FCC TEST REPORT

CATEGORY	:	Portable
PRODUCT NAME	:	Air Flo Wireless Controller for Xbox (2.4G)
FCC ID.	:	RNIX83381435-H
FILING TYPE	:	Certification
BRAND NAME	:	NYKO
MODEL NAME	:	81435
APPLICANT	:	**Esel International Co., Ltd.** Rm 15-17, 5/F, Cardinal Ind, Bldg, No.17 On Lok Mun St., Faniling, N.T. Hong Kong
MANUFACTURER	:	**Eastem Sources Electronics Manufacturer** Daji Industrial Zone, Hengshan District, Shipai Town, Dongguan City, Guangdong China
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.

Lab Code: 200079-0

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History of this test report

Original Report Issue Date: Nov. 12, 2004
Report No.: FR4O0803-01

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

with

47 CFR FCC Part 15 Subpart C (Section 15.249)

PRODUCT NAME : Air Flo Wireless Controller for Xbox (2.4G)

BRAND NAME : NYKO

MODEL NAME : 81435

APPLICANT : **Esel International Co., Ltd.**
Rm 15-17, 5/F, Cardinal Ind, Bldg, No.17 On Lok Mun St.,
Faniling, N.T. Hong Kong

MANUFACTURER : **Eastem Sources Electronics Manufacturer**
Daji Industrial Zone, Hengshan District, Shipai Town,
Dongguan City, Guangdong China

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and all test are performed according to 47 CFR FCC Part 15. Testing was carried out on Nov. 10, 2004 at SPORTON International Inc. LAB.

Dr. Alan Lane
Vice General Manager
SPORTON International Inc.

1. General Description of Equipment under Test

1.1. Applicant

Esel International Co., Ltd.
Rm 15-17, 5/F, Cardinal Ind, Bldg, No.17 On Lok Mun St., Faniling, N.T. Hong Kong

1.2. Manufacturer

Eastem Sources Electronics Manufacturer
Daji Industrial Zone, Hengshan District, Shipai Town, Dongguan City, Guangdong China

1.3. Basic Description of Equipment under Test

This product is a wireless XBOX Controller and its receiver. Both of them are transceiver with FSK modulation RF solution. The technical data has been listed on section " Features of Equipment under Test ". This report is for the receiver part only.

1.4. Features of Equipment under Test

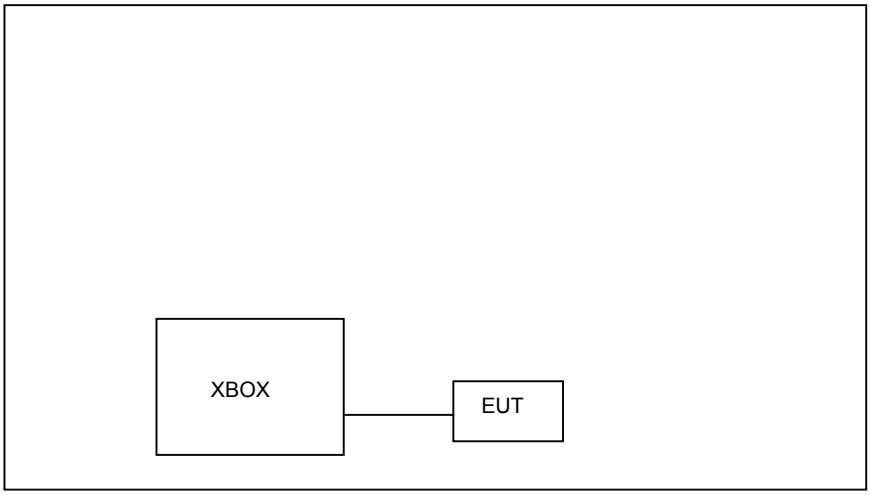
Items	Description
Type of Modulation	FSK
Number of Channels	80
Frequency Band	2402MHz ~ 2480MHz
Carrier Frequency	Please reference table below.
Antenna Type	Printed Antenna
Mode of operation	Half-Duplex
Testing Duty Cycle	50%
Power Rating (DC/AC, Voltage)	6VDC (XBOX powered)
Temperature Range (Operating)	0~ 40 ℃

1.5. Table for Carrier Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	39	2441 MHz	79	2481MHz	-	-

2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System



2.2. The Test Mode Description

Spurious emission below 1GHz is independent of channel selection, so only channel 79 was worst case tested.
AC conduction emission is independent of channel selection, so only channel 79 was worst case tested.

2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	Serial No.	CE mark	Data cable (m)
XBOX	Microsoft	R60-00133	10032	Yes	-

3. General Information of Test

3.1. Test Facility

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
	:	TEL 886-3-327-3456
	:	FAX 886-3-318-0055
Test Site No	:	03CH03-HY / CO04-HY

3.2. Test Conditions

Normal Voltage	:	110V/60Hz (host XBOX)
Extreme Voltages	:	126.50V and 93.5V (host XBOX)
Normal Temperature	:	20℃
Extreme Temperature	:	0℃ and 40℃

3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.
ANSI C63.4-2003
47 CFR Part 15 Subpart C (Section 15.249)

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.

3.5. Frequency Range Investigated

Radiated emission test: from 30 MHz to 10th carrier harmonic

3.6. Test Distance

The test distance of radiated emission (30MHz~1GHz) test from antenna to EUT is 3 M.
The test distance of radiated emission (1GHz~10th carrier harmonic) test from antenna to EUT is 1 M.

3.7. Test Software

There is no special test software. The channel can be switched by the hardware key.

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	15.249	Maximum Carrier Field Strength	Pass
5.2	15.207	AC Power Line Conducted Emission	NA
5.3	15.209/15.249	Spurious Radiated Emission	Pass
5.4	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Carrier Field Strength

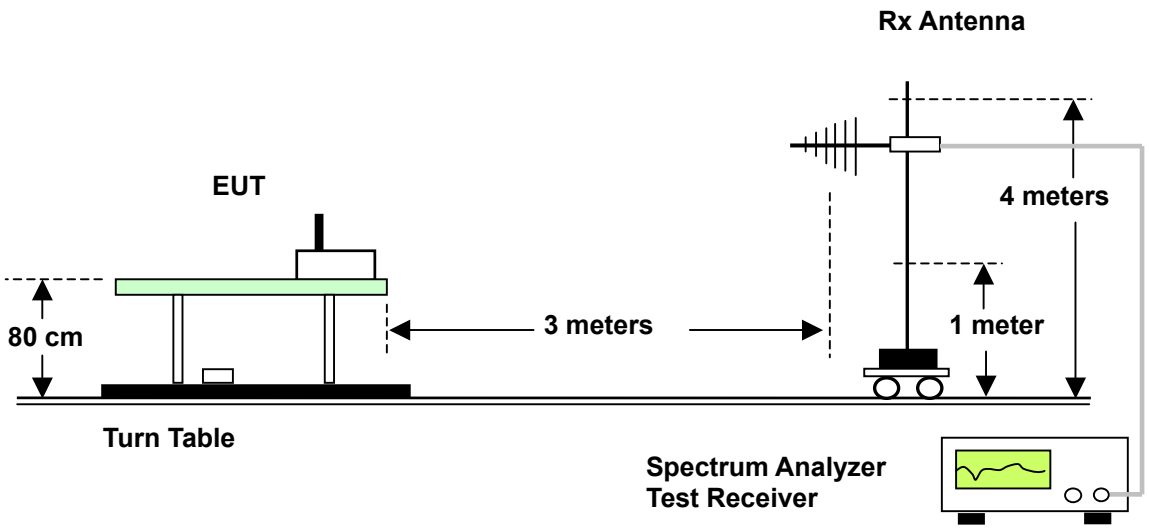
5.1.1. 5.1.1 Measuring Instruments

Item 1~9 of the table on section 7.

5.1.2. 5.1.2 Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. 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.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
6. 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.
7. 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.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

5.1.3. 5.1.3 Test Setup Layout



5.1.4. 5.1.4 Test Result

Test Channel	CH 00	Temperature	25 deg. C	Tested By	Ted Chiu
Frequency	2402MHz	Humidity	53%		

Frequency (MHz)	Level (dBuV/m)	Over Lmimt (dB)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Limit Line (dBuV/m)	Detect Mode
2389.230	55.01	-18.99	25.01	28.28	1.72	0.00	114	Peak
2389.230	42.77	-11.23	12.77	28.28	1.72	0.00	94	AV
2401.770	59.83	5.83	29.79	28.31	1.73	0.00	114	Peak
2401.770	69.82	-4.18	39.78	28.31	1.73	0.00	94	AV

Test Channel	CH 39	Temperature	25 deg. C	Tested By	Ted Chiu
Frequency	2441MHz	Humidity	53%		

Frequency (MHz)	Level (dBuV/m)	Over Lmimt (dB)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Limit Line (dBuV/m)	Detect Mode
2441.100	69.61	-4.39	39.44	28.40	1.77	0.00	114	Peak
2441.100	59.44	5.44	29.27	28.40	1.77	0.00	94	AV

Test Channel	CH 79	Temperature	25 deg. C	Tested By	Ted Chiu
Frequency	2481MHz	Humidity	63%		

Frequency (MHz)	Level (dBuV/m)	Over Lmimt (dB)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Limit Line (dBuV/m)	Detect Mode
2481.380	68.53	-5.47	38.25	28.49	1.79	0.00	114	Peak
2481.380	58.84	4.84	28.56	28.49	1.79	0.00	94	AV
2484.420	54.27	-19.73	23.99	28.49	1.79	0.00	114	Peak
2484.420	43.02	-10.98	12.74	28.49	1.79	0.00	94	AV

5.2. Test of AC Power Line Conducted Emission

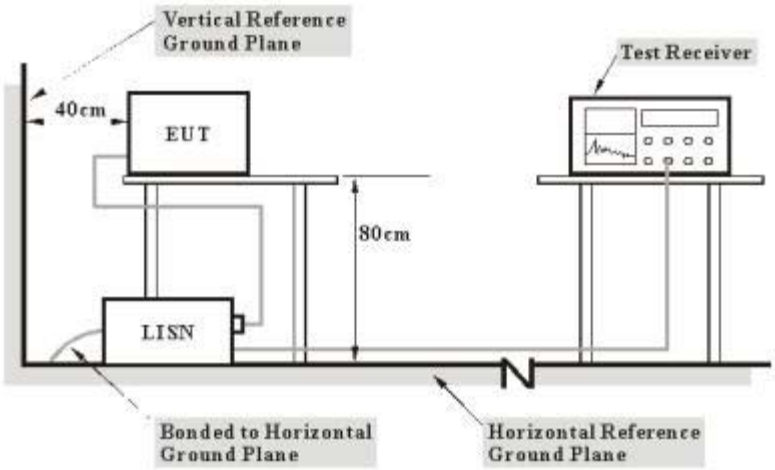
5.2.1. Measuring Instruments

Please reference item 1~5 in chapter 6 for the instruments used for testing.

5.2.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN)
4. All the support units are connected to the other LISNs. The LISN should provides 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Use the Channel & Power Controlling software to make the EUT working on selected channel and expected output power, then use the “H” Patter Generator software to make the supporting equipments stay on working condition.
7. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
8. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.

5.2.3. Test Setup Layout

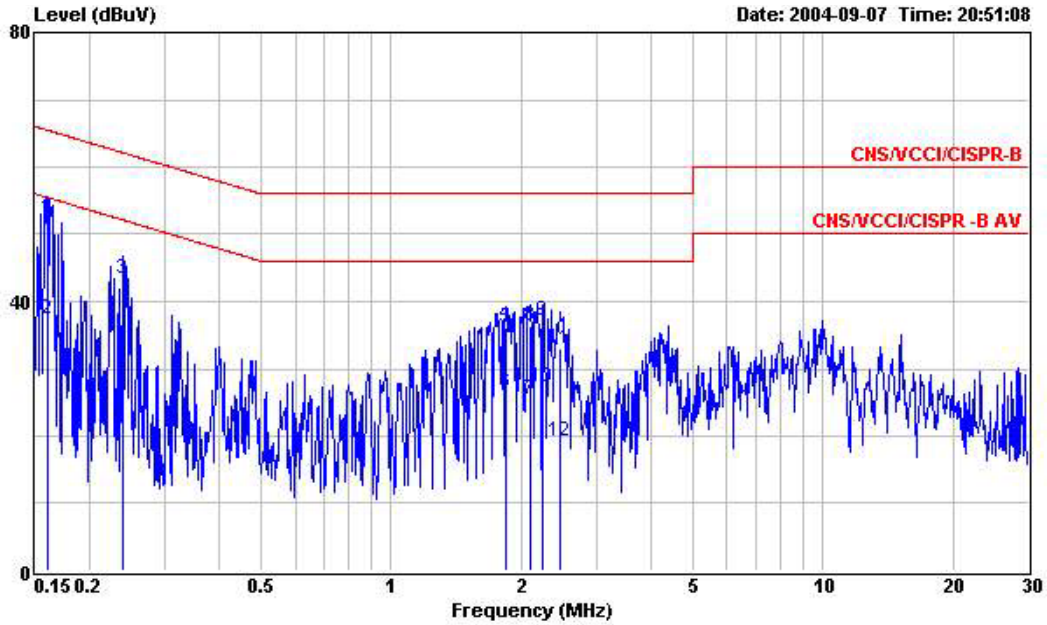


Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

5.2.4. Test Result of Conducted Emission

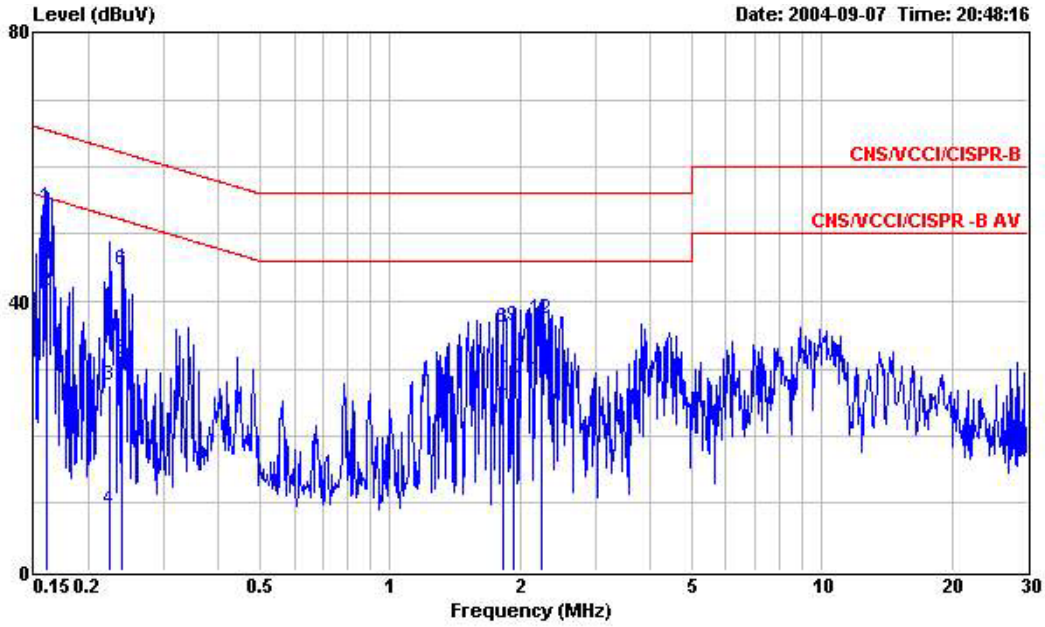
- Temperature: 24°C
- Relative Humidity: 63%
- Test Engineer: Hikaru Chan

Line to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.161	52.56	-12.88	65.44	52.42	0.10	0.04	QP
2	0.161	37.38	-18.06	55.44	37.24	0.10	0.04	Average
3	0.239	43.27	-18.86	62.13	43.12	0.10	0.05	QP
4	0.239	29.10	-23.03	52.13	28.95	0.10	0.05	Average
5	1.850	36.09	-19.91	56.00	35.90	0.10	0.09	QP
6	1.850	26.59	-19.41	46.00	26.40	0.10	0.09	Average
7	2.110	25.57	-20.43	46.00	25.37	0.10	0.10	Average
8	2.110	36.40	-19.60	56.00	36.20	0.10	0.10	QP
9	2.237	37.19	-18.81	56.00	36.99	0.10	0.10	QP
10	2.237	27.40	-18.60	46.00	27.20	0.10	0.10	Average
11	2.460	32.97	-23.03	56.00	32.77	0.10	0.10	QP
12	2.460	19.19	-26.81	46.00	18.99	0.10	0.10	Average

Neutral to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.160	53.96	-11.50	65.46	53.82	0.10	0.04	QP
2	0.160	41.62	-13.84	55.46	41.48	0.10	0.04	Average
3	0.223	27.59	-35.12	62.71	27.45	0.10	0.04	QP
4	0.223	9.13	-43.58	52.71	8.99	0.10	0.04	Average
5	0.239	31.34	-20.79	52.13	31.19	0.10	0.05	Average
6	0.239	44.56	-17.57	62.13	44.41	0.10	0.05	QP
7	1.830	24.23	-21.77	46.00	24.04	0.10	0.09	Average
8	1.830	35.98	-20.02	56.00	35.79	0.10	0.09	QP
9	1.927	36.42	-19.58	56.00	36.22	0.10	0.10	QP
10	1.927	28.56	-17.44	46.00	28.36	0.10	0.10	Average
11	2.250	28.24	-17.76	46.00	28.02	0.12	0.10	Average
12	2.250	37.31	-18.69	56.00	37.09	0.12	0.10	QP

5.2.5. Photographs of Conducted Emission Test Configuration

FRONT VIEW

REAR VIEW

5.3. Test of Spurious Radiated Emission

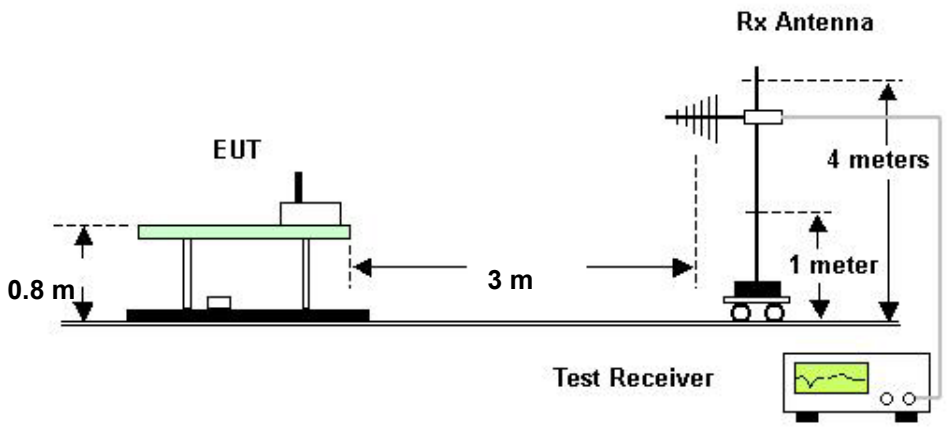
5.3.1. Measuring Instruments

Please reference item 6~17 in chapter 6 for the instruments used for testing.

5.3.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. 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.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
6. 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.
7. 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.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. 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.
11. 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.

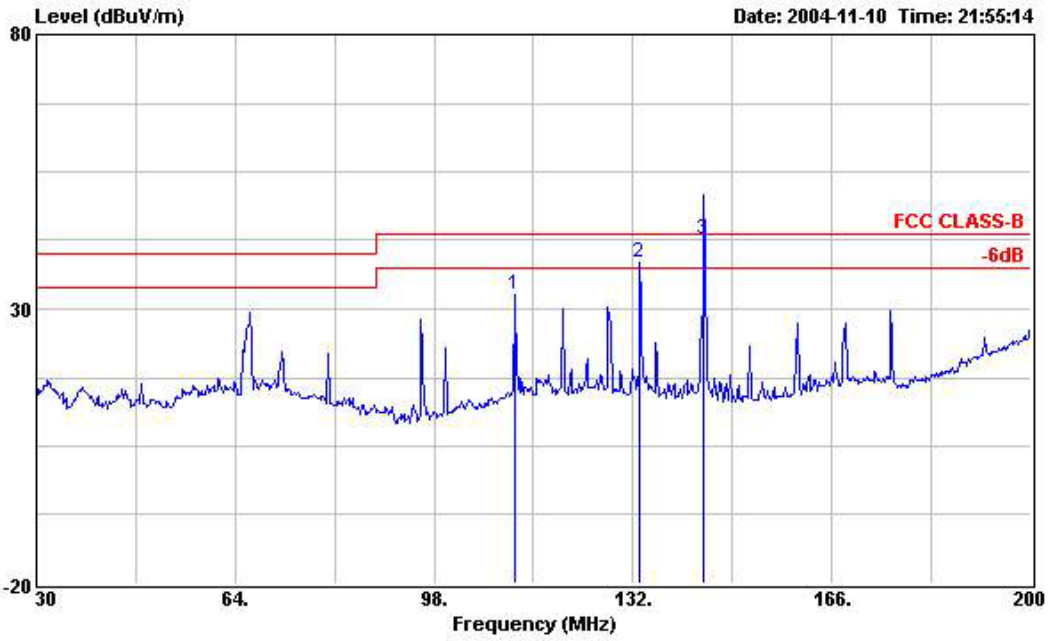
5.3.3. Test Setup Layout



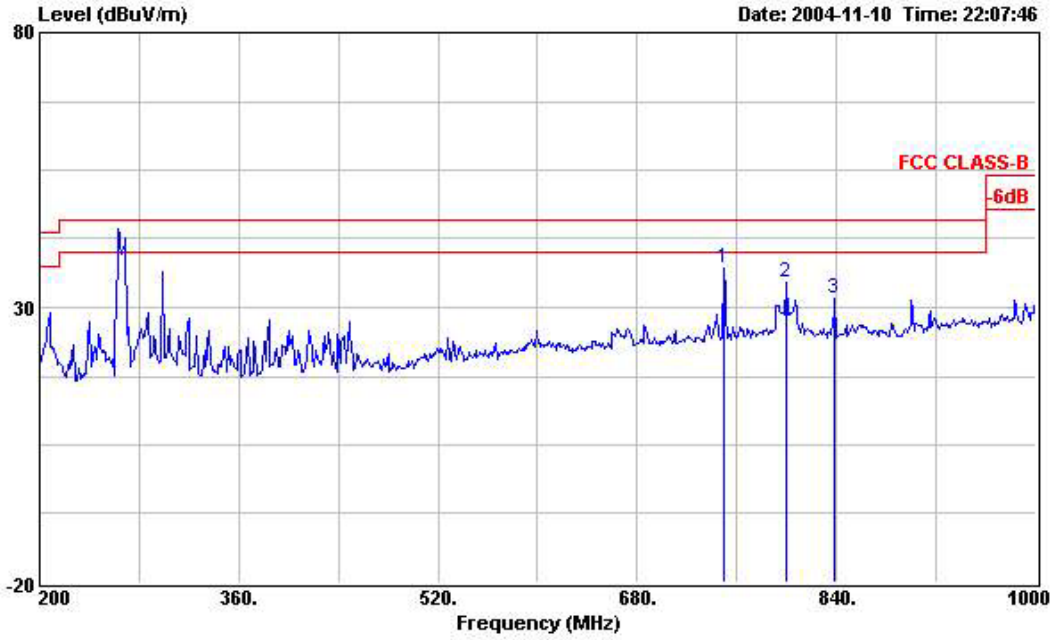
5.3.4. Test Results for CH 79 / 2481MHz (for emission below 1GHz)

- Temperature: 25°C
- Relative Humidity: 53%
- Duty Cycle of the Equipment During the Test: 50%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal

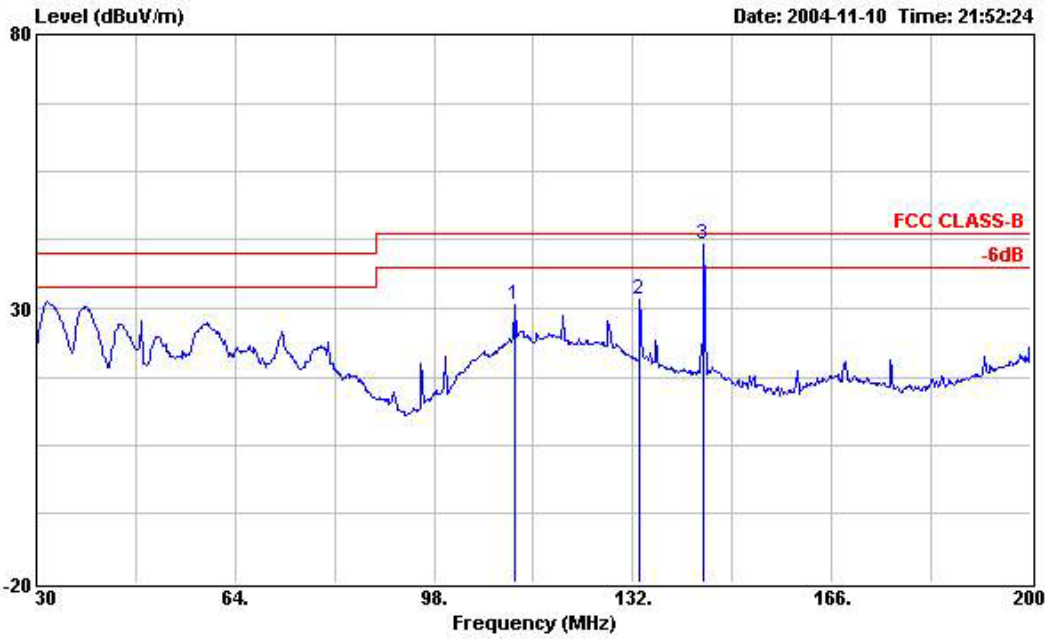


		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1		111.940	32.55	-10.95	43.50	47.11	10.73	1.89	27.18	Peak	---	---
2	!	133.190	38.56	-4.94	43.50	51.24	12.42	2.03	27.13	Peak	---	---
3	!	144.070	42.57	-0.93	43.50	55.25	12.31	2.12	27.11	QP	120	49

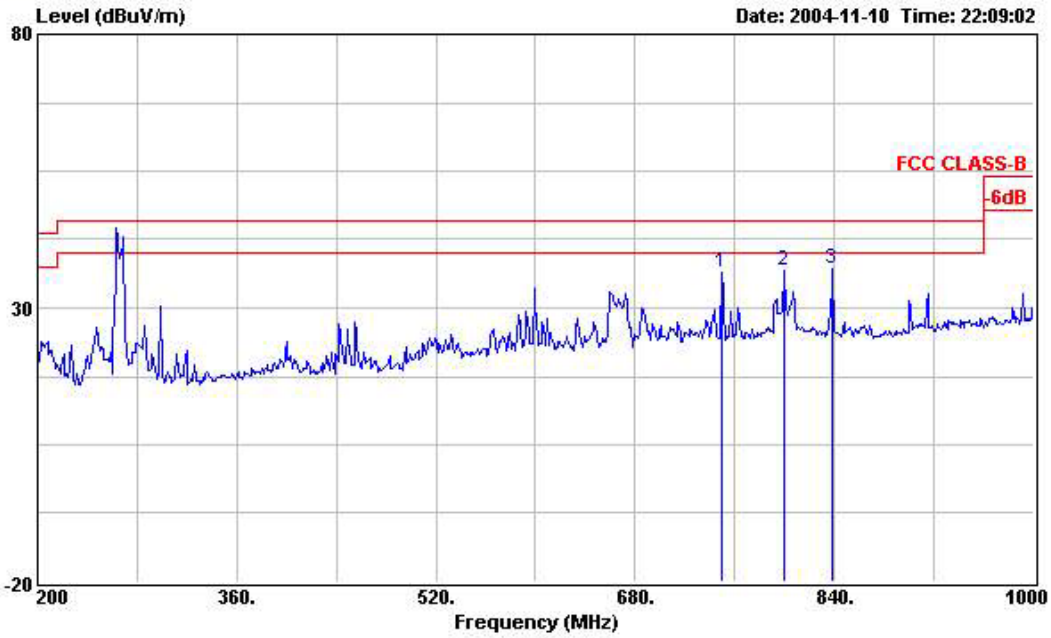


	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	749.600	37.08	-8.92	46.00	38.84	21.30	4.84	27.90	Peak	---	---
2	800.000	34.68	-11.32	46.00	35.34	21.90	5.14	27.70	Peak	---	---
3	838.400	31.61	-14.39	46.00	32.03	21.82	5.27	27.51	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	111.940	30.58	-12.92	43.50	45.14	10.73	1.89	27.18	Peak	---	---
2	133.190	31.69	-11.81	43.50	44.37	12.42	2.03	27.13	Peak	---	---
3 !	144.070	41.79	-1.71	43.50	54.47	12.31	2.12	27.11	QP	---	---



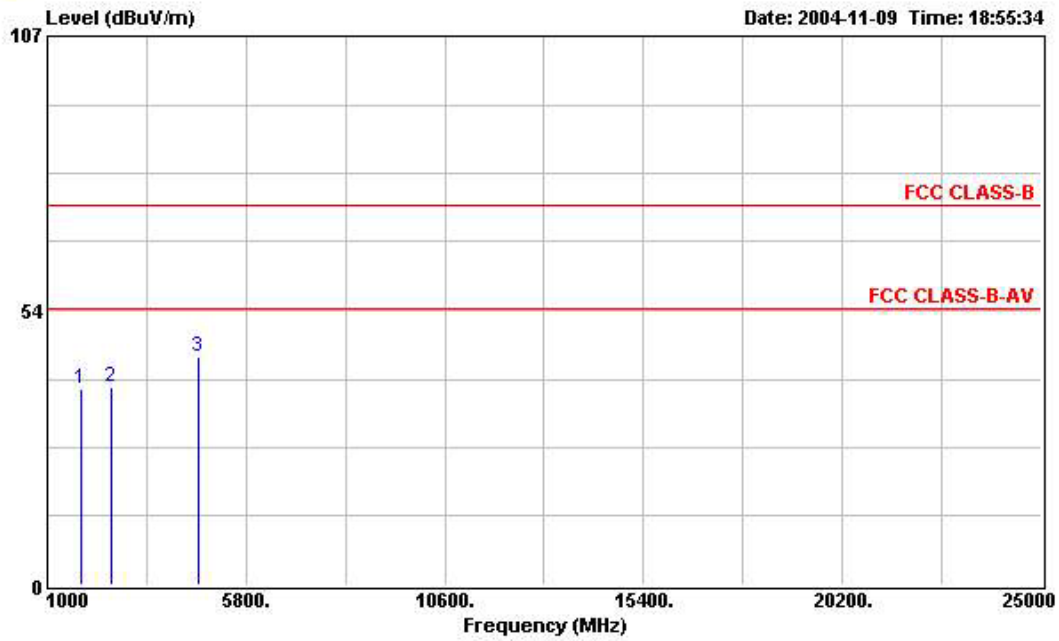
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	749.600	36.40	-9.60	46.00	38.16	21.30	4.84	27.90	Peak	---	---
2	800.000	36.92	-9.08	46.00	37.58	21.90	5.14	27.70	Peak	---	---
3	838.400	37.27	-8.73	46.00	37.69	21.82	5.27	27.51	Peak	---	---

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.5. Test Results for CH 00 / 2402 MHz (for emission above 1GHz)

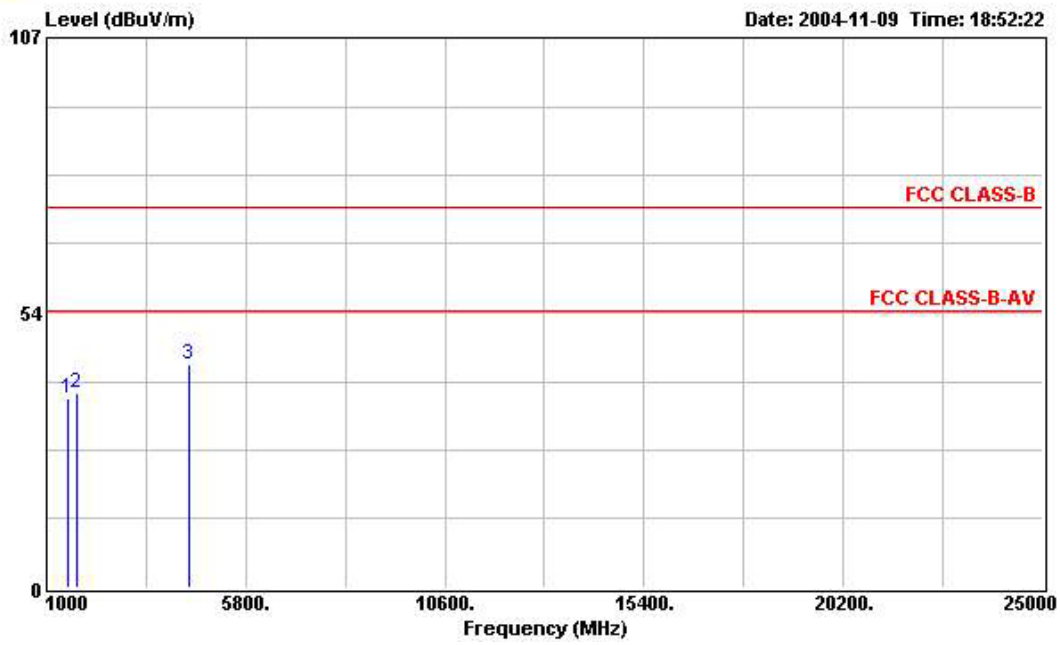
- Temperature: 25°C
- Relative Humidity: 53%
- Duty Cycle of the Equipment During the Test: 50%
- Test Engineer: Ted Chiu

(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	1836.000	38.14	-35.86	74.00	49.35	26.63	1.65	39.49	Peak	---	---
2	2556.000	38.45	-35.55	74.00	47.42	28.71	1.88	39.56	Peak	---	---
3	4632.000	44.34	-29.66	74.00	49.48	32.62	2.37	40.13	Peak	---	---

(B) Polarization: Vertical



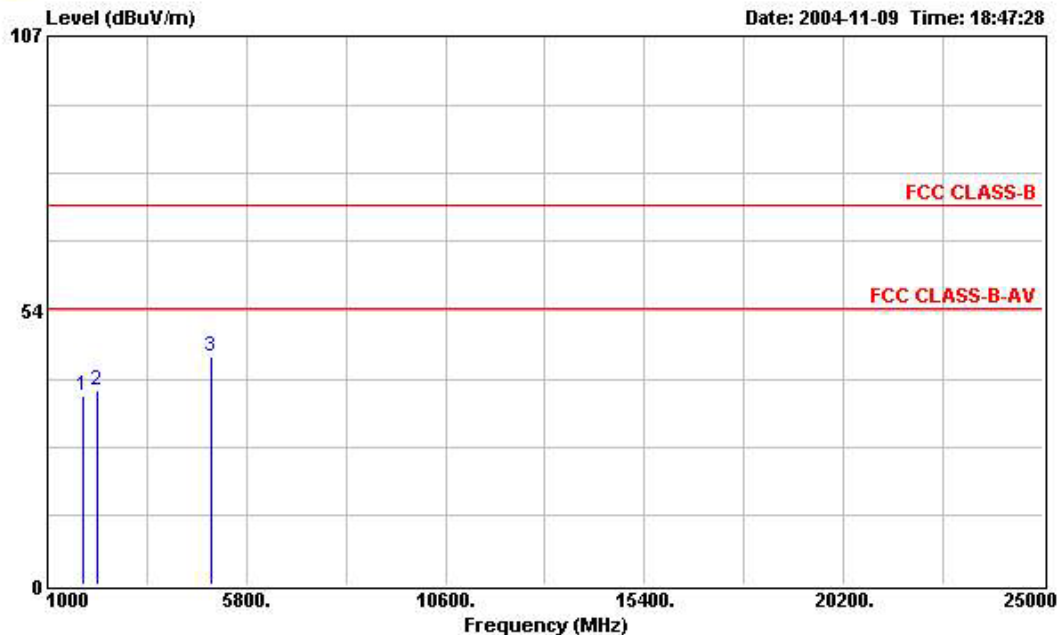
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1512.000	36.79	-37.21	74.00	49.33	25.18	1.46	39.18	Peak	---	---
2	1728.000	37.95	-36.05	74.00	49.73	26.10	1.50	39.38	Peak	---	---
3	4440.000	43.49	-30.51	74.00	48.66	32.42	2.43	40.02	Peak	---	---

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.6. Test Results for CH 39 / 2441 MHz (for emission above 1GHz)

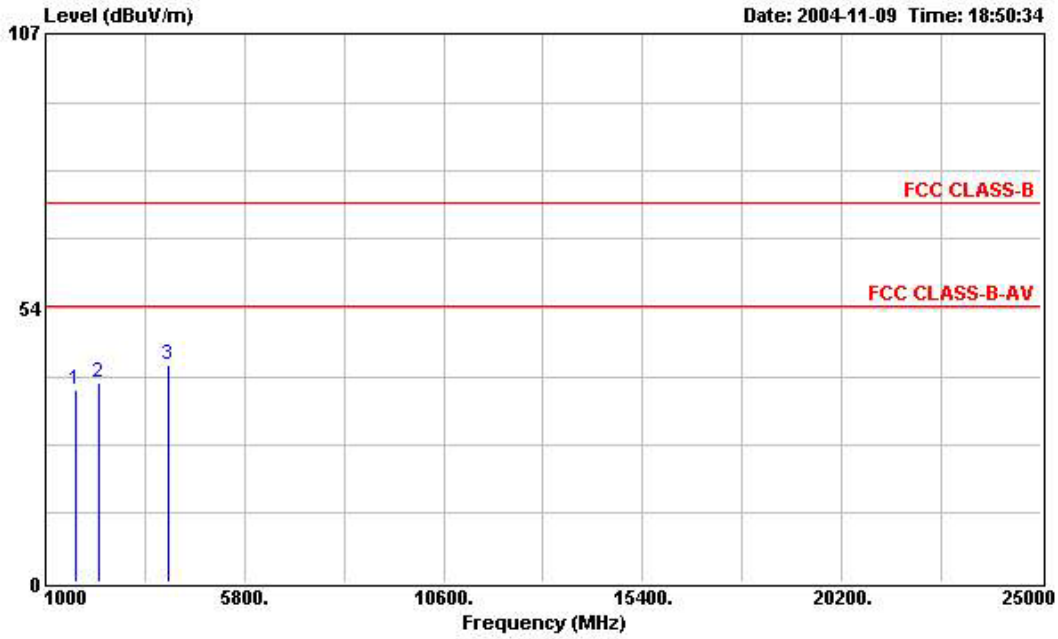
- Temperature: 25°C
- Relative Humidity: 53%
- Duty Cycle of the Equipment During the Test: 50%
- Test Engineer: Ted Chiu

(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	1856.000	36.98	-37.02	74.00	48.09	26.79	1.62	39.52	Peak	---	---
2	2212.000	37.75	-36.25	74.00	47.83	27.86	1.69	39.63	Peak	---	---
3	4956.000	44.50	-29.50	74.00	48.97	33.24	2.44	40.15	Peak	---	---

(B) Polarization: Vertical



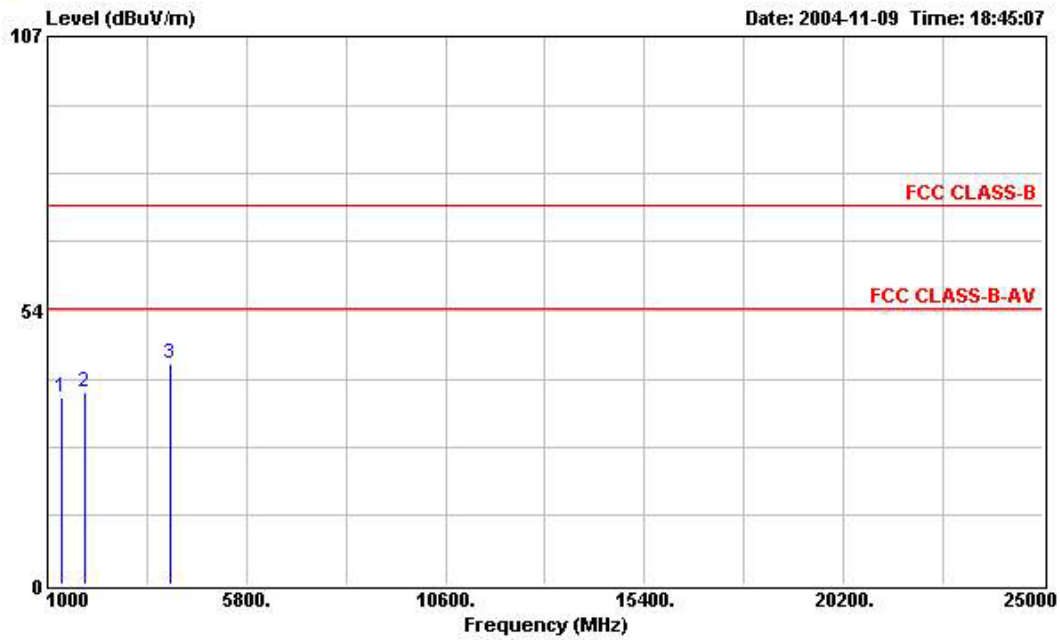
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1728.000	37.56	-36.44	74.00	49.34	26.10	1.50	39.38	Peak	---	---
2	2288.000	38.88	-35.12	74.00	48.71	28.04	1.74	39.61	Peak	---	---
3	3948.000	42.45	-31.55	74.00	48.51	32.41	0.92	39.39	Peak	---	---

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.7. Test Results for CH 79 / 2481MHz (for emission above 1GHz)

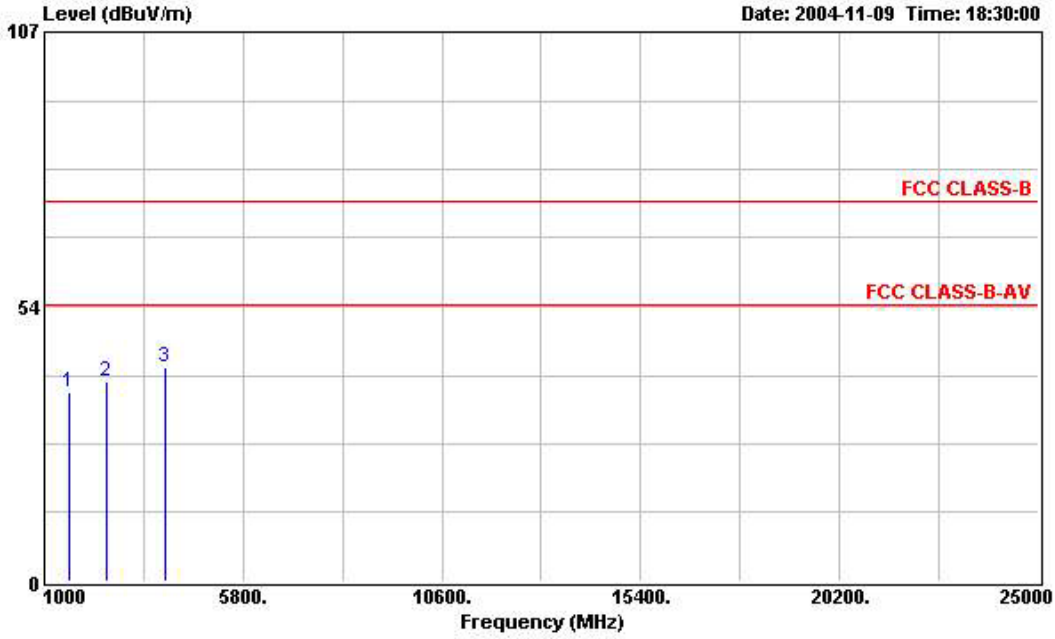
- Temperature: 25°C
- Relative Humidity: 53%
- Duty Cycle of the Equipment During the Test: 50%
- Test Engineer: Ted Chiu

(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	1364.000	36.51	-37.49	74.00	49.52	24.85	1.34	39.20	Peak	---	---
2	1916.000	37.47	-36.53	74.00	48.43	27.02	1.58	39.56	Peak	---	---
3	3976.000	43.02	-30.98	74.00	48.69	32.46	1.28	39.41	Peak	---	---

(B) Polarization: Vertical

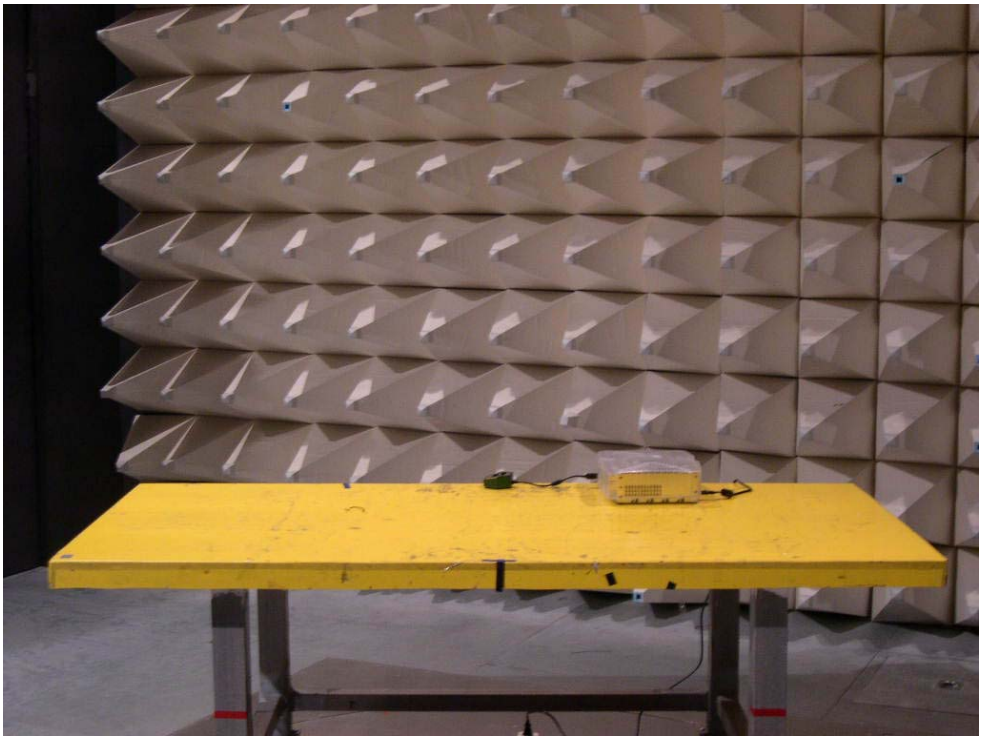


	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1620.000	36.67	-37.33	74.00	48.74	25.71	1.51	39.29	Peak	---	---
2	2508.000	38.95	-35.05	74.00	48.13	28.55	1.85	39.58	Peak	---	---
3	3940.000	41.77	-32.23	74.00	48.62	32.32	0.19	39.36	Peak	---	---

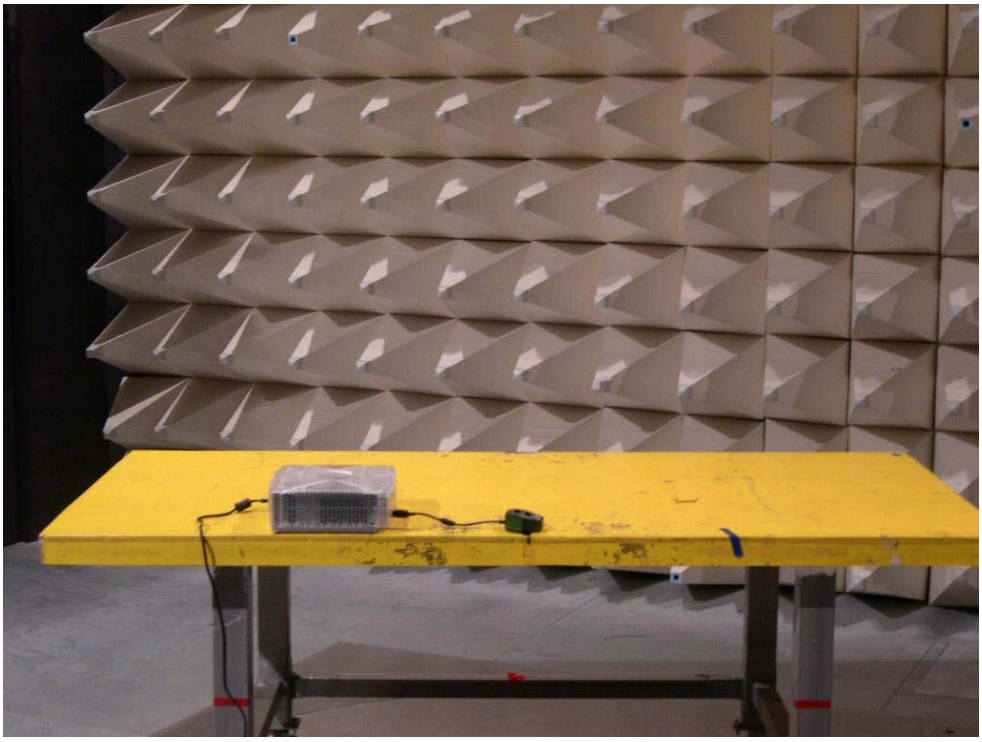
Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.3.8. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW



5.4. Antenna Requirements

5.4.1. 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.

5.4.2. Antenna Connected Construction

The antenna used in this device is printed antenna, there is no antenna connector.

6. 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	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
2	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 31, 2004	Radiation (03CH03-HY)
3	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 10, 2004	Radiation (03CH03-HY)
4	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 28, 2004	Radiation (03CH03-HY)
5	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 28, 2004	Radiation (03CH03-HY)
6	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
7	Amplifier	MITEQ	AFS44	849984	100MHz~26.5GHz	Mar. 26, 2004	Radiation (03CH03-HY)
8	Horn Antenna	EMCO	3115	6741	1GHz – 18GHz	Apr. 07, 2004	Radiation (03CH03-HY)
9	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
10	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
11	Horn Antenna	Schwarzbeck	BBHA9170	154	18GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
12	RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.