

# FCC Test Report

## Client Information:

Applicant: Sound Innovation Development Ltd.  
Applicant add.: 17/F Cheuk Nang Centre 9 Hillwood Road, Tsim Sha Tsui,  
Kowloon, Hong Kong.

## EUT Information:

EUT Name: IDESIGN WIRELESS SPEAKER  
Model No.: 623389  
Brand Name: Brookstone

## Prepared By:

Asia Institute Technology (Dongguan) Limited  
Add. : No.6 Binhe Road, Tianxin Village, Huangjiang,  
Dongguan, Guangdong, China.

Date of Receipt: Feb. 02, 2009      Date of Test: Feb.02. ~ Feb.10, 2009  
Date of Issue: Feb. 14, 2009      Test Result: **Pass**

## Test procedure used: ANSI C63.4-2003

This device described above has been tested by Asia Institute Technology (Dongguan) Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

\*This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. government.



NVLAP Lab. Code: 200800-0

Reviewed by: Bovey Yang  
Test director/Bovey. yang

Approved by: Kleven.Hu  
Technical director/Kleven.hu

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## 2 Test Summary

### 2.1 Compliance with FCC Part 15 subpart C

Test	Test Requirement	Standard Paragraph	Result
Antenna requirement	FCC Part 15 C:2008	Section 15.203	<b>PASS</b>
Conduction Emissions	FCC Part 15 C:2008	Section 15.249	<b>PASS</b>
Radiated Emissions	FCC Part 15 C:2008	Section 15.249(a) Section 15.249(d)	<b>PASS</b>
Band edges	FCC Part 15 C:2008	Section 15.249(d)	<b>PASS</b>

### 2.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, The following measurements uncertainty Level have estimated based on ANSI C63.4:2003, the maximum value of the uncertainty as below

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	Radiated Emission Test	$\pm 3.57\text{dB}$



### 3 Test Facility

**The test facility is recognized, certified or accredited by the following organizations:**

**.NVLAP- Lab Code: 200800-0**

Asia Institute Technology (Dongguan) Limited has been accredited by NVLAP on April 29, 2008.

**.FCC- Registration No: 248337**

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dongguan) Limited have been registered by Federal Communications Commission (FCC) on Dec.07, 2006.

**.Industry Canada(IC)-Registration No: IC6819A-1 & IC6819A-2**

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Asia Institute Technology (Dongguan) Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Nov.07, 2006.

**.VCCI- Registration No: R-2482 & C-2730**

The 3m/10m Open Area Test Site and Shielding Room of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on Jan.24, 2007.

**.TUV Rhineland**

Asia Institute Technology (Dongguan) Limited has been assessed on Jan.16, 2007 that it can carry out EMC tests by order and under supervision of TUV Rhineland.

**.ITS- Registration No: TMPSHA031**

Asia Institute Technology (Dongguan) Limited has been assessed and included in Intertek Shanghai TMP Program regarding Laboratory facilities and test equipment on Nov.10, 2006.

#### 3.1 Deviation from standard

None

#### 3.2 Abnormalities from standard conditions

None

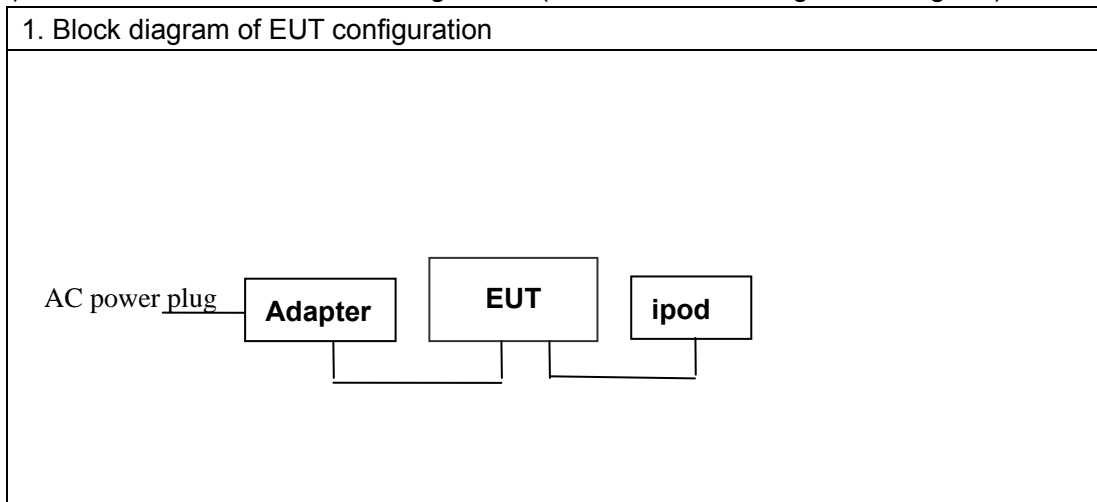
## 4 General Information

### 4.1 General Description of EUT

Manufacturer:	Sound Innovation Development Ltd.	
Manufacturer Address:	17/F Cheuk Nang Centre 9 Hillwood Road, Tsim Sha Tsui,Kowloon, Hong Kong.	
EUT Name:	IDESIGN WIRELESS SPEAKER	
Model No:	623389	
Operation frequency:	902 MHz to 928MHz	
Channel Number:	3	
Modulation Technology:	FM	
Antenna Type:	a black wire with an extended wire lay on PCB	
Brand Name:	Brookstone	
Serial No:	N/A	
Power Supply Range:	DC12V from adapter AC 100V~120V, 50/60Hz	
Power Supply:	AC 120V, 60Hz	
Power Cord:	N/A	
DC Output Line:	1.5m / Unshielded / Undetachable/ Without ferrite core	
Signal Cable:	N/A	
Description of Channel:		
Channel No.	Left Frequency(MHz)	Right Frequency(MHz)
1	903.4	926.6
2	902.6	925.8
3	904.2	927.4

## 4.2 Description of Test conditions

- (1) EUT was tested in normal configuration (Please See following Block diagram)



- (2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

- (3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required. Reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

- (4) Frequency range of radiated measurements:

According to the 15.33, the test range will be up to the tenth harmonic of the highest fundamental frequency

### 4.3 Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	iPod	Apple Inc.	A1285	YM838NYL3QS	N/A	N/A

## 5 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3132	160400005	2008.04.09	2009.04.08
2	EMI Measuring Receiver	Schaffner	SCR3501	235	2008.04.16	2009.04.15
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2008.09.11	2009.03.10
4	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2008.07.03	2009.07.02
5	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2008.09.11	2009.03.10
6	EMI Test Receiver	R&S	ESCI	100124	2008.12.29	2009.12.28
7	LISN	Kyoritsu	KNW-242	8-837-4	2008.04.09	2009.04.08
8	LISN	Kyoritsu	KNW-407	8-1789-3	2008.04.09	2009.04.08
9	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2008.09.11	2009.03.10
10	Spectrum Analyzer	ADVANTEST	R3182	150900201	2008.04.18	2009.04.17
11	Broadband Horn Antenna	SCHWARZBECK	BBHA9120A	451	2009.01.15	2010.07.14

## **6 Test Result**

### **6.1 Antenna requirement**

#### **6.1.1 Standard requirement**

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

#### **6.1.2 EUT Antenna**

The antenna is integrated on the main PCB and no consideration of replacement.



## 6.2 Conduction Emissions Measurement

### 6.2.1 limit

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency.

### 6.2.2 Test procedure

EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

## 6.2.3 Test result

Test Data: 2009-2-4

Operating Environment: 20.3°C, 58% RH, 102 Kpa

### Line

Frequency (MHz)	Factor (dB)	Reading Level (dBμV)	Quasi peak (dBμV)	Margin (dB)	Limit (dBμV)	Reading Level (dBμV)	Average (dBμV)	Margin (dB)	Limit (dBμV)
0.178	10.846	37.290	48.136	-17.064	65.200	23.090	33.936	-21.264	55.200
0.250	10.739	33.120	43.860	-19.283	63.143	21.020	31.760	-21.383	53.143
0.334	10.814	33.488	44.303	-16.440	60.743	20.388	31.203	-19.540	50.743
0.414	10.804	30.219	41.023	-17.434	58.457	18.119	28.923	-19.534	48.457
<b>*0.658</b>	<b>10.844</b>	<b>28.456</b>	<b>39.300</b>	<b>-16.700</b>	<b>56.000</b>	<b>17.356</b>	<b>28.200</b>	<b>-17.800</b>	<b>46.000</b>
1.134	10.955	24.040	34.995	-21.005	56.000	10.840	21.795	-24.205	46.000

### Neutral

Frequency (MHz)	Factor (dB)	Reading Level (dBμV)	Quasi peak (dBμV)	Margin (dB)	Limit (dBμV)	Reading Level (dBμV)	Average (dBμV)	Margin (dB)	Limit (dBμV)
0.198	10.694	35.875	46.569	-18.060	64.629	22.775	33.469	-21.160	54.629
0.270	10.773	31.584	42.357	-20.214	62.571	18.984	29.757	-22.814	52.571
0.334	10.814	32.388	43.203	-17.540	60.743	19.288	30.103	-20.640	50.743
<b>*0.402</b>	<b>10.804</b>	<b>34.256</b>	<b>45.060</b>	<b>-13.740</b>	<b>58.800</b>	<b>19.156</b>	<b>29.960</b>	<b>-18.840</b>	<b>48.800</b>
0.478	10.745	28.115	38.860	-17.769	56.629	14.015	24.760	-21.869	46.629
1.134	10.955	24.040	34.995	-21.005	56.000	11.440	22.395	-23.605	46.000

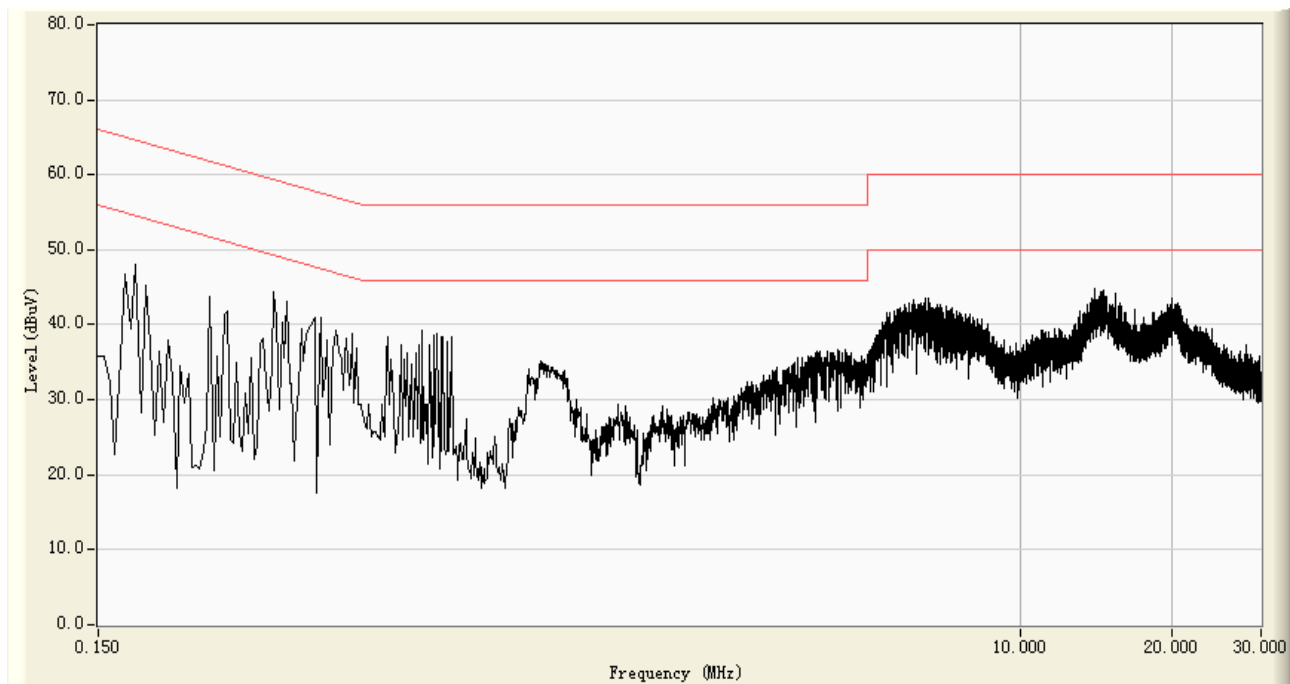
Note: “\*” means the worst case

Quasi peak/Average = Reading Level + Factor

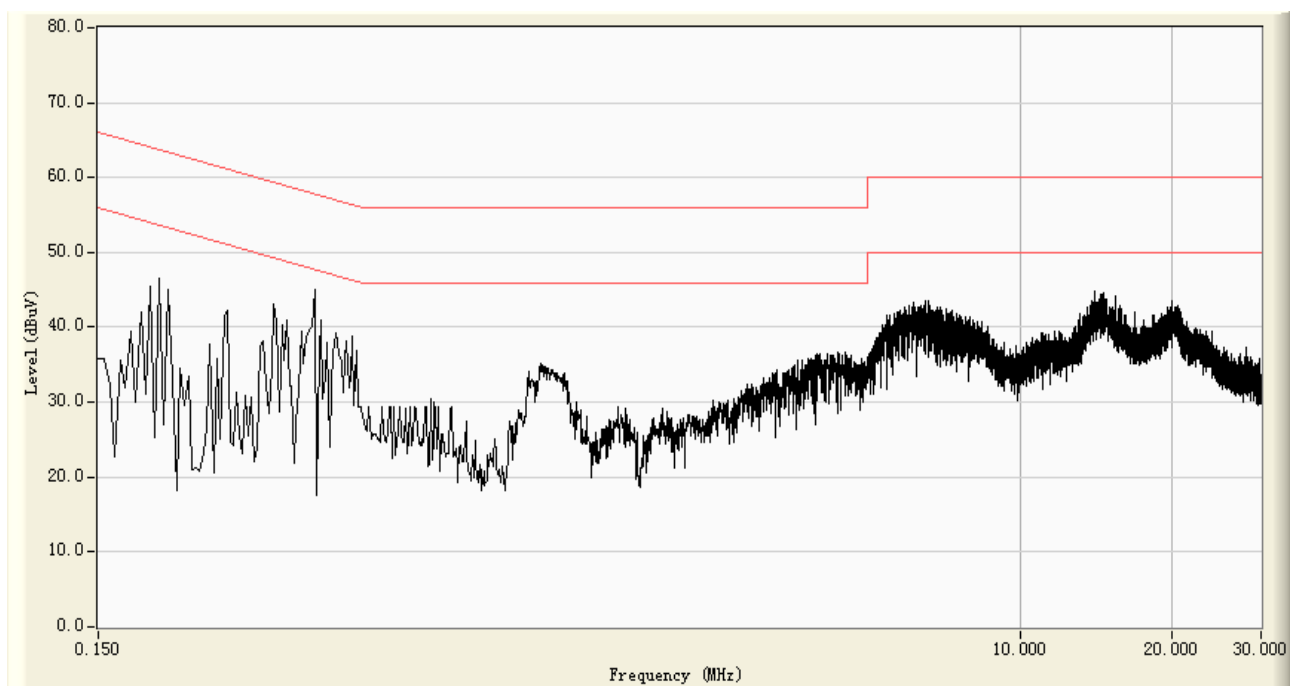
Factor= Cable Loss + LISN insertion loss

Mode: Running

**Line --Operating mode: running**



**Neutral --Operating mode: running**



## 6.3 Radiated Emissions Measurement

### 6.3.1 Limit

Fcc part15.249 (a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency of Emission (MHz)	Field Strength of fundamental (dB $\mu$ V/m)	Field Strength of Harmonics(dB $\mu$ V/m)
902-928	94	54
2400-2483.5	94	54
5725-5875	94	54
24000-24250	108	68

Note: Field strength limits are specified at a distance of 3 meters. the above field strength limits in paragraphs of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Fcc part15.249 (d)Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Frequency of Emission (MHz)	Field Strength		Measurement Distance (meters)
	$\mu$ V/m	dB $\mu$ V/m	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

### 6.3.2 Test procedure

EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

### 6.3.3 Test Result

Test Data: 2009-2-4

Operating Environment: 20.3°C, 58% RH, 102 Kpa

Frequency Range: 30MHz to 10GHz

Measurement Distance: 3 m

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
134.760	15.490	13.697	29.187	-14.313	43.500	QUASIPeAK
179.380	15.490	14.480	29.970	-13.530	43.500	QUASIPeAK
253.100	15.570	16.747	32.317	-13.683	46.000	QUASIPeAK
<b>*269.590</b>	<b>16.160</b>	<b>26.902</b>	<b>43.062</b>	<b>-2.938</b>	<b>46.000</b>	<b>QUASIPeAK</b>
404.420	19.970	15.945	35.915	-10.085	46.000	QUASIPeAK
674.080	25.810	13.029	38.839	-7.161	46.000	QUASIPeAK
903.000	29.790	45.926	75.716	-18.284	94.000	QUASIPeAK
926.280	30.260	48.088	78.348	-15.652	94.000	QUASIPeAK
1806.000	31.115	10.578	41.693	-12.307	54.000	AVERAGE
1806.000	31.115	11.078	42.193	-11.807	54.000	PEAK
1852.000	31.244	10.272	41.516	-12.484	54.000	AVERAGE
1852.000	31.244	11.472	42.716	-11.284	54.000	PEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
<b>*30.000</b>	<b>13.340</b>	<b>23.811</b>	<b>37.151</b>	<b>-2.849</b>	<b>40.000</b>	<b>QUASIPeAK</b>
60.070	14.320	19.745	34.065	-5.935	40.000	QUASIPeAK
269.590	16.160	25.467	41.627	-4.373	46.000	QUASIPeAK
404.420	19.970	17.234	37.204	-8.796	46.000	QUASIPeAK
539.250	23.080	15.045	38.125	-7.875	46.000	QUASIPeAK
675.050	25.840	10.765	36.605	-9.395	46.000	QUASIPeAK
903.398	29.802	52.100	81.902	-12.098	94.000	QUASIPeAK
926.280	30.260	45.742	76.002	-17.998	94.000	QUASIPeAK
1806.000	31.115	8.214	39.329	-14.671	54.000	AVERAGE
1806.000	31.115	10.114	41.229	-12.771	54.000	PEAK

Note: '\*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Channel 1:L903.4/R926.6MHz

(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBUV)	Measure Level (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Detector Type
134.760	15.490	14.885	30.375	-13.125	43.500	QUASIPeAK
253.100	15.570	16.716	32.286	-13.714	46.000	QUASIPeAK
<b>*269.590</b>	<b>16.160</b>	<b>20.527</b>	<b>36.687</b>	<b>-9.313</b>	<b>46.000</b>	<b>QUASIPeAK</b>
337.490	18.200	16.954	35.154	-10.846	46.000	QUASIPeAK
404.420	19.970	16.102	36.072	-9.928	46.000	QUASIPeAK
450.010	21.230	13.730	34.960	-11.040	46.000	QUASIPeAK
674.080	25.810	6.419	32.229	-13.771	46.000	QUASIPeAK
902.030	29.770	44.134	73.904	-20.096	94.000	QUASIPeAK
925.310	30.270	47.496	77.766	-16.234	94.000	QUASIPeAK
1808.000	31.120	9.820	40.940	-13.060	54.000	AVERAGE
1808.000	31.120	10.720	41.840	-12.160	54.000	PEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBUV)	Measure Level (dBUV/m)	Margin (dB)	Limit (dBUV/m)	Detector Type
<b>*231.760</b>	<b>14.720</b>	<b>28.233</b>	<b>42.953</b>	<b>-3.047</b>	<b>46.000</b>	<b>QUASIPeAK</b>
269.590	16.160	22.855	39.015	-6.985	46.000	QUASIPeAK
470.380	21.720	12.459	34.179	-11.821	46.000	QUASIPeAK
539.250	23.080	10.412	33.492	-12.508	46.000	QUASIPeAK
674.080	25.810	16.747	42.557	-3.443	46.000	QUASIPeAK
902.030	29.770	52.650	82.420	-11.580	94.000	QUASIPeAK
925.310	30.270	47.112	77.382	-16.618	94.000	QUASIPeAK
1804.000	31.110	10.723	41.833	-12.167	54.000	AVERAGE
1804.000	31.110	11.523	42.633	-11.367	54.000	PEAK
1850.000	31.235	9.909	41.144	-12.856	54.000	AVERAGE
1850.000	31.235	10.409	41.644	-12.356	54.000	PEAK

Note: '\*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Channel 2:L902.6/R925.8MHz



(a) Antenna polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
179.380	15.490	14.808	30.298	-13.202	43.500	QUASIPeAK
252.130	15.530	12.862	28.392	-17.608	46.000	QUASIPeAK
<b>*269.590</b>	<b>16.160</b>	<b>25.245</b>	<b>41.405</b>	<b>-4.595</b>	<b>46.000</b>	<b>QUASIPeAK</b>
314.210	17.530	13.108	30.638	-15.362	46.000	QUASIPeAK
404.420	19.970	14.336	34.306	-11.694	46.000	QUASIPeAK
450.010	21.230	16.566	37.796	-8.204	46.000	QUASIPeAK
473.290	21.790	7.736	29.526	-16.474	46.000	QUASIPeAK
539.250	23.080	6.225	29.305	-16.695	46.000	QUASIPeAK
674.080	25.810	9.060	34.870	-11.130	46.000	QUASIPeAK
903.970	29.820	44.345	74.165	-19.835	94.000	QUASIPeAK
927.250	30.250	49.172	79.422	-14.578	94.000	QUASIPeAK
1808.000	31.120	8.804	39.924	-14.076	54.000	AVERAGE
1808.000	31.120	9.404	40.524	-13.476	54.000	PEAK

(b) Antenna polarization: vertical

Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
168.710	16.260	12.521	28.781	-14.719	43.500	QUASIPeAK
179.380	15.490	13.316	28.806	-14.694	43.500	QUASIPeAK
<b>*269.590</b>	<b>16.160</b>	<b>25.402</b>	<b>41.562</b>	<b>-4.438</b>	<b>46.000</b>	<b>QUASIPeAK</b>
404.420	19.970	14.234	34.204	-11.796	46.000	QUASIPeAK
449.040	21.210	14.470	35.680	-10.320	46.000	QUASIPeAK
522.760	22.700	6.552	29.252	-16.748	46.000	QUASIPeAK
674.080	25.810	15.162	40.972	-5.028	46.000	QUASIPeAK
903.970	29.820	51.883	81.703	-12.297	94.000	QUASIPeAK
927.250	30.250	48.612	78.862	-15.138	94.000	QUASIPeAK
1808.000	31.120	10.829	41.949	-12.051	54.000	AVERAGE
1808.000	31.120	11.329	42.449	-11.551	54.000	PEAK
1854.000	31.253	9.308	40.561	-13.439	54.000	AVERAGE
1854.000	31.253	10.208	41.461	-12.539	54.000	PEAK

Note: '\*' means the worst case

Measurement Level = Reading Level + Factor

Factor=Ant Factor + Cable Loss

Channel 3: L904.2/R927.4MHz

## 6.4 Band edges

### 6.4.1 Limit

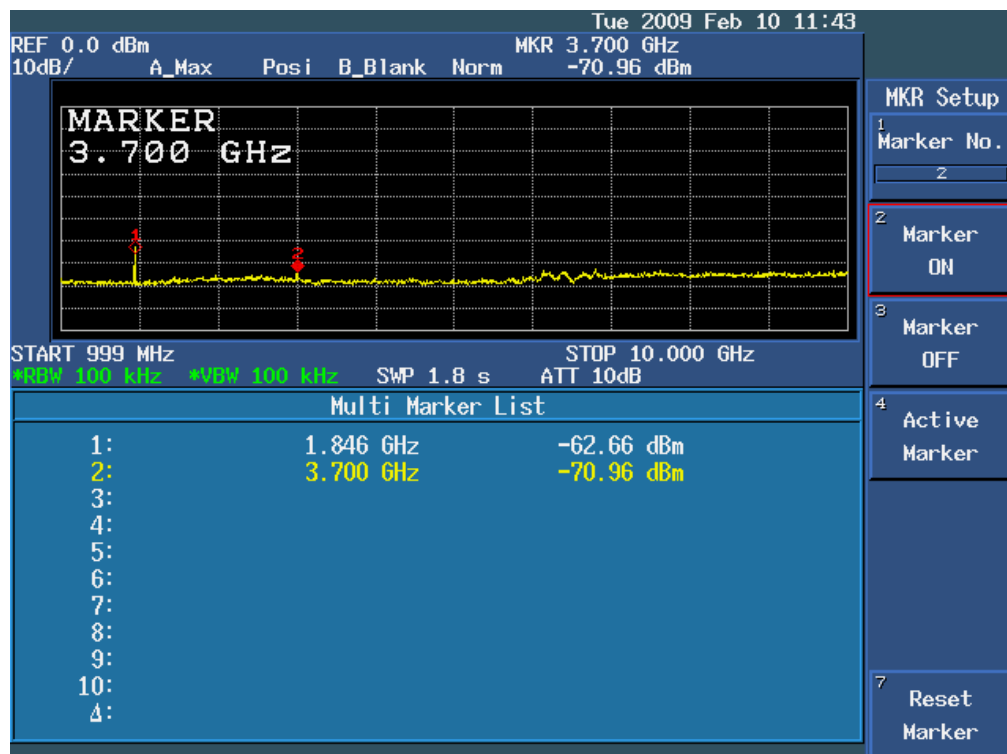
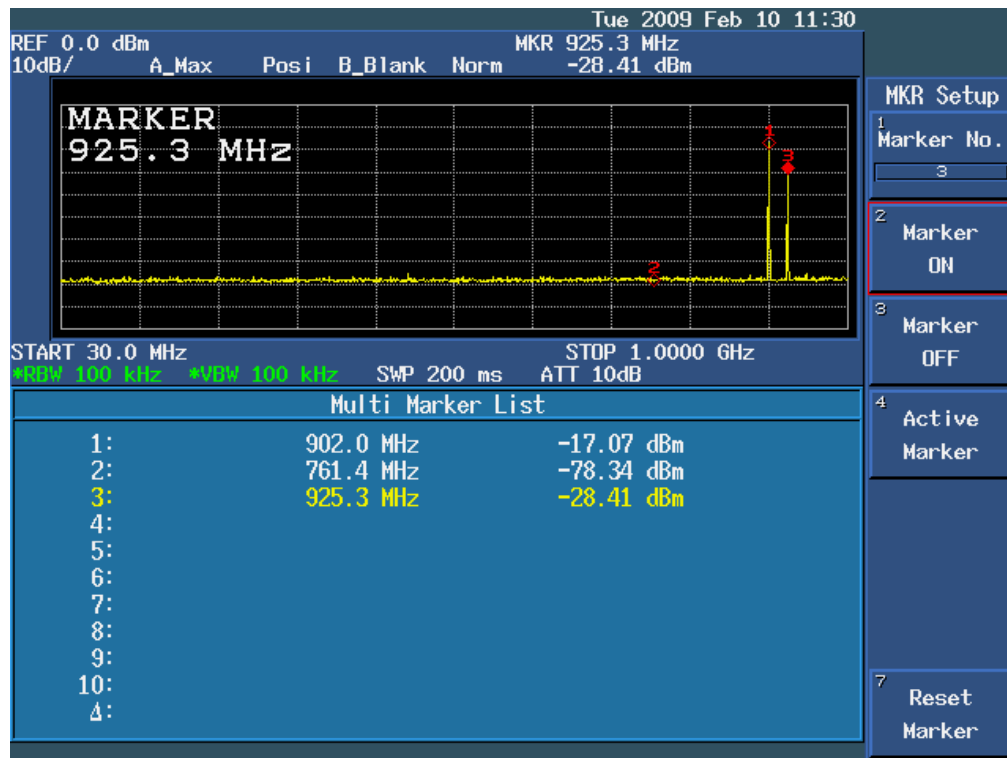
Fcc part15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

### 6.4.2 Test procedure

- (1) Connected the antenna port to the Spectrum Analyzer, set the Spectrum Analyzer as RBW=100Hz, VBW $\geq$ RBW, Sweep time=Auto, Detector Function=Peak
- (2) The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission.
- (3) The above procedure shall be repeated at the lowest, and the highest frequency of the stated frequency range.

### 6.4.3 Test Result

(1) Channel 2: L902.6 MHz



(2) Channel 3: R927.4MHz

