



SPORTON LAB.

FCC ID: OZY-CF002  
Issued on Apr. 13, 2004

Report No.: F432608

# FCC TEST REPORT

**CATEGORY** : Portable End Product

**PRODUCT NAME** : CLOWNFISH REMOTE CONTROL SUBMARINE

**FCC ID.** : OZY-CF002

**FILING TYPE** : Certification

**MODEL NAME** : CF-002

**APPLICANT** : Advocated Accompaniment Technology Co., Ltd.

8F-6, NO.76, Sec.1, Fu-Shin.S.Rd. Taipei, Taiwan, 106  
R.O.C.

**MANUFACTURER** : Same as Applicant

**ISSUED BY** : SPORTON INTERNATIONAL INC.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien,  
Taiwan, R.O.C.

## Statements:

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.



Dr. Alan Lane  
Vice General Manager  
Sporton International Inc.



1190  
ILAC MRA

NVLAP®

Lab Code: 200079-0

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***SPORTON International Inc.***

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## History of this test report

No additional attachment.

Additional attachment were issued as following record:



## 1. General Description of Equipment under Test

### 1.1 Applicant

**ADVOCATED ACCOMPANIMENT TECHNOLOGY CO., LTD**

8F-6, NO.76, Sec.1, Fu-Shin. S. Rd., Taipei, Taiwan, 106, R.O.C.

### 1.2 Manufacturer

Same as 1.1

### 1.3 Basic Description of Equipment under Test

This product is a wireless model controller used to control the toy submarine. The technical data has been listed on section " Feature of Equipment under Test ".

### 1.4 Features of Equipment under Test

ITEMS	DESCRIPTION
Type of Modulation	AM
Number of Channels	1
Frequency Band	49.86MHz
Function Type	Transmitter
Power Rating (DC/AC , Voltage)	3 VDC
Duty Cycle	100%
Temperature Range (Operating)	0 ~ 55



## 2. Test Configuration of the Equipment under Test

### 2.1 Description of the Test

- a. During testing, the equipment was placed on a non-conducting support.
- b. The EUT has been programmed to continuously transmit or receive during testing. The used peripherals as well as the configuration fulfill the requirements of ANSI C63.4:2001.
- b. The following test modes were performed for radiation test:
  - Mode 1: X axis
  - Mode 2: Y axis
  - Mode 3: Z axis
- c. The configuration is operated in a manner which tends to maximize its emission characteristics in a typical application.
- d. 3 meters measurement distance in semi-anechoic chamber was used in this test.

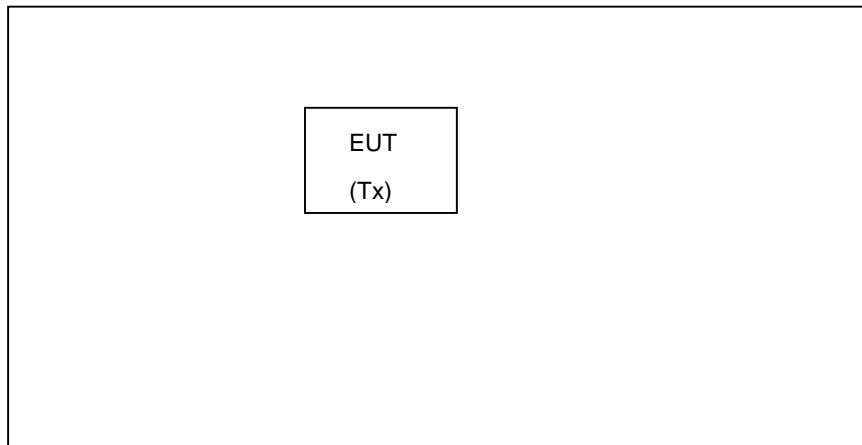
### 2.1 Frequency Range Investigated

Radiated emission test: from 30 MHz to 1000 MHz

### 2.2 Description of Test Supporting Units

The EUT was tested alone. No supporting device is needed for testing.

### 2.3 Connection Diagram of Test System





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## 2.4 Test Software

No test software was used during testing.

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### 3. Test Location and Standards

#### 3.1 Test Location

**Test Location :** Sporton Hwa Ya Testing Building  
**Address :** No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.  
Tel: +886 3 327 3456 Fax: +886 3 318 0055  
**Test Site No. :** 03CH02-HY

#### 3.2 Test Conditions

Normal Voltage : 120V/60Hz  
Extreme Voltage : 138V and 102V  
Normal Temperature : 20  
Extreme Temperature : -20 and 50

#### 3.3 Standards for Methods of Measurement

Here is the list of the standards followed in this test report.

**ANSI C63.4-2001**

**47 CFR Part 15 Subpart C ( Section 15.235 )**

#### 3.4 DoC Statement

This EUT is also classified as a device of computer peripheral Class B which DoC has to be followed. It has been verified according to the rule of 47 CFR part 15 Subpart B, and found that all the requirements has been fulfilled.



## 4. List of Measurements

### 4.1 Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	FCC Rule	Description of Test	Result
5.1	15.235(c)	Consumption Power From battery or power line	Pass
5.2	15.235(a)	Carrier field strength	Pass
5.3	15.235(b)	Band Edges Emission	Pass
5.4	15.107/15.207	AC Power Line Conducted Emission	Pass
5.5	15.235(b)/ 15.235(c)(4)	Spurious Radiated Emission	Pass
5.6	15.235(c)(3)	Antenna Requirement	Pass



## 5. Test Result

### 5.1 Consumption Power from battery or power line

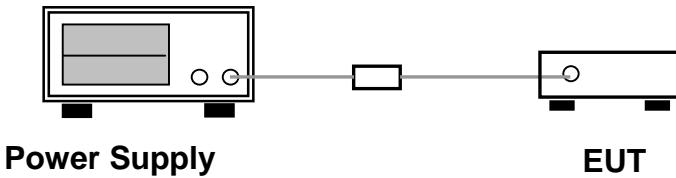
#### 5.1.1 Measuring Instruments

Item 10 of the table on section 7.

#### 5.1.2 Test Procedures

1. The transmitter DC input was connected to the power supply through cable.
2. Record the consumption Voltage and current.

#### 5.1.3 Test Setup Layout



#### 5.1.4 Test Result

- Temperature: 24°C
- Relative Humidity: 62 %
- Duty cycle of the equipment during the test: 100%

Voltage (V)	Current (A)	Power (mW)	Limits (mW)
3	0.005	15	100



## 5.2 Carrier Field Strength

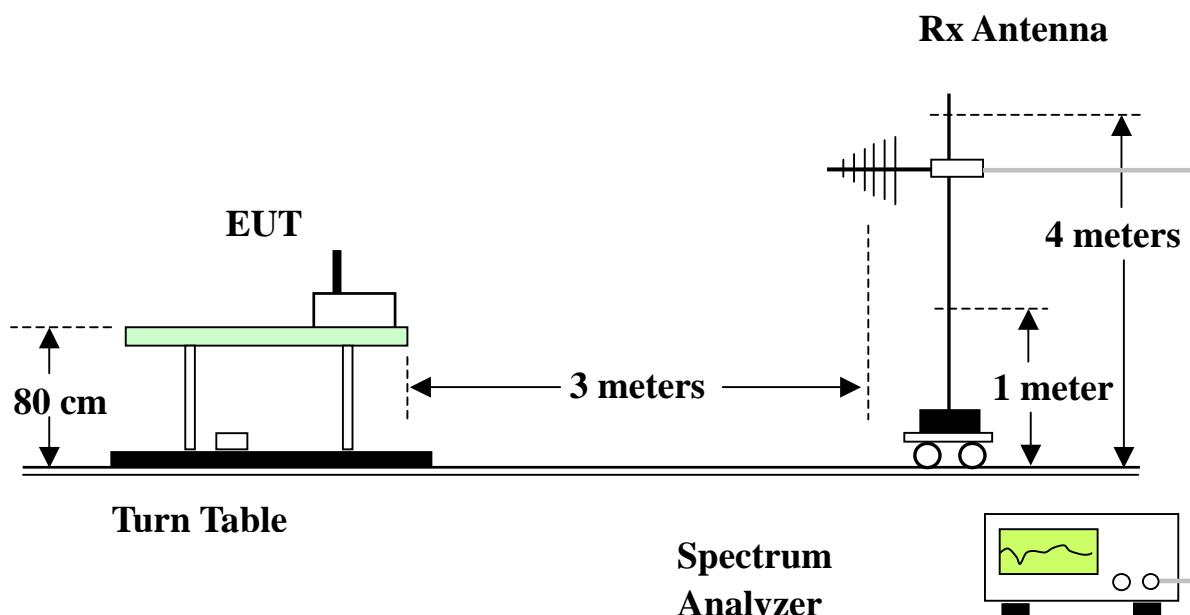
### 5.2.1 Measuring Instruments

Item 1~9 of the table on section 7.

### 5.2.2 Test Procedures

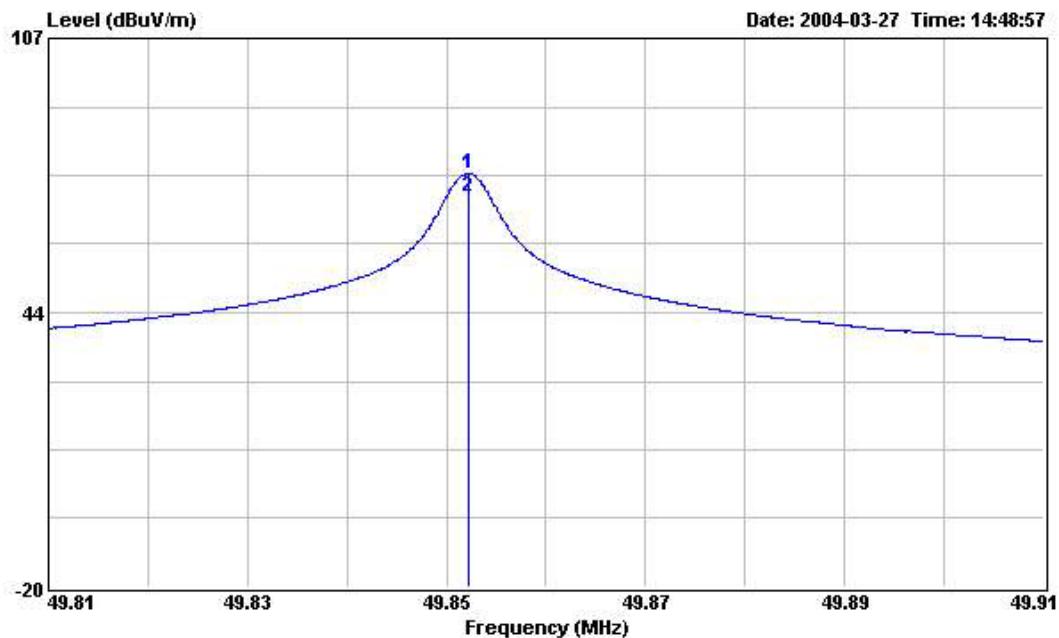
- a) Configure the EUT according to ANSI C63.4.
- b) The EUT was placed on the top of the turn table 0.8 meter above ground.
- c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
- d) Power on the EUT and all the supporting units.
- e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
- f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
- g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- i) For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- j) If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
- k) For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 5.2.3 Test Setup Layout





#### 5.2.4 Test Result



Frequency (MHz)	Level (dBuV/m)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Limit (dBuV/m)	Detect Mode
49.852	75.60	96.67	8.66	1.27	31.00	100	Peak
49.852	70.45	91.52	8.66	1.27	31.00	80	AV



## 5.3 Band Edges Emission

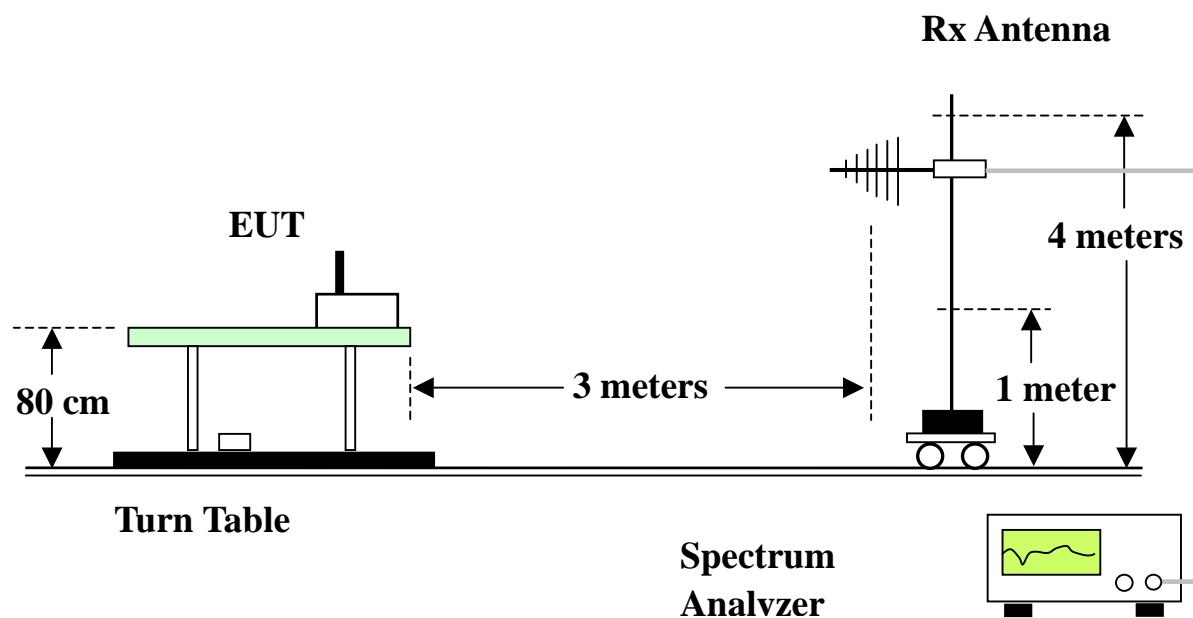
### 5.3.1 Measuring Instruments

Item 1~9 of the table on section 7.

### 5.3.2 Test Procedures

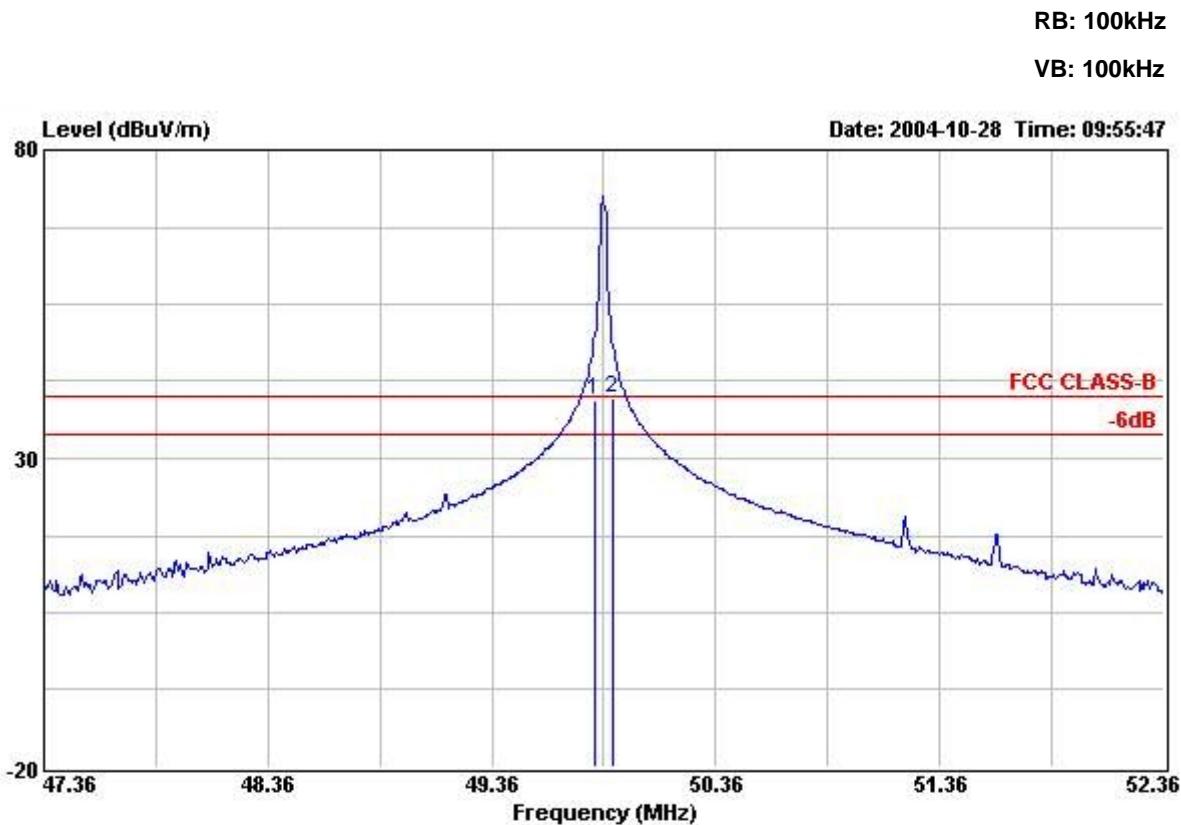
- a) Configure the EUT according to ANSI C63.4.
- b) The EUT was placed on the top of the turn table 0.8 meter above ground.
- c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
- d) Power on the EUT and all the supporting units.
- e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
- f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
- g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- i) The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26dB below the level of the unmodulated carrier.

### 5.3.3 Test Setup Layout





### 5.3.4 Test Result



Freq MHz	Level dBuV/m	Over Limit	Limit	Read Line	Probe Level	Cable Factor	Preamp Loss	Remark	Ant Pos	Table Pos
		dB	dBuV/m	dBuV	dB	dB	dB	deg	cm	deg
49.820	39.49	-0.51	40.00	54.89	11.42	1.18	28.00	QP	---	---
49.900	39.65	-0.35	40.00	55.06	11.41	1.18	28.00	QP	---	---



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## 5.4 AC Power Line Conducted Emission

The power is from Battery.

Conduction Powerline test is not applicable for this EUT.



## 5.5 Test of Radiated Emission

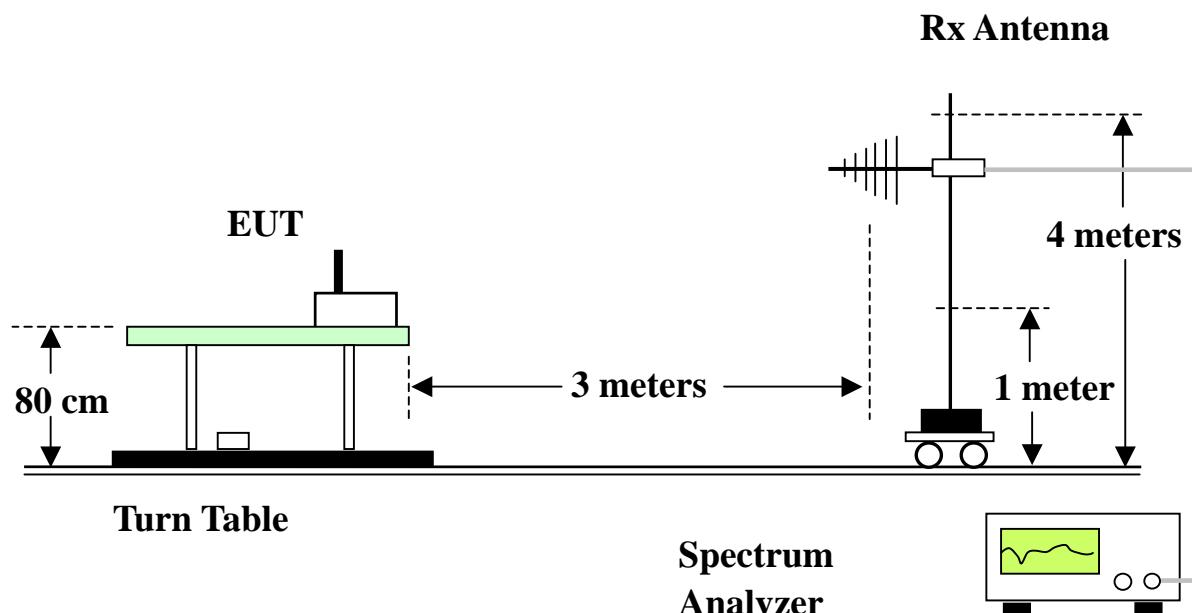
### 5.5.1 Measuring Instruments

Item 1~9 of the table on section 7.

### 5.5.2 Test Procedures

- a) Configure the EUT according to ANSI C63.4.
- b) The EUT was placed on the top of the turn table 0.8 meter above ground.
- c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
- d) Power on the EUT and all the supporting units.
- e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
- f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
- g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- i) For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- j) If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
- k) For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 5.5.3. Test Setup Layout





#### 5.5.4 Test Results and Limit

**Note:**

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Test Mode	Mode 1	Temperature	24 deg. C	Tested By	Wayne Hsu
Freq. Range	30MHz~1GHz	Humidity	62%		

#### (A) Polarization: Horizontal

Freq	Level	Over Limit		Read		Probe Factor	Cable Preamp		Ant Pos	Table Pos	
		MHz	dBuV/m	dB	dBuV/m		dBuV	dB			
1	99.660	36.07	-7.43	43.50	53.32	11.64	1.81	30.70	Peak	400	275
2	149.340	34.24	-9.26	43.50	52.05	10.56	2.23	30.60	Peak	---	---
3	199.290	35.69	-7.81	43.50	54.01	9.59	2.59	30.50	Peak	---	---
4	248.970	31.40	-14.60	46.00	45.61	13.32	2.92	30.45	Peak	---	---
1	349.000	36.15	-9.85	46.00	48.69	14.43	3.43	30.40	Peak	---	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit		Read		Probe Factor	Cable Preamp		Ant Pos	Table Pos	
		MHz	dBuV/m	dB	dBuV/m		dBuV	dB			
1	99.660	36.24	-7.26	43.50	53.49	11.64	1.81	30.70	Peak	---	---
2	149.340	30.75	-12.75	43.50	48.56	10.56	2.23	30.60	Peak	---	---
3	199.290	34.73	-8.77	43.50	53.05	9.59	2.59	30.50	Peak	---	---
4	248.970	31.53	-14.47	46.00	45.74	13.32	2.92	30.45	Peak	---	---
1	349.000	23.15	-22.85	46.00	35.69	14.43	3.43	30.40	Peak	---	---



Test Mode	Mode 2	Temperature	24 deg. C	Tested By	Wayne Hsu
Freq. Range	1GHz~25GHz	Humidity	62%		

**(A) Polarization: Horizontal**

	Freq	Over Level	Limit	Read Line	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	99.660	31.57	-11.93	43.50	48.82	11.64	1.81	30.70	Peak	---
2	149.340	24.20	-19.30	43.50	42.01	10.56	2.23	30.60	Peak	---
3	199.290	24.21	-19.29	43.50	42.53	9.59	2.59	30.50	Peak	---
1	349.000	23.33	-22.67	46.00	35.87	14.43	3.43	30.40	Peak	---

**(B) Polarization: Vertical**

	Freq	Over Level	Limit	Read Line	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	99.700	38.85	-4.65	43.50	56.10	11.64	1.81	30.70	Peak	100 283
2	149.340	29.38	-14.12	43.50	47.19	10.56	2.23	30.60	Peak	100 264
3	199.290	28.62	-14.88	43.50	46.94	9.59	2.59	30.50	Peak	---
4	248.970	29.07	-16.93	46.00	43.28	13.32	2.92	30.45	Peak	---
1	349.000	24.63	-21.37	46.00	37.17	14.43	3.43	30.40	Peak	---



Test Mode	Mode 3	Temperature	24 deg. C	Tested By	Wayne Hsu
Freq. Range	1GHz~25GHz	Humidity	62%		

**(A) Polarization: Horizontal**

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Ant Pos	Table Pos
		Limit	Line	Level	Factor	Loss	Factor		
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	deg
1	99.660	34.61	-8.89	43.50	51.86	11.64	1.81	30.70	Peak
2	149.340	27.01	-16.49	43.50	44.82	10.56	2.23	30.60	Peak
3	199.290	32.69	-10.81	43.50	51.01	9.59	2.59	30.50	Peak
4	248.970	24.00	-22.00	46.00	38.21	13.32	2.92	30.45	Peak
1	349.000	35.38	-10.62	46.00	47.92	14.43	3.43	30.40	Peak

**(B) Polarization: Vertical**

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Ant Pos	Table Pos
		Limit	Line	Level	Factor	Loss	Factor		
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	deg
1	99.660	35.54	-7.96	43.50	52.79	11.64	1.81	30.70	Peak
2	149.340	29.19	-14.31	43.50	47.00	10.56	2.23	30.60	Peak
3	199.290	28.22	-15.28	43.50	46.54	9.59	2.59	30.50	Peak
1	349.000	24.09	-21.91	46.00	36.63	14.43	3.43	30.40	Peak



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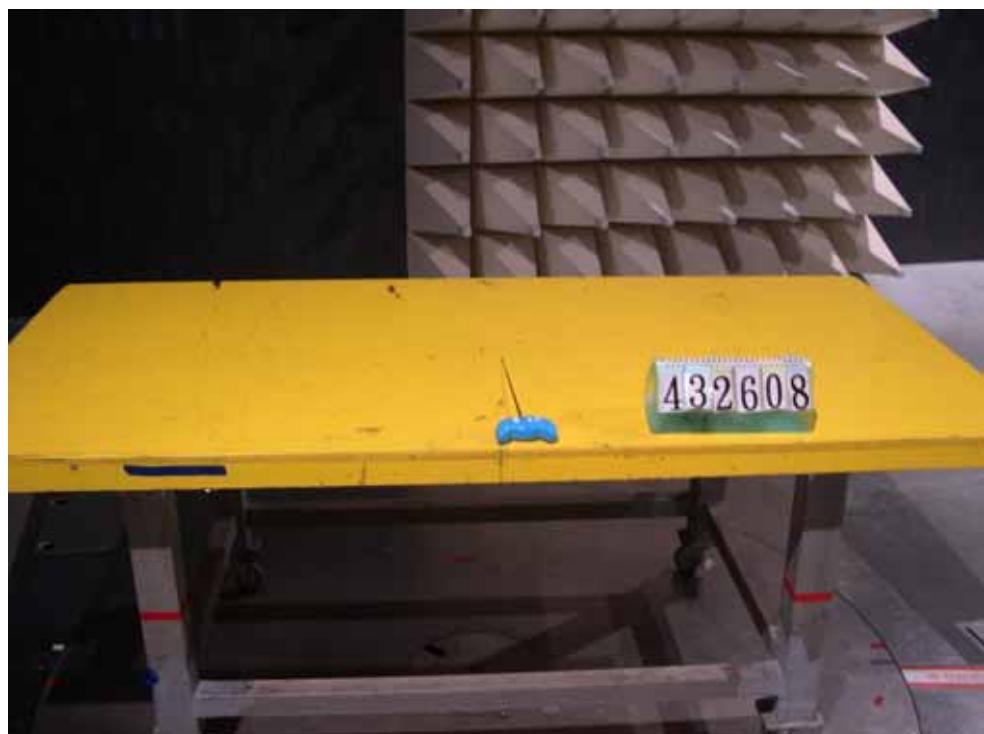
#### 5.5.5 Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW





## 6 Antenna Requirements

### 6.1 Standard Applicable

#### 47 CFR Part15 Section 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.

#### 47 CFR Part15 Section 15.235 (c):

The antenna shall be a single element, one meter or less in length, permanently mounted on the enclosure containing the device.



## 7 List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	Jun. 14, 2003	Radiation (03CH02-HY)
2	Spectrum Analyzer	R&S	FSP7	100644	9KHz – 30GHz	May 26, 2003	Radiation (03CH02-HY)
3	Receiver	SCHAFFNER	SCR 3501	416	9 KHz –1GHz	Feb. 26, 2004	Radiation (03CH02-HY)
4	Amplifier	ADVANTEST	BB525C	CH300001	9KHz – 3GHz	Nov. 21, 2003	Radiation (03CH02-HY)
5	Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz –2GHz	Dec. 03, 2003	Radiation (03CH02-HY)
6	Turn Table	HD	DS 420	420/649/00	0 ~ 360 degree	N/A	Radiation (03CH02-HY)
7	Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)
8	RF Cable-R03m	Jye Bao	RG142	CB020	30MHz~1GHz	Dec. 02, 2003	Radiation (03CH02-HY)
9	RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz-29.5GHz	Dec. 05, 2003	Radiation
10	DC power source	G.W.	GPC-6030D	C671845	DC 1V~60V	Nov. 06, 2003	Conducted

Calibration Interval of instruments listed above is one year.