

FCC EMC TEST Report

Report No. : NTEK-2011DG0723130E
Product : Wireless Floating Speaker
Model No. : Shark, Lionfish
FCC ID: ZN2SHARK-LIONFISH
Applicant : Aqua Ventus Ltd.
Address : Unit 514, 5/F, Kenning Industrial Bldg., NO 19 Wang Hoi Road Kowloon Bay Hong Kong
Issued by : NTEK Testing Technology Co., Ltd.
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Date of Receipt:

Jul. 18, 2011

Date of Test:

Jul. 18-21, 2011

Date of Issue:

Jul. 22, 2011

Test Result : Pass

Testing Engineer : Apple Huang
 (Apple Huang)
 Technical Manager : Jim He
 (Jim He)
 Authorized Signatory : Bovey Yang
 (Bovey Yang)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2009 ANSI C63.4: 2003	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd.

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
OS01	ANSI	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
OS02	ANSI	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Floating Speaker
Brand Name	N/A
Model Name.	Shark, Lionfish
OEM Brand/Model No.	N/A
Model Difference	All the model are identical except the model name
Manufacturer	Aqua Ventus Ltd.
Manufacturer Address	Unit 514, 5/F, Kenning Industrial Bldg., NO 19 Wang Hoi Road Kowloon Bay Hong Kong
Product Description	The EUT is a Wireless Floating Speaker.
Power Source	DC Voltage
Power Rating	DC 5V 500mA From adapter AC 120V/60Hz
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.1 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Receiver
Mode 2	USB
Mode 3	SD
Mode 4	Music
Mode 5	FM

For Conducted Test	
Final Test Mode	Description
Mode 1	Receiver

For Radiated Test	
Final Test Mode	Description
Mode 2	USB
Mode 3	SD
Mode 4	Music
Mode 5	FM

2.2 DESCRIPTION OF TEST SETUP



2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC	Series No.	Note
E-1	Wireless Floating Speaker	N/A	Lionfish	ZN2SHARK-L FISH	N/A	EUT
E-2	Adapter	N/A	CTR04-050-0500U	N/A	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	YES	1.5M	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.4 MEASUREMENT INSTRUMENTS LIST

2.4.1 CONDUCTED EMISSION

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Test Receiver	R&S	ESCI	101160	2012-4-24
2	LISN	R&S	ENV216	101313	2012-4-24
3	LISN	Kyoritsu	KNW-407	8-1789-3	2012-4-24
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2012-4-24
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2012-4-24
6	Absorbing clamp	R&S	MDS-21	100423	2012-4-24

2.4.2 RADIATED EMISSION

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	E4407B	160400005	2012-4-24
2	Test Receiver	R&S	ESPI7	101318	2012-4-24
3	Bilog Antenna	TESEQ	CBL6111D	31216	2012-4-24
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2012-4-24
5	Spectrum Analyzer	ADVANTEST	R3182	150900201	2012-4-24
6	Low Noise Pre Amplifier	Tsj	MLA-0120-A 02-34	2648A04738	2012-4-24
7	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	451	2012-4-24
8	Loop Antenna	ARA	PLA-1030/B	1029	2012-3-19

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (2) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003/EN 55022

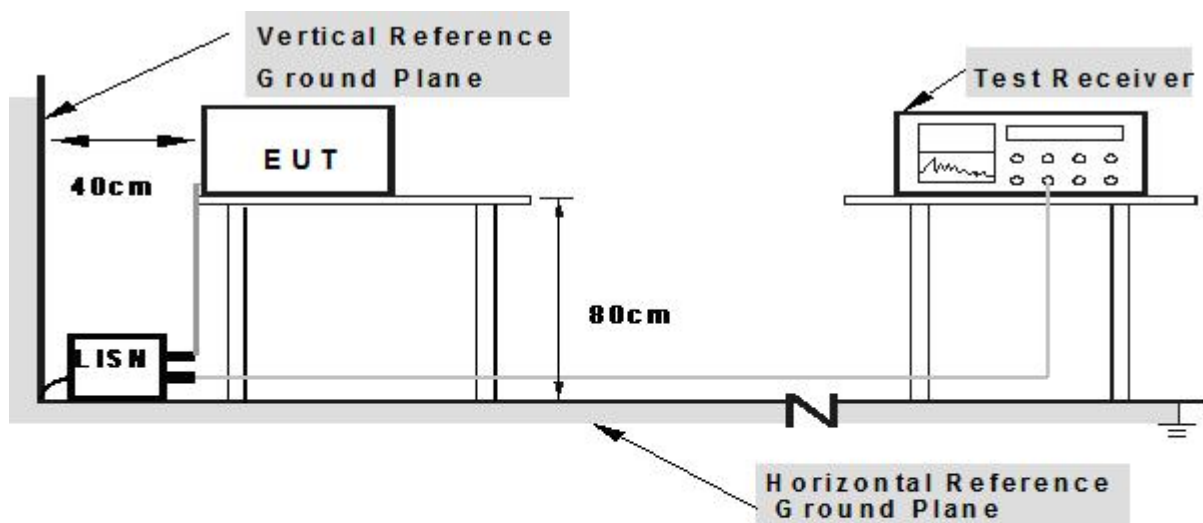
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

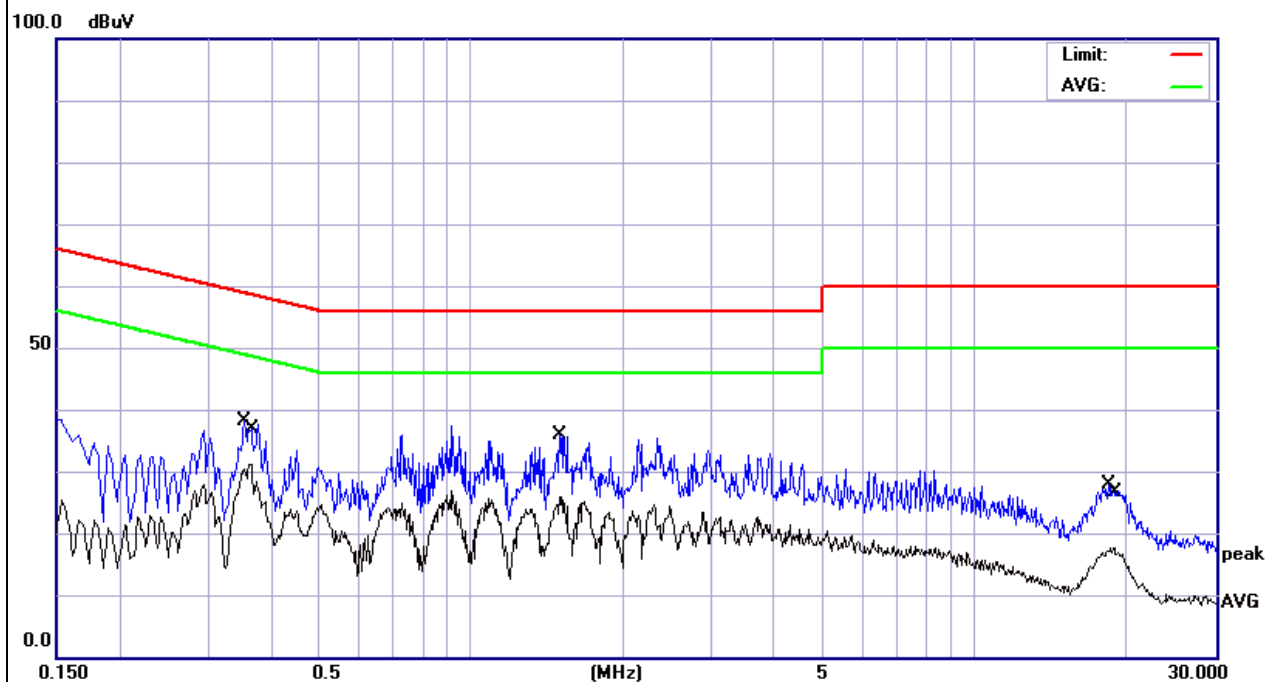
3.1.5 TEST RESULTS

EUT :	Wireless Floating Speaker	Model Name. :	Lionfish
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2011-07-22
Test Mode :	Receiver	Phase :	L
Test Voltage :	AC 120V/60Hz		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.3540	27.60	10.42	38.02	58.87	-20.85	QP
2	*	0.3620	20.63	10.42	31.05	48.68	-17.63	AVG
3		1.4980	25.50	10.41	35.91	56.00	-20.09	QP
4		1.5100	15.40	10.41	25.81	46.00	-20.19	AVG
5		18.3579	17.03	10.72	27.75	60.00	-32.25	QP
6		18.7259	6.87	10.73	17.60	50.00	-32.40	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case

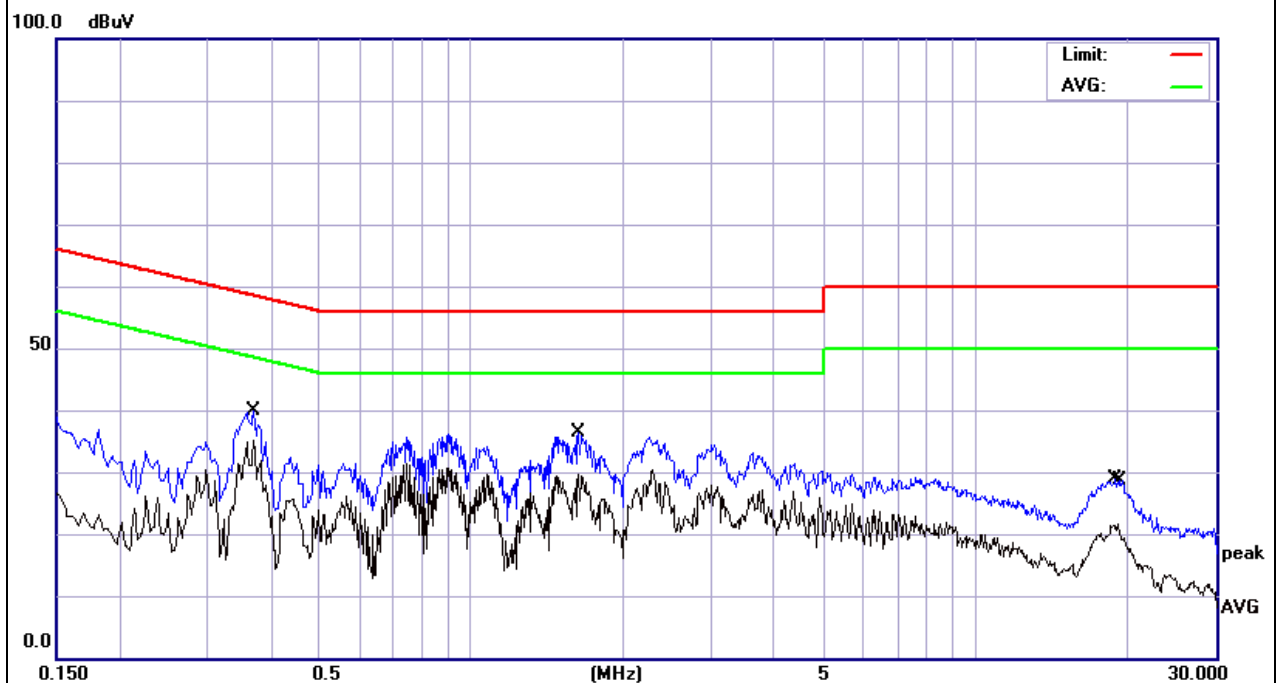


EUT :	Wireless Floating Speaker	Model Name. :	Lionfish
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2011-07-22
Test Mode :	Receiver	Phase :	N
Test Voltage :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.3700	29.37	10.42	39.79	58.50	-18.71	QP
2	*	0.3700	24.69	10.42	35.11	48.50	-13.39	AVG
3		1.6340	25.91	10.44	36.35	56.00	-19.65	QP
4		1.6340	19.14	10.44	29.58	46.00	-16.42	AVG
5		18.9939	18.06	10.76	28.82	60.00	-31.18	QP
6		19.1379	10.81	10.76	21.57	50.00	-28.43	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

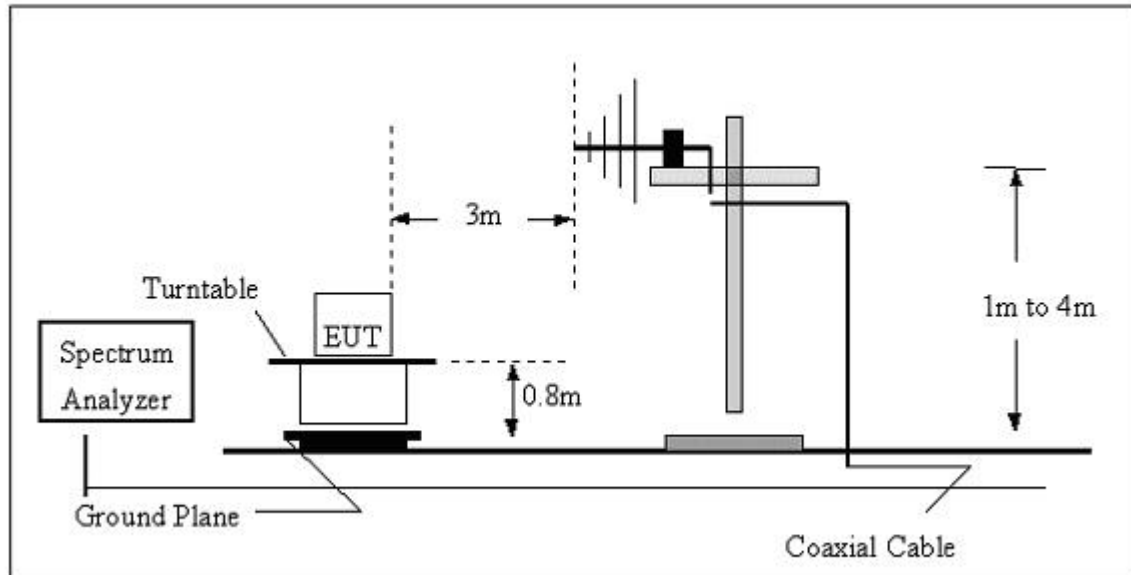
3.2.2 TEST PROCEDURE

- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

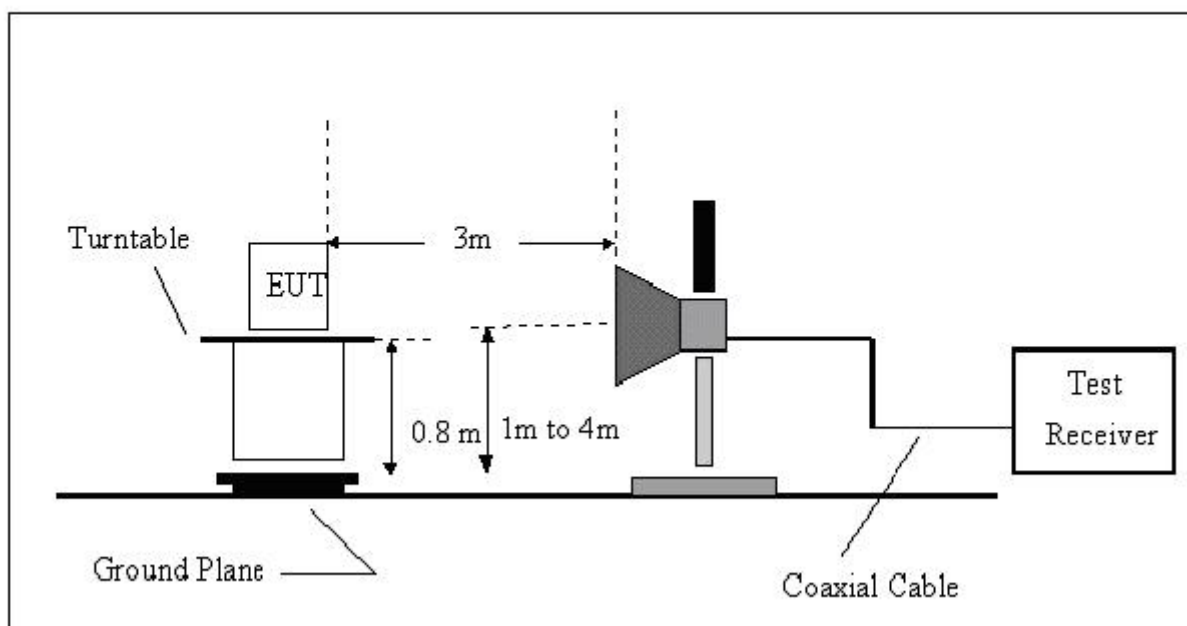
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Above 1GHz

(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



operating condition is specified in the follows during the testing.

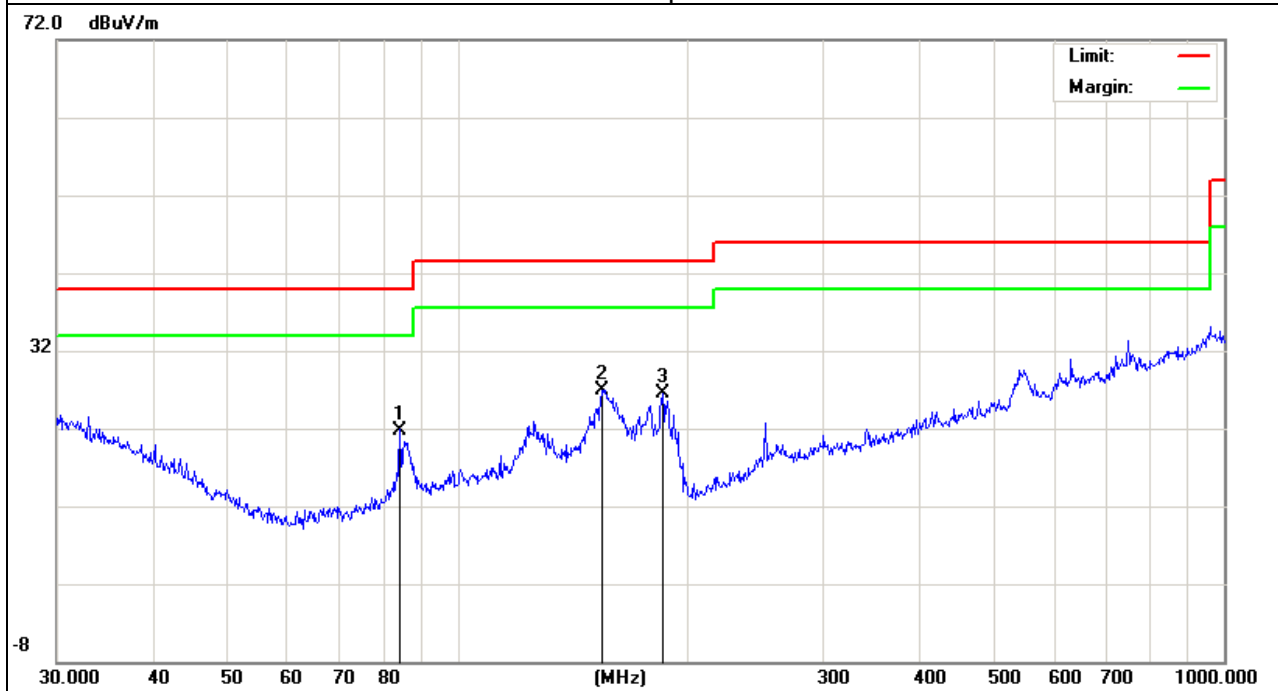
3.2.5 TEST RESULTS

EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	USB	Polarization :	Horizontal
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		84.1100	13.27	8.53	21.80	40.00	-18.20	QP
2	*	154.2786	15.49	11.38	26.87	43.50	-16.63	QP
3		185.1379	17.25	9.34	26.59	43.50	-16.91	QP

Remark:

1. " * " Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

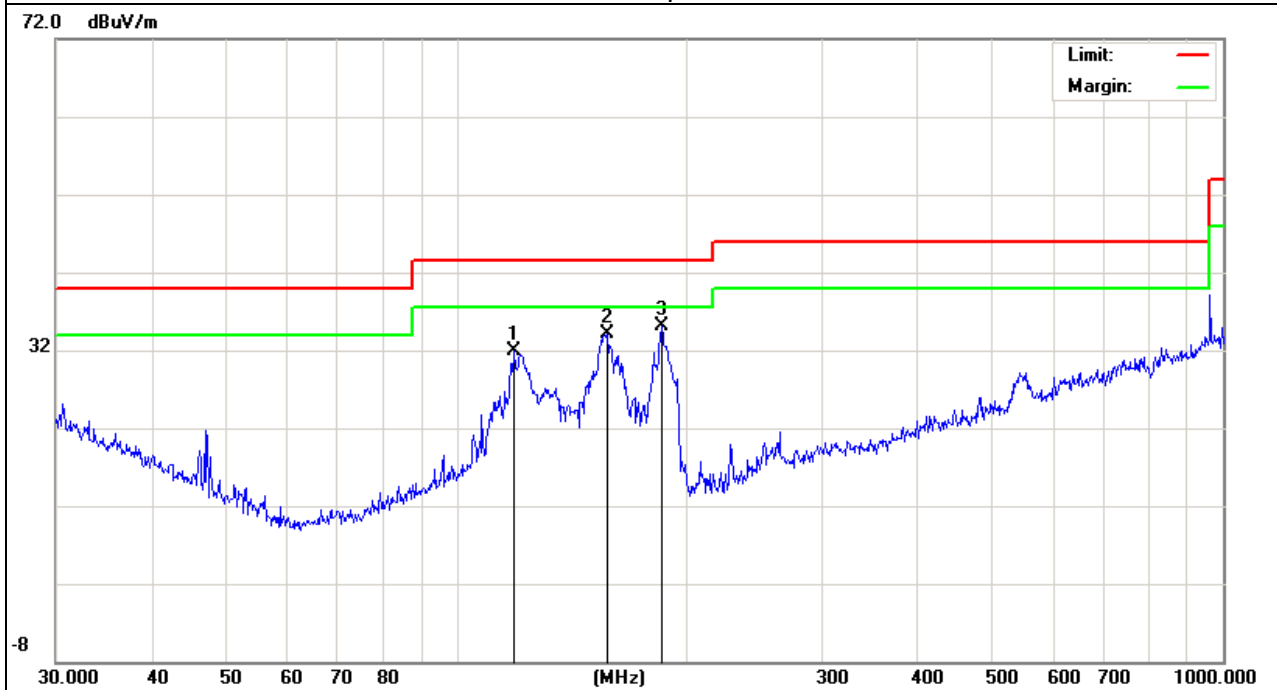


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	23 °C	Relative Humidity :	60 %
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	USB	Polarization :	Vertical
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		119.0180	20.10	11.75	31.85	43.50	-11.65	QP
2		157.5588	23.11	10.98	34.09	43.50	-9.41	QP
3	*	185.1379	25.76	9.34	35.10	43.50	-8.40	QP

Remark:

1. " * " Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

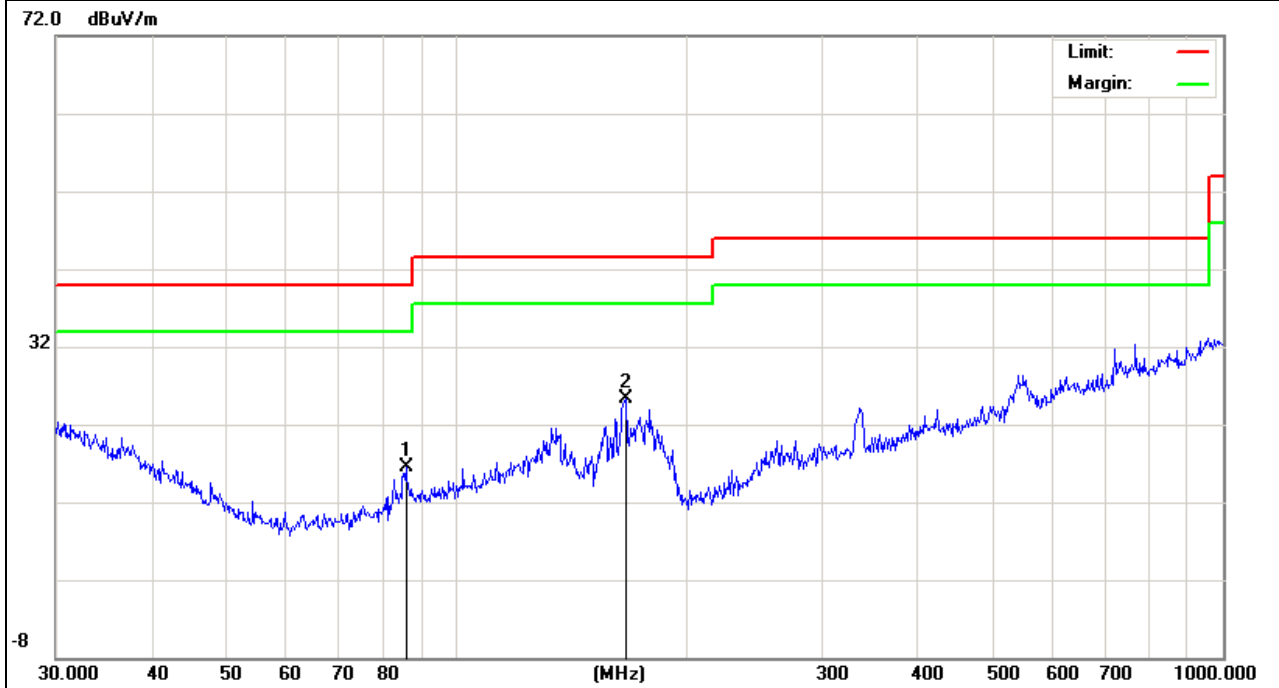


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	SD	Polarization :	Horizontal
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		85.8984	7.62	8.89	16.51	40.00	-23.49	QP
2	*	166.6514	14.91	10.31	25.22	43.50	-18.28	QP

Remark:

1. " * " Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

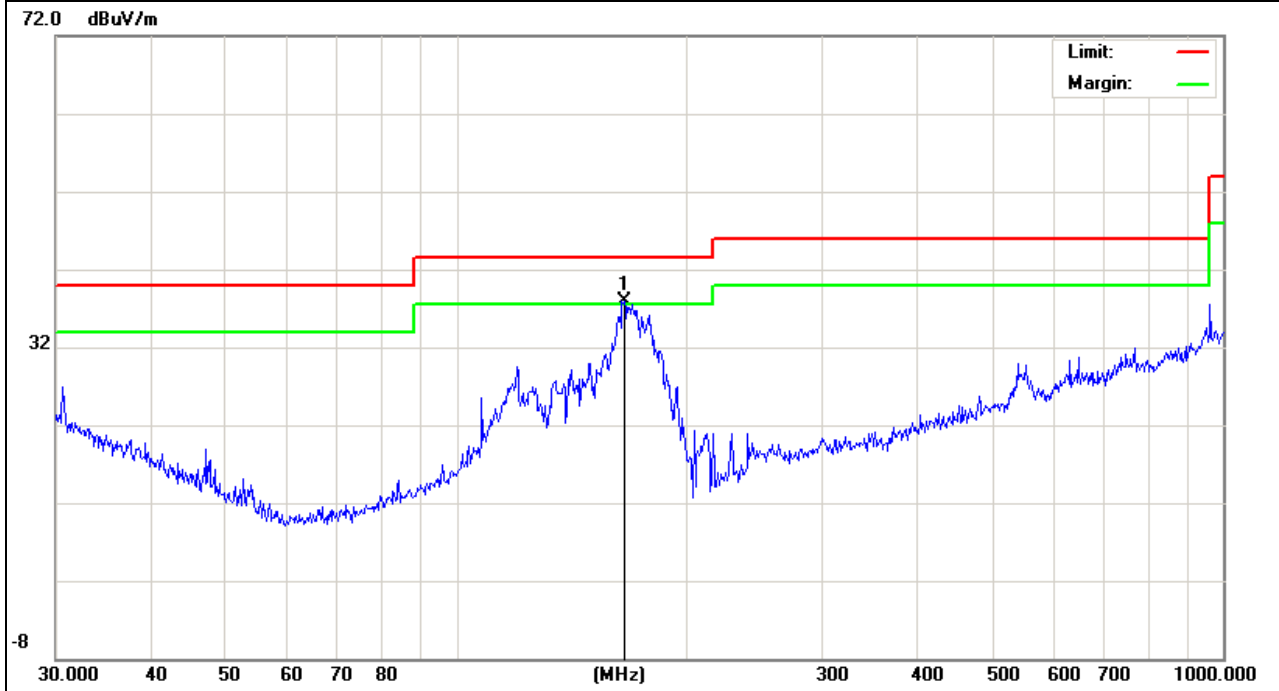


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	23 °C	Relative Humidity :	60 %
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	SD	Polarization :	Vertical
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB Detector
1	*	165.4866	27.43	10.41	37.84	43.50	-5.66 QP

Remark:

1. " *" Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

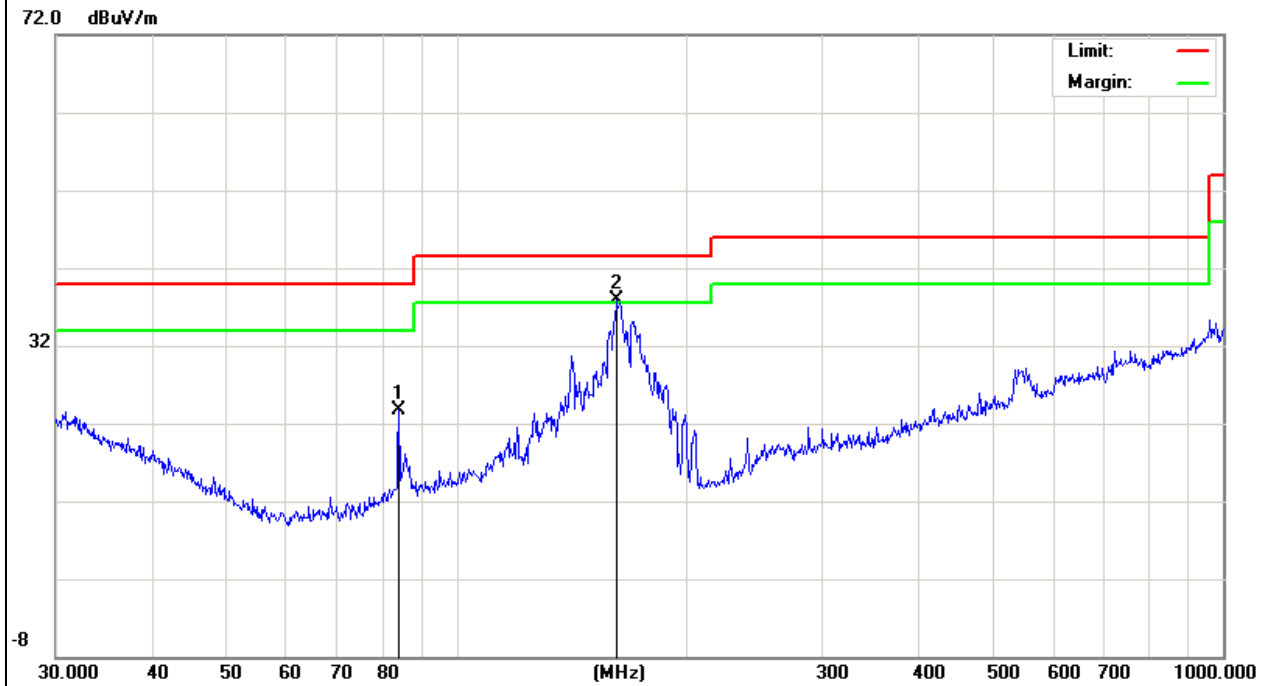


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	Music	Polarization :	Horizontal
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		84.1100	15.12	8.53	23.65	40.00	-16.35	QP
2	*	161.4742	27.27	10.59	37.86	43.50	-5.64	QP

Remark:

1. " * " Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

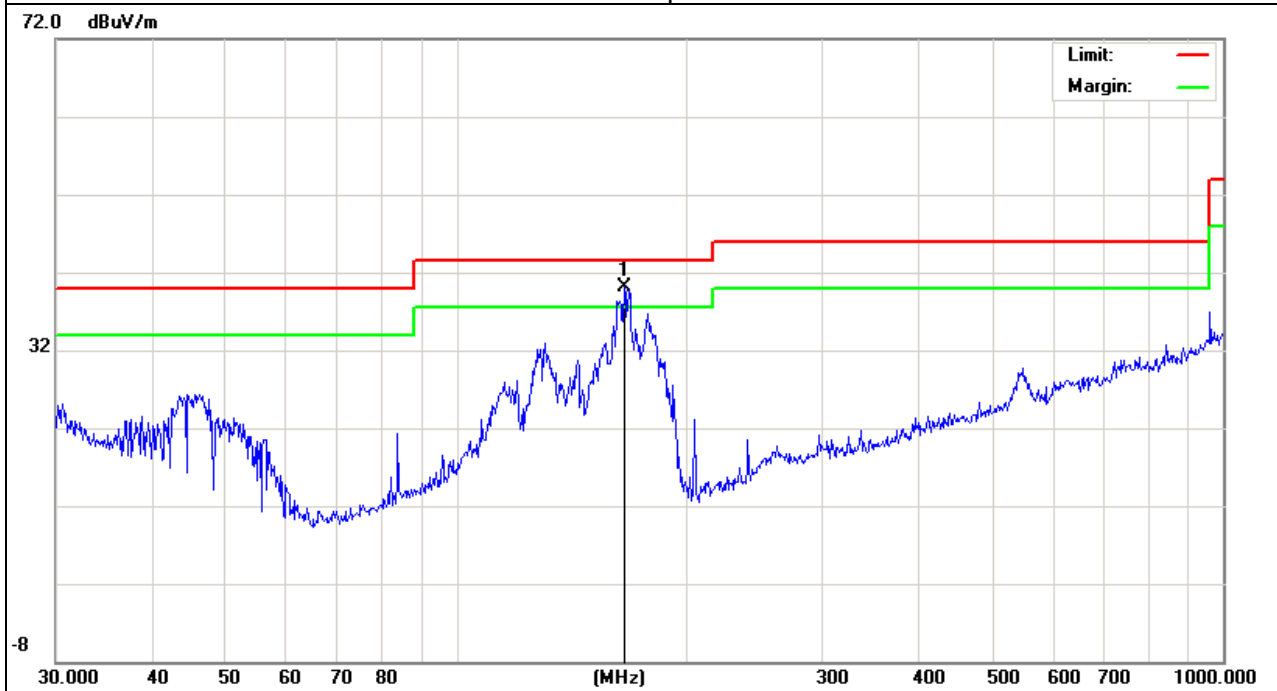


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	23 °C	Relative Humidity :	60 %
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	Music	Polarization :	Vertical
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
		MHz	Level	Factor	ment		
			dBuV	dB	dBuV/m	dBuV/m	dB
1	*	165.4866	29.63	10.41	40.04	43.50	-3.46
							QP

Remark:

1. " *" Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

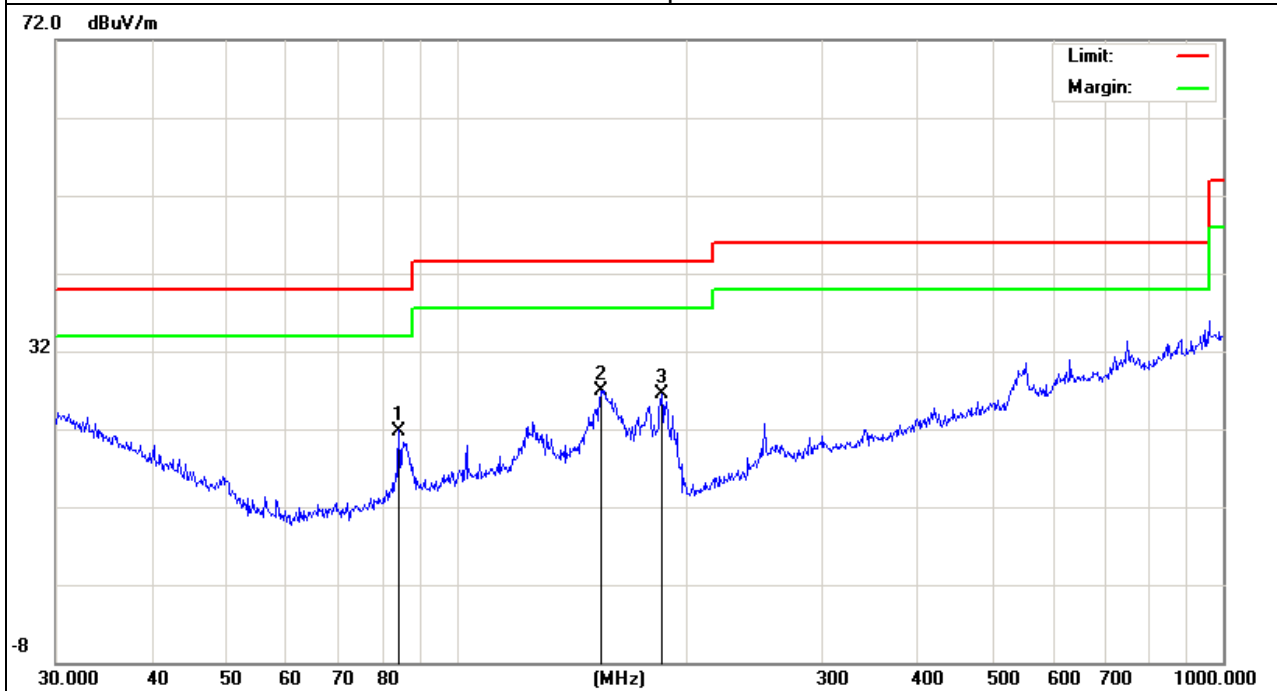


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	FM	Polarization :	Horizontal
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		84.1100	13.27	8.53	21.80	40.00	-18.20	QP
2	*	154.2786	15.49	11.38	26.87	43.50	-16.63	QP
3		185.1379	17.25	9.34	26.59	43.50	-16.91	QP

Remark:

1. " * " Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

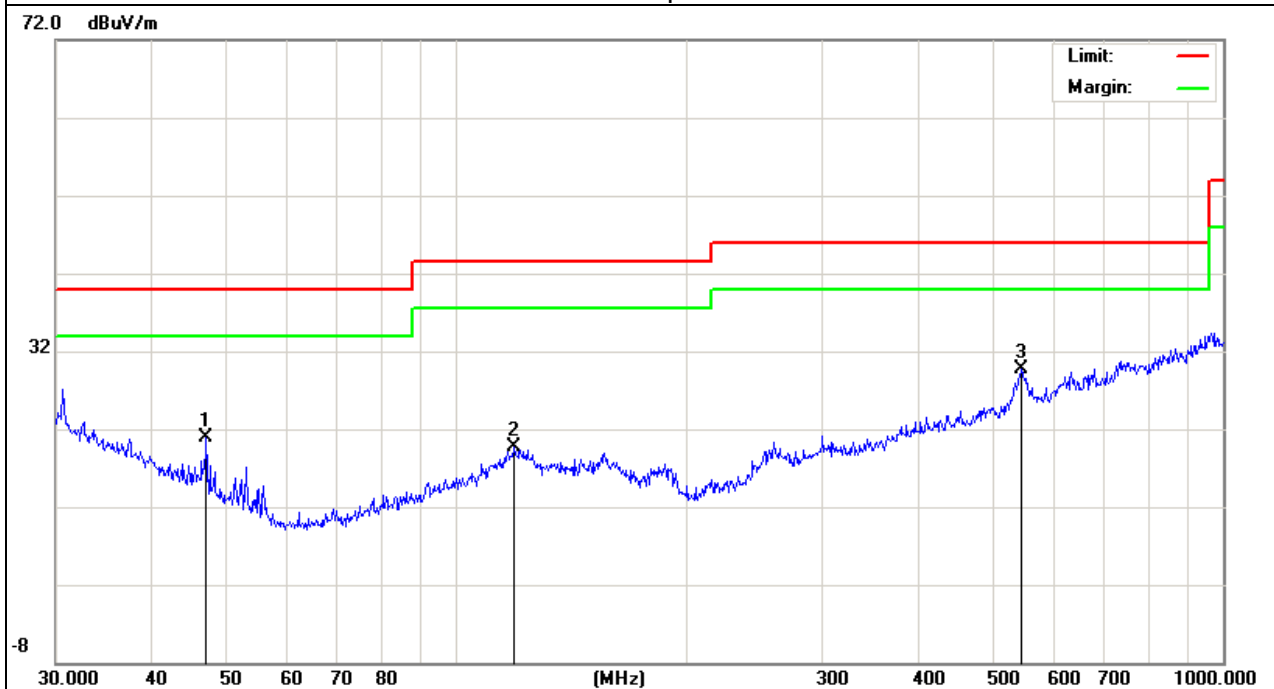


EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	23 °C	Relative Humidity :	60 %
Pressure :	1010 hPa	Test Date :	2011-07-21
Test Mode :	FM	Polarization :	Vertical
Test Power :	AC 120V/60Hz		

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		47.1599	11.37	9.53	20.90	40.00	-19.10	QP
2		119.0180	7.88	11.75	19.63	43.50	-23.87	QP
3	*	545.1826	6.20	23.47	29.67	46.00	-16.33	QP

Remark:

1. " * " Mark means readings are Peak Values.
2. " ** " Mark means readings are Quasi-Peak values.
3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



3.2.6 TEST RESULTS(1000~6000MHz)

EUT :	Wireless Floating Speaker	Model Name :	Lionfish
Temperature :	24 °C	Relative Humidity :	54 %
Pressure :	1010 hPa	Test Date :	N/A
Test Mode :	N/A		
Test Power :	N/A		