

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.





Table of Contents

History of this test report.....	ii
1. General Description of Equipment under Test.....	1
1.1 Applicant 1	
1.2 Manufacturer	1
1.3 Basic Description of Equipment under Test.....	1
1.4 Features of Equipment under Test	1
2. Test Configuration of the Equipment under Test.....	2
2.1 Description of the Test	2
2.1 Frequency Range Investigated	2
2.2 Description of Test Supporting Units	2
2.3 Connection Diagram of Test System	2
2.4 Test Software.....	3
3. Test Location and Standards	4
3.1 Test Location	4
3.2 Test Conditions	4
3.3 Standards for Methods of Measurement.....	4
3.4 DoC Statement	4
4. List of Measurements.....	5
4.1 Summary of the Test Results.....	5
5. Test Result	6
6 Antenna Requirements	20
7 List of Measuring Equipments Used	21
Appendix A. Photographs of EUT.....	A1 ~ A5

History of this test report

- ☒ No additional attachment.
- ☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

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.

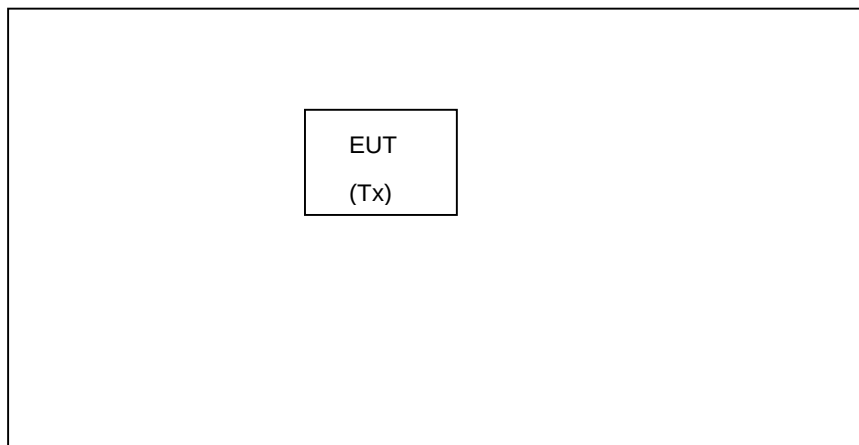
2.1 Frequency Range Investigated

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





2.4 Test Software

No test software was used during testing.



3. Test Location and Standards

3.1 Test Location

Test Location : Sporton Hwa Ya Testing Building

Address : No. 52, Hwa Ya 1st 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

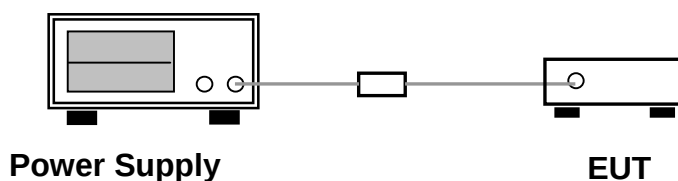
5.1.1 Measuring Instruments

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



5.2 Carrier Field Strength

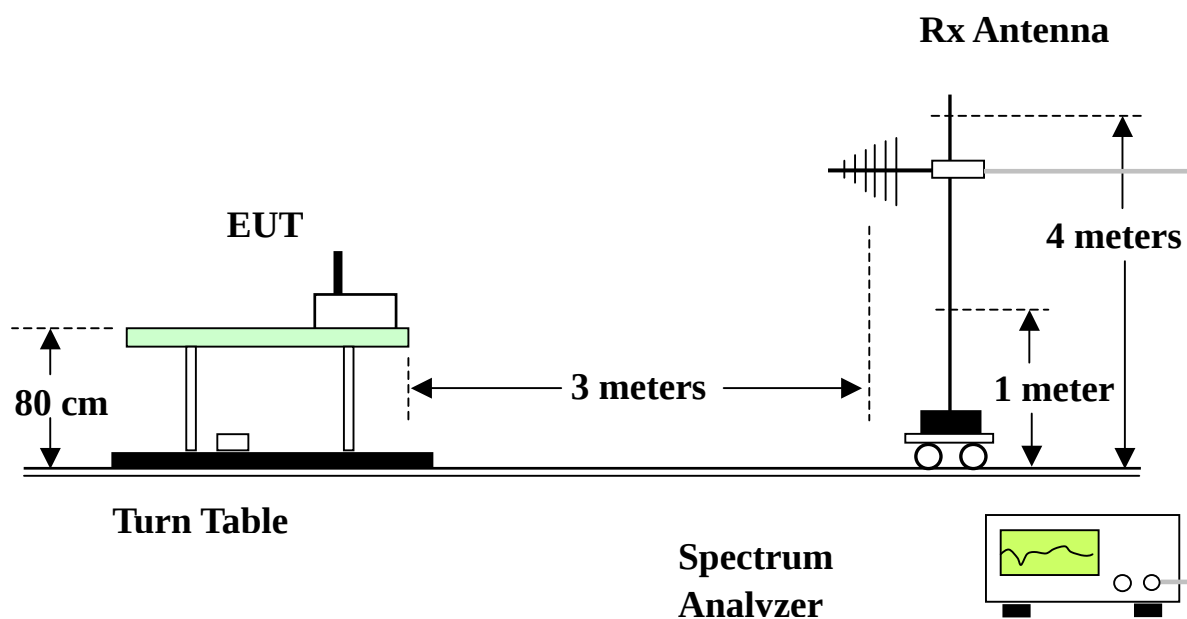
5.2.1 Measuring Instruments

Item 1~9 of the table on section 7.

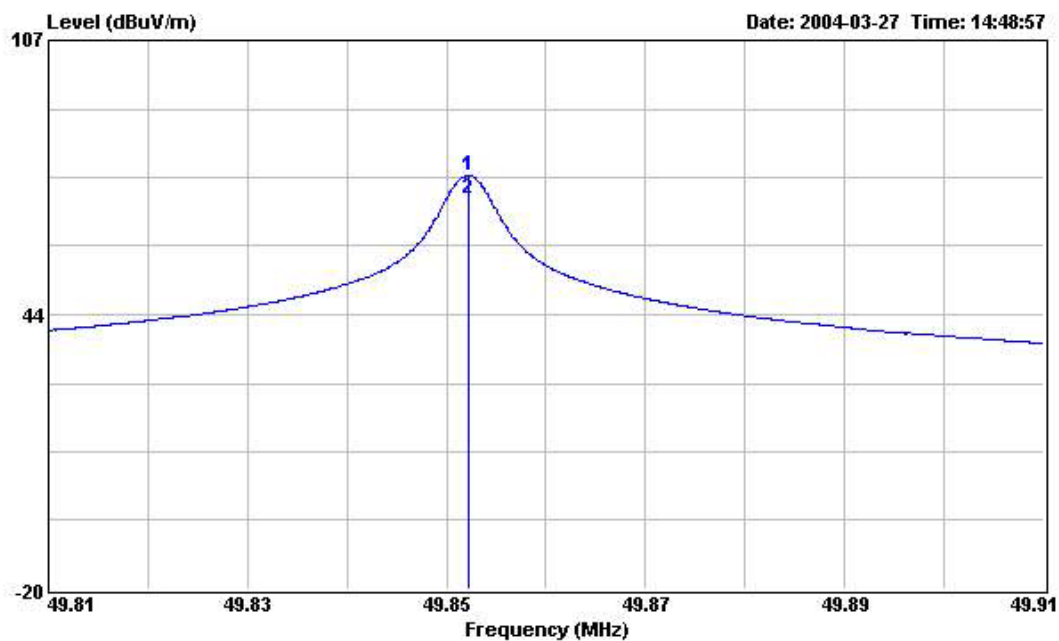
5.2.2 Test Procedures

- 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 Line (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

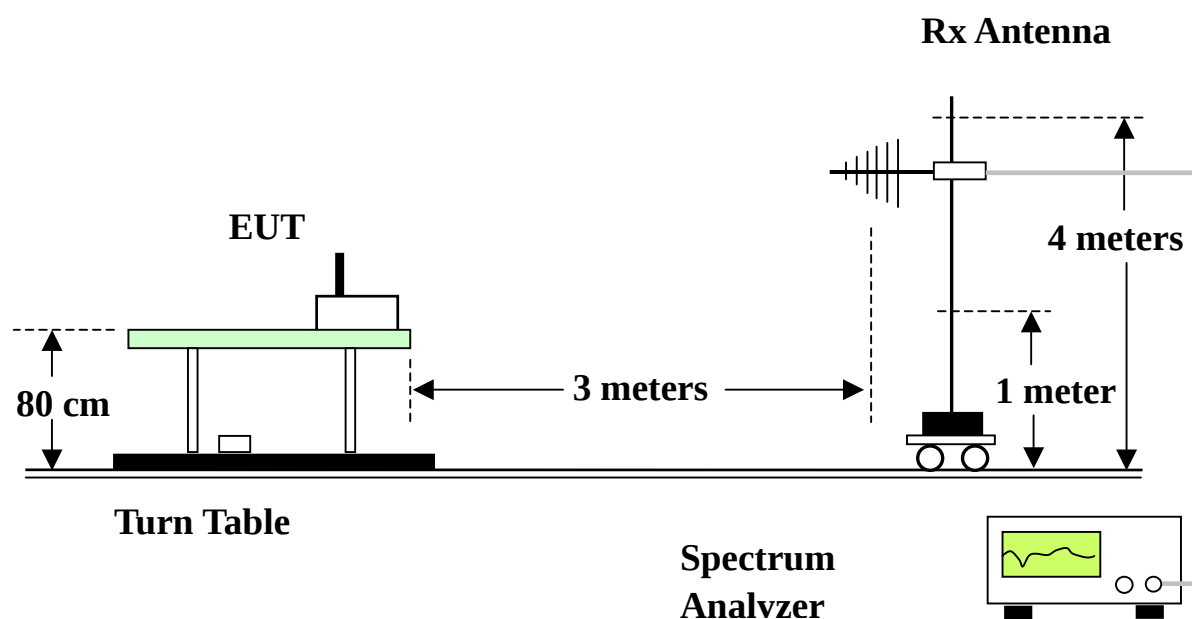
5.3.1 Measuring Instruments

Item 1~9 of the table on section 7.

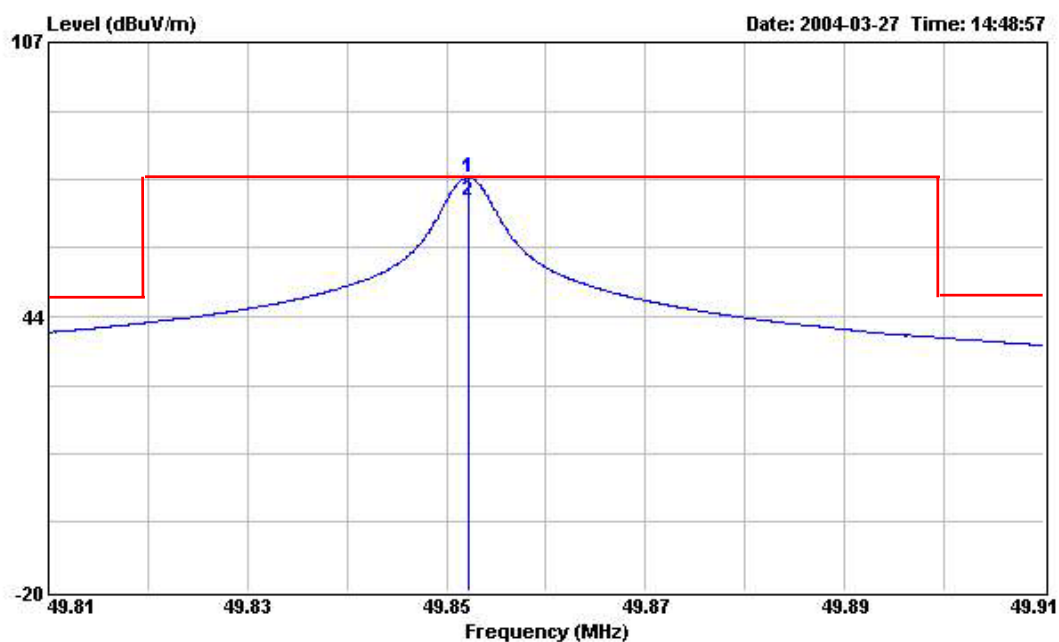
5.3.2 Test Procedures

- 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



Frequency (MHz)	Level (dBuV/m)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Limit Line (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



5.4 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

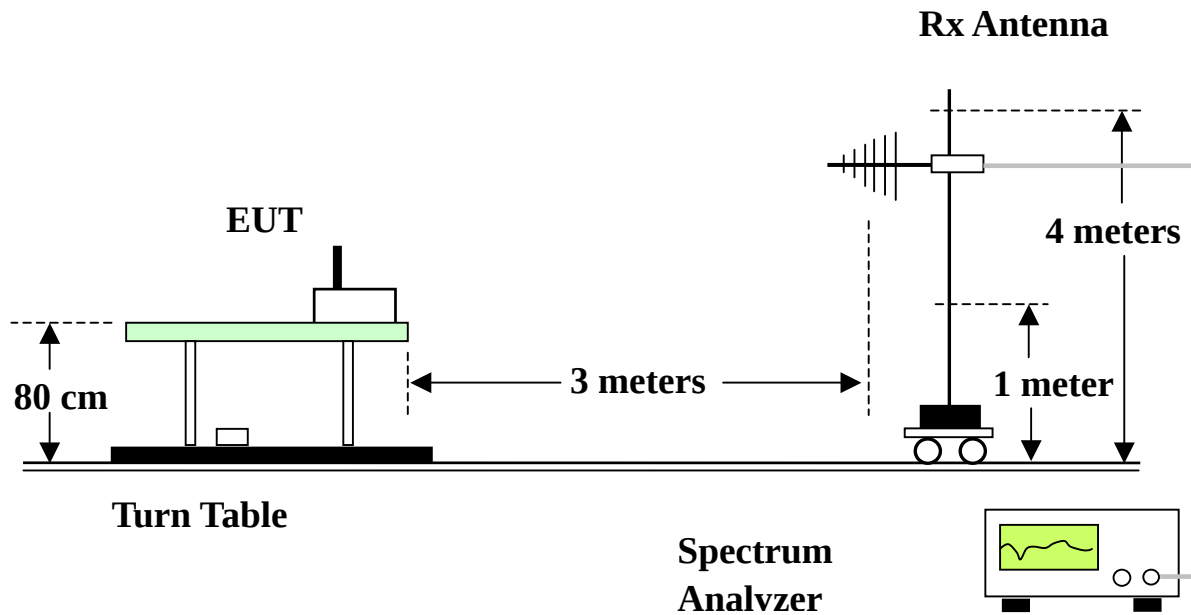
5.5.1 Measuring Instruments

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	Limit Line	Read Level	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	36.07	-7.43	43.50	53.32	11.64	1.81	30.70	Average	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	Limit Line	Read Level	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	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	Level	Over Limit	Limit Line	Read Level	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	Level	Over Limit	Limit Line	Read Level	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	Average	100	283
2	149.340	29.38	-14.12	43.50	47.19	10.56	2.23	30.60	Average	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	Limit Line	Read Level	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	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	Limit Line	Read Level	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	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	---	---

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.

APPENDIX A. Photographs of EUT



