lgP(W) dB	PASS
Occupied bandwidth	FCC Part 2.1049 c)	74.861 e) 5) Within 200kHz	PASS
Frequency Stability	FCC Part 2.1055	74.861 e) 4) <0.005% 50 ppm	PASS
Modulation Deviation	FCC Part 2.1047	74.861 e) 3) Within 75kHz	PASS

Remark: The EUT has one channel, which is located in the range 638.35MHz to 643.475MHz. Only test result of a sample in channels 638.35 MHz and 643.475 MHz were recorded in this report.

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name:	Ningbo Soundking Electronics and Sound Co.,LTD
Address:	Chengxin Road 818#, Yinzhou Investment Industry Park, Ningbo China

2.2 MANUFACTURER

Name:	Ningbo Soundking Electronics and Sound Co.,LTD
Address:	Chengxin Road 818#, Yinzhou Investment Industry Park, Ningbo China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Wireless Microphone
Model No.:	EW001
Trade Name:	Soundking
Power supply:	DC 9V
Frequency Range:	638.35MHz to 643.475MHz
Test channel:	638.35MHz, 643.475MHz
Type of Modulation:	/
EUT Type:	The EUT belongs to licensed lo w power auxiliary devices.

2.4 LOCAL SUPPORTIVE INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number
Signal generator	Agilent		

3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests and measurements refer to this report were performed by Guangzhou GRG Metrology and Test CO., LTD.

Add. : 163 Pingyun Rd, West of Huangpu Ave, Guangzhou, 510656, P. R. China

Telephone: +86-20-38699959, 38699960, 38699961

Fax : +86-20-38695185

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC Listed Lab (No. 688188)
China	CNAS （No.L0446）
China	DILAC (No.DL175)
Canada	Registration No.:8355A-1

3.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		**Frequency**	**Uncertainty**
Radiated Emission	Horizontal	30MHz～1000MHz	4.2dB
		1GHz～26.5GHz	4.2dB
	Vertical	30MHz～1000MHz	4.4dB
		1GHz～26.5GHz	4.4dB
Conducted Emission		9kHz～30MHz	3.1 dB

This uncertainty represents an expanded uncertainty factor of *k*=2.

3.4 LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due	Calibration period
Carried power					
Receiver	R&S	ESU40	100106	2015-01-26	One year
Spurious Emissions					
Receiver	R&S	ESU40	100106	2015-01-26	One year
Signal Generator	R&S	SML03	103002	2014-11-13	One year
Biconical Log-periodic Antenna	ETS.LINDGREN	3142C	00075971	2014-05-26	One year
Horn antenna	SCHWARZBECK	BBHA9120D	D752	2014-10-14	One year
Occupied Bandwidth					
Receiver	R&S	ESU40	100106	2015-01-26	One year
Frequency stability					
Receiver	R&S	ESU40	100106	2015-01-26	One year
Temperature& humidity chamber	CEPREI	CEEC-MSJ-60BE	11015	2014-05-21	One year
DC power supply	LONGWEI	TPR-6420D	201109090	2014-09-20	One year
Receiver	R&S	ESU40	100106	2015-01-26	One year

4. TEST RESULTS

4.1 CARRIER POWER

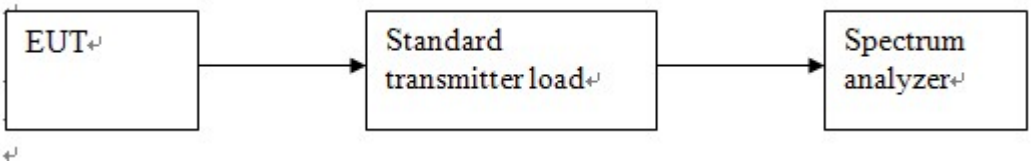
4.3.1 LIMITS

74.861 e) 1) The power of the measured un-modulated carrier power at the output of the transmitter power amplifier (antenna input power) may not exceed the following:
(1) 54-72, 76-88, and 174-216 MHz bands—50mW
(2) 470-608 and 614-698 MHz bands—250mW

4.3.2 TEST PROCEDURES

Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
The EUT shall be performed at the highest power level at which the transmitter is intended to operate.

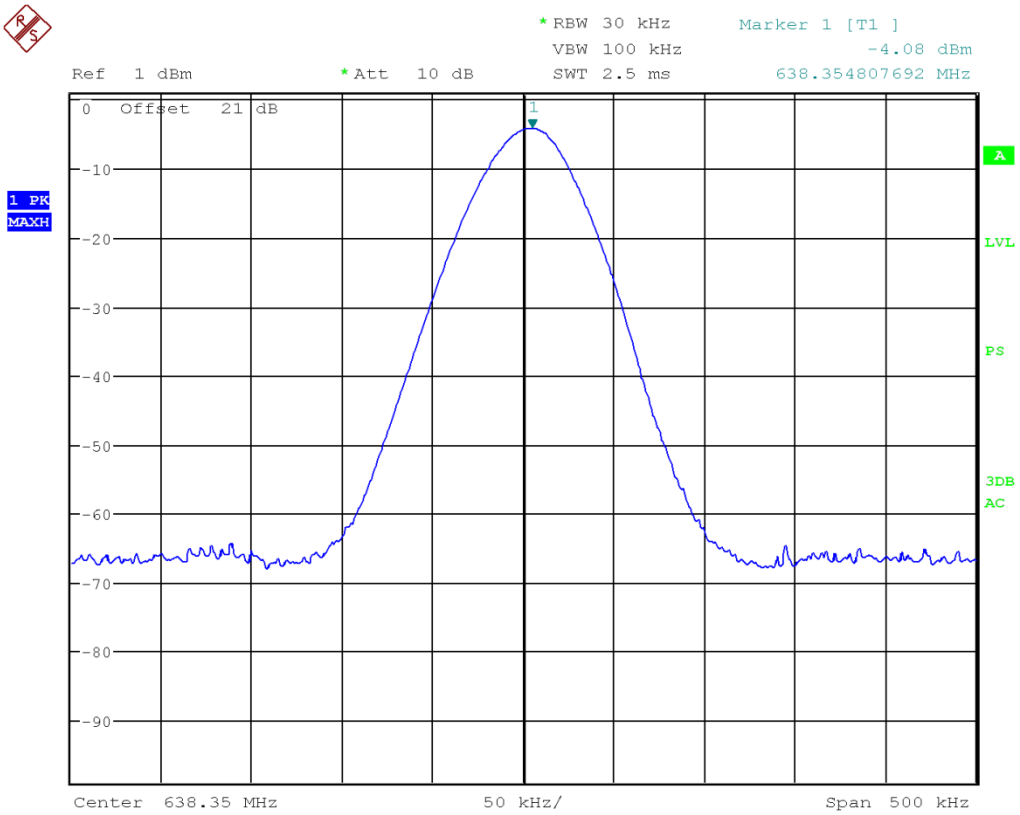
4.3.3 TEST SETUP



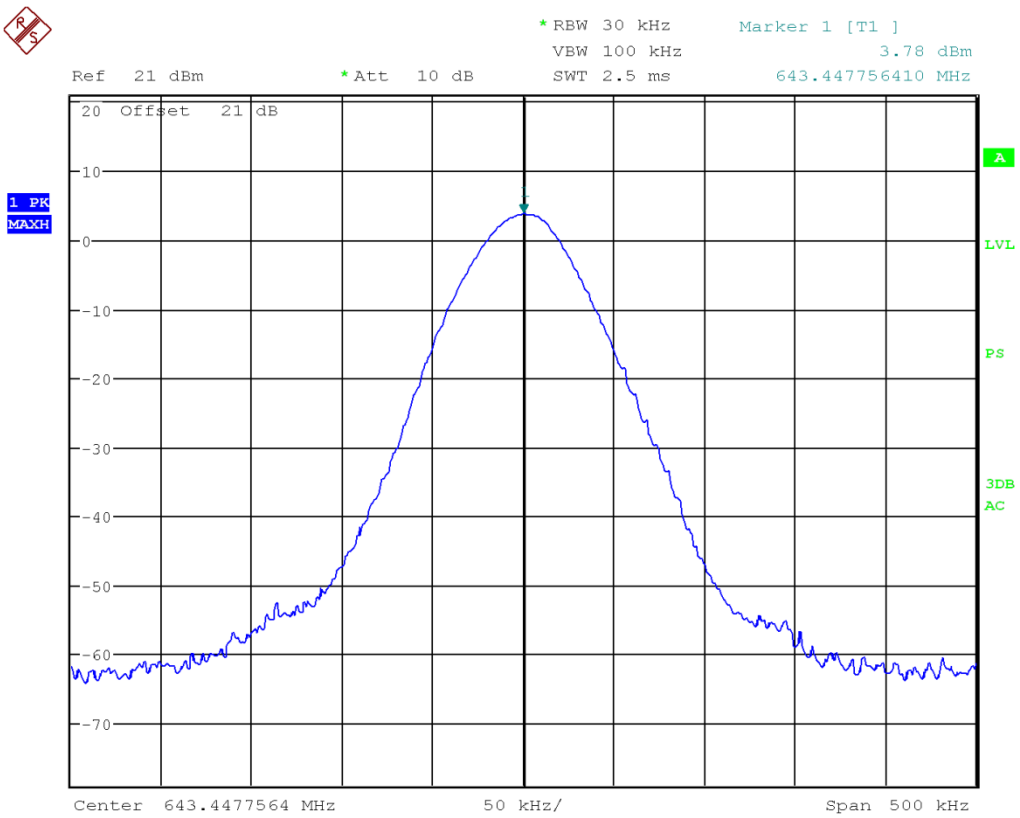
4.3.4 TEST RESULTS

Conducted Carrier Frequency (MHz)	Test result dBm (mW)	Limit
638.35	-4.09dBm(0.39mW)	24dBm(i.e. 250mW)
643.475	3.78 dBm(2.39mW)	

638.35MHz:



643.475MHz:



4.1 RADIATED SPURIOUS EMISSIONS

4.3.1 LIMITS

74.861 d) 3) An emission appearing on any discrete frequency outside the authorized band shall be attenuated, at least, 43+10 $\log_{10}$ (mean output power, in watts) dB below the mean output power of the transmitting unit.
According to the carrier power, the calculated limit is -13dBm.

4.3.2 TEST PROCEDURES

The procedure used was EIA/TIA 603-C: 2004.
The EUT shall be performed at the highest power level at which the transmitter is intended to operate. And Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. EUT shall be placed at the 1.5m support on the turntable.
The test antenna is at a horizontal distance of 3 m. It shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver in both the vertical and the horizontal polarization. Record the reading level, antenna position, polarization and turntable position.
Remove the transmitter and replace it with a substitution antenna.
Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by a cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test 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. This should be done carefully repeating the adjustment of the test antenna and generator output.

4.3.3 TEST SETUP

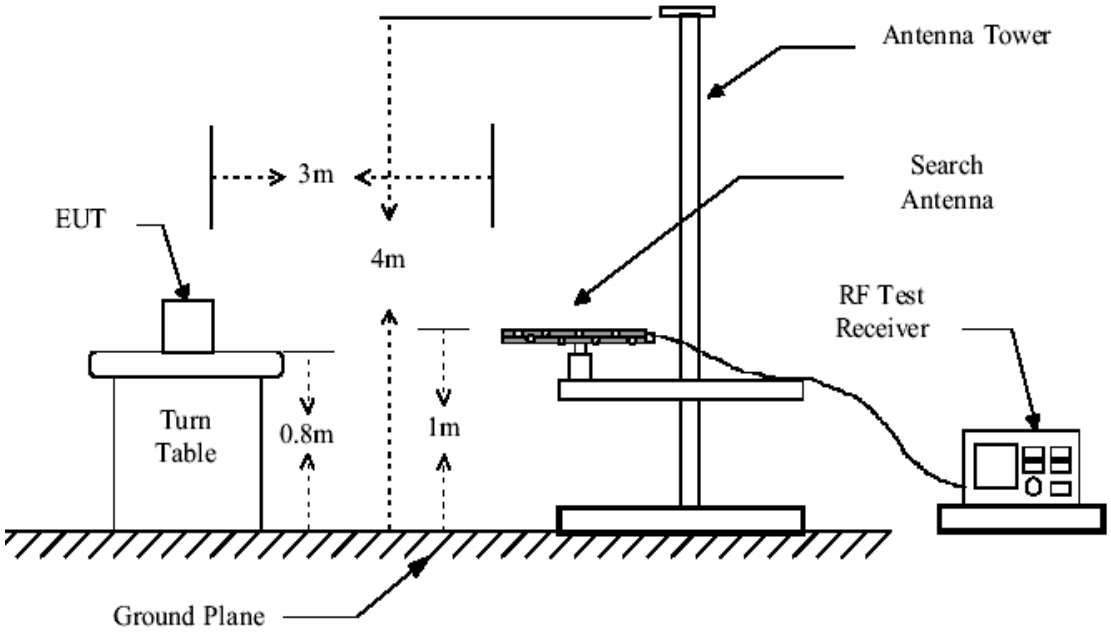


Figure 1: 30MHz to 1GHz radiated emissions test configuration

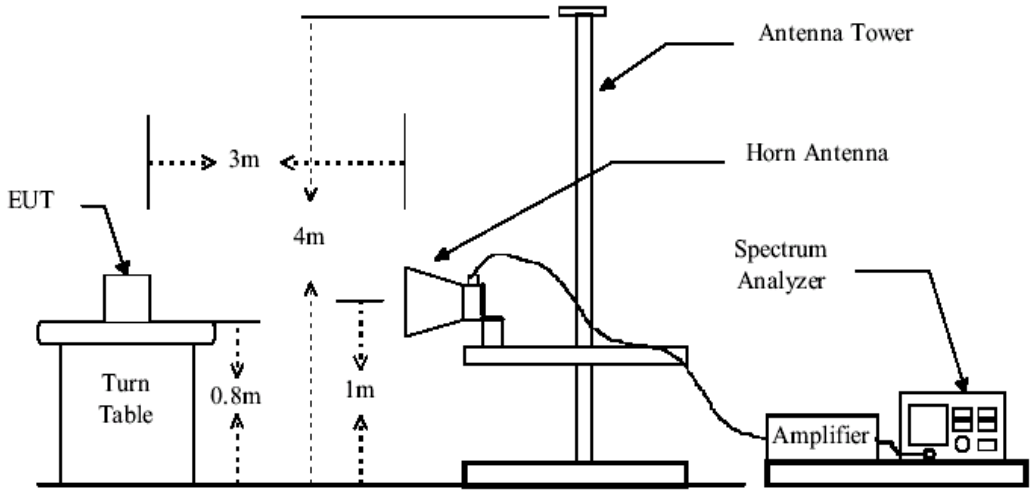


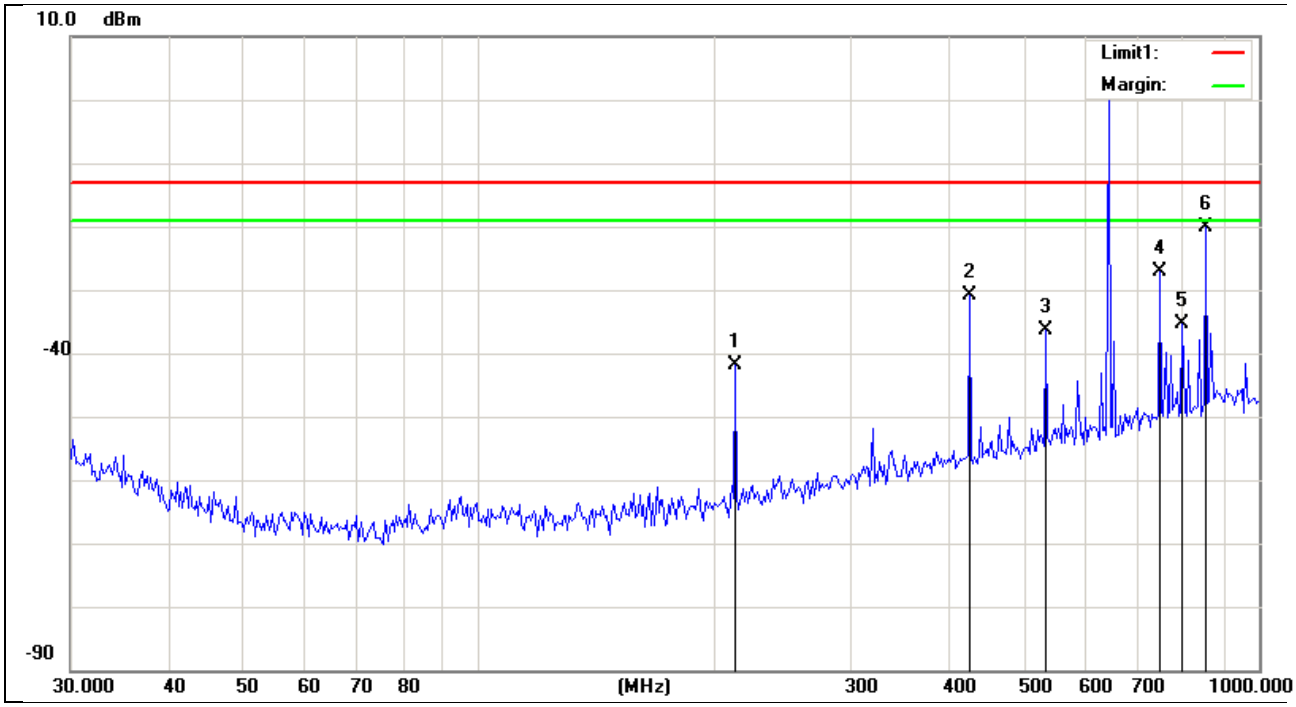
Figure 2: above 1GHz radiated emissions test configuration

4.3.4 TEST RESULTS

Lowest channel: 638.35MHz:

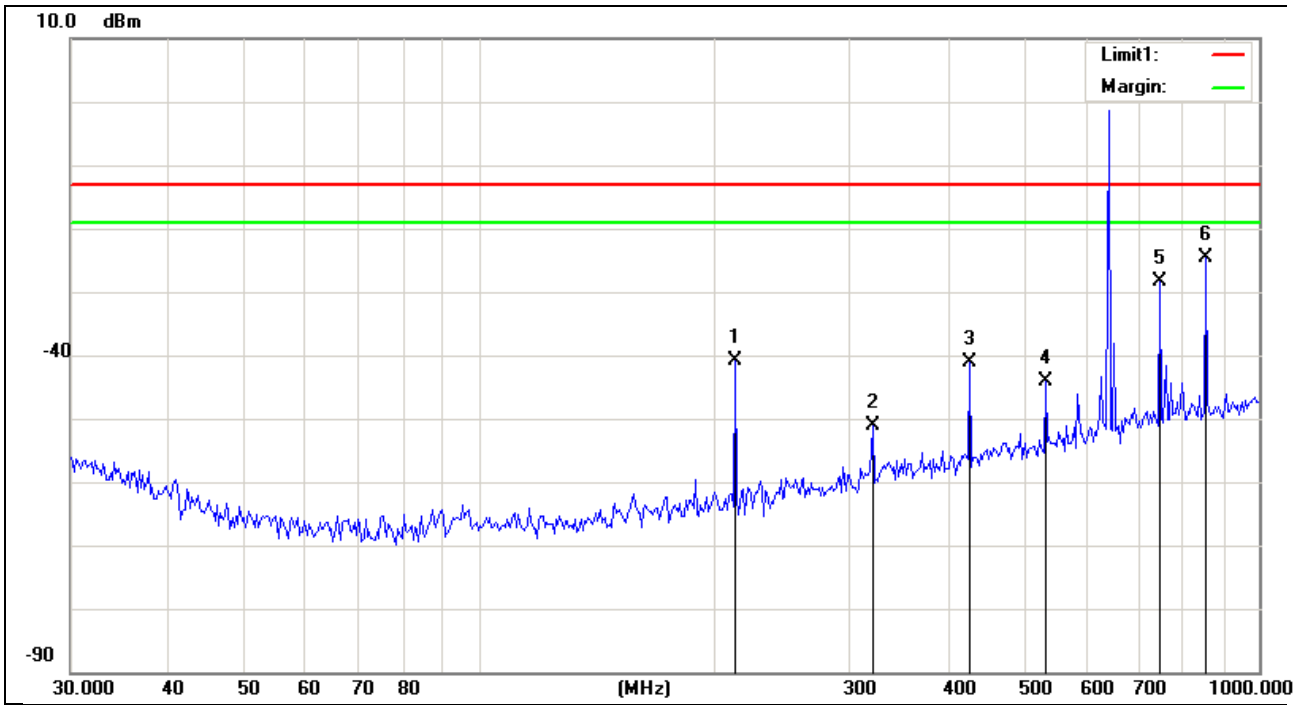
30MHz~1GHz:

Project No.:	**ZJ00036309**	**Polarziation:**	**Vertical**
Standard:	**FCC PART74**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**11:24:35**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**638.35MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	213.2355	-73.87	32.12	-41.75	-13.00	-28.75	QP
2	425.6399	-69.33	38.35	-30.98	-13.00	-17.98	QP
3	532.9207	-77.31	40.86	-36.45	-13.00	-23.45	QP
4	746.6094	-71.41	44.21	-27.20	-13.00	-14.20	QP
5	798.6924	-80.33	45.04	-35.29	-13.00	-22.29	QP
6	854.4088	-65.38	45.23	-20.15	-13.00	-7.15	QP

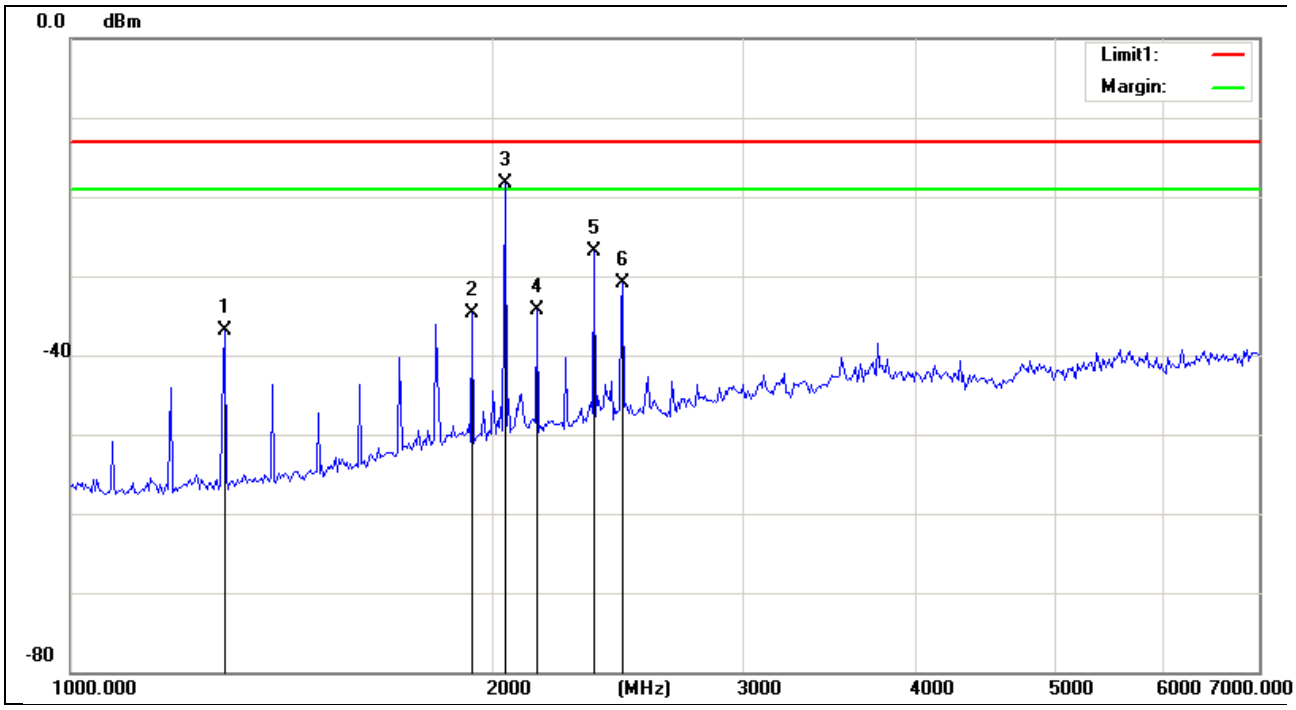
Project No.:	**ZJ00036309**	**Polarziation:**	**Horizontal**
Standard:	**FCC PART74**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**11:27:17**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**638.35MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	213.2355	-72.89	32.12	-40.77	-13.00	-27.77	QP
2	319.5776	-87.36	36.20	-51.16	-13.00	-38.16	QP
3	425.6399	-79.47	38.35	-41.12	-13.00	-28.12	QP
4	532.9207	-85.02	40.86	-44.16	-13.00	-31.16	QP
5	746.6094	-72.49	44.21	-28.28	-13.00	-15.28	QP
6	854.4088	-69.96	45.23	-24.73	-13.00	-11.73	QP

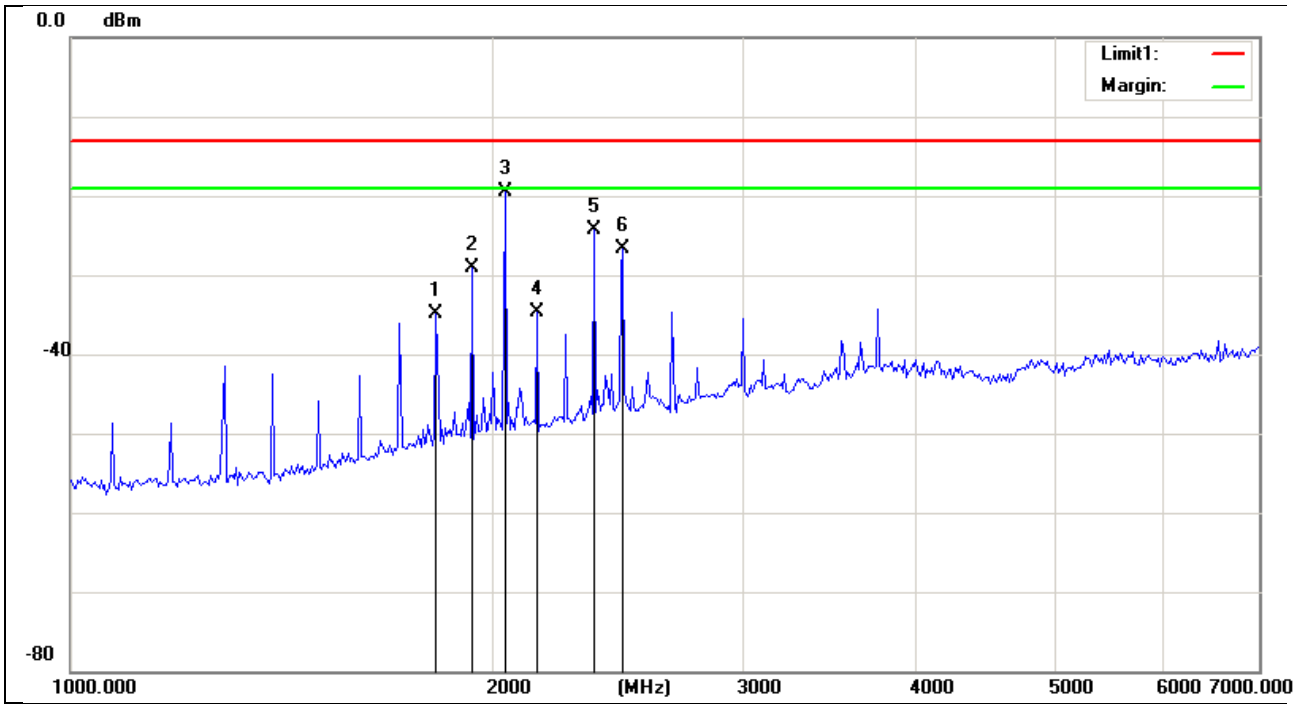
1GHz~7GHz:

Project No.:	**ZJ00036309**	**Polarziation:**	**Vertical**
Standard:	**FCC PART74**	**Power Source:**	
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**13:09:53**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**638.35MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1287.361	-58.35	21.37	-36.98	-13.00	-23.98	peak
2	1930.911	-63.28	28.63	-34.65	-13.00	-21.65	peak
3	2036.038	-47.95	29.61	-18.34	-13.00	-5.34	peak
4	2146.888	-64.78	30.39	-34.39	-13.00	-21.39	peak
5	2357.431	-58.83	31.86	-26.97	-13.00	-13.97	peak
6	2470.324	-63.65	32.66	-30.99	-13.00	-17.99	peak

Project No.:	**ZJ00036309**	**Polarziation:**	**Horizontal**
Standard:	**FCC PART74**	**Power Source:**	
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**13:07:55**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**638.35MHz**		

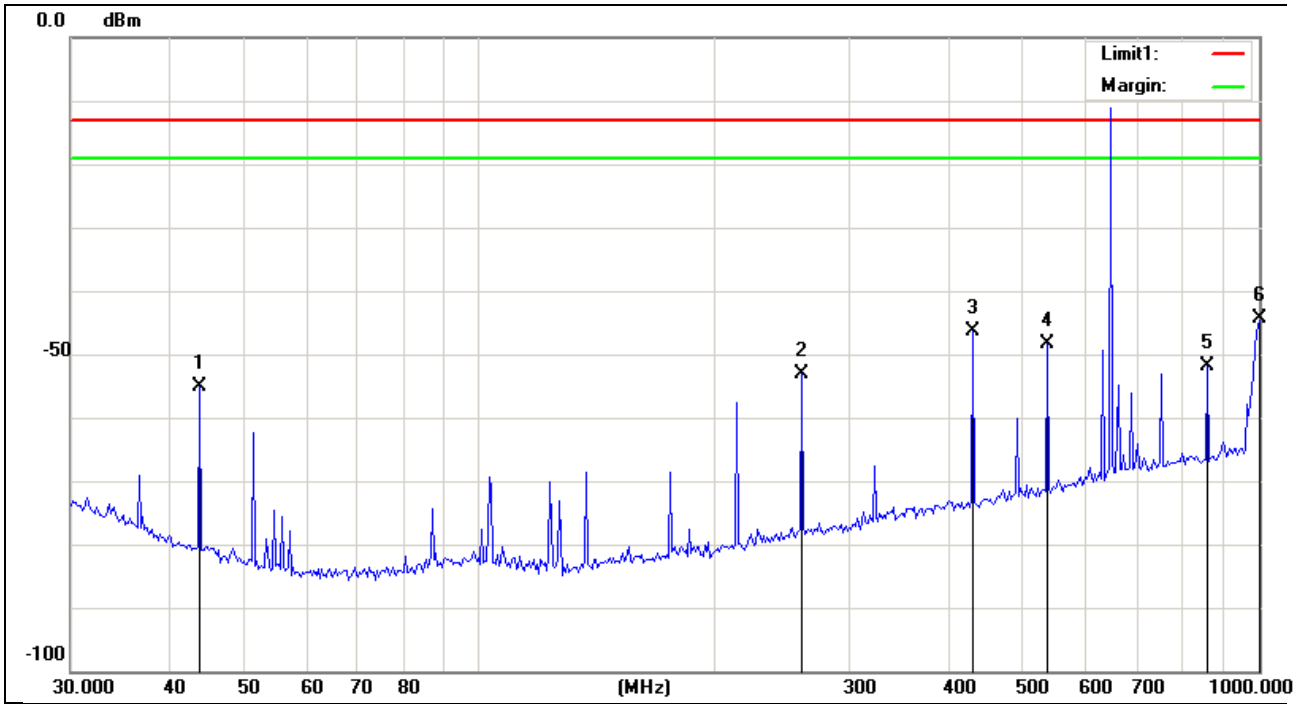


No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1819.827	-62.25	27.45	-34.80	-13.00	-21.80	peak
2	1930.911	-57.78	28.63	-29.15	-13.00	-16.15	peak
3	2036.038	-49.11	29.61	-19.50	-13.00	-6.50	peak
4	2146.888	-65.16	30.39	-34.77	-13.00	-21.77	peak
5	2357.431	-56.08	31.86	-24.22	-13.00	-11.22	peak
6	2470.324	-59.44	32.66	-26.78	-13.00	-13.78	peak

Highest channel: 643.475MHz:

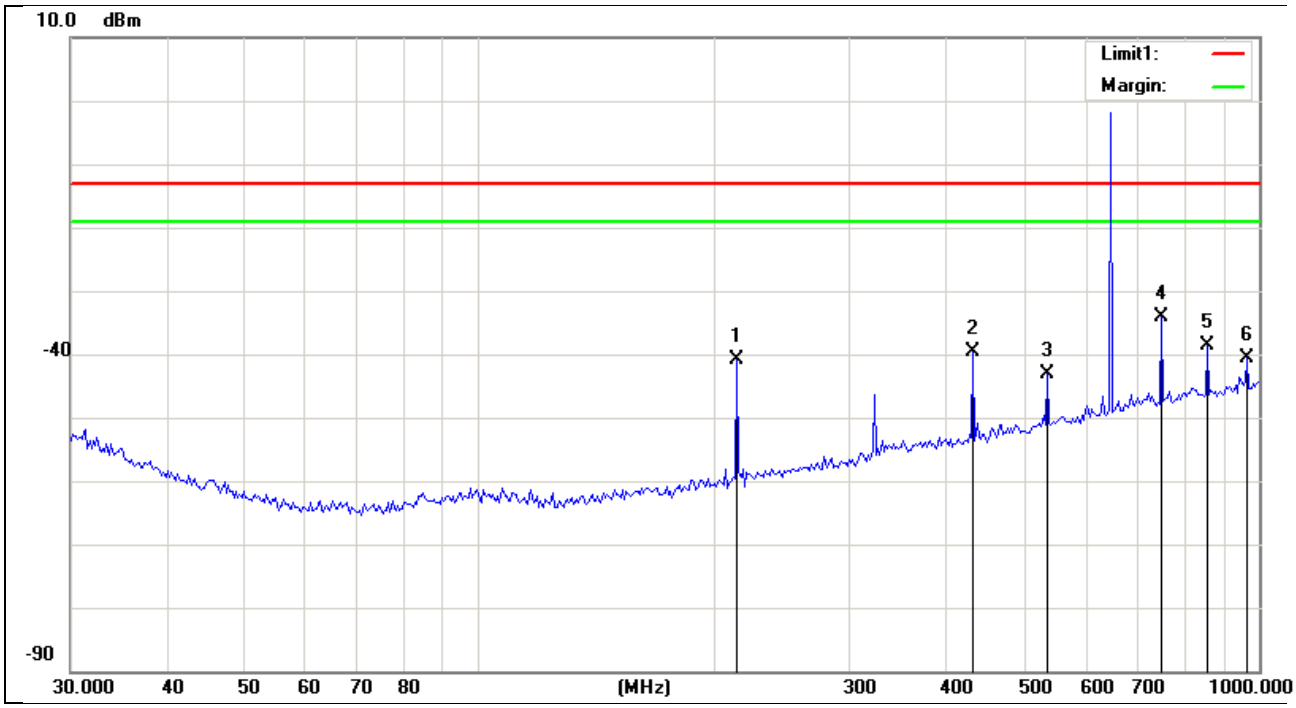
30MHz~1GHz:

Project No.:	**ZJ00036309**	**Polarziation:**	**Vertical**
Standard:	**FCC PART74**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**11:05:27**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**643.475MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	43.9617	-66.98	11.93	-55.05	-13.00	-42.05	peak
2	259.5837	-67.03	13.92	-53.11	-13.00	-40.11	peak
3	430.4506	-64.85	18.47	-46.38	-13.00	-33.38	peak
4	535.9239	-69.42	20.93	-48.49	-13.00	-35.49	peak
5	859.2236	-77.25	25.31	-51.94	-13.00	-38.94	peak
6	1000.0000	-91.49	47.08	-44.41	-13.00	-31.41	peak

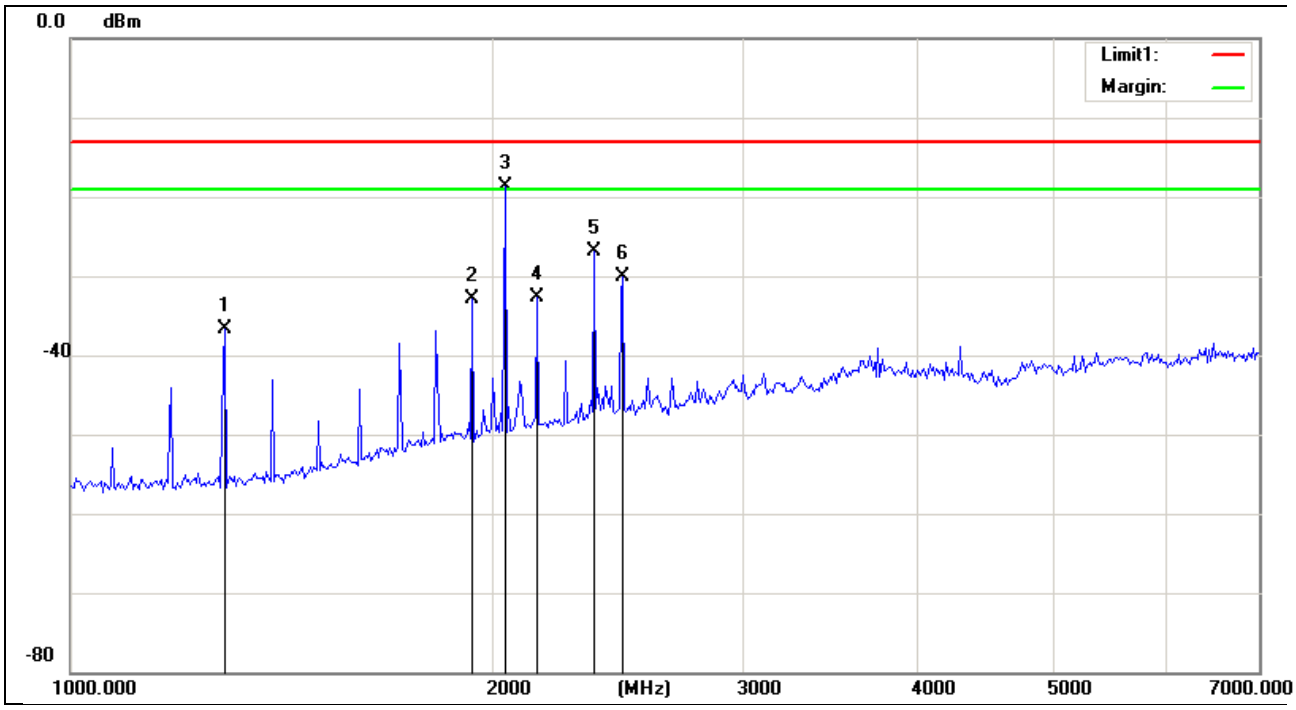
Project No.:	**ZJ00036309**	**Polarziation:**	**Horizontal**
Standard:	**FCC PART74**	**Power Source:**	**DC 9V**
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**11:07:02**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**643.475MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	214.4371	-73.12	32.18	-40.94	-13.00	-27.94	peak
2	430.4506	-77.98	38.47	-39.51	-13.00	-26.51	peak
3	535.9240	-84.11	40.93	-43.18	-13.00	-30.18	peak
4	750.8166	-78.37	44.22	-34.15	-13.00	-21.15	peak
5	859.2236	-83.93	45.31	-38.62	-13.00	-25.62	peak
6	966.8451	-87.18	46.53	-40.65	-13.00	-27.65	peak

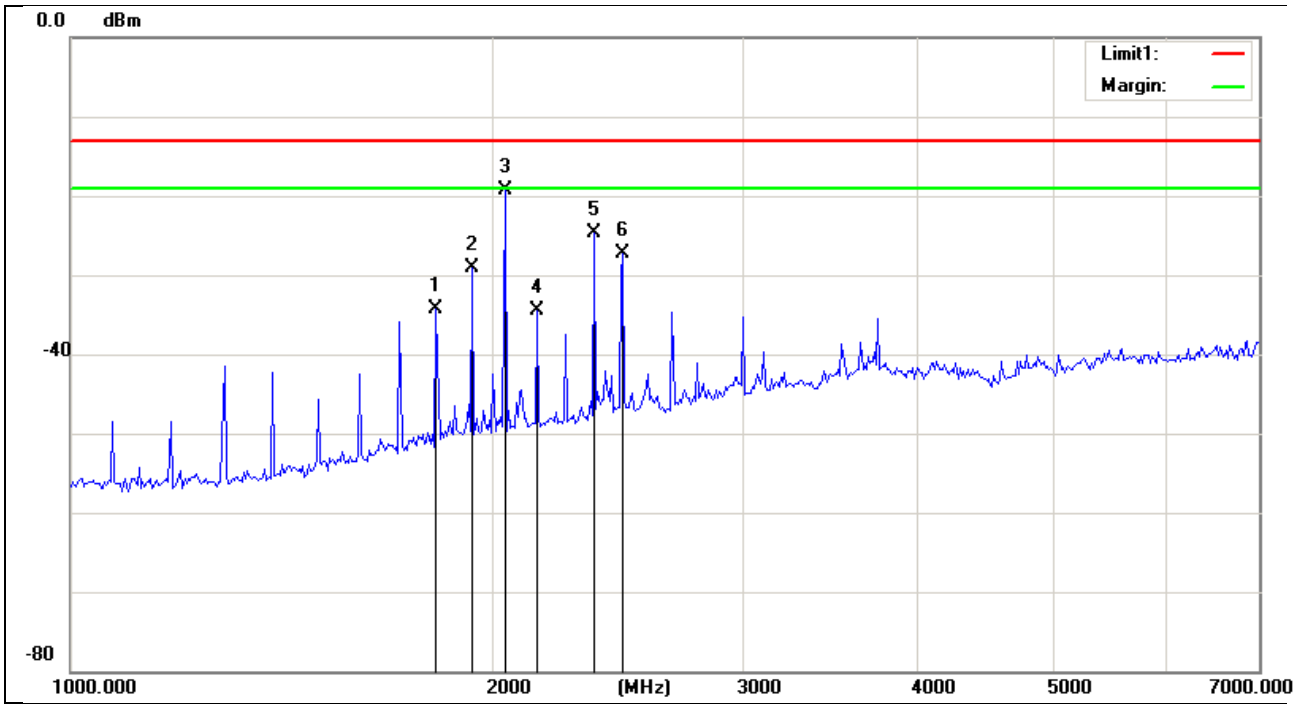
1GHz~7GHz:

Project No.:	**ZJ00036309**	**Polarziation:**	**Vertical**
Standard:	**FCC PART74**	**Power Source:**	
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**13:03:35**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**643.475MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1287.361	-57.98	21.37	-36.61	-13.00	-23.61	peak
2	1930.911	-61.50	28.63	-32.87	-13.00	-19.87	peak
3	2036.038	-48.34	29.61	-18.73	-13.00	-5.73	peak
4	2146.888	-63.10	30.39	-32.71	-13.00	-19.71	peak
5	2357.431	-58.76	31.86	-26.90	-13.00	-13.90	peak
6	2470.324	-62.75	32.66	-30.09	-13.00	-17.09	peak

Project No.:	**ZJ00036309**	**Polarziation:**	**Horizontal**
Standard:	**FCC PART74**	**Power Source:**	
Test item:	**Radiation Test**	**Date:**	**2014-2-27**
Temp./Hum.(%RH):	**21/56%RH**	**Time:**	**13:05:11**
EUT:	**Microphone**	**Distance:**	**3m**
Model:		**Test Result:**	**Pass**
Note:	**643.475MHz**		



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1819.827	-61.76	27.45	-34.31	-13.00	-21.31	peak
2	1930.911	-57.76	28.63	-29.13	-13.00	-16.13	peak
3	2036.038	-48.96	29.61	-19.35	-13.00	-6.35	peak
4	2146.888	-64.90	30.39	-34.51	-13.00	-21.51	peak
5	2357.431	-56.56	31.86	-24.70	-13.00	-11.70	peak
6	2470.324	-59.99	32.66	-27.33	-13.00	-14.33	peak

4.4 OCCUPIED BANDWIDTH

4.4.1 LIMITS

74.861 e) 5) The operating bandwidth shall not exceed 200 kHz.

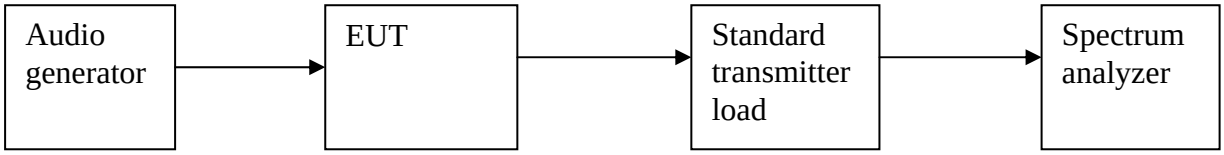
4.4.2 TEST PROCEDURES

Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

Input 2500Hz signal to the microphone, find the 50% rated deviation, and record the trace.

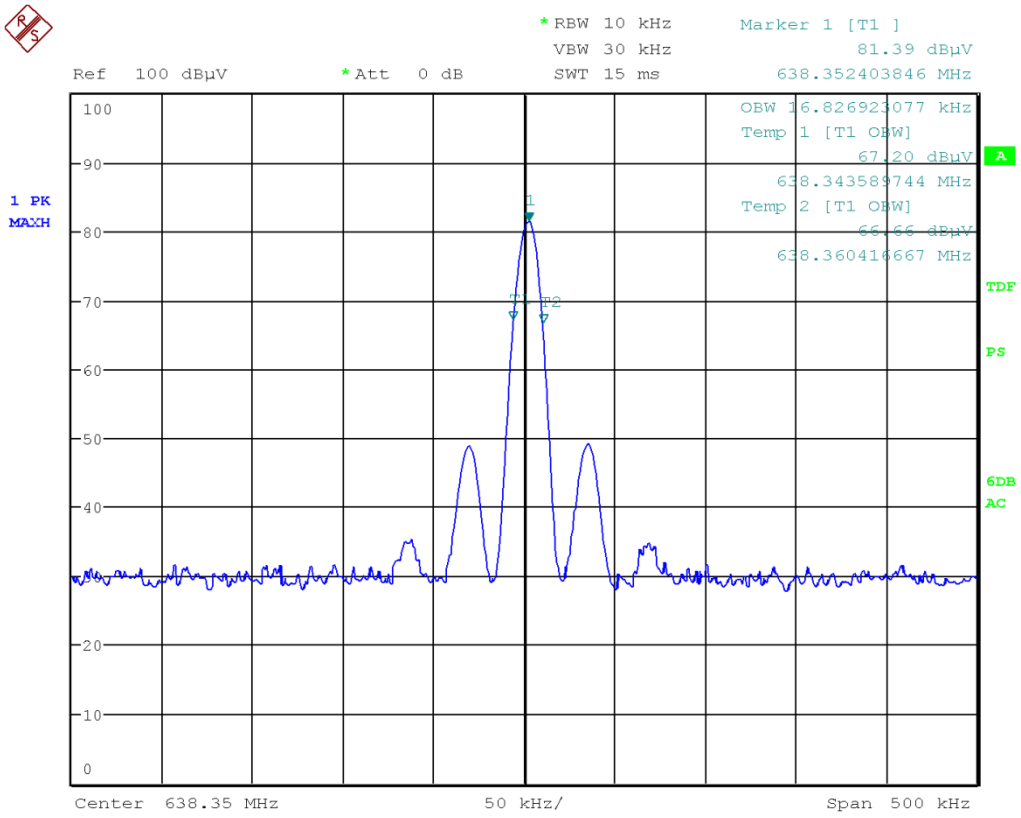
Add the level 16dB, test this status the 99% occupied bandwidth and record it.

4.4.3 TEST SETUP

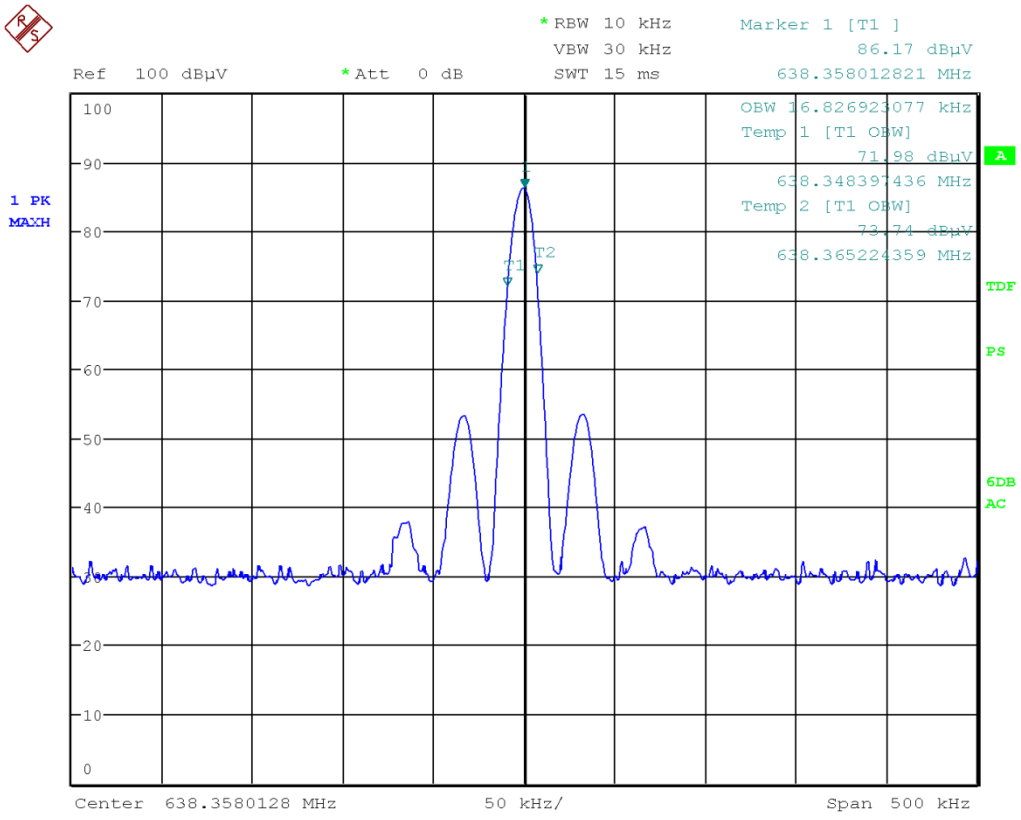


4.4.4 TEST RESULTS

Lowest channel: 638.35MHz:
Horizontal:

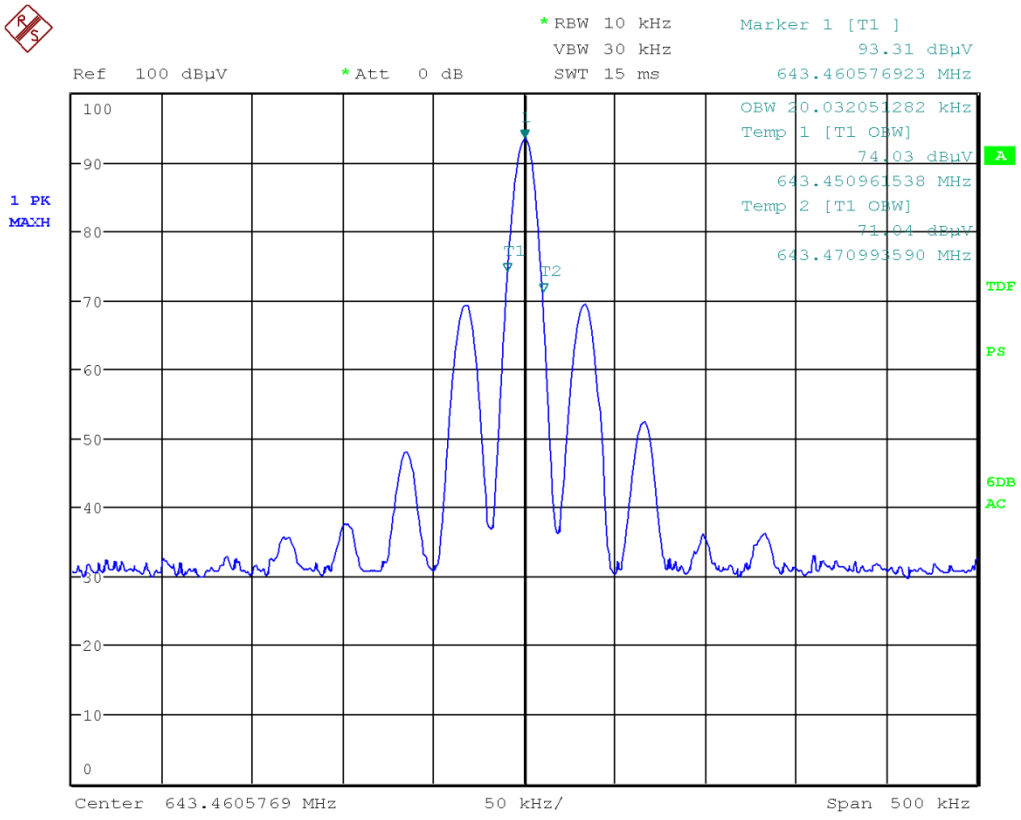


Vertical:

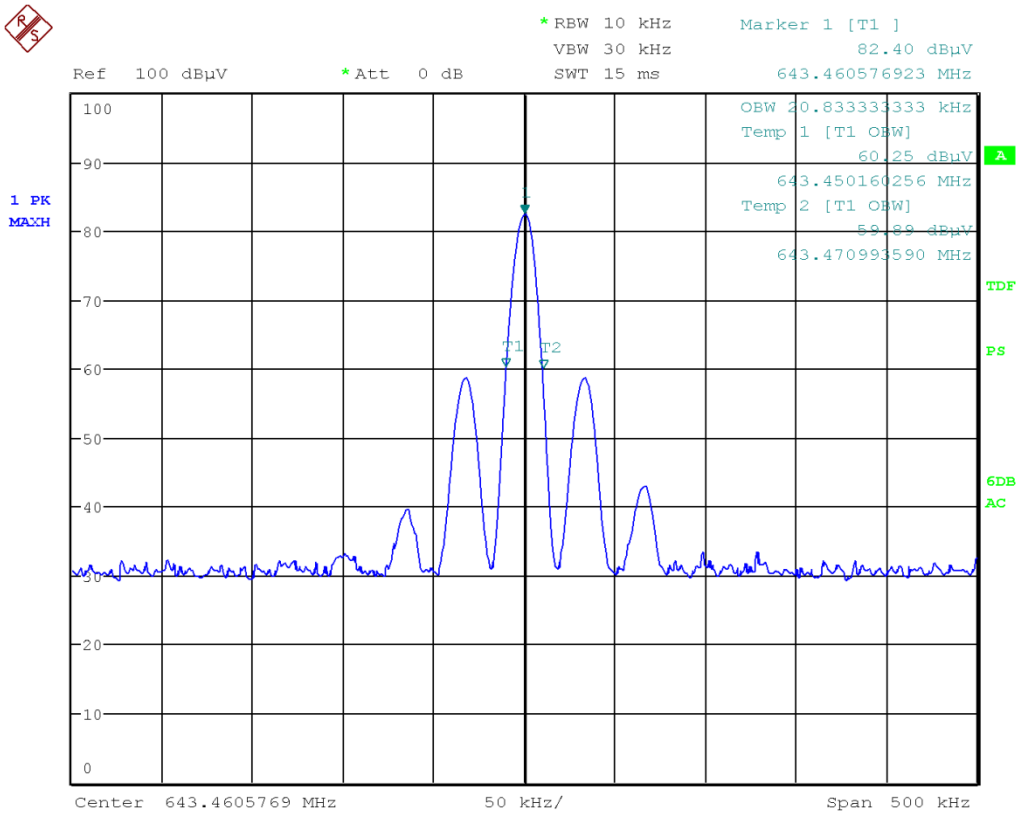


Highest channel: 643.475MHz:

Horizontal:



Vertical:



4.5 FREQUENCY STABILITY

4.5.1 LIMITS

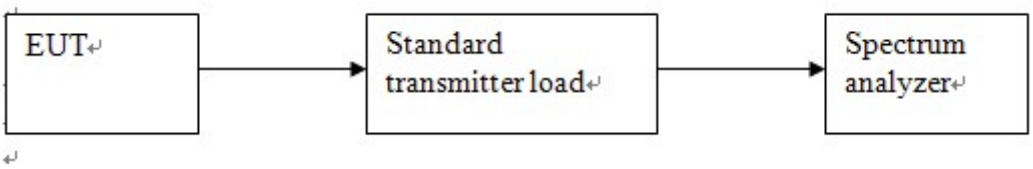
74.861 e) 4) The frequency tolerance of the transmitter shall be 0.005 percent (50ppm).

4.5.2 TEST PROCEDURES

Frequency stability versus Environmental Temperature
The equipment under test was connected to an external DC power supply and the RF output was connected to a spectrum analysis feed through attenuators.
The EUT was placed inside the temperature chamber. After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

Frequency Stability versus Input Voltage
At room temperature (25 ± 5°C), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage. For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

4.5.3 TEST SETUP



4.5.4 TEST RESULTS

Test frequency: 645.375MHz

Extremer condition : temperature				
Environment temperature(℃)	Power supplied(Vdc)	Measurement Frequency(MHz)	Measurement Frequency error (ppm)	Limit
-30	9.0	643.452	-35.74	50ppm
-20	9.0	643.452	-35.74	50ppm
-10	9.0	643.455	-31.08	50ppm
0	9.0	643.460	-23.31	50ppm
10	9.0	643.460	-23.31	50ppm
20	9.0	643.460	-23.31	50ppm
30	9.0	643.460	-23.31	50ppm
40	9.0	643.457	-27.97	50ppm
50	9.0	643.451	-37.30	50ppm
Extremer condition : power supply				
Environment temperature(℃)	Power supplied(Vdc)	Measurement Frequency(MHz)	Measurement Frequency error (ppm)	Limit
25	9.0	643.460	0.00	50ppm
25	8.0V	643.460	0.00	50ppm
25	5V	643.453	-34.19	50ppm

Test frequency: 638.35MHz

Extremer condition : temperature				
Environment temperature(℃)	Power supplied(Vdc)	Measurement Frequency(MHz)	Measurement Frequency error (ppm)	Limit
-30	9.0	638.340	-15.67	50ppm
-20	9.0	638.343	-10.97	50ppm
-10	9.0	638.345	-7.83	50ppm
0	9.0	638.345	-7.83	50ppm
10	9.0	638.345	-7.83	50ppm
20	9.0	638.345	-7.83	50ppm
30	9.0	638.345	-7.83	50ppm
40	9.0	638.345	-7.83	50ppm
50	9.0	638.343	-10.97	50ppm
Extremer condition : power supply				
Environment temperature(℃)	Power supplied(Vdc)	Measurement Frequency(MHz)	Measurement Frequency error (ppm)	Limit
25	9.0	638.345	-7.83	50ppm
25	8.0V	638.345	-7.83	50ppm
25	5V	638.344	-9.40	50ppm

4.6 MODULATION CHARACTERISTICS

4.6.1 LIMITS

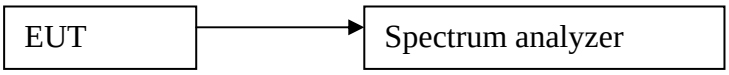
74.861 e) 3) Any form of modulation may be used. A maximum deviation of ±75 kHz is permitted when frequency modulation is employed.

4.6.2 TEST PROCEDURES

Audio Frequency Response

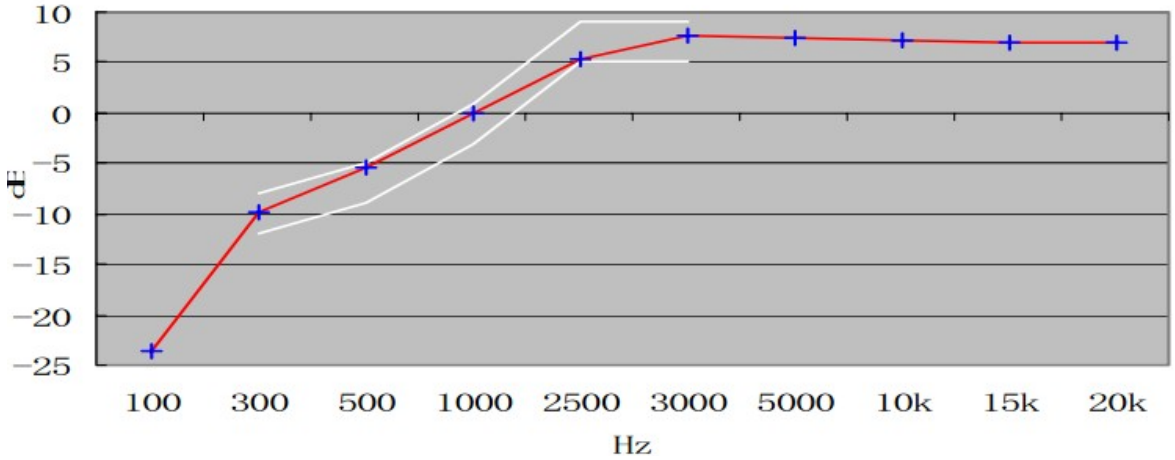
The RF output of the transceiver was connected to the input of FSP 30 with FM deviation module through sufficient attenuation so as not to overload the meter or distort the reading. An audio signal generator was connected to the audio input of microphone.
The audio signal input level was adjusted to obtain 20% of the maximum rated system deviation at 1 kHz, and recorded as DEVREF. With the audio signal generator level unchanged, set the generator frequency between 100 to 5000 Hz. The transmitter deviations (DEVFREQ) were measured and the audio frequency response was calculated as 20log10 [DEVFREQ / DEVREF]

4.6.3 TEST SETUP



4.6.4 TEST RESULTS

The plot(s) of Audio Frequency Response is presented hereinafter as reference.

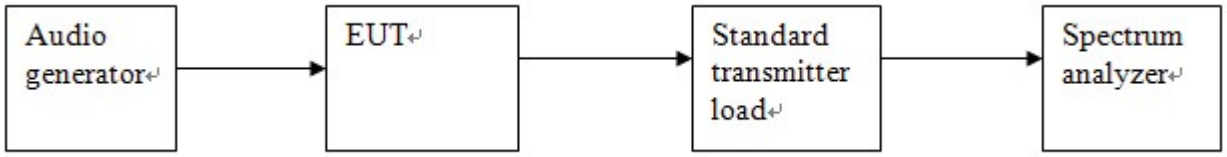


0dB=10mV at 1 kHz (20% of the maximum rated system deviation).

Modulation Limiting

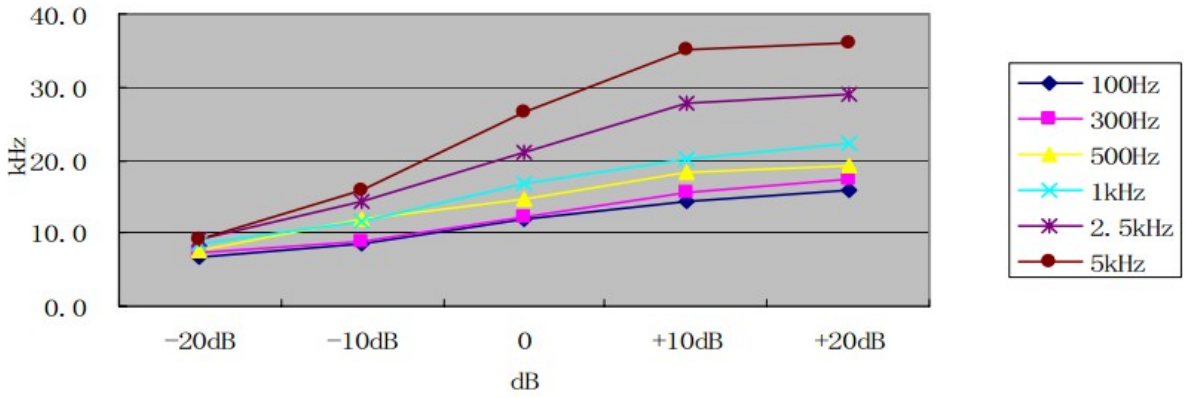
a) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
b) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 0.25 Hz to ≥ 15,000 Hz. Turn the de-emphasis function off.
c) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
d) Increase the level from the audio frequency generator by 20 dB in one step (rise time between the 10% and 90% points shall be 0.1 second maximum).
e) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.

f) With the level from the audio frequency generator held constant at the level obtained in step e), slowly vary the audio frequency from 100 to 5000 Hz and observe the steady-state deviation. Record the maximum deviation.



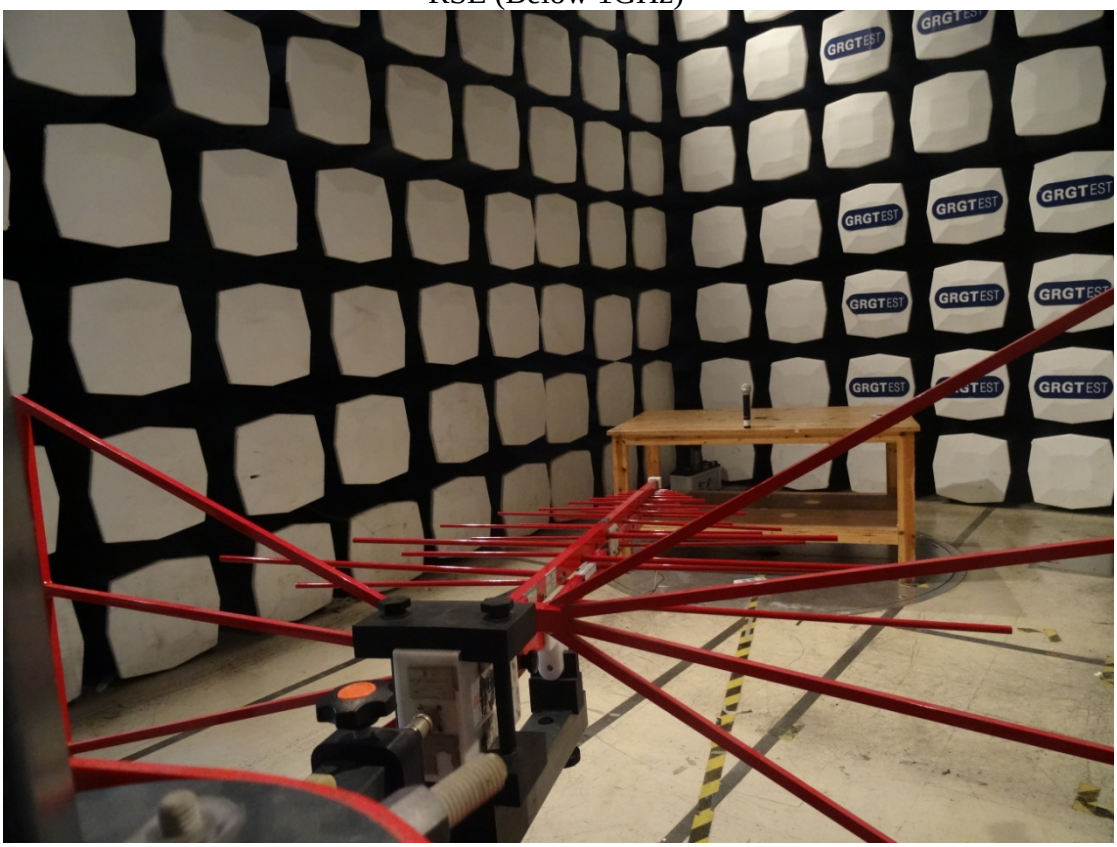
Test at five different modulating frequencies (100Hz ,300Hz, 500Hz, 1KHz, 2.5kHz, 5kHz), the output level of the audio generator was varied up to 1V and the FM deviation level was recorded.

Positive peak deviation

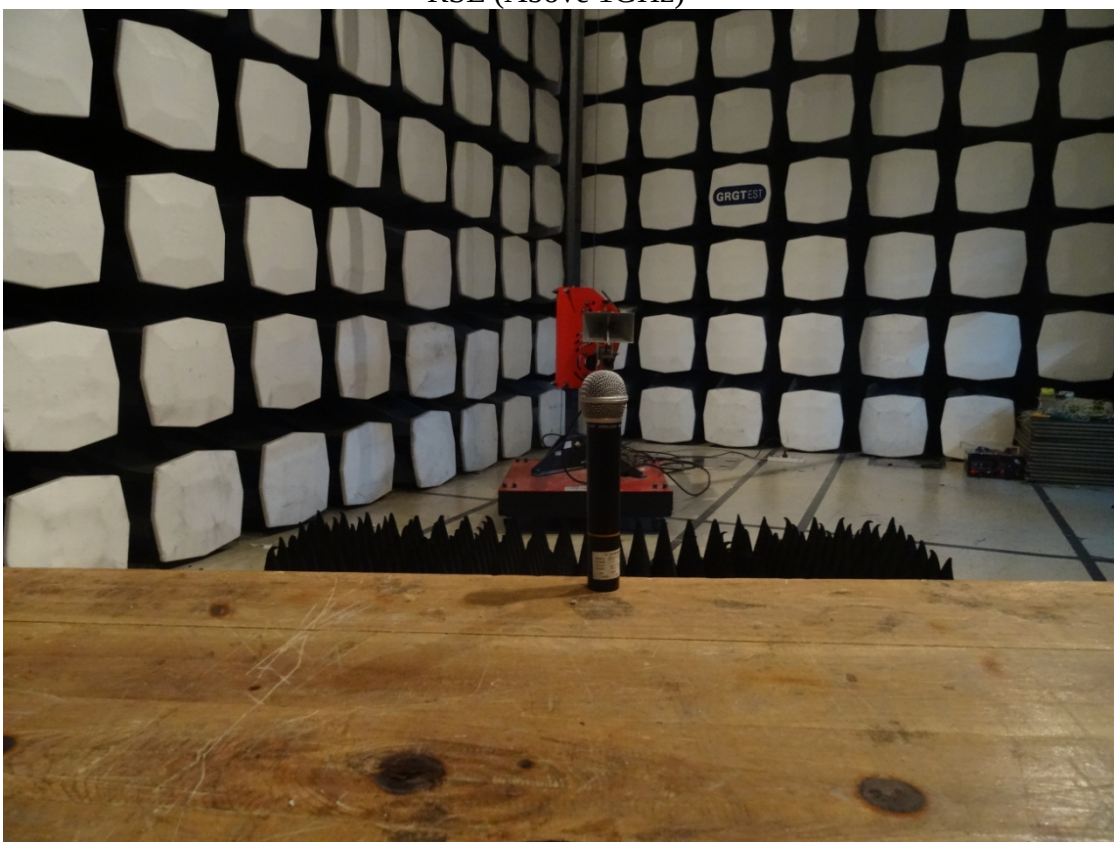


APPENDIX A: PHOTOGRAPH OF THE TEST ARRANGEMENT

RSE (Below 1GHz)



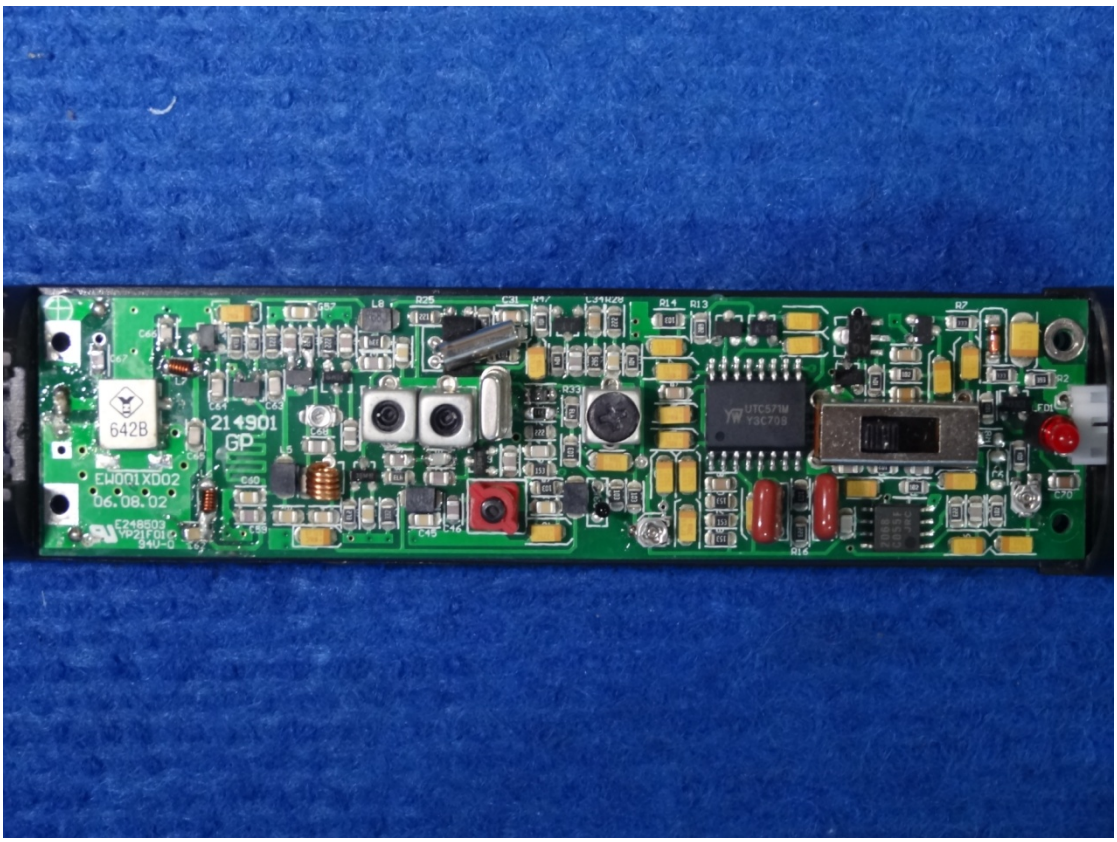
RSE (Above 1GHz)



APPENDIX B: PHOTOGRAPH OF THE EUT


PHONE


效鹿电池



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